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No. 1.

TWO NEW SPECIES OF PLEUROTOMA FROM CALIFORNIA.

BY WILLIAM JAMES RAYMOND.

Subgenus GENOTA H. and A. Adams.

Section *Dolichotoma* Bellardi.

Pleurotoma (*Genota*) *stearnsiana*, new species.

Shell broadly fusiform, spire acute, outline of spire moderately convex; whorls eight and one-half, convex anteriorly, slightly concave near the suture, the margin at the suture strongly appressed; suture distinct; aperture longer than the spire; color orange to cream, a broad, spiral, brown band below the suture and nine or ten narrow, clearly-defined bands on the last whorl, one or two of these also visible on the spire, bands nearly as wide as the lighter interspaces; interior of aperture yellowish, lighter within and spotted with brown on the outer lip by the external bands; first two whorls smooth, later whorls with numerous revolving threads, closely beaded on the spire by incremental lines which follow the outline of the lip, threads not beaded below the periphery of the last whorl, but roughened by the growth-lines and somewhat coarser anteriorly; aperture rather narrow; posterior sinus shallow, rounded; lip acute, produced below the sinus, canal wide; pillar solid, somewhat curved, obliquely truncate below. Operculum normal. Long. of shell 30.5, of aperture and canal 17, of body-whorl 23 mm.; max. diam. 13 mm. Divergence 50°. An extremely old specimen which shows a thickening of the pillar like an obscure fold, measures: long. of shell 41.5,

of aperture and canal 22.5, of body-whorl 29.5 mm.; max. diam. 18 mm. Divergence 48°. This specimen was dead when collected.

University of California Marine Biological Laboratory, stations 55 and 67, off San Diego, 25 to 30 fathoms, sand and mud, bottom temperature 50° F. Also dead specimens from stations 21 and 28, Catalina Island, 30 to 40 fathoms, sand and mud, bottom temp. 51° F.

P. (Genota) stearnsiana is at once separable from the forty or more specimens of its nearest ally, *P. carpenteriana*, examined by the writer. The former species is very uniform, although found in different localities. With the same number of whorls it is half as large as *P. carpenteriana* and is proportionately broader. The average ratio of length to diameter is 2.38 in five specimens of *P. stearnsiana*, in five specimens of *P. carpenteriana* it is 2.70. The spire is proportionately shorter in the former species and the brown bands are more conspicuous. *P. carpenteriana* has been found in the California Pliocene and Pleistocene and seems to be the first in time of a closely related group, embracing besides the two species already named, *P. tryoniama* Gabb, Pleistocene and Recent, and *P. cooperi* Arnold, found thus far in the Pleistocene of San Pedro only. It gives me great pleasure to dedicate the present species to Dr. Robert E. C. Stearns, known to all students of West American conchology.

Section *Antiplanes* Dall.

Pleurotoma (Antiplanes) catalinae, new species.

Shell sinistral, thin, elongated, slender, whorls ten to eleven; color light, pinkish-brown, without bands, interior of aperture a little lighter: upper whorls more or less chalky; nucleus smooth, inflated: later whorls convex, suture deeply impressed; sculptured by fine incremental lines and on the last whorls a few obscure, spiral striations, mostly below the periphery; anal fasciole traceable on the spire as a flattened or obscurely grooved band; aperture narrow; canal wide and short; pillar nearly straight, with a well-defined callus, obliquely truncate below; outer lip produced, deeply emarginate near the sutural margin of the whorl. Long. of shell 27, of aperture and canal 10.5; max. diam. 7.6 mm. Divergence 20°. Dredged in 125 fathoms, green mud, off Catalina Island, living, U. C. M. B. L. Station 36; off Point Loma, San Diego, 50 fathoms, Station 72 (a single, dead specimen); off Point Loma, 106 fathoms, green mud and sand, bottom temperature 47.9° F., Station 73.

This attractive shell is much like a reversed *P. (Antiplanes) santarosana* Dall, in color and sculpture, but the whorls are more oblique besides being reversed, and the spire is even more slender than in Dall's species. *P. (Antiplanes) catalinae* was found associated with *P. (Antiplanes) perversa* Gabb, which is also sinistral. The latter species is wider, has less rounded whorls and the color is a darker brown with a light, spiral band, as stated by Gabb in his original description. The two species are readily separated.

DESCRIPTIONS OF NEW JAPANESE LAND SHELLS.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota (Plectotropis) pamosa var. *awashimana* n. var.

This race is similar to *E. pamosa* in color, texture, sculpture and the profuse peripheral fringe, but differs in being much smaller, proportionally higher, with decidedly narrower umbilicus, which is not enlarged at the opening, the base being almost angular around it. Whorls $5\frac{1}{2}$, the last very shortly and slightly deflexed in front. It is more robust and less depressed than *E. deflexa*. Alt. 8, diam. 13 mm.

Awashima, Echigo. Types no. 86495, A. N. S. P., from no. 1164 of Mr. Hirase's collection.

Two species of *Plectotropis* have been described by A. Adams from Awashima: *H. setocincta* and *H. scabricula*. The first measures about 12x6 mm., the altitude half the diameter, being therefore more depressed than *awashimana*, in which the alt. is nearly two-thirds the diam. *H. scabricula* is about 9x6 mm., with $6\frac{1}{2}$ whorls, the last "subangulate" peripherally. This species is therefore smaller than *awashimana*, with more whorls and blunter ambitus.

Helix conella A. Ad., 1868, from "Tabu-Sima" (not *H. conella* Pfr., 1861), is probably a synonym of *Plectotropis deflexa* Pfr., from the same island.

Eulota (Plectotropis) shikokuensis subdiresta n. subsp.

Shell more depressed than *E. shikokuensis*, and smoother, the oblong granules bearing no cuticular scales, the periphery without a fringe. Whorls nearly 6, the last very shortly and abruptly de-

flexed in front. Umbilicus more broadly open. Alt. 7, diam. 16 mm., umbilicus 5 mm. wide.

Sodayama, Tosa. Types no. 84783, A. N. S. P., from no. 1022 of Mr. Hirase's collection.

E. s. var. *hadaka* (NAUTILUS xvii, 105) is a much less depressed form, measuring, alt. 9.5, diam. 16, umbilicus 4 mm. wide, and alt. 8, diam. 14 mm.

Eulota (Aegista) eminens n. sp.

Shell broadly and deeply umbilicate, low-trochiform, dull yellowish-brown, finely striate, the last striæ on the last whorl broken into low granules, which when quite unworn bear short cuticular laminae in places. Spire convex-conic. Whorls $6\frac{3}{4}$ to 7, slightly convex, closely coiled, and very slowly widening, the last whorl obtusely subangular at the periphery, and descending a little in front, very convex beneath. Aperture very oblique, rounded, about one-fourth of the circle excised at the parietal wall. Peristome thin, narrowly expanded, reflexed below. Alt. 7.3, diam. 10.8, width of umbilicus 3 mm.

Toba, Shima. Type no. 86493 A. N. S. P., from no. 590a of Mr. Hirase's collection.

This species belongs to the group of *Aegista mimula*, but differs from all the known species by its elevated spire, higher than in any other Japanese *Aegista*, and approaching the contour of the species referred to the section *Cælorus*.

Eulota (Aegista) mimula var. *goniosoma* n. var.

This race resembles *mimula*, *trachyderma* and *mikuriyensis* in the rather small aperture with thin, expanded lip, subreflexed below, but not thickened within. The spire is low conoid-convex, the periphery strongly angular and the base convex, abruptly curving into the wide umbilicus. The lusterless surface is brownish-yellow, freckled with buff dots, finely, rather irregularly striate, and in some specimens retaining short, triangular cuticular laminae below the periphery. Whorls $5\frac{1}{2}$ to $5\frac{3}{4}$. Alt. 6.5, diam. 11.3 to 12 mm., width of umbilicus 4 mm.

Amagisan, Izu. Types no. 86462 A. N. S. P., from no. 1165 of Mr. Hirase's collection.

On account of its strongly angular periphery, this might be con-

sidered a distinct species, and it may prove to be so; but it belongs to a group of forms which may for the present be ranked as subspecies of *E. mimula*, and including the following:

E. mimula Pils.

E. mimula trachyderma Pils. & Gude. (*E. aperta trachyderma*, Proc. A. N. S., 1901, 614).

E. mimula mikuriyensis Pils. (*E. aperta mikuriyensis*, Naut., xvi, 45).

E. mimula goniosoma Pils. & Hir.

Punctum elachistum n. sp.

Shell umbilicate, depressed, brown, the first whorl whitish. Whorls $2\frac{3}{4}$, the last one sculptured with rather widely spaced lamellæ and close spiral striæ in the intervals, the spire nearly smooth. The whorls enlarge rapidly, and the last one is somewhat compressed below the periphery, which is rounded. The aperture is large, oblique and rounded, about one-fourth of the circle excised by the preceding whorls. Alt. 7, diam. 1.2 mm.

Yanagawa, Chikugo. Types no. 86492 A. N. S. P., from no. 1159 of Mr. Hirase's collection.

There are fewer whorls than in *P. leptum*, which is also a little larger, and judging from the figures, more densely lamellose.

Punctum apertum n. sp.

Shell broadly umbilicate, depressed, thin, brownish-corneous, sculptured with delicate, thread-like riblets, in large part cuticular. Whorls 3, convex, parted by an impressed suture. Aperture oblique, rounded, slightly more than one-fourth of the circle excised by the preceding whorl; peristome thin and simple. Alt. 7, diam. 2mm.

Nemuro, Nemuro. Types no. 86490 A. N. S. P., from no. 1156 of Mr. Hirase's collection.

This little snail from the northeastern province of Yesso, is distinguished by its depressed form and wide, shallow umbilicus.

Zonitoides chishimanus n. sp.

Shell openly umbilicate, whitish-corneous, thin; closely and delicately rib-striate, densely and finely striate spirally between the lamellæ. Spire convex. Whorls nearly $3\frac{1}{2}$, convex, slowly increasing, the last rounded peripherally and below. Aperture quite ob-

lique, wide-lunate, the peristome simple and thin. Alt. .7, diam. 1.1 mm.

Kunashiri, Chishima chain (Kuril Is.). Types no. 86491 A. N. S. P., from no. 1155 of Mr. Hirase's collection.

This very small, whitish species is more closely sculptured than any Japanese *Punctum*, unless *P. leptum* Westerl. be an exception. That species from Nagasaki is larger and has a much narrower umbilicus.

Macrochlamys chaunax n. sp.

Shell perforate, convex-conic above, more convex below the slightly obtusely angular periphery, the angle above the middle; thin, somewhat transparent, pale yellow. Surface brilliantly glossy, showing some slight growth-wrinkles and densely-crowded, very minute spiral striae. Whorls 4, moderately convex, the last about double the width of the preceding, subangular, the angle becoming obsolete at the aperture. Aperture rather large, rounded-lunate. Peristome simple and thin, reflexed at the columellar insertion. Alt. 2.7, diam. 4.5 mm.

Imotoshima, an islet south of the Hahajima, Ogasawara. Types no. 83030 A. N. S. P., from no. 899 of Mr. Hirase's collection. Also found on Hahajima.

Macrochlamys cerasina shinanoensis n. subsp.

Shell resembling *M. cerasina* and *M. gudei*, but much larger than the former, more globose and more glossy than the latter. There are $6\frac{1}{2}$ convex, very slowly widening whorls, the last one angular at the periphery in front, becoming rounded on the latter part. Spire low conic, with nearly straight outlines. Base strongly convex, impressed around the narrow axial perforation, which is nearly concealed by the triangular dilation of the columellar lip. Alt. 10.4, diam. 7.4 mm.

Enasan, Shinano. Types no. 86483 A. N. S. P., from no. 1173 of Mr. Hirase's collection.

Tornatellina monodonta n. sp.

Shell imperforate, ovate-conic, thin, pale yellowish corneous, imperfectly transparent, almost smooth. Spire straightly conic, the apex obtuse. Whorls $4\frac{3}{4}$, moderately convex, the last somewhat swollen. Aperture oblique, ovate, somewhat less than half the total length. Outer lip thin and simple, columella strongly twisted, form-

ing a white spiral fold. No parietal lamella. Length 3, diam. 1.9 mm.

Imotojima, Ogasawara. Types no. 86479 A. N. S. P., from no. 1158 of Mr. Hirase's collection.

This form is distinguished at once from others described from Ogasawara-jima and the islands of Izu by the absence of a parietal lamella. It occurs also on Hahajima, no. 1158a of Mr. Hirase's collection.

Carychium nipponense n. sp.

Shell oblong, with a rather wide spire and obtuse apex, clear, transparent corneous, smooth and glossy. Whorls 4, convex, the suture well impressed. Aperture oblong, oblique, with a single, small, acute lamella at the middle of the inner margin, and a larger tubercle opposite to it within the outer lip, which is thickened throughout. Length 1.3, diam. .6 mm.

Sendai, Rikuzen. Types no. 86441 A. N. S. P., from no. 1157a of Mr. Hirase's collection.

A dwarf among pygmies. It is like *C. kachijoense* in its polished surface, but differs in the wide spire, not tapering regularly as in that insular form. *C. noduliferum*, *pessimum* and *borealis* are all conspicuously striate. *C. noduliferum* and *C. nipponense* are the only species at present known from the main island of Japan. Specimens sent from Uji-Yamada, Ise, indicate that *C. nipponense* has a wide range along the ocean coast of Nippon.

Alycæus oshimanus n. sp.

Shell of the depressed low-conoid shape of other Japanese species, the umbilicus oblong, the last whorl deviating tangentially about half-way across the preceding. Whorls $3\frac{3}{4}$, the first two smooth, reddish or yellowish, the following whorl rib-striate, at first finely and closely, but on the first half of the last whorl the riblets become quite widely spaced. Last half of the last whorl swollen, and very much more finely and closely sculptured than any other part of the shell; the neck rather strongly contracted, then swollen and sculptured again. Aperture very oblique, circular, the lip strengthened by an external rib, built forward beyond the rib, the upper and lower margins arched forward a little. Alt. 2, diam. 4 mm. Operculum thin, yellow.

Oshima, Osumi. Types no. 83385 A. N. S. P., from no. 931 of Mr. Hirase's collection.

This species differs from the allied *A. vinctus* in its sculptured neck and less developed "collar" or lip-rib. No land shell of the important island of Oshima is known to be identical with species of Kyushu or of the main island of Japan.

Stenothyra formosana n. sp.

Shell small, ovate, smooth and glossy, yellowish olivaceous. Spire convex-conic, about 4 whorls remaining, the earlier ones being eroded. Last whorl moderately inflated, distinctly compressed from back to face, strongly contracting to the aperture, which is subvertical, ovate, and not much exceeding one-third the length of the shell. Length 3.9, diam. 2.2 mm.

Kironten, Formosa. Types no. 86485 A. N. S. P., from no. 159 of Mr. Hirase's collection.

This small, plain species is related to a form in the collection of the Academy labelled *S. glabra* A. Ad., but is very much larger, and not quite so much contracted at the aperture. *S. glabra* was not very fully defined by Adams. It was described from Peiho, but has been reported from Formosa by Nevill, Handlist Ind. Mus., p. 43.

Melania hahajimana n. sp.

Shell rather thin and light, yellowish olive, usually with some indistinct reddish longitudinal streaks on the spire; somewhat glossy, sculptured with irregular, unequal but fine spiral grooves and striæ, which on the spire cut the longitudinal growth-wrinkles into oblong beads, irregularly and unevenly developed. The spire is slender with slightly concave outlines. Apex eroded, 6 or 7 remaining whorls but slightly convex, separated by an impressed, oblique suture. Last whorl inflated in the middle. Aperture ovate, oblique, broadly rounded below, the thin lip slightly sinuous.

Length 34, diam. 10.5, length of aperture 10.5 mm.

Length 30, diam. 10, length of aperture 10.8 mm.

Hahajima, Ogasawara. Types no. 8645 A. N. S. P., from no. 172 of Mr. Hirase's collection.

The slender spire, thin texture and inflated last whorl widely separate this form from *M. boninensis* of Chiehijima, the only Melanian hitherto known from the Ogasawara-jima. It is related to *M.*

tuberculata (Müll.), a widely distributed Oriental form, much more strongly sculptured, with more convex whorls.

M. boninensis Lea has been found to grow much larger than the original examples, reaching a length of 32.5 mm.

Melania libertina var. *gigas* n. v.

Very large, finely striate spirally, more coarsely so at the base, but without longitudinal folds. Olivaceous-brown, yellow in places, with some darker-brown streaks; the color concealed by a black ferrous coat. Length of decollate shells with about 4 to $4\frac{1}{2}$ whorls remaining, 48 to 51, diam. 20 mm., length of aperture 21 to 22 mm.

Arato, Echizen. Types no. 86441 A. N. S. P., from no. 171 of Mr. Hirase's collection.

This is the largest Japanese Melanian now on record. Some specimens of *M. löbbeckiana* are longer, but they are not so stout in figure.

A SINGULAR EOCENE TURBINELLA.

BY WILLIAM HEALEY DALL.

A singular *Turbinella* has recently been received from Mr. S. W. McCallie, of Georgia, which seems to stand, to some extent, between the two well known types, *Turbinella* proper and *Vasum*.

Psilocochlis subg. nov.

Shell thick and heavy, with depressed dome-like spire and few whorls, a strong siphonal fasciole surrounding a wide umbilical funnel, which is completely filled by a heavy deposit of callus, which also extends to the posterior angle of the aperture; the pillar exhibits three strong elevated plaits, and the surface is smooth or free from ribs, nodules, or prominent sculpture of any kind. Type:

Turbinella (*Psilocochlis*) *McCallie* sp. nov.

Shell short and broad, with about four whorls, of which all but the last are very small; apex hardly rising above the last whorl, which is dome-shaped above and widest at about the level of the posterior angle of the aperture, diminishing forward and slightly constricted behind the strong and flaring siphonal fasciole; umbilical funnel smooth, but nearly filled with a smooth appressed mass of callus, con-

tinuous over the body, and much thickened behind; pillar straight, with three strong plaits, canal shallow, short; suture distinct, surface smooth except for very fine incremental and revolving lines; outer lips broken, but apparently simple and sharp. Length 50, max. breadth about 38 mm., diameter of umbilical funnel about 20 mm.

Horizon: Claibornian Eocene of Richmond Co., Ga.

This singular shell has very much the aspect of *Pyrala smithii* Lea (*Lacinia alveata* Conrad), Contr. to Geology, pl. v, fig. 162; but has a lower spire, and is wider and rounder at the shoulder, beside having the strong plaits on the pillar which do not exist in *Lacinia*. It will be illustrated in a forthcoming publication. Meanwhile collectors should be on the lookout for it.

NEW VARIETIES OF AMERICAN LIMNÆAS.

BY FRANK COLLINS BAKER.

Limnæa reflexa iowaensis var. nov.

Shell thin, with a short, dome-shaped spire; whorls 5-5½, rather flat-sided, loosely coiled; suture well marked but not profound; aperture with the characteristic turret of typical *reflexa*, with a heavy plait extending across the columellar callus; spire and aperture of equal length; color dark horn, either plain or with spiral or longitudinal zebra-like markings; aperture marked internally by several longitudinal red bands, indicating the position of former peristomes; umbilicus covered.

Length 28.50, width 12.00, aperture length 13.50, width 7.00 mill.

Length 30.00, width 11.50, aperture length 15.00, width 7.00 mill.

Length 26.50, width 11.50, aperture length 14.00, width 7.50 mill.

Length 26.00, width 11.00, aperture length 12.00, width 6.00 mill.

This peculiar variety was found in a collection recently sent to the writer for study, by Mr. Bryant Walker. It differs from all forms of this species in having the spire and aperture of equal length, in the peculiar dome-shaped spire and in the general robust appearance.

In the Illinois and Michigan Canal, at Joliet, this variety is found and shows a perfect gradation from the short, stumpy variety, with

spire and aperture of equal length, to the long, spiral *reflexa*. In this lot one may trace the variation from *iowaensis*, through *umbrosa* and *jolietensis* to typical *reflexa*.

In a lot of shells received from Mr. Henry Hemphill, four specimens were found which appear to belong here. Two specimens are fairly typical, while two show a variation toward variety *umbrosa*. They are from Lake Albert Lea, Minnesota. The types are from Muscatine, Iowa.

Limnæa reflexa crystalensis nov. var.

Shell solid, with dome-shaped spire; whorls 5-6, flatly rounded, loosely coiled; sutures not impressed, but well marked; spire of variable length, but typically about the length of the aperture; aperture long-ovate, peristome with a heavy internal rib; columellar callus heavy, spreading over the inner lip and crossed by a strong plait; umbilical region showing a slight perforation beneath the overhanging columellar callus; color light or dark horn, some species are strongly zebra-marked, and all exhibit the fine wavy sculpture of this group of *Limnæas*. It seems sometimes malleated.

Length 19.50, width 8.00, aperture length 9.00, width 4.00 mill.

Length 21.00, width 8.00, aperture length 10.00, width 5.00 mill.

Length 22.00, width 9.00, aperture length 10.50, width 5.50 mill.

Length 23.00, width 8.50, aperture length 10.50, width 5.00 mill.

Length 23.50, width 10.50, aperture length 12.50, width 5.50 mill.

Length 28.00, width 10.00, aperture length 12.00, width 6.00 mill.

Length 23.50, width 9.00, aperture length 11.00, width 5.00 mill.

Length 28.00, width 9.00, aperture length 11.50, width 5.50 mill.

This variety may be collected in countless numbers at Crystal Lake, Illinois. The lot from which this description was drawn numbers 105 specimens, and was collected by Dr. N. H. Lyon. This variety bears the same relation to *reflexa* that variety *michiganensis* Walker does to *palustris*, and its growth is probably governed by the same physical conditions.

Limnæa reflexa hemphilliana nov. var.

Shell rather solid; color light horn; whorls 6, very flat-sided, loosely coiled, nuclear whorls very dark red; sutures not impressed; spire acutely pyramidal, about as long as the aperture; aperture elongate-ovate; peristome thin, bordered internally by a red band;

columella oblique, with a rather heavy plait; parietal wall covered by a spreading callus which almost closes the umbilicus; some specimens show a tendency to become malleated.

Length 27.00; width 11.00; aperture length 14.00; width 7.25 mill.

Length 27.00; width 11.50; aperture length 15.00; width 7.50 mill.

Distribution: Lake Albert Lea, Minnesota.

Specimens of this very distinct variety were found in a lot of shells received from Mr. Bryant Walker. They look like a widened-out variety *exilis* with a short spire. They have some relation to the variety *iowaensis*, but the spire is sharply conic, while in that variety it is dome-shaped.

GENERAL NOTES.

LIMAX MAXIMUS L. IN CALIFORNIA.—The United States National Museum has recently received several specimens of this species from Mr. S. A. Pease of San Bernardino, Cal. Mr. Pease informs us that they were collected out of doors, near a house, in Redlands, and that it was reported to him that they were feeding upon flowers and plants. He also states that he has heard of this same slug in different parts of San Bernardino county.

The specimens sent us are darker than the usual East American form and not so large, the longest individual (preserved in formalin) measuring 58. mm.—PAUL BARTSCH.

NOTICE OF SIX NEW SPECIES OF UNIOS FROM THE LARAMIE GROUP.—By R. P. Whitfield (Bull. Amer. Mus. Nat. Hist., XIX, 1903, p. 483-487). *U. æsopiformis*, *verrucosiformis*, *retusoides browni*, *percorrugata* and *postbiplicata* are described from Snow Creek, on the Missouri River, about 130 miles N. W. of Miles City, Montana. The names indicate the species of the recent fauna believed to be related to these Laramie forms; but the radial V-like beak-sculpture of at least part of them shows that there is nothing in the supposed relationship of the Laramie forms to any surviving North American Unios. They belong to the *Hyriinæ* of Simpson's arrangement, and are only referable to *Unio* in a Lamarckian sense. The name *Unio browni* Whitf. being preoccupied, that species may be called *Parreysia barnumi*. It is named for Mr. Barnum Brown, who collected the series.—H. A. Pilsbry.



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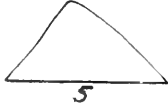
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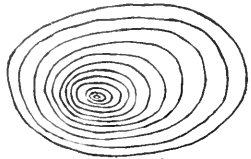
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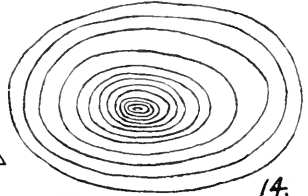
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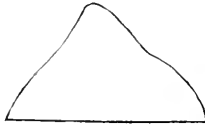
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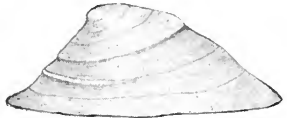
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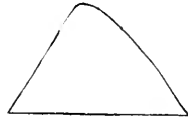
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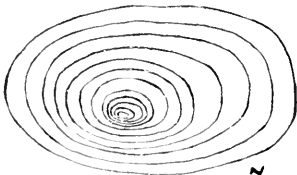
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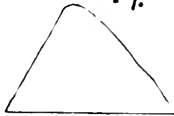
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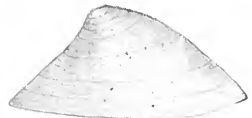
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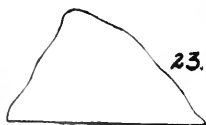
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THE NAUTILUS.

VOL. XVIII.

JUNE, 1904.

No 2.

ON THE GENERIC POSITION OF TEREDO FISTULA H. C. LEA.

BY CHARLES W. JOHNSON.

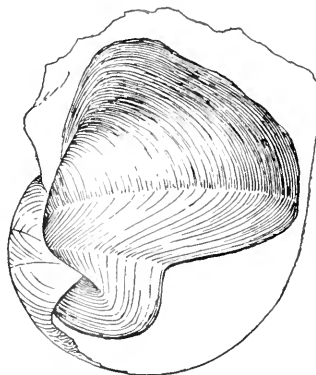
Among the H. D. and W. B. Roger's collection of tertiary fossils of Virginia, now in the Museum of the Boston Society of Natural

FIG. 1.



TEREDINA FISTULA, H. C. LEA.

FIG. 2.



TEREDINA FISTULA, H. C. LEA.

History are five specimens] (Catalogue no. 9582) of what is usually referred to as *Teredo fistula* H. C. Lea (Trans. Amer. Phil. Soc., 2

ser., ix 234, pl. 34, fig. 5, 1845). Dr. Dall (Trans. Wagner Free Inst. Sci., iii, pt. iv, p. 813, 1898) suggests that this may possibly be the same as *Teredo calamus* by the same author (op. cit., fig. 4) which apparently differs only in size. The position of *T. fistula* has always been questioned owing to the absence of all shell characters. Among the above-mentioned material is a specimen having a total length of 58 mm. with valves about 12 mm. in length imbedded in the lower end of the tube as shown in fig. 1. From this it will be seen that it evidently belongs to the genus *Teredina*, although I have seen no trace of the tube being separate, and the number of accessory valves are poorly defined, the small, dorsal, triangular space having but a slight median and transverse groove. The valves are divided into three areas by two faint radial lines which interrupt the concentric lines as shown in fig. 2. On the anterior angle near the margin are traces of a fine squamose imbrication over-riding the concentric lines.

A NEW SPECIES OF PLEUROTOMA FROM THE PLIOCENE OF CALIFORNIA.

BY WILLIAM JAMES RAYMOND.

Subgenus *Genota* H. and A. Adams, section *Dolichotoma* Bellardi. *Genota riversiana*, new species.

Shell narrowly fusiform, spire elevated, outline of spire contained within two straight lines; whorls slopingly shouldered, convex anteriorly, slightly concave near the suture, an obtuse angle separating the wider convex area from the narrower concave area, whose widths are in the ratio of five to four; posterior margin of the whorls strongly appressed, suture distinct; first two or three whorls broken away, later whorls with conspicuous, elevated, revolving threads, of which about eight below the shoulder and six above are more prominent, those above somewhat finer and closer; between the primary threads are much finer, secondary threads; on the last whorl about sixteen principal threads below the shoulder, coarser and more widely spaced anteriorly, with one to three secondary threads occupying each interspace; axial sculpture consisting of sharp, elevated growth lines, elegantly decussating the revolving threads,

especially conspicuous just below the suture; on the uppermost of the remaining whorls are faint nodes, about twenty to the whorl; aperture rather narrow; posterior sinus shallow, rounded; lip slightly produced below the sinus, as shown by the growth lines; two-thirds of last whorl broken away; canal rather wide; pillar solid, curved, a somewhat prominent, smooth swelling above; body whorl eroded in front of the aperture, with a wash of callus striated in lines parallel to the lip.

