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A SUPPLEMENT
TO THE
TERRESTRIAL
AIR-BREATHING MOLLUSKS
OF
THE UNITED STATES, &c.
BY
W. G. BINNEY.





THE

TERRESTRIAL
AIR-BREATHING MOLLUSKS

OF

THE UNITED STATES,

AND THE

ADJACENT TERRITORIES OF NORTH AMERICA.

VOL. IV.

BY

W. G. BINNEY,

MEMBER OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, CORRESPONDING MEMBER OF THE BOSTON SOCIETY OF NATURAL HISTORY, THE NEW YORK LYCEUM OF NATURAL HISTORY, THE ST. LOUIS ACADEMY OF SCIENCE, &C.

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THE TERRESTRIAL
AIR-BREATHING MOLLUSKS
OF THE
UNITED STATES.

VOLUME IV.

THE following pages are devoted to a continuation of the work of my father on the Terrestrial Mollusks of the United States. They are believed to contain all the latest information regarding the several species, their varieties, synonymy, geographical distribution, &c. I have also added many references to authors not quoted in the Mollusks, as well as to those whose works have appeared more recently. Descriptions of all the newly discovered species are added, and figures given of all to which I have been able to obtain access.

Since no species was described in the "Mollusks," with which the author or the able editor was not personally acquainted, there were quite a number of doubtful species entirely omitted in that work. These I have added, with all the information in regard to them which I have been able to obtain.

In addition to the species recently discovered, there are many shells which have been described as distinct species during the last twelve years, though considered as only

¹ The plates are numbered in continuation of those in the third volume of the "Terrestrial Mollusks," by Dr. Amos Binney; as the paper forms a continuation of that work.

varieties of other species by Dr. Binney. In treating these, I have followed the opinions of the latest writers, founded on the advanced state of our knowledge of this department of science.

In all doubtful cases, I have given the original description and figure of the authors whose opinions conflict, often reserving my own decision till more information has been obtained. I have also endeavored to increase the usefulness of my work by adding many descriptions and figures from rare and generally inaccessible works.

The measurements of the shells described are the same as adopted by Dr. Pfeiffer, and are given in the millimetre, which is equal to $\frac{1}{25}$ of an inch. I have also followed Dr. Pfeiffer in the systematic arrangement of the various genera.

The species of the Western Coast are grouped separately. I have described only those which have actually been found within the limits of the United States, though I have added the names of all the extra limital species found north of Mazatlan. In the second division of the work, I have included the species inhabiting the whole continent of North America, from the boreal regions to the Rio Grande.

I would take this opportunity of returning thanks to the numerous friends who have aided my studies by furnishing me specimens and interesting information regarding the species of their vicinity. I am particularly indebted to my friend Thomas Bland, Esq., of New York, for the use of his most interesting collection of American land shells, as well as for the great advantage I have derived from his valuable assistance during the four years I have devoted to the following pages. To Mrs. Thomas Say, also, I am under very great obligations for the use of her husband's MSS. and many letters from Fenessac and other conchologists. Many of Say's types, preserved in

the Philadelphia Academy, have been consulted by me, as well as those of my father which are in my own collection.

I have endeavored to include all the information on this subject which has been published prior to January 1st, 1859. In subsequent supplements I shall endeavor to present all the additional information elicited by future research. To this end, criticisms on the opinions I have advanced are solicited, and suites of local species from every part of the country.

The Auriculacea and the Aciculacea of the United States are added to the families described in the "Mollusks." This first attempt to describe them has been attended by many disadvantages, and is offered with great hesitation as necessarily quite incomplete.

Burlington, N. J., August, 1859.

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I. THE SPECIES OF THE PACIFIC COAST.

FAMILY LIMACEA.

GENUS ARION FERUSSAC.

ARION FOLIOLATUS GOULD.....vol. ii. p. 30, pl. lxvi. fig. 2.

Arion foliolatus GOULD, Ex. Ex. p. 2, fig. 2 a b.

GENUS LIMAX FERUSSAC.

LIMAX COLUMBIANUS GOULD.....vol. ii. p. 43, pl. lxvi. fig. 1.

Limax Columbianus GOULD, Ex. Ex. p. 3, fig. 1 a b c.

FAMILY HELICEA.

GENUS SUCCINEA DRAPANAUD.

SUCCINEA NUTTALLIANA LEA.....vol. ii. p. 81, pl. lxvii. a, fig. 2.

Succinea Nuttalliana LEA, Tr. Am. Phil. Soc. ix. p. 4.

PFEIFFER, Mon. Hel. Viv. ii. 523; iii. 15.

SUCCINEA OREGONENSIS LEA.....vol. ii. p. 77, pl. lxvii. c, fig. 2.

Succinea Oregonensis LEA, Tr. Phil. Soc. ix. p. 1, p. 5, (1844).

PFEIFFER, Mon. Hel. Viv. ii. 523; iii. 15.

SUCCINEA RUSTICANA GOULD.

PLATE LXXIX. FIGURE 14.

T. elongata, ovato-conica, tenuis, pallidè virens, impolita, lineis inequalibus incrementalibus et crassis striata, subtus convexa; spira acuta, anfr. 3 convexiusculis; apertura ovata, quadrantibus tres longitudinis adequans; columellâ arcuatâ, perspicuè plicatâ. (Gould).

SYNONYMS AND REFERENCES.

Succinea rusticana GOULD, Pr. Boston Soc. Nat. Hist. ii. 187, Dec. 1846; Expedition Shells, 31; Mollusca of Exploring Ex. p. 28, fig. 29, 1852.

PFEIFFER, Mon. Hel. Viv. ii. 523; iii. 15.

DESCRIPTION.

Shell elongate, ovate conical, rather large, thin and fragile; pale greenish horn color, surface rude and without lustre, coarsely and

irregularly marked by the lines of growth. Spire acute, of three or more moderately convex whorls, separated by a well impressed suture, the last whorl large and long, narrowing towards the base; body portion of the face of the shell moderately large. Aperture ovate, three fourths the length of the shell; fold of the columella distinct.

Length of axis $\frac{1}{2}$, breadth $\frac{1}{4}$ inch.

Geographical Distribution. Oregon.

Remarks. Somewhat allied to *S. pudorina* in form, but very different in color. (Gould).

I have not seen this species. The above is Gould's description. The figure I have given is a fac-simile of the outline of the figure referred to above.

EXTRA LIMITAL SPECIES.

Succinea cingulata Forbes, from Mazatlan, is described in the Proceedings of the Zoölogical Society, 1850, p. 56.

SPURIOUS SPECIES.

Succinea aperta Lea, vid. vol. ii. p. 67.

GENUS HELIX LINNÆUS.

HELIX TUDICULATA BINNEY.....vol. ii. p. 118, pl. xvi.

Helix tudiculata PFEIFFER, Mon. Hel. Viv. i. 283.

Pfeiffer (l. c.) repeats Binney's description, not having seen the shell, and suggests doubtfully its being a variety of *H. Californiensis*.

HELIX NICKLINIANA LEA.....vol. ii. p. 119, pl. vi. a.

Helix Nickliniana TROSCHEL, Arch. für Nat. 1839, ii. 221.

Helix Californiensis CHEMNITZ, ed. 2, p. 332, pl. lvii. fig. 14-15, Excl. var. 2, (1846).

REEVE, No. 661.

PFEIFFER, Mon. Hel. Viv. i. 339; iii. 229.

Helix arboretorum VALENCIENNES, Voy. de la Venus. Moll. pl. i. fig. 3.

Helix nemoraviga VALENCIENNES, l. c. fig. 1.

"*Animal* reddish gray, tentacles and base of foot bluish; quite

narrow in proportion to the length of the shell; tentacles short. Gregarious, inhabiting dry gullies and hill sides; many specimens found in a cabbage garden." (Thomson).

This shell varies very considerably in size and in the elevation of its spire. This fact will account for the difference in the figures referred to in the synonymy. That of pl. vi. a, is a perfect representation of what Lea's original specimen would be in a fresh state.

Helix Californiensis of Pfeiffer, Chemnitz, and Reeve, are to be referred to this species. Those authors are incorrect in considering *H. Nickliniana* a variety of *H. Californiensis*.

H. arboretorum is placed by Pfeiffer doubtfully in the synonymy of *H. Californiensis*, while *H. nemoraviga* is placed among the uncertain species. A fac-simile of Valenciennes's figure of the former is given, pl. 76, fig. 13, and of the latter on pl. 79, fig. 11.

I have described, under the names of *H. redemita* and *H. intercisa*, the shells figured on pl. vi. as varieties of this species.

HELIX INTERCISA.

PLATE VI. FIGURE 1. Middle figure.

Testa solidissima, luteo-cinerea, apice rufâ, globoso-conica; spira brevis; sutura impressa; anfractus quinque, convexiusculi, lineis parallelis volventibus, valdè demissis, strias incrementales distinctas intercidentibus notati; anfr. ultimus globosus, supra peripheriam fasciâ unicâ, rufâ obscurissimâ ornatus; apertura maximè obliqua, formâ equi calcei, rotundata; labrum albo-cinereum, incrassatum, subtus reflexiusculum, subunidentatum, umbilicum totum tegens; marginibus approximatis, callo interjunctis.

SYNONYMS AND REFERENCES.

Helix intercisa W. G. BINNEY, Proc. Acad. N. S. Phila. ix. p. 18, (Oct. 1857); Proc. Boston Soc. N. H. vi. p. 156; Notes, p. 1.

Helix Nickliniana var. BINNEY, Terrestrial Mollusks, ii. p. 120; iii. pl. vi. f. 1. *Icon in medio posita.*

DESCRIPTION.

Animal not observed.

Shell globose-conic, with five slightly-rounded whorls; spire little elevated; suture distinct; upon the body whorl a dark revolving band, hardly discernible; aperture very oblique, shape of a horseshoe; peristome thickened, heavy, dirty white, slightly reflected at the umbilicus, which it entirely conceals, near its junction with the columella furnished with a tooth-like process, the extremities connected by a heavy ash-colored callus, which is spread more lightly over the whole parietal wall; epidermis grayish yellow, apex rufous. The striæ of growth are very numerous and distinct, crossed by numerous, regular, revolving lines, so deeply impressed as to entirely separate them into small sections; thus the whole surface of the shell is divided into minute, raised parallelograms, separated by the deep longitudinal and horizontal furrows.

Greatest diameter, 22; lesser, 19; alt. 15 millimetres.

Geographical Distribution. Found in Oregon Territory.

Remarks. This shell I found in the collection of my father. It was labelled *H. Nickliniana* Lea, var., and as such is figured in the Terrestrial Mollusks. I cannot believe, however, that any species can admit of varieties differing so much as this does from *Nickliniana*. To Mr. Lea's figure and description it bears no resemblance whatever, either in shape or sculpturing.

It may readily be distinguished among the *Helices* of the Pacific coast, by its grayish, heavy shell, its thickened lip, and above all, by the peculiar markings of the surface.

HELIX REDEMITA.

PLATE VI. FIGURE 1.

Testa globoso-conica, imperforata, tenuiscula, minutè et confertim granulata, corrugata, rufo-brunnea; apex lævigata, obtusula, spira elevata; anfr. 6 convexi, suturâ impressâ distincti, ultimus permagnus, inflatus, ad

aperturam descendens, supra medium fasciâ fuscâ redimitus; apertura perobliqua, transverso-orbicularis, intus unifasciata; perist. simplex, rufocinereum, incrassatum, marginibus valde approximatis, basali reflexiusculo, callo albo umbilicum tegente.

SYNONYMS AND REFERENCES.

Helix redimita W. G. BINNEY, Proc. Acad. Nat. Sc. of Phila. vol. ix. p. 183, Notes, p. 3, Oct. 1857.

Helix Nickliniana var. BINNEY. Terr. Moll. iii. pl. vi. fig. 1, (exceptâ icone in medio positâ) 1857.

DESCRIPTION.

Animal not observed.

Shell globose-conic, imperforate, rather thin, wrinkled, covered with minute and crowded granulations; color reddish brown; apex free from granules, rather blunt; spire elevated; suture impressed; whorls six, convex, the last quite large and rounded, falling towards the aperture, and banded with reddish brown above the middle; aperture rather large in proportion to the size of the shell, very oblique, transversely rounded, within showing the band; peristome simple, reddish ash color, thickened, reflected slightly at the base, ends approached; umbilicus entirely covered with a white callus.

Greater diameter, 31; lesser, 17; height, 12 mill.

Geographical Distribution. I am not acquainted with the exact locality of this shell, but am inclined to refer it to California.

Remarks. This shell is figured by my father as a var. of *H. Nickliniana* Lea. A reference to Mr. Lea's figure and description will at once show it to be distinct, according to the present notions of specific weight. Dr. Gould refers it (Terr. Moll. iii. p. 26) to *H. Californiensis* Reeve, (Con. Icon. 661). It appears, however, to be distinct from the shell there figured.

In general outline it resembles *H. Kellettii* Forbes, Proc. Zool. Soc. London, 1850, pl. ix, f. 2, as well as Reeve's

fig. 665 *b*, not 665 *a*, Con. Icon. The resemblance will be found, however, to cease with the outline, on a comparison of the two shells. *H. Kelletii* is sometimes perforate, is differently colored, and belongs rather to the group of California *Helices* represented by *H. areolata* Sowb. and *H. Pandora* Forbes, than that of *H. Californiensis* Lea, *intercisa*, nob. and the shell before me.

HELIX ANACHORETA.

PLATE LXXVI. FIGURE 5.

T. orbiculato-convexa, apertè umbilicata, cinereo-rufescens, granulata et rarè indenta; spira elevata, conica; anf. 6 convexi, ultimus subtus ventricosus; sutura impressa; perist. incrassatum, vix reflexiusculum, violaceo-albidum, umbilicum haud multum occultans, marginibus approximatis, callo conjunctis; faux violacea; apertura obliqua, transverso-rotundata.

SYNONYMS AND REFERENCES.

Helix anachoreta W. G. BINNEY, Proc. Acad. Nat. Sc. of Phila. ix. p. 185, Notes, p. 5, Oct. 1857.

DESCRIPTION.

“*Animal* light ashen color, tentacles nearly white; average length of some thirty specimens $2\frac{1}{2}$ inches (2 diameters of shell); superior tentacles 5-8ths; inferior 3-16ths inch; foot broad at the posterior extremity; a line of large granules down the middle of the back; sides of foot margined with a line of light granules (pores); genital orifice posterior to and beneath the larger tentacles. In its habits solitary.” (Thomson.)

Shell reddish ashen, orbicularly convex; spire elevated, conic; umbilicus open, slightly concealed by the peristome; whorls six, granulated and sparsely indented; suture impressed; below ventricose; aperture transversely rounded; peristome thickened, scarcely reflected, whitish, with a violet tinge, the extremities approaching each other

and connected with a callus on the parietal wall; throat violet.

Greater diameter, 26; lesser, 21; height, 14 millimetres.

Geographical Distribution. Found by Mr. J. H. Thomson widely distributed in California.

Remarks. It was with some hesitation that I proposed a name for this shell. I at first considered it as a bandless variety of *Nickliniana* Lea. But on expressing this opinion to Mr. Thomson, he gave me the above description of the animal and its habits, which are quite distinct from those of Mr. Lea's shell. Its characteristics were found constant at various remote points of the State, and in a considerable number of specimens. They seem too great for a simple variety. The animal is also different in its habits from *Nickliniana*, being found only solitary, while the latter is gregarious.

The shell is one of the very few bandless species of California.

HELIX RETICULATA PFEIFFER.

T. umbilicata, globoso-depressa, solidula, oblique striata, striis subregulariter antorsum descendentibus oblongo-granulata, fulvida, fascia 1 rufa peripheria cincta; spira breviter conoidea; anfr. $5\frac{1}{2}$ convexiusculi, ultimus latus, rotundatus, antice non descendens; umbilicus angustus, non pervius; apertura diagonalis, rotundato-lunaris; perist. crasse albo-labiatum, marginibus distantibus, dextro vix expansiusculo, columellari declivi superne dilatato, reflexo.

Diam. maj. 22, min. 18, alt. $11\frac{1}{2}$ mill. Hab. in California.

(Pfeiffer, Malak. Blätt. 1857, p. 87.)

I have not seen this species. The above is Pfeiffer's description.

HELIX EXARATA PFEIFFER.

T. umbilicata, conoideo-depressa, solidula, undique malleato-rugulosa, lutescens, fasciâ 1 castaneâ cincta; spira breviter conoidea, acutiuscula; anfr. 7 parum convexi, lente accrescentes, ultimus latior, rotundatus,

antice vix decedens, circa umbilicum mediocrem, apertum subcompressus; apertura obliqua, latè lunaris; perist. leviter albo-labiatum, marginibus vix convergentibus, dextro breviter expanso, columellari superne triangulatim dilatato, patente. [Pf.]

SYNONYMS AND REFERENCES.

Helix exarata PFEIFFER, Proc. Zoöl. Soc. of London, May, 1857, p. 108.

Diam. maj. 30, min. 25, alt. 16 mill. Hab. California? (Pf.)

I have not seen this species. The description given above is Pfeiffer's.

HELIX CALIFORNIENSIS LEA.....vol. ii. p. 121, pl. vi. fig. 2.

Helix Californiensis TROSCHEL in Wieg. Arch. 1839, ii. 221.

DEKAY, N. Y. Moll. p. 46, — not of Pfeiffer, Chemnitz, Reeve.

Helix vincta VALENCIENNES, Voy. de la Venus, Moll. pl. 1, fig. 2, absq. desc.

CHEMNITZ, ed. 2, vol. ii. p. 487, t. 160, fig. 2 (1854).

REEVE, Con. Icon. No. 660.

PFEIFFER, Mon. Hel. Viv. iii. 183.

W. G. BINNEY, Notes, p. 9.

In my notes No. 2, I expressed the opinion that *H. vincta* figured by Valenciennes was distinct from this species. Having since carefully compared Lea's original specimen with Valenciennes's figure, I am convinced of their identity. The figure in the Terrestrial Mollusks is a correct representation of this species in a fresh state. Reeve's figure 660 is also good. That of Chemnitz (l. c.) is less characteristic. Lea's figure is very poorly drawn, and at best represents a dead and worn specimen.

Under the name of *H. vincta*, therefore, descriptions and figures of *H. Californiensis* are to be found in the works referred to in the synonymy. All other descriptions and figures referred to *Helix Californiensis* represent *Helix Nickliniana*, including those given in Chemnitz, Pfeiffer, and Reeve.

HELIX RAMENTOSA GOULD.....vol. iii. p. 12.

HELIX LORICATA GOULD.....vol. ii. p. 145, pl. xxix a. fig. 2.

Helix loricata GOULD, U. S. Ex. Ex. Moll. p. 68, fig. 39, a. b. c.

PFEIFFER, Mon. Hel. Viv. iii. p. 265.

Helix Lecontii LEA, Tr. Am. Phil. Soc. vol. x. No. 2, p. 303, pl. xxx. fig. 13 (1852).

PFEIFFER, l. c. iii. p. 265.

From an examination of Lea's original specimen of *Lecontii*, as well as from his description and figure, I am convinced of its identity with *loricata*. Gould expresses this opinion (Ex. Ex. p. *501, Addenda), Pfeiffer copies Lea's description, not having seen the shell, and remarks "Nonne varietas umbilicata *H. pustulæ*?"

"Animal white, linear, rough, posteriorly acute, tentacles very short." (Thomson.)

The shell is furnished with the peculiar internal fulcrum mentioned by Lea, (l. c.)

HELIX GERMANA GOULD.....vol. ii. p. 156, pl. xl a. fig. 3.*

Helix germana GOULD, U. S. Ex. Ex. Moll. p. 70, fig. 40 a. b. c.

PFEIFFER, Mon. Hel. Viv. iii. 269.

HELIX FIDELIS GRAY.....vol. ii. p. 159, pl. xviii.

Helix fidelis MÜLLER, Syn. Test. anno 1834 promulgatorum, p. 8.

CHEMNITZ, ed. 2, vol. i. 321, pl. lvii. fig. 12 - 13 (1846).

REEVE, Con. Icon. No. 657 (1852).

W. G. BINNEY, Pac. R. R. Rep. vi. p. 111 (1857).

PFEIFFER, l. c. iii. 229.

Helix Nuttalliana TROSCHEL, Arch. für Nat. 1839, ii. 229.

GOULD, U. S. Ex. Ex. Moll. p. 65, fig. 38 (1852).

All the more recent writers agree in placing *H. Nuttalliana* in the synonymy of *H. fidelis*, excepting Gould, who, as late as 1852, (l. c.) remarks, "As there are other species in that region corresponding equally well with Gray's indefinite description, I think it proper to retain Mr. Lea's name until the identity can be fully settled."

* On the copy of the plate referred to, engraved by Delarue, the aperture of *Helix maxillata* is erroneously placed next the figure of this species. This mistake does not occur on the other copy of the plate.

HELIX INFUMATA GOULD.....vol. iii. p. 13, pl. lxxix. fig. 2.

Helix infumata W. G. BINNEY, Pac. R. R. Rep. vi. p. 112.

HELIX TOWNSENDIANA LEA.....vol. ii. p. 161, pl. xix.

Helix Townsendiana TROSCHEL, Arch. für Nat. 1839, ii. 221.

CHEMNITZ, ed. 2, i. 323, pl. lvii. fig. 10, 11 (1846).

REEVE, Con. Icon. 625 (1852).

PFEIFFER, l. c. iii. 229.

GOULD, U. S. Ex. Ex. Moll. 67, fig. 36.

HELIX ARROSA GOULD.....vol. iii. p. 12, pl. lxxvi. fig. 4.

Helix æruginosa GOULD, l. c.

W. G. BINNEY, Pac. R. R. Rep. vi. p. 113.

Helix arrosa GOULD in litt.

W. G. BINNEY, Notes, p. 5.

This name is proposed by Gould in place of *æruginosa*, that being preoccupied.

HELIX DUPETITHOUARSI DESHAYES...vol. iii. p. 14, pl. lxxvi. fig. 9.

Helix Dupetithouarsi DESHAYES, in Fer. i. 169, pl. xcvi. fig. 8-10.

REEVE, Con. Icon. 659 (1852).

PFEIFFER, l. c. Excl. var. B.; iii. 229.

W. G. BINNEY, P. R. R. Rep. vi. p. 114.

Helix Oregonensis TROSCHEL, Arch. für Nat. 1839, ii. 221.

DEKAY, N. Y. Moll. 46.

PFEIFFER, l. c. iii. 272.

In the collection of the Smithsonian Institute there are specimens of this shell which are furnished with a delicate greenish-yellow epidermis. As this has never been noticed in descriptions, I believe it must exist only on very fresh specimens, which are rarely seen. On being immersed some minutes in water, the epidermis becomes of a bright golden color.

The figure is a fac simile of that of Deshayes.

HELIX MORMONUM PFEIFFER.

PLATE LXXIX. FIGURE 21.

T. umbilicata, depressa, tenuiscula, arcuato-striatula, pallide rufescens; spira vix conoideo-elevata; anfr. 6, vix convexiusculi, lente ac-

crecentes, ultimus utrinque convexior, antice turgidulus, vix descendens, supra medium fasciâ castaneâ, utrinque albido-marginatâ cinctus, basi convexus; umbilicus medioeris, conicus; apertura perobliqua, auriformi, lunaris; perist. albo-labiatum, marginibus convergentibus, dextro peraratuato, expanso, columellari arcuato-declivi, reflexo, superne dilatato. [Pf.]

SYNONYMS AND REFERENCES.

Helix Mormonum PFEIFFER, Proc. Zoöl. Soc. London, May, 1857, p. 109.

Diam. maj. 29, min. $24\frac{1}{2}$, alt. $12\frac{1}{2}$ mill. *Hab.* Mormon Island, California. (Pf.)

The above is Pfeiffer's description. I have not seen the shell, but through the kindness of Mr. Cuming I have been able to give a figure of it.

HELIX COLUMBIANA LEA. vol. ii. p. 169, pl. v. pl. xiii. a. fig. 1.

Helix Columbiana TROSCHEL, Arch. für Nat. 1839, ii. 221.

CHEMNITZ, ed. 2, i. 332, pl. lviii. fig. 10-12 (1846).

REEVE, Con. Icon. No. 692 (1852).

PFEIFFER, l. c. iii. 262.

Helix labiosa GOULD, vol. ii. p. 170; U. S. Ex. Ex. Moll. p. 67, fig. 35.

PFEIFFER, l. c. p. 262.

I think there can be no doubt of the identity of these two species. Lea's description was drawn from a worn specimen, denuded of its hairs. It will be remarked that Reeve and Pfeiffer describe it as being covered "pilis brevibus." The latter author gives Gould's description of *labiosa*, not having seen the shell, but records his belief in the identity of the two.

Mr. Thomson gives me the following note on the animal of this species. It seems more than probable that he has confounded it with some other shell, as his observations do not agree with those given on p. 171 (vid. Notes, p. 8).

"Animal twice as long as the breadth of the shell, dark slate color, almost black on the head and tentacles; a black line running along each side of the back from the base of the longer tentacles; body covered with com-

pressed granules; tentacles black, acutely pointed; *eyes at the base of superior tentacles*; anatomy believed to resemble, somewhat, that of the *Lymniadæ*. Gregarious; in its habits resembling *Lymnæa*, being found always near water, and laying its eggs on the water-cresses and other aquatic plants. Arrives at maturity in one year, one half the time required by the other species."

HELIX DEVIA GOULD.....vol. iii. p. 11, pl. lxxix. fig. 13.

Helix devia PFEIFFER, l. c. iii. 262.

GOULD, Addenda, Ex. Ex. *501.

Helix Baskervillei PFEIFFER, l. c. iii. 230.

There can be no doubt of the identity of these two species. Gould's original specimen agrees perfectly with the figure of Reeve (l. c.) and Pfeiffer's description. The latter remarks on *H. Baskervillei* "Conf. *H. devia* Gould, huic forsan peraffinis."

The shell figured is preserved in the Cumingian collection.

HELIX KELLETTI FORBES.

PLATE LXXVI. FIGURE 12.

H. testa angustè umbilicata, depresso globosâ, tenui, rugulosâ, granulâtâ, fulvâ, spirâ subturbinatâ, sordidè flavo conspersâ, rufo-unifasciatâ, anfr. 6 convexiusculi, ultimo ad peripheriam fasciâ pallidâ cineto, basi subinflato; aperturâ lunato-rotundatâ, intus pallidè fuscâ, unifasciatâ; perist. reflexiusculo, margine columellari dilatato, reflexo, umbilicum occultante. Diam. max. 22, min. 19, alt. 19 mill.

This species is nearly allied to *H. Californiensis* Lea. It differs in the more pyramidal contour of the spire, in the less tumid body whorl, and consequently differently shaped, more lunate, slightly elongated mouth. The margin of the mouth is more reflected. [Forbes.]

SYNONYMS AND REFERENCES.

Helix Kelletti FORBES, Proc. Zool. Soc. London, 1850, p. 55, pl. ix. fig. 2 a. b.

REEVE, Con. Icon. No. 665, (1852).

CHEMNITZ, ed. 2, ii. 467, pl. clvi. fig. 19, 20, (1853).

PFEIFFER, Mon. Hel. Viv. iii. 183.

Not possessing a fresh specimen of this species, I am not able to add a more detailed description to that of Forbes, repeated above. My figure is a fac-simile of his. In Gould's collection is a specimen said to have been found at San Diego. The species has been attributed to Central America, but probably through some error.

Reeve's figure *b* seems more closely allied to *H. areolata* or *H. levis*, than to the form figured by Forbes.

HELIX PANDORÆ FORBES. vol. iii. p. 15, pl. lxxvi. fig. 8.

Helix Pandoræ REEVE, Con. Icon. No. 671, (1852).

CHEMNITZ, ed. 2, ii. 467, pl. 156, fig. 17, 18, (1853).

PFEIFFER, Mon. Hel. Viv. iii. 127.

Reeve gives as habitat "Central America."

The figure given is a fac-simile of the original. I have not seen the shell. Below is Gould's description of *damascenus*.

HELIX DAMASCENUS. T. conico-globosa, imperforata, solidula, dilute prunina ad apicem violacea subtus cinerascens, rudis et lineis tenuibus interruptis numerosis cincta; anfr. 5 rotundatis; suturâ impressâ: apertura subcircularis; peristomate angustè reflexo, pallido, extremitatibus approximatis; fauce lividâ; columellâ incrassatâ, rotundatâ.

HELIX LEVIS PFEIFFER.

PLATE LXXVI. FIGURE 10.

Testa perforata, globosa, tenuis, levis, oblique striata, obsolete granulata, albida, punctis seriatim vel fasciis pellucide corneis varie ornata; spira brevis, acutiuscula; anfr. 5 vix convexiusculi, ultimus inflatus; apertura rotundato-lunaris, intus concolor vel fulvida; perist. acutum, intus sublabiatum, margine columellari superne dilatato, fornicatim reflexo, perforationem fere tegente. Diam. maj. 16, min. 14, alt. 13 mill.

β. Margine columellari dente unico, obtuso, calloso instructo.

Habitat in Californiâ, ad Columbia River. [Pfeiffer].

Helix levis PFEIFFER, Mon. Hel. Viv. i. 154; iii. 128. Zietschr, f. Mal. 1845, p. 152.

CHEMNITZ, ed. 2, i. 249, pl. xxxvi. f. 16, 17, (1846).

I have not seen this species. Pfeiffer's description is

given above, and a fac-simile of his figure in the second edition of Chemnitz is given on the plate referred to.

HELIX AREOLATA SOWERBY, . . . vol. iii. p. 14, pl. lxxvi. fig. 11; var. γ .
fig. 3.

Helix areolata PFEIFFER, l. c. iii. 127.

CHEMNITZ, l. c. 1, 248, (1846).

REEVE, Con. Icon. No. 664, (1852).

The original figure of Pfeiffer is copied on the plate referred to from Chemnitz, edition 2. Two varieties are mentioned by him.

“ β . Dente aperturæ obsoleto.

“ γ . Minor, globosa, dente aperturæ valido.” (fig. 3).

HELIX VANCOUVERENSIS LEA, vol. ii. p. 166, p. xx.

Helix Vancouverensis TROSCHEL, Ar. f. Nat. 1839, ii. 221.

PFEIFFER, l. c. iii. 155.

CHEMNITZ, ed. 2, ii. 146, pl. xciv. f. 21-23.

GOULD, U. S. Expl. Ex. p. 36, fig. 37.

REEVE, Con. Icon. No. 669 (1852).

Helix vellicata FORBES, Proc. Zool. Soc. London, Mar. 1850, p. 75, pl. ix. fig. 1.

CHEMNITZ, ed. 2, ii. 454, pl. cliv. fig. 42-44.

REEVE, Con. Icon. No. 673, (1852).

PFEIFFER, MÖB. Hel. Viv. iii. 155.

From the description and figure of Forbes, as well as from specimens received from Mr. Cuming's collection, I am satisfied of the identity of *H. vellicata* with this species. Forbes's description is given below.

H. t. apertè umbilicatâ, tenui, convexo-depressâ, subnitidâ, sulcato-striatâ, striis minutissimis spiralibus decussatâ, læte viridibus; spirâ convexiusculâ, anfr. 6, ultimo rotundato, magno, anticè dilatato, subdescendente; ap. perobliquâ, lunato-oblongâ; faux alba, perist. margine subreflexo, supernè deflexo-sinuato. Diam. max. 22, min. 18, alt. 8 mill.—Panama?

Distinguished from its near allies by the peculiar deflection of the upper portion of the lip margin.

HELIX SPORTELLA GOULD, vol. ii. p. 211, pl. xxii a. fig. 1.

Helix sportella GOULD, U. S. Expl. Ex. p. 37, fig. 42.

PFEIFFER, l. c. iii. 104.

The revolving striæ appear to be wanting in some indi-

viduals. In the mature shell the peristome is slightly reflected, and has the remarkable deflection which characterizes *H. Vancouverensis* and *H. concava*.

Found at San Diego by Dr. J. S. Newberry, and in Contra Costa Co. by Mr. J. H. Thomson. The latter gentleman's notes show the animal to be quite distinct from that of *H. concava* Say, however similar the shells may be, with the exception of the striæ on the Californian species. He writes, "Animal uniformly white or flesh-colored, with an orange line on top of back. Solitary — or only found in pairs."

HELIX NEWBERRYANA.

PLATE LXXVI. FIGURE 7.

Testa latè umbilicata; orbiculato-depressa; solida; striis tenuibus incrementi et lineis subtilissimis, spiralibus, leviter granulato-decussata; nigra, aut rufo-brunnea, sub epiderme alba; sutura valdè impressa; spira depressa; anfr. 6, regulariter accrescentes, superi plani, ultimus convexus, subtus rotundatus, ad aperturam descendens; umbilicus latus, perspectivus, anfr. omnes ad apicem monstrans; apertura obliqua, transverso-lunaris; in exemplis junioribus, paries aperturalis, sculpturâ anfr. præcedentis callo levi obliteratedâ, eleganter notata est lineis elevatis, numerosis, confertis, spiralibus; in exemplis maturis, hæc sculptura occulta est callo incrassato, sed intus in anfr. omnibus remanet; perist. simplex, acutum, intus callosum, marginibus sub-convergentibus, callo albo conjunctis.

SYNONYMS AND REFERENCES.

Helix Newberryana W. G. BINNEY, Proc. Acad. Nat. Sc. of Phila. x. p. 115, Notes, p. 16. May, 1858.

DESCRIPTION.

Animal not observed.

Shell broadly umbilicated; orbicularly depressed; solid; lightly decussated by incremental striæ, and numerous fine spiral lines: color black or reddish-brown, under the epidermis white and shining; suture deeply impressed; spire depressed; whorls 6, regularly increasing, the upper

ones flattened, the last convex, rounded below, and slightly deflected at the aperture; umbilicus broad, showing all the volutions clearly; aperture oblique, transversely-lunar; in young specimens the decussated sculpturing of the shell on the parietal wall of the aperture is covered with a light callus as the animal grows, and elegantly marked with numerous fine, crowded, spiral lines; in mature specimens this beautiful marking is entirely obliterated by the deposition of callus, but on breaking the shell, the lines will be found to exist within; peristome simple, acute, thickened within, ends slightly approximated, joined with a white callus.

Greater diameter, 37; lesser, 20; height, 13 millimetres.

Geographical Distribution. Found in considerable quantity by Dr. J. S. Newberry, of the Colorado Exploring Expedition, (Lieut. Ives,) within a few miles of San Diego.

Remarks. This species bears no close resemblance to any known American *Helix*. It belongs to the same group as *H. Vancouverensis* Lea, but differs in size, color, number of whorls, umbilicus, want of peculiar depression of the lip, by its beautifully decussated surface, and peculiar parietal wall of the aperture. In form alone, dead specimens may be compared with *H. algira* Lin., of Europe, but the spire is flatter and umbilicus larger.

I am unacquainted with any other species of *Helix*, distinguished by a like peculiarity of the parietal wall of the aperture.

Named in honor of Dr. J. S. Newberry, the Geologist of the Colorado Ex. Ex.

Very abundant at the locality given above. But few fresh specimens were brought, however, owing to the fact of there having been a drought for several years before the visit of the Expedition.

HELIX CULTELLATA THOMSON.

PLATE LXXVI. FIGURE 6.

Testa orbiculato-depressa, nitens, carinata, corneo-rufescens, ad peripheriam et ad suturas albo-zonata; anfr. $6\frac{1}{2}$ convexiusculi, striis minutis incrementalibus at lineis microscopicis spiralibus decussati; sutura impressa, apertura oblique lunaris; perist. simplex, acutum, ad columellam vix reflexiusculum; subtus lævigata, albida, infra carinam latè rufo-corneo-zonata; umbilicus perspectivus, anfr. omnes ad apicem monstrans.

SYNONYMS AND REFERENCES.

Helix cultellata THOMSON, in Proc. Phila. Acad. Nat. Sc. ix. p. 185, Oct. 1857; Notes, p. 5.

DESCRIPTION.

Animal twice the length of the diameter of the shell; color reddish.

Shell orbicular, depressed, carinated, shining, reddish horn color, with a broad revolving band of white at the periphery and sutures; whorls $6\frac{1}{2}$, rather convex, decussated by minute lines of growth and microscopic revolving lines; below these lines are obsolete, the surface is shining, whitish, with a broad reddish horn-colored band below the carina; suture impressed; aperture oblique, lunate; peristome acute, not thickened and scarcely reflected at the umbilicus, which is broadly expanded, and shows all the volutions to the apex.

Greater diameter, 35; lesser, 19; height, 13 millimetres.

Geographical Distribution. Found plentifully in Contra Costa Co., California, by Mr. J. H. Thomson, of New Bedford, Mass.

Remarks. Mr. J. H. Thomson, of New Bedford, Mass., proposes this name for a shell found by him living in considerable quantities. The circumstances in which it was discovered are very unfavorable to the supposition of its having been brought from abroad. The chances of a Dalmatian shell having been introduced into California,

and already multiplying there, are very small indeed. At the same time the shell before me bears strong resemblance to the European group of this type. It seems to be between *H. albanica* Ziegler, and *acies* Partsch; the carina being less sharp than in the latter. Mr. Thomson suggests that it may have been imported from the Sandwich Islands on vegetables, but there is no species native to that region which bears any resemblance to this.

Since the publication of this species in the Proceedings of the Academy of Natural Sciences, my doubts of its being a native of California have been materially lessened by the discovery of the allied species, *Helix Newberryana*, from the same Zoölogical region. The resemblance of *H. cultellata* to the group of Eastern Europe is quite remarkable, yet our knowledge of the Mollusks of the Pacific Coast is still too imperfect to allow us to consider this as a unique example of resemblance between species of the two regions.

HELIX STRIGOSA GOULD.....vol. ii. p. 210, pl. xxvi.

Helix strigosa GOULD, U. S. EX. EX. p. 36, fig. 41.

PFEIFFER, l. c. iii. 112; Malac. Blatt. 1857, 32.

“Rocky Mountains in New Mexico.” (Pfeiffer).

SPURIOUS SPECIES.

Helix Sagraiana Orbigny, a Cuban species, is erroneously attributed to California (on the authority of Sowerby) by Pfeiffer (Mon. i. 325) and Carpenter (Report, p. 214).

EXTRA LIMITAL SPECIES.

The following species have not yet been found within the territory of the United States, though they are known to exist in the neighboring States of Mexico.

Helix Acutedentata W. G. Binney. Plate lxxvi. Figure 1, and

Helix Loisa W. G. Binney. Plate lxxvi. Figure 2. (Notes

No. 2). These are perhaps but varieties of the same species. They inhabit Sinaloa, on the banks of the Mazatlan River.

Helix aspersa, Muller, is said by Forbes (Proc. Zoöl. Soc. 1850, p. 53) to have been found at Santa Barbara. Its presence may have been accidental.

Helix Mazatlanica Pfeiffer, Mal. Blatt. iii. 43, is attributed to the locality from which its name is derived.

GENUS BULIMUS SCOPOLI.

BULIMUS CALIFORNICUS REEVE.

PLATE LXXIX. FIGURE 15.

Bul. testâ subacuminato-ovatâ, tenuiculâ, vix umbilicatâ, anfr. 6, lævibus, columellâ reflexâ, labro simplici; lacteâ, zonulis interruptis transversis cœruleo nigricantibus cingulatâ.

Hab. California.

There is little novelty in the character or general aspect of this species, but it is certainly distinct. (Reeve).

SYNONYMS AND REFERENCES.

Bulimus Californicus REEVE, Con. Icon. No. 378, (Dec. 1848).

PFEIFFER, Mon. Hel. Viv. iii. 422.

Remarks. I have seen no authentic specimen of this species. Above is Reeve's description, and his figure is given on the plate referred to. Judging from them, I cannot agree with the opinion expressed by Gould (vol. ii. p. 275) that it is identical with *B. serperastrus*. The figure is one half larger than the natural size of the shell.

BULIMUS EXCELSUS GOULD.

PLATE LXXIX. FIGURE 12.

T. elongato-ovata, acuminata, solidiuscula, lævis, fulvida, albido strigata; spira elevata, peracuta, anfr. 7, ultimo trientes duos long. vix æquante: apertura trientem long. adequans, sub-ovata; labro albo anticè revoluta, subcontinuo, ad columellam expanso, fissuram latam obtegente.

Bulimus excelsus GOULD, Journ. Boston Soc. Nat. Hist. vol. vi. part 3, p. 376, pl. xiv. fig. 3, (Oct. 1853).

Bulimus elatus GOULD, l. c. in tab.

Shell ovate-fusiform, rather solid, smooth, pale coffee-colored,

with unequal longitudinal strigæ of white shading into each other, white at suture; spire acute, elongated; whorls seven, moderately convex, the last not quite two thirds the length of the shell; aperture less than half the length of the shell, obliquely subovate, lip soon becoming revolute, broadly so in front, rising, a little narrowed by a somewhat abrupt curve upon the columella, and expanding again as it rises, until the two extremities of the lip nearly meet; the columellar portion stands off from the body whorl, displaying a large umbilical fissure; lip white, with a brown submargin at the point of reflection.

Length, $1\frac{3}{4}$ inch; breadth, $\frac{3}{4}$ inch.

Inhabits California. *Maj. Rich.*

This shell has very much the appearance of *B. Lobbi* Reeve, from Peru; but the aperture is larger and differently proportioned; the colors are less bright, the stripes broader and more blended. *B. pallidior* Sowerby, has the aperture more like it, but is colorless, and has the spire less elongated. In form it is also much like *B. xanthostoma* D'Orb. It has the form of *B. membranaceus*, but is much larger and thicker.

This is Gould's description. His figure is given in the plate referred to. I have not seen the shell.

EXTRA LIMITAL.¹

Bulimus chordatus Pfeiffer,
Humboldti Reeve,
Mexicanus Lamarek,
Zebra Müller,
Ziegleri Pfeiffer,

have been detected in Cinaloa.

Bulimus vegetus Gould, was found at San Juan, Gulf of California, (Bost. Journ. vi. 375).

Bulimus vesicalis Gould, (l. c. Oct. 1853) "inhabits lower California." This name being preoccupied by a species described by Pfeiffer, (March, 1853,) Gould suggests *sufflatus* in its stead.

¹ *Bulimus Laurentii* Sowerby, var. β , is mentioned by Pfeiffer (Mon. Hel. Viv. ii. 218) as inhabiting "Sitka littoris Americæ occidentalis." Whether he refers to the Sitka of the northwest coast, or some South American locality, I do not know.

GENUS ACHATINA LAMARCK.

ACHATINA CALIFORNICA PFEIFFER.

PLATE LXXIX. FIGURE 19.

Testa subulata, tenuis, oblique confertissime rugoso-striata, cereo-albida: anfr. 12-13, summi convexi, 3-4 ultimi planati, ultimus 1-6 longitudinis paulo superans, basi acute carinatus, infra carinam subexcavatus; columella arcuata, basin attingens, incrassata, subtruncata; apertura subtetragona; perist. simplex, acutum. Long. 23, diam. $3\frac{1}{2}$ mill. Ap. 4 mill. long. $2\frac{1}{4}$ lata. (Pfr.)

Achatina Californica PFEIFFER, Symb. ad. Hist. Hel. 3, p. 89; Mon. Hel. Viv. ii. 267, iii. 501.

REEVE, Con. Icon. 115, (Mar. 1850).

Remarks. I have not seen this species, which is said to inhabit "Monterey, California." The figure I have given is a copy of Reeve's reduced to the natural size of the shell.

EXTRA LIMITAL.

GENUS GLANDINA SCHUMACHER.

Glandina Albersi, Pfeiffer, and

G. turris, Pfeiffer, are included by Carpenter in the Catalogue of the Riegen Collection, (p. 175).

FAMILY AURICULACEA.

SUB-FAMILY MELAMPEA.

GENUS MELAMPUS MONTFORT.

MELAMPUS OLIVACEUS CARPENTER.

PLATE LXXIX. FIGURE 8.

M. t. parvâ, sublævi, conoideâ, spirâ depressâ, infra suturam indistinctam obscure angulatâ; albidâ, fusco-purpureo irregulariter tessellata, epiderme adhærente, obivaceâ indutâ; anfr. 7 vix mostrantibus, planatis; aperturâ longâ, angustâ, ad marginem fusco-purpureâ, intus albâ; labro ad marginem acuto, intus dentato, dentibus in liras acutas, in adultâ sæpe obsoletas, decurrentibus; labio tenui, plicâ unâ parietali, transversâ, inter denticulas duas sitâ, in juniore denticulis numerosis intus conditis; columellâ plicâ unâ obliquâ, ad basin excurrente; parietibus internis in adultâ absorptis. (Carpenter, l. c.)

SYNONYMS AND REFERENCES.

Melampus olivaceus CARPENTER, in Riegen Cat. of British Museum, p. 178. anno. 1857.

DESCRIPTION.

Animal not yet observed.

Shell small, rather smooth, conical; spire depressed, obtusely angulated below the suture, which does not distinctly separate the whorls; color dirty white, with irregular patches or revolving lines of dark red or purplish; epidermis olive-colored; on young or very fresh specimens there are sometimes microscopic revolving lines near the base of the shell, and on the spire, which cross the delicate lines of growth so as to present under the microscope a granulated surface; whorls 7 to 9, the upper ones distinguished only by means of the lens, and flattened; aperture long, equalling $\frac{11}{13}$ of the shell, edge variegated in color by the termination of the reddish bands on the white ground of the shell, within white; the outer lip is furnished with numerous sharp, white laminæ, in the specimens before me varying from 1 to 9; the parietal wall of the aperture is covered with an almost imperceptible, shining, callus; there is one constant, prominent, elevated white tooth-like lamina revolving within the shell, which is usually placed within two smaller shorter ones; on the columella there is also a stouter lamina entering into the aperture, and passing outwards and curving downwards so as to join the termination of the labium.

Long. 13; diam. 18 mill.

Geographical Distribution. Mazatlan, (Riegen Cat. not uncommon,) San Diego, (Mr. W. P. Blake, in Smithsonian Collection).

Remarks. This is the first species of the family Auriculacea found on the Pacific coast of North America. There were numerous specimens found by M. Riegen, which Mr. Carpenter describes as distinguished generally

by the olive-green epidermis, variegated with purplish-brown patches. I find the number of laminæ in the aperture very variable, but the two prominent ones on the labium are constant in all the individuals I have had the opportunity of examining.

Mr. Carpenter (l. c.) says that M. Mörk has labelled this in Mr. Cuming's collection "*Melampus bidentatus* Say," and justly adds that it is much more nearly allied to *Melampus coffeus* Lin. It seems to me, however, to be a peculiarly well marked species.

The figure is taken from a specimen in the cabinet of the Boston Society of Natural History, labelled by Mr. Carpenter.

I am indebted to the kindness of Prof. S. F. Baird for specimens of this species.

FAMILY ACICULACEA.

GENUS TRUNCATELLA RISSO.

TRUNCATELLA CALIFORNICA PFEIFFER.

PLATE LXXIX. FIGURES 20, 22.

T. non-rimata, turrity-cylindracea, truncata, tenuiscula, leviter striata, parum nitens, pallide rubello-cornea; spira sursum vix attenuata; sutura simpliciter marginata; anfr. superst. 4 convexi, sensim accrescentes, ultimus basi non compressus; apertura verticalis, ovalis, superne vix angulata; perist. simplex, continuum, margine dextro expanso, superne sub-repando, columellari adnato. [Pf.]

SYNONYMS AND REFERENCES.

Truncatella Californica PFEIFFER, Proc. Zoöl. Soc. London, May, 1857, p. 111; Mon. Pneum, Viv. ii. p. 7.

DESCRIPTION.

Animal not observed.

Shell imperforate, cylindrical, truncated at tip, thin and translucent with light striæ, shining, amber-colored; spire in the perfect state of the shell composed of about

10 whorls, of which 4 only are not deciduous; these are convex, increasing in size rather rapidly; aperture oval, vertical, rounded above; peristome simple and continuous, slightly expanded, its pillar margin scarcely attached to the shell.

Length $4\frac{2}{3}$, diam. $1\frac{2}{3}$ mill.

Geographical Distribution. San Diego, California.

Remarks. This is the only *Truncatella* yet found on the western coast, excepting, perhaps, the doubtful species from Mazatlan mentioned in the Riegen Catalogue, p. 364.

It is readily distinguished by its amber or deep honey color, and its shining surface nearly unbroken by ribs. The bars are numerous, and are distinguished rather by making the shell more opaque than by their prominence.

I am indebted to Mr. Cuming for the figure I have given of a specimen in his collection, and to Dr. Gould for specimens of the shell.

This is the *Truncatella gracilentia* mentioned in the Errata of Vol. X. Phila. Proc. That name was proposed by Gould before meeting with Pfeiffer's description.

2. THE SPECIES EAST OF THE ROCKY MOUNTAINS.

FAMILY LIMACEA.

GENUS VAGINULUS FERUSSAC.

VAGINULUS FLORIDIANUS BINNEY..... vol. ii. p. 17, pl. lxxvii.

SPURIOUS SPECIES.

The following species are catalogued by Grateloup among the American *Vaginuli*, (Dist. Geog. des Limaciens, p. 22). They were all described by Rafinesque, and by him placed in his genus *Philomyces*. From the general inaccuracy of that author, as well

as the deficiency of the descriptions, I think they should be excluded from this or any genus.

Vaginulus flexuolaris, *Vaginulus oxyurus*,
 “ *fuscus*, “ *quadrilus*.

GENUS TEBENNOPHORUS BINNEY.

The first accurate description of this genus was published by Binney in 1841, (Proc. Boston Soc. p. 51). I have therefore given preference to the name he proposed over that of Rafinesque usually adopted. (Vol. II. p. 19).

Since the publication of the “Terrestrial Mollusks,” the name *Tebennophorus* has been retained in this country by Stimpson (Shells of N. E.) and by Grateloup, abroad. On the other hand, *Philomycus* has been adopted in Adams’s Genera of Recent Mollusca, where the characteristics of the mantle are correctly given; and in the British Museum Catalogue of Pulmonata.

