

Article XXIII.—CATALOGUE OF THE BINNEY AND
BLAND COLLECTION OF THE TERRESTRIAL AIR-
BREATHING MOLLUSKS OF THE UNITED STATES
AND TERRITORIES IN THE AMERICAN MUSEUM
OF NATURAL HISTORY, WITH ENUMERATION OF
TYPES AND FIGURED SPECIMENS, AND SUPPLE-
MENTARY NOTES.

BY L. P. GRATACAP.

WITH SIX MAPS (PLATES XLI-XLVI).

The Binney and Bland Collection of the Land Shells of the United States came into the possession of the American Museum in 1882. The importance of this well-known collection, containing some of the types and many of the specimens figured in 'The Terrestrial Air-Breathing Mollusks of the United States,' its association with the labors of three distinguished malacologists, and its excellent state of preservation warrant the publication of the present list; it being of interest and often important to know where may be found the types, figured specimens and other authentic material used as the basis of publications so authoritative as the works of Binney and Bland.

No attempt is made to give in this paper the synonymy or references to published descriptions of the species, the careful work of W. G. Binney (Bulletin of the U. S. National Museum. No. 28. A Manual of American Land Shells. Washington, 1885.), having rendered such matter entirely superfluous. While in some particulars the statements of Mr. Binney's 'Manual' may be subjected to slight rectification, his bibliography seems nearly complete. Mr. Binney's unrivaled acquaintance with American land shells and their literature is, of course, well understood.

The publication of this Catalogue seems also desirable on account of the register of specimens, printed in the appendix to Binney's 'Manual,' known as the "Binney Collection," presented to the U. S. National Museum by W. G. Binney, and also with reference to the specimens designated as the "Smithsonian Collection," and given in Binney and Bland's 'Monograph and Manual of Land and Fresh Water Shells,' Part I, published by the Smithsonian Institution in 1869.

The present Binney and Bland collection is distinct from either of these, and perhaps surpasses them both in historical and scientific interest. It includes the specimens used by Amos Binney and Augustus A. Gould in the preparation of their 'Terrestrial Air-Breathing Mollusks of the United States,' with which W. G. Binney incorporated his own specimens, and later the cabinet of his life-long co-worker and friend, Thomas Bland. It was used by Binney in the preparation of Vol. V of 'The Terrestrial Air-Breathing Mollusks of the United States,' published at Cambridge (July, 1878), as Vol. IV of the 'Bulletin' of the Museum of Comparative Zoölogy, and has been examined and commented on by many eminent students of this subject. It is thus in a high degree a historic collection.

In a letter to the writer Mr. W. G. Binney thus refers to these important collections: "The two collections (Binney and Bland) combined form the most valuable series illustrating the subject — such a series as never again can possibly be made, owing to my large correspondence with all the original authors, which enabled me to obtain their types as well as my own, my father's and Mr. Bland's — and valuable also from the care I took to collect specimens from every locality of every species."

The number of specimens now existing in the collection is in all cases accurately stated. In the references to the types and figured specimens the following abbreviations are employed:

T. M. = Terrestrial Air-Breathing of the United States, Vols. I-V, 1851-1878.

L. S. N. A. = Land and Fresh Water Shells of North America, Pt. I, 1869.

The nomenclature, with few exceptions, is that employed by Binney and Bland in labeling the collection. It is obviously at variance, in many ways, with modern lists, as that of such a master systematist as Pilsbry. But it seemed appropriate to leave the nomenclature as recorded on the specimens, for there can be no difficulty in determining its exact relationship to Pilsbry's latest compilation (Nautilus, August, 1897, to April, 1898).

The maps of so-called Biological Specific Intensity were prepared by a simple method, which while missing absolute verity, led to results consistent with the exact truth. The shading was laid on the map in a succession of equal tones *as often over the same area as there were recorded observations of different species hav-*

ing been met or taken there. In this way the regions occupied by the greater number of species became progressively deeper and deeper colored, while those with a less number remained, in exact relative proportion, lighter. The invaluable record of Dr. Pilsbry was taken as a determinative guide.

I am deeply indebted to the kindness of Dr. H. A. Pilsbry for suggestions, notes, and advice. His patience in reading the MS. and his genial and consistent helpfulness cannot be too gratefully acknowledged by the writer.

PULMONATA GEOPHILA.

A. MONOTREMATA.

AGNATHA.

FAMILY TESTACELLIDÆ.

***Glandina vanuxemensis* Lea.**

Cat. No. 1. Figured specimen, T. M., Vol. III, pl. lxii, fig. 1.
One specimen, locality unknown.

This specimen belonged to the original Amos Binney collection. It is slightly longer than the colored drawing in T. M., and differs now sensibly in color from that figure. It is a pale rufescent straw color with indistinct traces of green at the transparent lower edges. The outer lip, drawn entire, is now irregularly broken, and has lost some 5 mm. of its outer border. The longitudinal lines referred to in the original description — “surface coarsely granulated by the decussation of longitudinal and revolving lines” — are resolved in the upper half of the whorls into a series of narrowly elongated low beads which are sometimes confluent across the revolving lines but more frequently limited by them.

***Glandina truncata* (Gmelin).**

Cat. No. 2. Fig. spec., T. M., Vol. IV, pl. lxxx, fig. 9.
Cat. Nos. 2-15.

Alabama, 2.

Georgia, St. Simons Island, 13.

Florida, 6; Captive Island, 1.

South Carolina, Charleston, 6.

The collection does not contain the original specimens figured in T. M., pl. lix, lx. The chatoyant rosiness of the specimen

figured by W. G. Binney has almost disappeared, and his figure hardly expresses the slight tumidity below the suture, nor the corded effect — “delicately fluted” — of the shining longitudinal channeled striæ. Mr. Binney remarks of this specimen that it is “one of the most singular varieties of this variable species.” The varietal range of the species might be safely defined as lying between an elongated and a globose form. One vial holds a *Polygyra* taken from the stomach of one of the specimens.

***Glandina truncata*, var. *minor* Binney, MS.**

Cat. No. 16. Type of *texasiana*, var. W. G. B., T. M., Vol. IV, pl. lxxvii, fig. 21.

Three specimens, from Florida.

The two specimens received from Mr. Binney and placed with this form are more globose, the type specimen bearing a deceptive resemblance to *G. parallela* W. G. B., as limited by him (Proc. Acad. Nat. Sci. Phila., 1857), and now referred to *truncata*. The outer lip of this specimen is broken and the peculiar bluish fuliginosity, as figured, is faded. Var. *minor* is a collection term used by Dr. Binney and not in print. It is alluded to in T. M., Vol. IV, p. 141, “this well characterized species was considered as a variety of *Glandina truncata* by Binney.”

***Glandina truncata*, var. *Binney*.**

Cat. No. 17. Fig. spec., T. M., Vol. III, pl. lxi, fig. 2.

One specimen, from Key West, Florida.

This variety was regarded by W. G. Binney as a “well characterized species,” and placed under *G. texasiana* Pfeiff., but later (Manual Amer. Land Shells) referred back as a variety of *truncata*. This specimen is well preserved, still retaining the yellow and pale amethystine coloring of the figure.

***Glandina truncata*, var. *W. G. Binney*.**

Cat. No. 18. Outline figure, T. M., Vol. III, pl. lxii, fig. 2.

A specimen from Louisiana.

This variety was made the species *G. parallela* by W. G. Binney, “distinguished by its peculiar parallel sides and heavy

texture," "with a heavy callus." These features certainly fail to distinguish this species from No. 2, and Mr. Binney has referred it to *truncata*.

References : W. G. Binney, Proc. Acad. Nat. Sci. Phila., 1857, 189 ; T. M., Vol. IV, 140 ; L. S. N. A., I, 17 ; Tryon, Am. Journ. Conch., II, 226.

Glandina decussata (Desh.).

Cat. No. 20. Fig. spec., T. M., Vol. III, pl. lxi, fig. 1.

Cat. Nos. 19, 20. Three specimens, from Texas.

The figured specimen in T. M. was referred by Gould to *truncata*, and later (Proc. Acad. Nat. Sci. Phila., 1857, 189 ; T. M., IV, 139) by W. G. Binney made into "the most distinctly marked species of the genus found in America," *G. corneola*, from which specific position it was displaced by Deshayes and transferred to *Achatina decussata*, under which species Mr. Binney later placed it. In the other two specimens (No. 19) referred by Mr. Binney to this species the decussate surface is barely distinguishable. In the figured specimen the crisped surface suggests a microscopic reduction of that of *vanuxemensis*. Deshayes's figures (Pl. cxxxiv, figs. 33-35) of his *Agathine treillissée* are very good, but his description hardly separates it from *carmenensis*.

Glandina bullata Gould.

Cat. Nos. 21, 22. Three specimens, from New Orleans, Louisiana.

Certainly not distinguishable from the short globate and supposedly striate examples of *G. truncata*.

Glandina texasiana (Pfeiff.).

Cat. No. 23. One specimen, from Texas.

Mr. Binney says he "erroneously referred to this species the small form of *G. truncata*" (see above) ; on comparing the specimens in the collection the denticulate suture and low and finer striæ seem to form distinguishing features.

HOLOGNATHA.

FAMILY SELENITIDÆ.

Macrocyclus vancouverensis (*Lea*).Cat. No. 24. Fig. spec. T. M., Vol. III, pl. xx (as *Helix*).

Cat. Nos. 24-39.

California, 3; Oakland, 3; San Francisco, 6.**Montana**, Cœur d'Alene Mts., 2.**Oregon**, Astoria, 5; near Dalles, 3; Lake Klamath, 5; Portland, 2;

Willamette Valley, 2.

Washington, Kalama, 4; Columbia River, 3.

The collectors of these specimens have been the U. S. Exploring Expedition, H. Hemphill and Rev. Jos. Rowell. A very interesting specimen, apparently labeled in the handwriting of Mr. Bland, from Astoria, Oregon, affords a transition form to *sportella*. It is named on the collection labels var. *semi-decussata*, and shows on the inner whorls, with obsolete indications on the last, the revolving lines that, in crossing the "incremental striæ," sculpture the surface of *sportella*. Dr. Pilsbry suggests that it should not be accorded position and is probably var. *hybrida* Ancey.

Macrocyclus sportella (*Gould*).

Cat. No. 41 (?). Fig. spec., L. S. N. A., pt. 1, p. 57, fig. 97.

Cat. Nos. 40-42.

California, Contra Costa Co., 1.**Washington**, Tenino, 2.

A feature of differentiation from *vancouverensis*, not mentioned in published descriptions, is the formal structure of the lines of growth, "incremental striæ." They are regularly spaced and of uniform height.

Macrocyclus concava *Say*.

Cat. Nos. 43-65.

Alabama, 2.**Canada**, Pt. Levi, 1.**District Columbia**, 2.**Georgia**, 1.**Illinois**, 2.**Indiana**, 2.**Iowa**, 1.**Kentucky**, Henry Co., 3.**Michigan**, Kalamazoo, 1.**Mississippi**, Vicksburg, 2; Nat-chez Bluff, 3.**New York**, Westport, 1; Greenwich, 3; Utica, 4.**Ohio**, 6; Circleville, 2.**Pennsylvania**, Schuylkill, 1; Montgomery Co., 1; Broad Top Mt., 5; Canonsburgh, 2.**South Carolina**, Cooper River, 1.**Tennessee**, Monroe Co., 3.**Virginia**, Fairfax Co., 1.

Three specimens are marked var. *minor*. The distinction seems hardly founded in nature. They are impoverished or starved individuals.

Macrocyclus voyana *Newc.*

Cat. No. 66 (?). Fig. spec., T. M., Vol. V, p. 93, fig. 12.

Cat. Nos. 66-69.

California, 3; Alameda Co., 2; San Diego, 3.

Macrocyclus duranti (*Newc.*).

Cat. No. 70. Fig. spec., T. M., Vol. V, p. 94, fig. 13.

The specimens in the collection (Nos. 70-72) come from Catalina Is., Santa Barbara Is., and San Diego, Cal.

A MS. label expresses the opinion that this species is only the young of *M. voyana*. The ascertained young of *voyana* certainly approach it closely.

Macrocyclus hemphilli *W. G. B.*

Cat. No. 73. Two specimens, imperfect, from Olympia, Washington, collected by Mr. H. Hemphill in 1878.

At first glance the observer would be inclined to place this species under *vancouverensis*, as a variety, but comparison indicates Mr. Binney's good judgment in separating it, on account of the glassy texture, absence of all revolving lines, and the bur-nished umbilicus.

FAMILY LIMACIDÆ.

Zonites (Mesomphix) capnodes *W. G. B.*

Cat. No. 74. Type, T. M., Vol. IV, pl. lxxx, fig. 14; Vol. V, p. 98, fig. 19.

Cat. Nos. 74-79.

Alabama, 5; Uniontown, 2. **Arkansas**, 3. **Tennessee**, 2; Knoxville, 2.

Zonites (Mesomphix) fuliginosus (*Griff.*).

Cat. No. 81. Fig. spec. (?), T. M., Vol. III, pl. xxxi, fig. 1.

Cat. Nos. 81-89.

Florida, 4.

Tennessee, 6.

Ohio, Hamilton Co., 3.

South Carolina, Aiken, 2.

New York, Utica, 2.

The original (?) A. Binney specimens are without locality. There is a reversed and a sub-fossil specimen. An interesting

feature in the distribution of this species is mentioned by Dr. Call (*Mollusca of Indiana*), namely, its scarcity at Lawrenceburg, Indiana, and its frequency opposite that town on the south side of the Ohio River in Kentucky. Its metropolis seems to be Tennessee. In Mr. Pilsbry's paper on the 'Mollusca of the Great Smoky Mountains,' the boundary region of Tennessee and North Carolina, *Z. fuliginosa* var. *polita* Pils. is given as replacing the ordinary *fuliginosa* in those mountains.

Zonites (Mesomphix) friabilis (W. G. B.).

Cat. No. 93. Type, T. M., Vol. IV, pl. lxxx, fig. 2.

Fig. spec., T. M., Vol. V, p. 101, fig. 21.

Cat. Nos. 90-101.

Kentucky , Lawrence Co., 1;	Louisiana , Brashear Co., 5.
Trimble Co., 3.	Tennessee , 4.
Illinois , 1; Athens, 2; Wabash, 1.	Texas , Washington Co., 3 adult
Indiana , Madison, 6.	and 5 young.

The original specimen is from Wabash, Ill. Dr. Call (*Mollusca of Indiana*) remarks that he has "never found this species in Indiana," and enters it on the authority of Mr. Binney. The specimens from Indiana (Cat. No. 94) are quite unmistakably *friabilis*, and the initials A. G. W. on the locality label indicate Mr. Wetherby, of established fame as a collector, as the authority.

Zonites (Mesomphix) caducus (Pfeiff.).

Cat. No. 102. Fig. spec. (?), T. M., Vol. V, p. 102, fig. 22.

One specimen from Mexico possesses a well expressed insulation, but its identity with Say's *lucubrata* has been questioned by Mr. Binney himself, and Say's description, excepting "much wrinkled," fits it well enough. The oblateness of the last whorl and horny consistency are distinguishing features. The Mexican specimens in the Haines and Crooke sections of the Museum collection are, however, in some examples, strongly banded with color zones on the periphery of the volutions, which appear as a rufous ribbon at the suture.

Zonites (Mesomphix) lævigatus (Pfeiff.).

Cat. No. 104. Fig. spec., T. M., Vol. V, p. 103, fig. 24.

Cat. Nos. 103-123.

- | | |
|---|--|
| Alabama , Baldwin Co., 2. | Kentucky , op. Cincinnati, 3; Milton, Henry Co., 2; Henry Co., 1. |
| Arkansas , Helena, 2. | North Carolina , Cherokee Co., 1; Charlotte, 2. |
| Florida , St. Augustine, 3; Steinhatchie River, 2. | Tennessee , Lookout Mt., 6; Chilhowee, Val., 1; Eastern Tennessee, 3. |
| Georgia , Columbus, 3. | Texas , Orange, 1. |
| Illinois , 2. | |
| Indiana , 2. | |

This species is not mentioned in Call's 'Mollusca of Indiana' though it occurs at Lawrenceburg, in that State. An examination for Pilsbry's recent (1900) varieties *perlævis* and *latior* failed to detect them.

Zonites cultellatus (Thomson).

Cat. No. 124. Type, T. M., Vol. IV, pl. lxxvi, fig. 6. See also Proc. Acad. Nat. Sci. Phila., IX, p. 185, 57; Notes, p. 5.

The single specimen of this problematic species is from Contra Costa County, California, and, as originally suggested by Binney, is a form of *Zonites acies* Partsch. It is far less carinate, and the tabulation in the sutures is much less exsert, but the shell in all respects closely resembles *acies* with a derivative resemblance to *albanicus* Ziegl. or *compressus* Ziegl. In his 'Manual of American Land Shells' Mr. Binney excluded this from his list, as it seemed extralimital or European. Since then both Dr. Cooper and its author Mr. Thompson have alluded to its suspicious nature (Bull. Cal. Acad. Sci. IV, p. 246; Proc. Cal. Acad. Sci., series 2, I, p. 11, 1887). Mr. Thompson is apparently inclined to regard it as *Arionta mormonum* var. *circumcarinata* Stearns, a view apparently prompted by Dr. Newcomb. This is utterly unsustainable by comparison, and Binney's suggestion yet remains the most intelligible explanation of the occurrence of this beautiful and distinctive shell.

Zonites (Mesomphix) rugeli (Shuttl.).

Cat. No. 125. Two specimens from Roan Mountain, N. C., collected by Mrs. G. Andrews.

In both examples the peristome is sensibly darkened, and the intermittent growth of the shell is thus indicated by successional bands of deeper color.

Zonites (Gastrodonta) demissus (Binney).

Cat. No. 126. Type, Boston Journ. Nat. Hist., Vol. IV, pl. xvi, fig. 16. T. M., pl. xlii, fig. 1.

Cat. Nos. 126-138.

Alabama , Marengo Co., 5.	Pennsylvania , Cambria Co., 1.
Arkansas , Hot Springs, 5.	Tennessee , Union Co., 2; Roane Co., 2.
Florida , Cedar Keys, 1.	
North Carolina , Cherokee Co., 1;	Var. <i>acerra</i> Lewis.
Goldsboro, 1; Clay Co., 2.	Texas , 2.

The variety *acerra* Lewis according to Dr. Pilsbry's recent observations (Proc. Acad. Nat. Sci. Phila., 1900, p. 142) is "commonly distributed in the Smokies," attaining an altitude of 6,500 feet. The conditions operative in forming a species seem to have force in the case of this variety, but it also would seem a just tribute to nature to say she can make the same thing large and small, *acerra* being a recognition of her enlarging propensities.

Zonites (Gastrodonta) ligerus (Say).

Cat. Nos. 139-150.

Indiana , 3; New Harmony, 1.	Ohio , Hamilton Co., 6; Cincinnati, 12.
Kentucky , Whitley Co., 1; opp. Cairo, 10.	West Virginia , Big Sandy, Wayne Co., 6.
New Jersey , Red Bank, 1.	