Length of shell 59, of aperture and canal 30, of body whorl 41; max. diam. 20.5 mm. Divergence 30° . These measurements are taken from the broken shell. The spire was probably about 4 mm. longer and the total length of the perfect shell could not have been less than 75 mm., with 7 or 8 whorls. From the Pliocene of Santa Monica, California.

Genota riversiana is the narrowest form of this subgenus found in California. Only an occasional, greatly produced *G. carpenteriana* Gabb can compare with it in this respect. The narrow form, the prominence of the revolving sculpture and the obtuse angle, behind the middle of the whorls, well characterize this species. In *G. cooperi* Arnold and *G. tryoniiana* Gabb the angle is sharper and in front of the middle of the whorls. The principal revolving threads in the present species are more conspicuous and more nearly equal than in *G. cooperi*, of which a fine specimen from the Pleistocene of Santa Monica is before the writer. The latter species is the most sharply sculptured of those hitherto described. Form and sculpture at once separate *G. riversiana* from *G. carpenteriana* Gabb, and still more widely from *G. stearnsiana* Raymond, which is the shortest and widest species of the subgenus.

It gives me great pleasure to dedicate this beautiful species to the discoverer, Professor J. J. Rivers, who has made a large and most interesting collection of the Pliocene and Pleistocene fossils found in the vicinity of his home.

The list of subgenus *Genota* will now be as follows:

1. *Genota carpenteriana* Gabb, Late Tertiary to Recent.
2. " *tryoniiana* Gabb, Late Tertiary to Recent.
3. " *cooperi* Arnold, Quaternary.
4. " *stearnsiana* Raymond, Recent.
5. " *riversiana* Raymond, Late Tertiary.

It is a very compact group. No. 2 is scarcely more than a variety

of No. 1. The others are well differentiated, yet closely related. No. 1 is the most abundant in numbers; the others are apparently rare.

NOTES ON EASTERN AMERICAN ANCYLI. II.

BY BRYANT WALKER.

In preparing my former paper on this subject (NAUT., XVII, p. 13), I overlooked Hedley's note on *Ancylastrum* (Proc. Mal. Soc., I, p. 118) in which he calls attention to the fact that Bourguignat's type was *A. cumingianus* and not *A. fluviatilis*. The latter species being the type of the genus *Ancylus*, *Ancylastrum*, as used by Clessin and those who have followed him, was wholly unnecessary, being equivalent to *Ancylus s. s.* This rectification leaves the section represented by *A. fluviatilis* and characterized by its elevated, capuli-form shell, with the apex recurved and decidedly posterior, free, as it should be, to be known as *Ancylus s. s.*

The division of the Eastern American species into two sections distinguished by the character of the apex, was only a further step in the direction pointed out by Clessin in establishing his section *Haldemania* and, had his name been available, it would have been used for one of them. Independent of the apical characters, Clessin's group was a valid one, and he was entirely justified in separating it from the Eurasion sections represented respectively by *A. fluviatilis* and *lacustris*. And the fact that both of these species have the apex radiately striate, does not at all militate against the validity of Clessin's *Haldemania*, nor of the two sections that have been proposed to take its place. In order, however, that there may be no confusion hereafter on this point, the description of the section, which includes the Eastern American species with a striate apex, may be amended to read as follows:

Section *Ferrissia* Walker.

Shell conical, ovate, oval or oblong, usually elevated; apex acute or somewhat obtuse, placed only slightly behind the middle of the shell, and usually turned toward the right side, not recurved, radially striate.

Type: *A. rivularis* Say.

Most of the species belonging to this section are by preference in-

habitants of running water, and are usually found on stones, dead shells, etc., in rivers and streams. The smaller, stronger and more compact shell is no doubt the result of their environment. A few species, however, of which *A. parallelus* is the most notable example are to be found on plants or dead leaves in slow-flowing or stagnant water. The distribution of the species seems to be more general than that of the species of *Lævapex*.

I. *Ancylus rivularis* Say (1819). Pl. I, figs. 1-10 and 13-15.

This was the first species of American *Ancylus* to be described and the meagerness of the original description is probably to be attributed to this fact. But one dimension is given and nothing whatever is said in regard to the contour of the shell. It was not until *A. tardus* was differentiated in 1840, that any information was given on the latter subject and then only by inference. The consequent doubt as to what form was really intended to be covered by the description was recognized at an early date. The characteristic difference in the position of the apex and the shape of the shell was first pointed out by Adams (Thomp. Hist. of Vt., p. 164, 1842), and his remarks on the prevalent uncertainty in regard to Say's species are quoted with approval by Haldeman. It was not until the latter in his monograph supplied an accurate description and a good figure, that the species can really be said to have been established. I am inclined to agree with Haldeman rather than Tryon in considering Gould's *rivularis* (Invert. of Mass., p. 224), to be *parallelus* rather than Say's species.

Taking Haldeman's description as the typical expression of the species, *A. rivularis* is a well-marked form, which typically is easily differentiated from all other recognized species. It has a general distribution through the Northern States from New England to Nebraska and southerly to Virginia and through the Ohio and Mississippi Valleys southwest at least as far as New Mexico. I have not seen it, however, from any of the southern Atlantic or the Gulf States east of the Mississippi. It is subject to considerable variation, however, in size and contour, and it is not always easy to differentiate it from the western form of *A. tardus*. It is not likely to be mistaken for any of the other eastern American species, except perhaps *A. haldemani*, which differs in the particulars stated under that species.

(To be continued.)

A DREDGING TRIP TO SANTA CATALINA ISLAND.

H. N. LOWE.

Last October it was the writer's good fortune to spend a week at Avalon, Santa Catalina Island.

A small dredging outfit was included among the baggage. The same dredge had five years ago brought up *Fusus roperi* Dall and *Turbonilla lowei* Dall and previous to that had been used with such good results by the late Edward W. Roper off Eastport, Maine and with what results it was now used the following list will show. As there were numerous small power launches at anchor in the bay, I decided to venture the price of a day's use of a launch and see what strange creatures live in old ocean "a hundred fathoms deep."

I invited to go along as a traveling companion, my young friend, John Paine, for whom at my request Dr. Dall has named two of the new species dredged.

The morning selected was clear and bright and the water smooth as glass as we steamed up the island till just off "Moonstone Beach" and under the lee of "Long Point." Here we decided to make our first haul in some 30 fathoms of water.

The water was so transparently blue that we could see our dredge as it sank down, down into the realms of Mermaids and sea-serpents.

Anyone who has done any dredging well knows we did not take along any rocking chair or wear our Sunday clothes.

After the dredge had been down a reasonable length of time we commenced hauling in our thousand feet of dripping rope, by no means an easy task. Almost every haul would be different, sometimes the dredge would be entirely filled with soft mud or sand, again with broken shells, and twice it came up filled with small stones to which beautiful bunches of Brachiopods were attached.

The second day we dredged in somewhat deeper water up to fifty fathoms with very good results.

After my return it took every evening for over three weeks to sort over the dredgings with the aid of a strong lens.

Dr. Dall has kindly worked up the doubtful material and described the new species, in the Proceedings of the Biological Society of Washington, Dec. 13, 1903, pp. 171-176.

The following is a full list of the species dredged :

- Actæon punctocœlata* Cpr.
Actæon painei Dall. n. sp.
Actæon traski Stearns.
Admete gracilior Cpr.
Amphissa undata Cpr.
Amphissa versicolor Dall.
Angulus carpenteri Dall.
Bittium asperum Cpr.
Cadulus fusiformis P. & S.
Cæcum crebrecinctum Cpr.
Callista newcombiana Gabb.
Callista (Clementia) subdiaphana
 Cpr.
Cancellaria cooperi Cpr.
Cardium biangulatum Sby.
Cardium quadriganarium Conr.
Calliostoma splendens Cpr.
Callisotoma variegatum Cpr.
Protocardia centiflosæ Cpr.
 Only one adult specimen of
 this beautiful shell.
Capulus californicus Dall.
Cavolina pacifica Dall.
Chama exogyra Conr.
Clathurella lowei Dall. n. sp.
Cerithiopsis tuberculata Cpr.
Cerithiopsis assimilata Cpr.
Coms californicus Hds.
Columbella carinata Hds.
Columbella tuberosa Cpr.
Crepidula navicelloides Nutt.
Crenella columbiana Dall.
Chama muricata Hds.
 Two examples had unusually
 long, incurved spines.
Cuspidaria obesa Lov.
Daphnella clathrata Gabb.
Dentalium neohexagonum S. & P.
Diplodonta orbella Gld.
- Drillia cancellata* Cpr.
Drillia empyrosia Dall.
 Adult shells very rare.
Erato columbella Mke.
Erato vitellina Hds.
Eulima rutila Cpr.
Fusus ambustus Gld.
Fusus kobelti Dall.
 Fine large specimens.
Hinnites giganteus Gray.
Ischnochiton biarcuatus Dall. n. sp.
Ischnochiton interstinctus Gld.
Ischnochiton punctulatissimus Cpr.
Kellia suborbicularis Mont.
Kellia laperousi Deshayes.
Lucina annulata Rev.
Lucina approximata Dall.
Lucina californica Conr.
Lucina nuttalli Conr.
Laqueus californica Koch.
 Found in large bunches at-
 tached to stones, dead shells and
 ascidians.
Laqueus jeffreysi Dall.
 Found with *L. californicus*,
 rare.
Ledu acuta Cpr.
Leda hamata Cpr.
 A few live specimens of this
 interesting species.
Lepidopleurus crebricostatus Cpr.
Lepidopleurus mertensi Midd.
Leptochiton nexu Cpr.
Lima orientalis Cpr.
Limatula subauriculata Mont.
Lingula albida Hds.
Lunatia draconis Dall. n. sp.
Lyonsia californica Conr.
Macromphalina californica Dall.

Mangilia densistriosa Cpr.
Mangilia fancheræ Dall.
Mangilia sculpturata Dall.
Metzgeria californica Dall.
Mitra maura Swains.
Mitra lowei Dall. n. sp.
Modiola polita Verrill.
Murex californicus Dall.
Murex painei Dall.
Muricidea incessa Brod.
Muricidea santarosana Dall.
Nassa insculpta Cpr.

And a var. with heavy ridges.

Nassa perpinguis Hds. var.
Natica russa Gld.
Neæra californica Dall.

Occasional examples of this curious shell.

Nucula belloti A. Ads.
Ocenebra lurida Midd. var.
Odostomia amianta D. & B.
Odostomia kennerleyi D. & B.
Opalia retiporosa Cpr.
Orulum Sp.

Two fine specimens dredged.

Pandora bicarinata Cpr.
Pachypoma inæquale Martyn.
Pecten floridus Hds.
Pecten hericeus Gld.
Pecten latiauritus Conr.
Pecten vancouverensis Whiteaves.
Phasianella compta Gld.
Placiphorella velata Cpr.
Pleurotomu carpenteri Gabb.
Pleurotoma perversa Gabb.
Psephidea ovalis Dall.
Puncturella cucullata Gld.
Puncturella galeata Gld.
Ranella californica Hds.

The adult specimens dredged

were only half the size of those found on the mainland yet were twice as thick and heavy.

Scala crebrecostrata Cpr.
Scala bellastrata Cpr. var.
Scala sawinæ Dall. n. sp.
Saxicava rugosa L.
Semele pulchra Mtz.
Sistrum carbonarium Sby.
Tegula peramabilis Cpr.
Thracia plicata Cpr.
Terebratella obsoleta Dall.
Terebratella occidentalis Dall.

Several fine large specimens of these most beautiful brachiopods.

Tornatina culcitella Gld.
Trophon stuarti var. *smithi* Dall.
Trophon tenuisculpta Cpr.
Trophon triangulatus Cpr.
Turitella cooperi Cpr.
Turbonilla lowei D. & B.
Turbonilla simpsoni D. & B.
Turbonilla hypolispa D. & B.
Turbonilla hypolispa var. *stylina* Cpr.
Turbonilla auricoma D. & B.
Turbonilla aresta D. & B.
Turbonilla tridentata var. *catalinensis* D. & B.
Turbonilla aurantia Cpr.
Turbonilla eucosmobasis D. & B.
Turbonilla latifunda D. & B.
Turbonilla torquata Gld.
Trachydermon flectens Cpr.
Trivia ritteri Raymond.
Venericardia ventricosu Gld.
Verticordia ornata Orb.
Volva cylindricu Cpr.
Williamia peltoides Cpr.

NOTES ON A FEW SHELLS.

BY C. F. ANCEY.

Prof. H. A. Pilsbry has described and figured a few years ago (Proc. Acad. Nat. Sciences, Phila., 1901, p. 632, pl. xxxvi, fig. 30-41) a Japanese Clausilia which he called *Cl. oscariana*, in honor of Dr. Oscar Boettger, the well-known German writer on Clausiliæ. He was probably unaware that a Chinese species of this genus received the same name from P. V. Gredler (Zur Conchylien-Fauna von China. xvii Stück, Wien, 1892, p. 8), who, curiously enough, has dedicated his species to Dr. O. von Möllendorff whose Christian name is Otto not Oscar. At all events, the name *Oscariana* cannot stand for the Japanese Clausilia, this homonym having several years of priority. Hence, I propose to substitute for it the name *Clausilia pilsbryana* Anc.

I must also call attention to *Claus. oscar* Thiesse (Bttg., Proc. Zoöl. Soc. 1883, p. 34, fig. 16) a somewhat distinct form of *Cl. schuch*, v. Voith, perhaps entitled to specific rank, though Dr. West-erlund (Fauna der in der Paläarktischen region lebenden Binnen-Conchylien, iv, p. 140) calls this a variety of *Cl. schuch*.

Terebra histrio Desh., was described (Journ. de Conch. 1857, pl. iv, fig. 11) without a locality, from a specimen in Deshayes' collection. I have procured a fine specimen collected on the coast of Senegal together with *T. bitorquata* Desh., already known as West African, *Drillia rosacea* Reeve, *Marginella petiti* Duval, *M. goodalli* Sow., *M. cleryi*, Petit. My example, consisting of 16 whorls, is 42 mill. long and 10 mill. wide. For the identification I am indebted to Mr. Ph. Dautzenberg.

Natica prietoi Hidalgo (Journ. Conch. xxi, p. 332, Moll. Esp., pl. 20B, figs. 2-3), a very rare shell, discovered on the coast of Southern Spain, was found again by myself at Algiers. I secured a large, somewhat worn example and a smaller one very perfect. With this I detected a specimen of another scarce species worthy of record, viz., *Scalaria candidissima*, Monterosato.

Drymæus nubilis Preston, of which I have purchased a specimen from the author, who described it in the "Journal of Malacology," vol. x, no. 1, March 1903, appears to be absolutely the same as *Drymæus reclusianus* Pfr., var. *martensianus* Pils., from Costa Rica, which of course has the priority.

Helicina pterophora Sykes (Proc. Malac. Soc. of London, vol. v, no. 1, 1902, p. 20, fig.), from Guatemala, appears not to differ essentially from *H. oxyrhyncha* Crosse and Debeaux, from unknown locality. The shells labelled *oxyrhyncha* in the collection of the British Museum, from Bonacca Island, Honduras, are hardly referable to this species, hence, I suppose that Mr. Sykes has been misled in considering his species *pterophora* as distinct from the true *oxyrhyncha*. An example of the latter in my collection is quite typical, lacking the colored bands of *pterophora* and uniform yellow.

NOTES AND NEWS.

SNAILS AND SLUGS IN THE NEW INTERNATIONAL ENCYCLOPÆDIA.—In *The Dial* (Chicago) of Nov. 16, 1904, I took occasion to set forth the character of some of the articles on scientific subjects found in the most recent Encyclopædias. The article "slug" was examined in a number of them, with interesting results. I said, however, "the 'New International' and the 'Encyclopædia Americana' have not yet reached the letter S, so we cannot tell what surprises they have in store for us." The former of these has now come to S, and to-day I turned with interest to "slug." The common *Agriolimax campestris* appears as "*Lima campestris*" though one would think a campestrian *Lima* might find it difficult to exist! We are also told that slugs are "vegetable eaters," without qualification. Turning over the article "snail," I find a colored plate of American snails. The generic nomenclature is almost pre-historic, "*Helix*" covering three different families, not to speak of genera. Thus we have *Helix fuliginosa*, *Helix alternata*, etc. We also have *Bulimus dealbatus* and *Bulimus fasciatus*.

Now all this is stupid enough, and it seems fitting for those who

know better to agitate the matter sufficiently to bring about a reform, if that is possible.—T. D. A. COCKERELL.

A NEW COLLECTOR IN THE FIELD.—A few days ago I noticed in my garden, where a Chipmunk (*Tamias striatus* Linne.) had been "cleaning house" for the spring, the only refuse he had brought out was about a pint of empty shells, consisting of two species, about an equal number each, *Polygyra monodon* Rack. and *Succinea avara* Say. With the Polygyras the upper half of the shells were eaten away and then nicely cleaned of the animal, the Succineas all had the animal cleanly taken out without breaking the frail shell in the least. The Succineas are every season very plenty within fifty feet of Mr. Chipmunk's abode, and the *P. monodon* is the predominating species of the genus in this locality, Des Moines, Iowa.—T. VAN HYNING.

Messrs. Walker, Clapp and Henderson have made a short collecting trip in the Blue Ridge of Virginia. They report a small catch.

ADDITIONAL NOTES ON LIMAX MAXIMUS L. IN CALIFORNIA.—It may be appropriate to add to Mr. Bartsch's note on the occurrence of *Limax maximus* L. in California, that the Academy of Natural Sciences of Philadelphia has received this species from the following additional places in that state: Oakland, collected by Messrs. Williard Wood and F. L. Button in 1896; Los Angeles, Dr. R. E. C. Stearns, collected April 9, 1901; Monterey Co., Mr. Geo. H. Clapp; San Jose, collected by Mr. O. P. Jenkins in 1902; and also from Pasadena, Oct. 1896 and Long Beach in 1899, collected by Mr. H. N. Lowe.—E. G. VANATTA.

NOTE ON VENUS ARAKANA Nevill.—In the Proceedings of the Malacological Society for Oct., 1903, Mr. Smith has correctly referred *Venus malonei* Vanatta to Nevill's species, but at the same time he has added a new name to the synonymy by calling it *V. "arakanensis."* The brothers Nevill did not describe this shell as "*Venus (Timoclea) arakanensis,*" as quoted by Mr. Smith. They

called it "*Cryptogramma arakana*." The correct form is used by Sowerby, on p. 33 of his Supplement to Marine Shells of South Africa.—H. A. PILSBRY.

A DISTORTED OYSTER.—The most curious distortion that I have seen was handed to me by a parishioner a few days ago. The species is the common oyster taken from the Sound here (Branford, Conn.) The earlier growth is $4\frac{1}{2}$ inches long, $1\frac{1}{2}$ inches wide, the shell then shoots off to the right at an angle of 100° and continues $2\frac{1}{2}$ inches with a width of 2 inches. It next turns to the left at an angle of 120° and adds 2 inches more. This is the external appearance—Owing to the fact that in each case the animal abandoned a part of the shell and built from the middle, the internal appearance is a double curve.—HENRY W. WINKLEY.

PUBLICATIONS RECEIVED.

SYNOPSIS OF THE GENERA, SUBGENERA AND SECTIONS OF THE FAMILY PYRAMIDELLIDÆ.—By Wm. H. Dall and Paul Bartsch (Proc. Biol. Soc. Wash. XVII. pp. 1-16, Feb. 5, 1904). The family consists of four genera *Pyramidella*, *Turbonilla*, *Odostomia* and *Muschisonella*. The former is divided into 20 subgenera for 10 of which new names are proposed. *Turbonilla* consists of 12 subgenera of which five are new, and *Odostomia* 37 subgenera, eight of which are new. Four new species are described viz.—*P. dodona*, *T. archeri*, *O. pilsbryi* and *O. americana*. An elaborate system of subgenera and sections is proposed for the wonderfully varied and numerous forms of this difficult family. The work has long been needed, and when suitably illustrated will be of great utility.—C. W. J.

A LIST OF SHELLS COLLECTED IN WESTERN FLORIDA AND HORN ISLAND, MISS.—By E. G. Vanatta (Proc. Acad. Nat. Sci., 1903, pp. 756-759). The 119 species enumerated were collected by Mr. Clarence B. Moore, while engaged in archæological researches. *Vitrinella mooreana*, *Erycina floridana* and *Cuna dalli* are described as new.—C. W. J.



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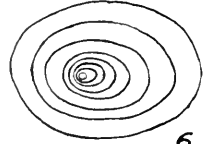
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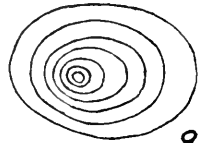
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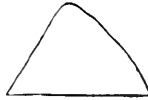
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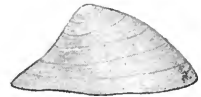
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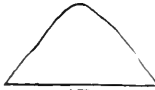
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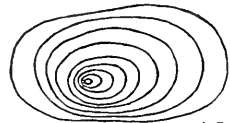
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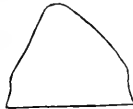
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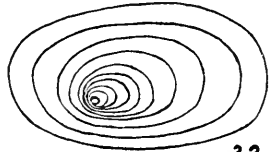
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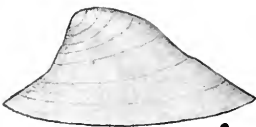
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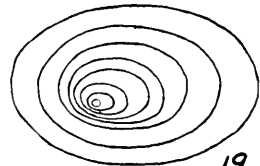
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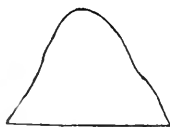
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THE NAUTILUS.

VOL. XVIII.

JULY, 1904.

No 3.

NOTES ON EASTERN AMERICAN ANCYLI. II.

BY BRYANT WALKER.

Ancylus rivularis Say. Pl. I, figs. 1-10, 13-15.

The typical form as established by Haldeman is represented by fig. 3 (the specimen figured agreeing almost exactly with his dimensions), and is an ovate, moderately elevated shell with a subacute apex, which is inclined toward the right side, and with about one-third of the shell posterior to it. The anterior and dextral slopes are regularly but not strongly convex; the posterior slope is quite concave immediately below the apex, but becomes nearly straight toward the peritreme; the left slope is nearly straight, sometimes slightly concave towards the apex. The lines of growth are well marked but quite irregular, and there is more or less of a tendency to the radial rippling on the anterior slope so common in many species. The shell is distinctly narrowed toward the posterior extremity, the greatest width being just in front of the apex. Associated with the specimen figured, and grading into it, is a more depressed form, with the apex less prominent and the posterior slope nearly straight (fig. 4). Similar examples have been supplied from several localities in the neighborhood of Buffalo, N. Y., and indeed it seems to be rather the characteristic form of that region. The few examples seen from eastern Massachusetts are smaller and rather more depressed than the typical form.* Western specimens appar-

* The "large specimens" from Caribou, Me., quoted by Nylander (NAUT., xiii, p. 105) should, I think, be referred to *A. parallelus*.

ently average larger than those from the Eastern States. The largest examined are from Lincoln, Neb., one of which is represented by fig. 6, which has the apex more obtuse than others from the same lot. A series submitted by Dr. Sterki, from Ohio, are uniformly of medium size, none of them attaining the dimensions of specimens from Michigan and further west. Fig. 9 represents another western form, larger, proportionately higher and with the anterior slope more convex than in the typical form, and which in the longitudinal outline approaches the western form of *tardus*, and not infrequently is very difficult to differentiate from it, while fig. 13 represents an extreme form, unusually high, with nearly straight lateral slopes and a very acute apex.

While as a rule it is not difficult to separate this species from *tardus*, and on the whole the two species seem sufficiently distinct, it is by no means always easy to decide in regard to individual cases or even large series. This has been particularly true in regard to the series from Ohio, received from Dr. Sterki, in which the two forms seem to run together almost inextricably. As shown by the figures given of each species, none of several distinctive characters relied on are invariable, the posterior slope is frequently quite as concave in *tardus* as in *rivularis*, while the convexity of the anterior slope is not uncommonly quite as great in the one as in the other, and neither the position of the apex nor the outline of the peritreme is an absolutely invariable character. The most that can be said is, that while typically the two forms are quite distinct, and in the main can be readily distinguished, nevertheless the variation is so great that, as is often the case with all the fresh-water groups, the supposed specific characters fail to give an infallible basis for determination, and the decision in such cases must be the result of the individual opinion of the observer based upon his general conception of the species as applied to the particular specimens in question.

Taking this species as a whole, it may be said to be distinguished from *tardus* by larger size, more depressed form, more acute apex, which is more inclined toward the right side, and nearer the centre (longitudinal) of the shell, the posterior slope is proportionately longer and more oblique, the anterior slope is usually not so convex, the left slope is usually longer and more convex than the right, the shell is usually decidedly wider anteriorly and the transverse section is wider in proportion to its height, and the side lines consequently

more oblique. This last specification is perhaps a more reliable distinction in doubtful cases than any of the others. Occasionally depressed specimens occur in which both of the side slopes are decidedly concave, and the apex quite papilliform. This form, however, seems to be an individual rather than a racial peculiarity.

The dimensions of the specimens figured are as follows :

No.	Length.	Breadth.	Altitude.
1	4.75	3.00	1.50 Min.
3	5.25	3.50	2.00 "
6	7.00	4.00	2.50 "
9	6.25	4.25	2.00 "
13	6.50	4.33	2.75 "

Var. *brunnea* Hald.

I have been unable to get any information whatever in regard to this form.

II. *Ancylus tardus* Say (1840). Pl. I, figs. 11, 12, 16-23. Pl. II, figs. 1-22.

Say differentiated this species from his *rivularis* on three grounds :

1. The apex inclined backwards, but not laterally.
2. The straight posterior slope.
3. The oval aperture, not distinctly narrowed at one end.

His type came from the Wabash. But two dimensions are given, length $\frac{3}{8}$, breadth $\frac{1}{10}$ in. (3.75 x 2.5 mm.). Binney errs in quoting the length as 4.25 mm. He also states that the type is in the collection of the Philadelphia Academy. Among the *Ancyli* received from the Academy is a single specimen (No. 58045) labelled "Wabash River, Mrs. L. W. Say," which is undoubtedly the specimen referred to. As shown by the figure (Pl. II, fig. 1), the posterior margin is somewhat broken. Its present dimensions are exactly those given by Say (3.75 x 2.5). It is a dead, somewhat worn, shell, and the defective peritreme might easily have escaped observation. When perfect, it must have been somewhat larger.

Adams (Thompson's Hist. of Vt., 1842), was next to recognize the species, which he says differs from *rivularis* in the position of the apex and shape of the aperture. His dimensions (6.25 x 4 x 3.25 mm.) indicate a much larger shell, proportionately a little wider and very much higher than the type.

Haldeman's descriptions (Mon., 1842), though short, when read in connection with his description of *rivularis*, clearly differentiate the form indicated. His figure was evidently drawn from the broad form found in eastern Pennsylvania, and which justifies his remark that *tardus* is proportionately broader than *rivularis*, when understood as applying to the outline of the peritreme and not to the transverse section. His dimensions, however, are quoted from Adams.

Neither Binney, Tryon nor Clessin, have added anything to our knowledge of this species.

I have not been able to find a specimen that agrees either actually or proportionately with the dimensions given by Adams, which indicate a large, narrow and very high form. Western specimens of the same length are uniformly wider and lower. The only Vermont specimens seen are a pair in the collection of the Philadelphia Academy labeled "Vermont," and a small suite of immature examples from Hartland (No. 58036) (pl. II., fig. 7). The former are quite typical in their longitudinal and transverse outlines, but are very wide, almost sub-circular in shape (4.5 x 3.5 and 4.25 x 3). The latter are similar, but more depressed. Similar specimens, intermediate in elevation (pl. II., fig. 4), have been found at Orono and in the Aroostook River in Maine. In all these the posterior slope is straight. An elevated form (pl. II., fig. 10) similar to the Vermont shells occurs at Silver Spring and Columbia, Pa., and is very like that figured by Haldeman; the posterior slope, however, is more oblique, and in some examples noticeably concave (pl. II., fig. 12). All these shells, however, are alike in the comparatively small size and great width, and should a larger suite show that this is the prevalent eastern form of the species it should probably be distinguished varietally. The western, and no doubt the typical, form is quite different. Larger, narrower and higher, it is typically a well-marked form. The resemblance between Say's type (pl. II., fig. 1) and the upper half of fig. 20, pl. II., is very striking, and I have no doubt but that Say's specimen is an immature example of this common western species, which is found abundantly from Ohio west to the Mississippi Valley. It is, however, quite variable, as shown by the figures, and, as already stated, at times very difficult to differentiate from the equally variable forms of *rivularis*. The typical western form is represented by figs. 17 and 20, pl. II., and is characterized by its regularly oval outline, elevated obtuse apex, which is scarcely

turned from the median line, and steep, nearly straight lateral slopes. The anterior slope is usually more decidedly convex than in *rivularis*, and the posterior slope, though frequently quite concave, is shorter, more direct and less oblique than in that species. The variations in contour leading towards *rivularis* are shown by figs. 11, 16, 18, 20 and 22 on plate I. An unusually narrow form (pl. II., fig. 14) occurred sparingly among the material supplied by Dr. Sterki.