TEBENNOPHORUS CAROLINENSIS Bosc. vol. ii. p. 20, pl. lxiii. fig. 1, 2.

Limax Carolinensis MRS. GRAY, Fig. Moll. An.

Limax marmoratus DEKAY, *absq. desc.*

LINSLEY, Shell of Conn. 9.

Philomycus Carolinensis GRAY and PFEFFER, Brit. Mus. Cat. Pulm.

H. and A. ADAMS, Genera, ii. p. 220. June, 1855. *absq. desc.*

Tebennophorus Carolinensis DEKAY, N. Y. Moll. p. 24.

STIMPSON, Shells of N. E. p. 56, *absq. desc.*

In 1842 (Boston J. N. H. iv. 2) Dr. Binney referred the *Limax Carolinensis* of Bosc to this genus. His description was the first correct one ever published. I have therefore retained the name he proposed for it.

Rafinesque’s Genus *Philomycus* bears an earlier date than *Tebennophorus*. His description appears to me insufficient to warrant this species being referred to his genus, as it has been in the works referred to in the synonymy.

From letters of Dr. Newcomb to Dr. Binney (1845) it appears probable that *Limax marmoratus* of DeKay’s ear-

lier report (1839, p. 31) and Linsley's Shells of Connecticut (p. 9) are to be referred to this species. Its characters are also given by Adams, in Silliman's Journal, vol. 40, p. 275, (1841). I have also in my possession unpublished notes of Say in which he accurately describes this species, and points out the defects of Ferussac's and Rafinesque's descriptions of *Philomycus* and *Eumelus*.

For anatomy of this species, vid. Wyman, Boston Soc. Proc. i. p. 154.

It is found sparingly in Burlington Co., New Jersey.

TEBENNOPHORUS DORSALIS BINNEY. vol. ii. p. 24, pl. lxiii. fig. 3.

Philomycus dorsalis BINNEY, Proc. Boston Soc. 1841, p. 52.

GRAY and PFEIFFER, Brit. Mus. Cat. of Pulmonata.

ADAMS, Gen. Rec. Moll. ii. p. 220, *absq. desc.*

Limax dorsalis DEKAY, N. Y. Moll. p. 22.

SPURIOUS SPECIES.

Tebennophorus bilineatus Cart., of Grateloup (Dist. Geog. p. 30) is unknown to me.

GENUS ARION FERUSSAC.

ARION HORTENSIS FERUSSAC. vol. ii. p. 27, pl. lxiv. fig. 1, lxv. fig. 2.

Arion hortensis DEKAY, N. Y. Moll. p. 23.

SPURIOUS SPECIES.

Arion empiricorum Ferussac is quoted as an inhabitant of the Western United States by Grateloup, (Dist. Geog. des Limaciens, p. 8). It has not been noticed by any American writer.

Arion foliolatus Gould is erroneously ascribed to Boston by the same author, (p. 8). It is an inhabitant of the Pacific Coast.

GENUS LIMAX FERUSSAC.

LIMAX VARIEGATUS DRAPANAUD. vol. ii. p. 34, pl. lxv. fig. 1.

Limax flavus DEKAY, N. Y. Moll. p. 21, pl. i. fig. 5.

GRAY and PFEIFFER, Brit. Mus. Cat.

LIMAX AGRESTIS MÜLLER. vol. ii. p. 36, pl. lxiv. f. 2.

Limax agrestis DEKAY, N. Y. Moll. p. 20, pl. i. fig. 4.

Mürch (Moll. Grœnl. p. 75) quotes this species as an inhabitant of Greenland.

LIMAX CAMPESTRIS BINNEY. vol. ii. p. 41, pl. lxiv. fig. 3.

Limax campestris BINNEY, Proc. Boston Soc. 1841, p. 52.

DEKAY, N. Y. Moll. p. 23.

SPURIOUS SPECIES.

Limax Columbianus Gould, is quoted erroneously by Grateloup (Dist. Geog. des Limaciens, p. 14) as inhabiting the Northern and Western States. It is found only on the Pacific Coast.

Limax fuliginosus Gould, and

Limax olivaceus Gould, are erroneously quoted by the same author (p. 30) as American.

Limax lineatus DeKay, is mentioned by name only, (vol. ii. p. 33).

Limax gracilis Rafinesque, of Grateloup and Gray and Pfeiffer, is *Deroceras gracilis* of the following list.

Of the following species of Rafinesque, Nos. 1, 2, and 3 are quoted in Grateloup's Catalogue, and No. 4-10 are described in the British Museum Catalogue of Pulmonata. The original description of these species is given in vol. i. p. 51, *et seq.*

- | | |
|-----------------|-------------------|
| 1. Eumelus | 6. Philomyces |
| 2. " lividus, | 7. " flexuolaris, |
| 3. " nebulosus, | 8. " fuscus, |
| 4. Deroceras | 9. " oxyurus, |
| 5. " gracilis, | 10. " quadrilus. |

Gray and Pfeiffer also ascribe to Rafinesque the genera *Testacina*, *Urcinella*, and *Zilotea*. I have never met with any description of them, and therefore exclude them with the others as unworthy of a place in the Catalogue of American *Pulmonata*.

FAMILY HELICEA.

GENUS VITRINA DRAPANAUD.

VITRINA ANGELICÆ BECK.

PLATE LXXIX. FIGURE 9.

Testa convexiusculo-depressa, lævigata, nitida, pellucida, virenti-lutea; spira parvula, sub-prominula; sutura subtiliter crenulata; anfr. $3\frac{1}{2}$ rapidè accrescentes, ultimus subtus latus; apertura obliqua, lunato-ovalis; perist.

simplex, subinflexum, margine columellari non recedente, leviter arcuato. Diam. maj. 6; min. 4 $\frac{2}{3}$; alt. 3 $\frac{1}{2}$ mill. [Pfeiffer].

SYNONYMS AND REFERENCES.

Vitrina Angelicæ, BECK, Index, p. 1 (*absq. desc.*)

MÖLLER, Index Moll. Grœnl. p. 4, (teste Pfr.)

PFEIFFER, Mon. Hel. Viv. ii. p. 510.

MÖRCH nat. Bidr. af Gron. p. 75 (*absq. desc.*)

Helix pellucida FABRICIUS, Fauna Grœnl. p. 389, excl. Syn. Müller.

Helix domestica STRÖM, Der Tronh. Vidensk. &c. vol. iii. p. 435, tab. vi. fig. 15, (teste Fabricius).

Geographical Distribution. Found in Greenland. Archangel (Fabricius).

Remarks. "Closely resembling *V. pellucida*, being scarcely distinguished by the more rapidly enlarging whorls, and the form of the aperture." (Pfeiffer, l. c.) I have not seen this species. The figure I have given was drawn from a specimen in Mr. Cuming's collection.

Fabricius referred this species to *V. pellucida* Müller. His description is given below. I have not been able to obtain access to Ström's description.

HELIX PELLUCIDA (Fabricius, l. c.) *Helix* testa imperforata, depressiuscula nitida, subvirescente, anfr. tribus. Descriptionem hujus exactissimam ap. Müll. de Verm. l. c. habemus. Vertex in meis omnibus albus, reliquum testæ albidovirescens. Anfractus maximus verticaliter plures strias subtiles subminentes habet, ad suturam notabiliores.

VITRINA LIMPIDA GOULD. vol. ii. p. 58, pl. lxxvii. a, fig. 1.

Vitrina pellucida DEKAY, N. Y. Moll. p. 25, pl. iii. fig. 4, 5 a. b.

STIMPSON Shells of N. E. p. 55, (*absq. descr.*) Say (Binney)
p. 31.

Vitrina Americana PFEIFFER, Dec. 1852, Proc. Zoöl. Soc. p. 156.

CHEMNITZ, ed. 2, p. 9, pl. i. fig. 22-25, (1854).

Vitrina limpida GOULD, in Agassiz, Lake Superior, p. 243, 1850. Terr. Moll. l. c.
PFEIFFER, Malac. Blatt. ii. p. 10, (1856).

In 1850 this species was declared to be distinct from the European *V. pellucida* by Gould. In 1852 a description of it was published by Pfeiffer under the name of *V. Americana*. That author has since withdrawn his name in favor of Gould's.

Say changed his opinion of the identity of this species and *V. pellucida*, subsequently to the publication of Long's Expedition. Among his notes, kindly furnished me by Mrs. Say, is a description of it under the name of *Helicolimax canaliculata*. The description was never published.

Stimpson (l. c.) observes, "This being a boreal species, occurring in Greenland, it is probable that it is identical with the European one to which it was referred by Mr. Say."

GENUS SUCCINEA DRAPANAUD.

SUCCINEA CAMPESTRIS SAY.....vol. ii. p. 67, pl. lxxvii. b, fig. 1.

Succinea campestris SAY, (Binney's ed.) p. 12.

PFEIFFER, Symb. ii. p. 56, (excl. Syn. Gould); Mon. Hel.

Viv. ii. p. 524, (excl. do.); iii. p. 15, (excl.

Syn. DeKay).

CHEMNITZ, ed. 2, p. 48, pl. v. f. 5, 6, (1854).

DESHAYES in Fer. ii. p. 139, nec DeKay, p. 54; Adams,

Linsley, Anthony, Prescott, (abs. desc.)

In Chemnitz, Pfeiffer, and Deshayes, *S. campestris* Gould is erroneously quoted as a synonym of this species.

Bishop Elliott discovered in the old cemetery at Savannah a variety, distinguished by a beautiful golden apex and uniform amber color.

Authentic specimens of this species are still preserved in the collection of the Philadelphia Academy of Natural Sciences.

SUCCINEA INFLATA LEA.....vol. ii. p. 66, pl. lxxx. fig. 11.

Having examined the original specimen of this shell in Mr. Lea's cabinet, I am inclined to doubt its specific weight. I have, however, had an outline of his specimen figured, and propose to leave to the future the question of its identity with *S. campestris* Say.

Succinea inflata LEA, l. c. 1841; Tr. Am. Phil. Soc. ix. p. 5, (1844).

PFEIFFER, Mon. Hel. Viv. ii. p. 526; iii. p. 16.

CHEMNITZ, ed. 2, p. 49, pl. v. fig. 9-11, (1854).

Succinea campestris var. BINNEY, vol. ii. p. 67.

Pfeiffer observes that the specimens which he describes were received from Griffith, and agree with Ferussac's figure of *S. campestris*.

The same author mentions a variety "Unicolor, corneolutescens," from the vicinity of New Orleans.

SUCCINEA OBLIQUA SAY.....vol. ii. p. 69, pl. lxxvii. b, fig. 3.

Succinea obliqua SAY (Binney's ed.) p. 32, pl. lxxiv. f. 7.

CHEMNITZ, ed. 2, p. 47, pl. v. fig. 1, 2, (1854).

PFEIFFER, Mon. Hel. Viv. iii. p. 15.

Succinea ovalis SAY (Binney's ed.) p. 8.

ADAMS, Shells of Vermont, p. 6, (1842).

DESHAYES, in Encycl. Meth. ii. p. 20; Fer. Hist. l. c. ii. p. 139, (excl. syn. Gould).

PFEIFFER, Mon. Hel. Viv. ii. p. 524; iii. p. 15, (excl. syn. Gould).

CHEMNITZ, ed. 2, p. 48, pl. v. fig. 3, 4.

Succinea lineata DEKAY, N. Y. Moll. p. 53, pl. iv. f. 51.

Succinea campestris of all American authors except Say.

Pfeiffer in 1841 (Symb. i. p. 7) says of *Succinea obliqua*, "An potius Linnæus." In 1853 he describes it as a *Succinea*.

It has been found at Ottawa City, Canada, (J. H. Redfield), and in the basin of the Red River of the North, (Robert Kennicott).

SUCCINEA TOTTENIANA LEA.....vol. ii. p. 65, 72, pl. lxxvii. b, fig. 2.

Succinea Totteniana LEA, Proc. Phil. Soc. ii. p. 32, (1841); Tr. Am. Phil. Soc. ix. p. 4, (1844).

PFEIFFER, Mon. Hel. Viv. ii. p. 526; iii. p. 15.

GOULD, in Terr. Moll. l. c.

Succinea obliqua BINNEY, var. l. c.

I agree entirely with Lea and Gould in separating this shell from *S. obliqua*. Its characteristics are constant and well marked in specimens, in my cabinet, obtained from Newport, R. I. (Lea); Maine, (Binney); Greenwich, N. Y. (Ingalls); and Marblehead, Mass. (J. P. Haskell).

SUCCINEA AVARA SAY.....vol. ii. p. 74, pl. lxxvii. c, fig. 4.

Succinea avara SAY, (Binney's ed.) p. 32, pl. 74, f. 6.

PFEIFFER, Symb. ii. p. 56; Mon. Hel. Viv. ii. p. 525, iii. p. 15.

Succinea avara DE KAY, N. Y. Moll. p. 54, pl. iv. fig. 55.

CHEMNITZ, ed. 2, p. 51, pl. v. fig. 18-20, (1854).

Succinea Wardiana PFEIFFER, Mon. Hel. Viv. ii. p. 525; iii. p. 15.

LEA, Tr. Am. Phil. Soc. ix. p. 3, (1844).

Pfeiffer (l. c.) gives Lea's description of *S. Wardiana*, marking the species as one he had not seen.

Specimens which are apparently referable to *S. avara* have been found at Alexandria, La. (Coll. Lea), and at St. Simon's Isle, Ga. (Postell).

I have found this species under logs, at great distances from any water. In this respect its habits differ from those of the other *Succineæ* of America.

In my Notes, No. 4, I have catalogued *Succinea vermeta* separately. I am not at all convinced of its identity with this species. I have never seen any specimen answering Say's description of the suture. It seems best, however, to leave *S. vermeta* in the synonymy of *S. avara*, where it has been placed by Binney, Gould, Adams, De Kay, and Pfeiffer. The original description is given below.

It is very certain that the large variety of *S. avara* is not *S. vermeta*, though usually known by that name. It sometimes reaches the length of 13 millimetres. I have it from Ohio, Utica, N. Y. (Jewett), and Mohawk, N. Y. (Lewis).

Say's original specimens of *S. avara* are preserved in the Philadelphia Academy.

SUCCINEA VERMETA (Binney's ed. p. 38). Shell suboval, yellowish, very thin and fragile, somewhat diaphanous, with nearly three very oblique volutions; whorls very much rounded, wrinkled; suture very profoundly impressed; spire rather prominent and acute; aperture ovate, the superior termination rounded.

Inhabits margins of ponds near New Harmony.

This species is remarkable for the very deep indentation of its suture, giving to the whorls of the spire the appearance of being almost separated from resting on each other; and by this character it may be readily distinguished from the other species of this country. It was found by Dr. Troost. (Say).

SUCCINEA AUREA LEA..... vol. ii. p. 76, pl. lxxvii. c. fig. 3.

Succinea aurea LEA, Tr. Am. Phil. Soc. ix. p. 4, (1844).

PFEIFFER, Mon. Hel. Viv. ii. 525; iii. 15.

Succinea ovalis var. ANTHONY, Shells of Ohio. 1843.

It has been found on Goat Island, Niagara Falls, (T. Bland.)

SUCCINEA OVALIS GOULD, non SAY..... vol. ii. p. 78, pl. lxxvii. a. fig. 3.

The only other reference to this species is in Gould's Invertebrata and perhaps in Adams's Shells of Vermont. Other authors have confounded it with Say's species.

I have specimens from Wisconsin, (Lapham); South Illinois (Kennicott); Michigan (Winchel); and Burlington, N. J.

SUCCINEA RETUSA LEA..... vol. ii. pp. 65, 66.

PLATE LXXIX. FIGURE 7.

Succinea retusa LEA, Trans. Am. Phil. Soc. vol. v. p. 117, pl. xix. fig. 86, (1837).

DEKAY, N. Y. Moll. p. 55.

PFEIFFER, Mon. Hel. Viv. ii. p. 525.

Succinea campestris ANTHONY, Ohio Cat. absq. descr.

If this species were identical with *S. ovalis* Gould, as suggested by Binney, it would take precedence by the rule of priority of publication. After examining the specimen from which Lea's description was drawn, I have decided to consider it a distinct species. The figure is a fac-simile of the outline of Lea's.

Pfeiffer had not seen this species, and DeKay mentions it among the extralimital species.

Lea remarks, (l. c.) "It differs so much from any of the described species, in the dilatation and retraction of the inferior part of the aperture, that I have not hesitated to consider it new."

SUCCINEA GROENLANDICA BECK.

PLATE LXXX. FIGURE 4.

T. oblonga, *solidula*, *striatula*, *vix nitidula*, *pallide cornea*, *albido-strigata*; *spira scalaris*, *papillata*; *anfr.* 3, *penultimus perconvexus*, *ultimus* $\frac{2}{3}$ *longitudinis subæquans*; *columella substrictè recedens*; *apertura ovalis*; *perist. simplex*, *marginè dextro arcuato*. *Long.* 8; *lat.* $5\frac{1}{2}$; *alt.* $3\frac{1}{2}$ *mill.* *Ap.* $5\frac{1}{2}$ *mill.* *longa*, $3\frac{1}{2}$ *lata*. (Pfeiffer).

SYNONYMS AND REFERENCES.

Succinea Groenlandica BECK, *Ind. abs. desc.*

PFEIFFER, *Mon. Hel. Viv.* ii. 529; iii. 20.

MÖLLER, *Ind. Moll. Grœnl.* p. 4, (teste Pfr.)

DESCRIPTION.

Animal not observed.

Shell elongated, rather heavy, lightly wrinkled, of a light horn color, mixed with white; spire scalariform, bulbous; whorls 3, the penultimate quite convex, the last equalling about $\frac{2}{3}$ the length of the shell; columella receding and narrowed, covered with a white callus; aperture oval; peristome simple, the right margin curved.

Greatest length 8, breadth $5\frac{1}{2}$, millimetres. Length of the aperture $5\frac{1}{2}$, breadth $3\frac{1}{2}$.

Geographical Distribution. Greenland (Möller, Mörch, &c.)

Remarks. This species is easily distinguished by its bulbous, turreted spire, and by its light horn color, broken by longitudinal white vittæ. When the epidermis is removed, the shell is of a dead white. The specimen figured is in Mr. Bland's collection.

SUCCINEA LINEATA.

PLATE LXXX. FIGURE 5.

Testa oblongo-ovata, *solidior*, *albida aut cinerea*; *spira elevata*, *acuta*; *anfractus* 3 *convexi*, *lineis parallelis inter rugas incrementales volventibus ornati*; *sutura impressa*; *apertura orbiculata-ovata*, *oviformis*, *partem testæ dimidiam æquans*; *columella plicata*, *callo albo induta*.

SYNONYMS AND REFERENCES.

Succinea lineata W. G. BINNEY, Proc. Acad. N. S. of Phila. vol. ix. p. 19; Notes, p. 1, (February 1857). Proc. Boston Soc. N. H. vol. vi. p. 155, (April, 1857).

DESCRIPTION.

Animal not observed.

Shell oblong-ovate, with three very convex whorls; spire elevated, acute; surface marked with irregular wrinkles of growth, between which are coarse parallel revolving lines, somewhat removed from each other. Aperture large, about as long as one half of the whole length of the shell, oval; columella folded; a deposition of callus on the parietal wall of the aperture.

Greatest diameter, 6; alt. 12 millimetres.

Geographical Distribution. Collected in considerable quantity by Dr. F. V. Hayden, (Yellowstone, Expl. Ex.) on high hills near Fort Union, Nebraska Territory.

Remarks. The specimens collected being dead and eroded, it is impossible to say what is the color of the shell when fresh. It is probably ashy white, resembling the true *S. campestris* of the Southern States. The revolving lines which distinguish it are most apparent on the middle of the body whorl. These are quite coarse, and placed at irregular intervals;—on some specimens scarcely discernible. The aperture is unlike that of any other of our species; being correctly egg-shaped,—it is nearest in form to that of *S. campestris*, but is less expanded. The parietal wall of the aperture is unusually horizontal.

In general aspect it resembles somewhat *S. vermeta*, but is distinguished from that shell by its more oval shape, and the greater convexity of the whorls. It is the heaviest American species.

This species must not be confounded with *S. lineata* DeKay.

SUCCINEA HAYDENI.

PLATE LXXIX. FIGURE 1.

Testa elongato-ovalis, tenuis, pellucida, succinea; spira parva, acuta; anfr. 3 convexi, ultimus rugis levibus incrementalibus et sulcis crassis spiralibus, interruptis, inequaliter notatus; sutura medioeris; columella callo levi induta, apicem interiorem a basi testæ monstrans; apertura obliqua, ovalis, 5-7 long. testæ æquans, ad basin expansior.

SYNONYMS AND REFERENCES.

Succinea Haydeni W. G. BINNEY, Proc. Acad. Nat. Sc. of Phila. x. p. 114. May, 1858. Notes, p. 15.

DESCRIPTION.

Animal of an uniform amber color, judging from the specimens preserved in spirits in the collection of the Smithsonian Institute.

Shell elongate-oval, thin, shining, amber-colored; spire short, acute; whorls three, convex, the last marked with the wrinkles of growth, and irregular, heavy, spiral furrows; suture moderate; columella covered lightly with callus, and allowing all the interior whorls to be seen from below to the apex; aperture oblique, oval, 5-7ths the length of the shell, the lower portion of its margin considerably expanded.

Length 21; diameter 9 millimetres.

Geographical Distribution. Found in considerable numbers by Dr. F. V. Hayden, the Geologist of the Yellowstone Exploring Expedition, in Nebraska, between the rivers Loup Fork and L'eau qui court.

Var. *Minor*. Length 15 mill. Found by Mr. Robert Kennicott near the Red River of the North.

Remarks. This is the largest known American *Succinea*.

Mr. Say describes *S. ovalis* as showing the interior apex from the base of the shell; in other respects his description does not apply to this shell. Its aperture is nearer that of *S. ovalis* Gould non Say, but the peristome is

much more flexuose, and the upper third of the shell becomes gradually attenuated, so as to give a sharp pointed appearance, though the spire itself is short. The revolving lines are sometimes continuous over the whole body whorl, but generally interrupted, or confined to the interstices of the incremental striæ or wrinkles. It shares this peculiarity with *S. concordialis* Gould, and *S. lineata* nob.

Named in honor of Dr. F. V. Hayden, the discoverer of the species.

SUCCINEA LUTEOLA GOULD. vol. ii. p. 75, pl. lxvii. c. fig. 1.

Succinea luteola PFEIFFER, Mon. Hel. Viv. iii. 16.

Texasiana PFEIFFER, l. c. vol. ii. p. 526; vol. iii. p. 17; in Roemer's Texas, p. 456.

CHEMNITZ, ed. 2, p. 42; pl. iv. f. 21-23, (1854).

Pfeiffer (Sept. 1857) writes "My *Succinea Texasiana* is a synonym of *luteola* Gould.

SUCCINEA CONCORDIALIS GOULD. vol. ii. p. 82, pl. lxvii. a. fig. 2.

Succinea concordialis PFEIFFER, Mon. Hel. Viv. iii. p. 16.

munita BINNEY, vol. i.

SUCCINEA EFFUSA SHUTTLEWORTH.

PLATE LXXX. FIGURE 12.

T. depresso-ovata, tenuissima, striatula, parum nitens, diaphana, griseo-cornea; spira brevissima, acuta; anfr. $2\frac{1}{2}$, ultimus magnus, depressus, 5-6 longitudinis æquans, columella vix arcuata, subrecedens; apertura ampla, obliqua, ovalis; perist. simplex, regulariter arcuatum, basi non incumbens. (Pfr.)

SYNONYMS AND REFERENCES.

Succinea effusa SHUTTLEWORTH, mss.

PFEIFFER, Mon. Hel. Viv. iii. p. 17.

CHEMNITZ, ed. 2, p. 42, pl. iv. fig. 18-20, (1854).

DESCRIPTION.

Animal not observed.

Shell depressed-oval, very thin, transparent and shining, lightly striated, grayish horn-colored; spire remarkably

short, acute; whorls $2\frac{1}{2}$, the last one very much the largest, depressed, equalling $\frac{5}{6}$ the length of the shell; columella scarcely rounded and hardly receding; aperture very large, oblique and oval; peristome simple, regularly rounding.

Length 12, diameter 7 millimetres. Length of the aperture 10, breadth 6 mill.

Geographical Distribution. East Florida (Pfeiffer); Spring Garden, Lake Florida (Bland's Coll.)

Remarks. It is readily distinguished from the other American species by the proportionally short spire, the very large body whorl, and expanded aperture.

SUCCINEA SALLEANA PFEIFFER.

PLATE LXXIX. FIGURE 18.

T. depresso-ovata, tenuissima, striatula, lineis spiralibus impressis irregulariter notata, pellucida, nitida, corneo-albida; spira brevissima, subpapillata; anfr. $2\frac{1}{2}$, penultimus convexus, ultimus $\frac{3}{4}$ longitudinis superans; columella subcallosa, stricte recedens; apertura axi subparallela, angulato ovalis; perist. submarginatum, margine dextro vix arcuato. Long. 19, diam. 10, alt. 7 mill. Ap. 16 mill. longa, infra medium 9 lata. (Pfeiffer).

Habitat prope New Orleans. (Sallé).

SYNONYMS AND REFERENCES.

Succinea Salleana PFEIFFER, Proc. Zööl. Soc. Nov. 1849, p. 133; Mon. Hel. Viv. iii. 16.

CHEMNITZ, ed. 2, p. 49, pl. 5, fig. 7, 8.

Remarks. I have not seen this species. The above is Pfeiffer's description, and the figure given on pl. 79 is a fac-simile outline of that referred to.

SPURIOUS SPECIES.

Succinea putris, Lin., (DeKay, 1839, p. 31, Fer. Tabl. Syst. p. 9.)
and

Succinea amphibia, Drap. (Forbes Br. Ass. 1837, p. 144, Ferussac; Tabl. Syst.; Binney, vol. ii. p. 159,) have been quoted from America. Having never seen a well authenticated specimen of either, I omit them.

GENUS HELIX LINNÆUS.

I have followed the artificial arrangement of species of this genus proposed on p. 92 of vol. ii.

HELIX MAJOR BINNEY.....vol. ii. p. 96, pl. 1.

Helix major DEKAY, N. Y. Moll. p. 45.

MRS. GRAY, Fig. of Mol. An. pl. 291, fig. 1, abs. desc. ex. Bost. Journ. non *major* Beck, p. 2.

Helix albolabris γ PFEIFFER, Symb. ad Hist. Hel. ii. 22; Mon. Hel. Viv. i. 290.

C. CHEMNITZ, ed. 2, i. 81, (1846).

Helix albolabris DESHAYES, in Fer. in tab. l. c.

REEVE, No. 656, (1852).

BLAND, Notes, p. 50, N. Y. Lyceum, vi. 359.

Well marked specimens of this species are rare in collections. It is, perhaps, owing to this fact that so few authors have followed Binney in separating it from *H. albolabris*.

For my own part, I am thoroughly convinced of its specific weight. Dr. Newcomb and Dr. Gould agree with me. On the other hand, Bland unites the two. It is subject to variation as are most of our species, and some individuals of *H. albolabris* may nearly approach some of its extreme forms. I am, however, confident of its being generally acknowledged as soon as it becomes better known.

The second figure of Ferussac referred to is a correct representation of the species. Deshayes makes no mention of it by name in the text of his continuation of that work, but appears to have confounded the two.

Mörch (Cat. Yoldi, p. 7) erroneously gives "H. major, Ohio."

It is catalogued distinct from *albolabris* by H. and A. Adams, ii. 206.

HELIX ALBOLABRIS SAY.....vol. ii. p. 99, pl. 11.

Helix albolabris SAY, (Binney's ed.) p. 21, pl. 69, fig. 1.

ADAMS, in Thompson's Vt. 1, 158, with wood-cut.

- Helix albolabris* CHENU, Bibl. Conch. 3, 23, pl. iii. fig. 3 a.
 PFEIFFER, Symb. ad Hel. Hist. ii. p. 22, Excl. γ and δ ; Mon.
 Hel. Viv. i. 290. Excl. β and ζ ; iii. 269.
 POTIEZ et MICHAUD, Gal. p. 69.
 CHEMNITZ, i. 81, pl. xv. f. 7, 8, (1847). Excl. var. C. and D. pl.
 x. fig. 4, 5.
 REEVE, Con. Icon. No. 624.
 DESHAYES, in Fer. pl. xliii. fig. 1, 2, 3, 5; i. 137.
 BILLINGS, Canadian Nat. and Geol. 1857, ii. 98, fig. 2, 3.
 BLAND, N. Y. Lyc. vi. 358; Notes 49.

Pfeiffer's var. γ and δ of the Symbolæ are respectively *major* and *exoleta*. In the Monograph his β is perhaps the former, and his γ certainly is. In Chemnitz ed. nov. he figures *exoleta* as var. D, and places *major* as C.

Deshayes in Ferussac's History erroneously gives Florida and Guadeloupe as the habitat. From his reference to Ferussac's plates he seems to confound *H. major* with *H. albolabris*.

Petiver mentions this species in Phil. Trans. 1698, p. 395.

As already mentioned, Bland unites *major* to this species.

I have this species from fourteen States. The series presents very remarkable variation in the height of the spire and in the form of the aperture. From Illinois I have a few of a large variety, furnished with a strong, tooth-like prominence on the reflected lip, near its columella extremity. There is a variety, quite common among the Pennsylvania Mountains, characterized by a strong parietal denticle. It might readily be confounded with *exoleta*, but wants the more ventricose body whorl of the latter. It occurs fossil in the Postpleiocene. From Natchez Bluff, I have specimens with a remarkably flattened spire.

Helix rufa DeKay (N. Y. Moll. p. 44, pl. iii. fig. 30 a b.) appears to be the young of this species. It certainly cannot be placed, even doubtfully, in the synonymy

of *lævigata*, as Pfeiffer has determined it. The latter species does not occur in New York.

HELIX MULTILINEATA SAYvol. ii. p. 103, pl. iii.

Helix multilineata SAY, (Binney ed.) p. 15.

DEKAY, N. Y. Moll. p. 41. pl. iii. fig. 24.

PFEIFFER, Symb. ad Hist. Hel. i. 41; Mon. Hel. Viv. i. 290; iii. 269.

CHEMNITZ, ed. 2, ii. 41, pl. lxxi. fig. 17-19, (1849).

REEVE, Con. Icon. No. 691, (1852).

DESHAYES, in Fer. i. 113, pl. l. c.

I have a variety of this with an open umbilicus. Another, received from Mr. I. A. Lapham, of Wisconsin, is small, of an uniform brownish-red, without any revolving lines.

Another resembles *H. Pennsylvanica* both in its general form and in the shape of the aperture. These, with those mentioned on p. 104, are the principal varieties. The extremes of size among the specimens in my cabinet are 19 and 29 mill. in diameter.

The varieties mentioned by Pfeiffer and Deshayes are distinguished merely by the revolving bands. In a large suite of specimens it is rare to find two on which these bands and lines are similarly arranged.

It has been found at Lake Canadaigua, N. Y. (Slack).

HELIX PENNSYLVANICA GREEN.....vol. ii. p. 105, pl. vii.

Helix Pennsylvanica DEKAY, N. Y. Moll. p. 41, pl. iii. fig. 34.

CHEMNITZ, ed. 2, ii. 51, t. 73, fig. 4, 5. (*Excl. H. clausa*).

PFEIFFER, Mon. Hel. Viv. iii. 270. (*Excl. H. clausa*).

MRS. GRAY, Fig. Moll. An. pl. 291, fig. 5, absq. desc. (Ex. Bost. Journ.)

REEVE, Con. Icon. No. 676. (*Excl. syn.*)

BLAND, N. Y. Lyc. vi. 299; Notes 23.

Helix Mitchelliana DESHAYES, in Fer. i. 137, pl. xcvi. fig. 4-7, nec 13-16.

Green described this species in 1827, and deposited three specimens of it in the collection of the Philadelphia Academy, where they are still preserved. In 1837 another description and an excellent figure were published by Binney

in a well-known and widely circulating Journal. It is, therefore, surprising that so many authors and collectors have confounded it with *Helix clausa*, quite a distinct species. Such, however, has been the case, as a reference to the above synonymy will show. It is, however, well known under its correct name by means of the figures published by Binney, Reeve, and Chemnitz, ed. 2. Deshayes is the only one who has figured it under a wrong name.

Bland has carefully and correctly arranged the synonymy in his valuable "Notes."

Pfeiffer adds doubtfully to the synonymy *H. thyroidus* var. *edentula*. Beck, Ind. p. 23.

Has been found also in Illinois, (Kennicott).

The following is Green's description:—

Shell subglobose, spire elevated, whorls six or seven, with numerous oblique wrinkles or striæ, sutures deeply impressed, epidermis smooth, and of an olive-brown color, like most of the American Helices, umbilicus closed or masked, aperture slightly contracted at the base, a small callosity on the inner margin of the other lip, near its lower angle; shell rather more than $\frac{1}{2}$ inch in diameter.

This shell resembles the *H. clausa* of Mr. Say, but may very readily be distinguished from that species by the closed umbilicus, the number of its whorls, and its general form. This shell is not uncommon near Charters Creek, Washington Co., Pa. I obtained five or six specimens with but very little trouble; associates with *solitaria*, *profunda* and *palliata*.

HELIX CLAUSA SAY. . . vol. ii. p. 107, pl. iv. (excepting the outline figures).

Helix clausa SAY, (Binney's ed.) p. 17, pl. xxxvii. fig. 1.

CHEMNITZ, Bibl. Concb. iii. 50, pl. xiii. fig. 2.

REEVE, fig. 694.

BLAND, N. Y. Lyc. vi. 336; Notes 27.

Helix Pennsylvanica PFEIFFER, Ex. parte, Symb. ad Hist. Hel. ii. 36; Mon. Hel. Viv. i. 291.

CHEMNITZ, ed. 2, ii. 51, ex parte.

REEVE, ex parte, No. 676.

Helix Mitchelliana CHEMNITZ, l. c. i. 332, pl. lvi. fig. 6-8.

I have differed from the opinion of *H. Mitchelliana* expressed on vol. ii. p. 109. My reasons for so doing will be found under that species. The outline figures representing it must, therefore, not be confounded with the central figures.

H. clausa Say has not been correctly described nor figured by any author but Say and Binney, until the last year, when it was correctly treated by Bland. DeKay has, indeed, described it as distinct from *Pennsylvanica*, but his figure is little characteristic, and his notes of its geographical distribution are incorrect. Reeve's figure referred to in the Synonymy may, perhaps, represent this species. In the text he confounds it with *Pennsylvanica*.

In the second edition of Chemnitz, Pfeiffer appears to have described and figured it, though he doubtfully refers it to *Mitchelliana*.

Say's original specimen is still preserved in the Academy of Natural Sciences.

The species occurs fossil in the Postpleiocene, and is found in the greatest profusion in some portions of the South, in what appears to be a semi-fossil condition. I have seen fresh specimens from Ohio, Indiana, Illinois, Kentucky (Kennicott), Missouri, Wisconsin, Mississippi, Alabama (Showalter).

The rounded, smoother variety, figured in the Boston Journal, may be distinguished from the following species principally by its perforation. There are forms, also, which nearly approach *H. bucculenta*.

HELIX MITCHELLIANA LEA.

PLATE IV. *Outline figures.*

T. superne obtuso-conicâ, inferne inflatâ, longitudinaliter et subtiliter striatâ, corneâ, diaphanâ, imperforatâ, anfr. 5; aperturâ subrotundatâ; labro reflexo; columellâ lævi.

Shell above obtusely conical, below inflated, longitudinally and

finely striate ; horn color, transparent, imperforate ; whorls 5 ; aperture nearly round ; outer lip reflexed ; columella smooth.

Remarks. I am indebted to Dr. Mitchell for this shell, which was sent to him by a friend from Ohio. It is rather larger than the *H. clausa* Say, and *H. jejuna* Say, but in form resembles them. It may be distinguished from the latter in not being perforate, and from the former in having a sharper lip. In its striæ it is distinct from both, in having them larger and much better defined.

Hab. Ohio. Diam. 7. Length .4 of an inch. [Lea].

SYNONYMS AND REFERENCES.

Helix Mitchelliana LEA, l. c.

TROSCHEL, Ar. f. Nat. 1839, ii. 221.

DEKAY, N. Y. Moll. p. 45.

PFEIFFER, Mon. Hel. V. i. 291 ; iii. 270.

BLAND, N. Y. Lyceum, vi. 339 ; Notes 29.

Helix clausa BINNEY, ex parte, p. 109.

In addition to the above synonymy, Pfeiffer and Bland quote doubtfully DeKay's figure of *clausa*. It is certainly little characteristic of either *Mitchelliana* or *clausa*.

Lea's figure is poor, and his remarks had better be entirely cancelled, having been written under a misapprehension of both the species referred to.

The figures I have referred to were intended to represent this species, and appear to me to do so. My friend Mr. Bland, however, refers them to *clausa*.

The shell figured by Deshayes under this name is *H. Pennsylvanica*. The figure in Chemnitz represents *H. clausa*. Anthony (Ohio Cat.) places *Mitchelliana* in the synonymy of *clausa*, and Kirtland (Ohio Rep.) seems to have catalogued it under the name of *Mitchella*.

I have never known this species to be found out of Ohio, where it appears to be not uncommon. It is readily distinguished from *clausa* by its more globose form and smooth, shining surface, its imperforate base, and by the following peculiarities pointed out by Bland. (l. c.)

“ In *H. clausa* the umbilical region is more widely excavated, and the groove, behind the reflected lip, producing the contraction of the aperture, is continued at the base of the shell, becoming wider as it joins the umbilical opening. In *H. Mitchelliana* the groove is almost obliterated at the point of reflection of the lip over the umbilicus, by the more tumid character of the last whorl.”

HELIX BERLANDERIANA MORICAND.....vol. ii. p. xlix. fig. 1.

Helix Berlanderiana DESHAYES, 3d ed. Lam. iii. 316.

CHEMNITZ, ed. 2, ii. 275, pl. cxxiii. figs. 15-18.

PFEIFFER, Mon. Hel. Viv. iii. 227, (nec. i.)

REEVE, Con. Icon. No. 708, (1852).

Helix pachyloma MENKE in Pfeiffer l. c. i. 323; Zeitschr. f. Mal. 1847, p. 32.

Helix virginalis PFEIFFER, Mon. Hel. Viv. iii. 132, i. 165 *sub nomine Berlanderiana*.

CHEMNITZ, ed. 2, i. 260, pl. xxxviii. figs. 18, 19.

There is considerable confusion in the synonymy of this species, owing to the extreme varieties having been considered distinct species. I have never seen *H. virginalis*, but am persuaded by the description and figure published by Pfeiffer in Chemnitz that it is identical with *Berlanderiana*. I give below his description and on pl. 77, fig. 22, a fac-simile of his figure. Those persons who follow him in separating the two, will remove *H. virginalis* and its references from the above synonymy. In so doing, it must be borne in mind that the shell described by him as *Berlanderiana* in vol. i. of the Monograph, is in vol. iii. considered *virginalis*. (See also Zeitschr. f. Mal. 1848, p. 115.)

Pfeiffer acknowledges in vol. iii. that his *pachyloma* of vol. i. is the true *Berlanderiana*.

The shell figured on pl. 49 as *H. albozonata* will be treated under the following species.

The species is found also in Mexico.

Moricand's description is given below, as well as Pfeiffer's.

Helix Berlanderiana. H. t. globosa, perforata, lucida, alba vel cinerea, fascia unica, angusta ciucta; labro exteriori crassiusculo, patulo. Long. 8, larg. 7 mill.—Mexique, dans Prov. de Texàs.

Cette coquille, tres voisine par sa forme de l'*H. tonelus*, Fer., est d'un blanc sale, formée de 5 tours, le sommet obtus; très-finement striée, les stries peu sensibles et très rapprochées; une bande étroite d'un gris clair, transparente, occupe le milieu du dernier tour et se prolonge sur le bord extérieur des tours de la spire; l'ouverture est semicirculaire; la levre intérieure peu apparente, l'extérieure plus épaisse que le reste de la coquille, renflée intérieurement par un bourrelet, qui la fait paraître évasée, le bord inférieur réfléchi sur l'ombilic dont il couvre la moitié. Obs. Les individus que j'ai reçus étaient tous dépouillés de leur épiderme.

Helix virginalis. T. umbilicata, depressa, striata, lucida, alba vel cinerea, interdum unifasciata; anfr. $4\frac{1}{2}$ convexiusculi, ultimus basi inflatus; apertura lunato-subcircularis; perist. acutum, intus labiatum, margine columellari juxta umbilicum angustum vix reflexo. Diam. maj. $8\frac{1}{2}$, min. $7\frac{1}{2}$, alt. $5\frac{2}{3}$ mill. Hab. in Texas. (Vid. pl. 77, fig. 22.)

HELIX GRISEOLA PFEIFFER.

PLATE XLIX. FIGURE 2. PLATE LXXVII. FIGURE 20.

T. umbilicata, depresso-globosa, oblique striatula, nitidula, grisea, cingulis pallidè fulvis, albo-marginatis circumdata; spira brevis; anfr. 4- $4\frac{1}{2}$ vix convexiusculi; umbilicus angustissimus; apertura lunaris; perist. simplex, album, reflexiusculum, margine columellari subexpanso. Diam. maj. 10, min. $8\frac{2}{3}$, alt. 6 mill. (Pfr)

Helix griseola PFEIFFER, Symb. Ad. Hist. Hel. i. 41; Mon. Hel. Viv. i. 337, iii. 228.

REEVE, Con. Icon. No. 327, (1852).

CHEMNITZ, ed. 2, i. 342, pl. lx. figs. 17, 18.

Helix cicercula FERUSSAC in Mus. teste Pfeiffer.

Helix splendidula ANTON, Verz. p. 36, absq. desc. teste Pfeiffer.

Helix albocincta BINNEY, i. 128.

Helix albozonata BINNEY in tab.

Brandybœna pisum BECK, Index, p. 18, abs. desc. teste Pfeiffer.

This is the shell referred to in vol. i. as *albocincta*, on pl. 49, as *albozonata*, and by Gould, vol. iii. p. 34, as *abolineata*. It would probably have been described as

distinct from *Berlanderiana* had the author lived to finish his work. Pfeiffer has, however, given its specific weight. A fac-simile of his figure in Chemnitz is given (pl. 77, fig. 20).

My specimens are from Texas. It is quoted from Vera Cruz, Mexico, by Pfeiffer, who also specifies a Central American variety.

HELIX HORTENSIS MÜLLER.....vol. ii. p. 111, pl. viii.

Helix subglobosa DEKAY, N. Y. Moll. p. 31, pl. ii. fig. 14, pl. iii. fig. 39.

memoralis STIMPSON, Shells of N. E. 54, (abs. desc.)

Inhabits also Greenland, (Mörch,) and perhaps Connecticut, (Linsley, Am. Journ. 48, 280).

HELIX ASPERSA MÜLLER.....vol. ii. p. 117, pl. lxxvii. fig. 4.

I am indebted for the shell figured to Dr. L. R. Gibbes, of Charleston, S. C.

HELIX DIVESTA GOULD.....vol. ii. pp. 122, 357, pl. xiii. a. fig. 2.

Helix abjecta PFEIFFER, Mon. Hel. Viv. iii. 270.

HELIX VARIANS MENKE.... vol. ii. p. 123, pl. xlvi; xlvii; lxxviii. fig. 22.

Helix varians MENKE teste Pfeiffer.

CHEMNITZ, ed. 2, ii. 221, pl. cix. figs. 1-5.

PFEIFFER, Mon. Hel. Viv. i. 238; iii. 183.

Helix carnicolor PFEIFFER, Symb. i. 37.

FERUSSAC Podr. 293 (absq. desc.)

DESHAYES, in Fer. i. 205, pl. xxix. A. figs. 14-17.

REEVE, Con. Icon. No. 283, (1852).

Helix pisana CHEMNITZ, ix. P. 2. p. 139. t. 132, fig. 1186. 87. Nec Müller.

FERUSSAC, Hist. l. c. ?

Helix submeris PFEIFFER, Mon. iii. 183.

Helix rhodocheila BINNEY, olim.

Hemotrichus hæmostomus SWAINSON, Malac. p. 165, f. 19. ?

In the Smithsonian Institute are specimens from Key Biscayne.

There can, I think, be no doubt of the identity of *H. polychroa* with *H. varians* of Porto Rico. Dr. Pfeiffer so decided after receiving authentic specimens from me.

Mighel's description of *submeris* is as follows.

Shell conic-globose, smooth, incremental striæ distinct, apex sub-acute; spire elevated, whorls $5\frac{1}{2}$, suture distinct, epidermis dark chestnut or mahogany colored, mottled, with an interrupted white zone around the body whorl; convex beneath, umbilicus minute, the region white; lip simple, thickened within; internal lip blending with the last whorl, and, with the inner margin of the outer lip, of a beautiful rose tint. Height $1\frac{1}{2}$ inch; breadth the same; depth $\frac{2}{3}$ inch. Hab. Key West, Florida.

Pfeiffer (l. c.) merely gives a Latin version of this description, never having seen the shell.

HELIX ELEVATA SAY.....vol. ii. p. 126, pl. iv.

Helix elevata SAY, (Binney's ed.) p. 27, pl. 37, fig. 2.

DEKAY, l. c. p. 36, pl. iii. fig. 20.

CHEMNITZ, ed. 2. i. 56, pl. vii. figs. 11, 12, (1846).

CHENU, Bibl. Conch. 3, 50, pl. xiii. fig. 2.

MRS. GRAY, Fig. Moll. An. pl. exci. fig. 7, *abs. desc.*

PFEIFFER, Symb. Hist. Hel. ii. 27; Mon. Hel. Viv. i. 217; iii. 270.

REEVE, Con. Icon. No. 681, (1852).

DESHAYES, in Fer. i. 329, pl. l. c.

Helix Tennesseensis TROSCHEL, Ar. f. Nat. 1837, ii. 124.

PFEIFFER, Mon. i. 149; iii. 120, (*verba Leana*).

LEA, Tr. Am. Phil. Soc. ix. p. 1.

In the Boston Journal, this species is said to be also *Mesodon helicinum* Rafinesque. I can find no description of any such species.

The species occurs fossil in the Postpleiocene.

Mr. Robert Kennicott collected, in Wisconsin, two specimens of a curious variety of this species, furnished with a broad, revolving, brownish band on the body whorl.

I give below Lea's description of *H. Tennesseensis*. There can be no doubt of its being the young of this species. The authors referred to in the synonymy have merely repeated this description, without having seen the shell.

Testa supra plano-convexâ, subtus convexâ, luteâ, obliquè striatâ, umbilicatâ; spirâ brevi; suturis subimpressis; anfr. 5, subconvexis; aperturâ lunatâ; labro intus incrassato. Diam. .45. Length .32 inch.

HELIX CLARKII LEA.

PLATE LXXVII. FIGURE 10.

T. supernè rotundatâ, infernè plano-convexâ, regulariter striatâ brunneo-corneâ, imperforatâ, unidentatâ: anfr. 7, obliquè striatis; aperturâ lunatâ, subdilatatâ; labro albido, reflexo, infernè calloso; columellâ in medio unidentatâ, ad basim impressâ. (Lea).

SYNONYMS AND REFERENCES.

Helix Clarkii LEA, Proc. Acad. Nat. Sc. Phila. x. p. 41, March, (1858).

DESCRIPTION.

Animal not observed.

Shell imperforate, globosely-rounded, regularly and finely striated, reddish horn color; spire obtusely conic; whorls 7, convex, with delicate incremental striæ, the last one very globose and rounded below; aperture lunate; peristome white, thickened, reflected, its basal termination quite heavy and covering the umbilicus entirely; one elongated, white denticle on the parietal wall of the aperture.

Greater diameter 14; lesser 13; height 9 millimetres.

Geographical Distribution. Cherokee County, N. C.

Remarks. This is a distinct species. At first sight it seems a miniature *elevata*, but is at once distinguished by its peculiar globular shape.

The figure referred to is twice the natural size of the shell.

HELIX THYROIDES SAY.....vol. ii. p. 129, pl. xi.

Helix thyroidus SAY, (Binney's ed.) p. 33, pl. xiii.

CHENU, Bibl. Conch. 3, 24, pl. iii. fig. 3.

DEKAY, l. c. p. 29, pl. ii. fig. 8.

MRS. GRAY, Fig. Moll. An. pl. 291, f. 6. (*Ex. Bost. Journ. absq. desc.*)

DESHAYES in Lam. 3d ed. 3, 309; in Fer. i. 209.

Helix thyroides CHEMNITZ, ed. 2, i. 331, pl. lviii. figs. 8, 9, (1850).

PFEIFFER, l. c. iii. 262.

REEVE, Con. Icon. No. 677.

Anchistoma thyroides ADAMS, Gen. pl. lxxviii. fig. 3.

I have followed Pfeiffer in the orthography of this species. Say's manuscript, also, shows the name proposed by him to have been *thyroides*.

I have specimens from nineteen States, showing some curious and apparently constant geographical varieties. One from Germantown, Pa., is very small, measuring only 15 millimetres in diameter. It is globose, shining, sometimes imperforate and generally without the parietal tooth. It is impossible to distinguish it from forms of *H. bucculenta*. Another peculiar form with an elevated, pointed spire and more triangular aperture inhabits St. Simon's Isle, Georgia, (Postell). The species is found in Louisiana and Texas, (Dr. Moore). It also occurs fossil in the Postpleiocene.

I am unable to find any description of *Mesodon leucodon* Rafinesque, quoted in the Boston Journal as a synonym. It is probable the name was sent to Ferussac by that author.

It is also mentioned by Petiver, No. 4, (l. c.)

HELIX BUCCULENTA GOULD,..... vol. iii. p. 9, pl. xi a.