A very high, as Dr. Pilsbry might express it, "bee hive" form from Indiana is conspicuous, and is marked by Binney as "abnormal." Following the prevalent hunt for varieties "*sagdinoides*" might be suggested as a soubriquet. As a matter of archæological interest, amongst these specimens is the *H. wardiana* Lea, with Dr. Ward's label. It was of this specimen that Gould remarks, it "is undoubtedly the young of this (*H. ligera*) species. The distinction in the animal, noticed by Dr. Ward, was afterwards ascertained by him to be merely accidental."

Zonites (Gastrodonta) intertextus (Binney).

Cat. No. 151. Outline figure, T. M., pl. xxxv, *ad dextram*.

Cat. Nos. 151-165.

Georgia , 4.	Ohio , 4; Adams Co., 5; Colum-
Indiana , 1.	bus, 3.
Kentucky , 3.	South Carolina , Aiken, 3.
Mississippi , Natchez, 1 (fossil).	Tennessee , Monroe Co., 2.
New York , Mohawk, 6; Niag-	Texas , 1.
ara, 1.	Virginia , Alleghanies, 5.

As Dr. Call has questioned the specific separation of *intertextus* from *ligerus*, and as Dr. Binney acknowledges his prolonged uncertainty as to its specific value, the result of comparing these suites of authentic specimens may be of interest.

It forms perhaps a convenient signal for the detection of specific *separateness* if we examine in a long suite of specimens the leading varietal tendency, and where in two approximate species one exhibits a predominant variation not shown in the other the original specific separation is justified. This might be called the *law of specific anomaly*.

In looking over *intertextus* a well marked tendency in form growth, not observable in *ligerus*, is seen in the compression of the spire with the consequent carination of the outer whorl. Traces of this in large and rotund specimens seem apparent in the slight peripheral angulation emphasized by the "whitish narrow band" mentioned in descriptions. The revolving lines cutting the striæ are also seen in some specimens, though generally it requires an enlightened imagination to detect them.

Zonites (Mesomphix) subplanus (Binney).

Cat. No. 166. Type, T. M., Vol. III, pl. xxxiii.

Cat. Nos. 166, 167.

The single specimen with a locality is from the Smoky Mountains, N. C. Dr. Pilsbry gives the diameter of two large individuals as $23\frac{1}{2}$ and $21\frac{1}{2}$ mm., respectively; the larger of Binney's two examples is 20.63 mm.

Zonites (Mesomphix) inornatus (Say).

Cat. No. 169. Fig. spec., T. M., Vol. III, pl. xxxiv.

Cat. Nos. 168-183.

Georgia, 2.

Kentucky, opp. Cincinnati, 2 ;
Pine Mt., Cumberland Gap, 1 ; Law-
rence Co., 2 ; Laurel and Whitley
Cos., 4.

Maryland, 4.

Massachusetts, Berkshire Co., 2.

New York, Greenwich, 5.

Ohio, 2.

Pennsylvania, Lycoming Co., 1 ;
Elk Co., 2 ; Cambria Co., 2 ; Hunt-
ingdon Co., 1 ; Warren, 1.

Virginia, 1.

The specimen indicated can only be doubtfully referred to the figure given in Gould's Binney (T. M.), being somewhat smaller than the figure. The specimen referred to by Mr. Binney (Manual of Amer. Land Shells, p. 218) as having "three well-developed, sharp, tooth-like processes on the internal thickened margin of the peristome" is in this collection.

Zonites (Hyalina) sculptilis (Bland).

Cat. Nos. 184, 185. Two specimens, one from Philadelphia, and one from mouth of Laurel River, Whitley Co., Ky.

Dr. Pilsbry remarks that "under a strong lens the surface of this species is seen to be granulose in spiral series"; Bland's specimens (type not found) do not show this feature.

Zonites elliotti (Redfield).

Cat. No. 186. Fig. spec., T. M., Vol. III, pl. lxxvii, fig. 18.

Cat. Nos. 186-188. Three specimens from East Tennessee, and three from Hayesville, N. C.

Zonites (Gastrodonta) cerinoideus (Anth.).

Cat. No. 189. One specimen from Charleston Co., S. C.

Zonites (Hyalina) cellarius (Müll.).

Cat. Nos. 190-193.

England, 4.

Italy, 2 ; Como, 2.

Massachusetts, Boston, 1.

Sweden, 1.

This globe-trotting species was announced in 1888 (Proc. Cal. Acad. Sci.) from San Francisco by Dr. Cooper, to whom Mr. W.

Sutton reported them as "numerous in a garden near the center of San Francisco," the locality producing large (.55 inch in width) specimens.

This snail was introduced, through commerce, into the United States, about fifty years ago, and maintains itself in sea-board towns or cities, living in cellars along the Atlantic coast.

Zonites (Hyalina) whitneyi (Newc.).

Cat. No. 194. Two specimens from Lake Tahoe, Nevada.

Zonites (Hyalina) nitidus (Müll.).

Cat. No. 195. Fig. spec., L. S. N. A., p. 32, fig. 35.

Cat. Nos. 195-200.

Germany, 4.

Michigan, Grand Rapids, 6.

New York, Hamilton, Madison Co., 2.

Ohio, 17; Columbus, 6.

Zonites (Hyalina) arboreus (Say).

Cat. Nos. 201-231.

Canada, Great Slave Lake, 3;
Pembina, 12; **River Rouge**, 2; **Bevins Lake**, 1.

Guadeloupe, 5.

Cuba, 6.

British America (?), 11.

Alabama, 4.

Arkansas, 5.

California, Los Angeles, 4; **San Diego Co.**, 5; **Emigrant Gap** (5000 ft.), 5; **Lake Tahoe**, 2; **Indian Valley**, 1.

District Columbia, 2.

Florida, **Sarasota Bay**, 6; **St. Augustine**, 4.

Kansas, 4.

Maine, **Orono**, 9; **Fairfield**, 9.

New Jersey, **Squam**, 6.

New Mexico, 20.

New York, **Greenwich**, 13; **Herkimer Co.**, 10.

Minnesota, 1.

Ohio, **Columbus**, 15.

Oregon, **Salem**, 8.

South Carolina, **Cooper River**, 3.

Utah, 3.

Dr. Pilsbry remarks (Mollusca of the Great Smoky Mts.) that "it seems to occur throughout the mountains, though far more sparingly than on lower country, and apparently varies from the northern shells in being somewhat smaller and frequently more widely umbilicated." Variations in the specimens so widely distributed as shown in the foregoing list are noticeable, but the impression left, after looking them over, is, that their specific uniformity is remarkable.

Zonites (Hyalina) viridulus (Menke).

Cat. Nos. 232-245.

Europe, 2.	New York, Mohawk Valley, 7;
Great Britain, 3.	Greenwich, 10.
Canada, Great Slave Lake, 2.	Ohio, Columbus, 30; N. Phila-
Georgia, 20.	delphia, 8.
Indiana, Lawrenceburg, 15.	Oregon, Portland, 7.
Maine, Orono, 18.	Texas, Bosque Co., 1.
New Mexico, Ft. Defiance, 2.	Utah, 1.

Dr. Call does not record this species for Indiana. The fifteen specimens were taken by Mr. Wetherby, and are clean and beautiful examples.

Zonites (Hyalina) indentatus (Say).

Cat. Nos. 246-258.

Canada, Missequi, 3.	Ohio, Circleville, 20; Columbus,
District Columbia, 2.	12.
Georgia, 4.	Tennessee, 5.
New Jersey, Sussex Co., 2.	Texas, 6.
New York, Greenwich, 3; Ulster	Utah, 1; Emigrant Cañon, 3.
Co., 1.	

It is difficult to resist the inclination to place this attractive little form with *sculptilis*, which it closely resembles.

Zonites (Hyalina) petrophilus Bland.

Cat. No. 259. Of this beautiful little species the collection contains four of the original lot from Knoxville, Tenn.

Dr. Pilsbry says it "is not known to occur in the Great Smoky Mountains," the form reported from that section being Dr. Pilsbry's recently described variety *pentadelphia*.

Zonites (Hyalina) wheatleyi Bland.

Cat. No. 260. Six specimens from the original locality, "The Cliffs" (on the southern bank of the Tennessee River), Knoxville, Tenn., taken by Mrs. G. Andrews.

Zonites (Hyalina) limatulus *Ward.*

Cat. Nos. 261-263. Lawrenceburg, Ind. ; Columbus, Ohio ; and San Mateo, Cal. ; numerous specimens.

The single specimen from California appears to be safely *limatulus* ; the flat spire and wide umbilicus appear to be infallible marks of separation from *arboreus*.

Zonites (Hyalina) minusculus (*Binney*).

Cat. Nos. 265-277.

Cuba , 15.	Michigan , 4.
California , Los Angeles, 5.	Ohio , 2 ; Columbus, 4.
District Columbia , Washington,	South Carolina , Sullivans Is., 6.
Georgia , 6 ; St. Simons Is., 15.	Texas , 3 ; Wash'n Co., 4.
	Without locality , 40.

Zonites (Hyalina) milium (*Morse*).

Cat. Nos. 278-281.

California, Lone Mt., 2. **Maine**, Orono, 14. **Ohio**, 7.

Zonites (Hyalina) binneyanus (*Morse*).

Cat. Nos. 282-283. Type specimens (?), from Orono, Maine.

Zonites (Hyalina) ferreus *Morse*.

Cat. No. 284. Four, from Orono, Maine.

Zonites (Hyalina) conspectus *Bland*.

Cat. Nos. 285-287.

Alaska, 4. **California**, San Francisco, 14. **Oregon**, Astoria, 4.

Zonites (Hyalina) exiguus (*Stimp*).

Cat. No. 288. Type, T. M., Vol. III, pl. lxxxvii, fig. 19.

Cat. Nos. 288, 289. Fifteen specimens, from the original locality, Orono, Maine.

The beautiful surface sculpture of this elegant species is fully revealed by a pocket lens of $\frac{1}{2}$ inch focal length.

Zonites (Hyalina) chersinellus (Dall).

Cat. No. 290. Type, L. S. N. A., p. 43, fig. 67.

Cat. Nos. 290, 291. California, Calaveras Co., 3.

The type specimen is marked as from Big Trees, California, and another specimen from Calaveras Co., Cal., is identical in character. The enlarged figure in the 'Manual of American Land Shells' is the only adequate representation of this interesting species, and is a facsimile of Dall's figure published in the Amer. Jour. Conch., Vol. II, pl. xxi, fig. 4.

Zonites (Hyalina) capsella (Gld.).

Cat. No. 292. Type (?), T. M., Vol. III, pl. xxix, fig. 1.

Cat. Nos. 292, 293. From Tennessee, and Lexington, W. Va.

Zonites (Hyalina) placentula Shuttl.

Cat. No. 294. Fig. spec., T. M., Vol. V, p. 124, fig. 44.

Cat. Nos. 294-296. Four specimens, from Monroe Co., Tenn., and St. Giles Co., Va.

This species, first united with *capsella* by Binney and afterwards separated, is now regarded by Pilsbry as a variety of *capsella*. In the collection the large size of *placentula*, the more robust last whorl and spreading umbilicus would, without a wider range of comparison, serve as distinctions.

Zonites (Hyalina) alliaris (Müll.).

Cat. Nos. 297-301.

Of this species, common in many districts in England—where the variety *viridulus* (not Menke) has also been noted—there are eleven specimens taken in the United States; one from New Jersey, three from Brooklyn, N. Y., one from Richmond, Ind., and six from Chicago. The species resembles *cellarius*. The specimen from Indiana was received from Dr. Call, though in his recent 'Mollusca of Indiana' it is not recorded. There are also three specimens from England.

Zonites (Conulus) upsoni Calkins.

Cat. No. 302. Eight specimens, from Rockford, Illinois.

Subsequently referred by Binney to *Vertigo ovata*, in a half-grown stage, a decision which seems to be correct.

Zonites (Conulus) fulvus (Drap.).

Cat. No. 303. Fig. spec., L. S. N. A., p. 46, fig. 73.

Cat. Nos. 303-330.

Canada, Red River of the North,
1; Great Slave Lake, 2; Lake St.
John, 1.

Siberia, Petropaulus, 4.

Alabama, 4; Perry Co., 11.

California, Lake Tahoe, 3.

District Columbia, 2.

Florida, St. Augustine, 1.

Maine, Orono, 50.

Michigan, Ann Arbor, 2.

Nebraska, 1.

Nevada, White Pine, 16.

New York, Buffalo, 30; Green-
wich, 4; Staten Island, 4.

Ohio, Cincinnati, 10; var. *dentatus*

Sterki, 2; Columbus, 3.

Oregon, Portland, 5.

South Carolina, Cooper River, 1.

Texas, Washington Co., 2; Bosque
Co., Mategora, 2.

Utah, Salt Lake (altitude 4500 ft.),

3.

There are also a few specimens from England and Savoy.

The above records are for *fulvus* in the former broad acceptance of the species, which is now subdivided into several species and varieties (Nautilus, XII, p. 113). The elevated and depressed forms are represented. Apparently the elevated forms are to be classed as *chersinus* Say.

Zonites (Conulus) gundlachi (Pfeiff.).

Cat. No. 331. Fig. spec., L. S. N. A., p. 48, fig. 77.

Five specimens, from Florida.

Zonites (Conulus) stearnsi (Bland).

Cat. No. 333. One specimen, from Portland, Oregon.

Zonites (Gastrodonta) gularis (Say).

Cat. Nos. 334-356.

Alabama, 5; Decatur, 4; Perry
Co., 2.

Georgia, 9; Franklin Co., 3; Co-
lumbus, 1.

Kentucky, Whitley Co., 6 +;
Henry Co., 4.

Pennsylvania, Alleghanies, 2.

Tennessee, 28 +; Union Co., 4;
Philadelphia, 2.

Virginia, 3; Lexington, 3.

Without locality, 7.

Dr. Pilsbry has examined a great number of specimens of this species, and remarks of it, that "the same sort of shell prevails throughout most of the localities thus far explored in the Great Smokies."

A group from Decatur, Ala., which Mr. Bland marked in his cabinet as *nov. sp.* are apparently young, but they are quite imperforate. A superb specimen from Kentucky, marked *major*, is five eighths of an inch (15.87 mm.) in height.

Zonites (Gastrodonta) cuspidatus *Lewis.*

Cat. No. 357. Four specimens, with wide umbilicus, from Tennessee.

Zonites (Gastrodonta) suppressus (*Say*).

Cat. Nos. 358-367.

Florida, Cowford, 1.

Michigan, 1.

New York, Staten Island, 2.

Ohio, 11; Summit, 2.

Pennsylvania, Columbia, 2.

South Carolina, Charleston, 14.

Tennessee, 1.

Virginia, Buffalo Co., 7 miles
from Lexington, 4.

Certainly very close to *gularis*.

Zonites (Gastrodonta) lasmodon (*Phillips*).

Cat. Nos. 368-371. Specimens from Alabama, Georgia, and Tennessee.

Zonites (Gastrodonta) macilentus (*Shuttl.*).

Cat. No. 372. One specimen, Knoxville, Tenn.

Zonites (Gastrodonta) significans (*Bland*).

Cat. No. 373. Three specimens, Union Co., Tenn.

Zonites (Gastrodonta) andrewsi *W. G. Binney.*

Cat. No. 374. One specimen, Roan Mt., N. C.

Zonites (Gastrodonta) internus (*Say*).

Cat. Nos. 375-379. Tennessee, Chattanooga, 8; University Place, 1; Lookout Mt., 10.

The *stephanophora* Desh., from Madeira, approaches unpleasantly near *internus*, and if taken in a neighboring district would be regarded as varietal. The lower surfaces of the two species differ; a greater rotundity, and absence of the umbilical deflection differentiates in superficial features *stephanophora* from *internus*.

Zonites (Gastrodonta) multidentatus (Binney).

Cat. Nos. 381-382. Twelve, from Ohio.

Vitrinizonites latissimus (Lewis).

Cat. Nos. 383-385. One specimen from Thunder Head in the Great Smoky Mountain Range, one from Bald Mountain, East Tennessee, animal from Roan Mountain, N. C.

Dr. Pilsbry says (Mollusca of the Great Smoky Mts.) "the species is ubiquitous in the Great Smokies everywhere above 2000 feet, though not found in great numbers, and restricted to moist places where moss carpets the rocks or logs. These conditions are met on the lower levels where the mountain slopes are densely shaded, but on the cloud-touched heights not much shade is necessary."

Vitrina limpida Gld.

Cat. Nos. 386-390.

Canada, Red River of the North, 1. Maine, Orono, 11. New York, 14.

Vitrina angelicæ Beck.

Cat. No. 391. One specimen, from Godhavn, Greenland.

Mörch remarks (Amer. Jour. of Conch.) that "the land shells of Greenland are nearly allied to those of Iceland. The *Vitrina*, the *Succinea*, and *Hyalina alliaria*, accord better with the species of Iceland than with American species."

Vitrina pfeifferi Newc.

Cat. No. 392. Fig. spec., T. M., Vol. V, p. 138, fig. 53; L. S. N. A., p. 27, fig. 23.

Cat. Nos. 392-395.

Colorado, 2. Nevada, White Pine, 5. Utah, Logan Cañon, 5000 feet.

Vitrina exilis Morelet.

Cat. No. 396. One specimen from Petropaulavski, Kamtschatka.

A membranous shell, slightly striate, peristome flaccid, impressed suture, and decrescent spire.

Limax maximus Linn.

Cat. No. 397. Internal plate, Newport, R. I., 1.

[November, 1901.]

***Limax agrestis* Linn.**

Cat. Nos. 399, 400. Internal plates.

Massachusetts, Cambridgeport, 1. **New York**, Brooklyn, 1.

Mr. G. W. Taylor (*Nautilus*, Vol. V, p. 92) notices the presence of this slug in Vancouver Island.

He says, "I believe that I first observed this slug about seven years ago in the Victoria gardens, and it has since developed into a dreadful pest. There cannot be, I think, any doubt as to the species being an introduced one, as it has not yet been noticed in any part of Vancouver Island other than in Victoria, and the specimens resemble British ones in every respect save that the milky slime is not nearly so copious."

***Limax campestris* Binney.**

Cat. No. 401. Internal plate, 1.

FAMILY HELICIDÆ.

***Helix (Patula) solitaria* Say.**

Cat. Nos. 404-414.

Idaho, Cœur d'Alene Mts., 3; near **Kentucky**, Henry Co., 2; Drennan Mission, 3. Hills, Henry Co., 5.
Indiana, Madison, 2 (1 fossil); New **Ohio**, 9; Strontian Is., Lake Erie, 2. Harmony, 2.

The fossil specimen is larger than the living examples, more robust, and with a thickened peristome. It still retains the brown revolving bands. This shell occurs in western Pennsylvania (Indiana and Allegheny Counties), as noted by E. H. Harn and S. H. Stupakoff. Bryant Walker remarks, "an inhabitant of the southern portion of Michigan; very rare in the southeastern part, where in some localities it is extinct; more common in the western."

***Helix (Patula) strigosa* Gld.**

Cat. No. 415. Fig. spec., T. M., vol. III, pl. xxvii a

Cat. No. 416. T. M., vol. V, p. 158, fig. 64.