The dimensions of the specimens figured are as follows :

	<i>Length.</i>	<i>Breadth.</i>	<i>Alt.</i>
Plate I., fig. 11	5.75	3.75	2.00 mm.
“ “ 16	6.00	3.80	2.25 “
“ “ 18	5.20	3.50	2.00 “
“ “ 20	5.00	3.25	2.25 “
“ “ 22	6.00	4.00	2.50 “
Plate II., fig. 1	3.75	2.50	1.75 “
“ “ 4	4.25	3.25	1.50 “
“ “ 7	4.25	3.00	2.00 “
“ “ 10	4.75	3.00	2.00 “
“ “ 12	4.25	3.00	1.90 “
“ “ 14	5.00	2.75	2.00 “
“ “ 17	5.50	4.66	2.50 “
“ “ 20	5.66	3.50	2.50 “

EXPLANATION OF THE PLATES.

All the figures are drawn on the same scale.

Plate I.

Figs. 1-5	<i>A. rivularis</i> Say.	Erie Canal, N. Y.
Figs. 6-8	“ “ “	Lincoln, Neb.
Figs. 9-10	“ “ “	Lamberton Creek, Kent Co., Mich.
Figs. 11-12	<i>A. tardus</i> Say.	“ “ “ “
Figs. 13-15	<i>A. rivularis</i> Say.	“ “ “ “
Figs. 16-23	<i>A. tardus</i> Say.	“ “ “ “

Plate II.

Figs. 1-3	<i>A. tardus</i> Say.	Wabash River.
Figs. 4-6	“ “ “	Orono, Me.
Figs. 7-9	“ “ “	Vermont.
Figs. 10-11	“ “ “	Silver Spring, Pa.

Figs. 12-13	<i>A. tardus</i>	Say.	Columbia, Pa.
Figs. 14-16	"	"	Tuscawaras River, Ohio.
Figs. 17-19	"	"	Plaster Creek, Kent Co., Mich.
Figs. 20-22	"	"	Rockford, Ills.

A NEW OMPHALINA FROM ALABAMA.

BY GEO. H. CLAPP.

Omphalina pilsbryi n. sp.

Shell about the size and general contour of *O. fuliginosa*; umbilicate, color rich reddish-chestnut with a dull satiny luster above, smoother and more polished below. Striae of growth fine and close, crossed by microscopic granules in spiral series like beads, giving the upper surface a dull luster; below the granules are obsolete and the surface polished. Apex *smooth*, and in all adult specimens seen denuded of the epidermis. Whorls $5\frac{1}{2}$, rather flattened and slowly increasing, the last whorl very much wider, more than double the width of the preceding one, almost round, no flattening on the base. Aperture oblique, circular. No thickening at the lip, which is darker than the balance of the shell.

Greater diameter 27, lesser $23\frac{1}{2}$, altitude $17\frac{1}{2}$ mm. Oblique height of aperture 14, width 14 mm.

Greater diam. 24, lesser 21, alt. 14.5 mm.

On hillsides in woods around Wetumpka, Ala. Collected by Herbert H. Smith.

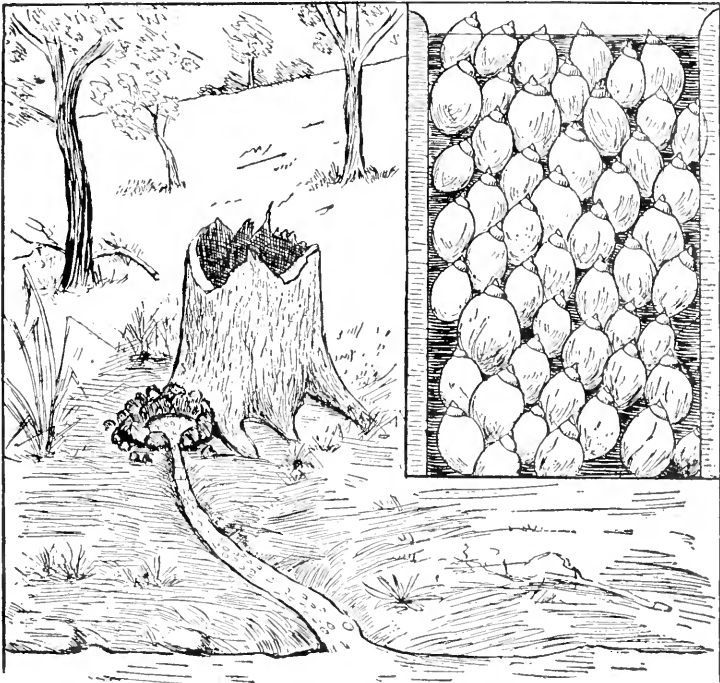
From above this shell has much the appearance of the large granulated variety of *O. lævigata* found with it, but it lacks the close ribs of that species, and the embryonic whorls are *smooth*, while in *lævigata* they are *sharply ribbed*. On the base the resemblance is less striking, as *lævigata* has a very small umbilicus, the base is flattened, and the internal white thickening makes the base several shades lighter than the upper surface.

This is one of the finest of the *Omphalinas*, and while it is quite common around Wetumpka, it appears to have been entirely overlooked by collectors. I take great pleasure in naming it after Dr. H. A. Pilsbry, who is doing so much to clear up the dark places in American Conchology. Type in my collection, and cotypes in the collections of the Academy of Natural Sciences, National Museum, etc.

A MOLLUSCAN STAMPEDE.

BY T. VAN HYNING.

In the summer of 1899, while collecting shells in the vicinity of Des Moines, Iowa, I made an observation which has seemed to me to be of more than ordinary interest. Along the margin of a bayou, adjacent to the Des Moines river, I discovered what was quite apparently an old, abandoned cray-fish hole beside an old stump. Clear,



cold spring water was bubbling up from within the hole, overflowing and running down the slope about ten feet to the bayou. All the way up the little stream, from the bayou to the hole, *Physa gyrina* was very numerous and in all stages of development, from very minute young ones up to well-developed adults. All were headed upstream and moving slowly towards the hole. Around the margin of the hole, and down in it as far as I investigated, about fourteen inches, the surface or wall of the hole was covered with them one

layer deep as tightly as they could possibly be crowded together, all headed downward. All in the hole were adult specimens. The lateral ones had wedged themselves in underneath the ones forward of them until they were seemingly forced to the bottom of the hole, and there became an immovable mass, as there would be no other way of escape but to back out, which the lateral ones were not inclined to do, but on the other hand were anxious to go ahead. With the water bubbling up through the space left in the center of the hole, the shells had become very smooth and shining. With a stick I dug down about fourteen inches and gathered about a pint of shells from the walls, and a great number fell down the hole. I do not know how much further it extended as it filled with dirt and shells from my interruption. About a month later I returned to get some of the water for analysis, but it had ceased to flow and dried up; recently dead shells were very plenty all around. I scraped up a cigar-box full more of them. My impression would be that the water, either from its cool temperature or some appetizing ingredient, was the attraction. I have been sorry ever since that I did not give it more thought at the time. The figure in the upper right-hand corner, while not artistic, serves to show the manner in which the shells were adhering to the walls of the hole; the density of the mass is not over-illustrated in the least, if any difference they were even more tightly arranged than illustrated; there was not a space in which a shell could possibly move.

DESCRIPTIONS OF NEW JAPANESE LAND SNAILS.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota (Euhadra) irrediviva n. sp.

Shell umbilicate, resembling *E. mercatoria*, but very much more depressed. Sculpture of fine growth-lines, minute scattered papillæ, and densely crowded, very fine spiral striae; the surface rather glossy. The specimens are fossil and have lost color except a dull reddish band above the periphery and sometimes another below it. Whorls 5, the apical one rather large, the last whorl double the width of the preceding, slightly subangular in front, only a trifle descending to the aperture. The aperture is oblique, wide and low, the upper and basal margins subparallel; lip reflexed and recurved, the basal lip noticeably straightened. Alt. 21, diam. 36 mm.

Okinoerabushima, Osumi. Type no. 87335 A. N. S. P., from no. 1250 of Mr. Hirase's collection.

The most depressed member known of the *mercatoria* group, and requiring comparison with no other species. It has been found only as a fossil, probably quaternary, and is the first land snail to be described from the island.

Eulota (Aegista) tokunoshimana n. sp.

Shell openly umbilicate, depressed with convexly conic spire, thin but rather strong, reddish brown, the spire a little paler. Surface dull, densely covered with minute short scales or the papillæ left after the loss of scales. Whorls 7 to $7\frac{1}{2}$, convex, very closely coiled, the last descending a trifle in front, barely perceptibly angular in front, elsewhere rounded, especially beneath. The aperture is rather small, oblique, lunate, the narrowly expanded and slightly thickened lip forming about three-fourths of a circle.

Alt. 14.3, diam. 21, width of umbilicus 5 mm.

Alt. 14, diam. 21.5, width of umbilicus 4 mm.

Alt. 13.5, diam. 18.5, width of umbilicus, 4 mm.

Tokunoshima, Osumi. Type no. 87334 A. N. S. P., from no. 1210 of Mr. Hirase's coll.

A peculiar, compact and high-spired *Aegista*, with more the sculpture of *Plectotropis*.

Eulota (Plectotropis) pressa n. sp.

Shell openly umbilicate, depressed, low-conic above, convex below the rather acute peripheral carina; thin, dull brown. Surface somewhat shining, finely striate, the striæ irregular, but not scaly. Whorls $5\frac{1}{3}$, the last hardly descending in front. Aperture small, oblique, the upper margin straightened, hardly expanded, lower margin narrowly expanded, slightly reflexed, thin, and deeply arcuate. Alt. 6.2, diam. 10.8, width of umbilicus 3.2 mm.

Okinoshima, Tosa. Types no. 87336 A. N. S. P., from no. 1181 of Mr. Hirase's collection.

A small, plain species, with the spire higher than in *E. intonsa*, and the last whorl narrower.

Eulota (Aegista) friedeliiana var. *vestita* n. var.

Differs from *E. friedeliiana* by being very densely covered with minute short scales. Alt. 9, diam. 16.5, width of umbilicus 5 mm.

Oshima, Osumi. Types no. 87338 A. N. S. P., from no. 1199 of Mr. Hirase's collection.

Eulota friedeliana var. *goniosoma* n. var.

More widely umbilicate and more depressed than *friedeliana* or var. *peraperta*. Whorls $5\frac{1}{2}$, the last bluntly angular at the periphery. Surface covered with short triangular cuticular scales, or their short solid bases. Alt. 8.5, diam. 19, width of umbilicus 7 mm.

Shimo-Koshikijima, Satsuma. Types no. 87337 A. N. S. P., from no. 1238 of Mr. Hirase's collection.

Eulota (Aegista) kobensis var. *pertenuis* n. var.

Shell very thin, very openly umbilicate, the spire very low; nearly planorboid. Lightly striate. Whorls 5, the last very slightly descending in front. Peristome expanded, *thin*, not thickened within. Alt. 6, diam. 15 mm., width of umbilicus 5.5 mm.

Irazuyama, Tosa. Types no. 87340 A. N. S. P., from no. 1098a of Mr. Hirase's collection.

Eulota (Aegista) kobensis var. *koshikijimana* n. var.

Shell rather thin, nearly planorboid, chestnut-colored; surface dull, densely, finely and sharply striate. Whorls $5\frac{1}{2}$, the last somewhat descending in front. Peristome expanded, narrowly reflexed, flesh-colored, only slightly thickened within. Alt. 6.5, diam. 15, width of umbilicus 5.3 mm.

Shimo-Koshikijima, Satsuma. Types no. 87341 A. N. S. P., from no. 1241 of Mr. Hirase's collection.

This is quite a distinct form by its thin lip and minutely lamellose cuticle.

The four *Aegistas* described above would probably be treated as species by many Helicologists, but their relationships are, we think, better shown by connecting them with the allied forms.

LIMAX MAXIMUS AND OTHER SLUGS IN CALIFORNIA.

BY ROBERT E. C. STEARNS.

The occurrence of *Limax maximus* at Redlands, as reported by Mr. Bartsch in the May number of the NAUTILUS, carries this form farther inland and to a higher altitude than heretofore known on the

West coast, at least in California, the general locality being over fifty miles from the sea, and the elevation over 1300 feet or more. Mr. Bartsch remarks that his specimens were "darker than the usual East American form, and not so large, the longest individual (preserved in formalin) measuring 58 mm." This slug is said to occur "in different parts of San Bernardino county."

In point of size, examples 75 mm. or more are not infrequent. Dr. Pilsbry, commenting on specimens sent to him a year or two ago, said "that it was not the common form, but a melanistic variety which I have never seen from the East." Hereabout there is considerable variation in this respect; occasionally individuals are met with that are much darker than any of those sent to him at that time.

In some places this slug has already become a pest. In my grounds I have not found that it does any material damage to flowers or plants, quite unlike *Helix aspersa* in this matter. It seems to prefer the vicinity of the garbage can, which it exploits after dark, being nocturnal in its wanderings, concealing itself in cool, damp, dark or well-shaded places during the day. A greasy, cast-away soup-bone is apparently to its liking, judging by the numerous slime-tracks centering around such an object. It frequently invades human habitations, directing its visits to the pantry. It is surprising how small a hole or narrow crack even the largest individuals can pass through. In order to keep them out, especially of the pantry and porches, ordinary table salt in liberal quantities strewn around and close to the threshold, inside and outside of the pantry and kitchen doors, and other places indicated by the shiny slime-tracks as points of entrance, will do these pests up every time; the salt adheres to their sticky bodies, dissolves and is absorbed, and the intruders are literally corned to death. For all places about the dwelling-house, salt is the safest and most effective article. Air-slaked lime that has not lost all of its heat is also good. This should be used freely in cellars and basements, and other places of concealment where the slugs occur. Another remedy, excellent, but too poisonous to be used unless safely placed out of the way of children or pet animals, is made by taking the refuse of the soup-kettle, adding water so as to make when stewed a gruel of the consistency of molasses; mix with it, after straining out the coarser portion, some Paris green; daub pieces of board or old shingles with some of the mixture, and place near such spots as are indicated by the tracks. This prescription is a settler.

Having experimented successfully with these "remedies," I can assure satisfactory results. Of course trapping under pieces of board placed here and there, turning the same occasionally and collecting by hand, may be practised with more or less success.

In England, in wet, cool seasons, slugs are particularly destructive to fields of young wheat; there they work at night. Lime is used to a great extent, and trapping under cabbage and other large leaves is often resorted to. Soot is sometimes used in the wheat fields in the same way as lime.

Another foreign slug *Limax* (*Analia*) *hewstoni* (= *A. gagates*?) had become a nuisance in the grass plots of San Francisco twenty years ago, and has presumably extended its territory over a larger area by this time. Our large native slugs, *Limax* (*Ariolimax*), *columbianus* Gld., and its near relative *californicus* Cp., inhabitants of Central California, the first-named found also as far north as British Columbia, appear to be free of the sins which have made the foreign forms obnoxious. These two species are sometimes met with of the length of six inches. Their dirty yellowish green color, often blotched or spotted, is rather repulsive. It is not unlikely that slugs may become a serious pest to the farmers in some parts of California at some future time, an unwelcome incident pertaining to the development of irrigation.

The sense of smell seems to be highly developed in *L. maximus*, and probably in all of the slugs, and again, the sense or instinct of direction. *L. maximus* is the only species that I have had an opportunity to observe in this connection. The slugs are "not popular with the masses;" and very good people call them "nasty things."

Los Angeles, Cal., June 13, 1904.

NEW MOLLUSCAN GENERA FROM THE CARBONIFEROUS. By George H. Girty (Proc. U. S. Nat. Mus. xxvii, 1904). *Limipecten* is a new genus of *Pectenidæ* based upon a Texan species, *L. texanus* n. sp. Its relations with *Aviculipecten* and *Acanthopecten* are fully discussed. *Pleurophorella* is a new group near *Allerisma*, type *P. papillosa*, Young Co., Texas. *Clavilites* is a new genus of *Dentaliidae*, annulate like *Plagioglypta*, but having a dorsal ridge over which the ribs pass with a strong anterior bend. Type *C. howardensis*, from Kansas. *Schuchertella* n. gen. is a Brachiopod group formerly called *Orthothetes*, but not *Orthotetes* of F. de Waldheim.

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LIST OF ALABAMA SHELLS COLLECTED IN OCTOBER AND NOVEMBER, 1903.

A. A. HINKLEY.

For several years I have been interested in the variations and geographical distribution of the family *Pleuroceridæ* of our fresh water shells. Under the same environments a species will often show considerable variation, while specimens from widely different stations will show very marked differences which are often confusing in the determination of species. This has been one cause of the large synonymy of this group.

Last fall I had the pleasure of a short visit to several of the streams from Decatur to Montgomery, Alabama. At Decatur, a stop between trains did not allow much time for collecting.

At Blount Springs, Randolph creek was followed over most of its rock-bed between the mountains, from the railroad to the bottom lands of the Mulberry river. The river was followed up stream for several miles. Most of the distance the water was shallow, flowing over a seamed rock-bed.

The Black Warrior was followed from the wagon bridge near Warrior to the L. and N. R. R. bridge. The only shoal places were at the two bridges.

The Bucksehatchee creek near Calera was a water course with pools here and there.

A walk of three miles from Calera to Wilson's creek gave an opportunity to follow that shaded stream into Montevallo. Individ-

nals were not numerous until the town was reached, where in some places the bed of the stream was literally covered with *Goniobasis*. A large spring at the edge of the town furnished several species.

The Coosa river at Farmer, Shelby Co., offered no good collecting places, but farther up the stream at Ft. William's Shoals the stream was explored for considerable distance with very satisfactory results. In the clear, shallow water everything was plainly visible, the colors of the shells often showing with remarkable distinctness. Shoal creek, below Farmer, contained but few individuals.

At Wilsonville only one small shoal was searched.

At Wetumpka there are more accessible places for collecting than at any of the other Coosa river localities visited.

The Tallapoosa river above Tallassee, is a much broken stream caused by a rough rock-bed, with a considerable fall.

The *Pleuroceridæ* were looked for closely, and especially the Coosa river forms; but many described species and others listed from that stream were not found. Some of them were undoubtedly overlooked or are to be found in other situations than those explored, but I think the earlier collectors in some way mixed their collections; and species are credited to the Coosa river which were not found there, while some of the Coosa river forms were credited to other streams. This subject is open for further investigation.

For aid in determination of the species, thanks are due Prof. Pilsbry for kindly comparing a large part of the *Pleuroceridæ* and part of the *Unionidæ* with specimens in the Academy of Natural Sciences, and for describing some new forms of *Limnæidæ*. To Mr. Bryant Walker for his excellent work with new forms of *Somatogyrus*, etc. and identifying part of the *Helicidæ* and *Unionidæ*. And to Dr. Sterki for identifying the *Corbiculidæ*.

Very little attention was given the land shells and the fresh-water species which inhabit muddy situations. The *Unionidæ* were taken as they were noticed while looking for the *Pleuroceridæ*, so that this list is not as full as it might otherwise have been.

In the genus *Schizostoma* or *Gyrotoma*, the fissure appears to be the most constant character, while the striæ, carinæ, nodules, bands, ground-color and outline, all vary more or less.

FAMILY PLEUROCERIDÆ.

Pleurocera annuliferum Con. Warrior, common.

P. anthonyi Lea. Wetumpka.

P. canalitium Lea. Wilsonville.

P. dignum Lea. Spring Creek, Farmer.

P. excruciatum Con. Decatur. Except for the striæ there is no difference between this and *moniliferum*.

P. formosii Lea. Wetumpka, common. Along the shore in muddy bays.

P. incrassatum Anth. Wilsonville and Wetumpka.

P. incrassatum Anth., var. *showalterii* Lea. Wetumpka.

P. moniliferum Lea. Decatur, often found in submerged logs.

P. nobile Lea. Decatur, found on muddy and sandy bottom.

P. ponderosum Anth. Decatur, common.

P. striatum Lea. Blount Springs.

P. thorntonii Lea. Spring Creek at Farmer.

P. vestitum Con. Montevallo and Blount Springs, common.

Lithasia brevis Lea. Wetumpka and Fort William Shoals.

Goniobasis ampla Anth. Wilsonville; Fort William Shoals and Wetumpka, common, often found devouring the animal from smaller shells.

G. capillaris Lea. Wilsonville; Fort William Shoals and Wetumpka.

G. carinifera Lam. Randolph Creek. Also Spring, Montevallo. This form was received from Prof. Call years ago, labelled *G. macella* Anth.

G. clausa Lea. Fort William Shoals and Wilsonville, common.

G. crebristriatus Lea. Wetumpka, specimens referred to this species are readily separated from *impressa* and *capillaris*, the young have not the carina of the former, and the mature specimens are not eroded like the latter, the outline and color differ from both.

G. crenatella Lea. Wetumpka; Fort William Shoals and Wilsonville.

G. cylindracea Con. Wetumpka and Fort William Shoals, common.

G. expansa Lea. Tallapoosa River, Tallassee; Mulberry River, Blount Springs, common.

G. fallax Lea. Wetumpka; Fort William Shoals and Wilsonville, common.

G. hydei Con. Black Warrior, Warrior, common.

G. impressa Lea. Wilsonville; Fort William Shoals and Wetumpka.

G. laeta Jay. Wilsonville; Fort William Shoals and Wetumpka, common. *G. lewisii* Lea and *culta* Lea are probably synonyms.

G. negata Lea. Wetumpka.

G. nigrocincta Anth. Spring at Montevallo.

G. nigrocincta Anth., var. *quadricincta* Lea. Tallassee.

G. nigrocincta Anth., var. *grata* Anth. Montevallo.

G. pybasii Lea. Calera.

G. rubicunda Lea. Wetumpka, common and variable.

G. semicostata Con. Randolph Creek and Blount Springs.

G. showalterii Lea. Fort William Shoals. The elongated operculum of this species, unlike that of *Anculosa rubiginosa*, shows a regular growth with the growth of the shell.

G. symmetrica Hald. Buckschatchee Creek, Calera; Randolph Creek, Blount Springs.

G. vanuxemiana Lea. Spring Creek; Fort William Shoals. Wetumpka and Wilsonville.

G. vanuxemii Lea. Fort William Shoals.

G. variata Lea. Montevallo, common.

G. wheatleyi Lea. Spring Creek, Farmer and Fort William Shoals.

Schizostoma alabamaensis Lea. Wilsonville and Wetumpka.

S. castaneum Lea. Coosa River, Wetumpka and vicinity. Mature specimens were rare. Fissure deep and narrow; three- or four-banded, when four-banded the two middle ones are approximate. The carina is obscure except at the tip of the young; the spire of mature specimens is eroded giving them a cylindrical shape.

S. constrictum Lea. The most plentiful species of this genus at Fort William Shoals, generally three-banded, smooth or inclined to be nodulous below the hem; differs from *incisum* by the fissure being more direct and deeper, ground color lighter, the bands are more distinct. *Incisum* is never nodulous. *S. amplum* and *salebrosum* are synonyms.

S. ellipticum Anth. (syn. *bulbosum* Anth.). Wetumpka and Wilsonville. Several hundred specimens show considerable variation, many are smooth, others more or less striate, some quite distinctly nodulous, three-banded, the bands generally broad, giving the shell a dark appearance. *S. cylindraceum* may be a form of this species.

S. glans Lea. Fort William Shoals, close to *ellipticum* if not a synonym.

S. excisum Lea (syn. *pumilum* Lea). Wetumpka and vicinity. Varies from cylindrical to globosely ovate, banded or without bands, those without bands are mature and nearly all of them show a disposition to have bands on the first whorl. The cord-like elevation behind the fissure is well developed on some while others show very little or nothing of it. The striæ are generally distinct. The fissure is direct, medium in length and width.

S. glandula Lea. Described from one specimen. The only noticeable difference from *incisum*, of which it is a color variety, is the light color and the bands more narrow and distinct. The color and bands resemble *constrictum*, but the fissure places it with *incisum*.

S. incisum Lea. The most plentiful species of this genus at Wetumpka. The fissure is very short, wide and oblique, in some cases only a sinuous outer lip. The three broad bands are clouded, giving the shell a dark color.

S. lewisii Lea. Coosa River, near Wilsonville, Ala. Two specimens referred to this species may be only elongated forms of *G. impressa* with a very sinuous outer lip.

S. ovoideum Shutt. Wetumpka.

S. pyramidatum Shutt. (syn. *pagoda* Lea, *wetumpkaensis* Lea, *babylonicum* Lea).

Shell smooth, striate, or carinaté, four-banded or without bands. The carina, always prominent on the young, disappears with the erosion of the spire. The fissure is short and constant in character. *Pagoda* was described from three specimens. In his description of *wetumpkaensis* Mr. Lea says it is umbilicate. I find this is not the case with all the specimens and especially the young, nor is the supposed umbilicus confined to *wetumpkaensis*. It is not a true umbilicus but caused by erosion. *S. babylonicum* was described from one specimen and I think it only a mature form of that described as *wetumpkaensis*. *Showalterii* and *demissum* may also be forms of this species.

Anculosa ampla Anth. There are not many specimens which I refer to this species. The epidermis and character of the bands, outline of body-whorl, and shape of aperture, differ from *picta* and all its varieties. The columella of the specimens from Fort William Shoals is always purple; it is white in a few specimens from Wetumpka and vicinity.

A small variety found on the exposed surface of stones in the swift current, is remarkably depressed with a very large aperture. The columella is broad and thickened its entire length; it is sometimes white instead of tinted and purple; the spire is very much depressed, hardly extending beyond the body-whorl; when placed aperture down, the apex is low down on the right side. One of the largest specimens measured over the columella, is .30 of an inch, the largest measurement is .40 of an inch. When placed aperture down, the height is .21; extreme length of aperture .30 of an inch, width from center of columella to outer lip .19 of an inch.

It seems to me that the forms described as *A. elegans* and *A. formosa* Lea, more properly belong in the synonym of *A. picta* instead of *ampla*. Young specimens referable to these varieties appear to be only color varieties of young *picta*.

A. melanoides Conrad. This unpretentious species was found on pebbles in strong current in Black Warrior River at a bridge near Warrior. The spire is more elevated than usual with the species of this genus, the perfect ones have four whorls, the spire of most specimens is eroded, only two whorls left. A few are banded, but most have no indication of bands. Mature specimens with eroded spire measure .40 to .45 length and .28 to .30 inch diameter. Columella a little thickened at the base and the aperture angulated at the juncture of the columella and outer lip.

A. picta Conrad. Common at Fort William Shoals, Wetumpka and vicinity. A very variable species, smooth, sometimes corded or plicate, or both. The bands extremely variable. The most common form is eight to twelve narrow bands made up of dots and dashes. These may be placed so as to form diagonal stripes as in *A. zebra* and *flammata*, and in some instances these diagonal bands are so strong as to blur the revolving lines of dashes. The bands are often continuous and number from two to twelve, or the two characters of bands may be alternate on the same specimen. Many are imperfectly banded and a few without bands, occasionally one in purple. The columella is often purple or tinged with that color; the prevailing color is white, the plicæ are often waves or folds. The shell may be globose. In old specimens the body-whorl is often compressed above the periphery, sometimes giving the shell a distorted appearance.

A. plicata Con. Black Warrior River at Warrior, Ala., common.

At this locality the species is not typical; among several hundred there are few with small or indistinct plication. Most specimens are smooth with the exception of a raised line a little below the suture, which is more or less crenulate. Many specimens are three-banded, the upper one just below the raised line and narrower than the other two. None were found in the Coosa River.

A. ligata Anth. Wetumpka. The young of this species was often found on the under side of rocks in swift water.

A. rubiginosa Lea. Coosa River at Wetumpka also found at Wilsonville. More or less striate, in some striae are remarkably well developed, producing costate specimens with a crenulated outer lip. In form they vary considerably. Some of the plicate specimens have a little resemblance to *A. plicata*, but evidently are not that species.

Specimens with an elongated operculum were found in only one situation, on the west side of an island above the Wetumpka bridge; the length of the operculum seemed to have no reference to the size of the shell. Occasionally one will have a clear, white columella. They are generally attached to rocks and pebbles in the current, and the colors show up bright and distinct through the clear water of the stream.

A. taeniata Con. The specimens I refer to of this species may be a smooth form of *rubiginosa*.

FAMILY VIVIPARIDÆ.