Helix bucculenta PFEIFFER, Mon. Hel. Viv. iii. 271.

Helix thyroides β PFEIFFER, l. c. i. 345.

HELIX EXOLETA BINNEY,..... vol. ii. p. 131, pl. x.

Helix exoleta DEKAY, N. Y. Moll. p. 27, pl. ii. fig. 6.

Helix albolabris δ PFEIFFER, Symb. ii. p. 22, absq. desc.

D. CHEMNITZ, ed. 2, i. 81, pl. x. figs. 19, 20.

Helix zaleta MRS. GRAY, Fig. Moll. An. pl. cxc. fig. 9.

PFEIFFER, Mon. Hel. Viv. i. 316; ii. 270.

DESHAYES, in Fer. i. 139.

REEVE, Con. Icon. No. 622, (1852).

Reeve (l. c.) considers the specific distinction of *exoleta*

as doubtful. Deshayes says that its anatomical details will decide the question. The dissections of Dr. Leidy have already done so.

The species occurs in Georgia.

HELIX DENTIFERA BINNEY.....vol. ii. p. 134, pl. xii.

Helix dentifera DEKAY, N. Y. Moll. p. 34, pl. ii. fig. 17.

MRS. GRAY, Fig. of Moll. An. pl. cxc. fig. 11.

nec PFEIFFER, vol. iii.

nec CHEMNITZ.

This is not the *dentifera* described by Pfeiffer in the third volume of his Monograph, and the second edition of Chemnitz. The species there described and figured is *H. Röemeri*, confounded by Pfeiffer with *dentifera*. Its distinguishing features are pointed out in the succeeding article. A copy of Binney's descriptions is given in Mon. Hel. Viv. i.

It is a mountain shell, has been found by Mr. Edwards in Virginia, Dr. S. E. Shurtleff in Western Pennsylvania, Mr. Conrad at Broad Top Mountain, and Mr. Phillips on the Lehigh. Also in Maine, (E. S. Morse).

HELIX ROEMERI PFEIFFER.

PLATE LXXVII. FIGURE 3.

T. anguste umbilicata, depressa, tenui, confertim striatula, diaphana, vix nitidula, sordide carnea, spira vix elevata; sutura leviter impressa; anfr. 5 convexiusculis, ultimo peripheria subangulato; apertura obliqua, lunari; peristomate valide albolabiato, margine supero recto, basali reflexo, ad columellam in laminam tenuissimam, umbilicum semi-occultantem dilitato. (Pfeiffer).

SYNONYMS AND REFERENCES.

Helix Röemeri PFEIFFER, in Röemer's Texas, p. 455; Zeitschr. f. Mal. 1848, p. 117.

REEVE, Con. Icon. No. 680.

Helix dentifera PFEIFFER, Mon. Hel. Viv. iii. 269, (excl. Binney et DeKay).

CHEMNITZ, ed. 2, ii. 331, pl. cxxxi. figs. 1-3, (Excl. do.) nec BINNEY.

DESCRIPTION.

Animal not observed.

Shell with a narrow, or partially covered umbilicus, depressed, rather thin, closely striated, rather transparent and smooth, horn-colored; spire slightly elevated; suture lightly impressed; whorls 5, rather convex, increasing slowly, the last one subcarinate at its periphery, scarcely descending; aperture lunar, oblique, generally slightly contracted by a parietal denticle which obliquely enters the mouth of the shell; peristome white, thickened, the upper portion hardly expanded, reflected below, and at the columellar junction spreading into a thin, partial covering to the umbilicus.

Greater diameter 21, lesser 18, height 10 mill.

Geographical Distribution. New Brauenfels, Texas, (Pfeiffer), Washington Co. (Moore).

Remarks. This species is confounded by Pfeiffer with *H. dentifera*, an authentic specimen of which he has not seen. It is quite a distinct species and inhabits a distinct geographical region. It may be distinguished from *dentifera* most readily by attention to the following particulars. Its umbilicus is generally but partially covered, while *dentifera* is always imperforate, its color is lighter, its surface smoother, and above all, its lip is not so broadly reflected; it is also distinctly subcarinate at the periphery.

The shell is described as "tenuis," and so appears in the figure in Chemnitz. I have specimens quite solid. This figure is erroneously referred to *dentifera*, under which name Pfeiffer in the third volume of his Monograph and in Chemnitz describes *Römeri*.

HELIX PALLIATA SAY..... vol. ii. p. 136, pl. xiv.

Helix palliata SAY, (Binney's ed.) p. 16.

DEKAY, N. Y. Moll. 33, pl. iii. fig. 36, (Excl. a. b.)

CHEMNITZ, ed. 2, i. 359, pl. lxii. figs. 15, 16, (1849).

PFEIFFER, Mon. Hel. Viv. i. 316; iii. 267.

MRS. GRAY, Fig. Moll. An. pl. 193, fig. 8. Ex. Boston Journal,
(absq. desc.)

DESHAYES, in Fer. i. 144, (excl. var.)

REEVE, Con. Icon. No. 678.

Helix denotata DESHAYES, l. c. 3d ed. iii. 309.

The extreme variation of this species has given rise to considerable confusion. I propose to designate as a prominent variety **HELIX CAROLINENSIS** LEA, which is considered as a variety only by Ferussac, DeKay, Binney, Chemnitz, Pfeiffer, Deshayes, and Reeve. The first mentioned of these authors says, "This is *H. palliata* Say, and my "*denotata*," (Bull. Zoöl. 1835, § 2, p. 100). Say is, I think, wrong in referring Lea's figure and description to *Helix appressa* var. *a*, (vid. Binney's ed. 36).

Triodopsis scabra Rafinesque is quoted by Binney (Boston Journal) and others as a synonym of this species. I know of no description of such a species. The generic definition of *Triodopsis* (vol. i. 49) will not apply to *palliata*.

I have found it in Vermont at Copperas Hill.

The succeeding article will contain my views of *Helix obstricta*, and *Caracolla helicoides*, which I have not retained in the synonymy of *palliata*.

HELIX OBSTRACTA SAY.

PLATE XV.

Shell depressed, with elevated lines forming grooves between them; epidermis pale brownish, naked; volutions five, depressed above, beneath rounded, with an acute, projecting carina; umbilicus covered with a white callus, indented; mouth resembling that of *H. palliata*.

Inhabits Ohio. Breadth nearly one inch.

This species is very closely allied to *Helix palliata*, but the epidermis is not covered with small elevations as in that shell, and the carina is very prominent and remarkable.

SYNONYMS AND REFERENCES.

Helix odstricta SAY (Binney's ed.) p. 17.

PFEIFFER, Mon. Hel. Viv. i. 317; iii. 267.

REEVE, Con. Icon. No. 683, (1852).

Helix palliata var. a SAY (Binney's ed.) p. 16.

Var. a b DEKAY, N. Y. Moll. p. 33, pl. ii. fig. 16.

Var. BINNEY, l. c.

Helix appressa var. DESHAYES in Fer. (*in tab. non in textu.*)

Helicodonta denotata var. FERUSSAC, Tab. Syst. 38; Hist. pl. L. A. fig. 7, *absq. desc.*

Caracolla helicoides LEA, l. c.

Remarks. This species is considered by Say, Binney, and DeKay as a variety of the preceding. It appears to me, however, sufficiently constant in its characteristics to be considered distinct.

I have added to the synonymy of this species *H. palliata* var. a Say. His description seems to agree with that of *obstricta* given above.

Var. a. A very prominent acute carina; destitute of minute prominences. Inhabits Ohio. Breadth nearly one inch.

Ferussac figured this species, l. c., without describing it. In Deshayes's continuation of the *Histoire* no mention is made of it, the figure being erroneously referred to *H. appressa* var. in the explanation of the plates.

As regards *Caracolla helicoides*, I think there can be no doubt of its identity with *obstricta*. Specimens received from Mr. Lea under this name are, however, furnished with the "minute protuberances" which Say describes as not present on *obstricta*. I believe they are not constant. Ferussac says that *Caracolla helicoides* is the same as the carinated variety of *palliata* (Bull. Zoöl., 1835, § 2, p. 100). His figure is certainly the same as that of Lea and Reeve. Say declares *Caracolla helicoides* to be the same as his *palliata* var. a (Binney's ed. p. 36).

Anthony (Ohio Cat.) places *obstricta*, *Carolinensis* and *helicoides* in the synonymy of *palliata*. Pfeiffer considers *helicoides* a synonym of *obstricta*. In the Boston Journal,

Binney erroneously quotes Say as describing *obstricta* with only one tooth on the outer lip.

The species is found fossil in the Postpleiocene at Natchez, and recent in Ohio and Tennessee.

HELIX APPRESSA SAY.....vol. ii. p. 140, pl. xiii.

Helix appressa SAY (Binney's ed.) 15.

PFEIFFER, l. c. iii. 267.

REEVE, Con. Icon. No. 689, (1852).

DESHAYES in Fer. l. c. i. 141.

Helix linguifera DESHAYES, in Lam. 2d ed. viii. 70; 3d ed. iii. 293.

PFEIFFER, Symb. ad Hist. Hel. p. 19, (*absq. desc.*)

CHENU, Ill. Conch. pl. xii. fig. 5.

DELESSERT, Recueil, pl. xxvi. fig. 5.

I have received from Illinois large quantities of Say's var. a. of this species, collected by Mr. R. Kennicott. It is thus described by Say:—"Labrum with two projecting angles."

HELIX INFLECTA SAY.....vol. ii. p. 143, pl. xlv. fig. 3.

Helix inflecta SAY (Binney's ed.) p. 16.

DEKAY, N. Y. Moll. p. 45.

Mrs. GRAY, Fig. Moll. An. pl. 193, fig. 7. (Ex. Bost. Jour. absq. descr.)

Helix clausa DESHAYES in Lam. 3d ed. 3, 309; in Fer. Hist. l. c. i. 143.

REEVE, Con. Icon. No. 704, (1852).

PFEIFFER, l. c. iii. 269.

Xolotrema clausa RAFINESQUE, Enumeration, &c. p. 3, (1831).

The young of this may, perhaps, be *H. porcina* Say (vid. *H. hirsuta*).

Pfeiffer mentions a Texan variety, smaller, "umbilico non omnino clauso."

It is a typographical error on p. 33, vol. iii. to call this *H. triodonta* Jahn.

Rafinesque thus describes *Xolotrema clausa*, "Subdepressed, 5 spires a little striated, opening almost hidden."*

* It is frequently argued that the descriptions of this author are indefinite. To do justice to him one should pay attention to his remark, that if one does not admit his generic distinctions "it would be requisite to repeat, in the descriptions of their specific characters, that of the characters of my new genera, which would render the definition of the species prolix." Tr. of Mon. p. ii.

I have specimens of this species from the following additional States, — Pennsylvania, Georgia, Louisiana.

HELIX RUGELI SHUTTLEWORTH. vol. iii. p. 18, pl. lxxviii. fig. 15.

Helix Rugeli SHUTTLEWORTH, Bern. Mittheil. 1852, p. 198.

PFEIFFER, Mon. Hel. Viv. iii. 268.

I am indebted to Bishop Elliott for specimens of this shell. It is in most respects similar to the preceding species, and would be mistaken for it unless the aperture be examined. The position of the upper tooth of the peristome far within the aperture at once distinguishes it. The size is not, however, any criterion, as I have individuals of *Rugeli* only 10 millimetres in diameter, while some of my specimens of *inflecta* are full 13 millimetres.

The plate shows an enlarged view of the aperture.

HELIX MONODON RACKETT. vol. ii. p. 147, pl. xli.

Helix monodon DEKAY, N. Y. Moll. p. 35, pars., excl. syn., pl. iii. fig. 19 — not fig. 21, a. b.

Mrs. GRAY, Fig. Moll. An. pl. 193, fig. 11. (Ex. Bost. Journ. abs. desc.)

BILLINGS, Canadian Nat. ii. 100, fig. 6.

Helix convexa CHEMNITZ, pars. (excl. syn. et tab. lxvi. figs. 24, 27).

PFEIFFER, l. c. iii. 268, (excl. β et γ).

DESHAYES, Lam. 3d ed. iii. 308; in Fer. l. c. i. 144.

REEVE, Con. Icon. No. 696 (1852), excl. syn.; No. 717, (1854).

Helicodonta hirsuta a. FERUSSAC, Tabl. Syst. 101.

VAR. FRATERNA SAY.

Helix fraterna SAY (Binney's ed.) p. 30, pl. lxxiv. fig. 3.

Mrs. GRAY, Fig. Moll. An. pl. 193, fig. 5 absq. desc. (Ex. Bost. Journ.)

Helix monodon DEKAY, l. c. ex parte, pl. iii. fig. 21, a, b.

WOOD, Ind. Suppl. vii. 15.

Helix convexa CHEMNITZ, ed. 2, i. 86, ex parte.

Var. REEVE, Con. Icon. l. c.

β PFEIFFER, l. c.

VAR. LEAH WARD.

Helix convexa γ PFEIFFER, l. c.

Var. CHEMNITZ, l. c. pl. lxvi. figs. 24, 25.

I have separated the synonymy of these varieties in such a way as to show the opinion of various authors on them. For my own part, I cannot consider them as distinct species. Mighels (Shells of Maine) considers *fraterna* and *monodon* distinct.

It has also been noticed in Washington Co. Texas, (Moore).

HELIX STENOTREMA FERUSSAC.....vol. ii. p. 151, pl. xlii. fig. 5.

Helix stenotrema PFEIFFER, Symb. ii. 39, (excl.? *pustula*.)

REEVE, No. 720, (1852).

Helix hirsuta β PFEIFFER, Mon. Hel. Viv. i. 421.

Var. *Stenotrema*, CHEMNITZ, ed. 2, i. 376 (1846), pl. lxx. figs. 12-14, (1849).

Helicodonta hirsuta a FERUSSAC, l. c. pl. L. A. fig. 3.

I have thought it best to separate this from the succeeding species, its characteristics being constant in Postpleiocene fossils as well as in recent individuals from Indiana, Kentucky, Mississippi, Georgia, Alabama, and Louisiana.

Ferussac considers this as var. a of *hirsuta* and gives *Stenotrema convexa* Rafinesque as a synonym. His figure is unmistakable. It appears, therefore, that *Stenotrema convexa* Rafinesque is not *hirsuta* but the heavy form. Its description in addition to that of the genus given in vol. i. is as follows: "Nearly round, both sides convex, smooth, 5 spires." I cannot, therefore, see any reason for considering Rafinesque's species to be *monodon*, as so many writers have done. In the continuation of the Histoire, Deshayes considers *stenotrema* as a variety only. He has caused confusion by quoting *Stenotrema convexa* Rafinesque as a synonym of *hirsuta*, and yet saying that the same author has given the name of *convexa* to the shell figured on pl. L. A. fig. 2, which is *monodon*.

Pfeiffer also, in vol. i., gives *Stenotrema convexa* Raf. as a synonym of *monodon*, on the authority of Ferussac, though a reference to his figure would at once show that he applied the name to the heavy form of *hirsuta*.

Gould quotes *Stenotrema convexa* as a synonym of *hirsuta* (Invert. l. c.)

HELIX HIRSUTA SAY.....vol. ii. p. 150, pl. xlii. fig. 3.

Helix hirsuta SAY (Binney's ed.) p. 8.

DE KAY, N. Y. Moll. p. 36, pl. iii. fig. 27.

DESHAYES, in Lam. ed. 3, vol. 3, p. 308; in Fer. i. p. 140.

Mrs. GRAY, Fig. of Moll. An. pl. 193, fig. 8, ex Bost. Journ.

CHEMNITZ, ed. 2, Excl. var., i. 374 (1846), pl. lxxv. fig. 9-11, (1849).

PFEIFFER, Mon. Hel. Viv. Excl. var. β , i. 421; iii. 126.

REEVE, Con. Icon. No. 714, (1852).

Helix sinuata γ GMELIN (teste Pfeiffer).

Helix isognomostomos γ GMELIN (teste Pfeiffer).

Tridopsis hirsuta WOODWARD, Man. pl. xii. fig. 7, absq. desc.

Stenostoma convexa RAFINESQUE, Enum. and Acc. p. 3, 1831, nec. Ferussac.

Junior?

Helix porcina SAY (Binney's ed.) p. 30, pl. lxxiv. fig. 2.

DEKAY, N. Y. Moll. p. 45.

PFEIFFER, Mon. Hel. Viv. iii. 97.

BLAND, N. Y. Lyceum, vi. p. 344, Notes, i. 34, with fig.

In the remarks on the preceding species will be found some notes referring equally to this.

The species is found fossil in the Postpleiocene, and recent in the localities already mentioned, as well as in Kansas (Hayden), Virginia, at the height of 2000 above the sea (Edwards), and the District of Columbia (Stimpson).

The generic description of *Stenostoma* or *Stenotrema* is given in vol. i. p. 49. The only specific description is the following: "Nearly round, both sides convex, smooth, 5 spires, Kentucky." It appears to me to apply more to this species than to *monodon*.

As regards *H. porcina*, Say's description is copied by the authors referred to, neither having seen authentic specimens. Bland refers it rather to *inflecta* than *hirsuta*, if a young shell, but anticipates its proving mature. From the figure of Say, I do not doubt the correctness of my father's view of this question. Other cases occur among Say's writings of still graver errors than describ-

ing a young shell as mature; compare, for instance, his description of the young of a common *Planorbis* as *Bulla fluviatilis* (Binney's ed. p. 71).

Say's description is as follows:—

Shell depressed, yellowish brown; epidermis rugose, with minute, very numerous bristles; whorls rather more than four, depressed above, beneath rounded, forming a very obtuse angle rather above the centre of the whorl; umbilicus open, rather small, profound; labrum simple.

Breadth rather more than three tenths of an inch. Inhabits the North-West Territory.

HELIX BARBIGERA REDFIELD.....vol. iii. p. 21, pl. lxxvii. fig. 2.

Helix barbigera REDFIELD, N. Y. Lyceum, vi. 171, pl. ix. figs. 4, 5, 7.

The figures referred to are fac-similes of those of Redfield, showing the outline of the shell, as well as a magnified view of a portion of the epidermis.

HELIX EDWARDSI BLAND.

PLATE LXXVIII. FIGURES 7, 9.

T. imperforatâ, lenticulari, carinatâ, tenuiusculâ, fulvâ; epidermide castaneâ, supra in striis pilosis prostratis minutis elevatâ,—infra tuberculis acutis minutis creberrime munitâ, quæ juxta aperturam setos erectos gerunt; spirâ convexo-conoideâ; anfr. 5, complanatis, lente accrescentibus; ultimo antice gibbo, subito subdeflexo; apice minute granulato; basi convexo, parum indentatâ, lineis numerosis spiralibus sub epidermide impressis; suturâ profunde impressâ; aperturâ obliquâ, transversâ, auriformi; dente angustâ, subarcuatâ, lamelliformi, prælongâ, parietis aperturalis coarctatâ; perist. margine supero acuto, parum reflexo, infero subarcuato, depresso, subreflexo, et ad anfractum ultimum subappresso, callo dentiformi intus instructo, obsolete inciso.

SYNONYMS AND REFERENCES.

Helix Edwardsi BLAND, N. Y. Lyceum, vi. p. 277; Notes, p. i. pl. ix. fig. 14-16.

DESCRIPTION.

Shell imperforate, lenticular, carinate, the carina obsolete near the aperture, rather thin, beneath the epidermis pale brown; the

epidermis dark chestnut-color, with numerous minute curved hair-like processes lying flat upon, and attached to the epidermidal surface of the upper whorls in the direction of the incremental striæ, the epidermis at the base covered with acute, raised, transverse tubercles, most numerous, and having erect bristles near the aperture; spire convex-conoid; whorls five, flattened, gradually increasing, the last gibbous above, suddenly but slightly deflected; apex minutely granulate; base convex, little indented in the umbilical region, and with impressed spiral lines beneath the epidermis; suture deeply impressed; aperture oblique, transverse, auriform, narrowed by a slender slightly arcuate lamelliform parietal tooth extending across from the umbilical axis, and terminating with a short angular deflection within the aperture; upper margin of the peristome acute, scarcely reflected, lower margin slightly arcuate, depressed, slightly reflected, and partially appressed to the body whorl, with a tooth-like callus within, having an almost obsolete notch in the centre.

Diam. maj. 9, min. 8, alt. 5 mill.

Geographical Distribution. Mountains in Fayette, or Green Briar Co., Virginia. (W. H. Edwards?)

Remarks. This species is allied to or rather intermediate between *H. barbiger*a Redf. (Plate IX. figs. 4-7), and *H. hirsuta* Say — the former connecting *H. spinosa* Lea with *H. fraterna* Say. It is smaller, more elevated, less acutely carinated, and readily distinguished from *H. barbiger*a by the partially appressed, notched peristome, and the different character of the epidermis. In *H. barbiger*a the attached hair-like epidermidal processes are produced, at the sutures and carina, into cilia, which are entirely wanting in this species. The same processes, though less numerous, and sometimes almost obsolete, are observable at the base of the former, while in the latter, the basal epidermis approaches in character to that of *H. palliata* Say. The deep characteristic notch in *H. hirsuta* is considerably less developed in *H. Edwardsi*, and the callus which connects the parietal tooth with the upper margin of the peristome in the former, does not exist in the latter. In the general character of the peristome the species under consideration resembles *H. hirsuta*, while *H. barbiger*a is in that particular more appropriately compared with *H. fraterna* Say.

While naming this species after my friend Mr. Edwards, who collected it, I am quite aware of the objections to such specific names, but in the Genus *Helix* it seems almost a hopeless case to find, for a shell closely allied to several others, an unpreoccupied name derived from any distinct specific character.

This is Bland's description. I have also given fac-similes of his figures.

HELIX SPINOSA LEA. vol. ii. p. 154, pl. xliv. fig. 1.

Helix spinosa DEKAY, N. Y. Moll. p. 47.
PFEIFFER, l. c. iii. 126.
CHEMNITZ, ed. 2, i. 375, pl. lxxv. figs. 15-17, (1849).
REEVE, Con. Icon. No. 685, (1852).

HELIX EDGARIANA LEA. vol. ii. p. 155, pl. xliv. fig. 2.

Caracolla Edgariana TROSCHEL, Arch. f. Nat. 1843, 2, p. 124.
Helix Edgariana PFEIFFER, Mon. Hel. Viv. i. 425; iii. 126.
REEVE, Con. Icon. No. 703.

I have specimens of this species from Tennessee (Elliott), Waschita Springs, Arkansas (Binney coll.), and Alabama, (ditto).

HELIX MAXILLATA GOULD. vol. ii. p. 157, pl. xl. a, fig. 2.

Helix maxillata PFEIFFER, Mon. Hel. Viv. iii. 126.

The impressions of this plate are printed from two separate copper plates. On one of them, the enlarged view of the aperture of this species is misplaced.

It has also been detected by Dr. H. M. Neisler along the Cattahoochee River in Georgia.

HELIX CONCAVA SAY. vol. ii. p. 163, pl. xxi.

Helix concava SAY, (Binney's ed.) p. 20.
Helix planorboides PFEIFFER, Mon. Hel. Viv. iii. 156.
CHEMNITZ, ed. 2, ii. 164, pl. xciv. fig. 17-19; cliv. fig. 45,
(1851)
REEVE, Con. Icon. No. 674, (1852).
DESHAYES, in Fer. l. c. i. p. 87.
Helix dissidens DESHAYES, l. c. i. 97, pl. 84, figs. 1, 2.
PFEIFFER, l. c. iii. 84.

The variety referred to as larger and from beyond the Rocky Mts. by Adams (l. c.), is *H. Vancouverensis* Lea.

I can find no description by Rafinesque of this species, though he is quoted by Binney in the Boston Journal, probably on the authority of Ferussac.

Pfeiffer (Mal. Blatt. ii. p. 11) points out the error made on p. 164 in referring to this species the figure in the Boston Journal.

It has also been found in Maine (Morse), as well as various other new localities, and occurs fossil in the Post-pleiocene.

Helix dissidens appears to me identical with this species. I have given a fac-simile of the figure of Deshayes (pl. lxxvii. fig. 5), and also subjoin his remarks, as well as description. Pfeiffer repeats the last, not having seen the shell, and notes the resemblance to *H. Vancouverensis* (*vellicata*).

HELIX DISSIDENS. Testa orbiculato-depressa, superne convexa sub-tus late et profunde umbilicata; anfr. convexusculis, ultimo cylindraceo; apertura rotundato-lunari, obliqua; labro simplici, superne inflexo; testa concolore, albo-viridula.

Diam. 17, alt. 7. Habite l'Amerique Septentrionale.

Nous soupçonnons que cette espèce a été confondue par les conchyliogues Américains avec notre *H. cellaria* d'Europe. Quoique très voisines, ces espèces se distinguent cependant par des caractères constants. Celle-ci est orbiculaire, très aplatie, à spire convexe, très obtuse, composée de $5\frac{1}{2}$ tours convexes, réunis par une suture déprimée. Le dernier tour est cylindraccé, un peu plus large en dessous qu'en dessus; il est percé au centre d'un très grand ombilic, dont le diamètre est égal à celui du dernier tour. L'ouverture est obronde, semilunaire; elle est légèrement déprimée du haut en bas; son diamètre transversal se trouve ainsi un peu plus long que le diamètre longitudinal. Les bords de cette ouverture restent simples; ils sont plus obtus et plus épais que dans *H. cellaria*, et dans le plupart des autres espèces du groupe. Quoique polie et brillante, cette coquille n'est par cependant tout à fait lisse: on remarque,

en effet, sur sa surface des stries irrégulières d'accroissement, qui grossissent en s'approchant de l'ombilic, se régulaissent dans cette cavité, et deviennent assez semblables à celle qu'on remarque dans quelques *solarium*. Cette coquille est mince, diaphane, et d'une couleur uniforme, d'un jaune verdâtre très pâle. Les stries qui s'enforcent dans l'intérieur de l'ombilic n'ont pas été représentées assez grosses dans les figures de cette ouvrage, auxquelles nous renvoyons.

HELIX JEJUNA SAY.....vol. ii. p. 172, pl. xlii. fig. 2.

Helix jejuna SAY, Journ. Acad. ii. 158; Binney's ed. p. 9.

DEKAY, N. Y. Moll. p. 46.

PFEIFFER, Mon. Hel. Viv. i. 147; iii. 124.

BLAND, N. Y. Lyceum, vi. p. 341; Notes 31.

Helix Mobiliana TROSCHEL, Ar. f. Nat. 1843, ii. 124.

PFEIFFER, l. c. iii. 219.

This species is not referred to under this name in the second volume of the Mollusks. Of all the authors referred to in the synonymy, none have seen authentic specimens of it. It has been known only by Say's description until within a few months past, when it was suggested to me by Dr. Pfeiffer that it might be identical with *Mobiliana*. Specimens found at the original locality* by Mr. O. S. Dorman, agree with Say's description sufficiently to convince Bland of their identity. Since there is no hope of ever deciding the question with certainty, it appears best to follow the suggestion of these two authors, as that most likely to be correct.

In notes taken by Dr. Binney at the Jardin des Plantes, it appears that a young shell is there labelled *H. jejuna*.

Lea refers to this species in his remarks on several species. As demonstrated by Bland, he had before him *clausa* under this name.

Anthony makes *Mobiliana* a synonym of *clausa* in his Ohio Catalogue.

* Mr. Dorman writes that the correct orthography of the spot is *Cowford*, and not *Cowfort*.

Living specimens sent me by Bishop Elliott present the following characteristics : —

Animal dirty white, neck darker, superior tentacles black, — not quite twice the breadth of the shell, — foot pointed.

It has also been found at St. Simon's Isle, Ga. (Postell), St. John's River and St. Augustine, Fla., (Dorman), and in the cemeteries of Savannah. (Elliott.)

The following is Say's description : —

H. JEJUNA. — Shell subglobular, glabrous, pale reddish brown ; volutions five, slightly wrinkled, regularly rounded ; spire convex ; suture rather deeply impressed ; aperture dilate lunate ; labrum a little incrassated within, not reflected ; umbilicus open, small.

Breadth rather more than one fifth of an inch. Inhabits the Southern States.

Animal — light reddish brown, with a granular surface, longer than the breadth of the shell ; oculiferous tentacula elongated, and rather darker than the body.

This shell is very closely allied to *H. sericea* of Southern Europe, but it differs from that species in being destitute of the hirsute vesture. I found several specimens of *jejuna*, during an excursion some time since into East Florida, at the Cow Fort on St. John's River. It is in the collection of the Academy.

HELIX INCRUSTATA POEY vol. ii. p. 174, pl. xxix. a, fig. 4.

Helix incrustata POEY, Memorias, vol. i. pp. 208, 212, pl. xii. figs. 11–16.

PFEIFFER, Mon. Hel. Viv. iii. 632.

This shell is described by Gould under the name of *saxicola*. It is, however, quite a distinct species. The true *saxicola* is more nearly allied to *chersina*, and its surface is bright and clean, the spire elevated, the general outline more globose, and the umbilicus small, being also slightly covered by the lip.

I am indebted to Mr. Poey for specimens of the true *saxicola* of Cuba, as well as of his *incrustata*. A compari-

son of the latter with the shell described by Gould, leaves no room for doubting their identity. Poey's description is as follows:—

Testa depressa, tenuis, corneo-fusca, perspectivè perforata, subtiliter striata; anfr. 4½, ultimo convexo, prioribus planulatis; apertura subcircularis, marginibus acutis approximatis.

HELIX PULCHELLA MÜLLER. vol. ii. p. 175, pl. xvii. fig. 1.

Helix minuta SAY, (Binney's ed.) p. 30.

STIMPSON, Shells of N. E. p. 54, absq. descr.

I have in my possession notes of Say never published, in which he acknowledges the identity of these two species. DeKay considers them distinct, but erroneously says the European *pulchella* is furnished with sharp parallel ribs, (referring to the variety). Stimpson also considers them distinct.

Ferussac, Pfeiffer, Deshayes, and Reeve unite them.

I am constantly receiving this species from every section of the country,—having specimens from the following new localities: Pennsylvania, District of Columbia, Michigan (Winchell), Kansas and Nebraska (Hayden), and Florida. It is brought down in immense quantities by the streams of Nebraska and Kansas, and deposited with drift-wood, other minute shells, &c., on their banks. Dr. Hayden collected myriads of them during his expedition to the Yellow-stone River. He was also so fortunate as to find about a pint of the heavily ribbed variety (**H. COSTATA**), which had before been noticed only at Cincinnati and Philadelphia, and that very sparingly. The discovery of this ribbed variety was a most interesting one, as it gives additional evidence of the identity of the American with the European *pulchella*, and is strongly opposed to the theory of the introduction of the species from abroad.

HELIX PROFUNDA SAY.....vol. ii. p. 177, pl. xxii.

- Helix profunda* SAY, (Binney's ed.) pp. 20, 36, pl. 37, fig. 3.
 DEKAY, N. Y. Moll. p. 42, pl. iii. fig. 38.
 CHEMNITZ, ed. 2, ii. p. 63.
 PFEIFFER, l. c. iii. 265.
 CHENU, Bibl. Conch. iii. 51, pl. xiii. fig. 26.
 DESHAYES in Fer. i. 69.
 REEVE, Con. Icon. No. 682, (1852).
 MRS. GRAY, Fig. Moll. An. pl. exciii. fig. 12. (Ex. Bost. Journ.)
- Helix Richardi* DESHAYES in Lam. 3d ed. iii. 283.
 CHENU, Ill. Con. xii. 13.
 DELESSERT, Rec. des Coq. pl. xxvi. fig. 7.
- Polygyra profundum* ADAMS, Gen. Rec. Moll. ii. 207, (absq. desc.)?

The shell figured in Ferussac, pl. 69 G, figs. 9, 11, and referred to as var. β by Pfeiffer, is merely one of the many varieties of the species.

I have a specimen collected by Mr. T. A. Conrad on Broad Top Mountain, Pennsylvania. It occurs fossil in the Postpleiocene.

HELIX SAYII BINNEY.....vol. ii. p. 180, pl. xxiii.

- Helix Sayii*, CHEMNITZ, ed. 2, No. 976, tab. cxlviii. figs. 13, 14.
 MRS. GRAY, Fig. Moll. An. pl. 193, fig. 10. (Ex. Bost. Journ.)
 DESHAYES in Fer. i. p. 79.
 REEVE, Con. Icon. No. 679, (1852).
- Helix diodonta* SAY, (Binney's ed.) p. 39, pl. lxxiv. fig. 4.
 DEKAY, N. Y. Moll. p. 34, pl. ii. fig. 18.

I have it also from Pennsylvania.

HELIX TRIDENTATA SAY.....vol. ii. p. 183, pl. xxvii.

- Helix tridentata* SAY, (Binney's ed.) p. 6, pl. lxx. fig. 1.
 DEKAY, N. Y. Moll. p. 28, pl. ii. fig. 7.
 POTIEZ et MICHAUD, Gal. p. 114.
 MRS. GRAY, Fig. Moll. An. pl. 291, fig. 3. (Ex. Bost. Journ.)
 CHEMNITZ, l. c. i. 84.
 PFEIFFER, l. c. iii. 263.
 DESHAYES in Lam. ed. 3, iii. 309, in Fer. l. c. i. 72.
 REEVE, Con. Icon. No. 690, (1852).
- Triodopsis lunula* RAFINESQUE, En. and Acc. p. 3.

I propose to separate from *tridentata* Binney both *fallax* and *Hopetonensis*. Their distinctive characters are suf-

ficiently strong and constant to warrant the separation, though many intermediate forms occur, scarcely referable to one more than to another. The present form occurs less plentifully in the Southern States, its place being filled by the two others.

Petiver's No. 6, is this species. *Triodopsis lunula* is also one of its synonyms. The generic description is given (vol. i. p. 49),—the specific description is as follows:—

Depressed, mouth narrow with thick lips, umbilicus lunulated. In Kentucky. Forms subgenus *Menomphis*.

In Ravenel's Catalogue, p. 9, (1834), a variety of *H. tridentata* is mentioned under the name of *ephebus*. I find among Say's manuscript the following description of it:—

H. TRIDENTATA S. var. *ephebus*. Small; labrum much more obtusely rounded; the elevated lines of the whorls more prominent and obvious. Breadth two fifths of an inch.

HELIX FALLAX SAY.....vol. ii. p. 183, pl. xxviii.

Helix fallax SAY, (Binney's ed.) p. 27.

DEKAY, N. Y. Moll. p. 28, pl. iii. fig. 23.

CHEMNITZ, l. c. i. 364, (1846).

PFEIFFER, l. c. iii. 263.

REEVE, Con. Icon. No. 686, (1852).

Helix tridentata BINNEY, Bost. Journ. l. c. pl. xviii. fig. 3.

This is certainly more than a variety of *tridentata* Say. Not only are the characteristic differences well marked, but the habits of the respective animals are different. Mr. J. G. Anthony tells me that *tridentata* is found on hill-sides in the grass, while *fallax* inhabits rich soils, in woods, under logs, and is not gregarious like the former. The difficulty is to mark the dividing line between the many varieties of *fallax*, some of which are quite as distinct as *H. Hopetonensis* Shuttl.

The shell mentioned on page 10 of my Notes as being furnished with an internal fulcrum, seems to be a distinct species.

I have specimens of *fallax* from the Northern, Western, and Southwestern States. It is also found in many of the Southern States, and is quoted from Texas by Röemer. Say's description is as follows:—

HELIX FALLAX. Spire convex; volutions five, with elevated lines forming grooves between them; labrum reflected, contracting the aperture, bidentate; teeth separated by a profound sinus; superior tooth inflected into the mouth; inferior tooth situated near the base; labrum with a large, prominent, oblique, lamelliform tooth, curving downwards so as nearly to reach the termination of the labrum; umbilicus open, exhibiting the volutions.

Greatest transverse diameter nine-twentieths of an inch.

This resembles the *tridentata* Nob., but the upper tooth of the labrum is much inflected, the spire is more elevated, and the size is less considerable; in the former character it coincides with *H. inflecta* Nob., but that shell has the umbilicus closed.

Presented to the Academy by Messrs. Hyde and Mason, who found it in the vicinity of Philadelphia, where it is not uncommon.

Since the above was written, I received a specimen from Mr. Stephen Elliott, of South Carolina, fully equal in size to the *tridentata*.

HELIX HOPETONENSIS SHUTTLEWORTH. .vol. iii. p. 17, pl. lxxvii. fig. 16.

Helix Hopetonensis SHUTTLEWORTH, Bern. Mitt. 1852, p. 198.

REEVE, Con. Icon. No. 709, (1852).

PFEIFFER, Mon. Hel. Viv. iii. 263.

CHEMNITZ, ed. ii. p. 420, pl. cxlviii. figs. 17, 18.

I have it also from Florida, and St. Simon's Isle, Georgia. (Postell.)

HELIX VENTROSULA PFEIFFER.

PLATE LXXVII. FIGURE 14.

T. rimato-perforata, depresso-globosa, tenuis, subtiliter striata, pellucida, corneo-albida; spira vix elevata; anfr. 5 vix convexiusculi, ultimus

superne subangulatus, subito deflexus, basi inflatus, antice gibbus et valde constrictus; apertura perobliqua, ringens; perist. acutum, latè reflexum, marginibus vix conniventibus, laminas elevatas in ventre anfractus penultimi angulatum junctas, emittentibus, dextro lamina subperpendiculari, dilata, basali dentibus 2 acutis munito. [Pfr.]

SYNONYMS AND REFERENCES.

Helix ventrosula PFEIFFER, Proc. Zool. Soc. 1845, p. 131; Mon. Hel. Viv. i. 417; iii. 266.

CHEMNITZ, ed. 2, i. p. 373, (1846,) pl. lxx. figs. 5, 6, (1849).

REEVE, Con. Icon. No. 687, (1852).

DESCRIPTION.

Animal not observed.

Shell minutely perforated, globosely depressed, thin and shining, pellucid, delicately striated, horn-colored; spire slightly raised, whorls 5 but little convex, the last one subangulated at the periphery, falling suddenly towards the aperture, inflated below, and strongly contracted; aperture very oblique, much complicated with teeth; peristome acute, broadly reflected, its terminations scarcely approaching each other, but joined by two white, elevated laminæ, which are placed at acute angles on the parietal wall; the basal termination is also furnished with two white acute denticles, while on the other is placed a white sub-perpendicular, extended lamina.

Greater diameter, 13; lesser, 11; height, $7\frac{1}{2}$ millimetres.

Geographical Distribution. Texas and Mexico.

Remarks. This shell was unknown to Binney, and erroneously considered by Gould (p. 193) as a synonym of *H. Texasiana*. It is, however, a remarkably well characterized species. It may readily be distinguished by the globose under-surface, and the basin-shaped aperture, narrowed to scarcely more than a chink by the prominent, white teeth.

HELIX AURICULATA SAY.....vol. ii. p. 186, pl. xl. fig. 1.

Polygyra auriculata SAY, (Binney's ed.) p. 10.

- Helix auriculata* DEKAY, N. Y. Moll. p. 47, pl. iii. fig. 28.
 CHEMNITZ, l. c. i. 371, (1846).
 DESHAYES in Lam. 3d ed. iii. 308: in Fer. l. c. i. 76.
 PFEIFFER, l. c. iii. 266.
 REEVE, Con. Icon. No. 700, (1852).

It will appear from the above synonymy that I have separated *H. avara* from this species. Other species may also be included in *auriculata* Binney, but I make no inquiry concerning them, as my friend Mr. Bland will soon publish an elaborate article on this group.

Ferussac's (pl. 50, fig. 3) *var. minor* is quoted as a variety of *auriculata* by Pfeiffer, in the first volume of his great work, but in volume third is doubtfully referred to *uvulifera*.

I have specimens measuring 16 millimetres in diameter. They are from St. Augustine, Fla., the only locality, indeed, from which I have received the true *auriculata*, the smaller variety from the keys being probably *H. uvulifera*.

The shell is carried on the animal in a manner quite different from that of the other species, the axis being quite horizontal.

HELIX AVARA SAY.....vol. ii. p. 186, pl. xl. fig. 2.

- Polygyra avara* SAY, (Binney's ed.) p. 11.
Helix avara DEKAY, N. Y. Moll. p. 47.
 CHEMNITZ, l. c. i. 370, (1846,) pl. lxxv. figs. 1, 2, (1849).
 PFEIFFER, l. c. i. 418; iii. 267.
 REEVE, l. c. No. 720.
 DESHAYES in Fer. l. c. i. 78.
Helix Sayii DEKAY, l. c. p. 47.

I have already remarked that the confusion existing concerning this and the preceding species is about to be rectified by Mr. Bland. I will, therefore, refrain from making any remarks at this time.

The species as it now stands has been found from Georgia to Texas; in some of the intermediate States the individuals are extremely numerous.

Say's description is as follows.

P. AVARA. — Shell covered with numerous short, robust hairs ; spire convex ; whorls four, regularly rounded, with hardly elevated lines forming grooves, which are much more conspicuous near the mouth ; mouth subreniform, two projecting, obtuse teeth on the outer lip within, separated by a deep sinus ; outer lip elevated, equal, describing two-thirds of a circle ; pillar-lip elevated, broadly but not profoundly emarginate, concave beneath, and connected to the inner side by an elongated, lamelliform tooth, which is placed obliquely on the penultimate whorl, near the middle of the mouth ; lips almost equally prominent, continued ; umbilicus moderate, not exhibiting the volutions, no groove on the penultimate whorl within it.

Breadth quarter of an inch. Inhabits Florida. Cabinet of the Academy. Animal longer than the breadth of the shell, acute behind, above granulated and blackish, beneath, and each side, white.

This we found in the orange groves of Mr. Fatio, on the river St. John, East Florida ; it is usually covered with a black, earthy coat, which is probably retained and collected by the hairs. When unencumbered with this vesture, the shell is of a horn-color. It is by no means so common as the preceding species.

HELIX UVULIFERA SHUTTLEWORTH.....vol. iii. p. 20.

Helix uvulifera SHUTTLEWORTH, Bern. Mitt. 1852, p. 199.

CHEMNITZ, ed. 2, ii. 420, pl. cxlviii. figs. 19, 20, (1853).

PFEIFFER, Mon. Hel. Viv. iii. 267.

Helix florulifera REEVE, Con. Icon. No. 699, (Aug. 1852).

Helix auriculata minor FERUSSAC, Hist. pl. l. fig. 3? (teste Pfeiffer).

This species is known in many American cabinets as a small variety of *auriculata*.

I have one specimen from Texas, received from Mr. Cuming.



HELIX VULTUOSA GOULD.....vol. ii. p. 189, pl. xl. a, fig. 4.

Helix vultuosa CHEMNITZ, ed. 2, ii. 365, pl. cxxvii. figs. 10-12.

REEVE, Con. Icon. No. 711, (1852).

PFEIFFER, Mon. Hel. Viv. iii. 263.

HELIX ARIADNÆ PFEIFFER.

PLATE LXXVIII. FIGURES 1, 3, 4.

T. arcuato-rimata, depressa, subdiscoidea, solidula, diaphana, superne plicatula, albida; spira subplana; anfr. 5 suturâ impressâ distincti, planiusculi, ultimus antice subito deflexus, valdè constrictus, basi paulo convexior, sublævigatus; rima umbilicalis arcuata, in perforationem obliquam, punctiformem terminata; apertura parvula, perobliqua, lunato-circularis, ringens; perist. breviter reflexum, marginibus conniventibus, linguâ bicruci, profunde intrante, flexuosâ junctis, basali plicis 2 validis, marginalibus, intransitibus, approximatis, dextro plicâ profundâ margini parallêlâ munito. [Pfeiffer.]

SYNONYMS AND REFERENCES.

- Helix Ariadnæ* PFEIFFER in Zeitsch. f. Mal. 1848, p. 120; Mon. Hel. Viv. iii. 266.
CHEMNITZ, ed. 2, i. p. 372, pl. lxx. figs. 19-21, (1846).
Helix Couchiana LEA, Proc. Phila. Acad. 1857, p. 102.

DESCRIPTION.

Animal not observed.

Shell with a rounded umbilical groove, terminating in a minute oblique perforation, depressed, subdiscoidal, nearly transparent, bluish white, with scarcely perceptible wrinkles on the upper surface; spire flattened; whorls five, separated by a distinct suture, flattened, the last one suddenly falling towards the aperture, very much contracted and pinched behind the peristome, more convex and smoother below; there is a deeply chiselled, rounded, umbilical groove as mentioned above, the umbilical region is also channelled; aperture small, extremely complicated with teeth, very oblique and circular; peristome white, slightly reflected, its terminations approaching each other and joined by two flexuose, elevated, acute laminae, converging to a point far within the aperture; the basal portion of the peristome is also furnished with two stout, entering, converging, marginal folds, while the right termination of the peristome has a more delicate, deeply seated, elongated lamina, running almost parallel with the peristome.

Greater diameter, 12; lesser, 10; height, 5 millimetres.

Geographical Distribution. Pfeiffer gives Central America as the habitat in Chemnitz, but in the Monographia he gives none. The shell figured (fig. 4) is from Tamaulipas, Mexico, where it was collected by Berlandier. I have seen no specimens found strictly within the limits of the Union, though we have every reason to expect to discover them in Texas.

Remarks. This can be confounded with no known American species. It is at once distinguished by the remarkable aperture, the flat spire, convex base, and umbilical channel. It is sufficiently transparent to allow the suture to be seen through the base of the shell, when held towards the light.

I have given the outlines of the figures in Chemnitz, as well as an enlarged view of the curious aperture.

The shell referred to doubtfully as a variety of *Helix Loisa* in my Notes p. 5, may be an immature specimen of *Ariadnæ*.

Mr. Lea's original specimen of *H. Couchiana* was obtained from the same source as the shell I have figured (fig. 4), and resembles it in every particular. I have not, therefore, the slightest hesitation in placing it in the synonymy of this species. His description is as follows:

T. supernè paulisper elevatâ, subplanulatâ, infernè subinflatâ; nitidâ, abidâ, longitudinaliter et subtiliter striatâ, minutè perforatâ; anfr. 5; aperturâ rotundatâ, quinquedentatâ; labro subacuto.

Hab. Texas — L. Berlandier, M. D.

HELIX HIPPOCREPIS PFEIFFER.

PLATE LXXVIII. FIGURE 19.

Testa angustè umbilicata, depressa, solidula, confertim arcuato-plicata, opaca, fuscula; spira vix elevata; anfr. 5½ angusti, vix convexiusculi, suturâ impressâ juncti, ultimus supernè carinatus, basi convexior, anticè solutus, subito deflexus, pone aperturam constrictus et gibboso-inflatus; umbilicus extus latiusculus, angustissimè pervius; apertura subhorizon-

talis, auriformis, ringens; perist. sublabiatum, marginibus callo elevato, angulari, supernè laminam profundè intrantem alteramque minorem prope columellam (ambas profundè ferri equino instar connexas) emitte-
tente junctis, supero breviter expanso, laminam obliquam immittente,
basali calloso-reflexo. [Pfeiffer.]

SYNONYMS AND REFERENCES.

- Helix hippocrepis* PFEIFFER in Roëmer's Texas, p. 455; in Zeitsch. f. Mal.
1848, p. 119; Mon. Hel. Viv. iii. 267.
CHEMNITZ, ed. 2, ii. 333, pl. cxxxii. f. 4-6.
REEVE, Con. Icon. No. 1238, (1854).

DESCRIPTION.

Animal not observed.

Shell perforated, depressed, rather heavy, closely striated, opaque, smoky; spire flattened; suture impressed; whorls $5\frac{1}{2}$, scarcely convex, the last carinated above, more convex below, falling abruptly at the aperture, and behind it very much contracted and with a prominent isolated bulge; umbilicus at first expanded and grooved, but rapidly terminating in a minute perforation; aperture almost horizontal, ear-shaped, complicated with teeth; peristome white, thickened, its extremities joined by an elevated, sharp, angular ridge, from which protrude far within the aperture two laminæ, (the upper one sharper and more prominent,) the connecting terminations of which within the shell resemble a horseshoe; the upper portion of the peristome is slightly reflected and furnished with an oblique entering angle, and the basal portion is callous and reflected.

Greater diameter, 12; lesser, 10; height, 5 millimetres.

Geographical Distribution. New Brauenfels, Texas. (Roëmer.)

Remarks. The smaller, columellar lamina, from which the name of the shell is derived, is not represented in the plate.

This species is remarkably well characterized and cannot be compared or confounded with any other known American shell. It is very rare in cabinets.

HELIX TEXASIANA MORICAND. vol. ii. p. 191, pl. xlv. fig. 1.

Helix Texasiana PFEIFFER, Mon. Hel. Viv. i. 418; iii. 267, excl. syn. and var. β .

CHEMNITZ, ed. 2, (1846,) i. p. 85, excl. var. and figure.

DESHAYES in Lam. ed. 3, iii. 316.

REEVE, Con. Icon. No. 707.

DESHAYES in Fer. i. p. 74, pl. l. c. (excl. synonym.)

Helix triodonta FERUSSAC, Mus. Par.

Helix Tamaulipasensis LEA, Proc. A. N. S. Phila. 1857, p. 102.

Deshayes, also, in Ferussac's great work, confounds *fati-giata* with this. In Chemnitz, ed. 2, Pfeiffer makes the same errors of synonymy as in his Monograph. The figure is not this species, nor is it easy to determine what it is.

Shuttleworth, in his Diagnosen, has also pointed out Pfeiffer's error in placing *fatigiata* and *plicata* in the synonymy of this species.

From notes received from Pfeiffer, and also from memoranda taken by my father at the Garden of Plants, it appears that *triodonta* is identical with this species. On vol. i. p. 162, a different opinion is expressed on *triodonta*.

The variety of this species figured on pl. 78, fig. 18, was at first considered a distinct species by me. Having sent specimens to Pfeiffer, he writes that they are merely varieties. It is distinguished by a wider umbilicus, and a somewhat different arrangement of teeth.