Cat. No. 458. T. M., vol. IV, pl. lxxvii, fig. 11.

Cat. Nos. 415-483.

- Colorado**, 17; Manitou, Williams Cañon, 1; Headwaters of Colorado River, 2; Grand Cañon, Arkansas River, 3, and 12 young; Deer Creek Cañon, 26.
- South Dakota**, Black Hills, 5.
- Idaho**, 3; near Franklin (5000 ft.), 2; Salmon River, 13; White Bird, 2.
- Nebraska**, 1.
- Oregon**, 1; Eastern Cos., 5.
- Utah**, Box Elder Co. (5000 ft.), 39; Logan Cañon (5000 ft.), 2; Oquirrh Mts. (4300 ft.), 4; near Salt Lake City (4500 ft.), 14; Summit Cañon, 2; Wasatch Range, 14; Weber Cañon, 10.
- Washington**, Bitter Root River (4000 ft.), 5; Bitter Root Mts. (2200-6600 ft.), 3.
- New Mexico**, Rio Piedro, 4.
- Wyoming**, Wind River Mts., 5; Bridger Pass, 1; Big Horn Mts., 11.
- Without locality**, 20.

Dr. Binney's observation that "the species varies greatly in shape" is certainly a just tribute to the protean character of this shell. Many of the specimens have been collected by Mr. Hemphill, who has so much enlarged the varietal nomenclature of the species. The variations present six phases of form growth,—flattening of the shell with or without carination; thickening and elevation of the incremental striæ; deflection of the last whorl at the aperture; development of evenly spaced revolving ribs; presence of a callus "yoking" the apertural limits; and texture of the shell. There is also diversity in the width, depth of coloration, and absence of the color bands. Dr. Binney has indicated the "distinct specific characteristics" of the genitalia of *P. strigosa* and *P. solitaria*; in some instances of well-rounded examples of the former, the shell would hardly establish a clear separation from the latter. In alluding to the character of the interblending varieties of this species, Mr. Hemphill remarks: "Taken as a whole, this series of shells as now completed, seems to me to offer the best guide or key to the study of species that the student can have. Every known external character belonging to the genus *Helix* is so gradually modified and blended with opposite characters, that if one had the molding or making of the many and various intermediate forms, he could scarcely make the series more complete than Nature has done herself."

***Helix (Patula) hemphilli* Newc.**

Cat. Nos. 484-490. Five specimens from White Pine Creek, Nevada, at elevations of 5000 and 8000 feet; two from the Oquirrh Mts., Utah, at an elevation of 4300 feet.

Dr. Binney retains "a distinct specific name for *hemphilli* on account of the presence of side cusps and cutting points to the central and lateral teeth on its lingual membrane; otherwise the shell would be considered a variety of *strigosa*." As far as the shells subserve the ends of classification, *hemphilli* seems a not very advanced variety of *strigosa*. There is in the last whorl a noticeable tendency to a deflection of the lip.

Helix (Patula) idahoensis *Newc.*

Cat. Nos. 491-509.

Idaho, Salmon River, 2; Salmon River Mts. (1500 ft.), 2. **Utah**, Bear River, 2; Box Elder Cr. (4500 ft.), 32; near Ogden (4500 ft.), 3.

Variations in the coarseness and elevation of the radiating ribs, absence or presence of color bands, development of callus at mouth, carination — in *wasatchensis* H. becoming an explanate collar or beaded line in the suture — and height of shell are variable features.

It is an adequate commentary on the foregoing group of interblending species to quote Mr. Simpson's observation that "in the wonderful series of *Patula*, beginning with elevated shells with rounded whorls and strong radiating ribs known as *Helix idahoensis*, which varies gradually through the less elevated and smoother forms of *cooperi* and *strigosa* to *hemphilli* and *haydeni*, which are lenticular and sharply keeled with strong revolving sculpture, we find such irregular varieties or natural hybrids, which hardly admit of naming. Elevated forms are not rare, having radiating sculpture and sharp keels, in others of the same general form the ridges are revolving, thus partaking more or less of the characters of *idahoensis* and *hemphilli*; and greatly flattened shells are met with, without keels and with more or less decussated or even radiating sculpture,—in fact, in the 1500 or more specimens of this protean form in the collection of the National Museum one can observe this crossing of characters in almost every direction. To attempt to designate these hybrids, if such they are, by name is simply an impossibility."

Helix (Patula) alternata *Say.*

Cat. No. 558. Fig. spec., L. S. N. A., p. 75, fig. 126.

Cat. Nos. 510-569.

- | | |
|---|--|
| Arkansas , 4. | New York , Westport, Lake Champlain, 3; Saint Island, 3; Utica, 4. |
| Alabama , 10. | Ohio , 3; Strontian Is., 3. |
| Georgia , Franklin Co., 2. | Pennsylvania , Alleghanies, 2; Canonsburg, 2; Wissahickon, 1. |
| Illinois , 7. | South Carolina , Aiken, 4. |
| Indiana , 5. | Tennessee , 2; Sewanee, 5; Cumberland Mts., 4; Franklin Co., 8; Monroe Co., 1; Wolf River, 1. |
| Iowa , 2. | Eastern Tennessee , 7. |
| Kentucky , Lawrence Co., 2. | Texas , 10. |
| Massachusetts , Berkshire Co., 1; Marblehead, 5; House Is., Manchester, 6. | Virginia , 1; Natural Bridge, 1. |
| Michigan , 3; Sault Ste. Marie, 2; Beauford Is., Lake Huron, 1. | Vermont , Copperas Hill, 1. |
| Maine , Broken Cave Is., Casco Bay, 1. | Manitoba , Lake of the Woods, 2; Ottertail Lake, Red River of the North, 1. |
| Minnesota , St. Paul, 3; Sources of Mississippi River, 1. | Canada , 1; Point Levi, Quebec, 2. |
| Missouri , 3; St. Louis, 2. | New Brunswick , 1. |
| Nebraska , 3. | Nova Scotia , Windsor, 1. |
| New Hampshire , 3. | |
| New Jersey , 3. | |

Variation in the intensity and distribution of the color marks, partial suppression and very coarse prominence of the striæ,—the latter in its extreme form in var. *costigera* Bld.,—and flattening of the whorls are the unstable features in this shell, as they are in so many helices presenting the natural phases of oscillation within the limits of specific identity.

Dr. Pilsbry (*Nautilus*, Vol. XV, p. 6) has recognized the following subspecies :

- P. alternata fergusonii* (Bld.), New York to Maryland.
- “ “ *rarinotata* Pils., Texas.
- “ “ *carinata* Pils.; Pennsylvania to Tennessee.
- “ “ *knoxensis* Pils., Tennessee.
- “ “ *costata* Lewis, Great Smokies.
- “ “ *mordax* Shuttl., Great Smokies.

Costigera Bld. is an unpublished (MS.) collection name, and is possibly synonymous with *costata* Lewis.

***Helix (Patula) cumberlandiana* Lea.**

- Cat. No. 570. Fig. spec., T. M., pl. 26.
- Cat. No. 571. Fig. spec., L. S. N. A., p. 76, fig. 130.
- Cat. Nos. 570-572. **Tennessee**, Sewanee, 5.

Helix (Patula) perspectiva Say.

Cat. Nos. 573-582.

Georgia , Floyd Co., 7.	Tennessee , 5; Union Co., 4.
Indiana , 5; New Harmony, 8.	Texas , 5.
Ohio , 1.	Virginia , 2.
Pennsylvania , 2.	West Virginia , Lexington, 6.

The variety *carinata* from Union Co., Tenn., is almost planate, and below the periphery the striæ approach extinction. This is a collection name and without published authorization.

Helix (Patula) bryanti Harper.

Cat. No. 583. **North Carolina**, Black Mts., 4.

Certainly interchangeable with var. *carinata* of *perspectiva*.

Helix (Patula) striatella Auth.

Cat. Nos. 584-597.

Arizona , Moqui Village, 1.	Nevada , White Pine, 9.
California , Mariposa Co., 2.	Ohio , 4; Circleville, 17.
Oregon , 2.	Canada , Pembina River, 3; Riv- ière du Loup, 2; 16 Island Lake, 2;
Pennsylvania , Canonsburg, 2.	Magdalen River, 2.
Kansas , 3.	
Maine , Orono, 50.	

Amongst these are twelve specimens labelled *P. cronkhitei* Newc., about which Dr. Binney in his 'Manual of American Land Shells' expressed himself as being unable "to decide about its specific distinction from *striatella*." Dr. Binney has, however, placed *cronkhitei* with *striatella*, and in the examples, in this collection, of the former, no definable difference can be surely indicated. Dr. Pilsbry regards *cronkhitei* as barely distinguishable and its "standing as a subspecies dubious."

Helix (Patula) ruderata Studer.

Cat. No. 598. **Colorado**, Ouray Co., 3.

If a distinction between *ruderata* and *striatella* can be reasonably insisted on, it rests in the more obsolescent character of the striæ on the inferior half of the whorls in the former.

***Helix (Patula) pauper* Glä.**

Cat. No. 599. One specimen from Petropaulovski, Kamtschatka, and two from Nippon.

The delicately exsert and even character of the striæ distinguish this shell.

***Helix (Patula) horni* Gabb.**

Cat. No. 601. Two specimens from Arizona.

This species, placed now by Dr. Pilsbry in the genus *Physanophora (Microphysa)*, has been the subject of an interesting note by that authority (*Nautilus*, Vol. XIII, p. 98) in which he indicates the rather misleading features of its figure in Binney's 'Manual.' In the specimens the "cuticular riblets" described by Dall are not evident. Mr. Ashmun has collected this species in Arizona and New Mexico, and Dr. Dall has seen it in "the drift of the Yaqui River, Mexico."

***Helix (Patula) asteriscus* Morse.**

The specimen figured in T. M., Vol. IV, pl. lxxvii, fig. 9, ascribed to this collection, is lost.

Cat. Nos. 602-607. Maine, Fort William, north shore of Lake Superior, and Salem, Oregon.

***Microphysa incrustata* (Poey).**

Cat. Nos. 608, 609. Seven specimens from Cuba.

***Microphysa vortex* (Pfeiff.).**

Cat. No. 610. Fig. spec., L. S. N. A., p. 70, fig. 115.

Cat. Nos. 610-613. Florida, 1; Cuba.

Dr. Pilsbry has substituted *Physanophora* for *Microphysa*, on account of the preoccupation of the latter generic term; but the latter name has become so imbedded in the nomenclature that it seems an unnecessary violence to disturb it. His remarks (*Proc. Acad. Nat. Sci. Phila.*, Vol. XL, p. 83) can be, however, appropriately quoted: "Of course the miscellaneous collection of small *Helices* under *Microphysa* in Albers-Martens's 'Die Heli-ccen' should be to some extent dismembered, as well as the genus as constituted by Binney (*Terr. Moll.*, V), and only the species

agreeing in characters of shell and dentition with *H. boothiana*, *H. vortex*, *H. incrustata*, etc., be included. This group then, after the elimination of all snails with narrow, thorn-shaped marginal teeth, will comprise about twenty species of West Indian shells."

Microphysa ingersolli (*Bland*).

Cat. Nos. 615, 616. **Colorado**, Howardsville, 3; **Utah**, Ogden, 2.

Pristiloma lansingi (*Bland*).

Cat. No. 614. **Oregon**, Portland, 2.

The anomalous character of the dentition was pointed out by Dr. Binney, who expressed his belief that "the development of the terrestrial mollusks has been too irregular to admit of our expressing it in any satisfactory system of classification."

Hemitrochus varians (*Menke*).

Cat. No. 617. Fig. spec., T. M., Vol. III, pl. xlvii, as *rhodocheila* Binney.

Cat. Nos. 617-625. **Florida**, and **New Providence**, Bahamas.

The varieties α to η inclusive are found, θ and ι are not evidently present.

Helicodiscus lineatus (*Say*).

Cat. Nos. 629-640.

Florida, Ft. Gibson, 4.

Idaho, Salmon River, 3.

Massachusetts, Cambridge, 3.

Maine, Orono, 4.

Lake Michigan, 2.

New Jersey, Squan, 5.

New Mexico, 2.

New York, Greenwich, 10.

Texas, Washington Co., 1.

Canada, Gaspé, St. Anne, 1.

Helicodiscus fimbriatus *Wetherby*.

Cat. No. 641. **Georgia**, Tuccoa Falls, 3.

FAMILY PUPIDÆ.

Holospira roemeri *Pfeiff.*

Cat. No. 626. **Texas**, 13 miles from San Antonio, 2.

Holospira goldfussi (*Menke*).

Cat. Nos. 627, 628. **Texas**, New Braunfels, 1. **Mexico**, 1.

FAMILY STENOGYRIDÆ.

Ferussacia subcylindrica (Linn.).

Cat. Nos. 642-652.

Great Britain , 7.	New York , Staten Is., 5 ; Utica, 4.
Massachusetts , 20.	Oregon , Oregon City, 5.
Maine , Orono, 11.	Washington , Snake River, 2.
Lake Michigan , N. Buffalo, 4.	Utah , Weber Cañon (4500 ft.), 3.
Michigan , Ann Arbor, 15.	Manitoba , Red River of the North,

I.

Cœcilianella acicula Müll.

Cat. No. 653. Fig. spec., L. S. N. A., p. 227, fig. 387 (enlarged).

Cat. Nos. 653-654. **Italy**, 3 ; **Florida**, 1.

Stenogyra (Rumina) decollata (Linn.).

Cat. Nos. 655-657. **South Carolina**, Charleston, 9 ; with many immature specimens ; **Corinthia**, 4.

Dr. Binney has observed, with reference to the invariable absence of the apex of this shell, that the effect is much too constant to be accounted for by accident. The calcareous secretion forming a solid cap at the separated whorl is a possible cause rather than consequence of this curious truncation.

Stenogyra (Opeas) oconoides (D'Orb.).

Cat. Nos. 663, 664. **Texas**, 30 ; **Jamaica**, 4.

In the Texan specimens the last volution is more globose than in the Jamaican examples, and the average expression of the shells less strict and elongated.

Stenogyra (Opeas) subula Pfeiff.

Cat. Nos. 665-671.

Alabama , Mobile, 3.	South Carolina , 1.
Florida , 10.	Bahamas , 4.

Stenogyra (Melaniella) gracillima (Pfeiff.).

Cat. Nos. 672, 673. **St. Thomas**, 4.

Specimens show variation in sculpture, the sparse riblets becoming almost obsolete.

FAMILY PUPIDÆ.

Pupa (Pupilla) muscorum *Linn.*

Cat. Nos. 674-680.

Maine, 1; Portland, 19; Casco Bay, **New York**, 6,
14; Cape Elizabeth, 3. **Germany**, 4.

T. D. A. Cockerell regards it desirable to separate *muscorum* into four races, characterized by the absence of all teeth in the aperture of the shell, or by one, two, or three. It does not appear that these varieties have geographical limitation, and except as a record of structural contrasts even their exact varietal value may be questioned. In reverting to the discussion as to whether this shell should be named *marginata* Drap., Dr. Pilsbry has pointed out that, as Hanley has detected, in the expression "aperture ovate-acuminata, mucrone obtuso," used by Linnæus, the latter's acquaintance with its frequently toothed character is established, and there is "little excuse for rejecting the name *muscorum* in favor of the later *marginata*."

Pupa (Pupilla) blandi *Morse.*

Cat. Nos. 681-684.

Missouri River, Drift, Ft. Berthold, 3. **Nevada**, 1.
Utah, 3.
Nebraska, 4.

Dr. Pilsbry has made this shell a variety of *muscorum*, while Dr. Sterki maintains its specific distinctness. Its swelling and less approximate spine seems readily to distinguish it from *muscorum*, with the latter's sloping volutions and retreating apex.

Dr. Sterki (Proc. U. S. Nat. Mus., 1888) has constructed a formula for the designation of *Pupa (Vertigo)* based on the development of the apertural lamellæ. Within the limits of the same species the formula varies considerably, and, as in this species *blandi*, when so many aberrant specimens occur with almost entire apertural margins, confidence in their diagnostic value is shaken.

Pupa (Vertigo) variolosa *Gld.*

Cat. Nos. 685, 686. **Jamaica**, 1.

This specimen was separated by Dr. Sterki from *P. contracta* Say, and is unique in the collection, as No. 685 is lost.

Pupa (Pupilla) pentodon Say.

Cat. Nos. 687-690.

Maine, 9.

Michigan, 2.

Ohio, 2.

Texas, 4.

Inasmuch as Dr. Sterki has admitted that "it is difficult to draw a limit between *Pupa* and *Vertigo*, and may prove to be impossible," the retention of *Pupa* and the relegation of *Vertigo* to a subgeneric standing seems ordinary prudence.

Pupa (Vertigo) curvidens Gld.

Cat. Nos. 691-695.

Michigan, Ann Arbor, 1; New York, Huntington, L. I., 4; Ohio, 4.

This species Dr. Binney places under *pentodon*, and the specimens now labelled *curvidens* in the collection have received that name upon the authority of Dr. Sterki. In this connection Dr. Sterki's observation can be profitably remembered: "*P. curvidens* is very variable. The two extreme forms, *gracilis* and *floridana*, would unhesitatingly be regarded as widely distinct species, if not connected by intermediate forms; the latter comes nearest *P. pentodon*, the former resembles some forms of *P. hordeacella* Pilsb." Dr. Sterki has indeed urged the different habitats of these two shells as an adequate justification for their specific separation, *pentodon* preferring low moist, and *curvidens* dry upland localities.

Pupa (Vertigo) decora Gld.

Cat. No. 696. British North America, Ft. Resolution, Great Slave Lake, 10.

Pupa (Vertigo) corpulenta (Morse).

Cat. No. 697. Utah, Ogden Cañon, altitude 4500 feet, 4.

Pupa (Vertigo) rowelli Newc.

Cat. Nos. 698, 699. California, Oakland, 5.

Pupa (Vertigo) californica Rowell.

Cat. Nos. 700-702. California, Monterey, 12; San Diego, 3.

As is well known, Dr. Sterki has separated this species into five varieties, which appear limited by geographical areas. Of

these the Monterey specimens which appear strongly lamellate may represent *trinotata* Sterki, and the less dentulate San Diego examples *diegoensis* Sterki. Dr. Sterki has examined hundreds of specimens of this species and remarks that it "is variable to a very exceptional degree, so that the extreme forms appear to be, or to belong to, quite different species or *even genera*."

Pupa arizonensis (?) Gabb.

Cat. No. 703. **Nevada**, White Pine, 25.

This shell, although so labelled, is not *arizonensis* at all. Dr. Sterki has pointed this out in a MS. letter. The slightest inspection shows this. It may be *muscorum*.

Pupa (Leucocheila) fallax Say.

Cat. Nos. 704-718.

District of Columbia , 5.	Ohio , 8.
Georgia , 7.	Tennessee , Clarkeville, 12.
Kentucky , 15.	Texas , Bosque* Co., 3; Howardsville, 1.
Louisiana , New Orleans, 3.	West Virginia , Lexington, 15.
Massachusetts , New Bedford, 1.	British North America , Ft. Simson, 12.
Mississippi , Natchez, 2.	
New Jersey , Burlington, 11.	
New York , Staten Island, 6.	