Viviparus contectoides Binney. n. var. Decatur. In a small swamp deeply shaded by a heavy growth of trees, this species was quite numerous. Mature specimens were rare, the larger part being very young to half grown.

Tulotoma magnifica Con. Coosa River at Fort William Shoals and Wilsonville. This species was nearly always found on the under side of rocks where there was little or no current. They were generally in colonies; it was not uncommon to find 20 or 30 under a single stone a foot square or more.

T. magnifica Con., variety *bimoulifera* Lea. Farmer and Wilsonville. This form was found only in a fossil state. In some places they were numerous in cultivated fields and some distance above high-water mark. The size averaged larger than the living *magnifica* and the lower row of nodules is more strongly developed.

T. angulata Lea. Coosa River, Wetumpka; this form differs

from *magnifica* by being smooth or nearly so, some being nearly as smooth as *viviparus*. They are found under rocks in the swift current of the stream. Both forms, *magnifica* and *angulata*, vary greatly in color from a light horn to a dark purple.

Cumpeloma ponderosum Say. Tennessee River, Decatur; Coosa River, Wilsonville; Fort William Shoals and Wetumpka.

C. coarctatum Lea. Black Warrior River, Warrior; Tallapoosa River, Tallassee.

C. decisum Say. Tennessee River, Decatur.

C. nolani Tryon. Coosa River, Wetumpka.

Lioplax cyclostomatiformis Lea. Black Warrior River, Warrior; Coosa River, Fort William Shoals and Wetumpka.

FAMILY VALVATIDÆ.

Valvata bicarinata Lea. Coosa River near the railroad bridge, Farmer, Ala., but three specimens found.

FAMILY AMNICOLIDÆ.

Somatogyrus aureus Tryon. Coosa River, Fort William Shoals, rare.

S. constrictus Walker. Coosa River, Wetumpka and Wilsonville, very few; nearly always found on the underside of the rocks associated with *S. coosaensis* and *S. hinkleyi*, very seldom more than one on the same rock. The light color, eroded spire and deep suture made them easily noticed among other species.

S. coosaensis Walker. Wetumpka, Fort William Shoals; common. On rocks in swift water; sometimes 25 to 30 were seen together.

S. crassus Walker. Wetumpka and Fort William Shoals; not plentiful.

S. hinkleyi Walker. At all localities in the Coosa River. One specimen supposed to be from the Tallapoosa River above Tallassee, was probably mixed with *S. pilsbryanus* by accident.

S. nanus Walker. Very plentiful at Fort William Shoals. They literally covered the rock-bed of the stream in favorable situations, showing up very plainly through the clear water, but owing to the swift current it was difficult and tedious collecting them.

S. obtusus Walker. Coosa River, Farmer, above the railroad bridge, found among the drift in a stagnant pool, made by the low stage of water.

S. pilsbryanus Walker. Tallapoosa River above Tallassee, very plentiful on rocks in swift water, often seen on the rocks back of the water as it fell over a natural dam.

S. pumilus Con. Tennessee River, Decatur, Ala. Found along the shore in muddy places, protected by saw-logs.

S. subglobosus Say. Tennessee River, Decatur, Ala. One specimen.

S. umbilicatus Walker. Wetumpka and Fort William Shoals, rare.

Ammicola n. sp. Coosa River near the railroad bridge, Farmer, Ala.

FAMILY LIMNÆIDÆ.

Limnæa desidiosa Say. In a small stream near the Union Depot, Montgomery, Ala. This species was quite numerous.

L. columella Say. Wilsonville, Fort William Shoals, Tallassee, Farmer and Blount Springs.

Physa pomilia Con. A small stream near the Union Depot, Montgomery, Tallapoosa River, Tallassee, Randolph Creek, and a small rill at Blount Springs.

(To be continued.)

THE LAND-SHELLS OF IRONBOUND ISLAND, MAINE.

BY DWIGHT BLANEY.

The following land-shells have been collected on Ironbound Island, Frenchman's Bay. This is one of the many rocky islands on the coast of Maine—with high cliffs toward the sea, and sloping to the water on the bay side.

Heavily covered with spruce mixed with a few birches, and with comparatively little cleared land, it does not seem a very likely place for collecting land-shells. Under the guidance of our friend Prof. Edward S. Morse, we have ransacked all favorable situations, and feel well rewarded with the following nineteen species.

The numerals refer to Pilsbry and Johnson's Land-shells of America.

No. 141. *Polygyra monodon* (Rack.), common.

No. 200. *Pupa muscorum* (L.), common.

No. 224. *Vertigo ventricosa* (Morse), common.

No. 224a. *Vertigo ventricosa* var. *elatio*r, (Sterki), rare.

This species is noted in the catalogue as from Ohio, Michigan and Minnesota.

226. *Vertigo bollesiana* (Morse), rare.

260. *Vitrea hammonis* (Ström), rare.

264. *V. binneyana* (Morse), common.

268. *V. ferrea* (Morse), common.

278. *Enconulus fulvus* (Müll.), common.

283. *Zonitoides arboreus* (Say), abundant.

293. *Z. exiguus* (Stimp.), common.

494. *Z. milium* (Morse), rare.

338. *Pyramidula alternata* (Say), abundant.

344. *P. striatella* (Anth.), abundant.

346. *Helicodiscus lineatus* (Say), common.

248. *Punctum pygmaeum* (Drap.), common.

353. *Sphyradium edentulum* (Drap.), rare.

362a. *Succinea obliqua totteniana* (Lea), common.

367. *S. avara* (Say), not common.

The *Pupa muscorum* L. was found in a most interesting situation. On the seaward side of the island, on a rough, stony beach, rises a pinnacle of rock many tons in weight. This is nearly fifty feet high and is separated from the main cliff by about forty feet. I climbed one day to a flat place near the top, three feet square, covered with Juniper bushes, to gather some wild bluebells, *Campanula rotundifolia* L., and while clinging in this narrow space, picked over the valves of clams and mussel shells brought by Crows. Needless to say, I was inspired to find hidden in the lower shells, deep in the bushes, quite a colony of *Muscorum*. This is the only place on the island where this species is found, and a careful search on the adjacent cliffs revealed no more of them. How they could have got there is of course an interesting problem. Two fresh-water species are found on the island. *Pisidium abditum* (Hald.) and *Lymnæa caperata* Say, and the following land-shells have been found on neighboring islands.

13. *Helix hortensis* Müll, Little Duck Island, common.

106. *Polygyra sayii* (Binn.), Hancock Point.

180. *Strobilops labyrinthica* (Say), Soward's Island, common.

254. *Vitrina limpida* Gld., Calf Island, common.

NOTES ON SOME CAPE COD MOLLUSCA.

BY C. W. JOHNSON.

During a recent trip on Cape Cod, Mass., I was mostly interested in studying the insect fauna, but incidentally collected a number of shells. One afternoon, at low tide I wandered over the sand-flats of Provincetown harbor; on my way out I met a little Portuguese boy (Portugese, by the way, constitute about one-third of the population) with a bucket full of periwinkles (*Litorina litorea*). I asked him what he was going to do with them. "Eat 'em," was his reply. To my inquiry whether they were good, he said, "Yep." The piling and rocks (the remains of an old pier) were literally covered with them; over almost everything was a coating of small barnacles (*Balanus balanoides*), and it was interesting to see the load carried by some of the periwinkles, often greater in size than the shell itself.

On every hand were trails of the sea-snails, but I was surprised to find that *Polinices* (*Neverita*) *duplicata* far outnumbered *P. (Lunatia) heros*; the former were much smaller than those I have collected on the New Jersey coast, and their nidamental bands, popularly known as "sand collars," were also correspondingly smaller. The nidus of *P. duplicata* is readily distinguished from those of *P. heros* by the lower or expanded margin being undulated or wavy. One specimen of *Columbella avara* was found. Of the Pelecypods, *Pandora gouldana* was abundant, and two specimens of the old *Cytherea convexa* Say (which we must now call *Callocardia morrhana* Linsley), were collected. In places the coarse sand had a dark purple line. Close inspection showed it to be made up of the little *Gemma gemma*.

At Eastham are located a number of large fresh-water ponds, with no apparent inlet or outlet, in which the water is very clear, and quite cool. In the one nearest the station, called Depot Pond, I found three species of the *Unionidæ*. All of them were undersized, and very much eroded, features characteristic of still water, even though apparently more pure than many streams. The specimens of *Unio complanatus* were about two inches in length. It was by far the most common species, although dwarfed *Lampsilis radiatus*, about two and a quarter inches in length, with a thick, dark, sparsely rayed epidermis, was also abundant. The other species was a very fragile example of *Anodonta cataracta* Say (*A. fluviatilis* Dillw.), about two

inches in length. Attached to shells and stones were a few *Amnicola limosa*. Under an old board I found a colony of *Pyramidula striatella* associated with *Zonitoides arboreus*. In the salt marshes east of the station *Melampus lineatus* was in great numbers, together with a few *Litorina rudis* var. *tenebrosa*.

My first stroll along the beach at Chatham was at high tide. Coming upon some lobster pots I found quantities of animal life strewn about. Among them were beautiful specimens of *Polinices heros*, but the animals were dead, and were left behind because they took up entirely too much room for their size; they were like some specimens a friend once described as "dead, but not gone, and unwilling to be forgotten." The next day, at low water, in the little bights between the several bars which extend out from the beach south of the inlet, were to be seen hundreds of specimens of *P. heros* of all ages, from the size of a pea to one nearly four inches in length, while the nidi-mental bands were unusually large, and owing to the coarse sand exceedingly handsome.

Among the other interesting shells were the *Arca* of the New England coast. *Arca transversa* and *A. pexata* Say, or as we must now call it *A. campechensis* Gmel. Is not this northern form worthy of a varietal name? As Say's description covers both, can we not restrict his name to this form as described and figured by Gould? Scattered along the outer beach we found upwards of twenty single valves of *Arca ponderosa* Say, several with portions of the ligament and epidermis in place. To find so many of this species at the extreme northern limit of its distribution was a surprise; it seems even to be more plentiful here than on the New Jersey coast. *Mesodesma arcuatum* was very common; a few valves of *Cochlodesma leanum*, *Astarte castanea* and two valves of *Divaricella quadrisulcata* were also found. In a heap of scallop shells *Pecten gibbus* var. *borealis* Say (*Pecten irradians* of authors), I obtained some very interesting examples of *Crepidula fornicata*, many of the specimens in adapting their shells to the surface of the scallop becoming strongly ribbed.

A rainy day had its advantages; it not only gave me a chance to attend to all the material I had collected, but it brought out the *Helix hortensis* in great numbers along the steep bank near the light-houses; they were all of the light-colored, bandless variety. I am not aware that this species has been recorded from this place which adds another locality to the mainland records.

THE NAUTILUS.

VOL. XVIII.

SEPTEMBER, 1904.

No. 5.

SOUTHWESTERN SHELLS.

BY JAS. H. FERRISS.

Joliet has a botanical park where nature herself made a good start in a collection. Fast as the money and friends can be had the collection is being improved. I am superintendent of the ferns upon a salary of 25 cents per year, which is to be paid whenever the commissioners have their salaries increased to that point. An effort to complete a collection of the U. S. ferns and cacti has led me into the Southwest after rare examples.

I was surprised on the first day out to find shells among the fern roots upon the hot side of the Franklin Mountain at El Paso, as surprised as when the ferns were found in the first place. This mountain of clay and rock, thoroughly baked, is as uninviting to the collector as a well-used brick kiln. There were two shells there, *Holospira roemeri* Pfr. and *Bulimulus dealbatus pasonis* Pils. This will be a species some day. Of less than twenty species found upon this first trip, six were new species or varieties.

Not until the last half of the fern trip made the present year were the snails given serious consideration. A collector will find few specimens in a land where to him the conditions are new, unless he gives his whole soul to the work.

Frank Woodruff, ornithologist and photographer of the Chicago Academy was with me a couple of weeks. At Deming, N. M., we formed an alliance with the city marshal who escorted us to the Florida Mts., ten miles away. At Bowie, Ariz., an expedition was

outfitted for the Chiricahua Mts. We went as far as old Fort Bowie. It was rather cold. Some mornings we crawled out from under snow-banks. Water was scarce, and our guides inexperienced. We were after birds, ferns, snap shots and Indian relics, and at the end of two weeks had found only four snails—*Sonorella hachitana* Dall, *Ashmunella walkeri* Ferriss, *A. levettei* Bld., and a *Physa*.

Former information told me the Chiricahuas were unexplored, and were occasionally exploited by the Apaches. By cautious approaches we made our way to the fort, now occupied by a single miner only. Here we learned there had been no raids for five years, and that the mountains were safe as the streets of Philadelphia.

At the fort Mr. Woodruff turned back to El Paso and Albuquerque. With a miner, ponies and a burro I pushed into the higher peaks. These run up about 8,000 feet. We pitched our tent in Cave Creek Canyon, and altogether it was a delightful situation,—caves, strange birds and plants, mountain streams, heavy forests, every day perfect, good folks, and new shells around every point. The miner herded the ponies, prepared warm suppers, and my regular daily grist was two shells I had never seen, and a new fern to the territory. The last day we packed up and visited a cave a quarter mile from our camp. Upon our return we found four snails we had never seen. Two were new species.

The next day we rode up a wagon road to a saw mill in a heavy pine forest at the top of the mountain. I walked a little and found one new species, two varieties and two I had not seen in the territory. This was a government forest reserve, and here we found Chas. T. McGlone, of Ashland, Ky., in charge, with a lion hunter for a partner, and the partner had a fiddle. The canyons are deep, heavily wooded and well watered; and truly at parting my heart was heavy. I know many species of snails were left behind.

The mountains seem rather difficult to reach from the railroads. They are far away, cattle ranches are about ten miles apart, and there are no stages or hotels, but the approach is easy enough, like snail hunting itself, when you catch on. From the Huachuca station on the Sonora branch of the Southern Pacific I walked fifteen miles across the plain to a canyon formerly visited, and in the next month wore out another pair of hob nails. I left home with rheumatism, dyspepsia and several more or less important defects, but was so busy no inventory had been taken since crawling out of the snow

in the Chiricahuas. The first Sunday morning in the Huachucas I rested up a little, and found there was nothing out of repair except a few fingers. I am not afraid of an automobile now.

Truly, snails were as thick together on the under surface of rocks as mussels are found on the seashore. At the very peak of one of the highest mountains, composed of slabs of limestone, there was not enough stone to cover the *Oreohelix*. They were hibernating on top and glued together in masses. Upon one side of the peak a dark banded variety was found, upon the other, not two hundred feet away, a white variety. This shell seems to be a home-body. A canyon though three miles in length from top to bottom, was usually peopled by one variety. Over a divide but a few steps was another variety, though every colony in the canyon was liable to have some distinctive mark in size, color or form. And this was true of the *Ashmunellas*. No two colonies seemed exactly alike, and they did not visit back and forth, nor travel far from the best part of their own rock pile.

On the south side of the Huachucas I found a colony of typical *Ashmunella chiricahuana* about one-half albinos, a mile west a colony of typical *Ashmunella levettei*, nearly all albinos. Half a mile lower down the *levettei* were chestnut-colored and polished. In between these three colonies were light horn-colored shells running from typical *levettei* with four large teeth to typical *chiricahuana* with no teeth at all, and all forms between, one tooth, two teeth, three teeth, rudimentary forms of these, and mere suspicions of teeth or thickening of the lip. Did these two species come together here, or was this the exact spot upon which the original *Ashmunella* Adam and Eve located? It is up to Dr. Pilsbry. I have described two species there can be no mistake in. With no courage left, the whole responsibility is now dumped upon his shoulders. The last heard from Messrs. Clapp and Walker, they were running too.

Some of the *Oreohelix* are black, white, brown, red, banded, lined, speckled, mottled and variegated, of only ten mm. diameter. Other colonies of similar colors were of twenty-five mm. diameter. Some were carinated, some as round-barreled and as umbilicated as a *Circinaria*, some depressed, and some were old-time bee-hives. The *levettei* colonies, outside of the albino camp, varied from dark chestnut to dull white, and from ten mm. diameter to twenty millimeters.

The broken rocks tumbled down from the cliffs, the "slide," or talus,

is the home of the snails. A good snail hoe is necessary, and one should wear gloves, for the chemicals, or climate, crack the collector's hands. A little shade helps, and the colonies will be found where the ventilation is good, the soil sweet and with a normal condition as to moisture, not wet or springy, but a natural soil condition. The most favorable location is selected, and the collector must not be discouraged at the absence of dead or living shells until after the thorough overhauling of a slide. *Ashmunella chiricahuana* was found, one by one, but after digging away at a rocky slide for an hour without results I found one pocket large as my hat with 85 examples, and soon after took 125 from a like pocket, and left the rest. *Oreohelix* and *Ashmunellas* were nearest the surface. Though hibernating, *Oreohelix* would be often found under the top stone. The *Ashmunellas* were next to the soil, and often buried in the loose leaf mould. *Sonorellas* were deep delvers, and lived down where the stones were wedged close together or buried in the soil. Seldom were more than one, two or three specimens found in one colony, not counting the little fellows, but such as they were I have never seen shells thicker in the southern mountains. I found a number of small shells in the drift on the plains which I did not find alive. *Holospiras* were usually found under dead vegetation upon dry hill-sides. *Vitrinas* were in damp ravines in the decaying vegetation. *Infundibularia tuba* Pils., was found in the drift of the San Pedro at Benson. It was not found in the Huachucas, or the drift of the streams from those mountains, and therefore I suspect it came from the mountains near Tombstone. There are a number of species credited to the Huachucas and Chiricahuas I did not find.

Fort Huachuca is a division headquarters of the army, and is occupied by three or four troops of cavalry. Many collectors visit the post and the mountains. Botanists and entomologists predominate. These mountains are probably no better than many others in the territory, but are good, and the collectors in the army lead the way. In the Carr Canyon I found C. R. Biedermann in a cabin of his own. He expects to remain there two or three years studying Arizona insect life for the Philadelphia Academy. From what he has told me of strange snails in strange places, and from what I have seen and run over without seeing, I am satisfied there is fully two years' hard work ahead for the collector who will do Arizona justice. I will do what I can, but all assistance will be cheerfully welcomed.

It is an open field, and the climate is glorious. Take a guide, for water is scarce. The verification of these wonders is now left to Dr. Pilsbry. He has the evidence.

Ashmunella walkeri Ferriss, n. sp.

The shell is much depressed, lens-shaped, acutely carinate peripherally, rather thin and pale corneous-brown. The umbilicus, narrow within, enlarges rapidly at the last whorl. Surface nearly smooth, very lightly marked with growth-lines. Whorls $4\frac{1}{2}$, slightly convex, the last very shortly descending in front. Base more convex than the upper surface. The aperture is small and very oblique, the lip well reflexed, white, with an obtuse, squarish tooth in the outer margin and two compressed teeth in the basal margin, the inner one smaller; these three being nearly equally spaced. There is a rather short, straight, obliquely set parietal tooth. Alt. $4\frac{1}{2}$, diam. $13\frac{1}{2}$ mm.

Florida Mountains, Luna Co., New Mexico. Found in a tumble of rock near the top of the mountain, probably an elevation of 6,500 feet. Only a few were found, and none found at any other place. Cotypes in collections of J. H. F. and A. N. S. P. This very distinct species differs from all other known forms of the *levettei* group in the small number of whorls. It is also flatter and more acutely keeled than any other *Ashmunella*.

Oreohelix clappi Ferriss, n. sp.

The shell is moderately depressed, the alt. about two-thirds the diam., and about equally convex above and below the obtuse peripheral angle. The umbilicus is about one-sixth the diam. and contracts rapidly within. It is brownish-white under a thin greenish-yellow cuticle with some darker oblique streaks and two indistinct brownish bands. In old individuals the cuticle remains only in small shreds. Sculpture of irregular growth-wrinkles and very fine, faint spiral striæ, nearly obsolete on the upper surface. Whorls $4\frac{3}{4}$, convex, the last double the width of the preceding, the first $1\frac{1}{2}$ radially obliquely costulate. Base very convex. The aperture is short-oval, nearly circular, and very oblique. The ends of the lips converge, and in old shells are continuous, being connected by a short raised parietal ledge.

Alt. 9.6, diam. 15 to 16 mm.

Alt. 9, diam. 14 mm.

Cave Creek Cañon, Chiricahua Mts. Cotypes in collections of J. H. F. and A. N. S. P. Found alive, buried deeply in rotten shale about the base of cliffs near the stream.

This species differs from all the forms of *O. strigosa* by its radially costulate apical whorls and greenish cuticle.

LIST OF ALABAMA SHELLS COLLECTED IN OCTOBER AND
NOVEMBER, 1903.

A. A. HINKLEY.

FAMILY LIMNÆIDÆ (continued from August number).

Planorbis trivolvīs Say. A very few specimens found in same location as *Viviparus*, near Decatur, Ala.

P. bicarinatus Say. A single specimen taken from the Coosa River, near the railroad bridge, Farmer, Ala.

P. dilatatus Gould. Coosa River, Farmer, and Wetumpka. Very few found.

P. tantillus Pilsbry. Coosa River, Wetumpka. Found on rocks in swift water, generally on the under side; they are so small that collecting them was tedious, though they were abundant in places.

N. g., n. sp. Same location as above.

FAMILY ANCYLIDÆ.

Ancylus rhodacme Walker. A common species in the Coosa River at Fort William Shoals, Wetumpka and vicinity.

FAMILY HELICIDÆ.

Polygyra pustuloides Bland. Blount Springs, one specimen at Tallassee, Ala.

P. tridentata tennesseensis, W. and P. Warrior, Tallassee. Larger than the northern form of *tridentata*.

P. inflecta Say. Blount Springs, Tallassee, Warrior and Milstead.

P. obstricta carolinensis Lea. Wetumpka and Tallassee.

P. appressa perigrapta Pils. Tallassee, Warrior, Milstead, Farmer and Montevallo.

- P. thyroides* Say. Tallassee, Farmer and Warrior.
P. spinosa Lea. Blount Springs and Warrior.
P. stenotrema Bland. Blount Springs, Tallassee and Warrior.
P. hirsuta Say. Blount Springs and Warrior.
P. downieana Bland. Blount Springs. Only one specimen found.
P. monodon fraterna Say. Tallassee.

FAMILY CIRCINARIIDÆ.

- Circinaria concava* Say. Blount Springs and Tallassee.

FAMILY ZONITIDÆ.

- Omphalina polita* Pils. Blount Springs. Only two young ones found.
O. lævigata Pfr. Tallassee and Warrior.
Vitrea carolinensis Ckll. Blount Springs, Tallassee and Warrior.
Eucomulus sp. Tallassee. Young specimens.
Zonitoides arboreus Say. Blount Springs, Tallassee and Warrior, common.
Gastrodonta demissa Binney. Blount Springs, Tallassee, Farmer and Montevallo.
G. interna Say. Blount Springs, Tallassee and Warrior.

FAMILY ENDODONTIDÆ.

- Pyramidula alternata* Say. Blount Springs, Tallassee and Warrior.
P. perspectiva. Blount Springs, Tallassee, Warrior and Milstead.
Helicodiscus lineatus Say. Tallassee.

FAMILY HELICINIDÆ.

- Helicina orbiculata* Say. Only dead specimens were found at Blount Springs. At Tallassee living specimens were found on a hill under leaves where the ground was damp.

FAMILY UNIONIDÆ.

Not being familiar with Charles T. Simpson's classification of the Unionidæ, I follow Dr. Lea, and use the genus *Unio* in its comprehensive sense.

- Unio ocutissimus* Lea. Mulberry and Black Rivers.
U. alatus Say. Decatur.

- U. anodontoides* Lea. Wetumpka.
- U. arctutus* Con. Mulberry River and Black Warrior River, common.
- U. arcus* Con. Wilsonville, Wetumpka and Farmer.
- U. asperatus* Lea. Fort William Shoals and Wilsonville, common.
- U. atrocostatus* Lea. Black Warrior River, common. Fort William Shoals.
- U. blandianus* Lea. Fort Willam Shoals, one specimen.
- U. brunbyanus* Lea. Mulberry River, common.
- U. caharbaensis* Lea. Mulberry River, common.
- U. cerimus* Con. Black Warrior River.
- U. chattanoogaensis* Lea. Coosa River, Wetumpka.
- U. chunii* Lea. Coosa River, Wetumpka, one specimen.
- U. compactus* Lea. Coosa River, Wilsonville and Farmer.
- U. cornutus* Bar. Fort William Shoals, Decatur and Wilsonville.
- U. corvunculus* Lea. Black Warrior River.
- U. crassidens* Lam. Decatur and Coosa River.
- U. ebenus* Lea. Decatur.
- U. decisus* Lea. Fort William Shoals and Wetumpka.
- U. dolosus* Lea. Wetumpka, common.
- U. dromas* Lea. Decatur.
- U. excavatus* Lea. Black Warrior River, common; Wilsonville, one specimen; Mulberry River and Wetumpka.
- U. fibuloides* Lea. Coosa River, Wetumpka, one specimen.
- U. flavescens* Lea. Black Warrior River, common; Mulberry River.
- U. foremanianus* Lea. Fort William Shoals, common.
- U. gibbosus* Barnes. Decatur.
- U. gracilis* Barnes. Coosa River, Black Warrior River at Warrior, Mulberry River at Blount Springs.
- U. greenii* Con. Mulberry River.
- U. instructus* Lea. Black Warrior River, common.
- U. lewisii* Lea. Coosa River, Fort William Shoals and Wetumpka.
- U. lienosus* Con. Black Warrior River, common.
- U. metaevecr* Raf. Fort William Shoals, one specimen.
- U. metastriatus* Lea. Black Warrior River.
- U. multiradiatus* Lea. Coosa River, Wetumpka, one specimen Wilsonville, one specimen.

- U. obliquus* Lam. Decatur.
U. orbiculatus Hild. Decatur.
U. parvulus Lea. Mulberry River and Black Warrior River.
U. penitus Con. Coosa River, Wetumpka and Black Warrior River.
U. perovalis Con. Mulberry River.
U. perplexus Lea. Decatur.
U. planus Lea. Coosa River and Fort William Shoals, two specimens.
U. plenus Lea. Decatur.
U. pyramidatus Lea. Decatur.
U. rectus Lam. Black Warrior River.
U. retusus Lam. Decatur, Ala.
U. rubidus Lea. Black Warrior and Mulberry Rivers.
U. rubellus Lea. Black Warrior River, Warrior, common.
U. rumphiannus Lea. Black Warrior and Mulberry Rivers.
U. securis Lea. Fort William Shoals, Wetumpka and Decatur.
U. sparus Lea. Mulberry River.
U. sublatns Lea. Mulberry and Black Warrior Rivers.
U. stabilis Lea. Black Warrior River.
U. tuberculatus Barnes. Found at all river localities.
U. vibex Conrad. Mulberry River, Blount Springs, Ala.
U. vanuxemensis Lea. Wetumpka, Black Warrior and Tallapoosa.
Anodonta subrexa Con. Black Warrior River.
A. sp. Black Warrior River and Warrior, Ala.
A. sp. Coosa River.

FAMILY CORBICULIDÆ.

- Sphærium solidulum* Prime. Bucksehatchee Creek, Calera, Ala., common.
S. striatinum Lam. Black Warrior River, and Warrior. Rather scarce, muddy places.
Musculium contractum Prime. A single specimen taken from the Bucksehatchee Creek, Calera, Ala.
Pisidium virginicum Gmel. Tennessee River, Decatur, Mulberry River, Blount Springs, Black Warrior River, Warrior, Ala.

THE CAMBRIDGE NATURAL HISTORY: ERRATA CORRECTED.

ROBERT E. C. STEARNS.

On page 38, Vol. III., "Molluses, etc.," of the Cambridge Natural History (1895), occurs the following:

"Mr. R. E. C. Stearns records³ a case of *Buliminus pallidior* and *H. veatchii* from Cerros I., living without food from 1859 to March, 1865."

The figure "3" refers to the Am. Nat., XI. (1877), p. 100; Proc. Calif. Ac., iii, p. 329, in the foot-note, as the sources of the foregoing statement which contains about as many errors as it is possible to get in less than three lines. I am well acquainted with the person referred to, and have been for many years, also with his articles in the volumes named in the foot-note, and can safely assert the word *Buliminus* does not occur in either of his papers. He does not say that the bulimoid form lived from 1859 to March, 1865, but that examples of *Bulimus pallidior* lived from March, 1873, the day they were collected, until June 22, 1875, *two years, two months and sixteen days*, and that the specimens were collected at San José del Cabo, Lower California; further, that one individual of the nine was still living October 18, 1875. This species has not as yet been reported from Cerros Island, where *H. veatchii* was collected and lived, as stated.