There can be no doubt of the identity of *H. Tamaulipasensis* with *H. Texasiana*. I have based my opinion on a careful examination of Mr. Lea's shell. His description is as follows :

T. supernè paulisper elevata, subplanulata, infernè subinflata, nitida, longitudinaliter et subtiliter striata, minutè perforata, anfr. 5; apertura lunata, tridentata; labro spissato, reflexo. Texas.

Pfeiffer describes a var. β , a larger form with 6 whorls, horn-colored, and having a reddish band revolving above the periphery. I have received it from Dr. Moore of Texas.

H. Texasiana is also found in the neighboring Mexican State of Tamaulipas. Reeve gives Alabama as the habitat.

HELIX MOOREANA.

PLATE LXXVIII. FIGURE 24.

Testa orbiculato-depressa, carinata, umbilicata, albida; spira obtusa, plus minusve elevata; anfr. 6, vix convexiusculi, striati, ultimus infra carinam non rotundatus; sutura impressa; subtus striæ minus distinctæ; anfr. 1 $\frac{1}{4}$, ultimus carinâ valdè productâ anfr. alterum et umbilicium profundum pene tegens; apertura orbicularis, contracta, tridentata; perist. album, incrassatum, vix reflexiusculum, margine basali dentibus duobus curvatis marginalibus sinu parvulo orbiculari separatis, armato; plica alba rectangularis, dentiformis, excavata, in medio aperturæ projecta ad columellam adnata et perist. margines connectans.

SYNONYMS AND REFERENCES.

Helix Mooreana W. G. BINNEY, Proc. A. N. S. Phila. 1857, p. 184; Notes p. 4.

DESCRIPTION.

Animal not observed.

Shell orbicular, depressed, white, carinated, umbilicated; spire more or less depressed, obtusely rounded; whorls 6, distinctly striated, hardly convex; suture impressed; below the carina the body whorl is not rounded, but slants down to the base which is parallel with the suture; below, the striæ are less distinct; at the umbilical region only 1 $\frac{1}{4}$ whorl is visible, the outer one strongly carinated so as to conceal a portion of the umbilicus and a great part of the remaining whorl; the umbilicus is very small, but perforates the shell to the apex, showing all the volutions with the aid of a lens; aperture rounded, contracted by three teeth; lip heavy, broad, white, hardly reflected, near the basal extremity, quite on the edge, armed with two short, incurving teeth, separated by a small, rounded sinus; on the columella there is a tooth-like fold, square, projecting across the aperture, its extremities joining those of the peristome.

Greater diameter 8 $\frac{1}{2}$, lesser 7, height 3 millimetres.

Geographical Distribution. Found in large numbers by Dr. Francis Moore in Washington Co., Texas.

Remarks. It is difficult to express correctly in words the specific differences of the various *Polygyræ*. This shell combines the characteristics of several American species. It has the spire of *H. monodon* Rackett, and the columellar fold of *Dorfeuilliana* Lea, as figured Tr. Am. Phil. Soc. vi. pl. xxiv. f. 118. The teeth are placed on the inner edge of the peristome, as in *Texasiana* Mor., and the curious carination at the umbilical region resembles that of *pustula* Fer., which has not been noticed in descriptions.

HELIX THOLUS.

PLATE LXXVIII. FIGURE 21.

Testa solidiuscula, albida, nitens, costis obliquis notata; spira rotundata, elevatiuscula, obtusa, tholiformis; sutura valdè impressa, anfr. 7, convexiusculi, superi magis planulati, ultimus ad aperturam descendens, obtusè carinatus, carina peristoma non attingens, post perist. canaliculatus; infra carinam costæ minus distinctæ; basis plana, umbilicus latus, perspectivus, anfractus canaliculatos monstrans, quorum 2 $\frac{1}{2}$ perspicuè, alii obscurè videntur; apertura perobliqua, semicircularis, ab axe remota; perist. album, latum, incrassatum, margine basali reflexiusculo, dentibus duobus sinu rotundato disjunctis armatum; plica parietalis acuta, in medio aperturæ projecta, margines peristomatis vix connectens.

SYNONYMS AND REFERENCES.

Helix tholus W. G. BINNEY, Proc. A. N. S. Phila. 1857, p. 186; Notes, p. 6.

DESCRIPTION.

Animal not observed.

Shell rather solid, white, shining, ribbed above, smoother below; spire obtuse, little elevated, rounded; whorls seven, convex, the upper ones more flattened, the last bluntly carinated; carina not reaching the peristome; base parallel to the suture; umbilicus broad, half the larger diameter of the shell, showing two and a half deeply grooved

whorls plainly, the others rapidly retreating towards the apex; aperture very oblique, semicircular, removed from the axis of the shell, bordered with a scarcely reflected, white, heavy rim, grooved behind, and armed with two stout teeth near the basal extremity, broadly reflected at the junction with the body whorl; on the parietal wall of the aperture is a white fold, hardly connecting the extremities of the lip, and projecting across the aperture into an acute point.

Greater diameter 11, lesser 9, height 4 millimetres.

Geographical Distribution. When describing this species I had seen but one specimen of it in the collection of Mr. Bland. It was supposed to inhabit Texas. Since that time another specimen has been received by him from an undoubted Texan locality.

Remarks. The aperture of this curious shell resembles that of *H. fatigiata* Say. It is readily distinguished from that and all other described species by the umbilicus, broad at the commencement, and rapidly narrowing beyond the second whorl, with the peculiar groove visible in all the whorls of the umbilicus, of the same character as that noticed by Say in *auriculata*, though deeper.

The name is derived from the resemblance of the slightly raised, rounded spire to a low dome.

HELIX FATIGIATA SAY.....vol. ii. p. 193 (pars), pl. xxxix. fig. 4.

Helix fatigiata (Polygyra) SAY, (Binney's ed.) p. 37.

BINNEY in Bost. Journ. l. c. ex parte, (excl. syn. et fig.)

SHUTTLEWORTH, Diag. n. Moll. ii.

BLAND, N. Y. Lyceum, vi. 283; Notes, 7.

Helix Texasiana var. B. CHEMNITZ, ed. 2. i. p. 86, excl. descr., syn. et fig.

DESHAYES in Fer. i. p. 74, excl. desc., syn. et fig.

Helix Texasiana β PFEIFFER, Mon. Hel. Viv. i. 418; iii. 267.

Helix Dorfeuilliana DESHAYES in Fer. i. 73 (excl. syn.) pl. 69 d, fig. 3.

Helicina fatigiata DEKAY, N. Y. Moll. p. 82.

The figure to which I have referred is a correct representation of the specimen of *H. fatigiata* deposited by Mr.

Say in the collection of the Philadelphia Academy. It represents the only form of the species, those included by Binney under the same name being referred more properly to the succeeding species. There is consequently much confusion in the synonymy, remarks, and geographical notes of this group. The true *H. fatigiata* is described by Shuttleworth (l. c.) and figured by Deshayes under a wrong name, as well as placed in the text of his work among the synonyms of *Texasiana*. Pfeiffer in both of his works considers it as a variety (distinctius carinata) of *Texasiana*, and in Malac. Blatt, 1856, p. 11, declares Shuttleworth's notes on it unsatisfactory. DeKay has placed it in the genus *Helicina*.

In the Boston Journal, Binney joins *pustula* to this species, though doubtfully. By his notes, taken at the Jardin des Plantes, it appears the species occurs there under the name of *operculata* Val.

Bland has corrected the errors of previous writers, and thus points out the distinguishing characteristics of the species.

H. fatigiata Say is larger than *Troostiana* Lea, *plicata* Say, and *Dorfeuilliana* Lea; it is most nearly allied to the first, and through it is connected with the second, but wholly distinct from the last. The parietal tooth is more rectangular than that of *Troostiana*, in which it is slightly emarginate near the tip, — but much more so in *plicata*, while the parietal tooth in *Dorfeuilliana* is rather quadrate. The teeth on the peristome in *fatigiata* and *Troostiana* are much alike, as regards form, size, and position, — the superior one being the largest, — both are larger and transverse in *Dorfeuilliana* and in *plicata*, the inferior one being the largest in the latter. Behind the peristome there are two small pits, showing the situation of the teeth in *fatigiata* and *Troostiana*, while there is scarcely more than a deep, well marked constriction in *Dorfeuilliana*. *H. Troostiana* has a slight groove on the inner side of the last whorl, the absence of which in *fatigiata* is noticed

by Say, but I scarcely consider that a good specific character. Fresh specimens of *H. fatigiata* are, I believe, covered with a very thin epidermis, on which hairs are sparingly scattered, — the scars of the hairs may be detected, especially on the last whorl, in denuded shells.

H. fatigiata has, at a short distance within the aperture on the base of the last whorl, a small, detached, erect, rounded tubercle, answering probably the same purpose in the economy of the animal, as the “fulcrum” originally noticed by Mr. Lea (Observations, Vol. V. p. 80) in *H. spinosa*, though of a different construction.

I do not think the true *fatigiata* inhabits Ohio. It seems more properly to belong to the region of Tennessee.

Pfeiffer’s objection to the retention of the name, which is evidently a misprint, can hardly be removed, since the name *fastigiata* is already occupied by another species.

HELIX HAZARDI BLAND.

PLATE LXXVIII. FIGURE 13.

Polygyra plicata SAY, l. c.; (Binney’s ed.) p. 21.

Helix fatigiata BINNEY, in Bost. Journ. l. c. (excl. syn. et fig.) in Terr. Moll. (excl. syn. et fig.)

Helix Texasiana PFEIFFER, l. c. (excl. syn. et descr.)
CHEMNITZ, (excl. syn., descr. et fig.)

Helix Dorfeuilliana DESHAYES, in Fer. l. c. (excl. descr., syn. et fig.)

Helix Troostiana W. G. BINNEY, Notes, p. 21.

Helix Hazardi BLAND, N. Y. Lyc. vi. 291; Notes 16, pl. ix. figs. 17–20.

Helicina plicata DEKAY, N. Y. Moll. p. 28.

There are Kentucky specimens of this shell deposited in the Philadelphia Academy by Say. His description is as follows:—

POLYGYRA PLICATA. Shell convex beneath, depressed above, spire slightly elevated; whorls five, compressed, crossed by numerous raised, equidistant lines, which form grooves between them; aperture subreniform, labrum reflected, regularly arcuated, describing two thirds of a circle; within two-toothed, teeth not separated by a remarkable sinus; labrum with a profound duplicature, which ter-

minates in an acute angle at the centre of the aperture ; beneath exhibiting only two volutions, of which the external one is slightly grooved near the suture.

Inhabits Alabama. Breadth, one fourth of an inch. Cabinet of the Academy.

This species is about the same size as *P. avara*, but, besides other characters, it is sufficiently distinguished by the acute fold of the labrum. It was sent to the Academy by Mr. Samuel Hazard.

A more careful study has induced me to change my opinion of the identity of this species with *H. Troostiana*.

Bland is the only author who has correctly dealt with this species. His description is given below, while his figure is given on pl. 78, fig. 13. He proposed this name in place of Say's preoccupied one.

This shell may be distinguished from *fatigiata* Say, and *Troostiana* Lea, independently of the absence of the carina, by its smaller size, and more particularly by the different form, relative size, and position of the teeth. In those species the superior tooth on the peristome is transverse, compressed, and larger than the inferior one, from which it is separated by a "remarkable sinus," distinctly visible on looking into the aperture ; the inferior tooth is obtuse. Immediately behind the peristome, the position of the teeth is marked by small shallow pits, giving the character to the last whorl designated by Shuttleworth "*scrobiculato-constrictus*," — the striæ run over the whorl up to the peristome. In *H. Hazardi*, the two teeth on the peristome are of the same character as the superior one in *fatigiata* and *Troostiana*, — the inferior tooth is however the largest, and so partially conceals the lower margin of the superior one as to obstruct the view into the aperture, and give no appearance of separation "by a remarkable sinus." Both the teeth are more deeply seated than in the other species. The nature of the scrobiculation behind the peristome in *H. Hazardi* alone sufficiently distinguishes it from its allies. The space behind the peristome, and between it and the curved pit, showing the seat of the superior tooth, is convex and smooth, the striæ not extending over it.

This species has, in common with *fatigiata* Say and *Troostiana*

Lea, a thin, brown, but more sparingly hirsute epidermis. I have noticed the tubercle within the last whorl, near the aperture, in *fatigiata* and *Troostiana*, but no such process exists in the species now under consideration. In *H. Hazardi*, the inferior tooth of the labrum, at its inner end, is continued back within the aperture, forming a white erect lamella on the floor of the whorl, parallel with, and leaving a narrow sinus between it and the inner wall, to which it is joined at its extremity, about $2\frac{1}{2}$ mill. from the edge of the peristome. The position of this lamella can be seen through the shell.

The species is also found among the Cumberland Mountains of Tennessee (Elliott).

Conrad, in the second volume (N. S.) of Silliman's Journal, speaks of finding *H. plicata* Say in Florida. He probably refers to some other species.

HELIX DORFEULLIANA LEA.

PLATE LXXVIII. FIGURES 2, 14.

Helix Dorfeuilliana BLAND, ANN. N. Y. Lyc. vi. p. 294; Notes, p. 18, pl. ix. figs. 24-26; nec PFEIFFER, DESHAYES, CHEMNITZ, REEVE.

Helix fatigiata BINNEY, Bost. Journ. et Terr. Moll. l. c. (excl. descr., syn. et fig.)
Polygyra Dorfeuilliana LEA, l. c.

TROSCHER, Ar. f. Nat. 1839, ii. 222.

The figure 2 which I have given is a fac-simile of Lea's; his description is as follows:—

T. supernè obtuso-conicâ, infernè subinflatâ, nitidâ, corneâ, longitudinaliter striatâ, late umbilicatâ; anfr. 6; aperturâ lunatâ, tridentatâ.

Shell above obtusely conical, below somewhat inflated, shining, horn color; longitudinally striate, widely umbilicate; whorls six; aperture lunate, three toothed.

Hab. Ohio. Mr. Dorfeuille, Cincinnati.

Diam. .3; length .2 of an inch.

Remarks. I adopt Mr. Say's genus *Polygyra*, believing the division, though very artificial, quite as good as many made by Lamarck. This species has, like *P. fatigiata* Say and *P. plicata*

Say, one large tooth on the left lip, and two smaller ones on the right lip. It differs from the first in not being carinate, from the last in being larger, and having larger striæ. In the *Dorfeuilliana* the tooth on the left lip is large and square, with an indentation in the centre. The view into the mouth is nearly obstructed by the teeth, leaving, to appearance, three nearly square apertures. The superior part of the shell is striate, while the inferior part is nearly smooth, and exhibits two volutions. I have seen but a single specimen, which, I believe, is the only one obtained by Mr. Dorfeuille, who obligingly sent it to me.

Mr. J. G. Anthony obtained from Mr. Dorfeuille some facts concerning the original discovery of this species, which prove beyond all doubt that it was accidentally brought from Kentucky. It is not an inhabitant of Ohio.

The species has been confounded with several others by Reeve, Pfeiffer, Deshayes, and Binney. Bland was the first after Lea to correctly treat it. He thus describes its characteristics:—

H. Dorfeuilliana Lea differs materially in its characters from the three preceding species; the striæ on the upper surface are not so well defined as in *Troostiana*, but more so than in *Hazardi*, while the base is more smooth than in either of them, having only very delicate striæ, with microscopic impressed spiral lines.

The parietal tooth is quadrate, — the two teeth on the right lip are more nearly of the same size and form than in *fatigiata* and *Troostiana*. In this species the inferior tooth is transverse, and in some specimens broader than the superior one, but has a somewhat pointed apex, — both are very nearly equally deeply seated, but so far apart as to allow a view between them into the aperture, leaving, as Mr. Lea expresses it, “to appearance three nearly square apertures.” Say would have described the two teeth as “separated by a remarkable sinus.” The peristome of this is more thickened and less reflected than in the other species, — behind it is deeply constricted, without any appearance of pits showing the position of the teeth within.

H. Dorfeuilliana Lea varies in size,—the following are the measurements of my largest and smallest specimens:—

Diam. maj. 8, min. 7, alt. $3\frac{1}{2}$ mill.

“ “ $6\frac{1}{2}$ “ $5\frac{1}{2}$ “ 3 “

With respect to the shell considered by Shuttleworth to be *H. Dorfeuilliana*, it will be seen from the figure (Pl. ix. fig. 26), which differs, as he says, from Lea's, that the superior tooth on the labrum is larger and more deeply seated than the inferior one, and that the latter, though more developed, is much of the same form as the inferior tooth in *fatigiata* and *Troostiana*. The parietal tooth partakes of the general character of that in Lea's type of *Dorfeuilliana*, but its lower and terminal margins project more perpendicularly from the parietal wall. The umbilical perforation is also larger, and the base of the shell is more smooth.

The following are the measurements of a large specimen:—

Diam. maj. 9, min. 8, alt. 4.

I am much inclined to consider this a distinct species, but remark upon it, as I believe it is more commonly found in cabinets under the name of *Dorfeuilliana*, than the shell described by Lea.

H. Dorfeuilliana, and also the shell last considered, have a tubercle within, very similar to that in *fatigiata* and *Troostiana*.

HELIX TROOSTIANA LEA.

PLATE XXXIX. FIGURE 2. PLATE LXXVIII. FIGURE 11.

Polygyra Troostiana LEA, l. c.

TROSCHER, Ar. f. Nat. 1839, iii. 222.

Helix Troostiana PFEIFFER, Mon. Hel. Viv. i. 419; iii. 267.

DESHAYES in Fer. i. 75, pl. 69 D. fig. 4. ?

CHEMNITZ, ed. 2, i. 376, pl. lxx. figs. 21–24.

REEVE, Con. Icon. No. 706, (1852).

BLAND, N. Y. Lyc. vi. 288; Notes, 12, pl. ix. figs. 21–23.

Helix fatigiata BINNEY in B. Journ. l. c.; in Terr. Moll., ex parte, ii. 193, pl. xxxix. fig. 2.

Helix plicata SHUTTLEWORTH, Diag. n. Moll. p. 18, (1852).

W. G. BINNEY, Notes, 11.

A more careful examination of Lea's specimen has convinced me of its specific distinction from *plicata*. On pl. 18, fig. 11, is a fac-simile of Lea's figure, and his description follows.

T. supernè subplanatâ, infernè subinflatâ, corneâ, longitudinaliter striatâ, late umbilicatâ; anfr. 6; aperturâ lunatâ, tridentata.

Shell above nearly flat, below somewhat inflated, horn color; longitudinally striate, widely umbilicate; whorls 6; aperture lunate, three-toothed.

Habitat. Tennessee. Prof. Troost.

Diam. .4, length .2 of an inch.

Remarks. This species strongly resembles *P. Dorfeuilliana*, herein described, being nearly of the same size, and possessing most of its characters. It differs, however, in the large solid tooth on the left lip being more angular, and in the two teeth on the right lip being somewhat differently placed. In the striæ it differs much, these being larger, much better defined, and passing over the whorls. In the umbilicus it is wider, and shows more of the two whorls. This shell forms the fourth of a group, the form of the apertures of which is exceedingly alike, viz. *P. fatigiata* Say, *P. plicata* Say, and *P. Dorfeuilliana* Nob.

As appears in the synonymy, this species has been much more fortunate than its allies, having been correctly determined by most writers. Shuttleworth, however, erroneously refers it to *plicata*.

Bland thus remarks on it:—

Mr. Lea has kindly allowed me to examine his original specimen, which differs from mine only in having the parietal tooth somewhat more emarginate.

H. Troostiana is very closely allied to *H. fatigiata* Say, from which I separate it with some hesitation. In its fresh state it has a thin, sparingly hirsute epidermis. I have moreover two specimens in my cabinet, (both hirsute,) which are as acutely carinated as *fatigiata*, with the striæ as prominent below as above, — (in one more numerous,) but both having the parietal tooth of *Troostiana*.

I am not altogether satisfied with the validity of Shuttleworth's remark, that the superior tooth in *fatigiata* is larger and more conspicuous than in *Troostiana*.

This species has the same tubercle within the last whorl as *H. fatigiata*.

HELIX CEREOLUS MÜHLFELDT, vol. ii. p. 196, pl. xxxviii. pl. lxxvii. fig. 23.

Helix cereolus MÜHLFELDT, Berlin Mag. viii. (1816,) p. 41, pl. ii. fig. 18.

CHEMNITZ, ed. 2, i. 378 (1846), pl. lxvi. figs. 1-3, (1849).

PFEIFFER, l. c. iii. 262.

REEVE, Con. Icon. No. 698.

Helix planorbula CHENU, Illustr. pl. xii. fig. 3.

Polygyra septemvolva SAY, (Binney's ed.) p. 11.

Mühlfeldt's description was published in 1816, and not in 1818 as quoted by Pfeiffer and others. This gives to his name the priority over Say's. His figure is copied on pl. 77, fig. 23; his description is as follows:—

Testa orbiculari, umbilicata, utrinque planata, alba, oblique subcostata, marginata, unidentata.

Die scheibenrunde genahelte, beiderseits flache, weisse, zart schief geribbte Schale, hat eine gesäumte, einzahnige Mündung.

Die im Durchmesser $4\frac{1}{2}$ Linien, in der Höhe aber, kaum mehr als 1 Linie haltende, matt weisse, zarte, aus achte Windungen bestehende Schnecke, ist beiderseits flach, doch hebet sich auf der oberen Seite, die deutlich schief geribbt ist, der Wirbel etwas empor, wodurch der Nabel der unteren Fläche, die nur zart schief gestreift erscheint, um so tiefer wird. Die erste Windung ist auf ihrem Oberrande etwas gekielt, die Mündung rund herum gesäumt, und da, wo die innere Lippe umgeschlagen, und dem Bauch der ersten Windung angewachsen ist, mit einem aufstehenden weissen Zahne versehen, der jedoch unausgewachsenen Exemplaren fehlt.

Der Aufenthaltsort ist vermuthlich Westindien? weil bei einer von daher gekommenen Parthie von Conchylien, sich etliche Exemplare befunden haben.

An error of quoting *Helix polygyrata* Binney has crept into Pfeiffer, Reeve, &c. The shell was never designated by that name.

The two following species, possessed by Dr. Binney in large quantities, are confounded by him in the text. The true *cereolus* is the middle figure of the plate referred to. It admits, however, of considerable variety. The most prominent variation is that furnished with an elongated thread-like lamina winding along the wall of the inner whorl of the shell. It is usually visible through the outer

whorl, at a little distance behind the parietal tooth, (vol. iii. p. 32). This lamina does not, however, distinguish it from the allied species, *H. microdonta*. The variety is also characterized by a less expansive umbilicus. It occurs in vast numbers on the banks of Indian River, Florida.

I am indebted to Mr. O. M. Dorman for fresh specimens of the true *cereolus*, found by him near St. Augustine. I have not received the species from any state but Florida, though Pfeiffer gives Georgia also as its habitat.

Another variety is furnished with the alternating spots which distinguish *H. microdonta*.

HELIX MICRODONTA DESHAYES.

PLATE LXXVIII. FIGURE 23.

Testa discoidea, planulata, albo-grisea, flammulis obliquis fuscis sub-rubrescentibusve ornata; supernè spira depressissima, subtus profundè latèque in ambitu umbilicata, tenuissimè et regulariter striata; apertura obliqua, marginata, ovato-semilunari; labio dente obliquo minimo prædito. Diam. 10; alt. 4 mill. (Deshayes.)

SYNONYMS AND REFERENCES

Helix microdonta DESHAYES, in Fer. Hist. i. p. 6, pl. lxxii. fig. 13.

CHEMNITZ, ed. 2. i. 380 (1846), pl. lxxvi. figs. 10-12, (1849).

PFEIFFER, Mon. Hel. Viv. i. 409; iii. 262.

REEVE, Con. Icon No. 705 (1852); No. 1040 (1853), *unspotted var.*

Helix plana DUNKER, Phil. Icon. i. 3, p. 51, tab. iii. fig. 11.

This shell was known to Dr. Binney by the numerous specimens in his cabinet from Florida Keys. He did not, however, recognize it as distinct. It is readily known by the alternating blotches of white on the under surface of the whorls, its heavier shell, less numerous whorls, and the internal lamina described under *cereolus*. This lamina and the white blotches are almost universally present. Specimens are common in cabinets. I have it from Key Biscayne, and many other Florida keys. Pfeiffer quotes it from Bermuda and Texas, and Poey from Cuba. The figure is copied from that of Deshayes.

HELIX VOLVOXIS PARREYSS.

PLATE LXXVIII. FIGURE 17.

T. umbilicata, orbiculato-convexa, tenuis, rufo-cornea, pellucida, regulariter costulato-striata; spira brevissima, convexa; anf. 7 convexi, regulariter accrescentes, ultimus reliquis superne vix latior, angulatus, infra angulum inflatus, striatus, nitidus; umbilicus latus, regularis, anfractu ultimo latissimo reliquis regulariter decrescentibus; apertura majuscula, reniformis; perist. intus callosum, reflexum, marginibus callo brevi, triangulari dentiformi junctis. Diam. maj. 9, min. 8, alt. 4 mill. (Pfeiffer.)

SYNONYMS AND REFERENCES.

Helix volvoxis PARREYSS in Pfeiffer Symb. iii. p. 80; Mon. Hel. Viv. i. p. 409; iii. p. 262.

CHEMNITZ, ed. 2, i. 379 (1846), pl. lxvi. figs. 4-6, (1849).

REEVE, Con. Icon. No. 1237, (1854).

Polygyra septemvolva BECK? abs. desc. teste Pfr.

This species is readily distinguished by its smoother surface, its uniform color, and its regular under surface, exhibiting fewer volutions than any of the other forms. I have not detected any internal lamina. It is also the smallest of the group. I have it from St. Simon's Isle, Georgia, (Postell,) and Jacksonville, Fla. (Dorman.) It occurs in immense numbers. The outside figures on pl. 38, and the upper line of pl. 39, are probably drawn from varieties of this species.

HELIX HINDSI PFEIFFER. vol. iii. p. 17, pl. lxxviii. figs. 5, 6, 8.

Helix Hindsi PFEIFFER, l. c. iii, 265.

REEVE, Con. Icon. No. 712, (1852).

I have added to an enlarged view of the aperture on pl. 78, outlines of Pfeiffer's figures in Chemnitz.

HELIX LEPORINA GOULD. vol. ii. p. 199, pl. xl. a. fig. 1.

Helix leporina REEVE, Con. Icon. No. 722, (1852).

BLAND, N. Y. Lyc. vi. 348; Notes, 39.

Helix pustula β PFEIFFER, Mon. iii. 268.

This species reaches a much more northern limit than

would have been anticipated. It occurs in Illinois (Kennicott!) Indiana (Ingalls)—also at St. Simon's Isle, Ga. (Postell!) Savannah (Elliott!) and on the Catta-hoochee River, Ga. (Neisler!)

From letters received from Dr. Pfeiffer, he seems to have reversed his opinion regarding the identity of this species and *H. pustula*.

“Within and near the aperture, there is what may be called the ‘*fulcrum*,’ extending from the floor of the last to that of the penultimate whorl, and approaching in character to, but less strongly developed, than that in *H. monodon* Rack. The outer edge of this *fulcrum* is uneven, — in one of my specimens somewhat denticulated.” (Bland.)

HELIX PUSTULOIDES BLAND.

PLATE XXXIX. FIGURE 3.

This is the *pustula* of the Terrestrial Mollusks (vol. ii. p. 201) and not of Ferussac. Bland's description is given below from the N. Y. Ann. vi. 350, Notes, 40.

The species has been detected at Darien, Ga. (Dr. S. W. Wilson,) Columbus, Ga. (Neisler.)

T. late et perspective umbilicatâ, planorboideâ, tenuiusculâ, rufo-vel pallide-corneâ, minute striatulâ; epidermide tenui, pilosiusculâ; spirâ vix elevatâ; anfr. 4-4½, convexiusculis, lente accrescentibus, ultimo superne ad peripheriam obtuse angulato, ad aperturam gibboso-constricto, subito deflexo, basi deviante; suturâ valde impressâ; umbilico lato, ½ diam. maj. æquante, omnes anfractus monstrante, præsertim penultimum; aperturâ obliquâ, lunato-circulari; dente erecto, obliquo, albo, lamelli-formi, in pariete aperturali munito, callo lineari subarcuato superne ad angulum aperturæ juncto; perist. reflexo, roseo, marginibus conniventibus, dentibus duobus sinu disjunctis instructo.

H. pustuloides is intermediate in size between *H. pustula* and *H. leporina*, — is less globose than the former, and more sparingly hirsute. It differs widely from both in the character of the umbilicus,

— the aperture is much like that of *pustula*, but more narrow than that of *leporina*. The inferior tooth on the peristome is more developed laterally than in *H. pustula*, — indeed it has a somewhat bifid appearance, in which respect it is more allied to *H. leporina*.

The *fulcrum* in *H. pustuloides* is of the same nature as that in *H. leporina*, but less developed, and with the outer edge entire.

As to the *station* of the species, I copy the following from one of his (Dr. Wilson's) interesting letters: —

“The place has an eastern exposure to the sea, high tides rising to the base of the low bluff where they exist. The growth of trees, which consists mostly of live oak and *Celtis occidentalis*, has never been cleared off; the *Palmetto serrulata* flourishes as an undergrowth. The soil is covered for a few inches in depth with oyster-shells thrown there by the Indians, and decayed leaves and fragments of branches are of course over all these, under which, and among the superficial oyster-shells, the *Helices* live. *H. pustula* is nowhere near, or at least a rigid search did not reveal any. *H. concava* (dead) occurs in small numbers. *H. inflecta* abundantly.”

HELIX PUSTULA FERUSSAC. . . . vol. ii. p. 201 (ex parte), pl. lxxvii fig. 12.

T. orbiculato-depressâ, tenue striatâ, anguste umbilicatâ; umbilico obtuso; rufâ vel pallide corneâ; anfr. angustis, convexiusculis, suturâ depressâ conjunctis, ultimo basi convexiore prope aperturam deflexo, coarctato; aperturâ angustâ, arcuatâ, obliquâ, albâ; marginibus reflexis, basi dente mediocri, linguiformi, conjunctis; labro bidentato, dentibus approximatis inæqualibus. (Deshayes.)

SYNONYMS AND REFERENCES.

Helix pustula DESHAYES in Fer. i. 78.

PFEIFFER, iii. 268, (excl. β).

CHEMNITZ, i. 376, (1846).

REEVE, Con. Icon. No. 721, (1852).

BLAND, N. Y. Lyc. vi. 346; Notes, 36.

I have given a fac-simile of Ferussac's figure of this species, there being no correct one in the Mollusks. As already observed, the *pustula* of Binney is not Ferussac's; it is *pustuloides* Bland. It is readily distinguished by its

more contracted umbilicus, as well as the following characteristics noticed by Bland.

The groove within the umbilicus is a very marked feature in Ferussac's species, and though not referred to in the description, is distinctly shown in one of his figures; it is entirely wanting in *H. leporina*, and also in *pustuloides*. This groove is not only an external character, but its presence modifies the internal structure of the shell. On opening the base of the last whorl immediately behind the aperture, a strongly developed transverse tubercle is seen within, from which a strong ridge-like lamella runs round the umbilical opening, corresponding in extent with the groove. This tubercle, and the extension of it, are entirely disconnected by a sinus or channel from the floor of the penult whorl.

The hirsute character of this species is not alluded to by any author. The outer edge of the peristome in specimens from St. Augustine, is of a deep rose color.

The true *pustula* has been found at various localities in Georgia, at St. Augustine, Fla. (Dorman), and in Texas, (Moore, Roemer.)

HELIX LABYRINTHICA SAY.....vol. ii. p. 202, pl. xvii. fig. 3.

Helix labyrinthica SAY, (Binney's ed.) p. 10.

CHEMNITZ, l. c. i. 382, (1846).

PFEIFFER, l. c. iii. 262.

REEVE, Con. Icon. No. 728, (1852).

DEKAY, N. Y. Moll. 39, pl. iii. fig. 31.

DESHAYES, in Fer. i. 210.

I have specimens of *H. labyrinthica* from the Northwest, Canada, Florida, and Texas. Its range is probably not surpassed by that of any other species.

Lea is erroneously given as authority for the specific name in Adams's Genera of Recent Mollusca.

HELIX LIGERA SAY.....vol. ii. p. 204, pl. xxxv.

Helix ligera SAY, (Binney's ed.) p. 19.

DEKAY, N. Y. Moll. p. 40, excl. fig.

CHEMNITZ, i. 208, (1846).

PFEIFFER, iii. 49.

DESHAYES in Fer. i. 184.

REEVE, Con. Icon. No. 493, (1852).

Helix Rafinesquea PFEIFFER, Symb. i. 39, (1841).

Helix Wardiana TROSCHEL, Ar. f. Nat. 1839, ii. 221.

DEKAY, N. Y. Moll. p. 46.

Helix Rafinesquea Ferussac may be *H. gularis*, as it is included among the group of that species in the Tableaux Systematiques. Deshayes, however, in the continuation of the Histoire refers it to *ligera*, as does Pfeiffer in his later works.

DeKay's figure is too little characteristic to be referred with certainty to any species.

H. Wardiana is universally acknowledged as a variety of this species.

Found also in Pennsylvania (Conrad!) and Kentucky (Kennicott!)

HELIX INTERTEXTA BINNEY.....vol. ii. p. 206, pl. xxxvi.

Helix intertexta DEKAY, N. Y. Moll. p. 38, pl. iii. fig. 29.

CHEMNITZ, i. 208, (1846).

PFEIFFER, l. c. iii. 49.

REEVE, Con. Icon. No. 668, (1852).

There is a strongly carinated, depressed form, occurring at the South, which forms a prominent variety.

The specimen figured is unusually large.

It is also found in Indiana, New York, Virginia, Kentucky, Tennessee, and Georgia. It also occurs fossil in the Postpleiocene of the West.

HELIX SOLITARIA SAY.....vol. ii. p. 208, pl. xxiv.

Helix solitaria SAY, (Binney's ed.) p. 19.

DEKAY, N. Y. Moll. p. 43, pl. iii. fig. 41.

CHEMNITZ, i. 180, (1846).

PFEIFFER, iii. 98.

REEVE, Con. Icon. No. 662, (1852).

The smaller variety mentioned in my Notes, p. 27, may,

perhaps, be referred to the following species. It was found at Fort Bridger.

Say's type is still preserved in the Academy at Philadelphia.

The species occurs in the Postpleiocene. It is doubtful whether it will ever be found in New York as DeKay anticipates.

HELIX COOPERI.

PLATE LXXVII. FIGURE 11.

Testa umbilicata; elevato-globosa: solida; striis obliquis incrementi et lineis spiralibus leviter intercidentibus notata; alba, ad peripheriam fasciâ unicâ, angustâ, rufâ, cincta, aut fasciis et lineis rufis, volventibus, variè dispositis, ornata; sutura impressa; spira elevata; anfr. 5 convexi, ultimus rotundatus, ad aperturam valde descendens; umbilicus mediocris, pervius, 1-5 diam. maj. testæ æquans; apertura perobliqua, circularis; perist. simplex, incrassatum, ad umbilicum reflexiusculum, marginibus valde approximatis, callo albo, crasso, conjunctis.

SYNONYMS AND REFERENCES.

Helix Cooperi W. G. BINNEY, Proc. Acad. Nat. Sc. Phila. 1858, p. 118; Notes, p. 16.

DESCRIPTION.

Animal not observed.

Shell umbilicated; elevated, globose; solid, with oblique incremental striæ intersected with delicate spiral lines; color white, variously marked with a single narrow band, or broader longitudinal and spiral patches of reddish-brown; suture impressed; spire elevated; whorls five, convex, the last rounded, very decidedly deflected at the aperture; umbilicus moderate, pervious, 1-5th the greater diameter of the shell; aperture very oblique, circular; perist. simple, thickened, reflected at the umbilicus, with its extremities very nearly approached, and joined by a heavy white callus.

Greater diameter, 15; lesser, 13; height, 9 millimetres.

Geographical Distribution. Found by Dr. F. V. Hayden

(Yellowstone Riv. Ex. Ex.) in considerable quantities among the Black Hills of Nebraska Territory.

Remarks. The shells collected were weather-worn, but sufficiently fresh to show considerable variety in the disposition of the bands and revolving patches of coloring.

Resembles nearly no described American species. Has an elevated spire like *H. Pennsylvanica* Green, and somewhat approaches *H. solitaria* Say. It is, however, very much smaller, has rougher striæ and revolving lines; the umbilicus is different, as is also the circular aperture, with nearly approaching ends like *H. vittata* Mull., of Ceylon. There is a curious variety of *H. solitaria* Say, found by Lieut. Bryan at Bridger's Pass, which may be compared with this in size; but the only specimen I have examined has no revolving lines, and wants the characteristic aperture. Some specimens of this species have a more flattened spire.

Named in honor of Dr. J. G. Cooper, of P. R. R. Survey.

HELIX ALTERNATA SAY.....vol. ii. p. 212, pl. xxv.

Helix alternata SAY, (Binney's ed.) pp. 6, 21, pl. 69, fig. 2.

DEKAY, N. Y. Moll. l. c. non *scabra*.

PFEIFFER, iii. 98.

DESHAYES, in Fer. i. 89.

CHEMNITZ, i. 181.

REEVE, Con. Icon. No. 670, (1852).

BILLINGS, 1857, Canad. Nat. 2, 99, figs. 4, 5.

Helix scabra CHENU, Illust. tab. vi. fig. 11.

Helix infecta PFEIFFER, Mal. Bl. 1857, p. 86 — non REEVE.

Helix strongylodes? PFEIFFER, Proc. Zool. Soc. 1854, p. 53.

REEVE, Con. Icon. No. 1296, (1854).

I have specimens of this species collected from Canada to Texas, and most of the intervening States. I do not know of its existence in Florida. It is found plentifully in the Postpleiocene of Natchez Bluff, still retaining its color.

Helix mordax Shuttleworth will, I think, prove a variety of this species. *H. strongylodes* is also a variety, to judge from the figure I have given, (pl. 77, fig. 8,) drawn by Mr.

Sowerby from the type in the Cumingian collection. In regard to *H. infecta*, I cannot find specific characters in the specimen kindly sent me by Dr. Pfeiffer. The original descriptions of these two forms now follow:—

HELIX INFECTA. T. umbilicata, conoideo-depressa, tenuiter costulato-striata, coruco-albida, rufo obsolete fasciata et radiata; spira conoidea, vertice subtili; anfr. 6 convexiusculi, lente accrescentes, ultimus antice non descendens, periphæria obsolete angulatus; umbilicus conicus, $\frac{2}{7}$ diametri subæquans; apertura diagonalis, lunato rotundata; perist. simplex, rectum, marginibus convergentibus, columellari subpatulo. Diam. maj. 17; min. 15; alt. 9 mill. Hab. in Canada teste Parreyss.

H. STRONGYLODES. H. t. umbilicata, convexo-depressa, solidula, oblique costulata, albida, maculis rufis superne variegata; spira parum elevata, obtusa; anfr. 6, sensim accrescentibus, primis isculis planu, sequentibus convexis, ad suturam tumidis, ultimo non descendente, terete; umb. perspectivus, $\frac{1}{2}$ diametri æquante; apertura diagonali, lunato-rotundata; perist. simplice, recto, — marginibus subconvergentibus, columellari superne fornicatim patente. Diam. maj. 19; min. $16\frac{1}{2}$; alt. $8\frac{1}{2}$ mill. Hab. Texas.

HELIX MORDAX SHUTTLEWORTH.....vol. iii. p. 19.

Helix mordax PFEIFFER, Mon. Hel. Viv. iii. 635.

I have already expressed my belief that this is a mere variety of *alternata*. Pfeiffer (l. c.) merely repeats the original description, not having seen the shell.

HELIX CUMBERLANDIANA LEA.....vol. ii. p. 216, pl. xxxi.

Carocolla Cumberlandiana TROSCHEL, Ar. f. Nat. 1843, ii. 124.

Helix Cumberlandiana PFEIFFER, iii. 114.

REEVE, Con. Icon. No. 701, (1852).

HELIX STRIATELLA ANTHONY.....vol. ii. p. 217, pl. xxx. fig. 2.

Helix striatella CHEMNITZ, ii. 115.

PFEIFFER, iii. 100.

REEVE, Con. Icon. No. 727, (1853).

Helix rudervata ADAMS in Sill. Journ. 40, p. 408.

Pfeiffer refers to this species the figure of Ferussac (t. 79, fig. 7) referred to *perspectiva* by Binney.

The species has been found also in Kansas, Wisconsin, and the District of Columbia.

HELIX LIMATULA BINNEY.....vol. ii. p. 219, pl. xxx. fig. 2.

Has also been detected in Michigan.

HELIX MINUTISSIMA LEA.

PLATE LXXVII. FIGURES 6, 7.

SYNONYMS AND REFERENCES.

- Helix minutissima* LEA, TRANS. ditto, vol. ix. p. 17.
 TROSCHER, Ar. f. Nat. 1843, ii. 124.
 PFEIFFER, Mon. Hel. Viv. i. 87; iii. 83.
Helix minuscula teste BINNEY, vol. ii. p. 221.
 ANTHONY, Ohio Cat. Jan. 1843.

There is every reason for reversing the decision of the identity of this and *minuscula*, expressed by Binney and Anthony. Lea's original specimen is figured in the plate from a drawing by Dr. Leidy. I give Lea's description below. The shell is readily distinguished from *minuscula* by its smaller size, less expanded umbilicus, minute striæ, and its greater resemblance in outline to *H. chersina*. Lea's specimen came from Ohio. It has been sent me from Greenwich, N. Y., by Dr. Ingalls.

Though considered in the Terrestrial Mollusks as a variety only of *minuscula*, I find a note taken by my father at Mr. Lea's collection, in which he says it is *not* the same.

This is our smallest shell, being one-fourth less in diam. than *H. exigua* St. The umbilicus is wide, and shows some of the interior volutions — though not so expanded as *H. minuscula* or *exigua*. The apex is distinctly and readily seen in the two last, and the suture is very much more impressed. *H. minutissima* has delicate striæ, but no ribs. The spire is variable in height.

HELIX MINUTISSIMA Lea. T. subglobosâ, supra obtuso-conoideâ, subtus convexa, fusco-cornea, minutissimè striata, umbilicatâ; suturis impressis; anfr. 4, rotundatis; apertura subrotundata, lab. acuto. Cincinnati.

Diam. .06, length, .04. It is the smallest species of our country which has come under my notice. Its very minute longitudinal striæ can only

be observed by a powerful lens. The umbilicus is rather large and deep. It is nearly the form of *H. labyrinthica* Say, but is a smaller species, is differently striated, and has no teeth. Found on wet sticks on the margin of a pond.

HELIX MILIUM MORSE.

The shell figured on plate 79, figs. 4 and 5, from a drawing of Mr. E. S. Morse, was sent me from Portland by that gentleman under this name. To publish it here would be anticipating his own description.

Since writing the above the description of this species has been published. It is given below, although it appeared after January 1st, 1859, the date to which the subject is brought down.

It is taken from the Proc. of Boston Soc. Nat. Hist. vii. p. 28, April, 1859.

Shell minute, transparent, shining; epidermis white, with a greenish tinge; distinctly and regularly striated above; whorls rounded, rapidly enlarging; suture very deeply impressed; spire slightly elevated; microscopic lines running parallel with the whorls, more conspicuous beneath; umbilicus quite large, deep, and showing all the volutions; outer lip sharp. Diam. 0.05; height, 0.02.

Distribution. Portland, Me.; Augusta, Me.; Bethel, Me.; Saco, Me.; Westbrook, Me.

Observations. The rapidly enlarging whorls remind one at first sight of the young of *H. indentata* Say. The under side resembles slightly the young of *H. minuscula* Binney. It is about the size of *H. minutissima* Lea.

The peculiarities of the shell are its diminutive size, its rapidly enlarging and well rounded whorls, its deep and regular striations, which become obscure at the apex, and the microscopic lines running parallel with the whorls.

This little shell I first found at Mt. Independence, Westbrook, Me., August 16, 1857, in company with *Pupa exigua* Say, and the smaller *Helices*.

Found generally on low lands, where they seemed to be sur-

rounded with water, though it has been found on high lands where the ground was comparatively dry. Mr. Charles B. Fuller, of Portland, found them quite numerous in a grove of pines, an unusual place for *Helices* to be found in.

HELIX EXIGUA STIMPSON.....vol. iii. p. 16, pl. lxxvii. fig. 19.

Helix exigua PFEIFFER, Mon. Hel. Viv. iii. 102.

Helix annulata CASE in Sill. Journ. May, 1847, vol. iii. p. 101; Ann. and Mag. Nat. Hist. 1847, p. 338.

PFEIFFER, l. c.

Helix striatella junior, GOULD, Sill. Journ. l. c. 276.

I also have specimens of this shell from Canada.

As suggested by Stimpson, (Shells of N. E. p. 55,) *H. exigua* is identical with *annulata* Case, which name, being preoccupied, will not stand. Gould, l. c., declares *annulata* to be the young of *striatella*, — an opinion he seems to have withdrawn by including Stimpson's description in vol. iii. He was at first rather inclined to refer the species to *costata* (vid. note to Case's description, l. c.)

I have given a fac-simile of one of Case's figures, which are characteristic, though rough. His description is given below. Pfeiffer copies both descriptions, not having seen either of the shells.

Shell minute, much depressed; umbilicus showing all the volutions; aperture simple and somewhat oval; whorls four, banded by sharp parallel ribs, inclining slightly forward; intercostal space marked with waved lines, running parallel with the whorls; nearly transparent; diam. about one line.

This minute but beautiful shell was found by Dr. B. A. Stanard, in the region about Lake Superior, and I have heard of its being observed in other places, but so far as I can learn it is undescribed. It differs from any description of the *pulchella* I have yet met with, in having uniformly an oval aperture and simple lip. The *minuta* of Say I believe never has the parallel ribs, and is supplied with a lip.

HELIX MINUSCULA BINNEY.....vol. ii. p. 221, pl. xvii. a. fig. 2.

Helix minuscula PFEIFFER, iii. 90.

CHEMNTZ, ii. 112.

REEVE, Con. Icon. No. 731, (1852).

Helix minutalis MORELET nec. Fer. Test. Nov. ii. p. 7.

Helix apex ADAMS, CONTR. CONCH. p. 36.

REEVE, l. c. 339.

Helix Lavelleana Orb. Moll. Cub. in textu, p. 161, excl. tab. (1853).

Helix Mauriniana Orb. l. c. in tab. viii. figs. 20-22, excl. textu.

Has been detected also in Michigan, Georgia, New York, and in Washington Co. Texas (Moore). Is also found in Cuba, Porto Rico, and Jamaica.

In Mal. Blatt. ii. 93, Pfeiffer states that *H. Lavelleana* is represented in the British Museum by poor specimens of *minuscula*. I follow the same author in placing *minutalis* and *apex* in the synonymy.

They are thus described.

Helix apex. Shell discoidal; whitish; with microscopic spiral striæ; spire scarcely elevated, convex; apex very obtuse; whorls 4, cylindrical, with a deep suture; aperture nearly circular; lip thin and sharp; umbilicus very wide.

Helix minutalis. T. perspective umbilicata, subdiscoidea, minute striatula, corneo-albicans; anfr. 4 convexiusculi, sutura impressa distincti; apertura vix obliqua, subcircularis; peristoma simplex, marginibus approximatis.

Hab. circa pagum Palizada provinciae Yucatenensis, necnon in insula Cubana.

HELIX ASTERISCUS MORSE.

PLATE LXXVII. FIGURE 9.

SYNONYMS AND REFERENCES.

Helix asteriscus MORSE, Proc. Bost. Soc. Nat. Hist., vi. p. 128, March, 1857.

Animal short, bluish.

Shell small, orbicular, very much depressed; whorls four, rounded above and below; banded by twenty-five to thirty very thin, transparent, and prominent ribs, very oblique, inclined backward; spire not rising above the last whorl; suture deeply impressed; umbilicus moderately large, showing all the volutions; finely striated between the ribs; in some specimens parallel lines may be observed. Color light brown.

Dimensions: breadth, $\frac{1}{16}$ in.; height, $\frac{1}{32}$ in.

Found at Bethel, Me., in company with *Pupa pentodon* and *Pupa exigua*, September 28, 1856.

Observations. This shell differs from *H. annulata* Case, in being smaller, the umbilicus not so large, spire not elevated, intercostal space not marked with parallel lines, but finely striated; the color is also different.

Its peculiar thin, transparent ribs, depressed spire, and deep umbilicus, are prominent features that can never confound it with other species.

The above is Morse's description from the Proceedings of the Boston Society of Natural History, March, 1857, vol. vi. p. 128.

The figure is very much enlarged from a specimen kindly sent me by the discoverer. The species is very distinct, and cannot readily be confounded with any other now known to inhabit America. Another character which easily distinguishes it from the nearest allied species, *H. exigua*, is this: the ribs are much less numerous and seem formed by a continuation or lapping over of the epidermis at every period of repose from growth of the shell.

It is difficult to imagine on what grounds Gould could have based the opinion copied below from the Boston Proc. vi. 72.

This species, the most minute of any yet observed, was found by Mr. Morse in the vicinity of Portland, and has been collected also at several localities in Massachusetts. Dr. Gould considered it to be the species described by Mr. Lea, under the name of *Helix minutissima*. It was regarded by Dr. Binney as the young of *H. minuscula*, but Dr. Gould believed it to be a distinct species.

HELIX KOPNODES.

PLATE LXXX. FIGURE 14.

Testa depresso-globosa, corrugata, subtus lævigata; spira brevis, depressa; sutura mediocris; anfr. quinque, rapidè accrescentes, ultimus permagnus, ventricosus, interdum lineis volventibus crassis notata; apertura magna, rotundata; perist. simplex, acutum, marginibus approximatis,

callo levi, brunneo conjunctis, ad umbilicum parvum et profundum reflexiusculum.