This un-Pupa-like shell, in its very wide distribution, raises again interest in the contrasted range of species. The very evenly maintained character of this species at widely separated points suggests the reflection that in a more or less homogeneous geographical area species only represent localized variations, and that a cosmopolitan species in this same area expresses structural rigidity which reluctantly yields its long inherited features to the influences of climate or environment.

Pupa (Leucocheila) modica Gld.

Cat. Nos. 719-722.

Alabama, 1. **Georgia**, St. Simons Island, 20. **South Carolina**, 5.

As Dr. Binney remarks, *modica* is *almost* uniformly a smaller shell than *fallax*, but its specific distinctness seems doubtful.

Pupa (*Leucocheila*) *hordacea* Gabb.

Cat. No. 723. Type, L. S. N. A., p. 240, fig. 416, as *arizonensis*; Man. A. L. S., p. 173, fig. 164; Proc. Acad. Nat. Sci., 1900, 588.

This shell, labelled in the collection *P. arizonensis* Gabb, has become involved in a slight fog of confusion and apparent misconception. Dr. Sterki's statement explains the difficulty attached to this identification; he says: "The shells sent out under this name by Gabb, or at least most of them, are known to be nothing else than *P. fallax*, *e. g.*, those in Smithsonian Inst. Coll., in Coll. of the Acad. of Philadelphia. When I found nothing else in several of the richer private collections, I also began thinking that *P. arizonensis* was nothing else than a synonym of *fallax*, in spite of the description and even more the figure in Binney's work, which seemed to point to something of another kind. But since I have seen the (only) type specimen of that fig. in B. & B. Coll. (Central Park Mus., N. Y.), I know that there is really such a thing as *P. arizonensis* existing."

The specimen referred to is undoubtedly the one figured in 'Land Shells,' Binney & Bland, and in the 'Manual,' but it is also the same species with the shell figured as *Pupa hordacea* Gabb in the Amer. Jour. Conch., Vol. II (1866), p. 331, pl. xxi, fig. 7, and as the reference to *arizonensis* by Binney of this shell is of course subsequent to that publication it seems, as Dr. Pilsbry says, that the name stands *P. (Leucocheila) hordacea*, or, as Dr. Pilsbry writes it, *Pupoides hordaceus* (Gabb). Full discussion of this question is found in Proc. Acad. Nat. Sci. Phila., Sep., 1900, 588, Pilsbry & Vanatta.

Pupa (*Leucocheila*) *hordacea* Gabb.

Cat. No. 724. Utah, Box Elder Cañon (alt. 4000 ft.), 2.

This identification is plainly wrong, and Dr. Sterki refers the specimens to *blandi*, which they may be, or *muscorum*.

Pupa (*Leucocheila*) *armifera* Say.

Cat. Nos. 725-737.

Alabama, 2.

Illinois, 15.

Kansas, Ft. Kearney, 20.

Lake Michigan, New Buffalo, 15.

Massachusetts, Boston, 15.

Nebraska, 13.

Ohio, Columbus, 50.

Tennessee, Clarkesville, 7.

Vermont, 15.

Washington, 7.

British America, Ft. Simson, 7.

Pupa (Leucocheila) contracta Say.

Cat. Nos. 738-747.

Illinois, Mt. Carmel, 20.

Ohio, 8.

Michigan, Ann Arbor, 50.

Texas, 80; Bosquet Co., 7.

New York, Greenwich, 10.

West Indies, Jamaica, 20.

Pupa (Leucocheila) rupicola Say.

Cat. Nos. 748-752.

Georgia, 50 ±. Florida, 20. South Carolina, 7.

Though Dr. Binney expressed the hope that this species and *corticaria* would prove identical, the systematists are disinclined, apparently with some reason, so far as the shell is concerned, to unite them, and *procera* Gld., made synonymous with *rupicola* by Dr. Binney, is also still isolated by Dr. Sterki.

Pupa (Leucocheila) procera Gld.

Cat. Nos. 754-758.

District of Columbia, Washington, 7. Maryland, Baltimore, 25. Texas, Bosque Co., 3.

Pupa (Leucocheila) holzingeri Sterki.

Cat. Nos. 759-761.

Nebraska, 50. Upper Missouri River, Ft. Berthold, 100.

These specimens are labelled *rupicola* Say, but have been separated by Dr. Sterki under the above name. They are very generally whiter than *rupicola*, the spire less inclined, and the apertural features more distinct. A MS. note by Dr. Sterki avers that these shells have "no relations to *P. rupicola*."

Pupa (Leucocheila) corticaria Say.

Cat. Nos. 762-764.

Illinois, Mt. Carmel, 49.

Pupa (Leucocheila) pellucida Pfeiff.

Cat. No. 765.

Texas, New Braunfels, 3 (from Dr. Sterki). Cuba, 30 (which Dr. Sterki calls *servilis* Gld. and regards as different from *pellucida*).

Shell minute, translucent, apex white, corneous, volutions pale yellow, fine, aperture oval-quadrate, shell subperforate, lamellæ on columella strongly developed, parietal and palatal denticles less strong or absent, peristome slightly recurved and thickened, suture impressed, outline of spire tapering, surface striate with low separable oblique lines of growth, outer lip faintly sinuate, suggesting a generic reference to *Vertigo*.

With reference to its subgeneric position Dr. Sterki (Proc. U. S. Nat. Museum, Vol. II, 1888, p. 376) has remarked that "in shape and dentition it entirely agrees with *Vertigo*," a position quite firmly denied by Dr. Pilsbry, who considers *servilis* and *pellucida* solely Antillean species.

Pupa (Anthracopupa) vetusta Dawson.

Cat. No. 767. Imbedded fossil fragments in Coal Measure shale from Nova Scotia.

**Pupa (Sphyradium) edentula Drap. var. alticola
Ingersoll.**

Cat. Nos. 769, 770. Colorado, Rio la Plata, 4.

Ingersoll remarks (Rep. U. S. Geol. and Geog. Surv. Terr. 1874, Special Report on Mollusca, p. 391): "It will not be difficult to recognize this species by its parallel sides, base-like expansion of the last whorl, coarse incremental lines, and edentate aperture. It seems to be an essentially alpine species, none having been found at an elevation less than 8,000 to 9,000 feet."

Its loop-like aperture, entire and smooth, seems characteristic, and indicated by Dr. Pilsbry as "perhaps a recognizable variety."

Pupa (Sphyradium) edentula Drap. var. simplex Glä.

Cat. Nos. 771, 772.

Maine, Orono, 4. Canada, Gaspé, 1.

The aperture of *simplex* seems identical with *alticola*, but the striae are less uniformly raised and the spire is reduced. This variety is regarded by Dr. Pilsbry as "typical *edentula*."

If this species is to be retained the specimens enumerated seem to meet the requirements of Wolf's description. Dr. Pilsbry retains it in his Check List of North American Land Shells (Proc. Acad. Nat. Sci. Phila., 1889, p. 191). Dr. Pilsbry informs me that the type is in the collection of the Academy of Natural Science, Philadelphia.

Pupa (*Vertigo*) *ventricosa* (*Morse*).

Cat. Nos. 789, 790.

Maine, Westbrook, 1. New York, Greenwich, 1.

Pupa (*Vertigo*) *oscariana* *Sterki*.

Cat. No. 791. Florida, Volusia Co., 2.

Pupa (*Vertigo*) *rugosula* *Sterki*.

Cat. No. 792. Florida, Volusia Co., 5.

***Strophia incana* (*Binney*).**

Cat. No. 794. Fig. spec., T. M., vol. IV, pl. lxxix, fig. 17.

Cat. Nos. 795, 796. Type, T. M., Vol. II, p. 316 (as *maritima* Pfeiff.); Vol. III, pl. lxxviii, 5 figs.

Cat. Nos. 794-803. Florida, 12; Key Biscayne, 4; Key West, 3.

As is well known, Gould considered this species synonymous with *maritima* Pfeiff., with which certainly it has confusing resemblances. It is usually less robust, less strongly ribbed, and with a more sloping apex. Four young specimens in the collection show the bee-hive form, thin lip, quadrate aperture.

FAMILY HELICIDÆ.

Arion foliolatus* *Gld.

Cat. No. 805. Without locality.

This genus *Arion* has been regarded by Mr. Cockerell as misapplied in connection with this species, and *Phenacarion*, a new genus, proposed for its reception (Nautilus, Vol. III, p. 126). It seemed hardly necessary to do more than substitute *Prophysaon*, and under this latter genus the species will probably be placed.

[November, 1901]

Ariolimax californicus *F. G. Cooper.*

Cat. No. 806. **California**, San Mateo.

Ariolimax niger *F. G. Cooper.*

Cat. Nos. 807, 808. **California**, San Mateo.

Ariolimax andersoni *F. G. Cooper.*

Cat. No. 810. **Without locality.**

Prophysaon hemphilli *Bld. & Binn.*

Cat. No. 811. **Without locality.**

Binneya notabilis *F. G. Cooper.*

Cat. Nos. 812-814. **California**, Sta. Barbara Is., 2; Guadalupe Is., 220 miles from San Diego, 1.

Hemphillia glandulosa *Bld. & Binney.*

Cat. Nos. 815, 816. **Oregon**, Astoria.

Strobila labyrinthica (*Say*).

Cat. Nos. 817-827.

Florida, 27.

Georgia, 20.

Illinois, 1.

Maine, Orono, 14.

New Jersey, Squam, 1.

New York, Staten Island, 5.

Ohio, Columbus, 9.

Texas, 27; Bosque Co., 1.

A fossil specimen (*H. labyrinthica* Mich.), from the Department of the Drome in France, is in the collection. It is more depressed and the ribs are finer. It does not seem sensibly different from *H. pseudolabyrinthica* Sandb., given in 'Coquilles Fossiles des Environs de Paris,' Cossman, Vol. IV, pl. xii, figs. 24-26.

Strobila hubbardi (*A. D. Brown*).

Cat. No. 228. Type (?), T. M., Vol. V, p. 261, fig. 153.

Cat. Nos. 828-831.

Georgia, Bonavista, Savannah, 1. **Texas**, Indianola, Calhoun Co., 1.
Jamaica, 3.

The type is in the A. D. Brown collection at the Acad. Nat. Sci. Phila. (*vide* Pilsbry).

Gonostoma yatesi (*F. G. Cooper*).Cat. No. 832. **California**, Calaveras Co., 2.**Polygyra auriculata** *Say*.Cat. Nos. 834-841. **Florida**, Florida Keys, 14; St. Augustine, 5; Cedar Keys, 1; Fort George Is., 1; Enterprise, 1; Indian River, 3.

The extremely foliated, reflexed, and complicated outlines of the peristome of this species, evinced less markedly in other species of the same genus, seems to have some relation with the deflexed and inferiorly inclined aperture of this group of shells, and might appear to have some reference to the protection of the animal against invasion. Some curious reflections are suggested upon the possibility of these extremely scrobiculated apertures becoming inimical to the life of a species, as if an organic tendency initiated as a defence became established and strengthened to the point of obstructive interference with its life. These interrupted or constricted apertures are seen also in *Stenotrema* and *Triodopsis*, where they are associated also with inverted oral positions, but of course do not attain the curiously intricate character shown in *auriculata*. The internal teeth placed behind this apertural constriction further defend the animal against attack.

Polygyra uvulifera (*Shuttl.*).

Cat. Nos. 842-848 +.

Florida, Ft. Dallas, 4; Cape Canaveral, 4; Punta Rosa Is., 1; South-western Florida, 5; Long Key, 4; Cape Sable, 2.Variety *minor*? **Florida**, Cedar Keys, 4.

The variety *minor* is a collection label simply. Although quite generally recognized as separate species the approximating ends of two series of *auriculata* and *uvulifera* rather leave the impression that a varietal separation would perhaps better express their relations. Dr. Binney's asseveration that "*P. uvulifera* may be distinguished from *P. auriculata* by the peristome," seems often misleading, nor does the umbilical region afford in young or small specimens much more definite marks of distinction. In both species the ribbing varies from distinctly discrete and raised

lines to more smooth surfaces with scarcely exert lines of growth. Dr. Pilsbry asserts that "they *constantly* differ in the form of the basal lip adjacent to the umbilicus."

***Polygyra auriformis* (Bland).**

Cat. Nos. 849-853 and 857.

Georgia, 9; Columbus, 2. Texas, Indiana Co., 2.

Apparently in typical specimens quite distinct from *P. avara*.

***Polygyra postelliana* (Bland).**

Cat. Nos. 858-863.

Florida, Baldwin, 20 m. E. of Jacksonville, 5. North Carolina, Ft. Macon, 4. South Carolina, grove near Charleston, 1. Georgia, Wayne Co., 2; St. Simons Is., 4.

***Polygyra espiloca* (Ravenel).**

Cat. Nos. 864-867.

Georgia, St. Simons Is., 2. South Carolina, 3. Louisiana, New Orleans, 2. Texas, 2.

This shell for its size possesses a very well-developed aperture; in some examples the last whorl somewhat envelops its predecessor, producing a more obvious sutural depression.

***Polygyra avara* (Say).**

Cat. No. 868. Florida, Lake Monroe, 2.

***Polygyra ventrosula* (Pfeiff.).**

Cat. No. 869. Mexico, Mazatlan, 1.

***Polygyra hindsi* (Pfeiff.).**

Cat. Nos. 870, 871. Mexico, 2.

The depleted but evident reflection of the aperture of *ventrosula*, seen in this shell, is interesting, and suggests, taken in connection with the varieties referable to the *auriculata* type, a group arrangement of the *Polygyras* based on the architecture of the mouth.

***Polygyra texasiana* (Mori.).**

Cat. Nos. 872-879.

Indian Territory, Ft. Gibson, 2. Texas, 8. Mexico, Vera Cruz, 1; Matamoras, 7.

"Revolving rufous band" not seen.

***Polygyra triodontoides* (Bland).**

Cat. Nos. 880, 881. Texas, 3.

***Polygyra mooreana* (W. G. B.).**

Cat. No. 882. Type, T. M., Vol. IV, pl. lxxviii, fig. 24.

Cat. Nos. 882-888. Texas, 30; Bosque Co., 2; Washington Co., 1.

Cat. No. 888. Type (? of *P. tholus*), T. M., Vol. IV, pl. lxxviii, fig. 21. Three specimens from Texas.

The type specimen in the collection is pale horn color. Two specimens of *mooreana* are marked var. *minor*; mature but smaller shells.

***Polygyra hippocrepis* (Pfeiff.).**

Cat. No. 889. Texas, New Braunfels, 1.

In this shell the bulge behind the aperture might seem a variable or occasionally absent feature; Pfeiffer, however, in his original description indicates it (*pone aperturam constrictus et gibbosus-inflatus*).

***Polygyra fastigans* (L. W. Say).**

Cat. Nos. 890-893. Kentucky, Henry Co., 3; Tennessee, Franklin Co., 1.

There is one specimen marked var. which is smaller than the type specimens, and offers in its sensible but indescribable variation an illustration of Dr. Binney's remark. Dr. Pilsbry makes this a synonym of *P. fastigans* Say. See also synonymy, Manual Amer. Ld. S., p. 270. The apertural teeth vary in this species greatly, and the "stout, subtriangular, excavated, deeply entering tooth" which joins the terminations of the peristome in one specimen is dwarfed into two papillate denticles.

***Polygyra jacksoni* (Bland).**

Cat. Nos. 894, 895. Indian Territory, 1; Fort Gibson, 1.

***Polygyra troostiana* Lea.**

Cat. No. 896. Fig. Spec., L. S. N. A., p. 98, fig. 175.

Cat. Nos. 896, 897. **Tennessee**, Franklin Co., 4.

In cross section this shell, which so closely resembles *fastigans*, presents a less cycloidal outline, being appreciably more planorboid.

***Polygyra hazardi* (Bland).**

Cat. Nos. 898-904.

Alabama, Tuscumbia, 3.

Georgia, 1.

Kentucky, Frankfort, 1; Mumfordsville, 2.

Tennessee, 2; Sewanee, 2.

***Polygyra oppilata* (Mori).**

Cat. Nos. 905, 906. **Florida**, Cedar Keys, 2. **Mexico**, 1.

***Polygyra dorfeuilliana* Lea.**

Cat. Nos. 907-919.

Alabama, Coosa River, 1.

Arkansas, Hot Springs, 2.

Indian Territory, Ft. Gibson, 2.

Kentucky, 2.

Louisiana, Ouachita, 3; Red River, 2.

Missouri, Springfield, 1.

Texas, 7.

***Polygyra ariadne* (Pfeiff.).**

Cat. No. 920. Fig. Spec., T. M., Vol. IV, pl. lxxviii, figs. 1, 3, 4.

Cat. Nos. 920, 921. **Mexico**, Tamaulipas, 2.

***Polygyra septemvolva* (Say).**

Cat. No. 922. Fig. Spec., T. M., Vol. IV, pl. lxxviii, fig. 17.

Cat. Nos. 922-952. **Florida**, 200 ±; Cedar Keys, 6; Jacksonville, 17; St. Augustine, 45. **Georgia**, 5.

The collection very fully illustrates the variations of this species and the irregular disposition of the terminal whorls, also the varying inflection of the columellar peristome.

***Polygyra cereolus* (Muhlif.).**

Cat. Nos. 953-964. **Florida**, 25; Indian River, 17; Indian Pass, 2; Egmont Key, 12; Key West, 4.

The two specimens from Indian Pass are beautiful large white shells, with flexuous warped superior surfaces, and, in one, with the last whorl strongly elevated at the aperture. The winding of *cereolus* is perhaps more irregular than in *septemvolva*, and at the upper angle of the last volution the carina seems in some examples subvent and marked by a faint constriction.

***Polygyra carpenteriana* (Bland).**

Cat. No. 965. Type, L. S. N. A., p. 108, fig. 183.

Cat. Nos. 965-981. **Florida**, 18; Biscayne Key, 12; Sarasota Bay, 10; Manatee, 2; Indian River, 3; Cedar Keys, 8; Egmont Key, 7; Ft. Dallas, 6; Tampa Bay Keys, 4.

The often-expressed doubt as to the validity of this species is rather strengthened by an inspection of the specimens. Mr. Binney's distinctions, based on the "strong, acute rib-like striæ and the peculiarity of the outer whorl," do not seem uniformly present. It is certainly very near if not conspecific with *P. cereolus*.

***Polygyra febigeri* (Bland).**

Cat. Nos. 982-984. **Alabama**, Mobile, 40. **Louisiana**, New Orleans, 1; Bearhead City, 2.

***Polygyra pustula* (Fér.).**

Cat. Nos. 985-991.

Florida, 4; St. Augustine, 1. **South Carolina**, 4.
Georgia, Savannah, 4; St. Simons **Texas**, 2.
Is., 8.

***Polygyra pustuloides* (Bland).**

Cat. Nos. 992-995. **Alabama**, 2; Perry Co., 1.

***Polygyra leporina* (Gld.).**

Cat. Nos. 996-1001. **Alabama**, Morango, 2. **Indian Territory**, Ft. Gibson, 1. **Texas**, 2.