On page 278 of the Cambridge volume it says that the genus *Buliminus* is peculiar to the Old World. I am not aware of its having any representative in the Americas. We now write *Bulimulus* for *Bulimus*, as I had it written in 1873.

Los Angeles, Cal., July 19, 1904.

PLECTOPYLIS IN THE RIUKIU ISLANDS.

BY H. A. PILSBRY.

Plectopylis (Sinicola) hirasei, n. sp.

Shell small, depressed, openly umbilicate, the upper surface convex; uniform olivaceous brown. Surface dull above, glossy beneath, sculptured above with fine growth-striæ cut into minute beads by equally fine decussating lines; below with arcuate, rather irregular and wide-spaced delicate riblets and fine growth-striæ, and rather

weak spiral lines. Whorls 6, very slowly increasing, convex, the last slightly deflexed in front, the periphery near the summit, the base very convex. Aperture small, lunate, the peristome narrowly reflexed and a little thickened, connected across the parietal margin by an elevated white, callous lamella. At its last third the last whorl is obstructed within by a vertical parietal barrier, behind the ends of which stand two tubercles, the upper one triangular, the lower one oblong, each giving out a low callous towards the other; and by six palatal plicæ: the first minute, subsutural; the second larger, slightly oblique and curved; the next three connected, larger and more oblique, and the sixth plica smaller and standing on the umbilical wall. Alt. 3, diam. 5.7 mm.; width of umbilicus 2 mm. Miyakojima, Riukiu. Types no. 87637 A. N. S. P., from no. 1295 of Mr. Hirase's collection.

This is the first *Plectopylis* found in the Japanese Empire, and is one of the most interesting of Mr. Hirase's many discoveries. The admirable studies of Mr. Gude enable us to fix its position as nearest the Chinese *P. cutisculpta* Mildff. (see Gude, *Science Gossip*, iii, 180, 181, Dec. 1896, and Mildff., *Jahrb. D. M. Ges.*, ix, 1882, p. 184, and x, 1883, pl. 12, f. 12).

A NEW LOWER CALIFORNIAN SONORELLA.

BY H. A. PILSBRY.

Sonorella lohrii lioderma, n. subsp.

The shell is similar to *lohrii*, but the last whorl is a little more convex and evenly rounded, and the last two whorls are glossy, with no granulation, being marked with faint growth-striæ only. The spire is sometimes a little more elevated than the type of *S. lohrii*.

Near Moleje, Lower California, Cotypes no. 58107 and no. 88367 A. N. S. P., the latter from Lower California without special locality.

The type specimen of *S. lohrii* Gabb is finely granulated throughout. *S. l. lioderma* would be a species the way some people cut up *Sonorella*.

GENERAL NOTES.

WEST AMERICAN SHELLS.—Professor Keep's new book on the shells of the Pacific coast is now in press, and will be published in a short time. There will be over 300 illustrations. The marine

shells include those of British Columbia and Alaska, and land and fresh-water shells from west of the Rocky Mountains.

CLAMS AFFECTED BY SEWERAGE.—The local quahog, or little-neck clam, and scallop industry is menaced by action of the State Board of Health declaring the shellfish taken in New Bedford harbor and Clark's cove to be infected, and calling upon the commissioners on inland fisheries and game to prevent further taking. The number of men engaged in quahog-fishing here is about 300, and the income involved ranges between \$50,000 and \$75,000.

The sewers of New Bedford and Fairhaven all enter into the river and cove. The eagerness of the fishermen, many of them French-Canadians, has carried them nearer and nearer to the sewers, until they are frequently seen at work at the sewers' mouths.

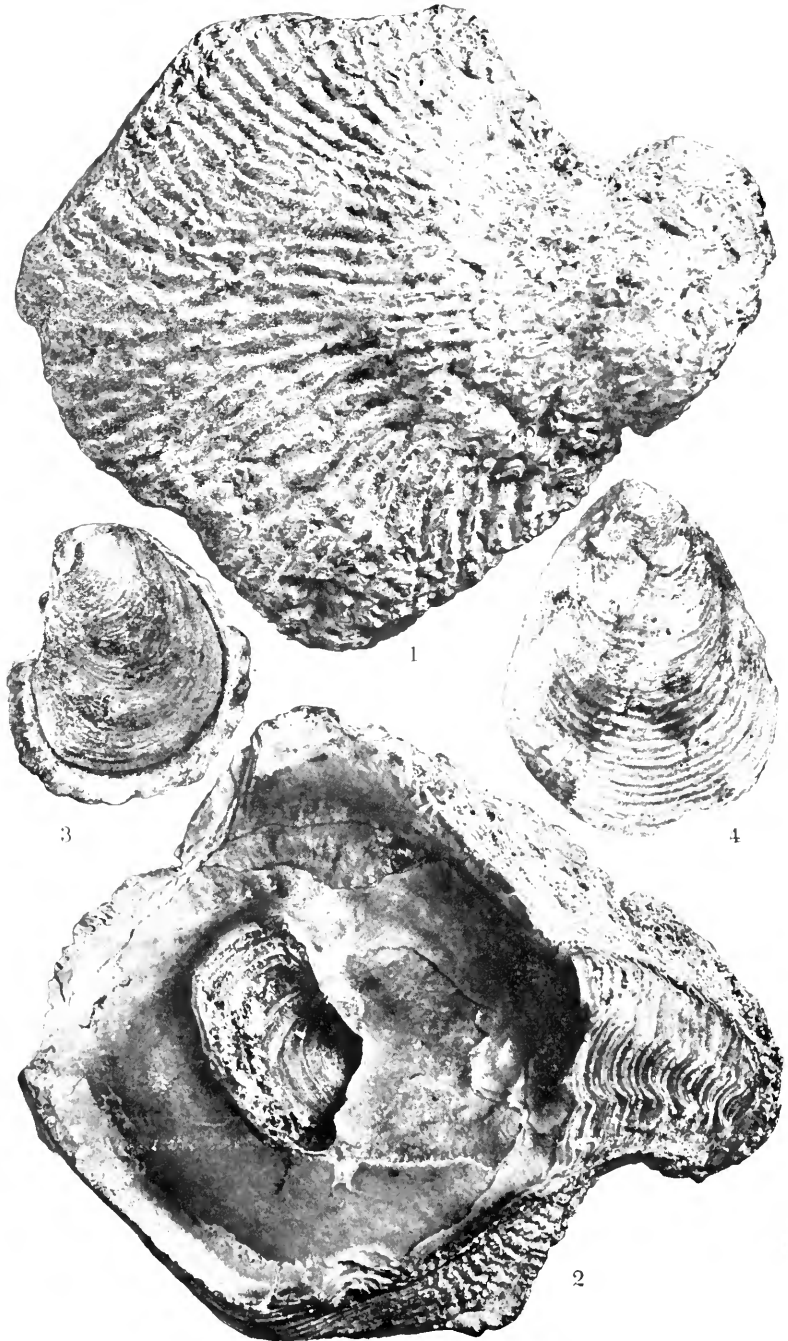
The board has been making bacterial tests since last spring, and reports that the shellfish are polluted by the sewer.

The demand of the State Board will also affect the fall and winter scallop fishing, another important industry.—*Boston Evening Record*.

ZOOLOGICAL RECORD FOR 1903.—The Zoölogical Society of London is now issuing "special records." Each volume is divided into twenty parts. The part (VII.) on *Mollusca* by Mr. E. R. Sykes, assisted by Mr. E. A. Smith, has been received. It contains 85 pages, the matter being arranged admirably for ready reference. It is furnished by the Society for 4 shillings.

A NEW LOCALITY IN SOUTH CAROLINA FOR RECENT AND FOSSIL MOLLUSKS.—I write to call the attention of collectors to a new locality in a new though old country. This is a long beach on the ocean front, without breaks for thirty miles, as I am informed. An ideal place for automobile explorations. I was only there for a half day, and saw only a part of the shells, but they are there by the millions.

There are many *Cretaceous*, *Eocene*, *Pliocene* and *Pleistocene* shells as well as immense numbers of recent specimens. The locality is "Myrtle Beach." There is a ten-mile railroad from Conway over there and a good hotel. Conway is the county town of Horry (pronounced "Oree") county, South Carolina, and has heretofore been out of the world, but now has railroad connections with the Coast Line Railroad, and is an ideal place for conchologists and botanists.—FRANK BURNS, Ph. D.



ALDRICH: *OSTREA ARROSIS*.

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No. 6.

A NEW OYSTER FROM THE EOCENE OF ALABAMA.

BY T. H. ALDRICH.

OSTREA ARROSIS n. sp. Pl. III, figs. 1-4.

Shell oval, lower valve thick and heavy, upper valve thin. Surface of lower valve strongly ribbed, ribs very numerous, close-set and cross marked by growth lines, inner edge of lower valve is scalloped. Both valves have a large, muscular scar, not central. The beak is strong, making a stout hinge in the lower valve, much smaller in the upper. The upper valve is smaller, fitting into the other ventrally above the crenulations; its surface is generally covered with fine, raised lines of growth; interior with crenulations near the beak, becoming obsolete on the ventral margin. Size of old specimens 125 to 140 mm. from beak to ventral margin, about one-fifth less at right angles across the shell.

Locality.—Fleming's Mill, on Pea River, in Southeast Alabama, from the Nanafalia horizon.

Remarks.—Figures 1 and 2 are the exterior and interior of a large, lower valve; fig. 4, upper valve of young shell; fig. 3, young shell with both valves in place. In old shells the ribbing becomes obsolete on the beak, and in some examples the beak is bent strongly to one side. This oyster seems to be the precursor of *O. sellaeformis* Con. Some young examples occur in the Alabama River lignitic, but the full-grown shell has not before been found that I am aware of.

NEW AMERICAN LYMNÆAS. II.

BY FRANK COLLINS BAKER.

Lymnæa decollata oronoensis var. nov.

Shell very globose, inflated, solid; whorls 3-3½, very convex, the last almost globular; spire broadly conic, depressed, sutures a little impressed; aperture roundly ovate, the upper part shouldered two-thirds the length the entire shell; columella with a distinct plait; umbilicus very narrowly open; color a rich greenish horn, inclining to black in some specimens. The spire is frequently decollated.

Length 17.00; width 11.50; aperture length 11.00; width 7.00 mill.

Length 16.00; width 10.00; aperture length 10.00; width 6.00 mill.

Length 17.00; width 12.00; aperture length 12.00; width 8.00 mill.

Length 12.00; width 9.00; aperture length 8.75; width 5.50 mill. (half grown).

Distribution: Orono, Maine. (Collection of Mr. Bryant Walker.)

This variety may be distinguished from *decollata* by its larger size, more globose form of whorls and the whole shell, and the rounded aperture shouldered at the upper part. The young or half-grown shell somewhat resembles young individuals of *mighelsi* and *catascopium*.

Haldeman's figure 3 on plate 14 of his monograph seems to represent a form of this variety. It appears to be quite a characteristic variety.

Judging from specimens received by Mr. Bryant Walker from Mighels and examined by the writer, *decollata* has been figured accurately only by Haldeman in his monograph, plate 14, figs. 1, 2. The species has not been understood by most American collectors, specimens of *emarginata*, *catascopium* and *mighelsi* having been received as *decollata*. It is, however, a very characteristic species, not closely connected with any other form. The variety *oronoensis* resembles some young forms of *mighelsi* as well as some varieties of *catascopium*. This resemblance, however, is merely superficial.

The typical *decollata* received from Mighels measure as follows:

Length 12.00; width 8.00; aperture length 9.00; width 5.50 mill.

Length 12.25 ; width 8.00 ; aperture length 9.00 ; width 5.50 mill.

Length 11.25 ; width 7.75 ; aperture length 8.00 ; width 5.00 mill.

Length 9.75 ; width 7.00 ; aperture length 7.00 ; width 4.50 mill.

Lymnæa randolphi nov. sp.

Shell large, generally inflated, ovate ; whorls five to six, rounded, inflated, distinctly shouldered ; spire short, pyramidal ; the first 3-4 whorls are small and regularly wound, but the last whorl abruptly enlarges to more than four times the diameter of the preceding whorls, causing the spire whorls to appear as though set upon a pedestal ; sutures deeply impressed ; sculpture consisting of close-set, regular lines of growth crossed by fine, impressed, spiral lines ; the surface is malleated in many specimens and in some individuals there is a tendency to form raised spiral ridges on the body-whorl ; aperture very large, ovate, almost patulous, distinctly shouldered at the upper part ; columella without distinct plait, but covered by a heavy, erect callus which overhangs the umbilicus ; umbilicus deep, widely open ; color probably horny as in the majority of *Lymnæidæ*, but chalky white in the type specimens. Length 29.5, diam. 20, length of aperture 19. mm.

Habitat : Marsh Lake, near Dyea Valley, Alaska, collected by Mr. P. B. Randolph.

This is a very distinct species, not easily confounded with any other. It has a superficial resemblance to *Lymnæa mighelsi* Binney, but that species is imperforate or at most only very narrowly perforated. The shape of the spire, the rounded aperture and the open umbilicus will easily distinguish it.

Lymnæa atkensis Dall, is a narrow species with a long spire, a very narrowly open umbilicus and wholly lacks its peculiar shouldered whorls. The sculpture is more marked in *randolphi*.

Cotypes are in the Academy of Natural Sciences of Philadelphia and in the Chicago Academy of Sciences.

A GLIMPSE AT THE SHELL FAUNA OF DELAWARE.

BY S. N. RHOADS.

Literature is strangely silent as to the fauna of the State of Delaware. To remedy this in some degree, as well as to satisfy a long-

standing curiosity to compare the zoölogical features of the Bay State with those of New Jersey, my old tramping ground, I paid her five or six visits in different localities during the spring, summer and fall of 1903. While these expeditions were mainly ornithological, the Mollusca claimed more than passing attention, and a small collection of specimens was made and presented to the Academy of Natural Sciences of Philadelphia, where Prof. H. A. Pilsbry kindly made the identifications and comparisons here recorded.

Disclaiming any but a tyro's knowledge of conchology, it only remains for me to preface these records by stating my conviction that the evidence given by the *vertebrates* of Delaware indicate that her southernmost border is more strictly Lower Austral than Upper Austral. Certain species of birds and reptiles are found there which do not occur in southern New Jersey or Pennsylvania. In the Brandywine valley hills above Wilmington there is perhaps a shade of approach to a preponderating number of species typical of the Upper Austral and Lower Transition. In the upper Choptank valley the Lower Austral finds its most northerly reaching arm on the Atlantic seaboard, and the bird fauna there found in the thickly-forested bottoms is a curious combination of three distinct sub-faunæ, one northern, one western, and another southern. (R.)

In general character, the snail fauna is nearly identical with that of eastern Maryland west of the Chesapeake, but there are a few somewhat conspicuous differences, such as the occurrence of typical *Polygyra tridentata*, in place of *P. t. justidens*, in Maryland. *Pyramidula alternata fergusonii* (Bld.) is another species of the coastal plain, which has not yet been found in Maryland or eastern Pennsylvania.

The *Unionidæ* offer unexpected interest by the finding of a colony of dwarf races of several species at Seaford, Sussex Co. (P.) Seaford is at the head of navigation on the Nanticoke River, an affluent of Chesapeake Bay, and lies near the centre of the level region reaching, with but slight elevation above high-tide level, across the entire peninsula. It is a sandy loam country with stretches of piney uplands and extensive areas of half-swamp lands. The left bank of the river is fifteen to twenty feet high in some places. Some scattered cypresses and white cedar occur on the left bank, but have nearly been exterminated. The botany and vertebrate zoölogy of the region are Lower Austral rather than Upper Austral in their prevailing

species, this being the dividing line between the two faunal regions. (R.)

In this locality the Uniones are normal in shape, but very much smaller than in other places in Delaware and the neighboring states.

Adult specimens of *Unio complanatus* measure 42 to 52 mm. long (the normal size being 70 to 95 mm. in other Delaware streams).

U. fisherianus is 40 to 43 mm. long, against 95 to 108 mm. at Choptank Mills.

Lampsilis cariosus, 40 to 44 mm. long.

Lampsilis ochraceus, 40 to 50 mm. long.

Lampsilis radiatus, 42 to 48 mm. long.

Lampsilis nasutus, 50 mm. long.

The whole *Unio* fauna is thus dwarfed, the shells being from about half to two-thirds the ordinary size. (P.)

It has occurred to me that the dwarfing of the Unionidæ of the Nanticoke may be due to the fact that no tributary of this sluggish river runs through a soil furnishing ingredients favorable to shell growth. The relative sluggishness of this whole river system may also have the degenerating effect of non-resistance. (R.)

In the following list a few Delaware shells collected by Mr. Witmer Stone are included, such records being duly credited :

Polygyra tridentata (Say). Brandywine Valley between Duponts and Rockland, Delaware.

Polygyra albolabris (Say). Brandywine Valley between Duponts and Rockland, and hills southwest side Brandywine near Paline, Delaware. (W. Stone!)

Polygyra thyroides (Say). Brandywine Valley between Duponts and Rockland; southwest of Brandywine Hills just below Penn. State line; and near Delaware City, Delaware. (W. Stone!)

Polygyra hirsuta (Say). Brandywine Valley between Duponts and Rockland, and near Delaware City, Delaware.

Polygyra monodon fraternus (Say). Brandywine Valley between Duponts and Rockland, Delaware.

Strobilops labyrinthicus (Say). Brandywine Valley between Duponts and Rockland; near Dover, Kent Co.; also near Delaware City.

Bifidaria contracta (Say). Near Delaware City, Delaware.

Circinaria concava (Say). Brandywine Valley between Duponts and Rockland, Delaware.

Vitrea hammonis (Strom). Choptank River, just below Choptank Mills (one mile east of Henderson, Maryland), Kent Co.

Vitrea indentata (Say). Choptank River, just below Choptank Mills (one mile east of Henderson, Maryland), Kent Co. Also Brandywine valley between Duponts and Rockland, and near Delaware City.

Zonitoides arboreus (Say). Choptank River, just below Choptank Mills, Kent Co.; Brandywine valley between Duponts and Rockland; Mt. Cuba and southwest side of Brandywine hills, just below Pennsylvania State line (W. Stone!), near Delaware City; near Dover, Kent Co., and Seaford, Sussex Co.

Gastrodonta ligera (Say). Brandywine valley between Duponts and Rockland.

Gastrodonta suppressa (Say). Brandywine valley between Duponts and Rockland. Southwest side Brandywine hills, just below Paline and Mt. Cuba (W. Stone!); also near Delaware City.

Philomyces carolinensis (Bosc.). Mt. Cuba (W. Stone!), Brandywine valley between Duponts and Rockland.

Pyramidula alternata fergusonii (Bld.). Brandywine valley between Duponts and Rockland.

*Lymnæa*¹ *humilis* (Say). Near Delaware City; between Dupont's Powder Mill and Rockland.

Lymnæa desidiosa (Say). Brandywine river between Duponts and Rockland.

Lymnæa columella (Say). Brandywine river between Duponts and Rockland; Seaford, Sussex Co.

Planorbis bicarinatus (Say). Brandywine river between Duponts and Rockland.

Physa heterostropha (Say). Brandywine river between Duponts and Rockland; Seaford, Sussex Co.; head of Red Clay creek, Christiana township.

Goniobasis virginica (Gmel.). Brandywine River between Dupont's Powder Mill and Rockland; also Seaford, Sussex Co., Delaware.

Sphaerium sp. Head of Red Clay Creek, Christiana Township, Delaware.

¹ The original orthography of this name is here restored. American authors have almost universally spelled it *Lymnæa*.—H. A. P.

Lampsilis nasutus (Say). Seaford, Sussex Co.; Choptank Mills, Kent Co., Delaware.

Lampsilis radiatus (Gmel.). Seaford, Sussex Co., Delaware.

Lampsilis cariosus (Say). Seaford, Sussex Co., Delaware.

Lampsilis ochraceus (Say). Seaford, Sussex Co., Delaware.

Unio complanatus ('Sol.' Dillw.). Seaford, Sussex Co.; Head of Red Clay Creek, Christiania Township; Choptank Mills, Kent Co.

Unio fisherianus Lea. Seaford, Sussex Co.; Choptank Mills, Kent Co., Delaware.

Anodonta cataracta Say. Mill-pond at head of Indian River, Millsboro, Sussex Co.; Choptank Mills, Kent Co., Delaware.

Strophitus edentulus (Say). Head of Red Clay Creek, Christiania Township, Delaware.

Strophitus undulatus (Say). Choptank Mills, Kent Co., Delaware. A single, well-developed specimen.

Alasmodonta marginata varicosa (Lam.). Head of Red Clay Creek, Christiania Township, Delaware.

NOTES AND NEWS.

A PECULIAR HALIOTIS.—Not long ago a freak in the *Haliotis* line came under my observation, and thinking it of sufficient interest to the readers of THE NAUTILUS, I send the following description: The shell is, in most particulars, a characteristic *Haliotis cracherodii*, measuring $4\frac{5}{8}$ inches in length, $1\frac{5}{8}$ inches in height, and $3\frac{1}{8}$ inches in width. It was obtained from a lot of shells brought from the coast of Lower California, by Frank Holzner, a local dealer in shells and curios, and unlike any other I have seen, has no holes whatever, and no scars or indentations to indicate even a good intention in that direction.—F. W. KELSEY.

NEW CAVE-SNAILS.—Dr. R. Sturany has been investigating an interesting collection of snails from caverns in Herzegovina (*Nbl. D. M. Ges.* for July-Sept., '04). Besides species of *Clausilia* and *Pupa*, he describes a very small subcylindric land-snail with a round mouth and hairy cuticle as *Pholeoteras euthrix*. It is 2.5 to 3 mm. long, and has minutely latticed sculpture, beginning even upon the embryonic whorl. As only empty shells were found, and nothing

resembling them is known, the position of the new genus is left uncertain. It is curious that with the exception of a *Carychium* discovered by Dr. R. E. Call in Mammoth Cave, no cave-snails have been found in America. Those having opportunities should search in other caves of this country.

PUBLICATIONS RECEIVED.

MOLLUSCA OF THE "PORCUPINE" EXPEDITIONS.—By E. R. Sykes (Proc. Malac. Soc., London, VI, 1904). The material collected by these dredging expeditions in the northeast Atlantic, etc., was not wholly examined by Jeffreys, whose death interrupted the work. Mr. Sykes is now supplementing his valuable reports, the first paper dealing with the Tectibranchs. A number of new forms are described, with valuable information upon others. An excellent plate illustrates several little-known species.

A CRITICAL LIST OF THE SPILEROSPIRA SECTION OF THERSITES.—By Hugh Fulton. (Journal of Malacology, XI, 1904.) With the specimens from the Cox and Beddome collections, Mr. Fulton has critically revised this group of handsome Queensland Helices, correcting numerous errors in former works, and naming as new *T. consors*, a form figured as *T. parsoni* Cox in the Manual of Conchology. It is only fair to say that most of the errors in former works were due to wrongly named shells sent out by Cox and other Australian conchologists. The work seems to be well done and will be of value to collectors having these fine Australian snails.—H. A. P.

AN HISTORICAL AND SYSTEMATIC REVIEW OF THE FROG-SHELLS AND TRITONS.—By W. H. Dall. (Smithsonian Misc. Coll., Vol. 47, 1904.) Perhaps no prominent gastropod family has suffered such vicissitudes of nomenclature as the Tritons. Dr. Dall, without going into their morphology to any length, has fundamentally examined the nomenclature and taxonomy of the group from the earliest times, and gives in this paper the results of an investigation of the early literature of the groups, which may well be called exhaustive. In the *Ranellidæ* he recognizes one genus, *Bursa* Bolten,

equivalent to the old genus *Ranella*. The Tritons are arranged thus :

Family SEPTIDE.

Genus *Trachytriton* Meek (Cretaceous only).

Genus *Personella* Conr. (Eocene, and perhaps including the recent *Triton quoyi* Rve).

Genus *Ranellina* Conr. (Eocene).

Genus *Gyrineum* Link (Tritons with continuous lateral varices).

Genus *Engyriua* Dall (Type *Ranella gigantea* Lam.).

Genus *Argobuccinum* Mörch (Type *Ranella vexillum* Brod. Includes also the West Coast species *Priene oregonensis* Redf., etc.).

Genus *Distortrix* Link (*Distorsio* of authors).

Genus *Cymatium* Bolten (*Triton femorale*, etc.).

Genus *Septa* Perry (Large forms such as *T. tritonis*, etc.).

In recent years all of these groups containing recent species have been generally recognized under one name or another. *Cymatium* contains nearly all the forms ordinarily called "Triton" except those segregated in *Septa*, a group which Dall considers sufficiently differentiated for generic rank, although Kesteven and others have opposed this view.

The classification proposed by Dall will, we believe, meet with general approval. It seems worthy of acceptance pending the investigation of the soft anatomy of the snails in question, which is still imperfectly known.

The chief innovations in generic nomenclature of the two families are for the most part consequent upon the adoption of the *Museum Boltensianum* as an acceptable source of nomenclature,—a position still in debate. This work is so excessively rare that it is hardly to be called published in the ordinary sense. Of the first edition—which is the only one seriously affecting nomenclature—there is one copy in America and we suppose not over half a dozen, if so many, known in the world. Even in Germany, Herrmannsen, over fifty years ago, could not get access to a copy, though he made conchological literature an exclusive study for years. The work has other objectionable features, as the free use of polynomials, such as *Cymbium cochlear neptuni*, *Cardium cor auritum*, *Murex mitra episcopalis*, *Cassia mitella polonica*, *Neptunea corona mexicana*, etc. Nobody who swallows these ought to choke over Chemnitz. It is evident that some general consensus of opinion is called for, before it will be ad-

visible to throw aside the clear-cut images of Lamarek and his school for their nebulous prototypes in Bolten, which have been all but unknown for over a century.

The genus *Colubraria* is made the type of a new family *Cobubrariidæ*, which, however, is not defined. *Colubraria* is as yet unknown anatomically. We have elsewhere shown that, as limited by Dall, the family is a mixture of *Buccinidæ* and *Muricidæ*, with possibly another, but still unknown, element in the typical *Colubrarias*.

The essay, though not lengthy, will be read with great interest by those who make a study of molluscan nomenclature. The eminence of its author, both in the field of malacology and of general zoölogical nomenclature, will ensure a thorough consideration of the positions taken, by those competent to deal with such questions—
H. A. P.

NOTES ON THE PLEUROTOMIDÆ, with description of some new genera and species. By Thos. L. Casey. (Trans. Acad. Sci. of St. Louis, XIV.) Mr. Casey proposes a new classification of the family, establishing eight "tribes" based chiefly upon characters of the sinus. The consideration of genera is confined mainly to those represented in the American tertiaries, some 20 new genera being erected. Numerous new Eocene species are described, chiefly from Alabama and Texas. A single new recent species, *Helenella insolens* from St. Helena, is described. Mr. Casey subdivides much more minutely than has been the custom in this family, raising nearly every group to generic rank. While "genera" and "subgenera," etc., are essentially conventional, varying in rank with every investigator, yet minute subdivision may easily be carried too far for practical convenience by reason of the great number of species likely to be found to fall between such narrowly restricted groups, requiring the formation of still more new "genera." The characters of the protoconch are extensively used. This is perhaps the most valuable feature in the paper, as they have not hitherto been adequately studied in the *Pleurotomidæ* generally. The genus *Donovania*, included by Mr. Casey in the *Pleurotomidæ*, has been shown to belong to the Rhachiglossa.—H. A. P.