SYNONYMS AND REFERENCES.

Helix kopnodes W. G. BINNEY, Proc. Acad. Nat. Sc. Phila. 1857, p. 186; Notes, 6.

DESCRIPTION.

Animal not observed.

Shell depressed globose, wrinkled, below smooth; spire short, depressed; suture moderate; whorls five, rapidly increasing, the last very ventricose and large, sometimes marked with coarse revolving lines; aperture large, round, lip simple, acute, ends approached, joined by a slight depression of brownish callus over the parietal wall, reflected at the small and deep umbilicus.

Greater diameter, 35; lesser, 28; height, 13 millimetres.

Geographical Distribution. Found in Alabama in considerable quantity by C. S. Hale, Esq., and Dr. E. R. Showalter.

Remarks. I was at first inclined to consider it an unnaturally developed form of *fuliginosa*, but have since been convinced of its being distinct by large suites of various stages of growth. The color is lighter, the shell larger, heavier, less globose; the umbilicus is narrower; the aperture larger, and less rounded; the spire less elevated. The heavy, interrupted revolving lines are present in four out of six specimens before me.

Reeve's figure 672 has some resemblance to it in shape, though less globose, and described as striate.

HELIX FULIGINOSA BINNEY.....vol. ii. p. 222, pl. xxxi.

Helix fuliginosa CHEMNITZ, ii. 104.

PFEIFFER, iii. 83.

REEVE, Con. Icon. No. 675, (1852). ?

This can hardly be the species designated by Ferussac as *H. lævigata*. His figure and the opinion of Deshayes,

in his continuation of the *Histoire*, are both opposed to this theory. Rafinesque, it must be remembered, is responsible for the application of the name *lævigata* to a striated shell. He makes, however, greater errors than this.

If Rafinesque notices *fuliginosa* at all, it is in the *Enumeration*, &c. &c. p. 3.

Omphalina—Differs from *Helix* by no lips, but an ombalic.

O. cuprea. Suboval, four spires, smooth, brittle, diaphanous coppery, shining, opening very large. In Kentucky.

Griffith writes to Binney that *lucubrata* is the same as *fuliginosa*. Adams, l. c., gives the same opinion, as does also Anthony in his *Ohio Catalogue*. Notwithstanding the opinion of these authors, I am inclined to believe that neither *lucubrata* nor *lævigata* have any connection with *fuliginosa*. From letters of Say, in the possession of Mr. Bland, it appears he was unacquainted with *fuliginosa*. As regards *lucubrata* it is a Mexican species. If known to us at all, it is by Pfeiffer's redescription of it under the name of *caduca*. Specimens of this last agree perfectly with Mexican specimens of *lucubrata* preserved for many years in the Philadelphia Academy. It is, however, at present impossible to decide whether *lucubrata* has been met with since Say found it in Mexico, (see Binney's ed. p. 36).

HELIX FRIABILIS.

PLATE LXXX. FIGURE 2.

Testa globosa, papyracea, friabilis, subdiaphana, nitens, rufescens; spira parvula, elevato-conica; anfr. quatuor, læviter corrugati, convexi, ultimus permagnus, ventricosissimus; sutura mediocris; apertura circularis, parum alta et longa, intus livida, callo levi, albo sub-incrassata; perist. acutum, tenue, simplex, ad basin reflexiusculum, violaceum, umbilicum parvum et profundum aliquantum tegens.

SYNONYMS AND REFERENCES.

Helix friabilis W. G. BINNEY, Proc. Acad. Nat. Sc. Phila. 1857, p. 187; Notes, p. 7.

DESCRIPTION.

Animal not observed.

Shell very globose, transparent, brittle, thin, shining, reddish; spire very short, conic; whorls four, convex, lightly wrinkled, rapidly increasing, the last very large and ventricose; suture moderate; aperture circular, equally high and broad, within bluish and slightly thickened by a very thin white callus; perist. simple, sharp, thin, at its junction with the body whorl, violet-colored and reflected, so as to cover a portion of the small and deep umbilicus; the parietal wall of the aperture is covered with a light violet-colored callus.

Greater diameter, 26; lesser, 20; height, 13 millimetres.

Geographical Distribution. Found by Mrs. Say on the banks of the Wabash, Indiana, and in Illinois by Kennicott. Occurs also in Alabama (Showalter), and Texas, (Moore).

Remarks. Belongs to the same group as *H. fuliginosa* Binney — but readily distinguished from that and all described species by its transparent, globular shell, ventricose body whorl, and circular aperture. At the localities where it was found it seems to take the place of *H. fuliginosa*, as that species does not occur with it.

The specimen figured was found by Mrs. Say, as stated above. From Texas the specimens are much heavier.

HELIX CADUCA PFEIFFER.

This species was originally described from Mexico, but is catalogued by Röemer (Texas, 455) as found at New Washington. The species is nearly allied, if not identical, with *lucubrata* Say, as already observed in the remarks on *H. fuliginosa*. Pfeiffer's description is given below.

T. umbilicata, depressa, fragilis, breviter striatula, albida, epiderme fulvo-corneâ induta; spira parum elevata, vertice subtili; anfr. 5½ convexiusculi, ultimus multo latior, basi subplanulatus, circa umbilicum

latum angustum, externe subinfundibuliformem excavatus; apertura majuscula, oblique truncato-ovalis; perist. simplex, tenue, marginibus subconniventibus, callo tenuissimo junctis, columellari vix expansiusculo. Diam. maj. 27, min. 22, alt. 14 mill.

HELIX LÆVIGATA PFEIFFER. vol. ii. p. 225, pl. xxxii.

Helix lævigata PFEIFFER, Mon. Hel. Viv. i. 64; iii. 67, (excl. syn.)
CHEMNITZ, ed. 2, ii. 106, pl. 84, figs. 17-19, (excl. syn.)
REEVE, Con. Icon. No. 672, (1852). ?
DESHAYES in Fer. i. 94.

Helix lucubrata BINNEY, l. c. nec. SAY.

Helix fuliginosa BINNEY in B. J. (pars., excl. desc., syn., et fig.)

Helix inornata REEVE, l. c. 666.

I have given the synonymy of this species in full to show under how many names it has appeared. It appears to have been sent to Ferussac by Rafinesque under the name it bears, though no description of it by that author is extant. Ferussac mentions it by name only in his Tableaux (1821), with no reference, however, to the figure which afterwards appeared (1832) in the Histoire. In 1840, Binney evidently refers to it in the Boston Journal as a striated variety of *fuliginosa* and quotes Ferussac's figure. He also suggests its identity with *lucubrata*. In 1848 the first description of the shell was published by Pfeiffer, whom I have given as the authority for the specific name. In continuing Ferussac's great work, Deshayes also describes the shell, as does also Pfeiffer in the second edition of Chemnitz. It was therefore well established and universally known by the name of *lævigata* when the Terrestrial Mollusks appeared. The name proposed by Binney would not, therefore, have precedence over Pfeiffer's, even had it been an entirely new name. Binney, however, commits the error of applying to this species Say's name of *lucubrata*, though there is no evidence of Say's ever having seen the species. On the other hand, in Mr. Poulson's collection are specimens of *lævigata* labelled by Say "Helix ——— Claiborne, Ala."

The label written during the last few years of Say's life shows conclusively his ignorance of the species.

Pfeiffer, Deshayes, Chemnitz, and Reeve have confounded *H. inornata* with this species, even quoting in some instances Binney's figure of *inornata* in the Boston Journal, which represents an entirely smooth shell. Pfeiffer also quotes *H. rufa* DeKay as a synonym of *lævigata*. It seems rather to be the young of some other species.

Reeve figured *lævigata* under the name of *inornata*, describing it as striate in the text.

Much confusion regarding the species of this group has existed also among American collectors, who have depended for the names of their shells on their friends rather than on descriptions.

The species under consideration is at once distinguished from all the others of the group by the fact of its being the only one furnished with striæ on the upper surface.

It has also been found in Illinois, Indiana, Kentucky, Arkansas, North Carolina, and Florida.

Pfeiffer mentions a large variety from Florida. Reeve's fig. 672 may perhaps represent it.

For the views of Bland see the remarks on the following species.

HELIX INORNATA SAY.....vol. ii. p. 227, pl. xxxiv.

Helix inornata SAY (Binney's ed.) p. 24.

Helix glaphyra ? PFEIFFER, Symb. ii. 29, (excl. *H. fuliginosa*); Mon. i. 57; nec.
REEVE, BLAND.

This species has been described and figured in America for many years, and is now well understood in American collections. During the last year it has been referred to *lævigata* by Bland, (N. Y. Lyc. vi. 352). In the remarks under *cellaria* his views will be given.

Pfeiffer gives Say's description, not having seen any authentic specimen. The shell described by him as *glaph-*

gra is evidently *inornata*. From his letters, it appears he will follow Binney's decision regarding *inornata* in the fourth volume of his Monograph.

Reeve figures and describes *inornata* under the name of *glaphyra*, misquoting Gould's opinion about the introduction of quite another shell. His *inornata* is the true *lævigata*.

Lewis (Bost. Proc. vi. 3) catalogues *inornata* under the name of *lucubrata*. My opinion is formed from an inspection of his specimen.

The species has also been found in the mountains of Virginia.

An anonymous writer (Sill. Journ. 31, p. 36,) suggests that *fuliginosa*, *glaphyra*, and *inornata* are but different stages of growth of the same shell.

HELIX SUBPLANA BINNEY.....vol. ii. p. 229, pl. xxxiii.

Found also in Pennsylvania. Pfeiffer suggests its identity with his *glaphyra*, (the true *inornata*). He had seen no specimen.

HELIX SCULPTILIS BLAND.

PLATE LXXVII. FIGURE 15.

T. obtecte perforatâ, suborbiculari, depressâ, subpellucidâ, pallide corneâ, nitenti, lineis transversis regularibus concinne impressâ; spirâ parum elevatâ, subconvexâ; anfr. 7, planulatis, ultimo rapide accrescente, prope aperturam $\frac{1}{2}$ diam. subæquanti; basi planulatâ, leviter excavatâ; suturâ parum impressâ; aperturâ subobliquâ, depressâ, transversâ, lunari; perist. simplici, acuto, sinuato, margine columellari rapide et anguste reflexâ, et perforationem minutam tegenti.

SYNONYMS AND REFERENCES.

Helix sculptilis BLAND, N. Y. Lyc. vi. p. 279; Notes, 3, pl. ix. figs. 11-13.

Shell scarcely perforate, suborbicular, depressed, subpellucid, pale horn-color above, of lighter shade beneath, shining, with regular, subequidistant, impressed transverse lines, those on the last

whorl extending over the periphery, and converging in the umbilical excavation; spire very little elevated, scarcely convex; whorls 7, planulate, the last rapidly increasing, equal at the aperture to $\frac{1}{3}$ the diam. of the shell, beneath flattened, and little excavated in the umbilical region; suture lightly impressed; aperture scarcely oblique, depressed, transverse, lunate; peristome simple, acute, sinuate, the columellar margin very rapidly and narrowly reflected over, and almost entirely covering the very small perforation.

Diam. maj. $12\frac{1}{2}$, min. 11, alt. 5 mill.

Habitat. "The Anantehely Mountains, which are a local spur of the Alleghany Mountains in North Carolina, just where that State touches Georgia and Tennessee." Bishop Elliott.

A single specimen of this very interesting species was found in the locality above mentioned, by Bishop Elliott, in whose cabinet I noticed it some months ago. In sculpture it is closely allied to *H. indentata* Say, of which it might almost be termed a gigantic variety, but the impressed striæ are more numerous, and closer together. The form of the aperture is very near that of *H. inornata* Binney.

The general aspect of this shell reminds one of the Asiatic group, to which *H. resplendens* Phil. and *H. vitrinoides* Desh. belong.

The above is Bland's description.

HELIX CELLARIA MÜLLER.....vol. ii. p. 230, pl. xxix. fig. 4.

Helix glaphyra SAY (Binney's ed.) p. 7, pl. 69, fig. 3.

BLAND, N. Y. Lyc. vi. p. 52; Notes, 52—nec PFEIFFER.

Helix cellaria DEKAY, l. c. (non cellaria.)

Found in Salem, Lynn, Marblehead, Providence, Connecticut, Portland.

Pfeiffer describes *inornata* under this name.

Helix glaphyra. There seems to me no doubt that Dr. Gould and my father are correct in considering this species to have been an accidentally introduced specimen of the European *Helix cellaria* Müll. See the Invert. of Mass. and Terrestrial Mollusks, as well as my Notes on American Land Shells, No. 2, Proc. A. N. S. Phila. That this

is one of those questions which it is quite impossible to settle to the satisfaction of all parties, is proved by the fact of my friend Mr. Thomas Bland having arrived at a different opinion from mine, though furnished with the same data. See Annals of N. Y. Lyceum of N. H. l. c. My decision is based on the following reasoning.

With the exception of the minute species, Mr. Say was acquainted with three shells only of this group, — *Helix lucubrata*, *inornata*, and *glaphyra*. The first mentioned was found in a distinct zoölogical province; consequently, the question lies between *inornata*, as determined by Dr. Binney, and the introduced *cellaria*. The figure given in Nicholson's Encyclopædia, rough as it is, can more readily be referred to *cellaria*. The resemblance to that shell also seems to have struck Mr. Say himself, since he speaks of it in his remarks under its synonym *H. nitens*, as he could hardly do of the larger, less broadly umbilicated *inornata* Binn. The peculiarity of its being "whitish beneath," on which Mr. Say lays particular stress, is more constant in *cellaria*. The description would apply equally to both, with the exception of "umbilicus moderate, not exhibiting the volutions." As regards this phrase, I must say that it seems to contain a contradiction; since any shell must show its volutions more or less in the umbilicus, if it is at all open. A minute perforation, as it is now called, would not show them; but all Say's perforated species are designated as having a "small" umbilicus. The term "moderate" is applied by Say to the umbilicus of *H. tridentata* in the same paper in which the description of *glaphyra* occurs, and subsequently he applies it to *H. septemvolva* alone. The only terms he uses for the umbilicus of his species is "small," "large" or "very large," and "moderate." After a very careful study of his descriptions, I am convinced he used the words "umbilicus moderate, not exhibiting the volutions," in a comparative sense, in con-

tradistinction to his usual term, "umbilicus large, exhibiting the volutions distinctly." Not only could Say have never applied the term "umbilicus moderate" to a perforated shell like *inornata* Binn., but his remarks under *H. ligera* would never apply to it. He says that shell is distinguished from *glaphyra* by having a smaller umbilicus, a condition fulfilled by *inornata* Binn., but evidently quite wanting in *cellaria*. The circumstance of the adoption of the name *glaphyra* by Western Conchologists can have but little weight, since they have not accompanied their lists with descriptions, and have not generally had access to Say's writings. Any one acquainted with the many singular errors abounding in the European treatment of American land shells, will not be surprised to find this species incorrectly determined abroad. Its synonymy now stands:—

Helix cellaria MÜLL. anno 1773, LAM. PFEIFFER, &c.

BINNEY, Boston Journ. iii. 421, Nov. 1840; Terrestrial Mollusks, ii. 230, 1851; iii. pl. xxix. f. 4, 1857.

GOULD, Invert. of Mass. 180, f. 104, 1841.

DEKAY, N. Y. Moll. 37, pl. iii. f. 25, 1843.

LINSLEY, Shells of Vt.; Silliman's J. 48, p. 280, 1845.

STIMPSON, Shells of N. E. 55, 1851, *absque descr.*

Helix glaphyra SAY, Nich. Enc. vol. iv. Am. ed. pl. i. f. 3, 1816-1819.

FERUSSAC, Tab. Syst. 45, 1822, *absque descr.*

non PFEIFFER, Symbolæ, i. 60, 1841; ii. 80, 1843; non Mon. Hel.

Viv. i. 57, 1848; iii. 63, 1853.

non REEVE, Con. Icon.

non DESHAYES, in Fer. pl. lxxxiv. f. 9, 10, teste Pfr.

Those persons who, like my friend Mr. Bland, do not assent to Dr. Binney's determination of *H. glaphyra*, but refer to it *inornata* Binn., are forced to find some shell on which to place Say's name of *inornata*. Mr. Bland would refer it to *lævigata* Pf. There is nothing in Say's description of *inornata* which directly opposes this construction, though it would be strange for Mr. Say to overlook the great peculiarity of *H. lævigata*, its striate upper surface and smooth base. But the habitat, Pennsylvania, which

he gives, would be incorrect of *lævigata*, as far as our present knowledge of geographical distribution will allow me to judge. It would be strange indeed if the thorough researches of so many Conchologists have never proved *lævigata* an inhabitant of that State, if it really exists there, while *inornata* Binn. is met with by every collector among the Alleghanies. Moreover, it must be remembered that it is utterly improbable, although within the bounds of possibility, that a shell confined strictly to damp retired localities in the woods, and found with great difficulty in its native localities, should have been transported fifty or one hundred miles, and picked up on a wharf in a city. Mr. Say speaks of its having been found by Mr. Ord in his garden in Philadelphia; but on making inquiries of that gentleman, I learn that a single empty shell was picked up by him on his wharf, far from any garden, but on the spot where he often found specimens of small foreign animals, accidentally imported in the Liverpool and London ships constantly disembarking their cargoes there. It is a well known fact that some European snails have been widely distributed by commerce. *Limax variegatus* F. is but too common in gardens and cellars of Philadelphia and other maritime cities. *Bulimus decollatus* Lin. (*B. mutilatus* Say) and *Helix aspersa* Müll. are still common in Charleston, S. C.; *Helix hortensis* Müll. has not yet lost its footing on the islands off the coast of the New England States; and this same *Helix cellaria* has been introduced and is still existing plentifully in Boston, New Bedford (J. H. Thomson), Marblehead (J. P. Haskell), Lynn (S. Tufts, Jr.), Halifax (Smithsonian Institute Coll.), Providence (J. G. Anthony, about 1830), Portland, Me. (E. S. Morse). It has never been found in the interior.

Every American author has coincided with my views of *glaphyra* and *inornata*; among them are Binney, Gould,

Adams, DeKay, Linsley, Stimpson. Some of the printed Western catalogues have quoted *glaphyra*, but this has arisen from the authors, in ignorance of the foreign origin of Say's shell, endeavoring to fix the name on some American shell. Abroad, Ferussac gives *glaphyra* by name alone in his *Tableaux Systematiques*, but had never seen the shell. In the continuation of the "Histoire," Deshayes considers *glaphyra* as the introduced *cellaria*, though Pfeiffer gives another name to the shell he figures.

On the other hand, Pfeiffer, in his *Symbolæ*, misconceives *glaphyra*, and also in his *Monographia*, but in a letter to me he says he now considers the shell described in the last-mentioned work as a variety of *inornata* Say. Reeve in *Con. Icon.* doubts Gould's opinion that *glaphyra* is an introduced species; he is right in considering his No. 667 a native American shell, because it is *inornata*, though wrong in applying Gould's opinion to it, as the shell is not mentioned in the *Invertebrata*.

There is also additional evidence of tradition in favor of my views, in the fact of Mr. J. G. Anthony taking to Philadelphia, about the year 1830, a specimen of *cellaria* found in Providence, R. I., and being told by the Conchologists of the former city that it was *glaphyra* Say. Dr. Griffith, also, in letters to my father, now in my possession, writes that the original specimen of *glaphyra* deposited by Say in the collection of the Academy was without doubt *cellaria*, and that it was subsequently broken and thrown aside. This fact destroys the value of a specimen of a young *inornata* labelled by Mr. Phillips as Say's original specimen of *glaphyra*; moreover, Mr. Phillips tells me that he labelled that shell from conjecture.

HELIX BULBINA DESHAYES.

PLATE LXXIX. FIGURE 10.

T. orbiculato-discoidea, latè umbilicata, tenuis, fragilis, corneo-flava,

pellucida, tenuissime punctulata; spira depressa; anfr. $5\frac{1}{2}$ planulati, ultimus ad peripheriam obtusissime subangulatus; angulo candidulo; apertura ovato-lunaris, obliqua, coarctata; perist. candidum, tenue, reflexum. Diam. 12, alt. 6 mill. (Deshayes.)

SYNONYMS AND REFERENCES.

Helix bulbina DESHAYES, in Fer. i. p. 108, pl. lxxxv. figs. 14-18.
PFEIFFER, Mon. Hel. Viv. iii. 201.

Remarks. This is Deshayes's description of a shell found by him in Ferussac's collection labelled *profunda*. It may be, perhaps, the young of that species. I have given a facsimile of one of his outline figures. Pfeiffer repeats his description, not having seen the shell.

The banks of the Ohio, Mississippi, and Missouri are given as the habitat.

HELIX DEMISSA BINNEY.....vol. ii. p. 232, pl. xlii. fig. 1.

Helix demissa REEVE, Con. Icon.

HELIX LUCIDA DRAPARNAUDvol. ii. p. 233, pl. xxii. a, fig. 2.

Found in Ohio.

Having sent some of Dr. Ingalls' shells to Pfeiffer, he declares there is no perceptible difference between them and the *lucida* of Europe.

HELIX ARBOREA SAY.....vol. ii. p. 235, pl. xxix. fig. 3.

Helix arborea SAY (Binney's ed.) p. 5, pl. lxxii. fig. 5.

CHEMNITZ, ii. 114, (excl. *Ottonis*).

PFEIFFER, iii. 88, (excl. ditto).

REEVE, Con. Icon. No. 733 (1852), excl. syn.

Mighels (Shells of Maine) declares he can see no difference between this and *lucida*.

Pfeiffer, l. c., unites *Ottonis* to this species. He quotes *arborea* from Cuba, but Poey doubts its existence there.

HELIX ELLIOTTI REDFIELD.....vol. iii. p. 23, pl. lxxvii. fig. 18.

The description is taken from the New York Lyceum Annals, vi. 170, pl. ix. fig. 10.

HELIX ELECTRINA GOULD.....vol. ii. p. 236, pl. xxix. fig. 1.

Pfeiffer (Symb. ii. 10) considers this a variety of *nitidosa*, but subsequently refers it to *pura*, as does also Reeve.

It has also been detected in Georgia and New York.

HELIX OTTONIS PFEIFFER.....vol. ii. p. 238, pl. xxix. a, fig. 3.

Also considered a synonym of *arborea* by Reeve, (No. 733.) See the remarks under *H. arborea*.

HELIX STEENSTRUPII MÖRCH.

In Mörch's catalogue of Greenland Mollusca (Rink's Greenland, p. 75) occurs the following mention of this species, which is the only information I can obtain in regard to it. (See also *H. Fabricii*.)

Helicella Steenstrupii, n. s.

Helicella sp. Stp. Conch. von Island.

Helix nitida Fabr. F. Gr. No. 385.

Helix alliaria Forbes, Br. Ass. 1839, 142.

HELIX CAPSELLA GOULD.....Vol. ii. p. 239, pl. xxix. a, fig. 1.

Helix rotula PFEIFFER, Mon. Hel. Viv. iii. 107.

Helix placentula SHUTTLEWORTH, (Zonites) Bern. Mit. 1852, 194.

GOULD, in Terr. Moll. iii. 19.

My opinion regarding the identity of *placentula* is founded on the description alone, not having seen any authentic specimen.

HELIX VORTEX PFEIFFER...vol. ii. p. 240, pl. xxix. a, fig. 2, vol. iii. p. 34.

Helix vortex PFEIFFER, Ar. f. Nat. 1839, ii. 351; Mon. Hel. Viv. i. 95; iii. 88.

CHEMNITZ, ed. 2, ii. 110, pl. lxxxviii. figs. 7-9.

REEVE, Con. Icon. No. 644, (1852).

GOULD, vol. iii. l. c.

Helix selenina REEVE, l. c. 716, (1852).

I have seen no specimens from America of the larger variety of the species found in the West Indies.

The species is found also in Haiti, St. Thomas, Porto Rico, Bermuda, and Cuba; and in Georgia, (Gould).

I very much doubt the identity of *tenuistriata* with this species. (See remarks in the following article).

HELIX TENUISTRATA BINNEY.

The following description I found among my father's papers. It is impossible to apply it to any known American species. It will, however, probably be rediscovered at some future time. Its habitat, size, and all its characteristics, are opposed to the theory of its identity with the preceding species, as suggested by Gould.

H. testâ depressâ, carinatâ, umbilicatâ, albido-cornea; anfractibus septem, oblique striatis; aperturâ angustâ, depressâ; labro sub-reflexo; basi convexo; umbilico aperto.

SYNONYMS AND REFERENCES.

Helix tenuistriata BINNEY, Boston Journal, 1842, iv. i. cover, p. 3.
PFEIFFER, Mon. Hel. Viv. i. 432.

Helix vortex GOULD, (non PFEIFFER,) Terr. Moll. iii. 34.

DESCRIPTION.

Animal not hitherto noticed.

Shell flattened, the upper surface acutely carinated; *epidermis* light horn-color; *whorls* seven, narrow, increasing in width very gradually from the apex to the aperture; striated with fine, prominent, distinctly separated, curved lines; aperture angular, depressed, contracted; lip above the carina acute, below a little reflected; base sub-convex, smooth; umbilicus open, moderate in size, exhibiting two or three volutions.

Greatest transverse diameter about half an inch.

Geographical Distribution. Found hitherto only in the eastern part of Tennessee, whence a single specimen was brought by Mr. Haldeman.

Remarks. This pretty species is described with some reluctance from a single specimen, as it may be considered doubtful until another be found, whether it may not be a foreign shell introduced by mistake among Tennessean shells. It is quite flat on the upper

surface, rising a little towards the apex; the whorls, which are distinctly marked, are beautifully striated with delicate prominent curved lines, which are crowded towards the apex, and separated by a distinct interval on the outer whorl; they terminate on the edge of the carina, which is a little plaited by them, the base below being smooth. The aperture is narrow, and marked by an angle at the carina. The lip below the carina has a distinct, though narrow reflection. The umbilicus is moderate, conical, and rather deep, exhibiting about three volutions. In Lamark's arrangement it would be a *Carocolla*.

HELIX INDENTATA SAY.....vol. ii. p. 242, pl. xxix. fig. 2.

Helix indentata SAY, (Binney's ed.) p. 24.

CHEMNITZ, i. 221, (1846).

REEVE, Con. Icon. No. 730, (1852).

PFEIFFER, l. c. iii. 65.

Found also in Florida, Canada, and Texas, (Moore). For its supposed presence in St. Domingo, see Mal. Bl. 5, 147.

HELIX CHERSINA SAY.....vol. ii. p. 243, pl. xvii. fig. 4.

Helix chersina SAY, (Binney's ed.) pp. 18, 31.

Helix fulva teste MIGHELS, (Bost. Journ. iv. 333,) CHEMNITZ, PFEIFFER, REEVE, FORBES and HANLEY.

I have separated the synonymy of *H. egena* Say, from that of *chersina*, since many authors consider them distinct. The typical *chersina* is well represented in the plate. The original specimen of *egena* is readily distinguished from it by having a short, pyramidal, acute spire, and a very rounded base, the separation of the two being very well defined. There exist, however, innumerable gradations between these extreme forms. It must be borne in mind, that the shell figured and described by Gould on p. 245, is not *egena* Say, but *Gundlachi* Pfr.

I give Say's description below.

H. EGENA. Shell convex, polished; whorls five, not distinctly wrinkled, rounded; aperture rather narrow, transverse; labrum

simple, at its inferior extremity terminating at the centre of the base of the shell; umbilicus none, but the umbilical region deeply indented.

Breadth more than one tenth of an inch.

This shell was found by Mr. John S. Phillips on the banks of the Delaware River, about ten miles from Philadelphia. It is much more elevated and not so broad as *H. arborea* Nobis; the aperture also is of a different shape. It is much broader than the *H. chersina* Nob.

SYNONYMS AND REFERENCES.

Helix egena SAY, (Binney's ed.) p. 30.

DEKAY, N. Y. Moll. p. 45.

CHEMNITZ, ed. 2, i. 237, pl. xxx. figs. 19-21 ? (1846).

REEVE, Con. Icon. No. 1263, (1854.)

PFEIFFER, Mon. Hel. Viv. i. 31; iii. 32, non GOULD.

HELIX FABRICII BECK.

PLATE LXXVII. FIGURE 17.

T. subimperfiorata, conica, tenuis, striatula, pellucida, fulva; spira conica, acutiuscula; sutura profunda; anfr. 6, convexi, angusti, ultimus latior, basi convexiusculus, medio impressus; apertura verticalis, latè lunaris; perist. simplex, acutum, margine columellari superne reflexiusculo, perforationem simulante. (Pfeiffer.)

SYNONYMS AND REFERENCES.

Helix Fabricii BECK, Ind. p. 21, (absq. desc.)

MÖLLER, Ind. Moll. Grœnl. p. 4.

PFEIFFER, Zeit. f. Mal. 1848, p. 90; Mon. Hel. Viv. iii. 32.

REEVE, Con. Icon. 1459, (1854.)

Helix nitida FABRICIUS, Fauna Gr. p. 389, teste PFR. et MÖLL.

Conulus Fabricii MÖRCH, 1857, Nat. Bidr. af Gr. 75, (absq. desc.)

Remarks. I have not seen this shell. The figure, which is enlarged, is a fac-simile of that given by Reeve from the Cumingian Collection. The description is Pfeiffer's. He also remarks that the shell is hardly distinguished from *fulva* Drap. by its more convex, subperforated base. It is a Greenland species.

Fabricius thus describes *H. nitida*, which is quoted as a synonym:—

Helix nitida, testa umbilicata, subdepressa, fulvo-cornea, pellucida, substriata, apertura larga.

Helix nitida Müll. prodr. 2898, Verm. 234.

Helix Hammonis, Act. Nidr. iii. 435, tab. vi. fig. 16.

Hujus testam vacuum tantum sub muscis rarissime offendi.

HELIX GUNDLACHI PFEIFFER.....vol. ii. p. 245, pl. xxii. a, fig. 3.

Helix Gundlachi PFEIFFER, Wieg. Arch. 1840, i. 250, Mon. Hel. Viv. i. 50; iii. 51.

CHEMNITZ, ed. 2, i. 239, pl. xxx. figs. 25-28.

Helix pusilla PFEIFFER, Ar. f. Nat. 1839, i. 351, nec LOWE.

Helix egena GOULD, l. c. nec SAY.

This is not *egena* Say, as stated in the remarks under *H. chersina*. Having sent some of the specimens received from Gould to Pfeiffer, I have received from him an assurance of their being identical with his *Gundlachi*, a Cuban species. His description is as follows:—

T. subperforata, turbinato-depressa, nitida, fulva; anfr. 5 convexiusculi, lente accrescentes, ultimus basi subplanulatus, sub lente lineis concentricis sculptus, circa perforationem excavatus; apertura depressa, lunaris; perist. simplex, rectum, acutum. Diam. maj. $2\frac{1}{2}$, min. $2\frac{1}{2}$, alt. $1\frac{3}{4}$ mill.

Similis speciminibus junioribus *H. fulvæ*.

HELIX INTERNA SAY.....vol. ii. p. 247, pl. xxx. fig. 4.

Helix interna SAY, (Binney's ed.) p. 18.

CHEMNITZ, i. 200.

REEVE, Con. Icon. No. 718, (1852).

PFEIFFER, l. c. iii. 142.

HELIX GULARIS SAY... vol. ii. p. 251, pl. xxxvii. figs. 3, 4.

Helix gularis SAY (Binney's ed.) p. 18.

CHEMNITZ, ii. 201, excl. var.

PFEIFFER, l. c. iii. 141, excl. β ; Symb. ii. 29, excl. β .

Mrs. GRAY, Fig. Moll. An. pl. 291, fig. 4, Ex Bost. Journ.

ADAMS, (*Gastrodonta*) Gen. Rec. Moll. pl. lxxi. fig. 4.

REEVE, Con. Icon. No. 719, (1852).

Helix bicostata PFEIFFER, l. c. i. 182; iii. 141; Symb. iii. 69.

CHEMNITZ, ed. 2, ii. 196, pl. 100, figs. 21-23.

REEVE, l. c. 697 (1852).

Pfeiffer, l. c., considers *H. suppressa* a variety of *gularis*. His *bicostata* is evidently the true *gularis*, with a less elevated spire. He acknowledges it to be so in letters lately received by me.

See also remarks on *ligera* for *H. Rafinesquea*.

HELIX SUPPRESSA SAY vol. ii. p. 253, pl. xxxvii. fig. 1.

- Helix suppressa* SAY, (Binney's ed.) p. 36.
 DEKAY, N. Y. Moll. p. 38, pl. iii. fig. 24.
 REEVE, Con. Icon. No. 723, (1852).
Helix gularis, var. CHEMNITZ, l. c.
 PFEIFFER, l. c.

The typical specimen is still preserved in the Philadelphia Academy.

Pfeiffer considers it as a variety of *gularis* furnished with one tooth only. DeKay also mentions but one tooth.

I have specimens from Alabama and Florida. It has been found by me only in fields at the roots of the grass, and not under decaying leaves and stumps as the other species.

HELIX LASMODON PHILLIPS vol. ii. p. 254, pl. xxxvii. fig. 2.

- Helix lasmodon* DEKAY, N. Y. Moll. p. 47.
 PFEIFFER, Mon. Hel. Viv. iii. 142.
Helix macilenta SHUTTLEWORTH, Bern. Mit. 1852, p. 195.
 GOULD, Terr. Moll. iii. 20.
 PFEIFFER, l. c. iii. 640.

I have seen no authentic specimen of Shuttleworth's species, but am inclined from the description to place it in the synonymy of *lasmodon*. It had not been seen by Pfeiffer or Gould, who repeat the original description.

HELIX PERSPECTIVA SAY vol. ii. p. 256, pl. xxx. fig. 1.

- Helix perspectiva* SAY, (Binney's ed.) p. 9.
 DESHAYES, 3d ed. Lam. iii. 315, (1839); in Fer. Hist. i. 81.
 PFEIFFER, l. c. iii. 99, (excl. *H. filiola*).
 CHEMNITZ, ii. 114.
 REEVE, Con. Icon. No. 695, (1852).
Helix patula DESHAYES, non *parruli*.

Occurs fossil in the Natchez Postpleiocene bluff.

The existence of the tooth within the aperture has been overlooked by all other authors but Binney. The position of the species in the artificial systems is materially altered by its presence.

Pfeiffer quotes Ferussac's pl. 86, fig. 1, for this species, and places pl. 79, fig. 7, in the synonymy of *H. striatella*. The former is said by Deshayes to be *filiola*, a species from Tonga, while the latter was figured from a specimen furnished by Say himself.

Potiez and Michaud give Austria as the habitat of *perspectiva*, having confounded it with *solaria* Menke (Gal. p. 99.)

HELIX MULTIDENTATA BINNEY, vol. ii. p. 258, pl. xlvi. fig. 3.

Helix multidentata CHEMNITZ, ii. 202.

PFEIFFER, iii. 142.

REEVE, Con. Icon. No. 729, (1852).

Found also in Ohio (Anthony), and in Maine (Morse).

Gould is erroneously quoted as authority for the specific name by all the foreign writers referred to in the synonymy.

HELIX LINEATA SAY, vol. ii. p. 261, pl. xlvi. fig. 1.

Helix lineata SAY, (Binney's ed.) pp. 9, 24.

CHEMNITZ, ii. 203.

PFEIFFER, iii. 142.

DESHAYES, in Fer. i. 80.

REEVE, Con. Icon. No. 724, (1852).

Found also in Virginia, and in Washington Co., Texas, (Moore.)

SPURIOUS SPECIES.

Helix arbustorum Lin. was found some years since in the neighborhood of Cincinnati; it was living in a situation from which it

could be traced to a nursery, the proprietor of which had imported many fruit-trees and bushes from France, and had probably brought over this stray species in the matting around their roots. (Anthony.)

Helix Bonplandi Lamark, vid. vol. i. p. 159.

Helix corpuloides Mont. is quoted from Boston, without description, among DeKay's extra limited species. On the page of Silliman's Journal, to which he refers, it is stated by Gould to be a species of "*Delphinoidea*," originally described as *Helix*.

Helix harpa Say is a *Bulimus*.

Helix dealbata Say is a *Bulimus*.

Helix depicta, Grateloup, vid. vol. i. p. 159.

Helix domestica, Strom, vid. *Vitrina Angelicæ*.

Helix hieroglyphica Beck, Ind. p. 8. "Am. Sept.?" No description is given. The species is unknown to Pfeiffer. Vid. Mon. i. 434.

Helix hispida Linnæus, Canada?

Helix irrorata. Shell imperforate, depressed, subglobular, pale reddish-brown, with very numerous small white spots, and about four deeper brown obsolete bands; whorls rounded, nearly five in number, wrinkles obsolete on the body whorl, more distinct on the spire; spire depressed, convex; suture declining much near the mouth; aperture on the side of the labrum, within somewhat livid; labrum reflected but not flattened, and not abruptly contracting the aperture, white before and yellowish behind; near the junction with the columella is a callus, which does not rise into an angle.

Length from the apex to the base of the columella, three-fifths of an inch nearly. Greatest breadth one and one-tenth of an inch. Inhabits Northumberland County, Pennsylvania. Cabinet of Mr. William Hyde.

This species may be compared with the *H. lactea* Müller and Ferrussac; the spire is rather more prominent, the white spots, or rather abbreviated lines are similar in form, size, and number, but its labrum preserves the same color with the exterior of the shell, and the livid tint of the inner portion of the body whorl is very

pale; the posterior face of the reflected labrum is immaculate, and its callus base is not angulated; the aperture is much less wide than that of *lactea*; and in Mr. Hyde's specimen, a small fissure remains near the umbilicus. It still more closely resembles a variety of a shell which inhabits the Island of Candia, but that species has always a white base, being immaculate beneath the inferior band. Say, (l. c.)

It seems probable that *Helix irrorata* is a variety of *H. lactea* Müll., with which I compared it when describing it. Say, (Binney's ed.) p. 36.

Helix irrorata SAY, (Binney's ed.) p. 23.

DEKAY, N. Y. Moll. 45, (var. of *lactea*).

PFEIFFER, Mon. i. 272.

Helix lactea MÜLLER, teste BINNEY, PFEIFFER, (iii.) REEVE, SAY.

Helix nemoralis Lin. teste Gray, Turtóns, Man. 27, ("Canada and United States.")

Helix pellucida Fabricius, vid. *Vitrina Angelicæ*.

Helix pisana Müll. quoted from U. S. by Ferussac, (Tabl. Syst.) and Gray (Turt. Man.)

Helix subcylindrica Pulteney is a *Truncatella*.

Helix Trumbulli Linsley. (Shells of Connecticut, p. 10; Sill. Journ. 48, p. 280). Spire much depressed or very little elevated; sutures slightly marked and umbilicus large and deep; color a dull white with a tinge of green; shell thin and translucent; diameter about $\frac{1}{10}$ inch, height $\frac{1}{20}$ inch; found on the shore of Long Island Sound near high-water-mark, and occasionally near low-water-mark at Stonington, by Mr. J. H. Trumbull. [May not this be *Margarita arctica*? Eds.]

"*Helix Trumbulli* is *Skenca serpuloides*." Gould, Silliman's Journ. n. s. vi. 235.

Helix virgata Mont. "United States," Ferussac, Tabl. Syst.

GENUS BULIMUS SCOPOLI.

BULIMUS ZEBRA MÜLLER. vol. ii. p. 271, pl. liv.; pl. lxxvii. fig. 13; pl. lxxviii. fig. 12.

For additional synonyms, &c. see Pfeiffer.

On pl. 78, fig. 12, is a variety of this species from Key

Biscayne, Florida. The variety described on page 273 is figured on pl. 77, fig. 13.

Agatina fuscata Rafinesque (vol. i. p. 50) is to be added to the synonymy.

BULIMUS SERPERASTRUS SAY.....vol. ii. p. 274, pl. 1. fig. 2.

Bulimus serperastrus SAY (Binney's ed.) p. 39.

CHEMNITZ, ed. 2, p. 82, pl. xxx. fig. 122; pl. xxxix. fig. 5, (1854).

PFEIFFER, l. c. iii. 341.

PHILIPPI, Icon. iii. 23, p. 97, tab. 9, fig. 6.

β Gracilior, spira elongata.

Bulimus Liebmanni PFEIFFER.

Bulimus Ziebmanni REEVE.

γ. Minor, imperfectus.

Bulimus nitelinus REEVE.

The above varieties are given solely on the authority of Pfeiffer.

The geographical distribution of the species doubtfully quoted by Gould as synonyms seem to remove the probability of their identity with this shell.

BULIMUS ALTERNATUS SAY.....vol. ii. p. 276, pl. li. fig. 2; pl. li. a; pl. lxxx. fig. 3; fig. 1?

Bulimus alternatus SAY (Binney's ed.) p. 39.

PFEIFFER, Mon. Hel. Viv. ii. 221.

Bulimus lactarius PFEIFFER, l. c. ii. 187; iii. 415.

REEVE, l. c. No. 217.

GOULD, Ter. Moll. iii. p. 35.

Bulimus dealbatus BINNEY, l. c. pars, nec Say.

There exists a great deal of confusion in regard to this and the allied species.

Bulimus alternatus is thus described by Say:—

BULIMUS ALTERNATUS. Ovate conic, with alternate gray and brownish longitudinal vittæ. Inhabits Mexico.

Shell umbilicated, ovate-conic, with longitudinal lines, subequal, gray and light brownish vittæ; the brown is paler, almost approaching in some instances a drab; the white vittæ consists of more or

less confluent, transverse, irregular lines, and small spots; whorls about six, a little convex; suture not profoundly impressed; labrum (in some specimens) with a thickened line or rib on the inner submargin; within white, with a perlaceous tinge.

Length one and one fifth of an inch. Greatest breadth seven tenths. This species appears to be not uncommon in Mexico, as many specimens were sent me by Mr. Maclure; but from what particular locality, I know not.

An original drawing of this species by Mrs. Say, under which is written, in the hand of her husband, "*Bulimus alternatus* — Mexico, Wm. Maclure," is copied on plate 80, fig. 3. This figure, in connection with the description, removes all doubt as to what shell Say had before him as *alternatus*.

It is, however, an extremely variable shell, being found on the same bush in large quantities, among which is every variety of marking. Some specimens exist without hardly any white in their coloring, as in the case of the specimen from Buena Vista figured (pl. 80, fig. 1), while some are but slightly varied with the brown vittæ.

B. alternatus occurs in large quantities in Texas and the neighboring Mexican State of Tamaulipas. Adams also quotes it from Louisiana, on the authority of one dead specimen found in Otter Creek, (Nat. Hist. Red Riv. La. p. 254).

Forbes, in the description of land-shells collected by the Herald and Pandora, P. Z. S. 1850, p. 54, speaks of "*Bul. alternatus*" being found at Panama. He gives no authority for the name; Pfeiffer describes no other *alternatus* than Say's.

Binney was familiar with *B. alternatus*, as he figured it on pl. li. a, and a variety of it on pl. li. fig. 2. He considered it, however, a variety of *B. dealbatus*.

Pfeiffer alone, of foreign writers, notices *B. alternatus*, by repeating Say's description as of a species unknown to

him. It appears that he had the true *alternatus* before him in describing *B. lactarius* as follows:—

T. rimata, vel perforata, ovato-acuta, palidissimè fulvida, strigis lacteis, opacis, longitudinalibus, denticulatis et fimbriatis ornata; spira conica, acuta; anfr. 7 convexiusculi, ultimus spiram subæquans; apertura ovalis; perist. simplex, acutum, marginibus callo junctis, columellari dilatato, reflexo. (Pfr. in Symb. iii. 85.)

Reeve also describes and figures the species as *B. lactarius*.

BULIMUS MARLÆ ALBERS.

T. anguste umbilicata, oblongo-conica, solida, sublævigata, alba, punctis et strigis obsoletis corneis plerumque notata; spira conica, acuta; anfr. 6½ convexiusculi, ultimus spiram subæquans, basi vix attenuatus; columella plica parvula, dentiformi munita; apertura vix obliqua, acuminato-oblonga, intus fusca; perist. rectum, margine dextro leviter arcuato, columellari sursum dilatato, patente. Long. 33, diam. 14-15 mill.; ap. 16-17 mill. longa, 7½ lata.

β. Anfr. superis corneis, lacteo punctato-strigatis, ultimo strigis lacteis denticulatis et violaceo-corneis alternantibus picto.

Hab. Texas.

This description was published by Pfeiffer in Proc. Zoöl. Soc. London, 1858, p. 23. The species must be nearly allied, if not identical, with some of the varieties of *B. alternatus*,—but I have not seen any authentic specimen.

BULIMUS BINNEYANUS PFEIFFER.

PLATE LI. b.

The shells figured on the plate referred to were considered as a variety of *dealbatus* by Binney (ii. 277), and as *B. Schiedeanus* by Gould (ii. 279). Having sent specimens to Pfeiffer for identification, they were returned to me labelled *B. Binneyanus*, with the remark that the true *B. Schiedeanus* has no tooth-like plate on the columellar.

The shell described by Pfeiffer (Mal. Blatt. iv. 229) does not appear to be identical with our Texan shell. We

must therefore leave the species temporarily under this name, until its position is more accurately ascertained.

BULIMUS SCHIEDEANUS PFEIFFER.

PLATE LXXX. FIGURES 8, 15.

T. perforata, ovato-acuta, calcarea, alba, longitudinaliter et irregulariter rugoso-striata; anfr. $6\frac{1}{2}$ convexiusculi, ultimus spiram æquans; apertura ovali-oblonga, intus fulvida; columella obsoletè plicata; perist. simplex, acutum, marginibus callo nitido junctis, columellari late reflexo, nitido, albo. Long. 31, diam. 17 mill. Ap. 17 mill. longa, 9 lata. (Pfr.)

SYNONYMS AND REFERENCES.

B. Schiedeanus PFEIFFER, Symb. ad Hel. Hist. i. 43; Mon. Hel. Viv. ii. 187; iii. 418.

CHEMNITZ, ed. 2, No. 216, pl. xlvi. figs. 3, 4, (1854).

PHILIPPI, Icon. i. 3, p. 56, pl. 1, fig. 12.

REEVE, Con. Icon. No. 361

Geographical Distribution. Texas and Mexico.

Remarks. This species is readily distinguished from that figured on pl. 51, b, (see last article,) by its rougher surface and the want of the tooth-like fold on the columellar.

Pfeiffer mentions a smaller variety. I have figured two others. One (pl. 80, fig. 15) has a very dark-colored aperture. The other (pl. 88, fig. 8) is distinguished by a smoother surface, a black apex, a light coffee-color below an obtuse carina situated about the middle of the body whorl, the remainder of the shell being quite white. It was found in Washington and De Witt Counties, Texas, (Moore). The other forms were not found with it. It occurred in large numbers, living, and constant in its characters through every stage of growth. Should it prove a distinct species, I would suggest its bearing the name of the discoverer.

BULIMUS PATRIARCHIA.

PLATE LXXX. FIGURE 13.

T. perforata, ovato, solidissima, alba, rugosa; anfr. 6 convexi, ultimus

ventricosus, 5-7 long. testæ æquans; apertura ovata; perist. simplex, intus incrassatum, marginibus callo albo, crasso, junctis, columellari reflexo, umbilicium subtegente.

SYNONYMS AND REFERENCES.

Bulimus patriarcha W. G. BINNEY, Proc. Phila. Acad. Nat. Sc. 1858, 116; Notes, p. 17.

DESCRIPTION.

Animal not observed.

Shell perforate, ovate, heavy, white, and wrinkled; whorls 6, convex, the last ventricose, equalling in length 5-7 of the shell; aperture ovate; peristome simple, thickened within, the extremities joined by a heavy white callus, the columellar extremity slightly reflected, so as partially to conceal the umbilicus.

Length 35, diam. 19; aperture, length 19, diam. 12 millimetres.

Geographical Distribution. Texas and Mexico, at Buena Vista, (Berlandiere).

Remarks. Belongs to the same group as *Bul. dealbatus* Say, *alternatus* Say, *liqualis* Reeve, *Schiedeanus* Pf., &c. The characteristics which form its specific differences are alike present in young and old specimens, and constant in all from the locality. I therefore consider it as well entitled to specific distinction as those named.

Named from its greater size and more antiquated appearance, as compared with the allied species.

BULIMUS DEALBATUS SAY. .vol. ii. p. 276, pl. li. fig. 1; pl. lxxx. figs. 6, 7.

Helix dealbata SAY, (Binney's ed.) p. 20.

DEKAY, N. Y. Moll. p. 46.

Bulimus dealbatus CHEMNITZ, ed. 2, p. 55.

PFEIFFER, l. c. iii. 418.

Bulimus confinis REEVE, Col. Icon. No. 643, (1850).

PFEIFFER, l. c. iii. 341.

Bulimus liquabilis REEVE, l. c. 387.

On plate 51, fig. 1, will be found a correct representa-

tion of what appears to me the type of *Bul. dealbatus*. The species varies considerably, but never sufficiently to authorize the quotation of *alternatus*, *Binneyanus*, *Schiedeanus*, and *patriarcha* as synonyms.

It is found in large quantities in Texas, Alabama, North Carolina, Missouri, and Arkansas. Future researches will probably prove it an inhabitant of the neighboring Southwestern States. It also occurs fossil in the Postpleiocene.

Say's description is as follows: —

H. DEALBATA. Shell conical, oblong, thin and fragile, somewhat ventricose; volution 6-7, wrinkled across, wrinkles more profound and acute on the spire; spire elevated, longer than the aperture, sub-acute; aperture longer than wide, labrum not reflected; umbilicus small and profound.

Length more than three-fourths of an inch, breadth nine-twentieths of an inch. In the Cabinet of the Academy and Philadelphia Museum. Inhabits Missouri and Alabama.

In outline it resembles a *Bulimus*. Four specimens of this species were sent to the Academy from Alabama, by Mr. Samuel Hazard; and a single depauperated specimen was found by myself on the banks of the Missouri.