***Polygyrella polygyrella* (Bland).**

Cat. No. 1002. Fig. spec., T. M., Vol. V, pl. i, figs. 12-14.

Cat. Nos. 1002-1004. **Idaho**, Cœur d'Alene Mts., 2; White Bird Creek, 1.

The apertural forms of *Polygyra* may be rudely referred to five groups which present a rational basis for an evolutionary theory;

first, the *septemvolva* type, embracing *septemvolva*, *cereolus*, *carpenteriana*, *polygyrella*, *febigeri*, and characterized by an entire margin bent into a cusp upon the columella; second, the *ventrosula* type, where the bent edge is prolonged into a more or less calloused, tongue-like (linguiform) collar, and including *ventrosula*, *hindsi*, *texasiana*, *triodontoides*, *mooreana*, *fastigans*, *jacksoni*, *troostiana*, *hazardi*, *dorfeuilliana*, *ariadne*; third, the *hippocrepis* type, where the tongue-like collar becomes an extended loop and is crossed by a high revolute continuation of the parietal peristome, forming a triangular compartment on the shell wall. *Hippocrepis* alone constitutes this type. The fourth type is that of *auriculata*, comprising *auriculata*, *auriformis*, *woulifera*, *postelliana*, *espiloca* (this species might be placed with *ventrosula* in examples where the supplementary folds are reduced with non-ringing peristome), *avara* (?), *dorfeuilliana*. This type attains the most expanded development of an irregular aperture, becoming trilobate and internally constricted by shelly expansions, folds, etc. The fifth type is represented in *pustula*, where the peristome is decidedly connected by a weak, low lamina narrowing the aperture into a lunate slit, which if enlarged or strengthened would produce a stenotremous-like opening. This type includes *pustula*, *pustuloides*, and *leporina*.

The natural hypothesis that the primitive form of the aperture of *Polygyra* was simple seems strengthened by the fossil form *carpenteriana*, and when the analysis of any of the forms reveals a more or less impeded effort at a simple constriction producing a superior bulge and an inferior auriform palet or loop, with a reflection of the mouth from the shell, the conclusion seems warranted that the more complicated apertures were later in time. If this was true we should expect to find, as we do, the simple and complicated forms in the same district (*auriculata* and *septemvolva* in Florida), while the simple and intermediate forms would be more widely distributed (*septemvolva*, *febigeri*, *ventrosula*, *hippocrepis*, *pustula*, in Texas, Mexico, Alabama, Georgia), with the simplest most widely ranged from its metropolis (*polygyrella* in Idaho).

Stenotrema spinosum (Lea).

Cat. Nos. 1005-1008. Georgia, 12. Alabama, Perry Co., 6. Tennessee, 8.

***Stenotrema labrosum* (Bland).**

Cat. No. 1009. **Arkansas**, Hot Springs, 2.

***Stenotrema edgarianum* (Lea).**

Cat. Nos. 1010, 1011. **Alabama**, 2. **Tennessee**, 1.

In this species the "parietal" (columellar?) tooth is marginally thickened by a reffluent callous edge not seen in *stenotremum*. The two specimens from Alabama appear in this respect to be *edgarianum*.

***Stenotrema edwardsi* (Bland).**

Cat. No. 1012. **Kentucky**, 4.

***Stenotrema barbigerum* (Redf.).**

Cat. No. 1013. **North Carolina**, Hayesville, 2.

***Stenotrema stenotremum* (Fér.).**

Cat. Nos. 1014-1028.

Alabama , Clark Co., 1.	Mississippi , Adams County, 2.
Georgia , Fannin Co., 1.	Missouri , Chillicothe, 3.
Kentucky , 1; Newcastle, 5; Laurel Co., 3.	Tennessee , 4; Bradon Mt., 3.
Indiana , 2.	Texas , 1.
Louisiana , Madison Parish, 2, and 2 fossil.	Without locality , 7.

In the fossil forms the "lamelliform tooth" is deficient or undeveloped; it scales off readily, and has probably been lost in this way.

***Stenotrema hirsutum* (Say).**

Cat. Nos. 1029-1049.

District Columbia , 4.	Ohio , Circleville, 4; Elyria, 6; Co-
Georgia , Fannin Co., 3; Franklin lumbus, 9.	
Co. , 3.	Pennsylvania , Allegheny Co., 1;
Indiana , New Harmony, 8	Canonsburg, 2.
Indian Territory , Ft. Gibson, 1.	Tennessee , Cumberland Mt., 4;
Iowa , 1.	Murfreesboro, 3.
Kentucky , 5; Newcastle, 2; Whit-	Virginia , 4; Green Banner Co., 2.
ley Co., 6; Pulaski Co., 2.	Without locality , 2.
North Carolina , Roan Mt., 2.	

Stenotrema maxillatum (Gld.).

Cat. Nos. 1050, 1051. **Alabama, 2. Georgia, 2.**

Stenotrema monodon (Rack.).

Cat. No. 1052. Fig. spec., L. S. N. A., p. 122, fig. 203.
Cat. Nos. 1052-1094.

Alabama, 11 ; Perry Co., 4.	New York, Greenwich, 2.
Illinois, 4 ; clays in Cass Co., 5.	New Hampshire, North Conway, 5.
Indiana, loess, New Harmony, 7.	Ohio, 4 ; var. <i>leai</i> , 12 ; Columbus, 7.
Indian Territory, 1.	Oregon, mouth of Columbia River, 2.
Iowa, 2.	Pennsylvania, Elk Co., 1 ; Alle-
Kentucky, opposite Cairo, 1.	gheny, 1.
Massachusetts, Berkshire Co., 1.	Tennessee, 2.
Michigan, 2 ; Grand Rapids, 3.	Texas, Beaumont, 5 ; Waco, 2.
Minnesota, St. Paul, 1.	Vermont, Copperas Hill, 1.
Mississippi, 1.	Canada, Montreal, 1 ; Point Levi,
Missouri, 1 ; Council Bluffs, 4.	1.
North Carolina, Hayesville, 2.	New Brunswick, Dalhousie, 1.

This widely distributed *Stenotrema* displays some range of variation in size of shell, in height of spine, width of umbilicus, and development of the "lamelliform tooth." The figured specimen is alluded to by Dr. Binney as "a curious pathological specimen" with a remade peristome showing two successive teeth. The collection possesses two other almost identical examples of this renewal. A number of Say's *fraterna* are in the collection, showing the obliteration of the umbilicus. Along with these are specimens of the glabrous and tightly-coiled *leai*. Dr. Pilsbry writes that "*Stenotrema leai* is the typical *monodon* of Rackett. The larger, less tightly-coiled common shells (*monodon* of Binney *et al.*), now stand as var. *fraterna* Say."

Stenotrema germanum (Gld.).

Cat. Nos. 1094, 1095. **Oregon, 2.**

This species, as in some instances of *monodon*, stretches the limits of the generic separation between *Stenotrema* and *Mesodon*. Specifically, its geographical distribution alone saves it from absorption in *monodon*.

Triodopsis palliata (Say).

Cat. Nos. 1096-1120.

Illinois , 4.	Pennsylvania , Alleghanies, 1 ;
Indiana , 6.	Cambria Co., 1 ; Elk Co., 1 ; Tioga
Kentucky , 4.	Co., 1.
Louisiana , 1.	Tennessee , 9; Pittsburg Landing,
New York , 1.	2.
Ohio , 3 ; Hamilton Co., 7.	Vermont , Orange Co., 1.

Amongst these specimens, one from Ohio and one from Tennessee show a faint white line just below the limit of the last whorl, which on the interior of the shell is seen to be impressed, a faintly elevated ridge being visible. The parietal tooth varies greatly, in size, elevation, and connection of its base with the umbilical callus, and the well-known oscillation of the outline of the whorls from angular to subspherical is well shown. The variety *carolinensis* is represented by five specimens. It is a collection MS. name.

Triodopsis obstricta (Say).Cat. Nos. 1121-1127. **Georgia**, 2. **Kentucky**, Green River, 4. **Tennessee**, 3 ; Franklin Co., 2.

The featural connection between the "stout erect denticle" and the carinal wing on the whorl is well seen, the former terminating on the peristome, the thickened edge of the former. It is also noticeable that the development of this tooth is coequal with the strength and prominence of the carina.

The MS. varieties *planulata* and *carolinensis* are both present.

Triodopsis appressa (Say).Cat. No. 1128. Fig. spec., L. S. N. A., p. 130, fig. 219, as *H. tridentata*.Cat. No. 1129. Fig. spec., T. M., Vol. V, p. 305, fig. 198, var. *a*.

Cat. Nos. 1128-1159.

Alabama , 4.	North Carolina , 1.
Arkansas , 2.	Ohio , 3 ; Hamilton, 3.
Georgia , 5 ; Savannah, 3.	South Carolina , 1.
Illinois , 3.	Tennessee , 5 ; Nashville, 3.
Indiana , 5.	Virginia , 5 ; Nat. Bridge, 1.
Kentucky , McLean Co., 1 ; Henry	Bermuda , 2.
Creek, 4 ; opposite Cairo, 4.	Without locality , 12.

The figured specimen is pathological and shows two peristomes and a disconnected, very weak parietal tooth. The second mouth constricts the aperture, has a defective thickened peristome, and appears to be an abortive effort on the part of the animal to form a new mouth for the shrunken body. A very peculiar specimen is from Henry Creek, Ky. It shows a strong medial basal fold which terminates at one end in the parietal tooth and at the other forms an emargination on the lip. The Bermuda specimens are pale in color and quite flattened. The parietal tooth varies from a sharply erected triangular blade to a more extended oblique and sometimes repressed denticle.

***Triodopsis inflecta* (Say).**

Cat. No. 1160. Fig. spec., L. S. N. A., p. 128, fig. 216 (base view).

Cat. Nos. 1160-1179.

Alabama , 8.	Kentucky , Henry Co., 5; Mammoth Cave, 3.
Arkansas , 1.	Louisiana , 1.
Georgia , St. Simons Island, 4; Taylor Co., 4; Darien, 2.	Michigan (?), 6; Adams Co., 5.
Illinois , 1.	Ohio , Circleville, 6.
Indiana , 5.	Pennsylvania , 1.
Indian Territory , Ft. Gibson, 4.	Tennessee , 3; Natchez, 4; Franklin Co., 3.

The specimens vary widely in size, attaining in individuals from University Place, Franklin Co., Tenn., a diameter of $\frac{5}{8}$ in. (15.87 mm.), with, in this instance, an open and profound umbilicus.

***Triodopsis rugeli* (Shuttl.).**

Cat. Nos. 1180-1183.

Kentucky, 7. **Tennessee**, 4; Union, 3; Mophale Springs, 3.

Specimens in the General Museum Collection have a circum-peripheral white line.

***Triodopsis tridentata* (Say).**

Cat. Nos. 1184-1206.

District Columbia , 3.	2; Niagara, 3; Greenwich, 3; Utica, 6.
Florida , 1.	
Indiana , 1.	North Carolina , 4.
Kentucky , Lawrence Co., 2; Newcastle, 4.	Ohio , 11.
New Jersey , 2; Bergen Point, 3.	Pennsylvania , 3.
New York , 3; Helderberg Mts.,	Tennessee , 1.

This familiar species shows variations in the strength of the striæ, size of umbilicus, position of peristomal teeth.

Triodopsis fallax (*Say*).

Cat. Nos. 1208-1235.

Arkansas, 1.

Illinois, 2.

Kentucky, 2; Whitley Co., 1.

Louisiana, 1.

Maryland, Oakland, 8.

Missouri, Springfield, 3.

New York, Staten Island, 2.

North Carolina, 2.

Ohio, 12.

Pennsylvania, Canonsburg, 2;
Broad Top Mt., 1; Warren, 1; Lancaster Co., 3.

Virginia, 2; Green Briar Co., (2000 ft.), 2; James River, 2; Fairfax Co., 2; York River, 4.

Tennessee, 1; Franklin Co., 2;
E. Tenn., 8.

Amongst these specimens occur four somewhat aberrant individuals; one shows the incipient development of a parietal tooth some distance in front of the finished aperture, with almost complete suppression of the upper peristomal tooth; a second has the lower peristomal tooth doubled; both of these specimens are flattened.

In the third, the lower peristomal tooth is obliterated, with a marked decumbency of the last whorl below the preceding one, so that the former envelops the latter at less than half its perimeter. The forms from Staten Island are thin, small, and pellucid; three albino forms from Ohio are to be noted: the smallest specimens, in instances, show a relatively much less expanded umbilicus than the large individuals. This shell Dr. Pilsbry has identified as his own *fraudulenta*.

Triodopsis introferens (*Bland*).

Cat. Nos. 1236-1240.

District of Columbia, Georgetown, 2.

North Carolina, Concord, 1;

Georgia, Gaston Co., 1.

South Carolina, Aiken, 1.

Tennessee, Knoxville, 3.

The parietal tooth is generally more arcuate than in *fallax*, but distinctions between *introferens* and *vultuosa* are not convincing in some examples of each species of the same size. *Introferens*, by the displacement of the *fallax* of authors, becomes the *fallax* of Say.

Triodopsis hopetonensis (*Shuttl.*).

Cat. Nos. 1241-1254.

Florida, 5; St. Johns River, 3; **North Carolina**, 2.
Fort George, 2. **South Carolina**, 6; Sullivan Co.,
Georgia, Houston Co., 2; St. Simons, 2; Charleston, 4.
mons Island, 8; Hopeton, 2. **Without locality**, 12.

The difficulties of identification in some instances are illustrated in this series by the conflicting labels, *tridentata* and *fallax*, upon some specimens. It would most readily be confounded with smaller forms of *fallax*, and the distinction of Dr. Binney that its "denticles are more widely separated" than in that species seems often a very minute and questionable feature; *fallax* is generally larger, and its peristome more expanded and reflexed, though some labelled examples of *fallax*, somewhat depauperate, almost indistinguishably resemble *hopetonensis*.

Triodopsis vannostrandi (*Bland*).

Cat. Nos. 1255-1259. **Georgia**, Augusta, 2. **South Carolina**, 1; Aiken, 1. **Without locality**, 3.

Triodopsis vultuosa (*Gld.*).

Cat. Nos. 1260-1264. **Georgia**, 1. **Texas**, Beaumont, 1; Orange, 2; Eastern Texas, 1.

The variety *henrietta* Mazyck is represented by one example.

Triodopsis copei *Wetherby*.

Cat. No. 1265. **Texas**, Beaumont, 1.

Specimens of *vultuosa*, so identified by Binney, from Beaumont also, are inseparable from this species.

Triodopsis loricata (*Gld.*).

Cat. Nos. 1266-1272. **California**, Mariposa, 1; San Francisco, 9; Lone Mt., 6; Mendocino Co., 2; Mt. Diablo, 1; Alameda Co., 2; Oakland, 7.

Triodopsis levettei (*Bland*).

Cat. No. 1274. Type, Ann. Acad. Sci. N. Y., II, p. 115, fig.
New Mexico, Santa Fé, 1.

This beautiful and satisfactory species is quite smooth, with appreciable but obsolescent striæ, and sigmoidal parietal tooth.

Triodopsis mullani (Bland).

Cat. No. 1275. Idaho (?), 1.

A hyaline example, not typically *Mesodon*, depressed spire, and without peristomal teeth, umbilicus half covered.

Triodopsis (Mesodon ?) hemphilli W. G. B.

Cat. No. 1276. Idaho, Kingston, 2.

Shell with umbilicus closed, translucent, greenish brown to brown; whorls 5, filiform striate; suture impressed; aperture sub-trilobate, auriform; peristome white with faint chestnut hue, reflexed, thickened, showing on face a median furrow, inner margin without teeth but faintly protuberant on the base, parietal tooth, narrow, isolate, placed one-third of the volution below apex of aperture.

Triodopsis sanburni W. G. B.

Cat. No. 1277. Idaho, Kingston, 2.

Shell perforate, umbilicus overlapped by peristome; whorls 5, thin translucent horn, colored, aperture trilobate, peristome white, reflexed, edge divided from body whorl by a deep continuous constriction, provided with two marginal teeth, the basal triangular elongate, the lateral short, rhombic, parietal tooth arcuate oblique, with the long slope inferior.

Mesodon major (Binn.).

Cat. Nos. 1278-1305.

Florida , 1.	South Carolina , 1; Abbeville
Georgia , 12; Athens, 1; Colum-	Dist., 2; Columbia, 2; Graniteville,
bus, 6; Macon, 2; Taylor Mt., 1;	2.
Taylor Co., 1; northern Georgia, 1.	Tennessee , 2; Lookout Mt., 2;
Kentucky , 1.	Philadelphia, 2.
North Carolina , Roan Mt., 1.	Without locality , 1.

This species varies in the elevation of the spire, the clavicular character of the basal callus, becoming distinctly toothed in one individual (see Binney), and in the solidity and weight of shell. Four specimens of very similar maturity weighed respectively 1.85, 3.01, 4.03, and 6.95 grammes. With one exception these specimens were from Georgia.

The critical question of the specific separation of *major* from *albolabris* is probably not a very useful discussion. Dr. Pilsbry has, however, placed *major* under *albolabris*, and Dr. Binney has practically authorized the change.

Mesodon albolabris (Say).

Cat. Nos. 1306-1354.

- | | |
|--|--|
| Arkansas , near Helena, 2. | chez Bluff (fossil), 3. |
| District of Columbia , Wash-
ton, 4. | Missouri , 3. |
| Georgia , Macon, 2. | New Hampshire , Charlestown, 1. |
| Illinois , 1. | New York , 6; Greenwich, 2; |
| Indiana , 1. | Staten Island, 2. |
| Kentucky , 2. | Ohio , 8; Strontian Is., Lake Erie,
1. |
| Maine , 2; Casco Bay, 1. | Pennsylvania , 2; Alleghanies, 2. |
| Massachusetts , Marblehead, 3; | Tennessee , 1; University Pl., 2. |
| Manchester, 3. | Virginia , 4; Natural Bridge, 1; |
| Michigan , 4; Sault St. Marie, 1. | Norfolk, 1. |
| Minnesota , Vermilion Lake, 1. | Canada , Restigouche River, 2. |
| Mississippi , Vicksburg, 1; Nat- | Without locality , 21. |

The posterior surface of the reflexed peristome still retains, in many specimens, an orange epidermal flush of color.

Mesodon divesta (Gld.).

Cat. No. 1355. Type, L. S. N. A., p. 139, fig. 233.

Cat. Nos. 1355, 1356. **Arkansas**, 1; Hot Springs, 2.

Mesodon multilineata (Say).

Cat. No. 1357. Fig. spec., L. S. N. A., p. 139, fig. 234.

Cat. Nos. 1357-1383.