THE MUSEUM. By L. P. Gratacap (Journal of Applied Microscopy, V.). All sides of the subject, from the location and archi-

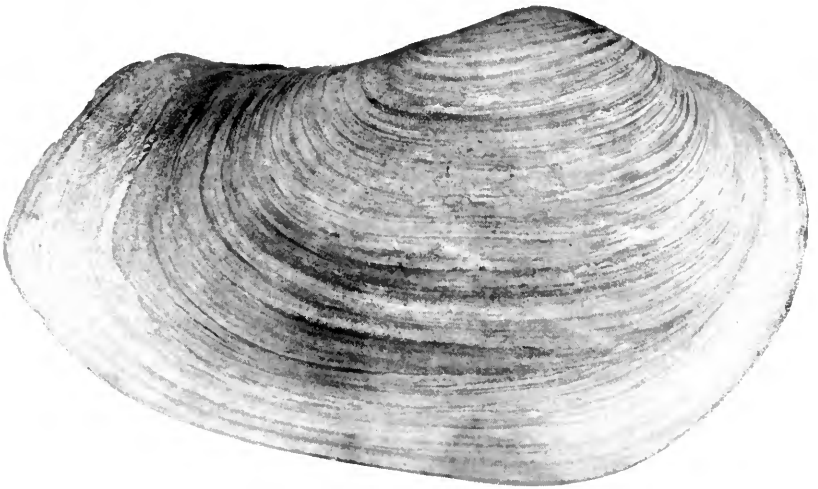
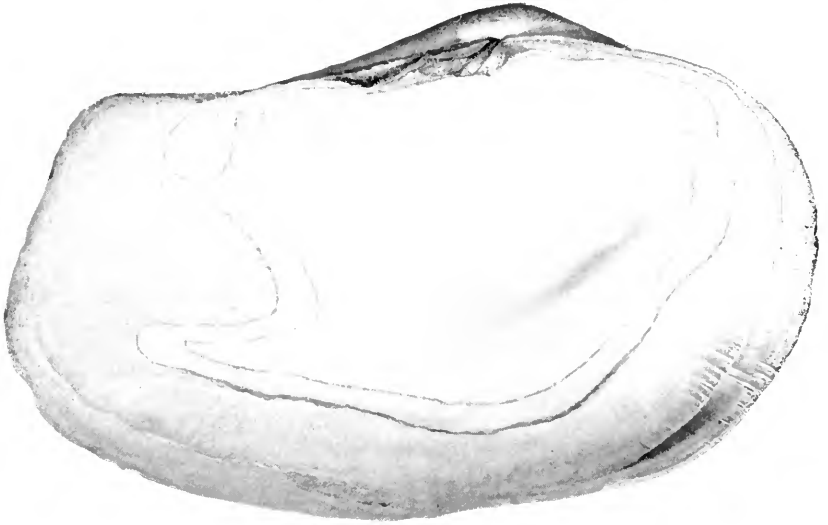
ture of museum buildings to the cases for storage and display, and the installation and labeling of collections, are considered by Mr. Gratacap, whose practical experience in one of our largest museums gives his ideas a high value. The brochure is copiously illustrated.

THE EFFECT OF THE BASSIAN ISTHMUS upon the existing marine fauna; a study in ancient geography. By C. Hedley (Proc. Linn. Soc. N. S. Wales, 1903). A 35-fathom line on either side would bound a submarine plateau 80 to 90 miles wide, stretching from Australia to Tasmania. Mr. Hedley considers at length the great faunal difference between the South Australian and East Australian coasts, concluding that the faunal evidence indicates that Bass' Strait was bridged until recent times by an isthmus. The deeply dissected south coast of Tasmania indicates recent subsidence there also, pointing to a former extension of Tasmania southwards, thus separating what he terms the *Adelaidean* from the *Peronian* or temperate East Australian faunas, by a promontory extending into decidedly colder waters. The ideas advanced are well supported and supply a beautifully simple explanation of the long-known and hitherto unexplained diversity of the South Australian and Victorian marine faunas.—H. A. P.

ADDITIONS TO THE MARINE MOLLUSCAN FAUNA OF NEW ZEALAND. By Charles Hedley (Rec. Australian Museum, V, pt. 2, 1904). In reporting upon a parcel of dredgings, Mr. Hedley remarks that "the fauna of the continental shelf of New Zealand is practically unknown. It also appears that the element common to New Zealand and Australia, hitherto calculated on the beach fauna, will be disproportionately increased when the fauna of the continental shelf is taken into consideration." Besides new forms of several genera, Hedley describes a new genus of the *Carditidæ*, *Verticipronus*. The valves are small, smooth, and capped by a flat prodissoconch. Another new genus, *Incisura*, is erected for *Scissurella lyttletonensis* Smith. This little snail is shown to belong to the *Fissurellidæ*, having characters similar to the very young of *Fissuridea*. The specimens we have examined bear out Mr. Hedley's interesting conclusion. *Incisura* is apparently the most primitive of existing *Fissurellidæ*.—H. A. P.

A NEW *ASHMUNELLA* FROM NEW MEXICO. By Paul Bartsch (Smithsonian Misc. Coll., vol. 47, 1904, p. 13, 14). *A. townsendi*, described from two specimens collected by Mr. C. H. S. Townsend on the slopes of the ridge on the south fork of Ruidoso river, about five miles above the town of Ruidoso, at an altitude of 8,500 ft. This is in the Sierra Blanca, Mescalero Indian Reservation, Lincoln Co., New Mexico. "*Ashmunella townsendi* is most nearly related to *A. rhyssa* Dall, but is much smaller than that form and is uniformly more strongly sculptured." It measures, alt. 8.2, diam. 15, width of umbilicus 2.3 mm., being thus larger than *A. altissima* Ckll. from the summit of Sierra Blanca. From an intermediate altitude, *A. townsendi* seems to be also intermediate in characters between *rhyssa* and *altissima*. The use of the term "axial" to describe obliquely radial sculpture seems rather forced. The direction of such sculpture approaches "axial" only at the periphery, and it is presumed that by "axial" is meant "in line with or in the direction of the axis" as the Century Dictionary expresses it.

SHELLS OF LAND AND WATER: a familiar introduction to the study of Mollusks. By Frank Collins Baker (Chicago, A. W. Mumford, large 8vo). As its title indicates, this book is for the use of those beginning the study of shells, and is especially designed to be placed in the hands of young people interested in nature study, but without much or any previous acquaintance with mollusks. The chapters on The Home of the Clam, Pond Snails, Snails of the Forest and Field, The Oyster and its Relatives, The Cowries, etc., afford an attractive insight into the mysteries of these creatures, and will be a revelation to many intelligent people to whom shells have had no meaning. Eight full-page colored plates are very good examples of the new "three-color process," and illustrate many of our native species besides numerous exotic shells. These figures will help many a learner to some knowledge of common "mantlepiece" shells. The text is also fully illustrated with wood-cuts and half-tone engravings, and a good deal of attention is given to the observation and collecting of mollusks. The work is written in the somewhat old-fashioned form of a series of discourses or monologues by a professor to several pupils. It is well gotten up typographically.—H. A. P.



JOHNSON. PANOPEA BITRUNCATA.

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No. 7.

PANOPEA BITRUNCATA CONRAD.

BY CHARLES W. JOHNSON.

The shell of the genus *Panopea*, like most of the burrowing Pelecypods is subject throughout its growth to considerable variability. The causes of mutation are so admirably described by Dr. Dall¹ that I quote in full the following paragraphs:

“All boring mollusks in which the shell has so degenerated that it no longer covers the whole adult animal when retracted are more liable to variation in minor details than those in which the valves meet distally, and dynamically influence their own development by fixing for it certain definite limits. This is markedly the case in the present genus. Those shells which live in an easily movable medium, such as sand or fine, soft mud, are thinner, better developed, more elongated and less distorted than their congeners who are obliged to confine themselves to a gravelly or stony *situs*. So marked is the difference that I have several times been presented with supposed new species based on these dynamic characters, and by a curious reversal of logic, have been assured that the differences must be specific, because the animals inhabited, respectively, the different kinds of ground alluded to.

“I have observed, also, that where the ground into which the

¹ Contributions to the Tertiary Fauna of Florida, by William Healey Dall. Transactions of the Wagner Free Institution of Science, Vol. III, part IV, page 827. Philadelphia, April, 1898.

burrowers retire is a comparatively thin coating over a stony or rocky layer which they cannot pierce, the tendency in *Panopea*, *Mya*, etc., is for relatively short and broad shells, with shorter siphons, to survive; which naturally have a wider, shorter, and more rounded pallial sinus, and shorter and more incurved nymphs. I believe the influence of environment is direct and not selective; at all events the association of *situs* and specimens so characterized is, as far as I have been able to determine, quite uniform, whether selective or not."

While living at St. Augustine, Florida (1880-87), I was fortunate in finding in the harbor, on a sand bar near "Marsh Island," a specimen of *Panopea bitruncata* with valves intact, and from which the animal had apparently just been removed. This specimen which is shown on plate IV, represents a nearly normal shell (reduced about one-fifth) with the lines of growth but slightly interrupted anteriorly. It had probably grown under favorable conditions in the adjacent sandy-mud bottom. The shell measures 133 mm. (5.25 inches) in length, with a width of 80 mm. On the ocean beach I also found several single valves; these were proportionately shorter, and wider, giving them a more truncated appearance. In my list of the shells of St. Augustine, Florida, in this Journal, Volume IV, page 4, I referred these to *Glycymeris bitruncata* Conr., while in naming the one from the harbor, I followed Dr. Dall's catalogue of the shell-bearing mollusks of the southeastern coast of the United States (Bull. 37, U. S. Nat. Mus.) and called it *G. reflexa* Say.

Since Dr. Dall's review of the species (Trans. Wagner Free Inst. Sci. Vol. III, pl. 4, p. 831), I have made a careful study of the type of *P. bitruncata* in connection with all recent specimens obtainable and find no greater variation than exists in the Pliocene specimens of Florida. The type of *P. bitruncata* is an injured specimen; the upper or dorsal portion of the posterior end being broken away, gives the shell a very oblique truncation, while the lower portion of the anterior has been frequently arrested in its development, the lines of growth being interrupted and crowded together, gives that end also a very oblique outline. The umbonal and younger portion of the shells are alike in all the specimens I have examined.

Uniting the recent and Pliocene forms, and adopting the oldest name will make the synonymy stand as follows:

PANOPEA BITRUNCATA Conrad.

Panopæa americana Stimpson. Check List Shells N. Amer. Smiths. Misc. Coll., Vol. II, 1860; Coues, Proc. Acad. Nat. Sci., 1871, p. 139; not of Conrad 1838.

Glycimeris bitruncata Conrad. Proc. Acad. Nat. Sci. for 1872, p. 216, pl. 7, f. 1.

Panopæa bitruncata Tryon. Amer. Marine Conch., 138, pl. 21, fig. 321, 1874.

Panopæa menardi Heilprin. Trans. Wagner Free Inst., I, 90, pl. 9, f. 19, 1887; not of Deshayes.

Panopæa floridana Heilprin. L. c. I, 91, pl. 10, f. 21.

Panopæa navicula Heilprin. L. c. I, 91, pl. 10, f. 22.

Panopæa reflexa Dall. Bull. 37, U. S. Nat. Mus., p. 70, 1889; not of Say.

Panopæa floridana Dall. L. c. III, pl. 4, p. 831, 1898.

Conrad's type was obtained at Fort Macon, North Carolina; it is also recorded from Cape Lookout, (*Bickmore*); Mobile Point, Miss., (*Conrad*), and the west coast of Florida (*Willcox*). It has also been taken at Crooked Island, Calhoun Co., Fla. (Clarence B. Moore), two specimens measuring 180x109 mm., and 165x112 mm. It is a common species in the pliocene of the Caloosahatchie, Shell Creek, and Alligator Creek, Florida.

The original spelling of the generic name is *Panopea* Menard, 1807. It is *Glycimeris* Lamarck, 1799, (not *Glycymeris* Da Costa, 1778), and *Panopæa* Lamarck, 1812.

NOTES ON EASTERN AMERICAN ANCYLI. III.

BY BRYANT WALKER.

Section FERRISSIA.

III. *Ancylus filosus* Conrad (1834). Pl. 6, figs. 1-8.

Conrad's description of this species is very meager. No dimensions are given and the only real specific character indicated is "the numerous, radiating, prominent lines." Subsequent authors have supplied no additional information except Haldeman, who gives a figure, though, curiously enough, he states in the text that the species is unknown to him. No specimens from the original locality, the Black Warrior River, have been accessible to me. The only ex-

amples seen are two lots in the Lewis collection, so labelled by him, one from the Coosa and the other from the Cahawba River, Ala., and a set from the latter stream collected by Call. Dr. Pilsbry has kindly compared these with the type specimen in the collection of the Academy and writes that though less strongly striated radially, "they agree with the type in form, and the almost invariably red apex."

As evidenced by these shells, *A. filiosus* closely resembles in shape and contour the eastern form of *A. tardus*. It differs, however, in the light green color, the radiating ribs and, when present, the rosy apex. In none of these shells are the ribs very strongly developed, nor do they extend uniformly over the shell from apex to periphery. But there are indications of them on all. They are usually more conspicuous on the sides, especially immediately below the apex and toward the anterior slope, the central portion of the side slope being comparatively smooth. Between these heavier ribs are usually several smaller ones, which seem to be extensions of the apical striæ. The larger ribs are heavier and coarser than those noticed in any other species and, when fully developed, would be "very prominent" and conspicuous. The anterior slope is usually strongly convex, although, as shown by the figures, there is some variation in this particular; the posterior slope is nearly straight and direct, not very oblique, and the side slopes are slightly convex. The marginal outline varies from a regular oval to obovate with the greatest width behind the apex.

The Cahawba River specimens are thinner and more translucent than those from the Coosa and are apparently less typical, being less elevated, with the anterior slope more oblique.

The apex is much eroded in all of the Coosa specimens, but is nearly perfect in those from the Cahawba. When perfect it is "somewhat inclined" or rather flattened posteriorly, and very slightly inclined to the right. Binney and Tryon are consequently in error in referring the species to *Acroloxus* (*Velletia*), which is a European group not represented in our fauna.

The dimensions of the specimens figured are as follows :

Fig. 1, length 4.0, breadth 2.9, alt. 1.9 mm.

Fig. 4, length 4.5, breadth 3.5, alt. 2 mm.

Fig. 7, length 4.0, breadth 3.0, alt. 1.75 mm.

IV. *Ancylus parallelus* Hald. (1841). Pl. 5, figs. 1-9.

This common and well-known species has a wide range through the northern states and Canada, extending from Nova Scotia and New England to Manitoba and Minnesota. It is peculiarly a northern form, and its range toward the south is comparatively limited. Rhode Island, Central New York, Northern Ohio and Indiana, so far as the records go, seem to mark the limit. It is not listed from Philadelphia (Shick) nor Alleghany Co., Pa. (Stupakopf), nor Cincinnati (Harper and Wetherby), nor the Chicago Area (Baker).

Mr. Marsh has kindly permitted me to examine the specimens from Mercer Co., Ill., which he quoted as this species in the NAUTILUS III, p. 34, and they prove to be a form of *A. tardus*. Shimek's citation from Iowa City, Ia., which should be verified, if correct, probably marks its extreme range to the southwest, as it does not occur in any of the Iowa lists nor in those of Missouri, Nebraska or Kansas. The tentative citation of this species from North Park, Col., by Ingersoll (Rep. U. S. G. & G. Surv., 1874, p. 405) must also be considered very doubtful.

It is easily distinguished by its narrow, elongated shell, with nearly straight lateral margins, which widen more or less anteriorly. The anterior slope is typically (fig. 1) only slightly convex, but there is considerable variation in this particular; the posterior slope is long, very oblique and nearly straight, the right slope is nearly straight, and the left slope slightly convex. The apex is sub-acute and slightly turned towards the right, and is nearly in the centre of the shell. Lines of growth well marked, but fine and irregular. It is at times subject to considerable irregularity in growth, when living on a small reed, the peritreme is concave at the ends (as noticed in *A. fuscus*) and the lateral slopes are noticeably more convex and the apex less prominent. Several examples have been noticed, in which the shell in the earlier stages was unusually narrow, but on approaching maturity, a sudden expansion of the entire margin took place, resolving the peritreme to nearly its normal outline (fig. 4). Specimens of extraordinary size (fig. 7), far surpassing those from any other locality, have been collected by Nylander at Caribou, Me. Specimens nearly as large (7.5 x 4.5 x 3) have been collected by Ferriss on the north shore of Lake Superior. Fine specimens larger than the average also occurred in Schuyler's and Little Lakes, N. Y. (fig. 4). In most places, however, the average length is less

than 6 mm. . *A. parallelus* is one of the few species of *Ferrissia* that by preference chooses the quiet waters of the inland lakes for its home. In northern Michigan, where it is the only species found, it is abundant on the under surface of the lily pads and on the round reeds (*Scirpus lacustris*), growing in water 3 to 6 feet deep.

The dimensions of the specimens figured are as follows :

Fig. 1. Length 6.5, breadth 3.10, alt. 1.75 mm.

Fig. 4. Length 4.80, breadth 3.25, alt. 1.75 mm.

Fig. 7. Length 8.66, breadth 5.00, alt. 2.50 mm.

V. *Ancylus haldemani* Bgt. (1844). Pl. 6, figs. 9-13.

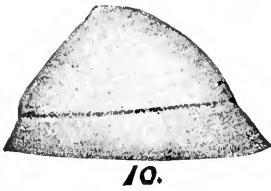
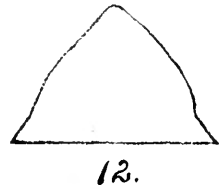
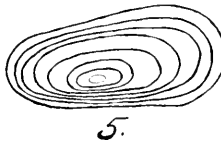
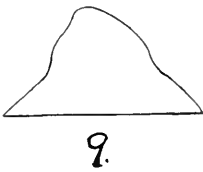
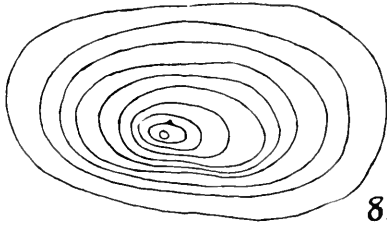
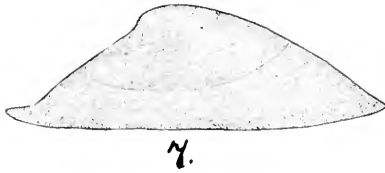
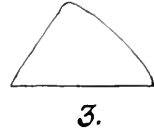
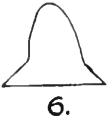
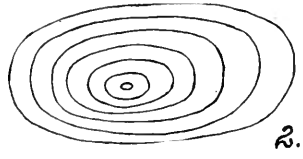
Haldeman's types of the species, for which he used the preoccupied name of *depressus*, came from the headwaters of the Holston River, in Washington County, Virginia, and are now in the collection of the Philadelphia Academy. Dr. Pilsbry has kindly furnished the accompanying outlines of the larger of the two specimens (figs. 9, 10), and states that "the base is a little raised at the ends, but very slightly so, so that the growth-lines appear nearly straight. There are some coarse radii, especially on the long slope, but not noticeable over the whole surface, but the apical tract is beautifully striate."

I have referred to this species a small series collected by Hemphill in the Doe River at Roan Mountain Station, Tenn. As shown by the figures (figs. 11-13), they agree quite exactly with the type. The specimen figured is decidedly obovate in its marginal outline, the greatest width being behind the apex, but others are more regularly oval.

It is a well-marked form, and, as stated by Haldeman, differs from both *rivularis* and *tardus* in the obtusely rounded apex, which in the Doe River specimens is directed nearly straight backwards. In the type specimen, it is apparently more excentric. There is no indication in the Doe River specimens of the "coarse radii" which are present on the type, but merely a slight rippling of the anterior slope. But this, no doubt, is a variable feature. The specimen figured is slightly longer and proportionately wider than the type; the dimensions being : Length 4.43, breadth 3.33, alt. 1.5 mm.

VI. *Ancylus elatior* Anth. (1855). Pl. 5, figs. 10-12.

Through the kindness of Mr. L. P. Gratacap of the American





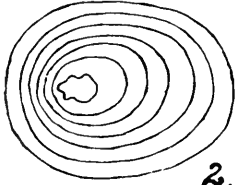
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3.



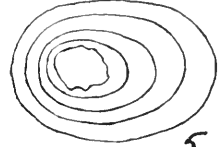
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5.



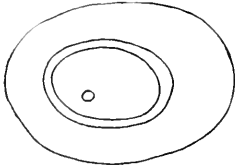
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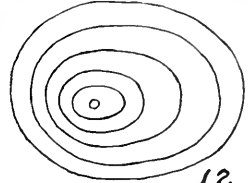
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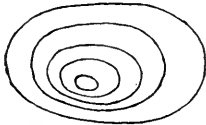
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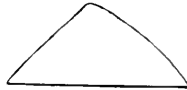
8.



12.



16.



13.



14.



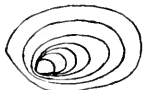
17.



15.



20.



18.



19.



22.



21.

Museum of Natural History in New York City, I have had the opportunity of examining an author's example of this rare species. This specimen, though not quite as large as the type, agrees with the description in all other particulars. The locality is given as Kentucky and there is but little doubt that it is one of the original lot.

It is a remarkably strong, heavy shell, as compared with the other eastern species, and differs from them all in its size, greater elevation and the convex outline of the posterior slope. The marginal outline is broadly oval, the greatest width being behind the centre and immediately under the apex. The apex is quite acute and turned toward the right. The apical striae are strong and close together at the apex, but rapidly diminishing in size, and the strong, irregular lines of growth on the outer half of the circumference are scarcely more than rippled by the radial lines. The apical portion of this specimen was quite heavily encrusted with lime, which I did not attempt to remove, and which covered up any indications of the rosy color mentioned by Anthony in his description. The irregular shape of this specimen is no doubt an individual peculiarity, caused by a change in the line of growth after a period of rest, possibly a change in the object on which the shell rested. Down to the line where the new growth began, the outlines are quite regular, but below it, there is first a decided constriction, rather more marked in the posterior and left slopes, and then a rapid expansion all around the circumference. Similar instances have already been described as occurring in *A. parallelus*. The dimensions of this specimen are: Length 5.75, breadth 4.5, alt. 3 mm.

Accompanying this shell were two smaller ones of evidently a different species, apparently the same as that found by Hinkley in the Ohio River, and which will be more fully described in connection with that form. In Mr. Hinkley's collection is a single specimen of the genuine *elatior*, which was collected by him in a creek near Florence, Ala. The apex is badly eroded, but the rosy tinge is very evident. Its dimensions are: Length 5, breadth 4.8, alt. 2.5 mm.

The outline is entirely regular without any trace of the constriction shown in the Anthonyan specimen.

VII. *Ancylus ovalis* Morse (1864).

I have not been able to get any information in regard to this

species in addition to that afforded by the original description. It is apparently a *Ferrissia* and distinguished from the other northern species by "the delicate ribs which radiate from the apex to the periphery of the shell." Judging from the figure, the shell widens posteriorly and not anteriorly, and the apex is turned to the right and not, as stated by the author, to the left. Whether this be so or not, the broadly ovate shape forbids its reference to the section *Acroloxus* (*Velletia*), made by Binney. Clessin's remark that the form of the apex as shown in Binney's figure recalls the European forms belonging to *Ancylus s. s.* seems equally untenable.

VIII. *Ancylus borealis* Morse (1864). Pl. 6, figs. 14-16.

I have not been able to get any authentic specimens of this species for examination. Its main characteristic is stated by the author to be the "fine regularly interrupted, radiating lines (which) mark the surface of the shell from the apex to the border." Otherwise "the species resembles *A. tardus* in its general form."

The only specimens, at all referable to this species, which I have seen, are those from the St. John's river at Fort Kent, Me., mentioned by Nylander (NAUT., XIII, p. 105), one of which is figured. They are quite close to *A. tardus* and possibly should be referred to that species, but they are narrower and more elliptical than the form of *tardus*, which is apparently prevalent in that State. The growth lines, especially near the apex, are quite strong, and where these are crossed by the apical striæ, the effect is that of "fine interrupted radiating lines," but this is confined to the apical region. The remaining surface of the shell is irregularly rippled in the manner noticed in nearly all the American species. In view of the fact that in many of the species where it occurs, the radial character (except at the apex) is a variable feature, the reference of these examples to *A. borealis* seems fairly justified. The dimensions of the specimens before me are as follows:

Length (fig. 14) 3.75, breadth 2.33, alt. 1.25 min.

Length 3.33, breadth 2.10, alt. 1.25 min.

Length 3.50, breadth 2.00, alt. 1.33 min.

Length 4.00, breadth 2.50, alt. 1.40 min.

Compared with the dimensions of the type, these shells are slightly narrower and not quite as high. But the difference is so slight as to be easily within the lines of individual variation.

The apex is very obtuse, being almost flat on top when viewed in profile.

IX. *Ancylus shimeki* Pilsbry (1890). Pl. 6, figs. 17-19.

1890. *Ancylus obliquus* Shimek. Bull. Lab. Nat. Hist. State Univ. Ia., I, p. 214.

1890. *Ancylus shimekii* Pilsbry. NAUT., IV, p. 48.

Shell elevated, thin, transparent, horn-colored, with a yellowish-brown epidermis; aperture ovate, conspicuously wider anteriorly, in many (especially young) specimens slightly reniform by a barely perceptible incurving of the right margin, the anterior, left and posterior margins regularly rounded, the right slightly incurved, straight, or but slightly convex; apex somewhat acute, elevated, strongly depressed posteriorly and to the right, and curved downward, in most specimens quite overhanging the posterior right margin of the shell; the apical portion of the shell (one-half or more) is strongly laterally, or rather obliquely, compressed, a character which makes the young appear proportionately much narrower than the adults; the posterior slope of the shell is long and strongly convex, the posterior being short and concave. The surface is marked by fine lines of growth.

Largest specimen: Length 3.5, width 1.8, height 1.2 mm.

Average dimensions: Length 2.7, width 1.7, height 1.2 mm.—(Shimek.)

As the Bulletin, in which this species was described, is very scarce and out of print, it seems better to reproduce the original description, which is very full and accurate, than to present a new one. The only specification to be added being that the apex is radially striate.

Through the kindness of Prof. Shimek, I have before me part of the original lot collected by him in Deadman's Run, near Lincoln, Neb. It has also been found at Calloway, Neb., living on *Ceratophyllum demersum* L. In the collection of the Philadelphia Academy a single immature specimen was detected in a vial of *A. rivularis* from the Delaware River at Philadelphia (No. 75811). These are the only authentic records known to me. The tentative reference of this species to *Gundlachia* by Pilsbry (NAUT., IV, p. 48, and IX, p. 63), was based on a misapprehension of the species, which is quite different from the Rock Island, Ills., examples figured by him.

The reference of the specimens from Rock Run, Joliet, Ills., to this species by Baker (Moll. Chic. Area, p. 306), is erroneous for the same reason.

The *A. shimekii* is a very distinct, little species, and, when once seen, is not likely to be mistaken for any other. The high, narrow shell with the rapid expansion towards the base; the prominent, excentric, deflected apex, almost reaching the posterior margin, the long convex anterior slope, and the peculiar posterior slope are very characteristic and separate it from all the described species. It is more nearly related to the small Ohio species, called *pumilus* by Sterki, than to any other, but is clearly distinct as pointed out under that species.

The specimen figured, the largest received from Shimek, is slightly smaller than the average size as stated in the original description, being:

Length 2.66, breadth 1.66, alt. 1.0 mm.

X. *Ancylus pumilus* Sterki (1900). Pl. 6, figs. 20-22.

1894. *Ancylus* ———? Sterki. The L. & F. W. Moll. of New Phila., O., sp. 83, p. 8.

1900. *Ancylus pumilus* Sterki. List of L. & F. W. Moll. of Tuscarawas Co., O., 8th, An. Rep. O. St. Acad. Sci., p. 36. Separate p. 7.

Shell small, thin, translucent, shining, horn-colored; oval or slightly obovate; ends regularly rounded; sides nearly equally curved; apex radially striate, prominent, rather obtuse, not depressed at the tip, about half way between the central and posterior margin and decidedly turned to the right; anterior and left slopes very convex; left slope nearly straight; posterior slope straight below the projecting apex; surface with the lines of growth fine and inconspicuous, more or less irregularly rippled with transverse wrinkles on the anterior slope.

Fig. 20. Length 2.75, breadth 1.75, alt. 1.0 mm.

This minute species, which was first detected in the Tuscarawas River near New Philadelphia, by Dr. V. Sterki, seems to have an extended range. Examples have been seen from the following localities: Alexandria, Va., Seneca, N. Y., Vermilion River, O., Cuyahoga River and Garrettsville, O., and the Mississippi River, Rockford, Ill. Specimens from the Kankakee River, Ill., and Iowa City, Ia., though differing from the typical form in having the

anterior slope only slightly convex, seem to be also referable to this species.

Distinguished primarily by its small size, this species is well characterized by the prominent, obtuse apex, the short, straight posterior slope and long, convex anterior slope. It is very close in general appearance to *A. shimckii*, but seems to differ persistently in having the apex, which is less excentric in position, projecting decidedly upwards and not depressed at the tip as in that species, the anterior slopes not quite so convex, while the posterior slope is longer, more oblique and nearly straight. The extreme lateral compression characteristic of *shimckii* is not present in this species, the right slope being nearly straight; this difference is particularly marked in the immature shells, which in *shimckii* are decidedly narrow and proportionately higher than the mature shell, while in *pumilus* the proportions are nearly the same. Sterki's types are immature examples, to which his statement, that "the sides are parallel," is quite applicable, but in mature examples the lateral margins expand a little and become more curved as shown in the figure, which is from one of the largest specimens seen, the dimensions being:

Length 2.75, breadth 1.75, alt. 1.0 m.m.

EXPLANATION OF PLATES.