Bulimus physoides Reeve (No. 507) corresponds exactly to a variety of *dealbatus* sent from Alabama by Dr. Showalter. It is quoted by Pfeiffer (iii. 418) as a synonym of *B. melo* Quoy.

Pfeiffer quotes *B. liquabilis* Reeve as a variety of *B. confinis* Reeve. I am inclined to consider them both as varieties of *dealbatus* — but subjoin Reeve's descriptions, having copied his figures respectively on pl. 88, figs. 6 and 7.

BULIMUS CONFINIS. Bul. testâ ovatâ, subventricosâ, profundè umbilicatâ, anfr. 6, rotundatis, tenuè striatis, columellâ latè dilatatâ, subreflexâ, aperturâ orbiculari, labro simplici; pellucido-corneâ, opaco-albido variegatâ. Hab. Texas.

BULIMUS LIQUABILIS. Bul. testâ ovato-conicâ, ventricosâ, umbili-

catâ, anfr. 6 ad 7, subrotundatis, lævibus vel minutè striatis, columellâ latè reflexâ, labro tenui, paululum expanso; pellucido-corneâ, strigis longitudinalibus opacis notatâ. Hab. Texas.

BULIMUS MULTILINEATUS SAY. vol. ii. p. 278, pl. lviii.

Bulimus multilineatus SAY, (Binney's ed.) p. 28.

DEKAY, N. Y. Moll. 56.

PFEIFFER, Mon. Hel. Viv. ii. 204; iii. 422.

Bulimus virgulatus BINNEY, l. c. nec FERUSSAC.

There can, I think, be no reasonable doubt of the identity of the species figured on pl. 58 with Say's species. The shells figured were found by Bartlett on the Florida Keys. Similar specimens have lately been sent to the Smithsonian Institute from Lower Matacumbe Key.

As regards *B. venosus*, Reeve's figure agrees exactly with the Florida shell, but he gives as its habitat the banks of the Orinoco. At all events, Say's name has many years of priority. Reeve quotes *Grunei* as a synonym of *venosus*.

Pfeiffer repeats Say's description, having seen no authentic specimen.

Bul. virgulatus Fer. is quite another shell.

Say's description is given below.

BULIMUS MULTILINEATUS. Shell conic, not very obviously wrinkled; whorls not very convex, yellowish white, with transverse entire reddish-brown lines; a blackish subsutural revolving line; suture not deeply indented, lineolar; apex blackish; umbilicus small, surrounded by a broad blackish line; columella whitish; labrum simple, blackish.

Length less than seven-tenths of an inch. Greatest breadth less than seven-twentieths of an inch. This species was found by Mr. Titian Peale on the southern part of East Florida.

It is quite distinct from *Bul. Dormani*, but appears somewhat related to *Bul. Floridianus*.

BULIMUS DORMANI.

PLATE LXXX. FIGURE 10.

Testa perforata, ovato-turrita, lævigata, albida, fasciis fuscis longitudi-

nalibus ornata; sutura impressa; spira elongato-conica, acuta; apex punctulata; anfr. 6 convexiusculis, lineis minutissimis volventibus ornati, superi striati, ultimus inflatus, ad marginem superam peristomatis obtusissimè carinatus; apertura ovata, partem testæ dimidiam subæquans; perist. simplex, acutum, margine columellari reflexiusculum, perforationem pene occultans.

SYNONYMS AND REFERENCES.

Bulimus Dormani W. G. BINNEY, Proc. Phila. Acad. Nat. Sc. 1857, p. 188; Notes, p. 8.

DESCRIPTION.

Animal not observed.

Shell perforated, rather heavy, shining, elongated-conic; white, with several regular revolving series of interrupted, perpendicular, reddish-brown patches; suture distinctly marked; apex punctured; whorls 6, rather convex, marked with numerous very fine revolving lines; upper whorls striate; last whorl full, with a hardly perceptible obtuse carina at the upper extremity of the peristome.

Length, 29; diameter, 12 millimetres.

Geographical Distribution. Found at several spots in the vicinity of St. Augustine, Fla., by O. S. Dorman, Esq.

Remarks. The only described species with which this shell can be confounded is *B. Floridianus* Pfr., Proc. Zoöl. Soc. London, 1855, p. 330. Though I have never seen Dr. Pfeiffer's shell, I should consider it nearly allied, though distinct. That species wants the minute revolving lines, the punctured apex, and striate upper whorls, which characterize *B. Dormani*, is a smaller shell, and has a different marking, being furnished with opaque whitish blotches as well as reddish patches; the latter also do not extend to the body whorl.

Since writing the above, I have received a drawing of the type of *B. Floridianus* which removes all doubt of its being identical with this species.

BULIMUS FLORIDIANUS PFEIFFER.

PLATE LXXIX. FIGURE 3.

T. angustè perforata, ovato turrata, sublævigata, griseo-hyalina, strigis et maculis opacis, albis notata; spira elongato-conica, acutiuscula; anfr. $6\frac{1}{2}$ convexiusculis, superis interruptè fusco-fasciatis, ultimo $\frac{2}{7}$ longitudinis subæquante, infra medium subangulato, basi attenuato; columella subtorta, recedente; apertura parum obliqua, ovali; perist. tenui, margine dextro angustè expanso, columellari dilatato, reflexo, fere adnato.

Long. $15\frac{2}{3}$, diam. $7\frac{1}{2}$ mill.

Habitat, Florida. (Pfr.)

The above is the original description of this species, (Proc. Zoöl. Soc. July, 1856, p. 330). I have not seen any specimen of it, but am able to add a figure drawn by Sowerby from the type in the Cumingian collection.

It appears nearest allied to *B. multilineatus*.

BULIMUS DECOLLATUS LINNÆUS. vol. ii. p. 280, pl. l. fig. 1.

Bulimus mutilatus SAY, (Binney's ed.) p. 25.

DEKAY, N. Y. Moll. p. 56.

PFEIFFER, l. c. 397.

In 1857 I received a large quantity of this species alive from Prof. Holmes of Charleston, S. C. From him I learn that the species is still but too common in that city. I placed a large quantity of them in my garden in Burlington, but they did not survive the succeeding winter.

Reeve gives no habitat, and no authority for the specific name.

It has also been introduced into Cuba, (Poey, Pfeiffer).

The animal is carnivorous.

BULIMUS SUBULA PFEIFFER. vol. ii. p. 285, pl. liii. fig. 4.

Bulimus subula PFEIFFER, l. c. iii. 399.

Bulimus hortensis ADAMS, vid. PFEIFFER, Mal. Blatt. i. 196; also vid. Contr. to Conch. p. 221.

BULIMUS GRACILLIMUS PFEIFFER. vol. ii. p. 293, pl. liii. fig. 3.

Bulimus gracillimus PFEIFFER, l. c. iii. 394.

REEVE, Con. Icon. No. 594, (1849).

Achatina gracillima BINNEY, l. c.

I have removed this species to the genus in which Pfeiffer places it.

BULIMUS GOSSEI PFEIFFER.

T. rimata, turrilo-cylindracea, obliquè costulata, albida, opaca, strigis semilunaribus, punctisque pellucidis corneis ornata; spira cylindracea apice attenuata, acuta; sutura crenulata; anfr. 11 convexi, ultimus $\frac{1}{4}$ longitudinis vix superans, rotundatus, basi subangulatus; apertura subcircularis; perist. breviter expansum, marginibus approximatis, columellari reflexo, patente. Long. 11, diam. $3\frac{2}{3}$ mill. Ap. $3\frac{1}{2}$ mill. longa, $3\frac{1}{2}$ lata.

Var. β, Paulo minor, strigis et punctis corneis obsoletioribus, (Pfr. Mon. Hel. Viv. i. 81, &c. &c.)

Pfeiffer gives Texas as the habitat of var. *β* of this species in his Monograph, and also on p. 456 of Roëmer's Texas it is quoted from New Brauenfels. The typical specimen is from Jamaica.

Poey (Mem. i. 395) considers *Macroceramus pontificus* a synonym of *Bul. Gossei*; the same species is referred by Pfeiffer to *Bul. Kieneri*.

I have seen no Texan specimen of the species, and have no means of clearing the confusion which appears to exist concerning it. Reeve's figure of *Kieneri* resembles *Macr. pontificus* nearer than his figure of *Gossei*.

BULIMUS HARPA SAY.....vol. ii. p. 290, pl. lii. fig. 3.

Helix harpa SAY, (Binney's ed.) p. 29, pl. lxxiv. fig. 1.

Bulimus harpa PFEIFFER, l. c. iii. 384.

CHEMNITZ, ed. 2, No. 305, pl. lx. figs. 17-19.

REEVE, Con. Icon. No. 596, (1849).

Found at various points in Maine, and at Berlin Falls, N. H., by E. S. Morse, Esq., who gives the following description of the animal:—

Animal small compared to the size of the shell. Body and head

slate-color, superior tentacles darker, short, thick, bulbous; eyes large, distinct; foot two-thirds of the length of shell; whitish, long, very narrow, rounded at tail; body narrower than foot.

In motion they are exceedingly graceful, at times poising their beautiful shell high above their body, and twirling it round not unlike the *Physa*, again hugging their pretty harp close to the back; the shell when in this last position continually oscillates as if the animal could not balance it. It rarely ever moves in a straight line, but is always turning and whisking about, and this is done at times very quickly and abruptly.

Mighel's description of *Pupa costulata* is as follows:—

Shell ovate-conic, scalariform, light yellowish-brown, thin and fragile, whorls four, convex, the last two prominently ribbed, the first two smooth; suture distinct; aperture semicircular, slightly oblique, unarmed; lip simple or modified by the last rib; umbilicus distinct. Length, $\frac{2}{15}$ inch; breadth, nearly $\frac{1}{10}$. Hab. Portland.

BULIMUS MARGINATUS SAY.....vol. ii. p. 288, pl. lii. fig. 1.

Cyclostoma marginata SAY, (Binney's ed.) p. 22.

Bulimus marginatus PFEIFFER, Malac. Blatt. ii. 94.

Bulimus fallax GOULD, in Terr. Moll. l. c.

STIMPSON, Shells of N. E. p. 84, (absq. desc.)

Pupa fallax SAY, (Binney's ed.) p. 28.

PFEIFFER, l. c. iii. 533.

CHEMNITZ, ed. Nov. (1844,) p. 58, pl. 12, figs. 20, 21.

Pupa Parraïana ORBIGNY, Moll. Cuba, p. 181, pl. xii. figs. 9-11, (1853).

I have retained the first specific name given by Say, at the suggestion of Pfeiffer, (Malak. Blatt. 1856, ii. p. 13, in the review of Terr. Moll.), who justly observes that if the species is referred to *Bulimus*, no name has the priority over it, as *B. marginatus* Pf. is now considered a synonym of *B. Guillianii*, Petit.

As for the name *albilabris*, it was suggested by Adams only because *marginatus* was preoccupied.

Gould (Invert. 192) considers *Pupa placida* Say as a synonym of this species; and Pfeiffer (ii. 309) makes it var. β of *marginatus*.

SPURIOUS, EXTRALIMITAL, &c.

Bulimus acicula Müller, and *Bulimus octona* Brug. have been found in greenhouses and gardens, where they have been introduced on plants.

B. exiguus Binn. is the same as *Carychium exiguum*.

B. fasciatus Binn. is the same as *Achatina fasciata*.

B. Gossei Pf., vid. *Macroceramus pontificus*.

B. Kieneri Pf., vid. *Macroceramus pontificus*.

B. lubricus Ad. &c. is the same as *Achatina lubrica*.

B. obscurus Dr., vid. *Pupa placida* Say.

B. striatus Brug. is the same as *Glandina truncata*.

B. vexillum Brug. is the same as *Achatina fasciata*.

B. zebra Orb. is the same as *Achatina fasciata*.

B. vermetus Anthony. Of this species I can give no information other than that furnished by the original description given below.

BULIMUS VERMETUS ANTHONY. (Cover of Haldeman's Monograph No. 3, July, 1841.) Shell turriculated, livid brown; whorls 5, striated longitudinally; suture deeply indented; apex entire; body whorl a little more than equal to the spire; spire $2\frac{1}{2}$ times the length of the aperture; length 3, width $1\frac{1}{2}$ lines; aperture obliquely ovate; length of the aperture equal to the width of the body whorl. Ohio, near Cincinnati.

Distinguished by its peculiar mouth, which is curved in a regular curve from right to left, contracted at the upper angle, and spreading below; the whorls are also very deeply indented, and twisted as they are in *Succinea vermeta*.

GENUS MACROCERAMUS GUILDING.

This genus is not accepted by Pfeiffer, who places its species under *Bulimus*.

MACROCERAMUS PONTIFICUS GOULD. . . vol. ii. p. 306, pl. lxix. fig. 1.

Pfeiffer refers this species to his *Bulimus Kieneri*, (Mon. iii. 365,) while Poey quotes it from Cuba, (Mem. i. 395,) as a synonym of *Bulimus Gossei* Pfr.

GENUS ACHATINA LAMARCK.

ACHATINA FASCIATA MÜLLER. vol. ii. p. 266, pl. lv. lvi. lvii.

- Achatina solida* SAY, (Binney's ed.) p. 29.
 DEKAY, N. Y. Moll. 56.
 PFEIFFER, Mon. Hel. Viv. ii. 246.
Achatina fasciata ζ PFEIFFER, l. c. iii. 479.
Agatina variegata RAFINESQUE, vid. vol. i. 50.
Bulinus fasciatus BINNEY, l. c.

Say's original specimen of *Achatina solida* is still preserved in the Philadelphia Academy.

This is not *vexillum* DeKay, which see.

The lower figure of pl. 56, is *Achatina picta*, considered distinct by Reeve and Pfeiffer, (vid. Mon. iii. 490.) Other West Indian varieties than those figured are from time to time received from Florida.

ACHATINA LUBRICA MÜLLER. vol. ii. p. 283, pl. lii. fig. 4.

- Bulinus lubricus* SAY, (Binney's ed.) p. 31.
 DEKAY, N. Y. Moll. p. 55, pl. iii. fig. 43.
Bulinus lubricoides STIMPSON, Shells of N. E. p. 54, (absq. descr.)

Stimpson, as will be seen by the synonymy, considers this distinct from the European shell.

SPURIOUS SPECIES.

Achatina virginica is quoted from Florida by Jay, (Cat. 1835). It is also given by DeKay under the name of *Bulinus vexillum*, (N. Y. Moll. 56, pl. iv. fig. 56).

A. bullata Pf. is the same as *Glandina bullata*.

A. flammigera, Fer. pl. 118, f. 5-7, quoted by DeKay, p. 56, as inhabiting Florida, is not a native of the United States, and could not have come from there. He probably gives the species on the authority of Say, who mentions (Binn. ed. 29) finding it there.

A. flammigera Say is the same as *Bulinus zebra*.

A. gracillima Pf. is the same as *Bulinus gracillimus*.

A. pellucida Pf. *olim*, Binn. is the same as *Blauneria pellucida*.

A. rosea Desh. is the same as *Glandina truncata*.

A. striata DeK. &c. is the same as *Gl. truncata*? He refers to Fer. pl. 136, figs. 8-10, which is *A. rosea*, and not an inhabitant of Florida, from whence DeKay quotes his species.

A. subula Pf. is the same as *Bulimus subula*.

A. Texasiana Pf. is the same as *Glandina Texasiana*.

A. truncata Pf. &c. is the same as *Glandina truncata*.

A. Vanuxemensis Pf. &c., is the same as *Glandina Vanuxemensis*.

GENUS GLANDINA SCHUMACHER.

GLANDINA BULLATA GOULD.....vol. ii. p. 298, pl. lxii. a.

Achatina bullata PFEIFFER, Mon. Hel. Viv. iii. 512.

Oleacina bullata GRAY and PFEIFFER, Brit. Mus. Cat. Pulm. 24.

GLANDINA CORNEOLA.

PLATE LXI. FIGURE 1.

Testa conico-oblonga, tenuis, nitens, cornea; anfr. 7 ad 8, convexi, tenuissimè et longitudinaliter striati, et lineis minutis creberrimis volventibus notati; sutura crenulata; apertura oblonga, partem testæ dimidiam æquans; columella contorta, truncata, callo induta.

SYNONYMS AND REFERENCES.

Glandina truncata var. BINNEY, vol. ii. p. 302.

Glandina corneola W. G. BINNEY, Proc. Phila. Acad. 1857, p. 189; Notes, p. 9.

DESCRIPTION.

Animal not observed.

Shell oblong-conic, thin, shining, horn-color; whorls 7 to 8, longitudinally striate, and covered with numerous minute revolving lines; suture slightly crenulated; aperture oblong, half as long as the shell; columella curved, truncated, covered with light callus.

Length, 50; diameter, 18 millimetres.

Geographical Distribution. Western Texas (Redfield), Mexico (Smithsonian Collection).

Remarks. This shell, very rare in collections, is distinguished by its light horn-color, thin shell, and revolving

lines. It is the most distinctly marked species of the genus found in America.

GLANDINA PARALLELA.

PLATE LXII. FIGURE 2.

Testa solida, albida, nitens, cylindraceo-elongata, striis creberrimis longitudinalibus notata; spira elevato-obtusa; anfr. 5 ad 6, superi convexi, ultimus lateribus rectis, æquis intervallis inter se distantibus, apertura angusta, partem testæ 3-7 æquans; labrum flexuosum, in medio rectum, margine basali curvatum; columella recta, truncata, callo induta.

SYNONYMS AND REFERENCES.

Glandina truncata var. BINNEY, l. c.

Glandina parallela W. G. BINNEY, Phila. Proc. 1857, p. 189; Notes, p. 9.

DESCRIPTION.

Animal not observed.

Shell heavy, shining, white, elongated, cylindrical; spire elevated, obtuse; whorls 6 to 7, with numerous, delicate, longitudinal striæ, the upper ones convex, the last one with straight parallel sides; lip straight along the middle, and parallel to the rectilinear side of the opposite whorl, at the basal extremity curved; columella straight, truncated, covered with a heavy callus.

Length, 56; breadth, 20 millimetres.

Geographical Distribution. Louisiana (Rev. E. R. Beadle).

Remarks. Distinguished by its peculiar parallel sides and heavy texture from any other described species.

GLANDINA TEXASIANA PFEIFFER.

PLATE LXI. FIGURE 2.

T. oblonga, solidula, longitudinaliter confertim striata, nitida, pellucida, carnea; spira convexo-conica, obtusa; sutura pallida, minutè denticulata; anfr. 6 convexiusculi, ultimus spirâ paulo longior, basi parum attenuatus; columella perarcuata, basi laminam albam, tortam, abruptè truncatam

formans; apertura vix obliqua, acuminato-ovalis; perist. simplex, obtusum. Long. 29; diam. $10\frac{1}{2}$ mill. Ap. mill. 16 longa, $5\frac{1}{2}$ lata.

Habitat Texas. (Pf.)

SYNONYMS AND REFERENCES.

Glandina truncata var. BINNEY, l. c.

Achatina Texasiana PFEIFFER, Novit. Conch. 8, p. 82, pl. xxii. figs. 11, 12, (1857); Proc. Zool. Soc. 1856.

Remarks. This well characterized species was considered as a variety of *Glandina truncata* by Binney. It appears to be a common species. A variety is figured by me on pl. 77, fig. 21.

GLANDINA TRUNCATA GMELIN. vol. ii. p. 301, pl. lix. lx. lxxx, fig. 9.

Achatina striata CHEMNITZ, ed. 2, tab. 3, figs. 3, 4.

Achatina truncata CHEMNITZ, l. c. Bul. tab. xxxviii. figs. 21, 22; *Achatina*, No. 78.

PFEIFFER, l. c. (nec *Glandina*,) iii. 512.

Glandina truncata SAY, (Binney's ed.) p. 34, pl. xx.

DEKAY, N. Y. Moll. 56.

Mrs. GRAY, Fig. Moll. An. pl. 301, fig. 5. (Ex Bost. Journ.)

BINNEY, l. c. excl. var. et pl. lxi. lxii.

Oleacina truncata GRAY and PFEIFFER, Brit. Mus. Pulmonata, p. 23.

Planorbis glans DEKAY, l. c. p. 56.

One of the most singular varieties of this variable species is figured on pl. 80. It came from Florida.

The varieties figured by Binney have been described as distinct species in the preceding articles.

Orbigny gives Cuba as its habitat, but Pfeiffer and Poey doubt its existence there.

For anatomy vid. Wyman in Boston Proc. i. 154.

GLANDINA VANUXEMENSIS LEA. vol. ii. p. 299, pl. lxii. fig. 1.

Achatina Vanuxemensis PFEIFFER, l. c. iii. 518.

Oleacina Vanuxemensis GRAY and PFEIFFER, Brit. Mus. Cat. Pulm. p. 36.

GENUS PUPA DRAPANAUD.

PUPA INCANA BINNEY. vol. ii. p. 316, pl. lxxviii.; pl. lxxix. fig. 17.

Pupa incana PFEIFFER, Mal. Blatt. ii. p. 13.

Pupa detrita SHUTTLEWORTH, Bern. Mitth.

PFEIFFER, Malak. Bl. i. 158, (1853); i. 205, (1854,) pl. iii. figs. 9, 10.

Pupa maritima GOULD, l. c.

γ PFEIFFER, Mon. iii. 539.

In 1851, this species was only designated by name in vol. i.; the full description was given in vol. ii., the name being changed by Gould to *P. maritima*. Shuttleworth's description of *detrita* has not priority over the name I have retained. In the third volume of the Monograph, Pfeiffer considers it a variety of *maritima*, but later, having received from me some specimens, he remarks on them that they are similar to the Cuba *detrita*, but must take the name of *incana*. He also says that the true *maritima* has not as yet been found in Florida.

Young specimens are furnished with several tooth-like processes within the aperture, one being on the columellar, one on the parietal wall, and a third on the base of the aperture, removed somewhat within.

The variety figured on pl. 79, fig. 17, is from Key Biscayne, Fla.

PUPA MODICA GOULD,.....vol. ii. 319, pl. lii. fig. 2.

Pupa modica PFEIFFER, Mon. Hel. Viv. iii. 533.

PUPA ARMIFERA SAY,.....vol. ii. p. 320, pl. lxx. fig. 4.

Pupa armifera SAY, (Carychium ?) Binney's ed. p. 21.

PFEIFFER, l. c. iii. 557.

CHEMNITZ, ed. 2, p. 57, pl. vii. figs. 17-19.

Pupa rupicola PFEIFFER, Symb. ii. 55, teste Pfr. l. c.

Say's original specimen is still preserved in the Philadelphia Academy. He appears to have considered it a *Carychium*.

PUPA BADIA ADAMS,.....vol. ii. p. 323, pl. lxx. fig. 3.

Pupa badia DEKAY, N. Y. Moll. p. 49, pl. iv. fig. 45.

CHEMNITZ, ed. 2. p. 117, pl. xv. figs. 25-29.

Pupa muscorum, pars, PFEIFFER, Mon. Hel. Viv. ii. 312.

FORBES and HANLEY, Brit. Moll. iv. 97.

It will be noticed that the wood-cut does not show the basal tooth, as does the plate referred to. Its presence seems exceptional.

Adams (l. c.) compares it with *Pupa marginata* Dr., while the above authorities consider it identical with *P. muscorum* of Europe.

PUPA CONTRACTA SAY.....vol. ii. p. 324, pl. lxx. fig. 2.

Pupa contracta SAY, (Carychium,) Binney's ed. p. 25.

PFEIFFER, l. c. iii. 556.

Pupa corticaria PFEIFFER, Symb. ii. p. 54, (an. var. β ? Pfr. l. c.)

Pupa deltostoma CHARPENTIER, in Chemnitz. ed. 2, p. 181, pl. 21, figs. 17-19.

Vertigo contracta ADAMS, Gen. ii. 172, absq. descr.

The figure of Küster is more like *armifera*. His description is of *contracta*.

Pupa deltostoma is evidently this species. The description is as follows :—

T. latè profundèque rimata, ovato-conoidea, nitidula, glabriuscula, alba; spira convexo-conica, obtusa; anfr. 5 convexis, ultimo basi rotundato, antice calloso; apertura trigona, quadriplicata, pl. 1 lamelliformi in pariete aperturali, 1 in columella, 2 in palato, peristomate undique expanso, marginibus conjunctis Tennessee.

PUPA DECORA GOULD.....vol. ii. p. 327, pl. lxxi. fig. 2.

Pupa decora PFEIFFER, Mon. Hel. Viv. iii. 555.

Vertigo decora ADAMS, Gen. Rec. Moll. ii. 172, (absq. desc.)

PUPA PENTODON SAY.....vol. ii. p. 328, pl. lxii. fig. 1.

Vertigo pentodon SAY (Binney's ed.) p. 27.

Pupa pentodon CHEMNITZ, ed. 2, p. 125, pl. xvi. figs. 24-26.

PFEIFFER, l. c. iii. 557.

Pupa curvidens PFEIFFER, l. c. ii.

In the second volume of the Monograph, Pfeiffer places both *Tappaniana* and *curvidens* in the synonymy. De Kay's figure shows no tooth. Say's type is still preserved in the Philadelphia Academy. Adams's description is as follows :—

PUPA TAPPANIANA Ward, MSS. P. testa minima, pellucida, subconica, perforata; anfractibus quinque; apertura suborbiculari, 8-dentata: dente uno columellari, majore, quatuor alteris magnis, tribus alteris parvis.

Shell very small, pale horn-color, translucent, tapering above the penultimate whorl; whorls a little more than five, convex, with a well impressed suture; aperture sub-orbicular, (the penult whorl cutting off about one third of the circle,) about one third of the length of the shell; margin sharp, with a narrow contraction in the sub-margin. beneath which is a thickening within, on which are the labial teeth; teeth eight, five primary and three secondary; of the former the largest is on the penultimate whorl, the next largest on the left side of the aperture; at the base, beginning at the left hand, is a primary, then a secondary, a primary, a secondary, a primary, and another secondary, extending nearly to the upper extremity of the right margin: the last three primaries are not constant in size; umbilicus open.

Length, .08 inch; breadth, .05 inch.

Cabinets of Middlebury College and my own.

Geographical Distribution. This shell has been found in Ohio, in Massachusetts, near Boston, and in this place.

Remarks. This species was discovered by the late Dr. Ward of Roscoe, Ohio, from whom I received specimens in April, 1840, with the above name. This I retain in justice to Dr. W., who was alike eminent for his attainments and liberality, and in whose sudden death science sustained a severe loss. Subsequently the species was found in Cambridge, Mass., by my friend T. J. Whittemore, Esq., and Dr. Gould. Among some minute shells collected in this town by Mr. M. W. Johnson, of the graduating class of last summer, I have detected this species, but too late for insertion in an article, on the Mollusca of this vicinity, in the next number of the American Journal of Science and Arts, and have therefore published this description separately.

PUPA PLACIDA SAY.

Shell dextral, cylindric-conic, pale yellowish horn-color; apex whitish, obtuse; whorls six and a half, somewhat wrinkled; suture moderately impressed; aperture unarmed, longitudinally oval, truncate a little obliquely above by the penultimate volution; columella so recurved as almost to conceal the umbilicus; labrum, with the exception of the superior portion, appearing a little recurved

when viewed in front, but when viewed in profile, this recurvature is hardly perceptible; umbilicus very narrow.

Length over three tenths of an inch. Inhabits Massachusetts.

For this shell I am indebted to Dr. T. W. Harris, of Milton, from whom I have received many interesting species of our more northern regions. At first view it might be mistaken for the *P. marginata* Nob., but it is quadruple the size, and the labrum is not reflected and thickened.

SYNONYMS AND REFERENCES.

Pupa placida SAY, (Binney's ed.) p. 39.

Pupa fallax DEKAY, N. Y. Moll. p. 51.

GOULD, Invert. 192.

Pupa fallax β PFEIFFER, Mon. Hel. Viv. ii. 309.

Bulinus hordeanus? DEKAY, l. c.

Bulinus obscurus GOULD, Mon. Pupa, p. 17.

PFEIFFER, iii. 350, on DEKAY's authority.

Remarks. This will probably always remain a doubtful species, since those having the best means of deciding upon it have not been able to agree. I therefore simply give Say's original description.

PUPA RUPICOLA SAY.....vol. ii. p. 341, pl. lxx. fig. 1.

Carychium? *rupicola* SAY (Binney's ed.) p. 22.

Pupa rupicola CHEMNITZ, ed. 2, p. 123, pl. xvi. figs. 17-19.

DEKAY, N. Y. Moll. p. 52.

PFEIFFER, l. c. iii. 557; nec Symb. ii. 55.

Pupa procera CHEMNITZ, p. 58, pl. vii. figs. 20, 21.

PFEIFFER, l. c. ii. 360.

Pupa carinata GOULD, 1842, Boston Journ. iv. 1, cover, p. 3.

PFEIFFER, l. c. ii. 359; iii. 557.

Pupa gibbosa CHEMNITZ, ed. 2, p. 123, pl. xvi. figs. 13-16.

Pupa minuta (SAY) PFEIFFER, l. c. ii. 356; iii. 555; Symb. ii. 54.

Vertigo rupicola BINNEY, l. c.

minuta? ADAMS, Gen. ii. 172, absq. descr.

Pupa procera is said to be identical with *rupicola* by Binney (Boston Proc. i. 105). Gould doubts the correctness of this decision (p. 106). DeKay confirms it, as does Pfeiffer in vol. iii. of his Monograph.

Pupa carinata Gould was subsequently referred by him to *P. procera* (l. c. iv. 3, p. 359); Pfeiffer retains it, not having, however, seen the shell. Binney (Boston Proc. i. 105) considers it a doubtful species. No mention of it is made in the Terrestrial Mollusks.

Say never described any species of *Pupa* under the names of *gibbosa* or *minuta* which are ascribed to him. Pfeiffer considers the two identical. Röemer quotes *minuta* from Texas. On pl. 78, fig. 17, will be found a facsimile of the figure of *gibbosa* from Chemnitz. Pfeiffer's description of *minuta* is as follows. From the two I should consider the species identical with *rupicola*.

PUPA MINUTA. T. vix rimata, cylindrica, nitida, pellucida, cornea; spira apice obtusa; anfr. 6 convexiusculi, ultimus basi subcompressus; apertura subsemicircularis, 4-dentata; dentibus subæqualibus, 1 parietali, 1 columellari, 2 palatalibus; perist. expansum, sublabiatum, marginibus disjunctis, dextro supernè arcuato. Long. 2 $\frac{2}{3}$, diam. 1 $\frac{1}{4}$ mill. Ap. oblique $\frac{3}{4}$ mill. longa. Habitat in Pennsylvania.

Obs. An forte varietas *P. procera*?

I suppose *Vertigo minuta* of Adams's Genera to be this species.

It is also placed in the subgenus *Vertigo* by Binney, though the animal had not been seen.

PUPA VARIOLOSA GOULD..... vol. ii. 343, pl. lxxii. fig. 3.

Pupa variolosa PFEIFFER, Mon. Hel. Viv. iii. 556.

Vertigo variolosa ADAMS, Gen. ii. 172.

PUPA CORTICARIA SAY..... vol. ii. p. 339, pl. lxxii. fig. 4.

Odostomia corticaria SAY (Binney's ed.) p. 7, pl. lxxii. fig. 5.

Pupa corticaria PFEIFFER, l. c. iii. 542.

CHEMNITZ, l. c. p. 97.

Carychium corticaria FERUSSAC, Podr. No. 3, (absq. desc.)

Pfeiffer (Mon. ii.) says that the *corticaria* of the Symbolæ is *P. contracta*.

Binney places the species among the *Vertigines*, though it is described as having four tentacles.

Ferussac, l. c., considered it a *Carychium*.

Say's type is still preserved in the collection of the Philadelphia Academy.

PUPA PELLUCIDA PFEIFFER.

T. subperforata, cylindræea, tenuis, pellucida, nitida, pallidè flavida; spira parum attenuata, apice obtusa; anfr. 5 convexi, ultimus præcedente planior; apertura semiovalis, 5-dentata: dentibus singulis validis in pariete aperturali et columella, 2 mediocribus in margine dextro, quinto minimo in basi palati; perist. simplex, margine dextro expanso, columellari reflexo. Long. 2; diam. vix 1 mill. Ap. vix $\frac{3}{4}$ mill. longa. (Pfeiffer Mon. Hel. Viv. ii. 360.)

This is Pfeiffer's description of a Cuban species quoted from Texas by Röemer (p. 456.)

PUPA HOPPII MÖLLER.

PLATE LXXVIII. FIGURE 2.

Testa dextrorsa, cylindræea, obtusa, lævi; columella bidentata. Long. 1, 2''' R. (Möller.)

SYNONYMS AND REFERENCES.

Pupa Hoppii MÖLLER, Ind. Moll. Grœnl. p. 4, (1842.)

TROSCHEL, Ar. f. Nat. 1843, ii. 126.

CHEMNITZ, ed. 2, pl. xix. figs. 29, 30.

PFEIFFER, Mon. Hel. Viv. ii. 325; iii. 536.

Pupa Steenbuchii BECK, (1847,) teste MÖRCH, Nat. Bidr. of Grœnl. p. 75.

Remarks. I have seen no specimen of this Greenland shell. The figure I have given is a fac-simile of one of those in Chemnitz, ed. 2.

SPURIOUS SPECIES.

Pupa albilabris Ad. is the same as *Bul. marginatus*.

P. costulata Mighels is the same as *Bul. harpa*.

P. exigua Say, &c. is the same as *Carychium exiguum*.

P. fallax Say, &c. is the same as *Bul. marginatus*.

- P. Gouldii* Binn. &c. is the same as *Vertigo Gouldii*.
P. milium Gld. is the same as *Vertigo milium*.
P. modesta Say &c. is the same as *Vertigo ovata*.
P. ovata Gld. &c. is the same as *Vertigo ovata*.
P. ovulum Pf. is the same as *Vertigo ovata*.
P. Parraiana Orb. is the same as *Bul. marginatus*.
P. simplex Gld. &c. is the same as *Vertigo simplex*.
P. unicarinata Bin., vol. i., is the same as *Macroceramus pontificus*.

SUBGENUS VERTIGO.

Stimpson, 1851, *Shells of N. E.*, p. 53, separates this group from the Helicidæ, considering the want of lower tentacles sufficient to form a family of Vertiginidæ.

VERTIGO GOULDII BINNEY vol. ii. p. 333, pl. lxii. fig. 2.

- Vertigo Gouldii* STIMPSON, *Shells of N. E.*, p. 53, absq. desc..
Pupa Gouldii CHEMNITZ, ed. 2, p. 124, pl. xvi. figs. 20-23.*
 PFEIFFER, l. c. iii. 557.

VERTIGO MILIUM GOULD vol. ii. p. 337, pl. lxxi. fig. 1.

- Pupa milium* PFEIFFER, l. c. iii. 559.
 CHEMNITZ, ed. 2, p. 119, pl. xv. figs. 39-42.

VERTIGO OVATA SAY vol. ii. p. 334, pl. lxxii. fig. 4.

- Vertigo ovata* SAY, (Binney's ed.) p. 26.
Pupa ovata CHEMNITZ, ed. 2, p. 118, pl. xiv. figs. 1, 2; xv. figs. 35-38.
 PFEIFFER, *Mon. Hel. Viv.* ii. 360; iii. 558; *Symb.* ii. 54.
Pupa modesta SAY, (Binney's ed.) p. 32, pl. 74, fig. 5.
Pupa ovulum PFEIFFER, olim, *Symb.* i. 46.

Adams (l. c.) considers these two species distinct.
 Found also in Mexico and Cuba, (Pfeiffer.)

VERTIGO SIMPLEX GOULD vol. ii. p. 343, pl. lxxii. fig. 3.

- Vertigo simplex* STIMPSON, *Shells of N. E.* p. 53, (absq. desc.)
Pupa simplex PFEIFFER, l. c. iii. 530.

* "In the States of New York, Baltimore, Cambridge."

SPURIOUS SPECIES.

- V. contracta* Ad. Gen. Rec. Moll. is the same as Pupa contracta.
V. decora Ad. Gen. Rec. Moll. is the same as Pupa decora.
V. minuta Ad. Gen. Rec. Moll. is the same as Pupa rupicola.
V. pentodon Say is the same as Pupa pentodon.
V. rupicola Binney is the same as Pupa rupicola.

GENUS CYLINDRELLA PFEIFFER.

CYLINDRELLA VARIEGATA PFEIFFER.

This species was described by Pfeiffer before *C. lactaria* Gould was published. Their identity is well established. I have not received any specimens of the true *variegata* from Florida, or any other portions of the United States. Pfeiffer (Mal. Blatt. i. 211) gives Florida as its habitat, probably on the authority of Gould's description in the Terrestrial Mollusks. At that time the figure had not been published.

Specimens of *lactaria* Gould, received from himself and also from Poey, agree perfectly with the text (p. 309), but are not the shell figured (pl. 69, fig. 2). Neither do they agree with the Florida shell. Having sent specimens of the shell found in Florida to Poey, he returned them labelled *C. Poeyana* Orb., and sent me Cuban specimens of the same species.

It follows, therefore, that the shell figured (pl. 69, fig. 2) is not described in the text, where reference is erroneously made to it under *C. lactaria* Gould, which is *C. variegata* Pfr. It will be noticed that no reference to geographical distribution is made by Gould. The shell figured is described in the following article.

CYLINDRELLA POEYANA ORBIGNY.

PLATE LXIX. FIGURE 2.

T. elongatissima, fusoidea, tenuis, cornea, longitudinaliter acuto-striata; spira elongatissima, inflata, posticè acuminata, truncata; anfr. 11 convexiusculi, ultimus anticè carinatus; apertura rotundata; perist. continuum, acutum. Long. 14, diam. 13 mill. (Orbigny.)

SYNONYMS AND REFERENCES.

Pupa Poeyana ORBIGNY, Moll. Cuba, i. 185, pl. xii. figs. 24-26.

Cylindrella Poeyana PFEIFFER, Mon. Hel. Viv. ii. 380; iii. 572.

POEY Memorias, ii. pl. xii. fig. 10.

Cylindrella lactaria BINNEY, l. c. in tab. non in textu.

Remarks. This is the shell figured under the name of *lactaria* Gould, as remarked in the preceding article. I will here add that this species may readily be distinguished from *lactaria* by having much rougher striæ, and by being entirely free from the "longitudinal, flexuose, milk-white lines" which are the principal characteristic of that species, and from which, indeed, its name is derived.

Found in large quantities in Florida; also in Cuba.

CYLINDRELLA JEJUNA GOULD.....vol. ii. p. 310, pl. lxix. fig. 3.

Cylindrella jejuna PFEIFFER, Mon. Hel. Viv. iii. 573.

Cylindrella variegata PFEIFFER, Mal. Bl. ii. 13.

Pfeiffer, in repeating Gould's description, not having seen the shell, suggests its being a variety of *C. lactaria*. Later (Mal. Blatt. ii. 13) he considers it a synonym of that species, which he refers to his *variegata*.

CYLINDRELLA ROEMERI PFEIFFER.

T. vix rimata, subcylindracea, apice obtuse conica, non truncata, substriata, carneo-albida; anfr. 14 angusti, planiusculi, ultimus basi carinatus, antrorsum solutus et extrorsum tortus; apertura verticalis, oblongo-circularis, intus plica marginis dextri coarctata: perist. continuum, undique breviter expansum. Long. 13-14, diam. $4\frac{1}{2}$ mill. Ap. 3 mill. longa, $2\frac{1}{2}$ lata.

β. Minor, sursum ventrosior, anfr. 12, ultimo brevius soluto; long. 11, diam. supra medium 4 mill.

SYNONYMS AND REFERENCES.

Cylindrella Römeri PFEIFFER, Mon. Hel. Viv. ii. 383; iii. 579; in Römer's Texas, p. 456.

Remarks. I have not seen this shell, which was found by Römer at New Brauenfels, Texas. I have given the original description above, and add an observation from the same source:—

Affinis quidem et præcedenti (*C. Piloceri* Pfr.) et sequenti (*C. Goldfussi* Mke.), tamen carinâ basalo anfractus ultimi et ejus torsione tam singulari, ut testam primo aspectu sinistrorse[m] putes, ab omnibus distinctissimo.

CYLINDRELLA GOLDFUSSI PFEIFFER.

PLATE LXXIX. FIGURE 33.

C. testa elliptico-oblonga, subcylindræca, apice conica, integra, acuta; umbilicata, luteo-cornea, tenui, pellucida; anfractibus undecim, convexiusculis, dense et tenuissime arcuatim costulatis: infimo parum protracto, basi rotundato, compressiusculo; apertura patente orbiculato-subcordata; canaliculo brevissimo, obtuso. (Pfr.)

SYNONYMS AND REFERENCES.

Cylindrella Goldfussi MENKE, in Zeitsch. f. Mal. 1847, p. 2.

PFEIFFER, Mon. Hel. Viv. ii. 383; iii. 579.

PHILIPPI, Icon. iii. 17, p. 6, tab. iii. fig. 9.

DESCRIPTION.

Animal not observed.

Shell umbilicated, elongated, more ventricose at the middle, apex conic, not truncated, thin, diaphanous, light horn-color, marked with numerous light subarcuate striæ; whorls 12, scarcely convex, narrow, the last slightly extended beyond the body of the shell, carinated, its right side somewhat furrowed, rounded at base; aperture subvertical, obliquely and subtriangularly pear-shaped; perist. slightly expanded at its entire circumference, its right termination flexuose.

Length, 11; diameter, $4\frac{1}{3}$ mill.

Geographical Distribution. Texas, (Pfeiffer.)

Remarks. The figure (somewhat magnified) is drawn from a specimen from Mr. Bland's collection.

In general form, it is more nearly allied to *Macroceramus pontificus* than any other figured in the "Mollusks."

SPURIOUS SPECIES.

Cylindrella pontifica Gould (p. 306) is *Macroceramus pontificus*, vid. p. 137.

This concludes the list of known American Helicidæ. The following genera and species have been described by Rafinesque, but are all included in the genus *Helix*: —

<i>Aplodon</i> Raf.	<i>Stenostoma</i> Raf.
<i>Aplodon nodosum</i> Raf.	<i>Stenotrema</i> Raf.
<i>Chimotrema</i> Raf.	<i>Stenotrema convexa</i> Raf.
<i>Chimotrema planiuscula</i> Raf.	<i>Toxostoma</i> Raf.
<i>Hemiloma</i> Raf.	<i>Toxostoma globularis</i> Raf.
<i>Hemiloma avara</i> Raf.	<i>Toxotrema</i> Raf.
<i>Mesodon</i> Raf.	<i>Toxotrema globularis</i> Raf.
<i>Mesodon maculatum</i> Raf.	<i>Toxotrema complanata</i> Raf.
<i>Mesomphix</i> Raf.	<i>Triodopsis</i> Raf.
<i>Odomphium</i> Raf.	<i>Triodopsis lunula</i> Raf.
<i>Odotropis</i> Raf.	<i>Trophodon</i> Raf.
<i>Omphalina</i> Raf.	<i>Xolotrema</i> Raf.
<i>Omphalina cuprea</i> Raf.; vide	<i>Xolotrema lunula</i> Raf.
<i>Helix fuliginosa</i> .	<i>Xolotrema triodopsis</i> Raf.

On vol. i., p. 48 et seq. will be found a reprint and translation of Rafinesque's descriptions. The following, omitted by Binney, will make the series complete: —

Aplodon nodosum. Trois tours de spire bosselés, légèrement ridés concentriquement en dessous.

The genus *Trophodon* differs from *Mesodon* by upper lip notched. The genus *Odomphium*, by having an umbilic.

Toxostoma globularis. Globular, smooth; 5 spires. In Kentucky.

Partula Otaheitana Fer., as observed in vol. i. p. 159, never existed in the United States.

FAMILY AURICULACEA.

Dr. Binney, in his work on the Terrestrial Mollusks of this country, mentions that there is much reason to doubt whether this family is truly Pneumo-branchiate. Considering its species to be, at all events, aquatic, he does not include them in his work.

More recent investigations have shown that they respire free air, and that they are amphibious rather than aquatic. The systematic arrangement of this family may be seen in the following tables, as proposed by Dr. Pfeiffer and H. and A. Adams. The arrangement adopted in the following pages corresponds with that of the former. I do not propose to refer to the many systems of other foreign authors, but shall notice those proposed by Americans.

By this table it will appear that Pfeiffer divides the air-breathing Mollusks in two grand divisions; A, including those furnished with four tentacles, and B, including those with two only. The latter are also subdivided into *a*, those not operculated, and *b*, those furnished with an operculum. In the former of these subdivisions, he places the family *Auriculacea*.

In the "Genera of Recent Mollusca," the air-breathing Gasteropods are divided into Inoperculate and Operculate. The former are subdivided, according to their terrestrial, lacustrine, and marine habits, into Geophila, Limnophila, and Thassilophila. The second subdivision is composed of the *Auriculacea*, under the name of *Elobiadae*, and the *Limnæidæ*.

In both of these systems, the family is placed nearest to the fresh-water Pulmonates, with which they are more closely allied than with the land snails.

Dr. Pfeiffer (Mon. Auric. Viv.) thus divides the

PULMONATA.

A. Tetracera,	{	a. Inoperculata,	{	I. Onchidiacea. II. Limacea. III. Helicea. IV. Limnæacea. V. Auriculacea. VI. Proserpinacea. VII. Aciculacea. VIII. Cyclostomacea. IX. Helicinacea. X. Amphibolacea. XI. Ampullariacea.
B. Dicera,	{	b. Operculata,	{	
		{	{	
		a. Terrestria, . . .	{	
		β. Aquatilia, . . .	{	

In the "Genera of Recent Mollusca," by Henry and Arthur Adams, the following division is made of the air-breathing Gasteropods:—

SUBCLASS PULMONIFERA.		
ORDER.	SUBORDER.	FAMILY.
Inoperculata,	Geophila,	{ Oleacinidæ.
		{ Testacellidæ.
		{ Helicidæ.
		{ Limnacidæ.
		{ Stenopidæ.
		{ Ariomidæ.
Operculata,	Limnophila,	{ Janellidæ.
		{ Veronicellidæ.
		{ Onchidiidæ.
		{ Ellobiidæ.
		{ Limnæidæ.
		{ Amphibolidæ.
		{ Siphonaridæ.
		{ Cyclophoridæ.
Operculata,	Ectopphalma,	{ Helicidæ.
		{ Opisopphalma,
		{ Truncatellidæ.
Operculata,	Prosopphalma,	{ Assiminidæ.

The family Ellobiidæ corresponds to Pfeiffer's family Auriculacea.

This family has been noticed only by the following American authors. The treatment of the various genera and species will be found in their respective synonymy.

In 1841 Gould placed the genus *Auricula* in the Lamarckian family *Colimacea*.

DeKay in 1843 places the *Auriculidæ* as the third family of *Pulmobranchia*. He unites all the species described in his Zoölogy of New York in the genus *Auricula*.

Stimpson in 1851 catalogues the family *Melampidæ*, comprising the genera *Melampus* and *Carychium*. He was the first American to remove *Carychium exiguum* from the genus *Pupa*.

The Auriculacea are easily distinguished from the other inoperculated land Mollusks. They are furnished with but one pair of non-retractile tentacles, on the inner base of which are situated the sessile eyes. The head is extended beyond the tentacles into an obtuse, rounded,

bilobed snout. The mantle is thin, thickened on its margin. The foot is elongated and pointed. The sexes are united in each individual.

The shell is spiral, extremely variable, and in the American species conic, generally with a flattened spire, and furnished with numerous tooth-like laminae, which contract the narrow aperture.

The *Auriculidæ* are amphibious Mollusks, breathing free air, but apparently dependent for existence on a great deal of moisture, if not on the actual vicinity of the sea. Some species pass their whole life under circumstances which seem to preclude the possibility of their respiring air. Thus *Alexia myosotis* is often found on isolated stones in salt marshes, which are entirely covered by the tide four hours out of twelve. This species, when immersed in fresh water, becomes benumbed and soon dies.

Carychium exiguum, on the other hand, though found under similar circumstances, does not depend on salt water, being widely distributed far beyond its influence over the interior of the country. *Blaumeria pellucida* also has been detected living far from any water in a garden in Washington, whither it was introduced on plants from Charleston, S. C. With the exception of the two last mentioned, the American species are found on salt marshes and in brackish water near the sea.

Of their geographical distribution but little is yet known. *Melampus bidentatus* is found from Maine to Florida. *Melampus obliquus* is referred by Say to South Carolina. *Alexia myosotis* was probably introduced from Europe, I have never known of its being found south of New York harbor. *Carychium exiguum* will probably be found in all the Middle and Northern States. The other species are confined to the coast of Florida and the Gulf of Mexico, some of them being common to Cuba and other West Indian Islands.

In order to make the following a complete monograph of American *Auriculacea*, I have copied from the Terrestrial Mollusks the entire description of the few species mentioned in that work.

So few persons are interested in this family of Mollusks, and the extent of our coast is so great, the following must be considered as a very imperfect attempt at a monograph of the American species of the family.

Pfeiffer subdivides the family into three subfamilies: — *Otinea*, *Melampea*, and *Auriculea*, respectively analogous to the *Ancylea*, a subfamily of *Limneacea*, — to the true *Limneacea*, and to the *Aciculacea*. The first subfamily is not represented in this country.

SUBFAMILY MELAMPEA.

This subfamily is distinguished by an acute, simple peristome. The aperture is generally armed with tooth-like laminae. The animals of all our species are subaquatic, living in close proximity to salt or brackish water.

H. and A. Adams give the name of *Melampinae* to this subdivision. In America it has been noticed as a family by Stimpson, (Shells of N. E.), who calls it *Melampidae*, and includes one species and one genus which Pfeiffer refers to a separate subdivision of the family.

GENUS MELAMPUS MONTFORT.

The characteristics of this genus are the same as those already given for the subfamily.

It is an inhabitant of every quarter of the globe.

MELAMPUS BIDENTATUS SAY.

PLATE LXXV. FIGURE 23.