- | | |
|---------------------------------------|---|
| Illinois , Vermilion River, 1. | Minnesota , St. Paul, 2; Vermilion
Lake, 2. |
| Indiana , 10; New Harmony, 4. | New York , 2. |
| Iowa , 1. | Ohio , 8; Columbus, 5; Circle-
ville, 4; Elyria, 4. |
| Kentucky , Henry Co., 1. | Without locality , 14. |
| Michigan , 5; Grand Rapids, 3; | |
| Kalamazoo, 1. | |

Many examples have the revolving bands almost or entirely suppressed, with sometimes deeper color and again light rosy tints varying to white. A group showing variations in the color stripes

exhibits the very unequal number, width, and disposition of these lines. The usual depressed and covered umbilical area, in individuals from Columbus, Ohio, is replaced by a half-covered or entirely open umbilicus, caused by the erect position of the peristomal lip, which is not in these instances reflexed over the umbilical opening. These umbilicated examples are not large shells, neither are they below the average weight of other imperforate shells of the same size.

Mesodon pennsylvanica (Green).

Cat. Nos. 1384-1393.

Illinois , 1.	Virginia , 1; Red Sulphur Springs,
Kentucky , Covington, 3.	Monroe Co., 1.
Ohio , 11; Circleville, 2; Colum-	Without locality , 1.
bus, 1.	

A perforate (umbilicated) example occurs, with the basal limb of the peristome sharply angulated.

Mesodon mitchelliana Lea.

Cat. No. 1394. Fig. spec., L. S. N. A., p. 142, fig. 240.

Cat. Nos. 1394-1400.

Kentucky , 4; opp. Cairo, 2.	Virginia , 1.
North Carolina , Cherokee Co., 2.	Without locality , 1.
Ohio , 10; Columbus, 5.	

Mesodon elevata Say.

Cat. Nos. 1401-1416.

Alabama , Stevenson, 2.	Mississippi , Vicksburg, 2.
Georgia , 1; Yellow River (?), 1.	Missouri , St. Louis, 1.
Illinois , 6.	Ohio , 2; Cincinnati, 4.
Indiana , 1.	Tennessee , 2; Jefferson Co., 1;
Kentucky , 5.	eastern Tennessee, 6.
Louisiana , 1.	Without locality , 5.

Umbilicated examples occur in young individuals before the peristome or basal callus has developed. In a fossil example from Louisiana the penultimate whorl overlaps and is separated from the preceding one, forming a sensible groove. This irregularity in the winding is simply individual.

Mesodon clarki (*Lea*).

Cat. No. 1417. North Carolina, Cherokee Co., 2.

Mesodon christyi *Bland*.

Cat. No. 1418. North Carolina, 1.

A poor exolete broken example.

Mesodon exoleta (*Binn.*).

Cat. Nos. 1419-1435.

Alabama , Walker Co., 2.	New York , western, 1.
Georgia , 3.	Ohio , 7.
Illinois , 3.	Pennsylvania , Broad Top Mt., 3.
Indiana , 4.	Tennessee , 2; eastern Tennes-
Mississippi , Vicksburg (fossil), 2; see, 2.	
Natchez Bluff (fossil), 1.	Without locality , 6

A large example labelled "type A. B." is certainly not the specimen figured on Pl. X, T. M., Vol. III, unless that figure is reduced in size from the type, and the irregularities of the surface and markings have been omitted. The parietal tooth, even in large specimens, is frequently absent.

Mesodon wheatleyi *Bland*.

Cat. Nos. 1436-1438. North Carolina, Hayesville, 1; Roan Mt., 2; Tennessee, 1.

Mesodon dentifera (*Binn.*).

Cat. No. 1439. Type, T. M., Vol. III, pl. xii.

Cat. Nos. 1439-1441. New York, Livingston Co. 1. Pennsylvania, Elk Co., 1. Vermont, 1.

Mesodon roemeri (*Pfeiff.*).

Cat. Nos. 1442-1446. Texas, Caldwell Co., 1. Without locality, 1.

The specimens show the umbilicated and imperforate forms, the parietal tooth present and absent, and the incipient callosity connecting the tooth with the basal margin of the peristome.

Mesodon wetherbyi (*Bland*).

Cat. Nos. 1447, 1448. **Kentucky**, Whitley Co., 2. **North Carolina**, Roan Mt., 2.

A varietal form from Roan Mountain is quite planulate, the last volution subcarinate, green, with the parietal tooth extending across the aperture, and, in one specimen, continuous with the peristome. This varietal form has been referred by Pilsbry to the species *subpalliata*.

Mesodon andrewsi *W. G. B.*

Cat. Nos. 1449-1452. **North Carolina**, 2; Roan Mt., 6.

One very large example has a width of 6.13 mm.

Mesodon ptychophorus (*Brown*).

Cat. No. 1453. Fig. spec., T. M., Vol. V, Suppl. II, pl. i, figs. 3, 16.

Cat. Nos. 1453-1455. **Idaho**, 5.

This variety of *townsendiana* is represented by two forms, one coarsely striate, and a smoother form.

Mesodon thyroides (*Say*).

Cat. Nos. 1456-1510.

Alabama , 3; Prairie Bluff, 2.	New York , 3; western New York,
Arkansas , 5; near Helena, 2.	3; Long Island, 2; Staten Island, 3.
District Columbia , Washington,	North Carolina , 4.
2.	Ohio , 11; Cunningham Is., 3.
Georgia , 1; Columbus, 2; St.	Pennsylvania , Germantown, 11;
Johns Is., 1; St. Simons Is., 4.	Broad Top Mt., 3.
Illinois , 2.	South Carolina , Graniteville, 3.
Indiana , 4; Adamsville, 1.	Tennessee , 2.
Kentucky , Henry Co., 2; oppo-	Texas , 9.
site Cairo, 2.	Virginia , Norfolk, 3; Natural
Louisiana , Madison Parish, 2.	Bridge, 1; Lexington, 4; James
Michigan , 1; Grand Rapids, 2.	River, 3.
Mississippi , 3.	Wisconsin , 1.
New Jersey , Burlington, 3.	Without locality , 24.

The thickening of the shell and its increased weight are very marked in some specimens, large individuals being exceeded in weight by much smaller shells whose texture is dense, porcellanous,

and somewhat opaque. The marked orange tint on the back of the reflexed lip is noticeable, but this deepening of the epidermal tissue behind the lip is observable in almost all *Helicidæ* with reflected peristomes. A very aberrant specimen from Indiana has an elevated spire, the volutions free and stepped one above the other. This disengagement has brought the upper edge of the lip of the last volution down below the shoulder of the penultimate whorl, and a callus closely resembling the normal tooth is coincident with it. The development of internal teeth, or denticles, "fulcrums," etc., and the apertural nodes have attracted attention; Godwin Austen, Brot, Moricand, Fischer, Mouquin-Tandon, Lea, Binney, and others have offered suggestions as to their functional significance and origin. The very unequal appearance of the "tooth-like process" in *thyroides*, its complete suppression in some cases, and the range of its development, from a scarcely traceable callus to a conspicuous prominence in others, led the writer to believe that its presence or absence bore some relation to the constriction or enlargement of the aperture itself,—that it was in the nature of a secretion stimulated by pressure at that point. The results, after measuring many shells, were utterly inconclusive. There did seem some connection between the habitat of the specimens and the development of this "parietal tooth," the individuals grown in limestone regions being *generally* characterized by its presence, while those from schistose or serpentine areas are apt to be toothless.

Mesodon bucculenta (*Gld.*).

Cat. No. 1511. Fig. spec., L. S. N. A., p. 149, fig. 254.

Cat. Nos. 1511–1527. **Texas**, 10; **Beaumont**, 4; **Houston**, 4; **Washington Co.**, 8. **Without locality**, 22.

Mesodon clausa (*Say*).

Cat. Nos. 1528–1544.

Alabama , 8; Selma , 8.	Missouri , 4.
Indiana , 2.	Ohio , 1; Hamilton Co. , 5.
Indian Terr. , 2.	Tennessee , 2; Franklin Co. , 3.
Kentucky , 3; Henry Co. , 1; Licking River , 3.	Without locality , 8.

The specimens from Selma are quite coarsely striated, the striæ becoming riblets.

Mesodon columbiana (*Lea*).

Cat. Nos. 1545-1559.

California, 17; **Oakland**, 2; **Mendocino Co.**, 1; **San Francisco**, 2; **San Leandro**, 2; **Santa Cruz**, 3. **Oregon**, **Portland**, 2; **Salem**, 1. **Sitka**, 2. **Without locality**, 3.

There is a marked tendency in this shell to produce a straight margin at the basal portion of the aperture.

Mesodon downieana (*Bland*).

Cat. No. 1560. **Kentucky**, **Whitley Co.**, 1.

Mesodon lawi (*Lewis*).

Cat. No. 1561. **North Carolina**, **Playesville**, **Clay Co.**, 2.

Mesodon jejuna (*Say*).

Cat. Nos. 1562-1566.

Florida, **Indian River**, 3; **Sarasota Bay**, 2; **St. Augustine**, 1. **Georgia**, **Savannah**, 3; **St. Simons Is.**, 2.

Mesodon mobiliana (*Lea*).

Cat. Nos. 1567-1570. **Alabama**, **Mobile**, 1. **Florida**, **Jacksonville**, 4. **Georgia**, **Brunswick Co.**, 3.

Mesodon devia (*Gld.*).

Cat. Nos. 1571-1577.

Idaho, 2; **Salmon River**, 3. **Washington**, 3; **banks of Snake River**, 2. **Oregon**, 2; **Cascade Mts.**, 2; **near Dalles**, 2.

Some forms are almost planorbial, the spire has so little elevation. Two specimens represent Mr. Binney's (not Cooper's) *Triodopsis harfordiana*, having a flat spire, large parietal tooth, two denticles on the peristome, with an evident dilatation of the apertural margin between them.

Mesodon profunda (Say).

Cat. Nos. 1578-1593.

Indiana, 5.	Pennsylvania, Broad Top Mt.,
Iowa, 1.	1; Elk Co., 1.
Louisiana, 2.	Tennessee, Knoxville, 2; Vicks-
Minnesota, St. Paul, 2.	burg, 1.
Missouri, 1.	Virginia, 1; Natural Bridge, 1.
New York, 1.	West Virginia, 1.
Ohio, 8.	Wisconsin, 3.
	Without locality, 5.

Mesodon sayii Binney.

Cat. Nos. 1594-1609.

Kentucky, 1; Whitley Co., 1; Big	Pennsylvania, Broad Top Mt., 2;
Hill, Jackson Co., 1.	Elk Co., 1.
Maryland, 1.	Tennessee, Campbell Co., 3.
New York, 2.	Canada, Toronto, 2.
	Without locality, 3.

The large specimens from Tennessee have no parietal tooth, and the basal denticle is obsolete.

Mesodon armigera Ancey.

Cat. No. 1610. Fig. spec., T. M., Vol. V, Suppl. II, pl. i, fig. 1.

Cat. Nos. 1610, 1611. California, San Francisco, 4.

Acanthinula harpa (Say).

Cat. No. 1612. Kamtschatka, Petropaulovski, 1.

Vallonia pulchella (Müll.).

Cat. Nos. 1613-1631.

Iowa, Davenport, 2.	New York, Canandaigua, 4; Stat-
Kansas, 15.	en Island, 50.
Maine, Orono, 20.	Pennsylvania, Pittsburg, 13;
Michigan, 2.	Philadelphia, 1.
Nebraska, 4.	Utah, Logan Cañon, 5.
Nevada, White Pine, 16.	Canada, Berthier, 2; Montreal, 4.
New Jersey, Mt. Holly, 7; Bur-	England, 6.
lington, 4.	
New Mexico, 3.	

The variety *costata* from Utah was taken at an altitude of 5000 feet. The numerous species recognized in the dismemberment of the old *pulchella* are not separately indicated in the collection.

Fruticicola hispida (Linn.).

Cat. Nos. 1632-1634. **Nova Scotia**, Halifax, 3. **England**, Norfolk, 6. **Germany**, 2.

Fruticicola rufescens (Penn.).

Cat. Nos. 1635, 1636. **Quebec**, 2; **Heidelberg**, 3.

Apparently in both of the above European species there is shown a tendency to dwarfing in the American forms. In *rufescens* this is more conspicuous.

Dorcasia berlandieriana (Moric.).

Cat. No. 1637. Fig. spec., T. M., Vol. III, pl. xlix, fig. 2.

Cat. Nos. 1637-1648. **Texas**, 30, from the following localities: Clifton, Comal Co.; San Jose, Washington Co.

Dorcasia griseola (Pfeiff.).

Cat. Nos. 1649-1651. **Texas**, Cameron Co., 6. **Mexico**, 2.

Turricula terrestris (Chemn.).

Cat. No. 1652. **South Carolina**, St. Peters Church, Charleston.

Aglaia fidelis (Gray).

Cat. No. 1653. Fig. spec., T. M., Vol. III, pl. xviii, 2 figs.

Cat. Nos. 1653-1680.

California, Eureka, 3; **Humboldt** **Washington**, 2; **Columbia River**,
Co., 16; **Mt. Shasta**, 1. 3.

Oregon, 12; **Dalles City**, 3; **As-** **Without locality**, 5.
toria, 2; **Portland**, 2.

An albino specimen in the collection has its upper surface a bleachy white, with the lower surface pale yellow green. Two specimens labelled "raised by J. H. Thomson at New Bedford" are small, far below the average size, but have rather disproportionately thickened lips.

Aglaia infumata (Gld.).

Cat. Nos. 1681, 1682. **California**, Marin Co., 1; **Mendocino Co.**, 2.

The surface characters shown enlarged by Dr. Binney in his *Manual of American Land Shells* offer a fair criterion for specific identification when compared with *fidelis*.

***Aglaia hillebrandi* (Newc.).**

Cat. Nos. 1683, 1684. **California**, Calaveras Co., 1; Tuolumne Co., 1.

***Arionta arrosa* (Gld.).**

Cat. Nos. 1685-1693. **California**, Marin Co., 6; San Mateo Co., 2; Santa Cruz Co., 3; near San Francisco, 1; 40 miles south of San Francisco, 1. **Without locality**, 1.

One albino specimen, a green and thin shell from south of San Francisco, is in the collection, lip broken but probably without peristomal reflexion and callus.

***Arionta townsendiana* (Lea).**

Cat. Nos. 1694-1703. **Idaho**, northwestern, 5. **Oregon**, 3; Amatilla Co., 1; Astoria, 3; Portland, 1. **Washington**, 7.

In this species the roughness, malleation, and textural inequalities of the last whorl, from a point one quarter to one half of the circumference behind the aperture, is conspicuous in many specimens. At this point there is often a swelling or protuberant angle which seems to mark the last rapid forward development of the shell.

In a group of smaller specimens from Idaho this final phase does not seem to be present, and the shell terminates with an evenly striate and uninterrupted surface. A node-like callus appears on the parietal wall of one specimen. The soft anatomy shows this species to be a "*Mesodon*."

***Arionta tudiculata* (Binn.).**

Cat. No. 1704. Type, Bost. Jour. Nat. Hist., Vol. IV, pl. xx; T. M., Vol. III, pl. xvi.

Cat. Nos. 1704-1712. **California**, 1; Copperopolis, 1; Mendocino Co., 2; San Diego, 5; San Pedro Landing, 3; Tuolumne Co., 1. **Without locality**, 2.

The specimen from Copperopolis is figured in Dr. Binney's 'Manual' as a variety under the name *cypreophila* (p. 140, fig. 119).

Arionta nickliniana (*Lea*).

Cat. No. 1713. Fig. spec., T. M., Vol. III, pl. vi a.

Cat. No. 1714. Fig. spec., T. M., Vol. IV, pl. lxxvi, fig. 5. (Type of *anachoreta* W. G. B.)

Cat. Nos. 1712-1728.

California, 6; San Rafael, Marin Co., 1; Mariposa Co., 1; San Francisco and vicinity, 6; Contra Costa Co., 4; Tomales, 2; Mendocino Co., 2.

Washington, Puget Sound, 1.

The variations in size amongst these specimens are extreme, as also in surface characters, height of spire, and lip consistency.

Arionta ayresiana (*Newc.*).

Cat. Nos., 1729-1731. **California**, San Miguel Is., 4 (one fossil); Santa Rosa Is., 1.

Arionta redimita (*W. G. B.*).

Cat. No. 1732. Type, T. M., Vol. III, pl. vi, fig. 1 (as *nickliniana*).

Cat. Nos. 1732, 1733. **California**, 2.

Arionta intercisa (*W. G. B.*).

Cat. No. 1734. Type, T. M., Vol. III, pl. vi, fig. 1 (middle figure as *nickliniana*).

Cat. No. 1735. Fig. spec., T. M., Vol. V, p. 361, fig. 241 (as *crebristriata*); L. S. N. A., p. 167, fig. 290.

Cat. Nos. 1734-1739. **California**, 3; San Clemente Is., 4 (two fossil).

The type shows the callus connecting the ends of the lip along the body whorl of the shell. This in the fossil specimens is far more developed, and the peristome is coarsely and abundantly thickened.

Arionta kelletti (*Forbes*).

Cat. No. 1740. Fig. spec., T. M., Vol. V, p. 361, fig. 242.

Cat. Nos. 1740-1745. **California**, 1; San Diego, 1; Catalina Is., 11.

The overlapping basal blade of the peristome covers the umbilical opening with a thin shelly film.

***Arionta stearnsiana* (Gabb).**

Cat. Nos. 1746-1750. **California**, 1; Coronado Is., 6; San Diego, 3; Todos Santos Bay, 3.

***Arionta exarata* (Pfeiff.).**

Cat. No. 1751. Fig. spec., T. M., Vol. V, p. 363, fig. 244; L. S., p. 168, fig. 292.

Cat. Nos. 1751-1756. **California**, Santa Cruz, 10; near San Francisco, 4.

***Arionta ramentosa* (Gld.).**

Cat. Nos. 1757-1790. **California**, 18; Healdsburg, 2; Half Moon Bay, 2; Contra Costa Co., 2; Alameda Co., 5; Oakland, 13; Santa Clara Co., 1; Santa Cruz, 1; San José Mission, 2; San Francisco, 18; Coast Range, 2.

Wide variations are prevalent in this species. The collection contains the two varieties *bridgesi* and *reticulata*. The differing or contrasted umbilical pit, the varying strength of the revolving band, the flatness or acuteness of the spire, the divergent development of the surface sculpture, the oblateness or sphericity of the body whorl are noticeable features which emphasize its varietal separation from *A. californiensis*.

***Arionta californiensis* (Lea).**

Cat. No. 1791. Fig. spec., T. M., Vol. III, pl. vi, fig. 2.

Cat. Nos. 1791-1797. **California**, 5; Monterey, 5; Tomales, Marin Co., 3.

***Arionta carpenteri* (Newc.).**

Cat. No. 1798. **California**, Coronado Is., 2.

***Arionta mormonum* (Pfeiff.).**

Cat. No. 1799. Fig. spec., T. M., Vol. V, p. 367, fig. 248.

Cat. Nos. 1799-1805. **California**, 1; Calaveras Co., 2; Sacramento Valley, 1; Stanislaus Co., 1; Tuolumne Co., 5.

The variety *circumcarinata* is represented by one specimen from Stanislaus Co. Dr. Pilsbry writes: "*A. circumcarinata* Stearns, has no specific relationship with *mormonum*. Neither Binney or anybody else ever saw any intermediate examples."