All the figures on each plate are drawn on the same scale, but those on Plate VI are somewhat more enlarged than those on Plate V.

PLATE V.

Figs. 1-3, *A. parallelus* Hald. Little Lakes, N. Y.

Figs. 4-6, *A. parallelus* Hald. Pine River, Marquette Co., Mich.

Figs. 7-9, *A. parallelus* Hald. Caribou, Me.

Figs. 10-12, *A. elatior* Hald. Kentucky.

PLATE VI.

Figs. 1-3, *A. filiosus* Con. Coosa River, Ala.

Figs. 4-6, *A. filiosus* Con. Coosa River, Ala.

Figs. 7-8, *A. filiosus* Con. Cahawba River, Ala.

Figs. 9-10, *A. haldemani* Bgt. Holston River, Washington Co., Va.

Figs. 11-13, *A. haldemani* Bgt. Doe River, Tenn.

Figs. 14-16, *A. borealis* Mse. St. John's River, Me.

Figs. 17-19, *A. shimckii* Pils. Deadman's Run, Neb.

Figs. 20-22, *A. pumilus* Sterki. Tuscawaras River, O.

NOTES AND NEWS.

Mr. A. A. Hinkley is making a collecting trip to Alabama.

EDITORS NAUTILUS :

In the course of some remarks on the "Museum Boltenianum," Dr. Pilsbry in the October NAUTILUS refers to the "free use of polynomials" in that work, citing some supposed examples, and suggesting that no one who could "swallow these ought to choke over Chemnitz."

The general question of the acceptability of Bolten's work is too large to enter upon here, and I believe it has been practically settled in a sense adverse to the arguments I used twenty years ago, and which Dr. Pilsbry now reiterates. But the matter of "polynomials" can be settled right here. Bolten used polynomials as much and no more than Linné and Gmelin, 1758-1792. Let us remember that Bolten's work was a posthumous MS. printed without revision by the writer. It contains 2409 entries of species. Of these 64 are what Dr. Pilsbry refers to as "polynomials." (The "*Murex mitra episcopalis*," by the way, is not one of them, and does not occur in the book as far as I can discover; "*Mitra episcopalis*" is there all right.)

Now Bolten's polynomials are partly hyphenated; part of them are words which we now combine in one word (as "*mille punctatum*"); a lot of them are taken from Gmelin or Linné (as "*caput serpentis*," "*lingua felis*," etc.), and have always been in use; others are geographical (as "*Novæ zeelandiæ*," "*Bonæ spei*"), and have also been in use continuously to this day; all of them are either substantive phrases like "*pes-asininus*," or adjective combinations like "*atro-viridis*," which we now use and write as one word. In the whole sixty-four there is only a single case where something like a Chemnitzian polynomial occurs, when to the name of the shell "*sinistrorsa*" is added, indicating that the specimen was reversed. Now exactly such polynomials occur in the work of Linné and most of the older writers after 1758, and have been accepted as valid without demur. Even D'Orbigny as late as 1853 indulged in at least one. While we may regard them as awkward and objectionable, they are not incompatible with the Linnean nomenclature, and have never been so considered.

The polynomials of Martini and Chemnitz, on the other hand, are simply descriptive phrases or brief sentences; the dwindled remnants of the earlier "*nomen triviale*" of pre-Linnean authors, and do not come under the same class as those above cited from Linné and Bolten. In short, with access to the book and a little comparison, Dr. Pilsbry could soon satisfy himself that, on the score of regular nomenclature, there can be no possible objection to Bolten.

WM. H. DALL.

THE NAUTILUS.

Vol. XVIII.

DECEMBER, 1904.

No. 8.

NEW FORMS OF POLYGYRA FROM ALABAMA.

BY GEORGE H. CLAPP.

Polygyra (Stenotrema) barbata n. sp.

At first glance this species would be readily taken for *P. stenotrema* and as it may exist in some collections under that name it can best be described by comparison with that well-known and widely distributed species.

Viewed from above, the difference is at once apparent, as *barbata* has stiff hairs about $\frac{1}{2}$ mm. in length which are widely spaced, and the diagonal series cross the lines of growth at nearly a right angle. The upper half of the outer lip is well reflected, not appressed as in *stenotrema* and there is a distinct constriction back of it. From below the difference is still more striking, as the width of the mouth in *barbata* is fully *double* that of *stenotrema*; in *barbata* the width, measured from the top of the tooth to the edge of the lip just below the notch, is 1 mm., while in a *stenotrema* of the same size it is only about $\frac{1}{2}$ mm. The lamelliform tooth is more sinuous and less massive. The flattened upper lip, which is markedly concave, has a well pronounced tooth just opposite the upper end of the abruptly truncated parietal tooth. The "fulcrum," which is plainly visible through the shell, is the most pronounced feature, as it is 3 mm. in length, extending from the axis fully half way across the body-whorl. Embryonic whorls polished and obsolete ribbed, while in *stenotrema* they are *granula-*

ted. The granulated embryonic whorls of *stenotrema* and its allies, would seem to make the section *Stenotrema* of at least subgeneric value, although the almost smooth apex of *barbata* indicates that there is some variation in the group. The young of *barbata* are umbilicate. In size there is a wide variation in this species but in all other particulars the characters are absolutely constant.

Greater diam. 11, lesser 10, altitude 7 mm.

Greater diam. 10, lesser 9, altitude $6\frac{1}{2}$ mm.

Greater diam. 8, lesser $7\frac{1}{2}$, altitude $5\frac{1}{2}$ mm.

The average diameter is 9 to 10 mm. Whorls about $5\frac{1}{2}$.

Types from the flood-plain of the Tallapoosa River near the Montgomery Road about five miles southeast of Wetumpka, Ala., in collections of Geo. H. Clapp and Acad. Nat. Sci. Phila.

This most interesting species was first found by Mr. Herbert H. Smith in November, 1903, and he reports it scarce and apparently very local.

On Poole's Island in the Coosa River just below the Georgia line, in Alabama, Mr. Smith found a smaller form of *barbata* which differs slightly in the mouth being still wider and the lip notch weaker. It averages from 8 to 9 mm. diam.

Polygyra stenotrema seminuda n. var.

In the Proceedings of the Academy of Natural Sciences, 1900, page 129, Dr. Pilsbry defines *P. stenotrema* var. *nuda* as follows: "Surface without hairs or their scars; other characters of typical *stenotrema*."

Among the shells collected by Mr. Herbert H. Smith in Central Alabama is a variety of *stenotrema* which differs from *nuda* in having *very short*, widely spaced hairs, in other particulars agreeing with var. *nuda*. As it appears to be a "connecting link," I have called it var. *seminuda*. In size it varies from $5\frac{3}{4} \times 8$ to 7×10 mm., the average diameter being 9 to $9\frac{1}{2}$ mm.; color from greenish-white, almost albino, to dark reddish-brown. Types from Bangor, 4 miles north of Blount Springs, Blount Co., Ala., in coll. G. H. C. and A. N. S. P.

Mr. Smith has sent in three or four apparently well-marked varieties of *stenotrema*, but it will be well to await the conclusion of his work before attempting to define these local races.

NEW SPECIES OF BUCCINUM FROM THE KURIL ISLANDS.

BY H. A. PILSBRY.

Buccinum inclitum n. sp.

Shell ovate-pyramidal, solid, cream-colored with a few inconspicuous reddish-brown stains. The spire is straightly pyramidal, the apex small, the first whorl wanting in the type specimen. 8 whorls remain; they are very convex and separated by deep, channelled sutures. Below the suture the flattened, sloping surface is sculptured with four or five spiral cords. These are followed by three very strong spiral ribs, separated by deep striate intervals. On the last whorl there are four large ribs, grouped near the periphery, which is formed by the second rib; below them the base has about 8 gradually decreasing spiral cords, with one to three smaller cords and threads in each interval, exclusive of those on the convex, siphonal fasciole. Over the whole of this sculpture there is a very fine spiral striation, and the upper slope of the whorls has small radial waves, making the ribs slightly nodose. The aperture is tinted with pale yellow on both lips, the outer lip being somewhat expanded, and posteriorly flaring. The anterior canal is short and wide.

Length 82, diam. 46 mm.

Etorō, Chishima [Kuril Is.]. Type is no. 88768 A. N. S. P., from no. 1704 of Mr. Hirase's collection.

This noble and beautiful species is somewhat related to *B. leucostoma* and *B. martensianum*, but it is much more strongly sculptured than either. *B. carinatum* Dkr. is also related, but it differs by the small number of spiral keels.

Buccinum chishimanum n. sp.

Shell ovate, rather thin but moderately solid, yellowish olive-green, the principal spiral ribs typically red-brown with light spots. Spire slate-blue or ashy-purple. Whorls 6, the apex slightly mamillar and smooth, the last whorl ventricose, sculptured with numerous very unequal spiral cords and threads, the larger cords widely spaced on the upper half, more numerous below. Over all there is a microscopic sculpture of distinct, fine and close fold-like growth-striae, and very fine, subobsolete spiral striae. The suture is bordered with weak folds, sometimes stronger and tubercular. The

aperture is half-round, glossy, dark chestnut-brown inside, the bevelled and slightly expanded lip cream-white. The basal notch is rather wide and not very deep.

Length 31, diam. 20 mm.

Etorô, Chishima (Kuril Is.), types no 87757 A. N. S. P., from no. 1597a of Mr. Hirase's collection.

This whelk seems to be related to the smaller, thinner and smoother *B. mörchianum* (Fischer), but the two are quite distinct. In some specimens the coarser spirals are all low, subequal and almost evenly distributed over the surface. As usual in *Buccinum*, the coarser sculpture is variable. Some specimens lack the thin, greenish cuticle, being dull, creamy-ashen, like many arctic shells. There is always a livid or purplish worn spot in front of the aperture.

ON THE NORTHERNMOST HABITAT OF *LIGUUS FASCIATUS* ON THE
FLORIDA EAST COAST.

BY CLARENCE B. MOORE.

These snails at the present writing (1904), live in great abundance at Miami, Dade Co., Florida. They were found by me in small numbers at Arch Creek, about nine miles north of Miami. Going northward I found them, here and there, along the banks of New River, below Ft. Lauderdale about 24 miles, in a straight line, north of Miami.

North of this point inquiries were made along the banks of the canal where "hammock" land (such as *Liguus* requires) is often in sight, but in no case had the snails been seen by the inhabitants. At Boca Raton, Dade Co., the hammock is not large, and much undergrowth has been burned recently. We saw no living *Liguus*, nor any of their shells on the ground. *Glandina* was present and various shells of other kinds.

Occasionally among the Keys, south and east of the peninsula, the statement was made to me by persons I met, that occasional snails of this species had been seen by them as far north as Lake Worth.

A number of inhabitants living about six miles south of Lake Worth had never seen the snails. Around the southern end of Lake Worth there is much fine hammock, where the vegetation seemed expressly made for *Liguus*, but a careful search made by my party

yielded no evidence of these snails on the trees or of their shells on the ground. *Glandina* and many smaller snail shells were found.

When I reached Palm Beach, on Lake Worth, I called on a dealer in shells, who told me he had sold many *Liguus* from Miami, but had found none around Lake Worth. He said he had placed a number of snails from Miami around Lake Worth, in the hammock, but the snails died.

At present, therefore, New River is apparently the northern limit of *Liguus* on the East Coast; and satisfactory evidence is lacking that it ever extended further north.

NEW LAND SNAILS FROM NORTH CAROLINA.

BY H. A. PILSBRY.

Polygyra appressa tryoniiana n. subsp.

The shell is imperforate, similar in shape to *P. appressa*; rather dark greenish-brown; very glossy. Sculpture on the last 4 whorls of regular, fine, curved riblets, which are slightly narrower than their intervals, and fine engraved spiral lines, more prominent in the intervals than on the ribs. The first (embryonic) $1\frac{1}{2}$ whorls are densely sculptured to the apex with obliquely radial striæ, followed by a small fraction of a whorl with coarser, irregular striæ before the riblets set in. Spire convexly conic. Whorls $5\frac{1}{2}$ to $5\frac{3}{4}$, slowly increasing, the last somewhat angular at the periphery in front. The suture descends slightly to the aperture. The aperture is very oblique, somewhat "dished." The peristome is very wide, strongly thickened within, contracting the aperture, and broadly, flatly reflexed; white, with a fleshy outer border in all but old shells. The back of the lip is bright yellow, this color spreading to form a triangular spot at the suture. A stout, strongly curved parietal tooth stands on the parietal wall.

Alt. 11, diam. 17.5 mm.

Alt. 10.5, diam. 17 mm.

Tryon, Polk Co., North Carolina. Types no 88769 A. N. S. P., collected by H. A. Green.

This form resembles *P. appressa perigrapta* in sculpture and shape, although a little less depressed than that form. It differs in the wider peristome, which contracts the aperture more, and in the

basal lip, which lacks the long tooth of *appressa* and *perigrapta*, or has only the slightest vestige of it. *P. a. tryoniana* differs from *P. wheatleyi* in the more depressed body-whorl with a tendency to angulation, the larger parietal tooth and especially in the sculpture. *P. wheatleyi* has small sharp raised points scattered over the upper surface and in the more delicate specimens upon the base also, and while some spiral lines may be seen on the base in some specimens, they are very weakly developed. In *P. tryoniana* there is no trace of hair-bases or points, the sculpture being like that of *P. appressa perigrapta*.

Polygyra wheatleyi clingmanica n. subsp.

Shell small, thin and fragile, somewhat transparent, pale. The glossy surface is set throughout (except near the apex) with short delicate hairs, readily removed and often in large part lost from old or cleaned shells. The rib-striae of the typical form are much weakened or nearly effaced. Lip narrow, no parietal tooth. Alt. 8.7 diam., 13 mm.

Near the summit of Clingman Dome, Great Smoky Mountains. Types no. 77616 A. N. S. P., collected by Messrs. Ferriss, Clapp, Walker, Sargent and the author, 1899.

This form was noticed by me, Proc. A. N. S. Phila., 1900, p. 127. It seems sufficiently differentiated from the typical form of *wheatleyi* from Cherokee Co., N. C., from the more solid form prevalent in the Great Smoky Mts., generally, and from the form of Roan Mt., to require a special name. It was found from the summit of Clingman Dome to our camp at the "Balsams," near the western end of the mountain. Lower down, the ordinary *P. wheatleyi* replaces it. It is analogous to *P. andrewsæ altiraga*.

AGRIOLIMAX AGRESTIS IN COLORADO.

BY T. D. A. COCKERELL.

To-day, October 25, 1904, I was surprised to find *Agriolimax agrestis* in abundance in a vacant lot in the town of Boulder, Colorado. This is the first indication of the establishment of this slug in the Rocky Mountain region. The specimens are much darker than those one ordinarily finds in England, and those I collected are referable to the following mutations:

(1.) *Mut. rufescens*, Dumont and Mortillet. Reddish, without any distinct spots or lines. Sixteen specimens.

(2.) *Mut. brunneus*, Taylor. Very dark-brown; one or two are so nearly black that they could be taken for *mut. niger*, Morelet. Eight specimens.

(3.) *Mut. semirufus*, nov. Head and mantle rufous; body posterior to mantle almost black. Two specimens. This indicates that the coloration of the head and mantle, and that of the body, may be separately inherited, though more frequently the color of the animal above is uniform.

The common English forms *pallida* Schrenk, and *reticulata* Müller, are absent.

MARGARITANA MARGARITIFERA IN PENNSYLVANIA.

BY CHAS. H. CONNER.

A few weeks ago, I had the pleasure of receiving a few specimens of *Margaritana margaritifera* Linnaeus, which were taken from Still Creek, near Quakake, Schuylkill Co., Pa. As I believe this species of fresh-water mussels has not been reported living in Pennsylvania, I send you this note.

Mr. Frank M. Ebert, who kindly forwarded the specimens to me, states that they are found in the several streams of the vicinity. He and others have taken a great quantity of pearls of all sizes and grades from them. Though Mr. Ebert has collected the species for some time, he informs me that he has never found a gravid specimen.

The foot and gills of the specimens examined are brownish, the rest of the body being white.

NOTES AND NEWS.

ARION CIRCUMSCRIPTUS, JOHNS. (FASCIATUS NILSS., *pars*).—Last June I found this European slug in abundance on Goat Island, Niagara Falls, N. Y. It appears to be an addition to the fauna of New York, but Dr. N. L. Britton, to whom I mentioned the occurrence, said he was sure he had heard some report of it. The specimens were of the usual grey color, with narrow bands and a slight keel. In 1887 I searched the same locality, but at that time the *Arion* was apparently absent.—T. D. A. COCKERELL.

ALBINO POLYGYRA MONODON AND *P. HIRSCUTA*.—I am sending the white (albino) form of *Polygyra monodon*, which I have found this season near Des Moines, Iowa. This white form is associated with the ordinary brown ones, but I never find *P. monodon* near *P. monodon fraterna*. *P. m. fraterna* and *P. hirsuta* I find associated. I also have a few white *P. hirsuta*.—T. VAN HYNING.

GEOGRAPHIC RANGE OF *POLYGYRA TRIDENTATA DISCOIDEA* IN INDIANA.—I send you to-day specimens from Charlestown Landing and Mt. Vernon of *P. tridentata discoidea* Pils. It seems that this variety extends across the whole width of the State, for Charlestown Landing is 50 miles above Louisville, Connelton, the original locality of the variety, is 75 miles below, and Mt. Vernon is but a little way above the Illinois line, where the Wabash river joins the Ohio. At all of these places the variety occurs on the immediate banks of the Ohio river, but when you go back into the country you get the typical *tridentata*.—L. E. DANIELS.

PUBLICATIONS RECEIVED.

PHYLOGENY OF FUSUS AND ITS ALLIES. By Amadeus W. Grabau (Smithsonian Miscellaneous Collection [no. 1417] part of Vol. XLIV, 1904).

This work represents a great amount of investigation and careful study. A pupil of the late Professor Hyatt, the author has applied the principles of development, parallelism and acceleration in defining genetic boundaries. In this group the author considers the protoconch and nepionic stages of the conch to be the most important, although not always to be relied upon. Parallelism is constantly cropping out, "but parallelism is no guide to affinity, and hence grave mistakes in classification are made, unless this fact is borne in mind. Parallelism is much more potent in the later stages of development than in the earlier ones, although it is by no means unknown in these latter." This and the following quotation briefly define the author's views:

"The Fusidæ as a group are highly accelerated, and near the acme of development. Primitive types are uncommon, except in the eocene and even there regressive species appear. The majority of species have attained the acme of development for the group, many

of them reaching it while still young. * * * *Fusus colus*, the type of the genus, is itself a regressively accelerated type, in which the characteristic acmatic features have nearly disappeared in the adult. Excessive degradational acceleration is seen in *Cyrtulus*, *Clavilithes* and similar genera."

In the eocene of the Gulf States there is a group of shells having the form of a true *Fusus* but with a protoconch similar to many species usually referred to *Pleurotoma*. For such shells the new genus *Falsifusus* is proposed. Type: *Fusus meyeri* Aldrich (not Dunker). I beg to differ with the author in using *F. meyeri* Aldr. *Fusus meyeri*, being preoccupied, becomes a synonym and remains a synonym; the name of *F. ottouis* Aldr. proposed in its stead should be adopted.

For two forms (*Fusus quercollis* and *F. rugatus*) from the lower eocene of Alabama, the name of *Fulgurofus* is proposed. The protoconch is Fulguroid. The new generic name of *Heilprinia* is given to a number of recent and late tertiary fusoid shells from the Antillean region and Florida. "They differ from *Fusus* in the very remarkable, strongly accelerated protoconch, which is throughout its greater portion crossed by riblets." Type: *Fusus caloosaensis* Heilp.

Under the head of Phylogerontic Fusidae is placed the peculiar *Cyrtulus serotinus* Hinds. Its genetic relation to *Clavilithes* is disputed; in its young stages it is a typical *Fusus*, but in the adult the whorls become thick and loosely wrapped about one another; this type of structure is designated as Melongenoid. To the eocene forms which most closely resemble *Cyrtulus*, the new generic name of *Clavellofus* is given. "Genotype: *Clavellofus spiratus* sp. nov." Under this genus are described three new species from the Paris Basin, forms which are considered by most authors to be only variations of the variable *Clavilithes longævus* Lam. The author seems to have had very few specimens showing the protoconch on which to base such novel conclusions. Under the genus *Clavilithes* several new species are described, including *C. solanderi*, based on the *Murex longævus* Solander (in part) and including specimens figured by Sowerby. (Mineral Couch. 1, 141, tab. 63, f. 1, 1812). It may be of interest to know that this identical specimen is in the collection of the Academy of Natural Sciences, Philadelphia. It was presented to the Academy by Dr. Thos. B. Wilson, who purchased it

in Europe many years ago, together with several others illustrated in the same work.

For another new genus derived in part from the genus *Clavilithes* of authors, the name of *Rhopalithes* is proposed ("Genotype: *Fusus uox* Lamarck"), while three new species have been found in the gleanings from the Paris Basin. The generic name of *Cosmolithes* is proposed for *Fusus uniplicatus* Lam.

It is not easy to define the true position of many of the genera. Whether a Pleurotomoid or a Fulguroid protoconch should remove a shell in every other respect a *Fusus*, from the family, or what position a shell with the protoconch of a *Fusus*, but with the form of a *Hemifusus*, should occupy, the author has not always clearly defined. A table of genera showing their relative position to allied forms would have been very useful and would more readily convey to students the author's conclusions.

The work contains 192 pages, including 18 plates. The two plates of protoconchs are exceedingly fine, but the half-tone plates could be improved upon.—C. W. J.

STUDIES ON AUSTRALIAN MOLLUSCA. Part VIII. By C. Hedley. With a Note on *Terebra Hedleyi* Tate. By Edgar A. Smith (Proc. Linn. Soc. N. S. Wales, Pt. 1, 1904, pp. 182-212, plates 8-10). The author has again brought forward some changes in nomenclature that should be adopted. The *Strombus urceus* Linn. = *S. floridus* Lam. The species commonly known as *S. urceus* L. is rightly *S. ustulatus* Schumacher. *Acmæa octoradiata* Hutton 1873, should be used in place of *A. saccharina* Linn., var. *perplexa* Pilsbry, as suggested by Dr. Pilsbry. A new genus *Stiva* and 14 new species are described. *Lima sydneyensis* is proposed in place of *L. brumea* Hedley not Cook.—C. W. J.

NOTES ON THE GENUS SONORELLA, WITH DESCRIPTIONS OF NEW SPECIES. By Paul Bartsch. (Smithsonian Miscellaneous Collections, vol. 47, part 2, Oct. 10, 1904.) This study deals with a group of Southwestern Helices, nearly all of which have been described since 1890; and the foundation of the genus dates only from 1901. To the anatomical characteristics already known, Mr. Bartsch adds a very useful conchological generic character, distinguishing the genus from *Epiphragmophora*: the shell of *Sonorella*

never has incised spiral lines. The species are shown to fall into groups according to the sculpture of the embryonic shell; the characters and distribution of all of them are discussed more or less fully, and the following new forms are described: *S. ashmuni*, *S. dalli*, *S. baileyi*, *S. baileyi orcutti*, *S. fisheri* from the United States, and *S. nelsoni*, *S. goldmani*, *S. merrilli*, *S. mearnsi* from adjacent states of Mexico. Six plates of illustrations represent all of the known species and typical examples of the apices; all being reproduced from photographs.

There will probably be some difference of opinion about the rank given to the several forms described as species; but whether they be ultimately ranked as species or subspecies, Mr. Bartsch's careful work in discriminating the numerous forms gives the paper a high value. It ought to be mentioned that the use made of Hyatt's terms of growth is almost throughout erroneous; but as this is in the present case a mere question of descriptive terms, it does not seriously detract from the value of the essay.—H. A. P.

A NEW SPECIES OF AMPHIDROMUS. By Paul Bartsch (Smiths. Misc. Col., vol. 47, pp. 292-3). *A. gossi*, from Mount Kin Baloo, North Borneo, is described and figured. It is probably a color-form of *A. pictus* Fult., also described from Mt. Kina Balu, and a very variable species, as the specimens I have seen demonstrate.—H. A. P.

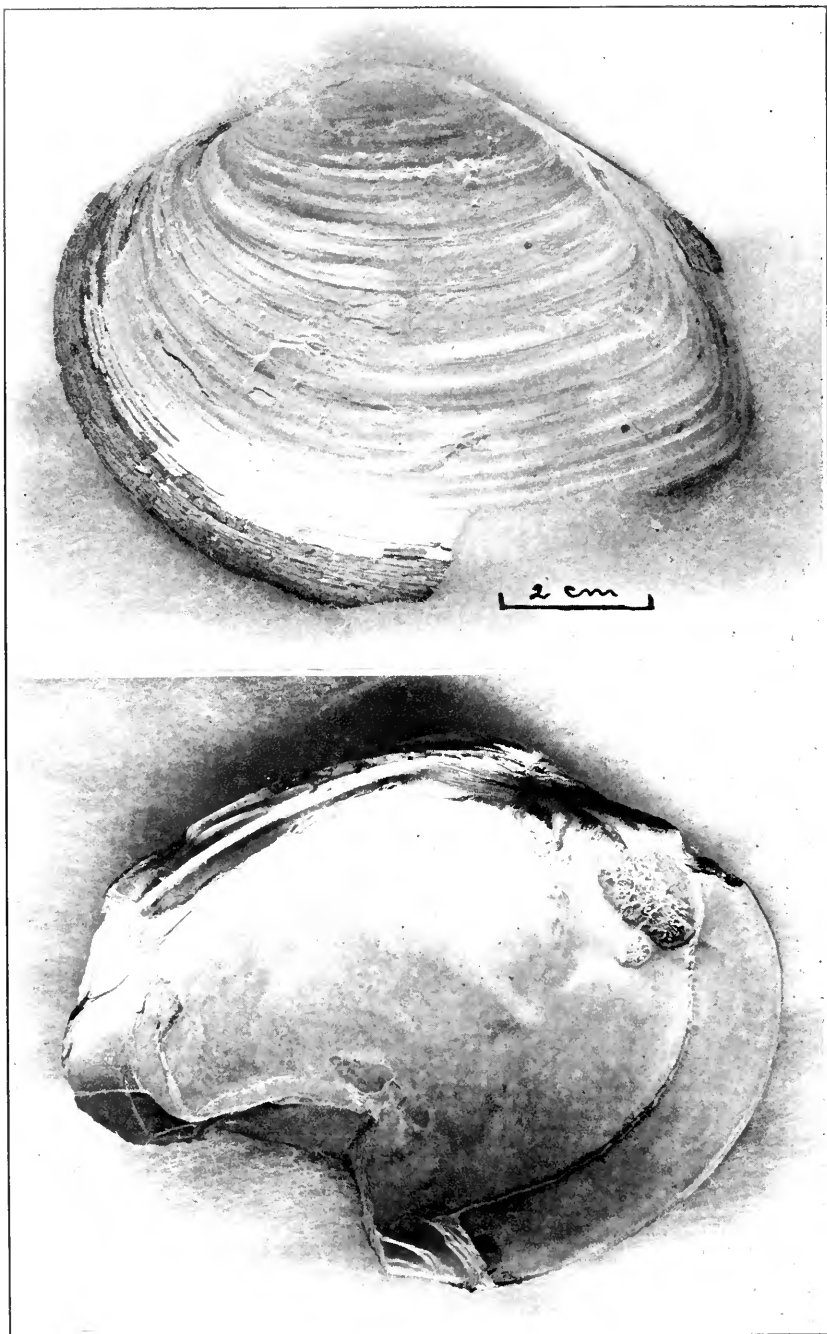
WEST AMERICAN SHELLS. By Josiah Keep, A. M. San Francisco, 1904. Pp. 360, 304 figs. Twenty-three years ago Professor Keep published a modest little book, "Common Sea-shells of California." This was the first successful attempt to popularize the study of American mollusks. It was followed in 1887 by a more extended book, "West Coast Shells," which also met with a cordial welcome from advanced students and beginners in nature study alike.

The edition of this book being exhausted, Professor Keep has prepared a more extended work including descriptions and figures of many more species, and a list of West Coast and Rocky Mountain Mollusca. The descriptions are simply worded, and being supplemented by several hundred figures in the text, enable the western student to identify and learn something of nearly all the shells likely

to be encountered in ordinary shore collecting, or dredging in moderate depths. Lovers of shells everywhere, even those not interested in Pacific shells, will delight in the simple and direct English of the book, and will find their knowledge of mollusk-life broadened by it. There is a contagious enthusiasm in its pages.