T. imperforata, elliptico-ovata, tenuiuscula, nitens, (aut corrosa,) lineis minutis transversis, et rugulis longitudinalibus notata; cornea, aut griseo-brunnea, interdum fasciis 4 rufis, angustis, cingulata; sutura distincta; spira brevis, obtusa; anfr. 6-7, superi planiusculi, ultimus $\frac{2}{3}$ long. æquans,

obtusè subcarinatus; apertura subobliqua, angusta, ad basin expansior, $\frac{5}{7}$ long. æquans; perist. simplex, acutum, tenue, intus inerme, aut dentibus albis, transversis, 1-7, marginem non attingentibus, in liras decurrentibus, interdum in callo longitudinali positis, armatum; paries aperturalis callo nitente induta, et dente unicâ, albâ, transversâ, in aperturam intrante armata; columella plicam unam, albam, ad basin excurrentem gerens; anfr. interni et axis absorpti.

SYNONYMS AND REFERENCES.

- Melampus bidentatus* SAY, Journ. Acad. Nat. Sc. Phila. vol. ii. p. 245, July, 1822; Binney's ed. p. 84.
 RUSSELL, Journ. Essex Co. Nat. Hist. Soc. vol. i. part 2, p. 67, anno 1839.
 PFEIFFER, Mon. Auric. Viv. p. 45, (excl. Mel. borealis).
 ADAMS, Genera, ii. p. 243, Sept. 1855, absq. desc.
- Melampus buplicatus* PFEIFFER, Mon. Auric. Viv. p. 21.
- Melampus corneus* STIMPSON, Shells of N. E. p. 51, (absq. desc.)
 BECK, Ind. (absq. desc.)
- Melampus ? Jaumei* PFEIFFER, Mon. Auric. Viv. p. 25.
- Melampus lineatus* BECK, Ind. (absq. desc.) p. 107.
- Auricula cornea* DESHAYES, Encycl. Meth. ii. p. 90; ditto in Lam. ed. 2, viii. p. 339; ed. 3, vol. iii. p. 390, (1839).
- Auricula bidentata* GOULD, Inv. Mass. p. 197, fig. 130.
 DEKAY, N. Y. Moll. p. 57, t. v. fig. 92, 1, 2, 3.
 KÜSTER, Chemn. ed. 2, Auric. p. 41, pl. vi. figs. 7-11.
 JAY, Cat. 264, (absq. desc.)
- Non *Auricula bidens* POTIEZ et MICHAUD, p. 201, pl. xx. figs. 9, 10.
- Auricula Jaumei* MITTRE, Rev. Zool. (Mars. 1841), p. 66.
- Auricula buplicata* DESHAYES, Encycl. Meth. ii. p. 91.
- Conorulus buplicatus* BECK, Ind. 106, (absq. desc.)
- Melampus bidentatus* var. *lineatus* SAY, l. c.
- Melampus bidentatus* β . PFEIFFER, l. c. p. 46.
 a. DEKAY, l. c.

DESCRIPTION.

Animal about as long as the shell, and the foot is transversely bifid; tentacula somewhat wrinkled, cylindrical, rather smaller towards the tips, which are obtuse or rounded; eyes placed at the inner base of the tentacula; rostrum somewhat wrinkled, nearly as long as the tentacula, bilobate before; foot, anterior segment emarginate behind, posterior segment bifid at the extremity; all above, with the exception of the tentacula and rostrum, glabrous, reddish-brown, beneath paler. (Say.)

Shell imperforate, elliptically ovate, rather thin, shining when perfect, but usually found much eroded; the surface is marked with longitudinal wrinkles, and very minute revolving striæ; horn-color, or grayish-red, often with revolving, narrow, rufous bands, four or five in number; suture well marked; spire short, and usually obtuse, often somewhat eroded; whorls usually 6, the upper ones flattened, the body whorl equalling about $\frac{2}{3}$ of the entire length of the shell, and obtusely angulated at its greatest width; aperture hardly oblique, very long and narrow, enlarging gradually towards the base, about $\frac{2}{3}$ the length of the shell; peristome very thin and sharp, not reflected, on the interior furnished with no laminæ, or with from one to seven; these laminæ are elongated, white, and do not reach the margin; they are usually separate, placed at irregular intervals, but sometimes are found on a longitudinal elevated, white callus; they enter but a short distance into the aperture; the parietal wall of the aperture is covered with a thin, shining, enamel-like callus, and bears on its lower half a single, white, prominent and transverse tooth, entering into the aperture; the columellar is also furnished with a white, tooth-like fold, commencing at the termination of the sharp peristome, and revolving upwards into the interior of the shell; this fold does not extend far into the aperture, as all the internal whorls and axis of the shell are early absorbed by the animal.

Length of an unusually large individual 13, breadth 7 millimetres.

Geographical Distribution. I have this species from the vicinity of Boston, from New Jersey, and South Carolina. Say found it at the mouth of the St. John's River, in Florida, and in Maryland; Mittre gives Virginia; Pfeiffer, Georgia; DeKay, New York. Stimpson did not detect it farther North than Massachusetts Bay. It may, therefore, be said to range from that point southward along the

whole Atlantic coast. It has also been found in Texas, (Röemer.)

Gould mentions its being said to have been found living with a *Planorbis* at Windsor, Vt. If so, it must be adapted to a remarkable difference of station, being usually found near the sea. Pfeiffer also gives Vermont as the habitat, probably on the above authority.

Remarks. This shell is familiar to all those who have collected among the salt marshes of Massachusetts Bay. Around Boston it is found not far below high-water-mark, often crawling up the stems of grasses, as if to avoid the returning tide.

The shell when young is quite pretty, being shining and often variegated by the revolving bands. But few mature shells are met with in a perfect condition. They are usually much eroded. From the toothless outer lip to that bearing a heavy callus ridged with transverse laminæ, every intermediate variety is found. The absence of the laminæ is equally common in mature and young shells.

Authentic specimens of this species are still preserved in the collection of the Academy of Natural Sciences of Philadelphia.

The original descriptions of Mitre and Deshayes are given below. I have seen authentic specimens of neither of their shells. The descriptions are merely copied by Pfeiffer, in the works referred to in the synonymy.

Say designates by the name of *lineatus*, a form peculiar for its revolving lines or bands and more narrow base of the aperture, (vid. Binn. ed. p. 85.) I have met with none sufficiently marked to form a variety, much less a distinct species. The revolving lines are very commonly found on young specimens. DeKay mentions this as *var. a*, Pfeiffer as β . The latter author thus describes a *var. γ* .

Anfractu ultimo infra suturam subexcavato, minutè spiraliter

striato, labro pone limbum fuscum albo-callosio, regulariter 6-10 plicato. Georgia.

He quotes in the synonymy of this variety *Mel. borealis* Conr. of Cuming's collection. Conrad's species is much more likely to be *Alexia myosotis* than any variety of *Mel. bidentatus*.

Potiez and Michaud describe and figure quite a distinct shell under the name of *Auricula bidens* Say.

Stimpson gives precedence to Deshayes's name *corneus*. Say's name has eight years priority, and is not preoccupied in the genus *Melampus*. It was while treated as an *Auricula* that any question existed in regard to its specific name.

Pl. 75, fig. 23, represents a specimen not furnished with laminæ within the peristome.

The date of publication of this species is erroneously quoted by Pfeiffer as 1821. The title-page of the first part of vol. ii. of the Academy Proceedings bears this date. The description was actually published at the date given by me.

AURICULA JAUMEL. A. testa conoïdea, lævi, corneo-lutescente, longitudinaliter substriata; spira brevi, obtusa, sæpe erosa; apertura elongata, angustissima; columella basi alba, buplicata, labro tenui, acuto, intus dentato atque sulcato.

Petite coquille mince, presque lisse, conoïde, d'une couleur jaunâtre cornée; chez les jeunes individus on voit des fascies brunes, transversales et régulièrement disposées. Sa spire est courte, obtuse, souvent érodée, comme chez la plupart des coquilles fluviatiles; l'ouverture est étroite, allongée; la columelle offre, vers sa base, deux dents blanches, égales et légèrement obliques; le bord droit, simple et tranchant, présente, à l'intérieur, une rangée de plis saillans, inégaux, séparés par des sillons d'autant plus marqués qu'ils sont plus inférieurs. Cette Auricule appartient à la section des Conovules; elle est voisine de l'*Auricula cornea* de Deshayes, dont elle diffère néanmoins par son bord droit constamment denté et sillonné. Elle a 3 à 4 lignes de longueur.

Elle habite les marais, aux environs de Hampton en Virginie, où elle

vit presque toujours dans l'eau; rarement la trouve-t-on montée sur les jones qui comblent les mares d'eau où ces Mollusques abondent.

Dédiée à mon ami M. Jaume, chirurgien de la Marine, qui, pendant mon voyage sur le vaisseau l'Hercole, m'a accompagné et aidé dans mes recherches Zoologiques. (Mittre, l. c.)

AURICULA CORNEA. A. testâ ovato-coniformi, translucidâ, transversim substriatâ, corneo-griseâ, spirâ brevi, obtusâ, saepe erosâ; aperturâ angustâ, elongatâ, columellâ biplicatâ, basi albâ, labro tenui, acuto.

Habite les marais salins des environs de New York. Petite coquille ovulaire, lisse, couleur de corne, à test mince et translucide; elle appartient à la section des Conovules; sa spire est courte et obtuse, son ouverture longue et étroite à un bord droit, simple et tranchant; vers la base, la columelle offre deux petits plis blancs, égaux et peu obliques. Cette petite coquille a 10 millim. de long et 6 de large. (Desh. in Lam. l. c.)

MELAMPUS CINGULATUS PFEIFFER.

PLATE LXXV. FIGURES 12, 13.

T. imperforata, fusiformis, solida, sublævigata, nitida, fusca, fasciis inæqualibus albidis cingulata; spira convexo-conica, acutè-mucronulata; sutura simplex; anfr. 10, superi planiusculi, perangusti, ultimus $\frac{2}{3}$ longitudinis fere æquans, basi attenuatus; apertura vix obliqua, angustissima, basi plica unica columellari valida, acuta, oblique ascendente bipartita; perist. simplex, acutum, margine dextro intus dentes 6-8, quorum infimum majorem, plicæformem, gerente. (Pfr.)

SYNONYMS AND REFERENCES.

Auricula cingulata PFEIFFER, in Wieg. Arch. f. Nat. 1840, i. p. 251.

CHEMNITZ, ed. 2, Auric. p. 40, t. 40, figs. 4-6.

Auricula oliva ORBIGNY, Moll. Cub. i. p. 189, t. 12, figs. 8-10.

Auricula stenostoma KÜSTER, olim, in Ind. fasc. 42, (teste Pfeiffer).

Melampus cingulatus PFEIFFER, Mon. Auric. Viv. p. 18.

Auricula JAY.

Melampus C. B. ADAMS, SHUTTL., POEY. } absq. descr.

Tralia H. & A. AD. }

DESCRIPTION.

Animal not hitherto observed.

Shell imperforate, fusiform, heavy and thick, shining, polished, with numerous microscopic revolving lines, most prominent on the last whorl; brownish, with numerous irregularly wide, white revolving bands; spire convex-

conic, terminating in an acute transparent point; suture simple; whorls 10, the upper ones flattened and narrow, the last one tapering towards the base, and equalling about $\frac{2}{3}$ the length of the shell; aperture hardly oblique, very narrow, divided at its base by a stout, sharp, columellar fold, which ascends and winds obliquely into the aperture; peristome simple, acute, armed within with from 6 to 8 elongated laminae, not quite reaching the edge of the lip, the lower one being most fully developed.

Length of the specimen before me, 11; breadth, 5; length of aperture, 6 millimetres.

Geographical Distribution. The only American specimen of this species I have seen, was collected in Florida by Mr. Bartlett. The species is also found in Cuba, Jamaica, and Porto Rico.

Remarks. This is one of the species common to the peninsula of Florida and some of the West Indian Islands. It is well known that very many marine shells are also common to the same localities, so that it is easier to account for its presence than that of some strictly terrestrial species.

The shell cannot readily be confounded with any other known American species. It is readily distinguished by its elongated form, and peculiar enamel-like surface, which reminds one of the highly polished *Olivæ*.

The figure referred to is copied from Orbigny's *Mollusca of De la Sagra's Cuba*.

MELAMPUS COFFEA LINNÆUS.

PLATE LXXV. FIGURES 21, 25.

Testa imperforata, conica, solidissima, lævigata, nitens, lineis volventibus microscopicis, et rugis lævigatis incrementi notata; sub epiderme griseâ, livida, fasciis 3-4 albis, unâ ad carinam obtusam latâ, alteris angustioribus, cineta; sutura mediocris, spira brevis, conica, apice nigrâ, acutâ, nitente; anfr. 9-10, superi planiusculi, ultimus obtusè-subcarinatus, $\frac{17}{19}$ long. testæ æquans; apertura subverticalis, longa, angusta, infra la-

tior, $\frac{1}{9}$ long. æquans; perist. simplex, intus callis 1-3 longitudinalibus, albis, crassis, liras 15-22 transversales, immitentibus armatum; paries aperturalis dentes duos, albidos, intrantes, (supero multo majori) gerens; columella callo brunneo, nitente, induta, laminâ unicâ, in aperturam ascendente, armata; anfr. interni absorpti.

SYNONYMS AND REFERENCES.

- Bulla coffea* LINNÆUS, Syst. Nat. x. p. 729.
Voluta coffea LINNÆUS, Syst. Nat. xii. p. 1187.
 SCHRÖTER, Einleit. ii. p. 200.
 GMELIN, Syst. Nat. xiii. p. 3438.
 DILLWYN, Descr. Cat. vol. i. p. 506.
Voluta minuta GMELIN, Syst. p. 3436, ex parte.
 DILLWYN, l. c. p. 506.
Auricula Mide parva, fusca, albo-fasciata MARTINI et CHEMNITZ, vol. ii. p. 119,
 pl. 43, fig. 445? (an potius Mel. flavus?)
Ellobium Barbadosense BOLTEX, Mus. Britt. p. 106, ed. nov. p. 74?
Bulinus coniformis BRUGUIÈRE, Encycl. Meth. i. p. 339.
Melampus coniformis MONTFORT, Conch. Syst. vol. ii. p. 318.
 LOWE, Zoöl. Journ. vol. v. p. 292.
 ADAMS, Contr. to Conch. p. 42, 186, (absq. descr.)
 SHUTTLEWORTH, Bern. Mitth. (absq. desc.)
Melampus fusca MÖRCH, Cat. Yold, p. 38, (teste Pfr.) (absq. desc.)
Melampus coffea MÖRCH, Cat. Yold, p. 38, (teste Pfr.) (absq. desc.)
Melampus coffeus ADAMS's Gen. Rec. Moll. vol. ii. p. 243, t. 82, figs. 7, 7 a, (absq. desc.)
 POEY, Mem. sob. Hist. p. 394, (absq. desc.)
Melampa minuta SCHWEIGGER, Handb. p. 739.
Tornatelle coniforme BLAINVILLE, Dict. Sc. Nat. pl. Malac. 54, f. 4.
Auricula coniformis FERUSSAC, Tab. Syst. p. 109, (absq. desc.)
 LAMARK, Hist. an. s. Vert. vol. vi.
 DESHAYES, in Lam. vol. viii. p. 332; ed. 3, vol. iii, p. 387.
 POTIEZ et MICHAUD, Gal. vol. i. p. 202.
 REEVE, Conch. Syst. ii. t. 187, f. 7, (teste Pfr.)
 SOWERBY, Conch. Man. p. 77, f. 298?
 CHEMNITZ, ed. 2; Auric. p. 31, t. 4, figs. 14-17.
 PETIT, Journ. Conch. ii. p. 427, (absq. desc.)
Auricula ovula ORBIGNY, Moll. Cub. vol. i. p. 187, t. 13, figs. 4-7, (1853).
Conovulus coniformis LAMARK, Encycl. Meth. t. 459, fig. 2, (absq. desc.)
 ANTON, Verz. p. 48, (absq. desc.)
 WOODWARD, Man. Moll. t. 12, f. 37; p. 173, (1854).
Conovulus coffeus BECK, Ind. p. 106, (absq. desc.)
Conovulus coffee GRAY, Turt. Man. p. 20, (absq. desc.)

DESCRIPTION.

Animal (from figure in Adams's Genera, copied on pl.

75, fig. 21) about the length of the shell; tentacles short, pointed, eyes at their interior base; proboscis extending beyond the head, bilobate, bluntly terminating; posterior termination of the foot short, bifid, color dark brown.

Shell imperforate, cone-shaped, very solid and heavy, smooth and shining in fresh specimens, with delicate wrinkles of growth, and very numerous microscopic revolving lines; light fawn-color when deprived of its russet epidermis, with three or four revolving bands of white on the body whorl, of which the uppermost is broadest; suture moderate; spire short, conic, apex black, shining, pointed; whorls from 9-10, the upper ones flattened, the last obtusely angulated below the suture, $\frac{17}{19}$ the length of the entire shell; aperture subvertical, long and narrow, gradually widening towards the base of the shell, about $\frac{16}{19}$ the entire length of the shell; peristome acute, not reflected, but thickened within by a heavy white callus, extending as high up as the carina of the body whorl; on this callus are from 15 to 22 white, transverse laminæ or ridges, not reaching the edge of the peristome, and not entering far into the aperture; sometimes there is a second and even third series of these laminæ visible within the aperture; on the parietal wall are two elevated, white, entering folds, the upper one much more prominent; the columella is covered with a shining, brown callosity, and furnished with one rather prominent fold, which commences at the termination of the peristome, and winds upwards into the interior of the shell; the interior whorls and axis are entirely absorbed.

Diameter of a large specimen, 10; length, 19 diameters.

Geographical Distribution. The only specimens I have seen were collected in Florida by Mr. Bartlett, more than ten years ago.

It is a well known and very common shell in the West Indies. Referred also to Mexico by Pfeiffer.

Remarks. Figure 25 of plate 75 is a fac-simile of Orbigny's figure of *Auricula ovula*. It is a good representation of our Florida shells.

West Indian specimens are well known in cabinets. I know of no American specimens, with the exception of the few collected by Mr. Bartlett.

Pl. 79, fig. 6, may represent a variety of this species. It is from Texas.

MELAMPUS FLORIDIANUS SHUTTLEWORTH.

PLATE LXXV. FIGURE 30.

T. imperforata, ventroso-fusiformis, tenuis, sublævigata, griseo-fulva; fasciis castaneis variè ornata; spira regulariter conica, acuta; sutura linearis; anfr. 10 plani, superiores radiato-striati, ultimus $\frac{2}{3}$ longitudinis formans, supernè obsoletè angulatus, versus basin valdè attenuatus; apertura subverticalis, angusta, utrinque angulata; plicæ parietales 2 minutæ, approximatae; plicæ columellaris valida, obliquè ad basin producta; perist. acutum, margine dextro (in adultis) intus plicis albis transversis subæqualibus munito, columellari brevi, calloso. (Pfr.)

SYNONYMS AND REFERENCES.

Auricula Floridiana SHUTTLEWORTH, MSS.

Melampus Floridianus (Tralia) ADAMS, Proc. Zool. Soc. 1854, ii. (absq. desc.)

PFEIFFER, Malak. Blatt. 1854; Mon. Auric. Viv. 36.

Tifata Floridiana ADAMS, Gen. Rec. Moll. ii. 245, absq. desc.

DESCRIPTION.

Animal not observed.

Shell imperforate, ventricose, fusiform, thin, smooth, grayish, with varying chestnut bands; spire regularly conic, acute; suture linear; whorls 10, flattened, the upper ones radiately striate, the last comprising $\frac{2}{3}$ of the length of the shell, obsoletely angulated above, and very much smaller at its base; aperture subvertical, narrow, angular; 2 parietal plicæ, one strong, one on the columella, obliquely continued towards the base; peristome acute, its right side in adult specimens armed with transverse,

white, subequal folds, its columellar portion both short and callous.

Length, $7\frac{1}{2}$; diameter, $4\frac{1}{3}$; aperture in length almost 5, in breadth $1\frac{1}{3}$ millimetres.

Geographical Distribution. Florida Keys. (Bartlett.)

Remarks. Pfeiffer compares it with *Mel. cingulatus*. It appears to me easily distinguished from that and the other species of the United States.

MELAMPUS FLAVUS GMELIN.

T. imperforata, obconica, lævigata, castanea, fasciis 3 angustis pallidis ornata; spira brevis, convexo-conoidea, mucronata; sutura linearis; anfr. 9-10, superi planiusculi, ultimus $\frac{3}{4}$ long. fere æquans, basi arcuato-cristatus; apertura subverticalis, angusta, basi angulata; plica 1 parietalis profunda; plica columellaris valida, subverticalis, ad basim porrecta; perist. rectum, acutum, margine dextro fusco-labiato, intus albo-callosa, costis sub 10 transversis, brevibus! munito, columellari callosa, dilatato. (Pfr.)

SYNONYMS AND REFERENCES.

- LISTER Hist. t. 834, fig. 60.
 FAYANNE Conch. t. 65, fig. H, i.
Auricula Mide parva, &c. MART. and CHEMN. ii. p. 119, 126, t. 43, f. 445.
Voluta n. 106, SCHRÖTER, Einl. i. p. 272.
Voluta flava GMELIN, Syst. p. 3436, No. 5.
 DILLWYN, Cat. i. p. 506, n. 17.
Voluta flammea γ GMELIN, l. c. 3435, n. i.
Bulinus monile BRUGUIERE, Encycl. Meth. i. p. 338, n. 70.
Melampa monile SCHWEIGGER, Handb. p. 739.
Conovulus monile GOLDFUS, Hand. p. 657.
Conovulus flavus ANTON, Verz. 1776.
Auricula monile FERUSSAC, Podr. p. 105.
 LAMARK, Hist. vi. 2, p. 141: ed. Desh. viii. p. 333.
 KÜSTER in Chemn. ed. 2, Auric. p. 30, pl. iv. figs. 7-9.
Auricula flava DESHAYES in Lam. viii. p. 33.
 PETIT, Journ. Conch. ii. 1851, p. 427.
Auricula coniformis ORBIGNY, Cuba.
Melampus monile LOWE, Zool. Journ. v. p. 292.
 BECK, Ind. p. 108.
Melampus minutus β BECK, l. c. 107.
Melampus flavus ADAMS, Contr. p. 42, 186.
 POEY, Mem. i. 394.
 PFEIFFER, Mon. Auric. Viv. 21.

Melampus torosa MÖRCH, Cat. Yold. p. 38.

Melampus moullis SHUTTLEWORTH, Diagn. No. 7, p. 162.

DESCRIPTION.

Animal not observed.

Shell imperforate, obconic, smooth, chestnut-colored, with 3 light, narrow bands; spire short, convex conic; suture slightly impressed; whorls from 9 to 10, the upper ones flattened, the last about equalling $\frac{3}{4}$ of the length of the shell, arcuately ridged below; aperture subvertical, narrow, angulated below; one deep parietal fold, one subvertical, stout columellar fold, extended towards the base; peristome straight, acute, its outer margin reddish, thickened with white within and furnished with 10 short, transverse ribs, its columellar portion expanding and callous.



Length, 12; breadth, $8\frac{2}{3}$; length of aperture, $9\frac{1}{2}$; breadth at the middle, 3 millimetres.

Geographical Distribution. Collected in Florida by Mr. Bartlett.

Remarks. This species is a well known inhabitant of the West Indian Islands, but whether its presence in Florida is accidental or not, I cannot say. It is readily distinguished from the other Florida species.

The synonymy is Pfeiffer's.

MELAMPUS OBLIQUUS SAY.

Obconic, reddish brown, rather thick; spire very little elevated; whorls eight or nine, wrinkled across; labium with two very distinct teeth, and an intermediate and equidistant slight obtuse prominence; inferior tooth very oblique, terminating at the base; labrum with about eight teeth or striæ, which terminate on the margin; base of the aperture a little contracted by the basal tooth.

Length more than seven twentieths of an inch. I am indebted to Mr. Stephen Elliott for this species, who obtained it on the coast of South Carolina. It is closely allied to *Bulinus monile* Brug., but it has no appearance of bands, which distinguish that shell. In the collection of the Academy are specimens from the West Indies. (Say.)

SYNONYMS AND REFERENCES.

Melampus obliquus SAY, Journal Acad. Nat. Sc. Phila. vol. ii. p. 377, (Dec. 1822);
Binn. ed. p. 27.

PFEIFFER, Mon. Auric. Viv. p. 30.

Auricula obliqua DEKAY, N. Y. Moll. p. 58.

Melampus BECK, *absq. desc.*

Remarks. It is not now known what shell Say had in view when the above description was written. No authentic specimen is preserved, and no author has seen any shell from that locality answering to the characters laid down. DeKay mentions it among the extra-limital species in his report, his words being nearly a repetition of Say's. Pfeiffer repeats Say's words, and suggests the identity of the species with *Melampus coffea*. Say being familiar with that shell (*M. coniformis*, vid. ed. Binn. p. 85), it seems hardly probable he would have described a variety of it.

The question must remain undecided until we are better acquainted with the species of the South Carolina coast.

MELAMPUS PUSILLUS GMELIN.

PLATE LXXV. FIGURE 29.

Testa imperforata, elongato-ovata, solida, nitens, levigata, lineis microscopiacis ventribus notata; rufa, fasciis indistinctis magis candidis cineta; sutura non valdè impressa; spira elongato-conica, apex nigra, acuta, nitens; anfr. 6-7, superi planiuseuli, ultimus obtusè angulatus, ad basin regulariter attenuatus, $\frac{1}{2}\frac{8}{3}$ testæ long. æquans; apertura subverticalis, supra angusta, infra rapidè dilatans, testæ long. $\frac{1}{2}\frac{5}{3}$ æquans; perist. simplex, acutum, intus callosum et plicam obtusam intus positam gerens, margine basali appresso et in plicam columellarem intrantem ascendente;

paries et columella callo nitente induta; dentes parietales duo, intrantes, albidii, infero magiori; septæ internæ absorptæ.

SYNONYMS AND REFERENCES.

- Auricula Mide parva fusca unicolor* MARTINI and CHEMNITZ, vol. ii. p. 119, t. 43, f. 446.
FAVANNE, t. 65, f. H. 4, (teste Pfr.)
- Voluta* n. 108 SCHRÖTER, Einl. i. p. 273.
- Voluta pusilla* GMELIN, Syst. p. 3436, (teste Pfr.)
DILLWYN, Cat. i. p. 507.
WOOD, Index, t. 19, fig. 20.
- Voluta triplicata* DONOVAN, Brit. Shells, vol. v. pl. 138, (1808).
MONTAGU, Test. Brit. Suppl. p. 99.
DILLWYN, Cat. p. 507.
WOOD, Ind. pl. 19, f. 19.
- Bulimus oculus* BRUGUIERE, Encycl. Meth. i. p. 339.
- Melampa oculus* SCHWEIGGER, Handb. p. 739, (teste Pfr.)
- Auricula ovula* (*Conorula*) FERUSSAC, Tabl. Syst. p. 108, (absq. desc.)
- Auricula nitens* LAMARK, An. s. Vert. vol. vi. 2, p. 141.
DESHAYES in Lam. vol. viii. p. 332; ed. 3, vol. iii. p. 387.
CHEMNITZ, ed. 2, Auric. p. 18, pl. ii. f. 11-13.
- Auricula pusilla* DESHAYES in Lam. vol. viii. p. 332.
JAY, Cat. (absq. desc.) p. 265.
- Auricula leucodonta* NUTTALL, mss. teste H. et A. ADAMS.
- Conorulus nitens* VOIGHT in Cuv. Thierr. III. p. 112, (teste Pfr.)
- Conorulus pusillus* ANTON, Verz. p. 48.
FORBES and HANLEY, Brit. Moll. vol. iv., p. 197, (absq. desc.)
- Melampus pusillus* C. B. ADAMS, Contr. Conch. p. 42, 186, (absq. desc.)
PFEIFFER, Monog. Auric. Viv. p. 48.
POEY, Mem. i. p. 394, (absq. desc.)
SHUTTLEWORTH, absq. desc.
- Pythia orulum* BECK, Ind. p. 104, (teste Pfr.)
- Pythia triplicata* BECK, Ind. p. 104, (teste Pfr.)
- Tralia pusilla* GRAY in Turt. Man. p. 21, (absq. desc.)
H. et A. ADAMS, Gen. Rec. Moll. vol. ii. (Sept. 1855,) p. 244, pl. 82, f. 8.
- Tralia orulum* MÖRCH, Cat. Yold. p. 38, (teste Pfr.) absq. desc.

DESCRIPTION.

Animal not observed.

Shell imperforate, lengthened ovate, solid, shining, smooth, marked with microscopic revolving lines, most easily detected on the spire; reddish-brown, with lighter, hardly perceptible revolving bands; suture moderate, less ragged than in the other species; spire elongate-conic;

apex acute, shining, black; whorls 6-7, the upper ones flattened, the body whorl obtusely carinated, regularly decreasing in diameter towards the base, and equalling about $\frac{13}{23}$ the length of the shell; aperture subvertical, narrow, rapidly widening towards its base, and equalling in length about $\frac{15}{23}$ of the entire shell; peristome simple, acute, within thickened by callus, and furnished with a rather blunt, short, transverse, not very prominent lamina; the basal termination of the peristome is appressed to the shell, and imperceptibly terminates in a columellar lamina which ascends and winds into the aperture; the columella and parietal wall are covered with a shining callus; there are two parietal teeth, which are white, and enter into the aperture of the shell, the lower one being much the smaller. Internal septæ absorbed.

Greatest diameter, 5; length, 11 millimetres.

Geographical Distribution. The only American specimens I have seen are in my collection. I detected them among minute marine shells and sand, collected in Florida by Mr. Bartlett.

Remarks. This species is well known in cabinets by specimens from the West Indian Islands, in several of which it exists. Pfeiffer also refers it to the Sandwich Islands.

The shell resembles an *Oliva*. It is readily distinguished by its polished, mahogany-colored shell. It varies less than most of the *Melampi*.

MELAMPUS REDFIELDI PFEIFFER.

T. subrimata, ovata, solidula, striatula, nitidula, albida, fasciis variis spadiceis plerumque interruptis subtessellata; spira brevis, convexo-conoidea, acuta; sutura vix impressa; anfr. 9-10, planiusculi, ultimus $\frac{3}{4}$ longitudinis fere formans, supernè obsoletè angulatus, basi attenuatus; apertura vix obliqua, oblonga, supra basin subdilatata; plicæ parietales 2, supera major, transversa, altera approximata, dentiformis; plica columellaris acuta, arcuatim in marginem basalem continuata; perist. simplex,

margine dextro supernè subsinuato, tum fere strieto, intus serie profundâ plicularum brevium, confertissimarum munito, columellari calloso, albo, subappresso. Long. 12, diam. max. 7 mill. Ap. 10 mill. longa, medio $2\frac{1}{2}$ lata. (Pfr.)

Remarks. This species is inserted with some doubt among the American *Melampi*. Some immature specimens found in Florida cannot be referred to any of the other species I have enumerated. Having sent them to Mr. Redfield, he writes me that they do not in any way differ from immature specimens of *Melampus Redfieldi*, which he has from Bermuda.

The above description is from the Monograph of *Auriculacea*, p. 35.

SPURIOUS SPECIES.

Melampus borealis Conrad, I have referred to *Alexia myosotis*.

Melampus denticulatus Stimpson, is also identical with *Alexia myosotis*.

SUBFAMILY AURICULEA.

Animal terrestrial, living in moist localities; shell with an expanded or thickened peristome. (Pfr.)

It forms the subfamily *Ellobiinae* of Adams's Genera.

The American genera are as follows:—

GENUS AURICULA LAMARK.

No species of this genus, as restricted by Pfeiffer, is found in the United States. The following list contains all the species described as *Auriculæ*, and the position in which they are now classed.

Auricula bidentata Gld., &c. is the same as *Melampus*.

A. biplicata Desh. is the same as *Melampus bidentatus*.

A. cingulata Pf. &c. is the same as *Melampus cingulatus*.

A. coniformis Fer. is the same as *Melampus coffea*.

A. cornea Desh. is the same as *Melampus bidentatus*.

- A. denticulata* Gld., DeK. is the same as *Alexia myosotis*.
A. Floridianus Shutt. is the same as *Melampus Floridianus*.
A. Jaumei Mitre is the same as *Melampus bidentatus*.
A. nitens Lam. is the same as *Melampus pusillus*.
A. obliqua DeK. is the same as *Melampus obliquus*.
A. oliva Orb. is the same as *Melampus cingulatus*.
A. pusilla Desh. is the same as *Melampus pusillus*.
A. Sayii Küster is the same as *Leuconia Sayii*.
A. stenostoma Küster is the same as *Melampus cingulatus*.

GENUS ALEXIA LEACH.

Shell oblong-ovate, thin, spire pointed; last whorl large, rounded at base; aperture rather broad, oval, acuminate; parietal wall furnished with from 1 to 5 tuberculous laminae; columellar fold oblique; peristome expanded, armed with teeth, or thickened within. (Pfr.)

The species of this genus are truly terrestrial, though many authors consider them marine.

We have but one species, *A. myosotis*. The figure of its animal given on pl. 79, fig. 16, will be found to differ somewhat from the figure given in Adams's Genera, which I have copied on pl. 75, fig. 22.

ALEXIA MYOSOTIS DRAPARNAUD.

PLATE LXXV. FIGURE 33. PLATE LXXIX. FIGURE 16.

T. minutè perforata, elongato-ovata, tenuis, lævigata, nitens; cornea lineâ rufâ suturalis cincta; spira producta, apice acuta; sutura impressa; anfr. 7-8, superi convexiusculi, ultimus elliptico-ovatus $\frac{5}{7}$ longitudinis testæ æquans; apertura ovata, subverticalis, $\frac{4}{7}$ long. testæ æquans; perist. tenue, acutum, margine dextro interdum intus armato, basali, appresso, reflexiusculo, in plicam columellarem intrantem ascendente; paries aperturalis plicis duobis albis armata, superâ parvulâ, alterâ erectâ, acutâ, transversim intrante.

SYNONYMS AND REFERENCES.

Auricula myosotis DRAPARNAUD, &c.

Auricula denticulata GOULD, Invert. of Mass. p. 199, fig. 129, (excl. *Voluta denticulata* Mont. et syn. suis.) nec MONTFORT.

Auricula denticulata DEKAY, N. Y. Moll. p. 58. pl. v. figs. 91, 93, (excl. *Voluta denticulata* Mont. et. syn.) nec MONTFORT.

Melampus denticulatus STIMPSON, Shells of N. E. p. 52, (absq. desc.) excl. syn. Mont.

Melampus borealis CONRAD, Am. Journ. Sc. vol. xxiii. p. 345, (1833).

Alexia myosotis H. et A. ADAMS, Gen. Rec. Moll. vol. 2, p. 241, (Sept. 1855,) absq. desc.

PFEIFFER, Mon. Auric. Viv. p. 148.

DESCRIPTION.

Animal short, about one half the length of the shell, dirty white, darker on the head and tentacles; eyes black, placed at the inner base of the feelers; feelers quite short, wrinkled, bulbous at tip, sufficiently dark to be visible through the thin shell when the animal withdraws itself; head continued beyond the tentaculæ into an obtuse, short, bilobed snout; the shell is carried horizontally on the animal's back; the obtusely pointed posterior termination of the foot is just visible beyond the shell; the animal is sluggish in its movements. See plate.

Shell elongate-oval, thin, semi-transparent, smooth and shining; dark horn-color, with a narrow reddish sutural line; spire produced with an acute apex; suture distinctly impressed; whorls from 7 to 8, the upper ones rather convex, the last one elliptically ovate, equalling $\frac{5}{7}$ of the shell's length; aperture subvertical, about $\frac{4}{7}$ the length of the shell; peristome thin, sharp, sometimes furnished with tooth-like folds on its inner side; its basal termination appressed to the shell, slightly reflected over a minute perforation, and turning upwards till it blends with the columellar fold, which winds into the aperture; the parietal wall is furnished with a white, transverse, thin, and sharp denticle, and a second smaller, much less prominent one, placed above it.

Greatest diameter 4, length 8 millimetres.

Geographical Distribution. Found in Massachusetts Bay, (Gould, Stimpson, Tufts); New York harbor, (De-

Kay); Rhode Island, (Conrad?) It is also a well-known inhabitant of parts of the coasts of England, France, Spain, &c.

Remarks. I have placed this shell in this genus on the authority of Pfeiffer and of Adams Genera. It has been placed in many different genera by European authors. In America it has been considered an *Auricula* by Gould and others, until Stimpson classed it among the *Melampi*. From the exterior of the animal there appears no difference between it and *Melampus bidentatus*. It does not even agree with the animal of *Alexia*, given by Adams in the Genera of Recent Mollusca, which I have copied on pl. 75, fig. 22. This figure represents the true *Alexia denticulata* Montfort, with which Gould confounds this species. The shell is also quite distinct. It is, however, united to *Alexia myosotis* by Forbes and Hanley, in their work on British Mollusca. Pfeiffer considers them distinct.

It is probably an imported species, as Stimpson remarks, (l. c.,) being found only in the Atlantic seaports. At Boston it is common on the piers of the wharves in the harbor. It is also found on isolated stones which are immersed by the rising tide at least four hours out of the twelve. When placed in fresh water it becomes benumbed and dies.

There can be no doubt of *M. borealis* Conrad being identical with this species. Conrad's description is given below, as is also a description of it found among Say's manuscripts, but never published.

DeKay also says :

The *borealis* of Jay's Cat., of an olive-green color, an elevated apex, and with slightly impressed sutures, with a thin transverse tooth above and a small sinous tooth beneath, I suppose to be a young variety of the above described species, (*A. myosotis*).

MELAMPUS TURRITUS. Ovate-acute, polished, dull whitish; spire prominent, tapering, of eight whorls; aperture rather wide, not longer

than the spire; labium two-toothed; lower tooth small; labrum without teeth. Length one fifth of an inch. Inhabits Rhode Island.

This species is remarkable for the elevation of its spire, and it is the smallest species I have seen, and was presented to me by Dr. Griffith. (Say).

MELAMPUS BOREALIS. Shell ovate-acute, elongated; pale horn-color, with darker longitudinal bands; whorls 6 or 7, with a revolving impressed line below the suture; spire elevated, conical; columella with three distant and distinct plaits, the middle one most prominent; aperture obovate-acute. Length, about one fourth of an inch.

This small species of *Melampus* has been found sparingly on the coast of Rhode Island, by Lieut. Brown of Newport. It is similar in form to a *Bulimus*, and is very unlike the common species with which it associates. (Conrad).

GENUS BLAUNERIA SHUTTLEWORTH.

Shell imperforate, oblongly turreted, thin; aperture narrow, elongated; parietal wall with one fold near the columella, which is subtruncated; peristome simple, not reflected. (Pfr.)

This genus was proposed for the following species. Its habits and the characteristics of the animal remove it from *Achatina* and *Oleacina*, where it was formerly placed.

BLAUNERIA PELLUCIDA PFEIFFER.

PLATE LIII. FIGURE 2.

Testâ sinistrorsâ, ovatâ, elongatâ, hyalinâ, politâ, dilutè corneâ; spirâ obtusâ, anfractibus ad septem convexiusculis; suturâ lineari; aperturâ angustâ, labro acuto; columellâ brevi, lamellâ intus decurrente superne instructâ. (Gld.)

SYNONYMS AND REFERENCES.

Achatina pellucida PFEIFFER, in Wieg. Archiv. 1840, i. 252.

GOULD in Binn. Terr. Moll. ii. 294.

Tornatellina Cubensis PFEIFFER, Symb. ii. 130; Monog. Helic. Viv. ii. 391.

CIEMNITZ, ed. 2, Pupa. p. 151, pl. xviii. figs. 16, 17.

Blauneria pellucida PFEIFFER, Malak. Bl. 1854; Mon. Aunc. Viv. 153.

Ostomia? Cubensis POEY, Mem. i. 394.

Oleacina Cubensis ADAMS, Gen. ii. 106, absq. desc.

DESCRIPTION.

Animal not observed.

Shell sinistral, ovate-lanceolate, acuminate, pellucid, highly polished and glistening. Whorls seven, very oblique, scarcely convex, the last one somewhat ventricose towards the base, about two thirds the length of the shell. Aperture narrow ovate, acutely prolonged posteriorly; lip simple; turning up the columella it becomes thickened, and winds into the aperture in the form of a tooth-like lamella.

Length one tenth of an inch; breadth one thirtieth of an inch.

Geographical Distribution. Found in Florida, among small shells drifted in the sand.

Dr. Foreman collected a few specimens in a garden of Washington city. He believes them to have been brought on plants from Charleston, S. C.

It has been detected in Cuba, Jamaica, and Porto Rico, and has been introduced into England.

Remarks. Perhaps no shell has rejoiced in more numerous and longer names, both generic and specific, than this minute one. Nor has the true station of any one been more difficult to decide. It is now, however, acknowledged to be air-breathing, and amphibious in its habits.

Binney is the only American author who mentions its existence in this country. He places it under *Achatina*. Gould, in Terr. Moll., leaves it in that genus provisionally, mentioning the doubt existing concerning it.

Shuttleworth in letters to Bland adds to the synonymy.

Voluta heteroclita MONT., LASKEY.

Acteon heteroclita FLEMING.

Auricula heteroclita THORPE.

Tornatella? heteroclita FORBES & HANLEY.

Should he be correct, the species would stand, by the rule of priority, as *Blauneria heteroclita* (*Voluta*) Mont.

This species is readily distinguished among the fine sand, shells, &c., washed ashore in Florida, by its bright, shining surface, and reversed form. All the specimens I have seen were collected by Mr. Bartlett more than ten years ago, excepting those found by Dr. Foreman.

GENUS LEUCONIA GRAY.

The following species is doubtfully referred to this genus by Küster and Pfeiffer. But, as observed in the remarks, it is very doubtful whether the genus exists at all in this country.

LEUCONIA (?) SAYII, KÜSTER.

PLATE LXXV. FIGURE 34.

A. testa minima, conico-ovata, nitida, cornea, striata; spira acuta, latè conica, anfr. 6 convexiusculis; apertura oblonga, columella buplicata.

Eine der kleinsten Arten. Das Gehäuse ist dünnwandig, stark durchscheinend, regelmässig gestreift, seidenglänzend, hornfarben; das Gewinde hoch, breit kegelförmig, im Allgemeinen in der Mitte convex, der Wirbel fein zugespitzt, die einzelnen Windungen sind niedrig, flachgewölbt, durch eine etwas vertiefte Naht vereinigt. Hauptwindung ziemlich gross, bauchig, unten verschmälert; Mündung länglich, zugespitzt, nach unten erweitert; Mundsaum dicht anliegend, geschweift absteigend, geradeaus, stumpf zugeschärft; Spindelsäule mit geringem Umschlag und zwei weissen Falten, die obere ist zahnartig zugeschärft, die untere tritt schief heraus und geht unmittelbar in den Rand des Mundsaums über. Zuweilen bemerkt man oberhalb noch eine kleine faltenartige Schwielle, jedoch nur bei ganz alten Exemplaren. Höhe $2\frac{1}{2}'''$, Breite $1\frac{1}{2}'''$.

Aufenthalt: in den vereinigten Staaten von Nordamerika.

SYNONYMS AND REFERENCES.

Auricula Sayii KÜSTER, in Chemnitz, ed. 2, Auric. p. 42, pl. vi. figs. 14, 15.

Leuconia Sayii H. et A. ADAMS, Gen. Rec. Moll. vol. ii. p. 248, 1855, (absq. desc.)

PFEIFFER, Mon. Auric. Viv. p. 157.

Remarks. The above is Küster's description. The figure to which I refer is a fac-simile of one of his. This is the only information I have been able to obtain with regard to the species. It has not been described by any other author but Pfeiffer, who merely quotes the above description, not having ever seen the shell.

Küster's figure represents no known American shell; there exists, however, a strong resemblance between it and his figure of *Alexia myosotis*. His original specimen may have been a variety of that species.

Pfeiffer compares the species with *Melampus infrequens* Ad.

GENUS CARYCHIUM MÜLLER.

Shell pupa-shaped, very thin, transparent, with but few whorls; aperture suboval; with one dentiform columellar fold, sometimes obsolete; parietal wall with 1 or 2 teeth; peristome expanded, terminations not approximating, the right hand one with one internal tooth. (Pfr.)

See the remarks under the following species.

CARYCHIUM EXIGUUM SAY.

PLATE LIII. FIGURE 1.

C. testâ minutissimâ, albâ, fusiformi, sub-acuminatâ; anfractibus quinque vel sex, obliquis, convexis; aperturâ obliquâ; columellâ dente albo ornatâ; labro albo, reflexo.

SYNONYMS AND REFERENCES.

- Pupa exigua* SAY, Journ. Acad. ii. 375; ed. Binn. p. 26.
 GOULD, Boston Journ. iii. 398, pl. 3, f. 20. Invertebrata, 191, f. 120.
 DEKAY, New York Report, 31; Fauna, 49, pl. iv. fig. 46.
 ADAMS, Vermont Mollusca, 8.
- Bulimus exiguus* BINNEY, ii. 286.
- Carychium exiguum* GOULD, in Terr. Moll. ii. 286.
 CHEMNITZ, ed. 2, p. 61, pl. i. figs. 13, 14.
 STIMPSON, Shells of N. E. p. 52, (absq. desc.)
 FRAUENFELD, 1847, Akad. der Wiss. xix. p. 79; Zoöl. Bot. Wien, iv. p. 10, pl. 1, fig. 1.
 BOURGIGNAT, Mag. Zoöl. 1857, p. 209.
- Carychium exile* H. C. LEA, Am. Journ. 42, 109, pl. i. fig. 5.
 TROSCHER, Ar. f. Nat. 1843; ii. 128.
- Carychium existelium* BOURGIGNAT, l. c. p. 220.
Carychium euphæum BOURGIGNAT, l. c. p. 221.

DESCRIPTION.

Animal colorless; tentaculæ stout, hyaline, one third the length of the foot, the upper pair alone developed. The foot is short, thick, distinctly divided into two segments, the anterior of which is bilobed, and projects, when the animal is in motion, considerably in advance of the head. Eyes oval, situated on the back, near the base of the tentacles. Its motions are very sluggish. It carries the shell directed horizontally; the shell is so transparent that the viscera of the animal may be seen through it. (Compare the figures of the animal on plate 53.)

Shell elongated, tapering at both ends, white, translucent, shining; apex rather obtuse; whorls five to six, convex, very oblique, with transverse striæ; suture distinct, impressed; aperture obliquely oval, white, with a prominent plait on the columellar margin, about midway between the extremities of the lip, and a slightly prominent fold near the junction of the lip with the umbilical extremity of the shell; lip thick, reflected, flattened; umbilicus perforated.

Length, one fifteenth; breadth, one fortieth of an inch.

Geographical Distribution. Common in all the Northern and Middle States (Binney), in Ohio (Kirtland, Anthony, Higgins), and Arkansas (Gould), New York (DeKay, Lewis), Michigan (Winchel), Massachusetts (Gould, &c.), Connecticut (Linsley), Maine (Mighels), Pennsylvania (H. C. Lea), Texas (Röemer).

Remarks. The extreme minuteness of this shell has doubtless prevented its being noticed in many localities where it exists. It probably inhabits a very wide range of territory. The plane of the aperture is not so nearly parallel with the axis as in *Bulimus subula*. It has been said to resemble *Carychium minimum* of Müller, but neither the figure nor description, as given by Draparnaud, correspond with our shell.

It is found under stones and fragments of wood, and especially among moss, in damp places. Though found far removed from the influence of the sea over a wide extent of country in the interior, it still possesses a fondness for the sea in common with the other species of the family. Around Boston they are found at or below the surface in swamps, growing among mosses.

It is the only species of this family inhabiting the interior.

This minute shell is well known in American cabinets as a *Pupa*. Say described it as such in 1822, though he mentions the probability of its being a *Carychium*. It has been described since that time as a *Pupa* by Gould, DeKay, and Adams, and catalogued among the species of the same genus by all the American writers who have mentioned it, until 1851, when its correct position was pointed out by Stimpson and Gould. The former places it in his family of *Melampidæ*. The latter thus writes:—

“This shell should be removed to another family, under the name of *Carychium exiguum*. Besides the peculiar structure of the shell, and the form of its aperture, the position of the eyes of the animal plainly remove it from the true *Helicidæ*, and associate it with the *Auriculidæ*. Its habits, and the characters of the shell, also indicate the same relation.”

Dr. Binney, in 1843, (Boston Journal, p. 106,) considers it a *Pupa*. In his great work he places it under *Bulimus*.

Notwithstanding its distinct generic peculiarities having been pointed out in 1851, we find the shell considered as a *Pupa* in several American catalogues as late even as 1857; (vid. Boston Proc. vi. p. 128.)

In 1852, Jay removed it from *Pupa* to *Carychium*; (Cat. p. 263.)

In Europe, we find its true position pointed out by

Pfeiffer as early as 1841, and adhered to by subsequent writers.

I have added to the synonymy of this species *Carychium exile* H. C. Lea, a shell I have never seen. Dr. Gould has expressed the same opinion; (Bost. Proc. i. p. 61.) Though there seems to me no room for doubt of the justness of this decision, I add the description of Mr. Lea, as well as a somewhat reduced copy of his figure (pl. 75, fig. 23) of the aperture.

I add also a copy of M. Bourignat's description of *C. existelium* and *C. euphæum*. Persons may thus judge for themselves whether my decision is correct. I have not seen authentic specimens.

CARYCHIUM EXILE (pl. 1, fig. 5). C. testâ ovato-conicâ, valdè elevatâ, subperforatâ, diaphanâ, albidâ, longitudinaliter striatâ; spirâ obtusâ; anfractibus senis, convexis; suturis impressis; aperiturâ ellipticâ, integrâ, dentibus tribus; labio valdè reflexo.