***Arionta sequoicola* Cooper.**

Cat. No. 1806. Fig. spec., T. M., Vol. V, p. 368, fig. 249.

Cat. Nos. 1806-1808. California, 3; Santa Cruz, 2.

***Arionta diabloensis* (Cooper).**

Cat. Nos. 1809-1811. California, Alameda Co., 2; Oakland, 3.

***Arionta traski* (Newc.).**

Cat. Nos. 1812-1820. California, 3; Coronado Is., 1; Los Angeles, 1; Santa Barbara, 2; San Diego, 1; Ventura Co. (?), 2. Lower California, 2.

***Arionta dupetithouarsi* (Dsh.).**

Cat. Nos. 1821-1825. California, Monterey, 12.

***Arionta ruficincta* (Newc.).**

Cat. No. 1826. California, Catalina Is., 2.

***Arionta gabbi* (Newc.).**

Cat. Nos. 1827-1834. California, Santa Barbara, 14; Catalina Is., 3; St. Nicolas Is., 4; San Clemente Is., 1.

The last volution is unequally globose in specimens, and in the Santa Barbara examples there is shown a tendency to elevate the spire by a protracted coil.

The group *Arionta* furnishes, or might be made to furnish, reflections on the influence of isolation, or what the Rev. Mr. Gulick more descriptively named "Divergent Evolution through Cumulative Segregation." This section of Californian pulmonates offers some close specific approximations in conjunction with geographical isolation. Dr. Binney has indicated this in his remarks on the genus (Manual American Land Shells, p. 126): "The geographical distribution of the species is very peculiar: *A. Townsendiana* belongs to the Oregon fauna. *A. Mormonum* belongs to the Sierra Nevada counties, as does *A. tudiculata*, which also is found in southern coast counties. All the others are restricted to the coast counties, the following being island species: *A. ruficincta*, *Gabbi*, *intercisa*, *Ayersiana*, and *Kelletti*. *A. Stearnsiana* and *Carpenteri* are Lower Californian species."

It would be irrelevant to discuss Mr. Gulick's very elaborate analysis of the kinds and results of segregation, but when we

consider the slight differentiations of some of the Ariontas and their sensibly limited habitats Mr. Gulick's speculations upon the extraordinary diversity of the Achatinellidæ [the contiguous valleys of the Sandwich Islands seem applicable to them. *Exarata* and *arrosa* are mutually divergent along lines of geographical contact from some common ancestor. *Townsendiana*, from a wider zonal separation, assumes stronger specific traits. If *ramentosa* and *diabloensis* are varieties of *californiensis* their geographical excursion beyond the Monterey sub-region is responsible for it. *Nickliniana* seems much more likely referable to a specific sundering from *townsendiana*, *exarata*, and *arrosa*. The strong features of *mormonum* have evolved through a longer and more complete separation. *Dupetithouarsi*, which is an occupant of the Monterey sub-region, is so contrasted with *californiensis*, while referable to the more northern species, that it must be regarded as an invader of this southern coast region. *Sequoicola* may be regarded as a differentiate from *mormonum*, or *mormonum* is the intensive form of *sequoicola* developed by environment and segregation. *Kelletti* and *stearnsiana* are related or derivative forms, and evince surface characters that are related to geographical areas contrasted with those farther north. The island species, *gabbi*, *ruficincta*, have enjoyed prolonged isolation and have evolved strong ringent calloused peristomes. *Traski* is an offshoot from *sequoicola* or *mormonum* recently introduced upon some of the islands.

***Glyptostoma newberryanum* W. A. B.**

Cat. No. 1835. Type, T. M., Vol. IV, pl. lxxvi, fig. 7.

Cat. Nos. 1835-1839. **California**, San Diego, 8; 21 m. northeast of San Diego, 2.

***Euparypha tryoni* (Newc.).**

Cat. Nos. 1840-1846. **California**, 6; San Nicolas Is., 3 (2 fossil); Santa Barbara, 12 (3 fossil).

***Tachea hortensis* (Müll.).**

Cat. Nos. 1847-1858.

Massachusetts, 12; Kettle Is., 5; Magnolia, 2; Manchester, 3. **Canada**, Gaspé, 2; Hare Is., 1. **Europe**, 9.

Environment or changed conditions do not seem to have in any way modified the specific character of this shell.

Pomatia aspersa (Müll.).

Cat. Nos. 1859-1862. **South Carolina**, Charleston, 4. **Europe**, 3. **Hayti**, 2.

FAMILY CYLINDRELLIDÆ.

Cylindrella poeyana (D'Orb.).

Cat. Nos. 1863-1869. **Florida**, 4. **Texas**, 1. **Cuba**, 6 (*variegata*);
Matanzas, 7.

Cylindrella jejuna Gld.

Cat. Nos. 1870-1872. **Florida**, 3.

Macroceramus pontificus (Gld.).

Cat. No. 1873. Fig. spec., L. N. S. A., p. 220, fig. 375.

Cat. Nos. 1873-1876. **Florida**, southern part, 2. **Texas**, 2; **Atascosa Co.**,
3. **Central America**, 1.

A large specimen from Central America is recorded as *kieneri*, and as a "Type from Pfeiffer's Cabinet." There is noticeable in it a peculiar deceptive angulation in the whorls, produced by contact of light and darker patches along a white line. This indeed is also seen less conspicuously in *M. pontificus*. It is doubtless a trivial distinction.

Macroceramus glossei (Pfeiff.).

Cat. Nos. 1879-1884.

Florida, Sarasota Bay, 7.

Cuba, 1.

Bahamas, New Providence, 2.

Jamaica, 9.

The Floridian shells have been separated by Pilsbry as *M. floridanus*.

FAMILY BULIMULIDÆ.

Bulimulus patriarcha W. G. B.

Cat. No. 1885. Type, T. M., Vol. IV, pl. lxxx, fig. 13.

Mexico, Buena Vista.

Bulimulus alternatus (Say).

Cat. No. 1886. Fig. spec., T. M., Vol. III, pl. li b (figured as *dealbatus*).

Cat. No. 1887. Fig. spec., T. M., Vol. IV, pl. lxxx, fig. 1.

Cat. No. 1888. Fig. spec., L. S. N. A., p. 203, fig. 349 (figured as *maria*).

Cat. Nos. 1886-1899. **Texas**, 13; **Laredo**, 1. **Mexico**, Tamaulipas, 12.

Bulimulus schiedeanus (*Pfeiff.*).

- Cat. No. 1900. Fig. spec., T. M., Vol. IV, pl. lxxx, fig. 8.
 Cat. No. 1901. Fig. spec., T. M., Vol. V, p. 392, fig. 279 (as var. *mooreanus*).
 Cat. No. 1902. Fig. spec. (?), L. S. N. A., p. 205, fig. 355 (as var. *mooreanus*).

Cat. Nos. 1900-1921.

Texas, 45 (about half var. *mooreanus*); Washington Co., 26; Bosque Co., 1; De Witt Co., 2. **Mexico**, 4; Leon, 4 (var. *mooreanus*).

A number of examples occur in the collection with black or livid apices, and yellow sub-volutional areas, which are to be assigned to *mooreanus*. The wide range in form is well shown. One specimen exhibits a curious oblique white stripe over the body volution, a probable vestige from injury. A very discernible equatorial angulation appears on the last whorl of many individuals, probably immature; the "light delicate waxen vittæ upon the first two whorls" are only occasional, as Dr. Binney remarks.

Bulimulus dealbatus (*Say*).

- Cat. No. 1922. Fig. spec., T. M., Vol. III, pl. li a (outer figs.).

Cat. Nos. 1922-1935.

- Alabama**, 2; Marengo Co., 7. **Tennessee**, Nashville, 5.
Kentucky, Henry Co., 4. **Texas**, 26; Austin, 12; Comanche Peak, 3.
North Carolina, 1.

Variations in the markings and surface coloring are extreme, unichrome individuals occur, passing through those with faint rubescent and bluescent streaks to the marbled surfaces, in which dendritic bands of ashen green and white alternate, and reciprocally predominate in different individuals.

Bulimulus serperastrus (*Say*).

- Cat. No. 1936. **Mexico**, 1.

Bulimulus multilineatus (*Say*).

- Cat. No. 1937. Fig. spec., T. M., Vol. III, pl. lviii (as *virgulatus*).
 Cat. Nos. 1937-1939. **Alabama** (?), 1. **Hayti**, 1. **Venezuela**, 1

Bulimulus dormani *W. G. B.*

Cat. 1940. Type, T. M., Vol. IV, pl. lxxx, fig. 10.

Cat. Nos. 1940-1942. **Florida**, near Suwannee River, 1; Halifax River, near Port Orange, 2; St. Augustine, 1.

Two specimens from Port Orange are exceedingly fragile and hyaline, and resemble *marielinus* in texture.

Bulimulus maculatus (*Lea*).

Cat. No. 1943. **Nicaragua**, 1.

Bulimulus marielinus (*Poey*).

Cat. No. 1944. Fig. spec., Manual L. S., p. 408, fig. 450.

Cat. Nos. 1944, 1945. **Florida**, southern part, 3. **Cuba**, 5.

FAMILY ORTHALICIDÆ.

Liguus fasciatus (*Müll.*).

Cat. No. 1947. Fig. spec., T. M., Vol. III, pl. lvi (lower fig.).

Cat. No. 1948. Fig. spec., T. M., Vol. III, pl. lvii (central left-hand fig.).

Cat. No. 1949. Fig. spec., T. M., Vol. III, pl. lv (central figs.).

Cat. No. 1950. Fig. spec., T. M., Vol. III, pl. lvii (central right-hand fig.).

Cat. Nos. 1947-1964. From **Cuba** and **Florida**, without definite localities.

The three varieties mentioned by Mr. Binney are well represented, but the rosy apex and columellar margin seem associated with other forms, as well as with those bearing brown bands or spots.

Orthalicus undatus (*Brug.*).

Cat. No. 1965. Fig. spec., T. M., Vol. IV, pl. lxxvii, fig. 13.

Cat. No. 1966. Fig. spec., T. M., Vol. III, pl. liv (as *zebra*, lower central fig.).

Cat. No. 1967. Fig. spec., T. M., Vol. III, pl. liv (as *zebra*, upper central fig.).

Cat. Nos. 1965-1973. **Florida**, 3; Key West, 1; Sandy Key, 5. **Jamaica**, 2.

The first of the above-figured specimens Dr. Pilsbry refers to "typical *O. princeps*"; the second to *O. undata reses*; the third, he remarks, "is unknown, the heavy columella being unlike any species known to me, and very unlike *undatus*."

FAMILY HELICIDÆ.

Punctum pygmæum (*Drap.*).

Cat. Nos. 1974-1979.

California, Lone Mt., 6; near San Francisco, 4.
Maine, Orono, 20.
New York, Staten Island, 2.
Texas, 2.
Europe, 10.

FAMILY SUCCINIDÆ.

Succinea haydeni *W. G. B.*

Cat. No. 1980. Type, T. M., Vol. IV, pl. lxxix, fig. 1.

Cat. Nos. 1980-1983. **Indian Territory**, Fort Gibson, 2. **Utah**, near Salt Lake City, 6.

Succinea retusa *Lea.*

Cat. Nos. 1984, 1984*a*. **Indiana** (?), 4.

Succinea sillimani *Bland.*

Cat. Nos. 1985-1988. **California**, Antioch, 1; Stockton, 6. **Utah**, near Salt Lake City, 10.

Succinea ovalis *Gld.*

Cat. Nos. 1989-2002.

Illinois, 2.
Iowa, 6.
Michigan, 1; Ann Arbor, 5.
Minnesota, 1.
New Jersey, Burlington, 2.
New York, Greenwich, 5; Herkimer Co., 9; Lake Champlain, 2; Mohawk, 5; Otsego, 4.
Wisconsin, Milwaukee, 7.

Succinea higginsii *Bland.*

Cat. No. 2003. Put-in-Bay, Lake Erie, 3.

Succinea concordialis *Gld.*

Cat. Nos. 2004, 2005. **Texas**, 6.

Succinea luteola *Gld.*

Cat. Nos. 2006-2013.

Florida, 15; Long Key, 2.
Mississippi, Natchez, 30 ±.
Texas, 2; Washington Co., 4; Brownsville, 3.
Mexico, Matamoros, 3.

***Succinea lineata* W. G. B.**

Cat. Nos. 2014-2019.

- | | |
|-----------------------------------|--|
| Arizona , 7. | Nebraska , Platte River, 2. |
| California , Hollister, 5. | British America , Ft. Simpson, 7. |
| Idaho , Franklin, 6. | |

***Succinea avara* Say.**

Cat. Nos. 2020-2055.

- | | |
|--|--|
| Alabama , Columbus, 1. | wich, 7; Mohawk, 3; Staten Island, 6; |
| Colorado , 4. | Ticonderoga, 8; Utica, 4. |
| District of Columbia , 1. | North Dakota , Pembina, 2. |
| Georgia , St. Simons Is., 15. | Ohio , 2; Elyria, 6; Columbus, 7. |
| Idaho , Salmon River, 3. | Pennsylvania , Germantown, 9. |
| Illinois , 20. | Vermont , 2. |
| Maine , 1; Orono, 11. | Virginia , Alexandria Co., 2. |
| Michigan , Grand Rapids, 20. | West Virginia , Lexington, 8. |
| New Mexico , 17. | Wisconsin , Milwaukee, 1. |
| New Jersey , Squan, 1. | Quebec , Metis Co., 1; Magdalen, 1. |
| New York , Crown Point, 2; Green- | Without locality , 20. |

***Succinea stretchiana* Bland.**

Cat. Nos. 2056, 2057. **Nevada**, Washoe Co., 1. **Oregon**, 1.

***Succinea aurea* Lea.**

Cat. Nos. 2058-2061. **New York**, Staten Island, 15. **Ohio**, Springfield, 2.

***Succinea grœnlandica* Beck.**

Cat. No. 2062. Type, figured, T. M., Vol. III, pl. lxxx, fig. 4.

Cat. Nos. 2062, 2063. **Greenland**, 2.

***Succinea obliqua* Say.**

Cat. No. 2064. Fig. Spec., T. M., Vol. III, pl. lxxvii b, fig. 3 (four in individuals).

Cat. Nos. 2064-2098.

- | | |
|---|---|
| Arkansas , 1. | Vermont , 1. |
| Georgia , 4. | West Virginia , Lexington, 7. |
| Illinois , 5. | Wisconsin , Milwaukee, 4. |
| Mississippi , Vicksburg, 1. | Canada , Gaspé, Magdalen River, 1; |
| New Jersey , 2. | Restigouche, 1; Rivière Rouge, 1; |
| New York , Niagara, 10; Mo- | Rivière du Loup, 1; Trois Pistoles, 1; |
| hawk River, 12; Trenton Falls, 2; | Winnipeg, 1. |
| Greenwich, 1. | New Brunswick , Dalhousie, 2. |
| Ohio , 14; Birmingham, 3; Colum- | Without locality , 14; fossil, 1. |
| bus, 9; Elyria, 2. | |

[November, 1901.]

***Succinea totteniana* Lea.**

Cat. No. 2099. Fig. Spec., T. M., Vol. III, pl. lxxvii *b*, fig. 2.

Cat. Nos. 2099-2105.

Connecticut, 5. **New York**, Greenwich, 6; Staten
Maine, 1; Orono, 4. **Island**, 5.
Massachusetts, Marblehead, 8. **Rhode Island**, 1.

***Succinea campestris* Say.**

Cat. No. 2106. Fig. Spec., T. M., pl. lxxvii *b*, fig. 1.

Cat. Nos. 2106-2123.

Alabama, 2. **Louisiana**, New Orleans, 4.
Florida, 53; Sarasota Is., Bald- **South Carolina**, Charleston, 2; Sul-
winnville, 3. **livans Island**, 22.
Georgia, Savannah, 6; St. Simons
Is., 11.

***Succinea rusticans* Gld.**

Cat. Nos. 2124, 2125. **Nevada**, White Pine, 4.

***Succinea nuttaliana* Lea.**

Cat. Nos. 2126-2130.

California, 8. **Montana**, Bitter Root Valley (eleva-
Idaho, Lewis River, 1. tion 2500-4500 ft.), 1.
Illinois, 2. **Oregon**, 1; Portland, 1.

***Succinea oregonensis* Lea.**

Cat. Nos. 2131-2134. **California**, San José, 2. **Idaho**, 2; Cottonwood
Creek, 1.

***Succinea effusa* Shuttl.**

Cat. Nos. 2135, 2136. **Florida**, Spring Garden Lake, 1. **Texas**, 2.

***Succinea salleana* Pfeiff.**

Cat. No. 2137. Fig. Spec., T. M., Vol. IV, pl. lxxix, fig. 18.

Cat. Nos. 2137, 2138. **Louisiana**, Alexandria, 1; New Orleans, 2.

***Succinea haleana* Lea.**

Cat. No. 2139. Fig. Spec., L. S. N. A., p. 259, fig. 460.

Cat. No. 2139. **Louisiana**, Alexandria, 1.

***Succinea mooresiana* Lea.**

Cat. No. 2140. **Nebraska**, Platte River, 1.

***Succinea grosvenori* Lea.**

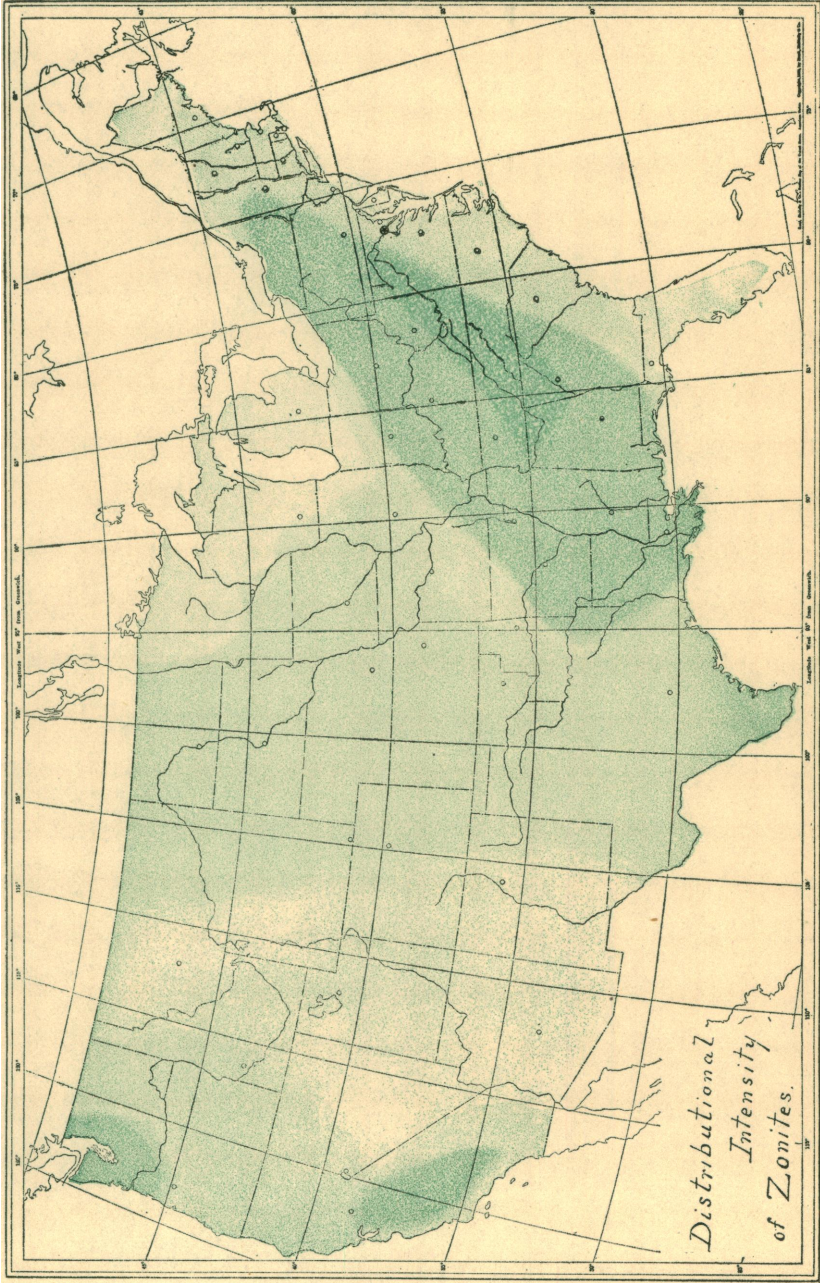
Cat. No. 2141. **Louisiana**, Alexandria, 1.