Shell ovately conical, much elevated, subperforate, diaphanous, whitish, longitudinally striate; spire obtuse; whorls six, convex; sutures impressed; mouth elliptical, entire, with three teeth; lip much reflexed. Length, .075; breadth, .025 of an inch.

Hab. Under dead leaves and mould, on the Wissahiccon Creek, near Philadelphia. Cabinet of I. Lea.

Remarks. This beautiful little shell bears a strong resemblance to the *Pupa exigua* of Say, and it is with some doubt that I propose it. The chief points in which it differs from that shell are the following. The lip is continuous round the mouth, and not interrupted by the last whorl, as is the case with the *Pupa*, thus being a true *Carychium*; the lip is flattened, the number of whorls is greater, there is a tooth on the outer lip, the size is smaller, and the shape more elongated. It also nearly approaches the *Carychium minimum* Leach, a European shell, but may be easily distinguished by its striæ, shape, number of whorls, perforation and teeth. The tooth on the outer lip is very variable, being sometimes almost obsolete, and sometimes larger than those on the inner one. Of the two teeth on the inner lip, one is placed at the middle, and

the other very near the base of the mouth, and so far in as to be almost invisible on a front view. The mouth is .02 of an inch in length. It appears to be the only true *Carychium* yet found in the United States, its small perforation, hardly amounting to an umbilicus, not being sufficient to separate it from that genus. In its shape and mouth it strongly resembles the genus *Clausilia*, but it wants the clausum, the distinctive mark of that curious and interesting genus. I have only met with it on the Wissahiccon, where it does not seem to be very common.

CARYCHIUM EXISTELIUM. Testa vix rimata, elongato-turrita, hyalina, lævi, vel vix striatula; spira elongata, acutiuscula; anfr. 6 convexis; ultimo $\frac{1}{3}$ longitudinis æquante; apertura parum obliqua, ovata, paululum parvula; pariete aperturali prope columellam dente minutissimo munito; peristomate reflexo; margine externo paululum intus inflexo.

Coquille turriculée, très-allongée, hyaline, lisse ou à peine striée, et munie d'une fente ombilicale peu sensible. Spire allongée, à sommet aiguë. Six tours très-convexes, dont le dernier égale le tiers de la longueur totale. Ouverture peu oblique, ovale, proportionnellement petite, ornée seulement d'une seule denticulation peu sailante située près de la columelle. Péristome réfléchi. Bord extérieur un peu infléchi en dedans.

Long. $2\frac{1}{2}$ mill.; diam. $\frac{3}{4}$ mill.

Habite les États-Unis d'Amérique. Nous ne connaissons point la localité précise où a été recueilli ce Mollusque.

Le *Carychium existelium* se distingue du *Carychium exiguum*, avec laquelle il peut être assimilé, par sa taille plus élancée, plus grêle; par sa bouche moins dilatée et munie d'une seule denticulation située sur la paroi aperturale, vers l'insertion de la columelle; par sa columelle lisse; par sa suture plus prononcée; par son dernier tour de spire, qui égale le tiers de la longueur et qui ne le dépasse point comme dans l'*exiguum*.

CARYCHIUM EUPHÆUM. Testa vix rimata, elongato-turrita, hyalina, lævi; spira acuminato-acutiuscula; anfr. 5 convexiusculis; ultimo $\frac{1}{3}$ longitudinis superante; apertura parum obliqua, oblonga; pariete aperturali denticulo mediano adornato; peristomate leviter labiato, reflexo; margine externo intus inflexo.

Coquille allongée, turriculée, hyaline, lisse, à peine pourvue d'une

fente ombilicale. Spire acuminée, aiguë. Cinq tours un peu convexes, dont le dernier surpasse le tiers de la longueur totale. Ouverture peu oblique, oblongue; paroi aperturale munie, vers le milieu, d'une seule denticulation assez forte. Péristome légèrement bordé et assez réfléchi. Bord extérieur infléchi en dedans.

Long. $1\frac{3}{4}$ de mill. ; diam. $\frac{3}{4}$ mill.

Habite les États-Unis d'Amérique.

Le *Carychium euphæum* peut être rapproché des *Carychium existelium* et *exiguum*.

1°. On le distinguera de *l'existelium* à sa taille plus faible, à sa spire plus aiguë, à son ouverture proportionnellement plus dilatée, à sa paroi aperturale ornée, vers son milieu, d'une petite denticulation; à son péristome plus réfléchi et plus épaissi, etc.; enfin à ses cinq tours de spire, etc. etc.

2°. On le séparera de *l'exiguum* à sa taille également plus faible, à son ouverture munie seulement d'une seule denticulation, tandis que celle de *l'exiguum* en possède deux, à son péristome plus épaissi, plus réfléchi, à sa spire plus aiguë, etc. etc.

SPURIOUS SPECIES.

Carychium armigera, *contracta*, and *rupicola* of Say (l. c.) are now ascertained to be true *Pupæ*, as he suggested they might be; as is also *Carychium corticaria* Ferussac, (Tabl. Syst.)

PNEUMONOPOMA.

The above named order includes all the following families. The animals which compose it are distinguished from those of the preceding families of *Limacea*, *Helicea*, and *Auriculacea*, by the presence of an operculum, which is affixed to the foot and covers the aperture of the shell when they are withdrawn in it. They are terrestrial, breathing air by means of organs analogous to lungs. They are also unisexual, and have but two contractile instead of retractile tentacles, at the base of which are situated two eyes. The mantle is sometimes, though not always, free.

This order is made well known by the genera *Cyclostoma* and *Helicina*. It contains many other foreign genera, but these two and *Truncatella* are the only ones inhabiting the United States.

It is divided by Pfeiffer into two suborders: *Opisophthalma* and *Ectophthalma*, respectively characterized by the eyes being placed behind the base of the tentacles, and at their external base. The

SUBORDER OPISOPHTHALMA

is characterized as above, and contains one family only, the

FAMILY ACICULACEA.

In addition to the characters of the order, it has a thin spiral operculum and few whorls. It contains the European genus *Acicula*, and the genus *Geomelania*, of Jamaica, as well as *Truncatella*, which last alone inhabits the United States.

GENUS TRUNCATELLA RISSO.

Shell imperforate, but with an umbilical groove, cylindrical, turreted, usually pellucid and smooth, of a reddish horn-color; the upper whorls are also truncated in the adult, the remaining ones are usually gradually increasing in size, and covered with more or less strongly developed ribs. The peristome is simple or double, sometimes reflected; the base is generally furnished with a prominent carina or ridge, formed by the peristome. The operculum is horny, hardly spiral, with a basal nucleus.

Animal with a small foot, against the end of which rests the operculum when the animal is withdrawn; the tentacles are short, acute; the snout is extended beyond them as much as the whole length of the animal. The shell is carried horizontally. The other characteristics of the genus are the same as those of the order and suborder. The animal lives in close proximity to the sea.

A figure of the animal as it appears while in motion is given on pl. 75, fig. 11, taken from Adams's *Genera of Recent Mollusca*. It represents a species not found in our country.

The animal walks by contracting the space between its lips and foot, like the geometric caterpillars.

Remarks. This genus has been but little understood by authors until the most recent investigations have proved it to belong to the same group as *Helicina*, *Cyclostoma*, &c. It has formerly been referred to the following genera:—*Truncatula*, *Fidelis*, *Choristoma*, *Erpetometra*, *Helix*, *Turbo*, *Cyclostoma*, *Acmea*, *Paludina*, *Pyramidis*, *Rissoa*, and *Turritella*. A full description of it will be found in the works of Pfeiffer referred to.

At first sight it seems almost impossible to admit of more than one species among the shells I have received from Florida. However well marked may be some individuals, when separately compared, there seem to be many others forming a chain of connection between them. I have, however, sent to Messrs. Pfeiffer and Poey our Florida specimens, and have received from them the decisions regarding their identity which I give below.

In all cases I have given Pfeiffer's Latin description of the species, and the figure of it to which he refers.

TRUNCATELLA CARIBÆENSIS SOWERBY.

PLATE LXXV. FIGURES 2, 4.

T. subrimata, subcylindrica, parum attenuata, solidula, rubella, succinea vel flavida, subtiliter costulata; costulis subrectis, sæpe in medio anfractuum evanescentibus; sutura lævis; anfr. superst. 3-4, sensim accrescentes, parum convexi, ultimis sæpe lævigatus, basi breviter carinatus; apertura subverticalis, ovali-elliptica, supernè angulata; perist. continuum, rectum, ad anfractum penultimum et in angulo insertionis incrassatum. (Pfr.)

SYNONYMS AND REFERENCES.

Truncatella Caribæensis SOWERBY, MSS.

Truncatella Caribæensis REEVE, Conch. Syst. 11, t. 182, fig. 7.

PFEIFFER in Zeitsch. f. Mal. 1846, p. 182; Mon. Auric.

Viv. ii. 185; Mon. Phan. Viv. ii. p. 7.

CHEMNITZ, ed. 2; Auric. p. 9, pl. i. figs. 35, 36; pl. ii. fig. 22; non pl. ii. figs. 2-4.

Truncatella Gouldii ADAMS, ined.

Truncatella succinea ADAMS, Proc. Bost. Soc. 1845, p. 12.

DESCRIPTION.

Animal not observed.

Shell subperforated or grooved, subcylindrical, rather solid, in its truncated state but slightly decreasing in size towards the apex, reddish, or dark amber-colored, with delicate ribs, which are but little curved, and often hardly perceptible on the middle of the whorls; suture slight; whorls not truncated, three or four, distinctly increasing in size, equally convex, the last often smooth, slightly carinated on its base; aperture subvertical, ovally elliptic, angular above; peristome continuous, straight, thickened at its connection with the penultimate whorl.

Length, 7-8; diameter, 3 millimetres. Length of aperture, $2\frac{1}{2}$ millimetres.

Geographical Distribution. Found among fine driftwood, sand, and marine shells received from the Florida Keys. Is also quoted from Mexico and Alabama by Küster (Chemn. ed. 2), and from Cuba and Jamaica by Pfeiffer.

Remarks. This species shares the variations common to the genus. Its ribs are hardly as strongly developed as those of *bilabiata* and *pulchella*, nor are its whorls as convex. It is more nearly allied to the following species with which it appears to be confounded by Küster.

Both of my figures are from Chemnitz, fig. 2 representing the base of the shell.

TRUNCATELLA SUBCYLINDRICA GRAY.

PLATE LXXV. FIGURES 5, 6, 8.

T. vix rimata, cylindrica, costulis confertis regularibus, vel ad suturam

modo conspicuis, vel evanescentibus munita, nitida, pellucida, corneo-flava vel hyalina; anfr. superst. 4 convexiusculi, medio planati, regulariter accrescentes, ultimus basi non cristatus; apertura verticalis, ampla, angulato-ovalis, basi subeffusa; perist. leviter incrassatum, margine externo subproducto, columellari breviter reflexo, adnato et supernè incrassato. (Pfr.)

SYNONYMS AND REFERENCES.

Helix subcylindrica PULTENEY, Cat. Dorsetsh. p. 49.

MONTAGU, Test. Br. ii. p. 393.

Truncatella subcylindrica GRAY in Turton's Man. p. 22, f. 6.

SHUTTLEWORTH, Diagn. 7, p. 154.

PFEIFFER, Mon. Auric. Viv. 187; Mon. Phan. Viv. ii. 7.

ORBIGNY, Moll. Cub. ii. p. 5, (excl. *T. truncatula*.)

Truncatella truncatula LOWE, in Zool. Proc. 1845, p. 217?; in Zool. Journ. V. p. 299, tab. 13, figs. 13-18.?

Truncatella Caribæensis PFEIFFER in Zeitsch. f. Mal. 1846, p. 182, ex parte.

KÜSTER in Chemn. ed. 2, Auric. pl. ii. figs. 1-4.

DESCRIPTION.

Animal not observed.

Shell scarcely perforated or grooved, cylindrical, with crowded numerous ribs, sometimes quite imperceptible, and sometimes perceptible at the suture alone, shining, pellucid, light horn-color; four remaining whorls, rather convex, flattened at the middle, regularly increasing, the last one not prominently carinated at its base; aperture vertical, large, oval, with an angle above, spreading below; peristome slightly thickened, its outer margin slightly drawn out, reflected at the columellar, and thickened.

Length, 5; breadth, 2 millimetres. Aperture 2 mill. long.

Geographical Distribution. Found among rubbish from Florida Keys. Also is a common West Indian species.

Remarks. I have given the figure from Chemnitz to which Pfeiffer refers. Küster confounded it with the preceding species, from some forms of which it appears very difficult to separate it. Orbigny refers it to *T. truncatula*, a species described by Lowe from Madeira.

The shell of which the base is given (fig. 8) was found

in Florida, and having been referred to Pfeiffer for identification, was returned with the name of *subcylindrica*.

Its accidental introduction into England accounts for its presence in the English works above referred to.

The base is not furnished with the prominent ridge or carina.

TRUNCATELLA BILABIATA PFEIFFER.

PLATE LXXV. FIGURES 3, 7.

T. subrimata, cylindræa, gracilis, solida, opaca, fusca, costulata; costis subarcuatis, elevatis, obtusis, interstitia æquantibus; sutura profunda, simplex; anfr. superst. $4\frac{1}{2}$ –5 convexi, ultimus vix longior, basi subcompressus, callosus; apertura verticalis, ovalis, supernè vix angulata; perist. duplex; externum album, callosum, patens, in cristam basalem transiens, internum continuum, breviter porrectum. (Pfr.)

SYNONYMS AND REFERENCES.

Truncatella bilabiata PFEIFFER in Wieg. Arch. 1840, i. 253; in Zeit. f. Mal. 1846, p. 187; Mon. Auric. Viv. 192; Mon. Pneum. Viv. ii. 8.
CHEMNITZ, ed. 2, p. 7, pl. 1, figs. 27–31.

DESCRIPTION.

Animal not observed.

Shell subperforated or grooved, cylindrical, elegant, solid, opaque, brownish; ribs subarcuate, elevated, obtuse, at equal distances; suture deep and simple; remaining whorls $4\frac{1}{2}$ to 5, convex, the last scarcely longer than the others, heavy and subcompressed at base; aperture vertical, oval, scarcely angular above; peristome double, the outer one white, heavy, and terminating in the basal ridge or carina, the inner one continuous.

Length $5\frac{1}{2}$, breadth $1\frac{3}{4}$, length of aperture $1\frac{1}{2}$ millimetres.

Geographical Distribution. Found with the preceding species; also in Cuba (Pfeiffer), and on Carmen, an island of the Gulf of Mexico (Küster).

Remarks. The duplicated peristome and highly devel-

oped basal ridge or carina are the characteristics of this species.

Both of the figures are from Chemnitz. Pfeiffer refers to them as representing his species.

TRUNCATELLA PULCHELLA PFEIFFER.

PLATE LXXV. FIGURES 1, 9, 10.

T. subrimata, oblongo-subcylindrica, gracilis, rufo-cornea vel succinea, rarius hyalina, nitida, subpellucida, subtiliter costulata; costulis vix elevatis, filiformibus, interstitia non æquantibus, ad suturam mediocrem sæpe distinctioribus; anfr. superst. 4-4½ modice convexi, lente accrescentes, ultimus infra medium plerumque lævigatus, basi breviter compresso-carinatus; apertura subverticalis, oblique fere elliptica, basi subeffusa; perist. simplex, continuum, expansiuseulum, margine dextro crista levissima cincto. (Pfr.)

SYNONYMS AND REFERENCES.

- Truncatella pulchella* PFEIFFER, in Wieg. Arch. 1839, i. 356; in Zeitsch. f. Mal. 1846, p. 186; in Mon. Auric. Viv. 192; Mon. Pneum. Viv. ii. 8.
SHUTTLEWORTH, Diag. 7, p. 155.
CHEMNITZ, ed. 2, Auric. 10, pl. ii. figs. 11-15.

DESCRIPTION.

Animal not observed.

Shell subperforated, or grooved, oblongly subcylindrical, light, reddish horn-color or amber, shining, pellucid, lightly ribbed; ribs scarcely elevated, threadlike, at irregular intervals, often more distinct at the moderate suture; remaining whorls 4 to 4½, rather convex, gradually increasing in size, the last generally smooth below the middle, compressly carinated at its base; aperture subvertical, obliquely elliptical, enlarging at base; perist. simple, continuous, somewhat expanding, and furnished with a slight ridge at its right extremity.

Length 4½-5, diameter 1½-2, length of aperture 1⅔ millimetres.

Geographical Distribution. I detected specimens of

this West Indian shell among small shells collected by Mr. Bartlett in Florida.

Remarks. Instead of figuring American specimens, I have preferred giving a fac-simile of the figures referred to by Pfeiffer. Fig. 1 is, however, from one of our specimens.

Pfeiffer mentions a variety unknown to me, "distinctius costata, peristomate subduplicata."

It seems nearest allied to the preceding species, and admits of no little variation.

SUBORDER ECTOPHTHALMA.

Eyes at the side of the head at the external base of the tentacles; foot subelongate; operculum horny or testaceous, not concentrically striate, and not always distinctly spirated. (Pfr.)

It contains two families, *Cyclostomacea* and *Helicinacea*, which Binney united in the family *Helicinadæ*.

FAMILY CYCLOSTOMACEA.

In addition to the characters of the suborder, Pfeiffer enumerates these: "whorls numerous and subequal, or few and rapidly increasing."

SUBFAMILY CISTULEA.

Operculum suboval, cartilaginous, with few whorls and excentric nucleus; shell globose conic or ovate-turritid. (Pfr.)

GENUS CHONDROPOMA PFEIFFER.

Operculum oval, subcartilaginous, flat, with few, rapidly increasing whorls, and a nucleus generally very excentric. Shell oblong-turritid, generally truncated at tip, more rarely globosely conic; aperture oval; peristome simple,

or more or less thickened, straight, expanded or widely reflected. (Pfr.)

The only species of the old genus *Cyclostoma* found in this country belongs to *Chondropoma*, and not to *Cyclostoma*, as restricted by Pfeiffer, as stated by Gould on p. 349. Other species are found in the West Indies.

CHONDROPOMA DENTATUM SAY. .vol. ii. p. 348, pl. lxii. lxxv. fig. 24.

Cyclostoma dentatum SAY, (Binney's ed.) p. 29.

Chondropoma dentatum PFEIFFER, *Mon. Pneum. Viv.* i. 286; ii. 140; *Malak. Bl.* 1856, p. 132.

GRAY and PFEIFFER, *Brit. Mus. Phan.* 203.

A view of the animal, twice its natural size, is given on pl. 75, fig. 24.

It will be noticed that I have omitted from the synonymy the West Indian species *C. lineolatum*, *crenulatum*, *Auberianum*, and *lunulatum*. It is at present impossible to speak with certainty about their identity with *dentatum*. Poey removes it from his Cuban Catalogue, (*Mem.* i. 393.)

It is worthy of note that Orbigny describes *Auberianum* as having equal transverse and longitudinal striæ. A reference to the enlarged figure of the surface shows a very different case in *dentatum*.

SPURIOUS SPECIES.

Cyclostoma Cincinnatensis Lea and DeKay, and *C. lapidaria* Say, Linsley, and Kirtland, are species of *Amnieola*.

Cyclostoma marginalis Kirtland, (*Ohio Rep.*) and *C. marginata* Say, are species of *Bulimus*.

Cyclostoma tricarinata Say is a *Valvata*.

FAMILY HELICINACEA.

Operculum without any vestige of a spiral form, testaceous, heavy or horny, thin, and furnishing no reliable

characters by which to designate and divide the several genera: semioval or triangular.

Pfeiffer gives these as additional characteristics to those of the suborder.

There are several genera comprised in the family, — *Alcadia*, *Trochatella*, *Lucidella*, *Stoastoma*, and *Helicina*, but the latter only has been found in this country.

For remarks on the animals of this family, see vol. ii. p. 350.

GENUS HELICINA LAMARK.

HELICINA CHRYSOCHEILA BINNEY. . . . vol. ii. p. 354, pl. lxxiv. fig. 4.

Helicina chrysocheila PFEIFFER, Mon. Pneum. Viv. ii. p. 197.

I have in my cabinet my father's type of this species, and consider it distinct from *Hel. Jamaicensis* Sowb., and all other described species. I have a note taken by my father at the collection of M. Petit, in Paris, in which he says that a similar shell is labelled from Tampico.

In the collection of the Smithsonian Institute is an individual from Texas, (Würdemann.) It seems allied to *Hel. turbinata* Wiegman.

Shuttleworth has used this name (1852) for another species, but has not priority.

HELICINA HANLEYANA PFEIFFER.

PLATE LXXV. FIGURES 14, 16.

T. globoso-conica, solidula, lineis concentricis impressis, subdistantibus sculpta, vix diaphana, nitida, fulvo-cornea; spira breviter conoidea, obtusiuscula; anfr. 5 vix convexiusculi, ultimus rotundatus, antice subdescendens; apertura parum obliqua, subsemicircularis; columella brevissima, extrorsum denticulata, callum tenuem, albidum, diffusum emittens; perist. album, vix expansiusculum, intus subincrassatum, basi in denticulum columellæ abiens. Operc. ? Diam. maj. $7\frac{1}{2}$, min. $6\frac{1}{2}$, alt. $5\frac{3}{4}$ mill.

Habitat prope New Orleans (Sallé).

SYNONYMS AND REFERENCES.

- Helicina Hanleyana* PFEIFFER, in Proc. Zool. Soc. 1848, p. 122; Mon. Pneum. Viv. i. 376; ii. 203.
 CHEMNITZ, ed. 2, p. 45, pl. ix. figs. 7, 8.
 GRAY et PFEIFFER, Brit. Mus. Phan. p. 302.

Remarks. I have not seen this shell. The original description is given above, and a fac-simile of the figures from Chemnitz, ed. 2.

HELICINA OCCULTA SAY vol. ii. p. 356, pl. lxxiv. figs. 1, 2.

- Helicina occulta* SAY (Binney's ed.) pp. 36, 37, pl. xlvi. figs. 4-6.
 CHENU, Bibl. Conch. iii. p. 59, pl. xv. figs. 2 b, 2 c, 2 d.
 DEKAY, N. Y. Moll. p. 82.
 PFEIFFER, Mon. Pneum. Viv. i. 347; ii. 185.
 CHEMNITZ, ed. 2, p. 18, (1846), pl. iv. figs. 11, 12, (1850).
 GRAY and PFEIFFER, Brit. Mus. Phan. p. 250.

Helicina rubella GREEN, l. c.

This is probably the species referred to in Kirtland's Ohio Rep. p. 199 (1838).

I am inclined to consider *Hel. rubella* Green as a synonym of this species. From Sheboygan, Wis., I have received an apparently recent specimen of it collected by Mr. Lapham. Green's description is as follows:—

HELICINA RUBELLA. Shell more than $\frac{1}{4}$ inch broad, subglobose; spire slightly elevated, conical; whorls 5 or 6, with minute oblique striae; sutures slightly impressed; epidermis smooth and of a light brick-red color; aperture irregularly lunate, or semi-elliptical; outer lip white, callous, and partially reflected near the base; operculum corneous, smooth. Hills, western Pennsylvania.

HELICINA ORBICULATA SAY . . . vol. ii. p. 352, pl. lxxiii. lxxiv. fig. 3.

- Helicina orbiculata* SAY, (Binney's ed.) pp. 7, 36, pl. xlvi. figs. 1, 2.
 CHENU, Bibl. Conch. 3, p. 58, pl. xv. fig. 2, 2 a, 2 c.
 DEKAY, N. Y. Moll. p. 82.
 CHEMNITZ, ed. 2, p. 74, (1846), pl. x. figs. 32, 33.
 PFEIFFER, Mon. Pneum. Viv. i. 375; ii. 199, (excl. *II. rubella*).
 GRAY and PFEIFFER, Brit. Mus. Phan. p. 272, not of SOWERBY.

I adhere to the opinion expressed in vol. i. that *Hel. rubella* Green is identical with *Hel. occulta*, and not with this species. Pfeiffer follows the opinion of Gould.

The most northern locality at which this species has been found is Tennessee.

Helicina orbiculata Sowerby (Thes. Conch.) is not this species. Pfeiffer refers it to *Hel. nitida*, a Cuban shell.

Helicina vestita Guilding, in Sowerby's Thesaurus, No. 71, p. 14, tab. 1, fig. 42, appears to be the young of this species. Its description is copied by Pfeiffer, who was unacquainted with the shell (Mon. Pneum. i. 353). It is given below, while the figure is copied on my pl. 75, fig. 19.

H. VESTITA. T. globosa, tenui, concentricè lyrata, parva; apertura semi-lunari; labio externo tenui. Globose, thin, concentrically ribbed, small; aperture semi-lunar, outer lip thin. North America.

Helicina castanea Sowerby (l. c.) may also be an immature specimen of *orbiculata*. The figure of Sowerby is copied on pl. 75, fig. 20, and his description given below. Pfeiffer refers it to a variety of *Hel. subfusca* Menke (Mon. Pneum. i. 355).

H. CASTANEA. Guilding? T. *H. orbiculatae* simili, sed lævi, depressa labio externo tenui.

Like *H. orbiculata*, but smooth and depressed, outer lip thin. North America.

Sowerby's figure of *Hel. minuta* is given pl. 75, fig. 18.

HELICINA TROPICA IAHN.

PLATE LXXIII. Middle fig. of lower line.

T. globosa, solida, lævigata, alba; spira fornicata, subacuminata; anfr. 5 convexiusculi, ultimus tumidus, anticè non descendens; apertura fere verticalis, subsemicircularis, multo altior quam lata; columella brevis, basi tuberculata, retrorsum in callum basalem diffusum, concolorum, antrorsum in peristoma crassum, reflexum, interdum duplicatim continuata. Operc.? Diam. maj. 8, min. 7, alt. 6½ mill. (Pfr.)

SYNONYMS AND REFERENCES.

- Helicina tropica* IAHN in Chemnitz, ed. 2, p. 37, pl. iv. figs. 9, 10.
 PFEIFFER, Mon. Pneum. Viv. i. 375; ii. 199.
 GRAY and PFEIFFER, Brit. Mus. Phan. p. 271.
 TROSCHEL, Gebiss d. Schn. p. 81, pl. v. fig. 9, (teste Pfr.)
Helicina Ambeliana SOWERBY, Thes. Tab. i. fig. 19, nec Roissy.

Remarks. The figure referred to is evidently this species, which is common in Texas. It appears to me to run imperceptibly into *Hel. orbiculata*, and will, in all probability, prove one of its many varieties. Indeed, Pfeiffer observes, "Ex icone Sayana hanc speciem sequenti (*orbiculata*) identicam suspicor."

Helicina Ambeliana Sowerby (not of DeRoissy) is referred to a "var. β flavida, vel rubella, interdum subfasciata," by Pfeiffer, to which also he refers Chemnitz's variety (fig. 22). Sowerby's figure is given (pl. 75, fig. 15), and his description here follows.

H. AMBELIANA. T. conica, lævi, spiraliter tenuissimè striata; apertura semi-lunari; labio externo crasso, reflexo, rotundato; operculo corneo.

Rather conical, globose, nearly smooth, with the aperture semilunar, and the outer lip thickened, reflected, and rounded; operculum horny. Antilles and Texas.

HELICINA SUBGLOBULOSA POEY.

PLATE LXXV. FIGURE 17.

T. globoso-conica, solida, striatula, parum nitida, alba, unicolor, vel zonis 2^o rufis ornata: altera lata prope suturam, altera angusta prope peripheriam; spira convexo-conica, acuminatiuscula; anfr. 6, primi planuli, penultimus convexior, subbiangulatus, ultimus subcarinatus, basi parum convexus; columella brevis, arcuata, sursum dilatata, linea impressa munita, callum emittens tenuem, diffusum; apertura parum obliqua, irregulariter semiovalis; perist. latum, angulatim patens, subexcavatum, ad utramque insertionem attenuatum. Operc.? Diam. maj. 10, min. 8½, alt. 7 mill. (Pfeiffer.)

SYNONYMS AND REFERENCES.

- Helicina subglobulosa* POEY, Mem. i. 115, 120, tab. xii. figs. 17-21.
 PFEIFFER, Malak. Blatt. 1854, 107; 1856, 146; Mon.
 Pneum. Viv. ii. 209.

Remarks. This species is an inhabitant of Trinidad and Bayamo in Cuba. A single specimen, found at Key Biscayne, Florida, (Smithsonian Coll.) is figured on the plate, magnified to twice its natural size. Whether its introduction was but accidental, or whether it is well established in Florida, remains to be proved.

SPURIOUS SPECIES.

Helicina fastigiata and *plicata* of DeKay (N. Y. Moll. p. 82 are respectively *Helix fastigiata* Say and *Helix Hazardi* Bland.

ERRATA.

- On page 2, line 34, for Fenessac read Ferussac.
 5, " 39, " R. T. Shuttleworth read R. J. Shuttleworth.
 10, " 6, " redimita read redemita.
 48, " 9, " 7. read .7.
 51, " 2, " its read it.
 57, " 12, after 100) read ".
 58, " 2, for odstricta read obstricta.
 64, " 20, dele ?.
 80, " 14, for connectans read connectens.
 99, " 14, " isculus planu read planiusculus.
 124, " 7, " limited read limital.
 128, " 36, " consists read consist.
 131, " 29, " 88 read 80.
 133, " 2, " convexiusculus read convexiusculi.
 135, " 10, " Macroceramus read Macroceramus.
 138, " 32, " gracillmus read gracillimus.
 166, " 16, dele !.
 192, for 592 read 192.

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EXPLANATION OF THE PLATES.

PLATE LXXV.

Fig.

- 1 Base of TRUNCATELLA PULCHELLA Pfr.
- 2 “ “ CARIBEENSIS Sowb., from Chemn. pl. 2,
fig. 22.
- 3 TRUNCATELLA BILABIATA Pfr., from Chemn. pl. 1, fig. 28.
- 4 “ CARIBEENSIS Sowb., from Chemn. pl. 1, fig. 36.
- 5 “ SUBCYLINDRICA Gray, from Chemn. pl. 2, fig. 2.
- 6 “ “ “ “ “ “ “ fig. 4.
- 7 Base of TRUNCATELLA BILABIATA Pfr., from Chemn. pl. 1, fig. 30.
- 8 “ “ SUBCYLINDRICA Gray.
- 9 TRUNCATELLA PULCHELLA Pfr., from Chemn. pl. 2, fig. 12.
- 10 “ “ “ “ “ “ pl. 2, fig. 13.
- 11 Animal of TRUNCATELLA, from Adams Gen. pl. 78, fig. 1.
- 12 AURICULA CINGULATA Pfr., from Orbigny pl. 13, fig. 8.
- 13 “ “ “ “ “ “ pl. 13, fig. 9.
- 14 HELICINA HANLEYANA Pfr., from Chemn. pl. 9, fig. 7.
- 15 “ AMBELIANA Sowb., Thes. Conch. pl. 1, fig. 19.
- 16 “ HANLEYANA Pfr., from Chemn. pl. 9, fig. 8.
- 17 “ SUBGLOBULOSA Poey — twice the natural size.
- 18 “ MINUTA Sowb., from Thes. Conch. pl. 1, fig. 41.
- 19 “ VESTITA Gould, “ “ pl. 1, fig. 42.
- 20 “ CASTANEA Gould, “ “ pl. 1, fig. 32.
- 21 Animal of MELAMPUS COFFEA Lin., from Ad. Gen. pl. 82, fig. 7.
- 22 “ ALEXIA DENTICULATA Mont, “ “ pl. 82, fig. 5.
- 23 MELAMPUS BIDENTATUS Say.
- 24 Animal of CHONDROPOMA DENTATUM Say — twice the natural size.
- 25 MELAMPUS COFFEA Lin., from Orbigny pl. 13, fig. 6.
- 27 Operculum of 24 — enlarged.

Fig.

- 29 MELAMPUS PUSILLUS Gmel.
 30 MELAMPUS FLORIDIANUS Shuttl.
 31 Enlarged view of head of HELICINA TROPICA Jan.
 32 CARYCHIUM EXILE Lea, reduced view of aperture from Sill. Journ.
 42 l. c.
 33 ALEXIA MYOSOTIS Drap.
 34 LEUCONIA SAYII Kust., from Chemn. pl. 6, fig. 16.

PLATE LXXVI.

- 1 HELIX ACUTEDENTATA.
 2 " LOISA.
 3 " AREOLATA Sowb. var. from Chemn. pl. 36, fig. 13.
 4 " ARROSA Gould.
 5 " ANACHORETA.
 6 " CULTELLATA Thomson.
 7 " NEWBERRYANA.
 8 " PANDORÆ Forb., from Proc. Zoöl. Soc. 1850, pl. 9, fig. 3 b.
 9 " DUPETITHOUARSI Desh., from Mag. Zoöl. 1841, pl. 30.
 10 " LEVIS Pfr., from Chemn. pl. 36, fig. 16.
 11 " AREOLATA Sowb., from Chemn. pl. 36, fig. 10.
 12 " KELLETTI Forb., from Zoöl. Proc. 1850, pl. 9, fig. 2 b.
 13 " ARBORETORUM Val., from Voy. de la Venus, pl. 1, fig. 3 a.

PLATE LXXVII.

- 1 Enlarged view of epidermis of HELIX BARBIGERA Redfield, from N. Y. Lyc. vi. pl. 9, fig. 7.
 2 HELIX BARBIGERA Redfield, from N. Y. Lyc. vi. fig. 4, 5.
 3 " RÖEMERI Pfr.
 4 " ASPERSA Müll.
 5 " DISSIDENS Desh., from Fer. pl. 84, fig. 1.
 6-7 " MINUTISSIMA Lea — much enlarged.
 8 " STRONGYLODES Pfr., from original specimen.
 9 " ASTERISCUS Morse — very highly magnified.
 10 " CLARKII Lea — twice the natural size.
 11 " COOPERI — slightly enlarged.
 12 " PUSTULA Fer., from pl. 50, fig. 1.

Fig.

- 13 *BULIMUS ZEBRA* Mull. var.
 14 *HELIX VENTROSULA* Pfr.
 15 " *SCULPTILIS* Bland.
 16 " *HOPETONENSIS* Shuttl.
 17 " *FABRICII* Beck, from Reeve, 1459 — magnified.
 18 " *ELLIOTTI* Redf.
 19 " *ANNULATA* Case, from Sill. Journ. N. S. iii. 101.
 20 " *GRISEOLA* Pfr., from Chemn. pl. 60, fig. 17.
 21 Variety of *GLANDINA TEXASIANA* Pfr. ?
 22 *HELIX VIRGINALIS* Jan, from Chemn. pl. 38, fig. 19.
 23 " *CEREOLA* Mühlf., from Berlin Mag. l. c.

PLATE LXXVIII.

- 1 *HELIX ARIADNÆ* Pfr., outline of Chemn. pl. 65, fig. 31.
 2 *HELIX DORFEULLIANA* Lea, var. ? from N. Y. Lyc. vi. pl. ix.
 fig. 26.
 3 Same as fig. 1, pl. 65, fig. 29.
 4 " " aperture magnified.
 5 *HELIX HINDSI* Pfr. — aperture magnified.
 6 " " " outline of Chemn. pl. 65, fig. 9.
 7 *HELIX EDWARDSI* Bland, from N. Y. Lyc. vi. pl. ix. fig. 15.
 8 Same as 6, pl. 65, fig. 8.
 9 *HELIX EDWARDSI* Bland, from N. Y. Lyc. vi. pl. ix. fig. 16.
 10 " *FASTIGIATA* Say — magnified four times, from N. Y. Lyc. vi.
 pl. ix. fig. 18.
 11 " *TROOSTIANA* Lea " " " " pl. ix. fig. 23.
 12 *BULIMUS ZEBRA* Müll. var. from Key Biscayne.
 13 *HELIX HAZARDI* Bland, magn. 8 times from N. Y. Lyc. vi. pl. ix.
 fig. 27.
 14 " *DORFEULLIANA* Lea, magn. 4 times from N. Y. Lyc. vi.
 pl. ix. fig. 25 a.
 15 " *RUGELI* Shuttl., magn. 4 times.
 16 *PUPA GIBBOSA* Pfr., from Chemn. pl. 66, fig. 6.
 17 *HELIX VOLVOXIS* Parr.
 18 " *TEXASIANA* Mor. var. (triodonta Binn.)
 19 " *HIPPOCREPIS* Pfr.
 20 *PUPA HOPPII* Moll. from Chemn. pl. 19, fig. 30.
 21 *HELIX THIOLUS*.

Fig.

- 22 Animal of *HELIX VARIANS*.
 23 *HELIX MICRODONTA* Desh., from Fer. pl. 70, fig. 13.
 24 “ *MOOREANA*.

PLATE LXXIX.

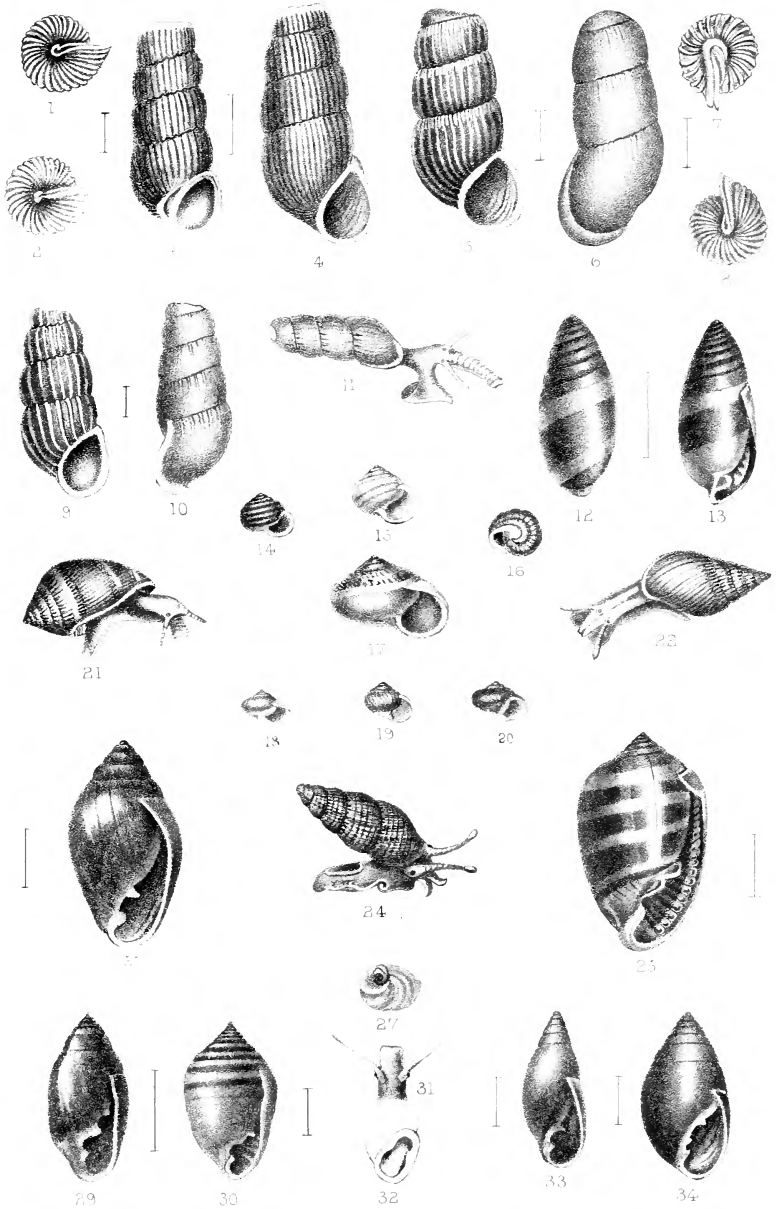
- 1 *SUCCINEA LINEATA*.
 2 *HELIX INFUMATA* Gould.
 3 *BULIMUS FLORIDIANUS* Pfr., from original specimen.
 4 *HELIX MILIUM* Morse — very highly magnified.
 5 “ “ “ “ “ “
 6 *MELAMPUS COFFEUS* Lin. var. ?
 7 *SUCCINEA RETUSA* Lea, from Phil. Tr. l. c. pl. 19, fig. 86.
 8 *MELAMPUS OLIVACEUS* Carpenter.
 9 *VITRINA ANGELICÆ* Beck — highly magnified.
 10 *HELIX BULBINA* Desh., from Fer. pl. 85, fig. 17.
 11 “ *NEMORIVAGA* Val., from Voy. de la Venus pl. 1, fig. 1 a.
 12 *BULIMUS EXCELSUS* Gould, from Bost. Journ. 1857, pl. xiv. fig. 3.
 13 *HELIX DEVIA* Gould.
 14 *SUCCINEA RUSTICANA* Gould, from Ex. Ex. fig. 29.
 15 *BULIMUS CALIFORNICUS* Reeve, No. 378 — increased one half.
 16 Animal of *ALEXIA MYOSOTIS* Drap.
 17 *PUPA INCANA* Binn., var. fasciata.
 18 *SUCCINEA SALLEANA* Pfr. from Chemn.
 19 *ACHATINA CALIFORNICA* Reeve, No. 115 — natural size.
 20 *TRUNCATELLA CALIFORNICA* Pfr. — greatly enlarged.
 21 *HELIX MORMONUM* Pfr., from type.
 22 Same as 20.
 23 *CYLINDRELLA GOLDFUSSI* Mke. — twice the natural size.

PLATE LXXX.

- 1 *BULIMUS ALTERNATUS* Say, var. ?
 2 *HELIX FRIABILIS*.
 3 *BULIMUS ALTERNATUS* Say, from his drawing.
 4 *SUCCINEA GRÆNLANDICA* Beck — enlarged.
 5 “ *LINEATA*.
 6 *BULIMUS LIQUABILIS* Reeve, No. 387.

Fig.

- 7 *BULIMUS CONFINIS* Reeve, No. 643.
- 8 " *SCHIEDEANUS* Pfr. ? apice nigrâ.
- 9 *GLANDINA TRUNCATA* Gmel. var.
- 10 *BULIMUS DORMANI*.
- 11 *SUCGINEA INFLATA* Lea, from type.
- 12 " *EFFUSA* Shuttl. — enlarged.
- 13 *BULIMUS PATRIARCHA*.
- 14 *HELIX KOPNODES*.
- 15 *BULIMUS SCHIEDEANUS* Pfr. var. ? fauce nigrâ.





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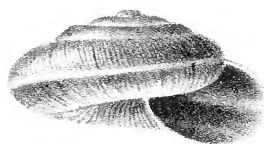
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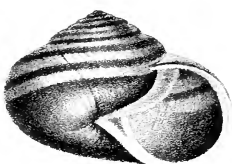
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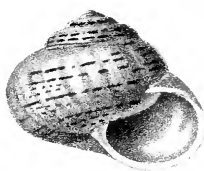
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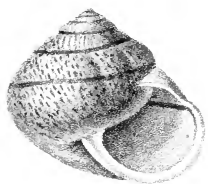
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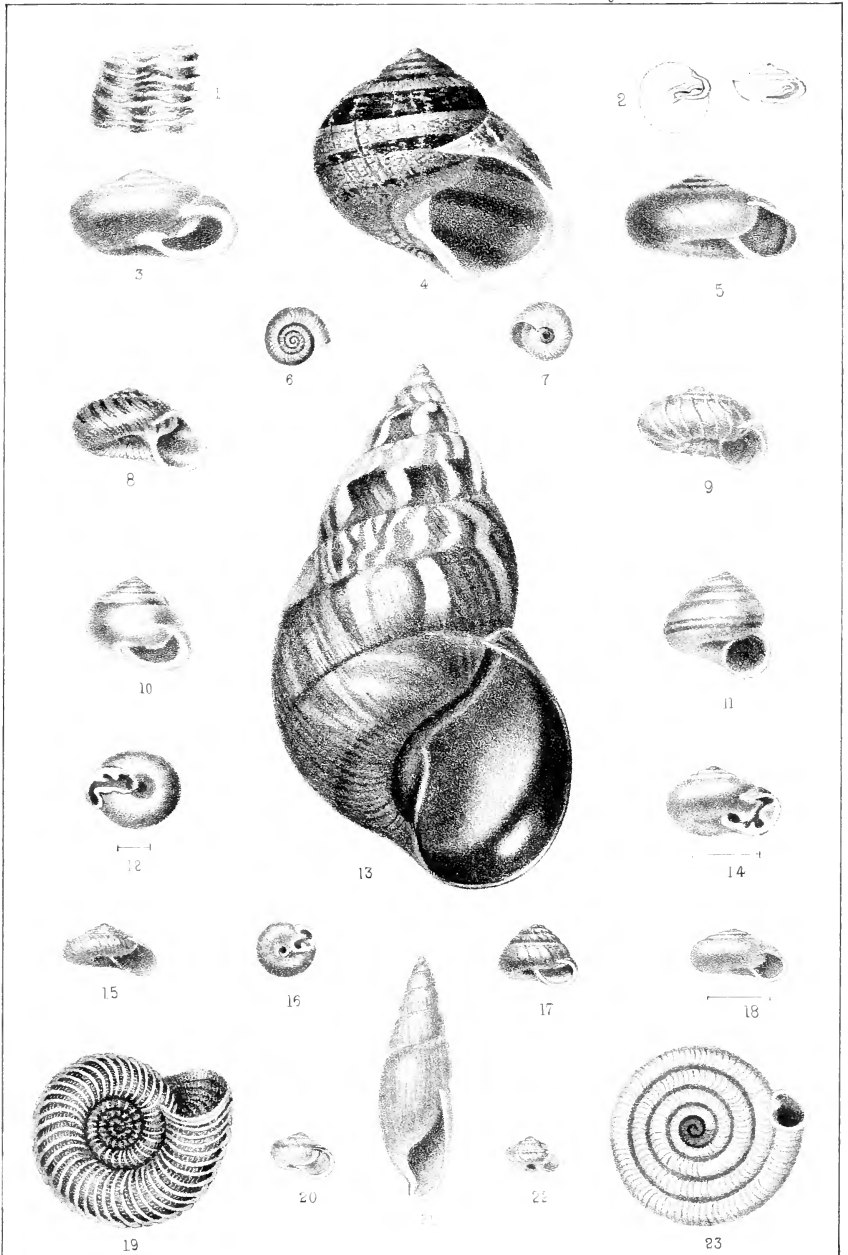
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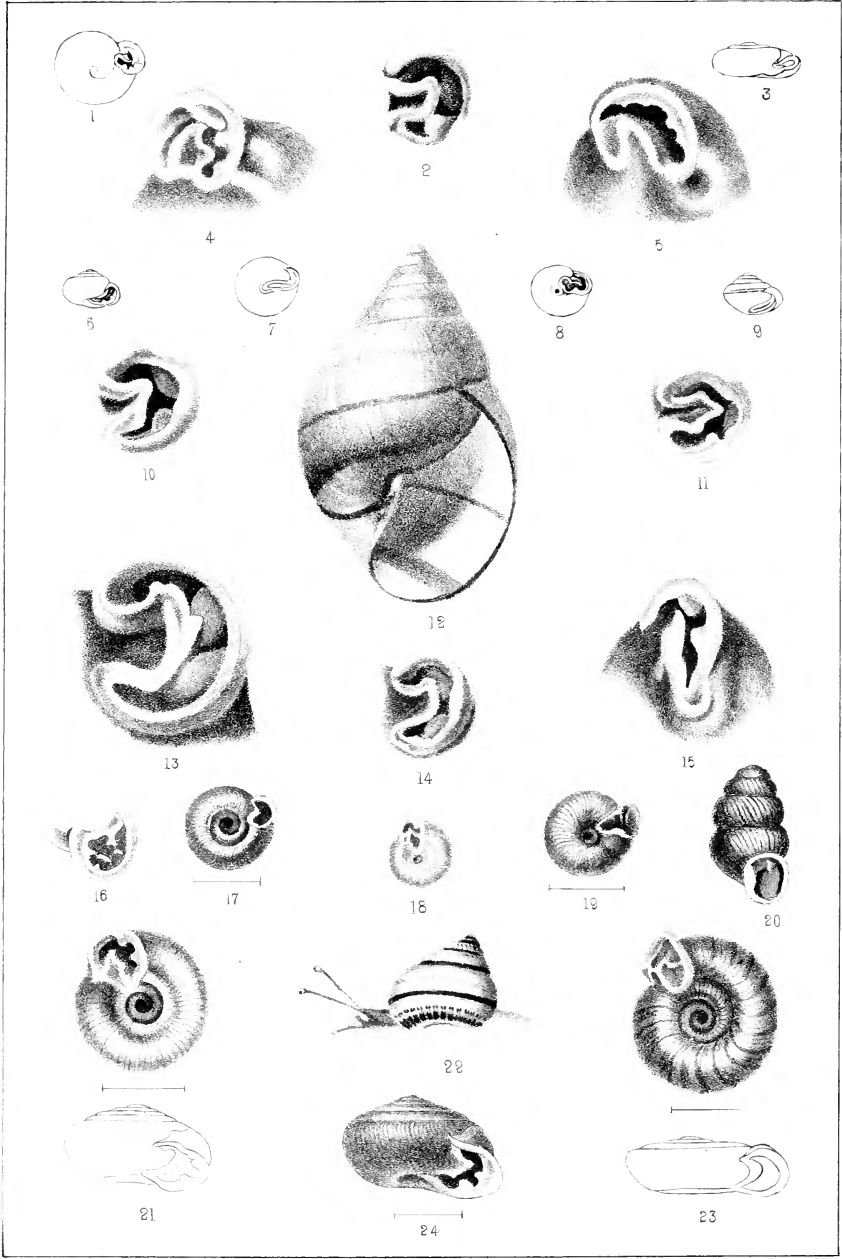


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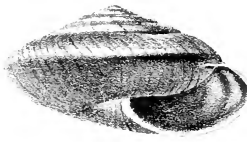
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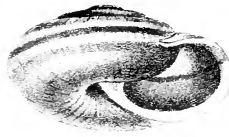
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