***Succinea forsheyi* Lea.**

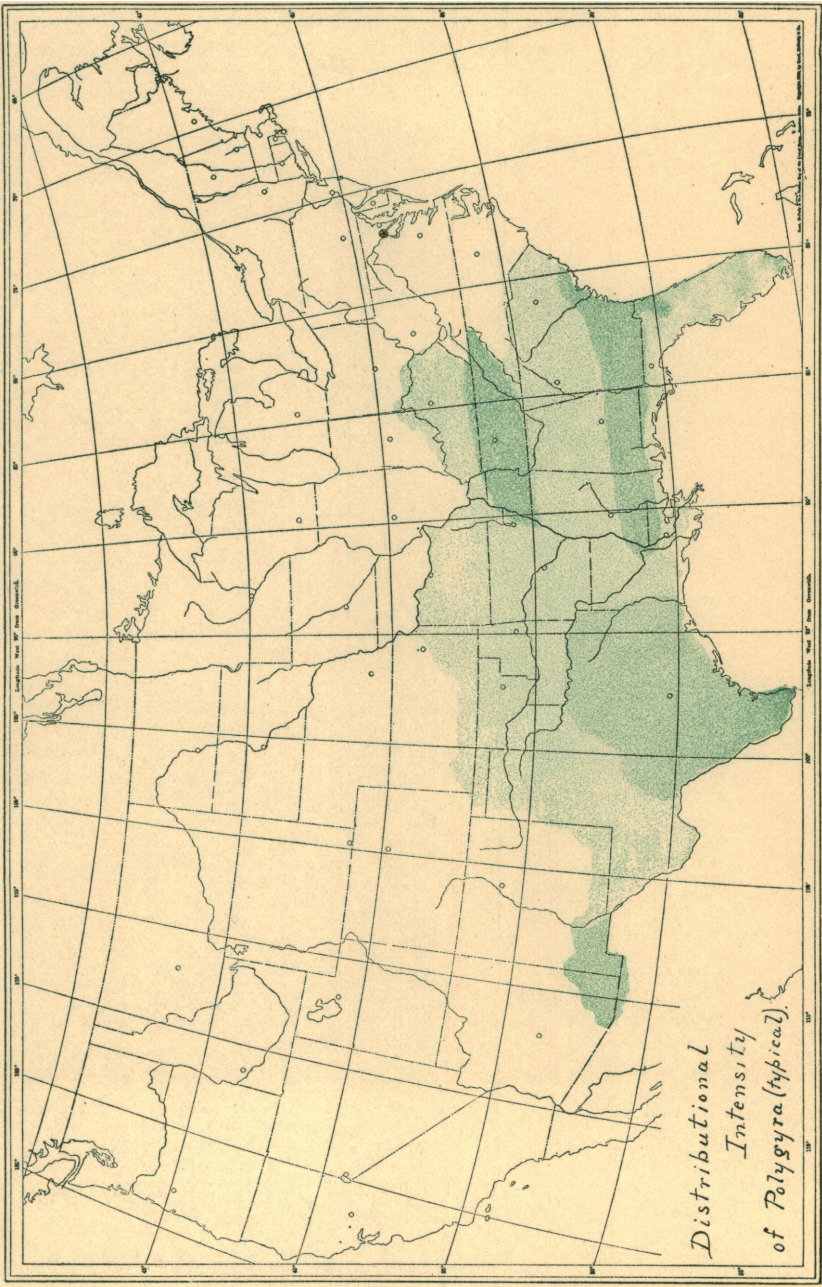
Cat. No. 2142. **Texas**, Rutersville, 1.

***Succinea pellucida* Lea.**

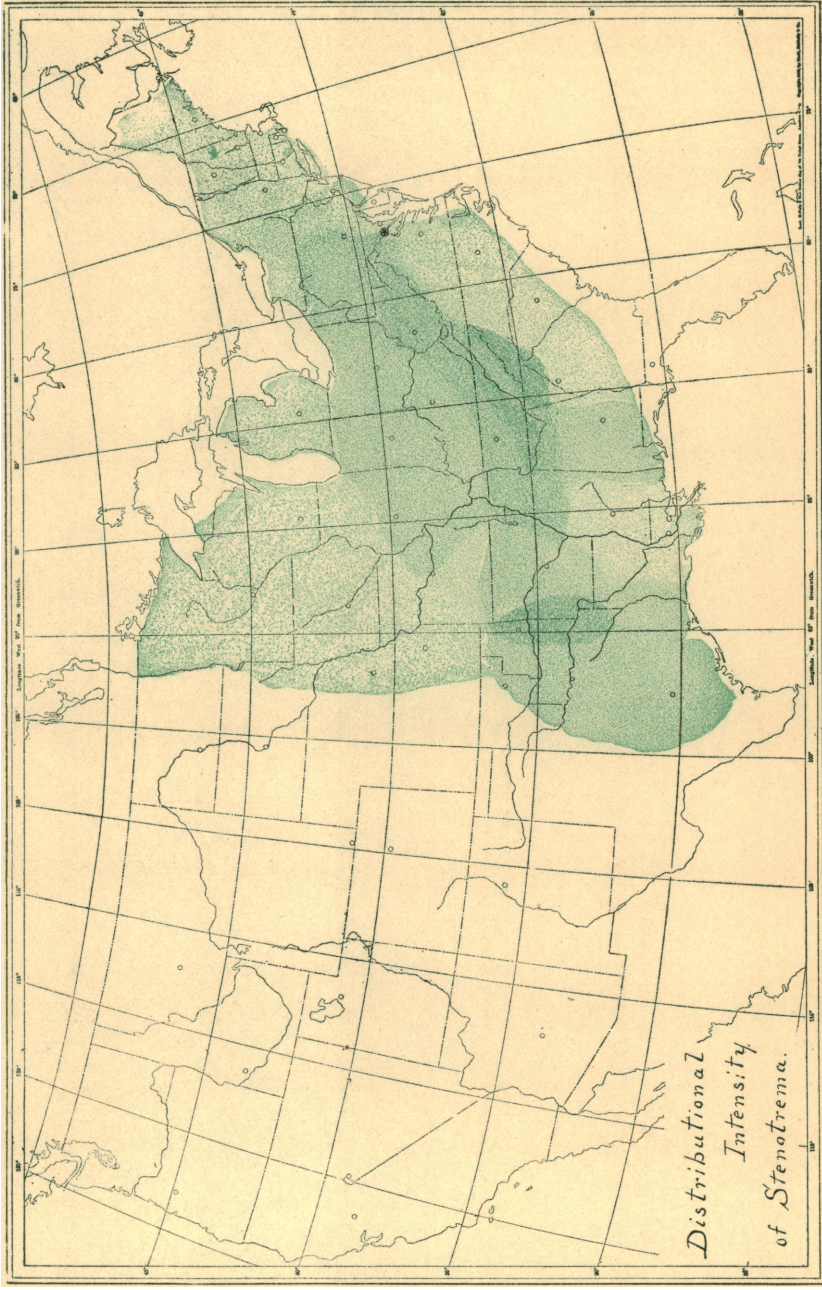
Cat. No. 2143. **United States**, 1. Miscellaneous lots from California and Idaho, 30.



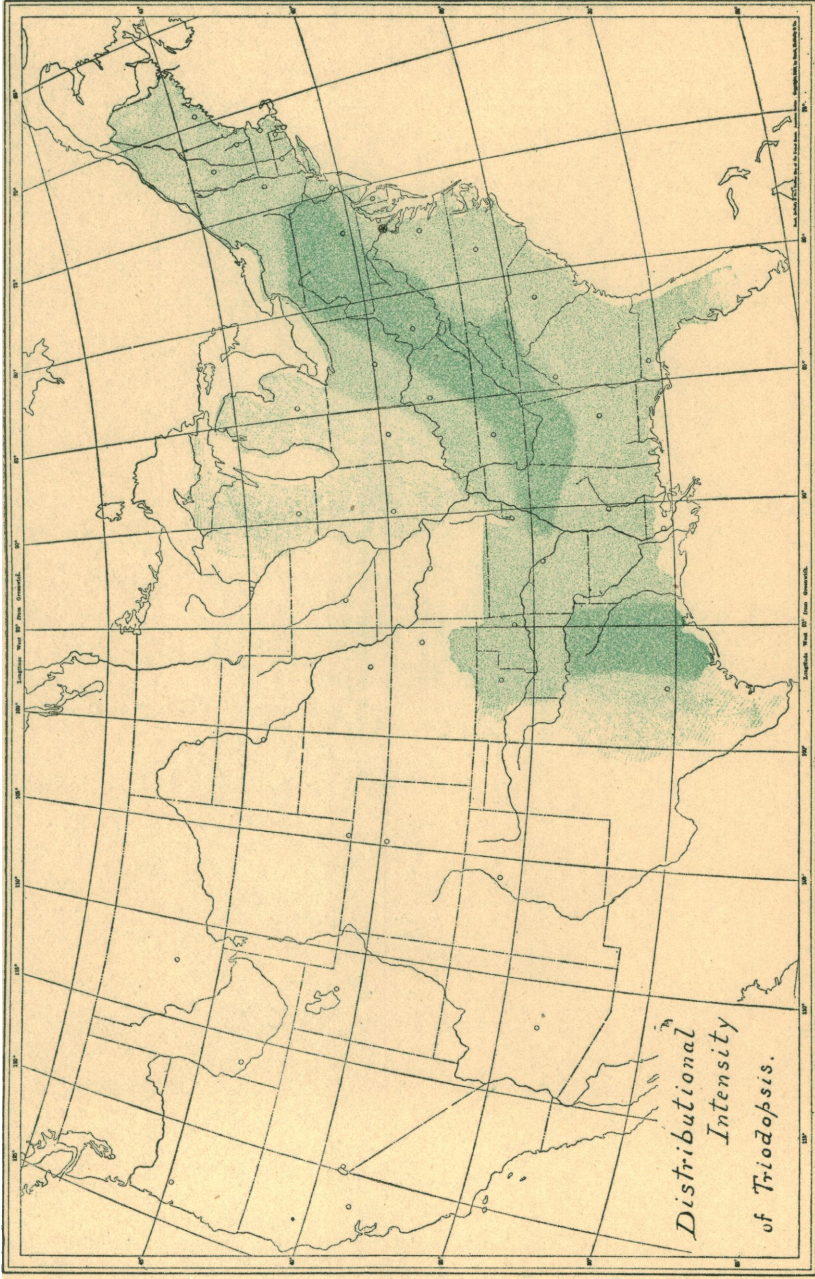
DISTRIBUTIONAL INTENSITY OF ZONITES.



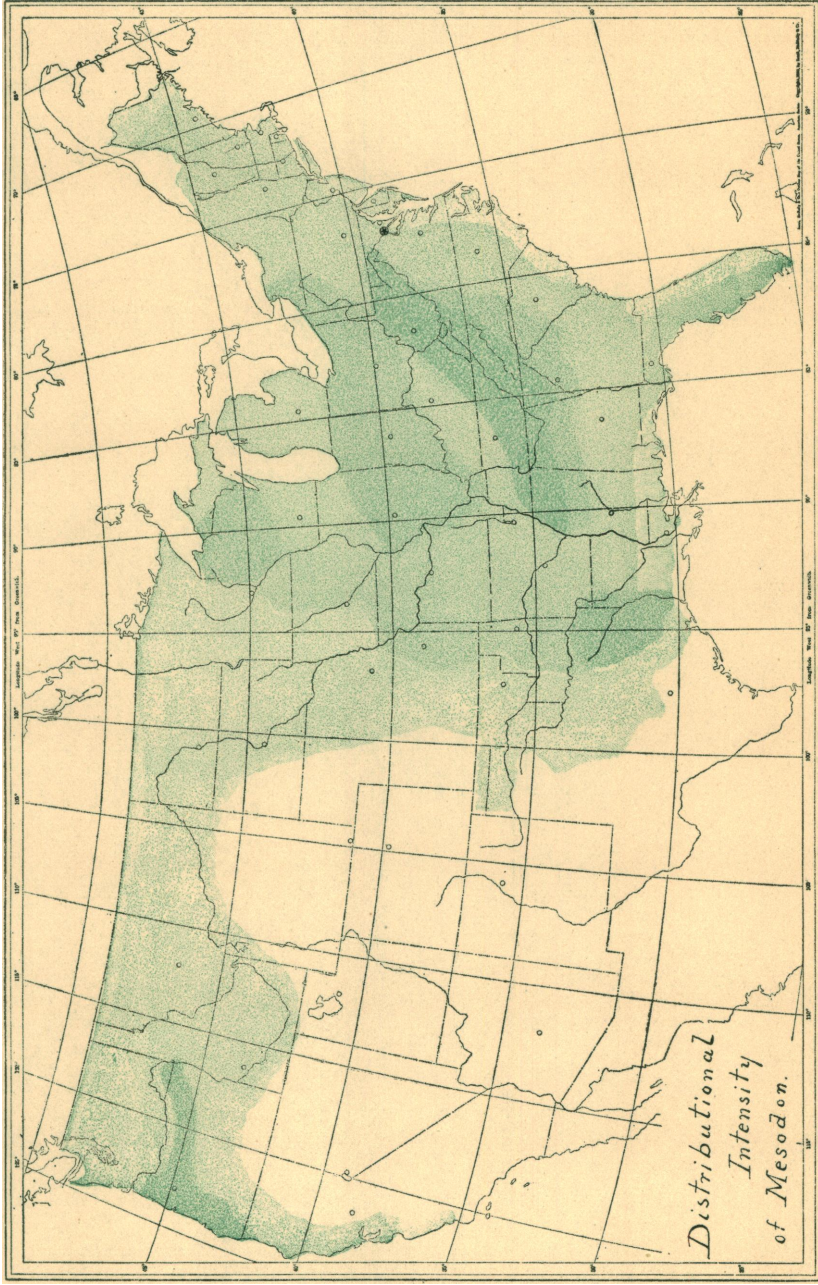
DISTRIBUTIONAL INTENSITY OF POLYGYRA (TYPICAL).



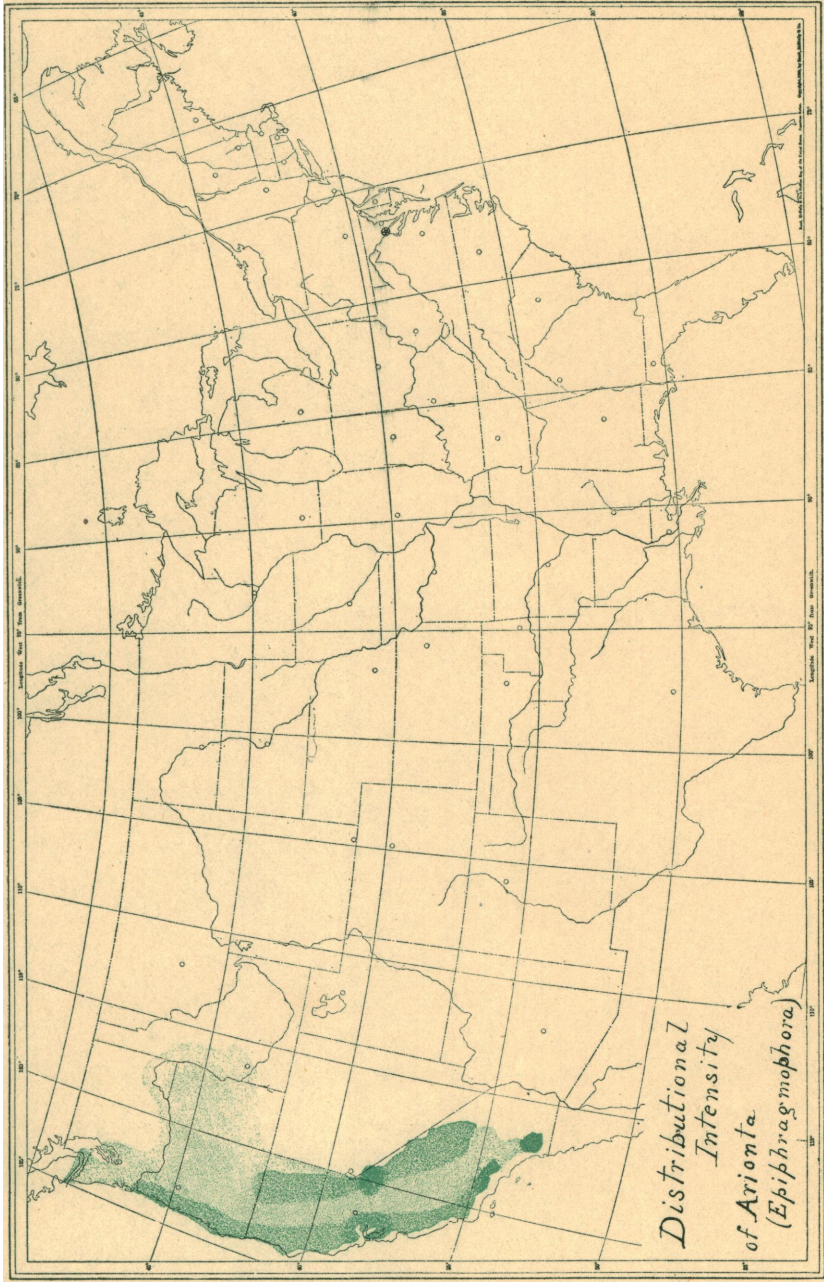
DISTRIBUTIONAL INTENSITY OF STENOTREMA.



DISTRIBUTIONAL INTENSITY OF TRIODOPSIS.



DISTRIBUTIONAL INTENSITY OF MESODON.



DISTRIBUTIONAL INTENSITY OF ARIONTA (EPIPHRAGMOPHORA).