So much good must be said of Professor Keep's book that we hesitate to mention any defects. On p. 152, *Physa* "*columbella*" is a misprint for *P. columbiana*, and *Aplexa* is misspelled. Fig. 136, on p. 154, is apparently *Planorbis binneyi*. *Ancylus subrotundus* is a species of *Lanx*. Fig. 103, on p. 123, is *Oreohelix haydeni*, not *strigosa*. The species *striatella* and *cockerelli* are not *Oreohelices*. Figs. 119 are not *Ashmunella levettei*. Various other errors occur among the land shells. There are many wrong authorities given for specific names, and the list at the end contains a great many errors and entries of the same species under two or three names which might have been avoided by submitting it to specialists on Molluscan nomenclature. Such a check, to pick up loose ends, is necessary in a work covering so wide a field, for part of which the author must rely on published data of various periods and various degrees of perfection. Fortunately many of the errors occur in the list, rather than in the main text of the work, which aside from these defects deserves all the praise we have given it.—H. A. P.

THE CYPREÆ OF THE PERSIAN GULF, GULF OF OMAN, AND NORTH ARABIAN SEA. By Jas. Cosmo Melvill and Robert Standen. (Jour. of Conch. XI, pp. 117-122, Oct., 1904.) About 35 species and varieties are recorded, including the following new varieties: *Cypræa caurica* L. var. *cairnsiana* nov. "This variety which we dedicate to Mr. Robert Cairns * * * is precisely to the typical form of *caurica* what *coloba* Melvill (= *gregori* Ford) is to *eruenta*." *C. ocellata* L. "var. *pelidna*, a pale, pinkish-livid or grey shell, from Karachi, is most peculiar and remarkable. In form and marking it is as the type; the basal lineations are faint, but normal. The color, however, shows no trace of brown." *C. pulchella* Sowb. var. "*pericalles* nov. Shell uniformly smaller (32 mm.), very polished, in form like the type, dorsal markings similar, and as variable, with occasional dark sepia blotches, more or less distributed in various examples, * * * Kiener figures the var. *pericalles* (Genre Porcelaine pl. xxiii, f. 2a), mentioning it as the young form (p. 26). Our specimens, twelve or more in number, are, however, mostly adult, exhibiting a dwarf race of this very beautiful and still uncommon species."—C. W. J.



WAGNER: FOSSIL UNIO CRASSIDENS FROM WISCONSIN.

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No. 9.

ON AN INTERESTING FOSSIL UNIO FROM WISCONSIN.

BY GEORGE WÄGNER.

A little over a year ago Mrs. George Marston, of Quincy, Illinois, presented to the University of Wisconsin the mollusca brought together by her late husband, an ardent and an able collector of our Wisconsin forms. The collection was placed in my hands for arrangement. In looking it over I was immediately attracted by a single somewhat broken valve of a *Unio*, evidently fossilized, and the only fossil form in the collection.

Mrs. Marston had very kindly, and very wisely, sent with the collection all of her husband's correspondence relating to it. In looking over the letters I came across a copy of one written by Mr. Marston, and containing the necessary locality data for this shell.

According to this letter the shell was found about 1889 in the city of Green Bay, Wisconsin, during excavations for the city water-works reservoir. It came from a depth of about fifteen feet below the surface, and presumably from the till.

As Mr. Marston well knew, the shell is wholly unlike any Unionid now found in Wisconsin. It is a left valve, quite heavy but very brittle. When found, the outer surface still retained most of the epidermis, but this has almost entirely disappeared. The height is 70 mm., the breadth of the single valve approximately 22 mm.

The shell when complete was very evidently smooth, with a rather elliptical outline. The wall is thick but thins down considerably

toward the posterior end. Anterior margin incrassate. Posterior dorsal curve regular and strong. Posterior umbonal slope flattened, and separated by a decided angle from the lateral slope. There are some traces of waviness on this posterior slope. The umbones are not very prominent and but very slightly incurved; the ligament long and heavy. The cardinal teeth, though much weathered, were evidently short and heavy, the lateral teeth long and nearly straight. The anterior adductor cicatrix is large and deep, strongly pitted; the protractor impression triangular. The pallial cicatrix is very deep, and crenulate. Only a small portion of the posterior cicatrix remains.

On comparing the valve with the *Unio* in our collection, I am forced to the conclusion that we have here a specimen of *Unio crassidens* Lam. I am further strengthened in this belief on comparing the specimen with the figures and description of *U. crassidens* by Call (a study of the Unionidæ of Arkansas, etc.—Trans. Ac. Sciences, St. Louis, Vol. VII, pp. 1-65, plates I-XXI). Finally I have compared it with two specimens of *U. crassidens*, one from the Ohio river, the other from southern Michigan, which were kindly sent to me for this purpose by Dr. W. S. Strode, of Lewistown, Illinois. It may be that further material will force us to recognize it as a separate variety, but I do not think it probable.

Now let us consider the present distribution of *U. crassidens*. According to Call (*l. c.*) it is abundant in the Cumberland river of Tennessee as well as in other rivers of that State. It occurs abundantly also in the Coosa and the Alabama, in the Tombigbee, and southeast to the Chattahoochee (Simpson, Synopsis of the Naiades, Proc. U. S. Nat. Mus., Vol. XXII, pp. 501-1044). It also occurs in the Mississippi and its eastern tributaries as far north as the forty-second parallel; or, in general, to northern Illinois and southern Michigan. It does not occur within the Basin of the Great Lakes, neither has it ever been found in any stream west of the Mississippi so far as I know. We must look upon it then as essentially a southeastern form, with its center of distribution lying probably somewhere in the rivers of Tennessee.

We are thus confronted with the problem of its occurrence, in fossil form at Green Bay, in the St. Lawrence Basin. It is because this involves an interesting point in the causes affecting present geographical distribution, that this note is written.

One of the marked topographic features of Wisconsin is a long diagonal valley extending from Green Bay, and really as a continuation of the basin of this bay, toward the southwest. It follows the basin of Lake Winnebago and the course of the Fox river. In the neighborhood of Portage it overrides the water-shed, and is continued in the valleys of the Wisconsin and the Rock. At Portage the Fox and the Wisconsin are less than two miles apart, and in Spring become confluent, the upper Wisconsin contributing largely toward the floods of the Fox (Irving, *Geology of Wisconsin*, Vol. II, pp. 418, 419).

Now, according to Irving (l. c. p. 426), it is very probable that in preglacial times the entire area of the Fox river drainage, including the basin of the Wolf, far north of Green Bay, was drained by the Wisconsin, or a stream occupying approximately its bed. Given this former unity of the Fox and the Wisconsin drainage, the occurrence of a Mississippi form as a fossil in Green Bay is made clear, even though this form be now a southern one. For it must be remembered here that southern forms in general had a decidedly more northern distribution before the Pleistocene, and especially before the Pliocene.

How as to its disappearance? We know that during the Pleistocene the northern part of our hemisphere became ice-coated nearly as far south as the Ohio river. One of the lobes of this great ice mass entered this very same Green Bay—Wisconsin Valley—and plowed through it nearly its entire length.

It is evident that this enormous ice mass swept everything living before it, or buried it beneath, and *Unio crassidens* had to go with the rest.

When the ice finally receded the conditions were so changed as to forbid the establishment of previous faunal conditions. In the first place, the drainage of the Fox was now separated from that of the Wisconsin. But more important, the climate of this region had become so much colder that many of the former inhabitants, *U. crassidens* among them, seem not to have been robust enough to regain even such part of their former territory, to which the waterway was freely open. Finally alteration in tension between various species probably also contributed to the same general result.

It is highly desirable that the Unionids, as well as other mollusca found on both sides of the divide between the Mississippi and St.

Lawrence Basins be much more completely studied, especially in regions where the divide is narrow. Together with this we need to obtain and study the fossil forms of the Tertiary and Pleistocene. Thus and thus only can we get a much more accurate and detailed knowledge of the effect of the Glacial Period on the distribution of animals.

Plate VII. External and internal views of fossil *Unio crassidens* from Green Bay.

University of Wisconsin, Zoölogical Laboratory, November 29, 1904.

ON THE SPECIES OF MARTESIA OF THE EASTERN UNITED STATES.

BY CHARLES W. JOHNSON

Three species of the genus *Martesia* are found on the eastern coast of the United States. They are more abundant south of Cape Hatteras, becoming less common or rare to the northward. Like most burrowing shells they are subject to considerable variation. There is also a great difference in appearance between the young and adult shell, the large anterior gape of the young being closed in the adult by a calcareous deposit called the "callum" attached to either valve and extending to the middle or lower edge of the valve.

The shell has a large protoplax and a narrow elongated metaplax and hypoplax; mesoplax and siphonoplax wanting; valves with a single radial sulcus. The species can readily be distinguished by the form of the protoplax, which though showing slight variation, probably due to a favorable or unfavorable *situs*, is quite constant in its general character.

MARTESIA STRIATA (Linn.). Fig. 1.

Pholas striata Linn., Syst. Nat. 12 ed. 1111, 1767.

Pholas pusilla Linn., Syst. Nat. 12 ed. 1111, 1767.

Pholas nana Pultney, Dorset. Cat. p. 27, 1799.

Pholas falcata Wood, Gen. Conch. t. 16, f. 5-7, 1815.

Pholas clavata Lam., Anim. s. Vert. V, p. 446, 1818.

Pholas conoides Fleming, Brit. Anim. p. 457, 1825.

Pholas Hornbeckii Orb., Historia Fis. Polit. y Nat. de la isla de

Cuba, *Moluscos*, p. 282, pl. 25, f. 23-25 (1845); and in the French edition, p. 217, pl. 25, figs. 23-25, 1853.

Pholas semicostata H. C. Lea, *Proc. Bost. Soc. Nat. Hist.* 1, 204, 1844; Boston, *Jour. Nat. Hist.* V, p. 285, pl. 24, f. 1, 1845.

Pholas terediniformis Sowb., *Proc. Zool. Soc.* 1849, p. 161.

Pholas Beauviana Recluz, *Jour. Conch.* IV, p. 49, pl. 2, f. 1-3, 1853.

Pholas corticaria Sowerby, *Thes. Conch.* II, 495, pl. 108, f. 94-96, 1855.

Martesia striata Tryon, *Mon. Pholadacea*, p. 92, 1862.

Martesia corticaria Tryon, *Mon. Pholadacea*, p. 92, 1862.

Shell narrowly wedge-shaped, thin, anterior truncated, cordate, with sinuous elevated crenulated ridges, showing slight radial sculpture anteriorly; radial sulcus slight; the posterior portion marked only by somewhat irregular concentric undulations or growth lines; callum smooth, and angulate at the line of attachment; the protoplax normally three-lobed, those of the sides sometimes wanting in the smaller specimens, giving the protoplax a "halberd-shaped" appearance as shown in the figure of *P. corticaria* Sowb. Length, 8-23 mm.

Distribution, South Carolina, Florida and the West Indies, Europe, Japan (Dunker), Philippines (Cuming). It was described by Linnaeus from southern Europe, while to the West Indian shell he gave the name of *P. pusilla*. The slight radial sulcus and angular margin of the "callum" of *P. semicostata* H. C. Lea, shows that it is undoubtedly a synonym of this species. *P. terediniformis* and *P. falcata*, as stated by Tryon, are only the young of this species. *P. Hornbeckii* Orb., also comes under this category. The type of *P. corticaria* was found in a piece of cast-up mahogany.

Through the kindness of Mr. J. J. White, of Rockledge, Florida, I received an interesting series varying in size from 8-21 mm. long. They were collected at Oceanus, Florida. These specimens were also found in drift-wood, a feature which undoubtedly accounts for the wide distribution of this species.

MARTESIA CUNEIFORMIS (Say). Fig. 2.

Pholas cuneiformis Say, *Jour. Acad. Nat. Sci.* II, p. 322, 1822.

Martesia cuneiformis Tryon, *Mon. Pholadacea*, p. 91, 1862.

Shell broadly wedge-shaped, anteriorly truncate, cordate; with broad sinuose crenulated ridges, the anterior crenulations forming

radial costae; near the deep radial sulcus the crenulations are wanting, and beyond the sulcus are merely concentric undulations or growth lines, callum smooth, line of attachment rounded, cordate; protoplax arrow-shaped with a medial depression and oblique striae. Length, 14–18.

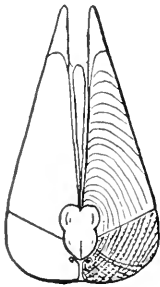


FIG. 1.

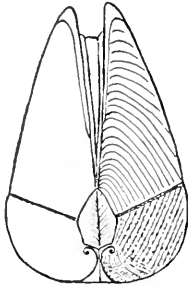


FIG. 2.

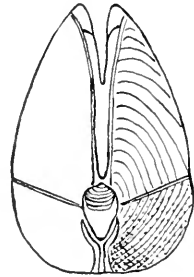


FIG. 3.

Connecticut to the West Indies. Near New Haven, Ct., in oyster shells (Perkins); Holly Beach, N. J. (Ford); Oceanus, Fla. (White), and found by the writer at St. Augustine.

Subgenus *DIPLOTHYRA* Tryon, 1862.

The protoplax and also the metaplax are bordered by an elevated callous margin; in the former case obliterating the deep depression in front of the umbones. Metaplax and hypoplax divaricating. Tryon considered the sculptured and smooth portions of the protoplax as a "double accessory valve," and on that character founded the genus *Diplothyra*. The above characters seem to separate it subgenerically from the typical *Martesia*.

MARTESIA (DIPLOTHYRA) CARIBÆA (Orbigny). Fig. 3.

Pholas caribæa Orb., *Historia, etc.*, p. 281, pl. 25, f. 20–21, 1845. French edition, p. 211, t. 25, f. 20–21, 1853.

Diplothyra Smithii Tryon, *Proc. Acad. Nat. Sci.* 1862, p. 450; *Mon. Pholadacea, etc.*, p. 126, pl. —, f. 2, 1862.

Shell broadly wedge-shaped, inflated anteriorly and tapering abruptly towards the posterior; the anterior half with fine wavy lines forming slight radial costae, radial sulcus quite prominent, posterior half marked only by small concentric undulations and growth lines;

the form of the protoplax is variable and the sculptured portion often very irregular or obsolete; callum round and tumid. Length, 9–17 mm.

New York to Florida, Cuba and Texas. Tottenville, Staten Island, burrowing in oyster shells (Tryon).

Although the figure given by d'Orbigny lacks the protoplax, the raised callus border surrounding it is clearly defined, while his description of the protoplax—"Ovato-oblonga, antice producta, acuta uncinata, postice dilatata angulata," agrees with what has been considered *D. smithii*. During my residence at St. Augustine (1880–87), I found a large number of fine specimens in a piece of soft artificial limestone off the water battery of Fort Marion. In my list of the shells of St. Augustine (THE NAUTILUS IV, 4) I confused this with *M. cuveiformis*. This species has only been recorded from shells and limestone while *M. striatus* and *cuveiformis* are more frequently found in wood. Its occurrence as far north as New York is probably accidental.

NOTE ON THE NOMENCLATURE OF THE SNAILS USUALLY CALLED PUPA.

BY T. D. A. COCKERELL.

Since it appears that the name *Pupa* is not applicable to the snails usually known as *Pupa muscorum*, *blandi*, etc., it becomes necessary to determine what generic name they are entitled to. Mr. B. B. Woodward has placed them in *Jamini*a, Risso, 1826, of which he regards *Pupilla*, Leach, as a synonym. A study of Dr. Dall's paper in NAUTILUS, 1904, p. 114, convinced me that this conclusion was not unassailable, and with the help of additional information very kindly supplied by Dr. Dall, I have decided to my own satisfaction in favor of *Pupilla*. The argument is as follows:

1. *Jamini*a, Risso, 1826, contained species afterwards referred to *Alæ* (1830), *Abida* (1831), *Pupilla* (1831), *Eucore* (1837), and *Sphyradium* (1837). The first species is *minutissima* Hartmann, but this does not agree with the generic diagnosis. The only figured species is an *Abida*, or *Eucore*.

2. *Alæ*, Jeffreys, 1830, contained among other things *edentula*, Draparnaud (now referred to *Sphyradium*) and *minutissima*, Hartmann. The latter is taken as the type by Dr. Dall (t. e., p. 115). Conchologically, *minutissima* has the characters of *Sphyradium*, and not at all those of *Vertigo*, *Pupilla*, etc. Its reference to *Sphyradium*

should be fortified by an examination of the jaw and lingual membrane, but for my own part, I am satisfied that it belongs there. If this is confirmed, *Alæa* takes the place of *Sphyradium*, Agassiz, 1837.

3. *Abida*, Leach in Turton, 1831, has for its sole example and therefore type *Pupa secale*. *Eucore*, Agassiz in Charpentier, 1837, was proposed for *P. tridens* and *P. quadridens*. I do not think these can be regarded as different genera, but the characteristic European group of "*Pupa*" *secale*, *P. tridens*, *P. quadridens*, etc., surely deserves to rank as a valid genus, separate from the circumpolar group commonly known as *Pupa*, subg. *Pupilla*.

4. If *Alæa* = *Sphyradium*, and *Eucore* = *Abida*, all the species of *Jaminiæ* were provided for by 1831. If *Sphyradium* is distinct from *Alæa*, apparently the diagnosis of *Jaminiæ* prevents us from using that name for *Sphyradium*.

5. *Jaminiæ* is therefore either *Abida* or *Pupilla*, both published in the same work. *Abida* has in its favor the figured example; *Pupilla* has Mr. B. B. Woodward's decision. Apparently priority of place should decide the matter.

6. Dr. Dall informs me that in Turton *Pupilla umbilicata* is on p. 98, *P. marginata* (our *muscorum*) on p. 99; *Abida secale* on p. 101 as a synonym of *Vertigo secale* (Draparnand) Turton. Hence *Pupilla* was first removed, and *Jaminiæ* stands as the proper name for *Abida*, with *Eucore* as a section.

7. I do not think the status of *Pupilla* is affected if we regard *umbilicata* as its type, for I cannot imagine any one could place *umbilicata* and *muscorum* in different genera:

8. Our forms of *Pupilla* stand thus:

Pupilla muscorum (Linné).

b. *unidentata* (C. Pfr.).

c. *bigranata* (Rossm.).

Pupilla hebes (Ancey).

Pupilla blandi Morse.

b. *sublubrica* (Ancey).

c. *obtusa* (Ckll.).

d. *alba* (Ckll.).

Pupilla sonorana (Sterki).

b. *tenella* (Sterki).

Pupilla syugenes (Pilsbry).

b. *dextroversa* (Pils. & Van.).

Pupilla sterkiæna (Pilsbry).

NOTES ON THE NOMENCLATURE OF PUPILLIDÆ.

BY H. A. PILSBRY.

The receipt of an article from Professor Cockerell upon this subject, published in this number, causes me to insert here some notes which had been prepared for a forthcoming paper upon the snails of Arizona and New Mexico. The status of the name *Pupa* was discussed by Mr. B. B. Woodward (Journ. of Conch., Oct., 1903, 358), who did good work towards clearing the ground. Dall in this journal for February, '04, also went over the nomenclature correcting some errors, but complicating the question by a few new ones. His statement that "Risso's first species [of *Jaminiæ*] is *Vertigo minutissima* Hartmann, which should properly have been placed in *Saraphia*," is not borne out by an examination of Risso's work, wherein the species stand thus:

<i>Risso's species.</i>	<i>Equivalents in ordinary use.</i>	<i>Modern genus.</i>
<i>Jaminiæ muscorum</i>	<i>Pupa muscorum</i> L.	<i>Pupilla.</i>
<i>J. marginata</i>	<i>Pupa umbilicata</i> Drap.	<i>Jaminiæ.</i>
<i>J. edentula</i>	<i>Bulimus obscurus</i> Müll.	<i>Ena.</i>
<i>J. secale</i>	<i>Pupa secale</i> Drap.	<i>Abida.</i>
<i>J. tridens</i>	<i>Bulimus tridens</i> Brug.	<i>Encore.</i>
<i>J. granum</i>	<i>Pupa granum</i> Drap.	<i>Abida.</i>
<i>J. sulculata</i>	Undetermined	<i>Abida.</i>
<i>J. trilamellata</i>	Undetermined	<i>Abida.</i>
<i>J. heterostropha</i>	<i>Bul. quadridens</i> Müll.	<i>Encore.</i>
<i>J. quinquelamellata</i>	<i>Pupa cinerea</i>	<i>Abida.</i>
<i>J. septemdentata</i>	<i>Pupa avenacea</i> Brug.	<i>Abida.</i>
<i>J. heptodonta</i>	Undetermined	<i>Abida?</i>
<i>J. multidentata</i>	<i>Pupa polyodon</i> Drap.	<i>Abida.</i>
<i>J. niso</i>	<i>Bulimus niso</i> Pfr.	<i>Encore.</i>

All of Risso's species of *Jaminiæ* that are recognizable belong to the subsequent groups *Ena* 1831, *Pupilla* 1831, *Abida* 1831, *Encore* 1837, and *Lauria* 1840.

Now *P. muscorum* under the name *marginata* was second of the two species for which the name *Pupilla* was proposed in 1831 in Turton's *Manual*, the other being *P. umbilicata*. The latter was removed in 1840 to *Lauria*, leaving *P. muscorum* the type of *Pupilla*. There is

nothing especially new about this conclusion, since it was reached by Gray in 1847 (P. Z. S., p. 176), and has been held by Pfeiffer, by Von Martens (Die Hel. 1860, p. 290), and nearly every one else. There have been differences of opinion about the limits of the group *Pupilla*, but never about its type. Among American writers, Morse and Tryon have used *Pupilla* as a generic name.

Abida was next removed from *Jamina*. This is the group commonly known as *Torquilla*. Then in 1837 *Eucore* was proposed for the species *tridens* and *quadridens* (*heterostropha* Risso). These successive eliminations leave only the group *Lauria* Gray, represented by *J. marginata* Risso (= *Pupa umbilicata* Drap.) to bear the name *Jamina*.*

From the foregoing it follows that the name *Pupilla* will replace *Pupa*, as Prof. Cockerell has held. The groups represented in *Jamina* Risso, will stand thus :

PUPILLA Lch. in Turton, for *Pupa* of authors.

JAMINIA Risso, restricted, for *Lauria* Gray.

ENA Leach in Turton, for *Buliminus* Auct.

ABIDA Leach in Turton, for *Torquilla* Auct.

EUCORE Ag. in Charp., for *Chondrula* Auct.

All of these groups I regard as of generic rank.

As to *Saraphia* Risso, the only species of the group that has been positively identified is *S. tridentata*, which is the *Carychium tridentatum* of recent authors.

After a bout with Risso, one is likely to accept as a just one Bourguignat's estimate of his abilities : "Écrivain fécond, mais sans jugement, innovateur infatigable, mais absurde, Risso a embrassé dans ses écrits presque toutes les branches de l'histoire naturelle, sans en avoir bien traité une seule."

The group *Alæa* Jeffreys, 1830, has been discussed by Professors Dall and Cockerell, who agree that its type must be *Pupa minutissima* Hartm. It does not do to fix types for these old groups without reference to what has been done by our predecessors. Gray and Herrmannsen took a hand in this game over fifty years ago, and they expressly selected *Alæa palustris* = *Vertigo antirertigo* as the

* The progress of events had already restricted *Jamina* before Gray chose *J. heterostropha* for its type (P. Z. S., 1847, p. 176). His selection came too late and is ineffective.

type of *Alæa*. I do not see how their action can be successfully opposed. The name *Alæa* has quite generally been used for dextral forms of *Vertigo*, and is so retained in Westerlund's last *Catalog*. No valid grounds exist for shifting the name; and the advisability of substituting *Alæa* for *Sphyradium*, as Prof. Cockerell suggests, need not be considered. His suggestion that *P. minutissima* may be a *Sphyradium* is interesting, and deserves investigation.

Ptychochilus Boettger, is preoccupied by Agassiz in *Pisces*: a fact I neglected to mention at the time I proposed *Nesopupa*. The names stand thus:

Ptychocheilus Agassiz, Amer. Journ. Sci. and Arts, XIX, 1855, p. 227.

Ptychochilus Jordan, Bull. U. S. Nat. Mus. no. 10, p. 58 (1877).

Ptychochilus Boettger, Conch. Mittheil., 1881.

Bifidaria and *Eubifidaria* of Sterki call for some notice in view of the note by Dall in NAUTILUS, Feb., 1904, p. 116. The original species referred by Sterki to *Bifidaria* were *Pupa contracta* Say and *P. servilis* Gld. from certain Mexican localities. For *P. contracta* Sterki subsequently (1892) proposed the section *Albiunla*, leaving *servilis* the type of *Bifidaria*.

In January, 1893, Dr. Sterki proposed *Eubifidaria* with the type "*hordeacea* Gabb," by which he meant the form which I call *Bifidaria procera cristata*. This is demonstrated by his previous article treating of "*hordeacea*," by his list of the preceding year, and by the words of his diagnosis of *Eubifidaria*, "lamellæ typical."

The type of *Eubifidaria* is therefore *P. hordeacea* Sterki not Gabb = *B. procera cristata* P. & V., and the group becomes an absolute synonym of *Bifidaria*, s. str. The true *hordeacea* Gabb, which Dr. Sterki demonstrably did not intend, belongs to a different genus, *Pupoides*.

In conclusion I might say that the generic and subgeneric nomenclature of the United States forms, given in my catalogue of 1900,* stands as there set forth with the single exception of the genus *Pupa*, which now becomes *Pupilla*.

The family name having precedence for the group is *Pupillidæ* Turton, 1831.

* Proc. Acad. Nat. Sci. Phila., 1900, pp. 605-610.

NEW SPECIES OF PISIDIUM.

BY V. STERKI.

PISIDIUM LIMATULUM, n. sp.

Mussel small, inequipartite, somewhat oblique, well inflated, superior margin slightly curved, angle at the scutum projecting and rather sharp, at the scutellum rounded; supero-anterior slope distinct, almost straight, anterior end a rounded angle situated low; inferior margin rather well curved, posterior truncate; beak somewhat posterior, moderately large and projecting over the hinge margin, rounded or slightly flattened on top; surface dull to somewhat shining with subregular, crowded, sharp striæ very fine over the beaks, becoming coarser towards the margins; color pale horn in the adult, straw to whitish in younger specimens; shell rather thin; hinge comparatively stout, plate rather narrow; cardinal teeth; the right slightly curved, its posterior end much thicker and grooved, the left anterior slightly curved, the posterior oblique, long, more projecting than the anterior; lateral teeth rather large, cusps pointed, strongly rugose, and so are the grooves, the outer posterior in the right valve comparatively long; ligament moderately thick.

Size: long. 3, alt. 2.5, diam. 2 mill.

Habitat: Alabama: Calera, in the current of a creek, and pools left on same; Town Creek at Montevallo; spring creek at Ebenezer Church, a spring branch in Big Wills Valley, six miles south of Valley Head, all collected by Mr. Smith in 1904, and sent for examination by Mr. Bryant Walker.

Pis. limatum is related to *P. punctatum* Sterki, but considerably larger, and like that minute *Pisidium*, ranges under the *Rivulina* group. With a little care, it cannot be mistaken for any other species; even half-grown examples are considerably different from *P. punctatum*.

PUBLICATIONS RECEIVED.

LIST OF SHELL-BEARING MOLLUSCA OF FRENCHMAN'S BAY, MAINE. By Dwight Blaney (Proc. Boston Soc. Nat. Hist., Vol. 32, no. 2, pp. 23-41). This valuable list of 127 species and 5 varieties collected during the summers of 1901-1904, shows what can be done by careful and continuous work, and adds much to our knowledge of the distribution of New England marine shells. C. W. J.

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No. 10.

SENSITIVENESS OF CERTAIN SNAILS TO WEATHER CONDITIONS.

BY J. B. HENDERSON, JR.

While collecting last summer about Cazenovia, N. Y., my attention was constantly drawn to the extreme sensitiveness to atmospheric conditions of several species of land snails. I was surprised to find that upon some clear days collecting was excellent while upon rainy days scarcely a living specimen could be found. Puzzled by this failure of my expectations, I selected for special observation a certain wooded hillside where the prevailing larger types were *Polygyra albolabris*, *thyroides*, *dentifera*, *Gastrodonta intertexta*, *Omphalina inornata* and *fuliginosa*. I visited the locality from day to day keeping careful note of weather conditions.

I found that the periods of greatest activity among these snails were invariably marked by a falling barometer, but these periods began considerably before there were any noticeable meteorological symptoms presaging rain. At the commencement of actual rainfall, the larger Zonitids only remained especially active. Towards the close of a rain period (generally lasting from twelve to twenty-four hours) though before definite signs of clearing were apparent, all the snails disappeared, sometimes almost completely. The bright clear days succeeding a rain epoch were always poor collecting days, even though the woods were left damp and wet from the drenching that only a Cazenovia rain can give. It would appear therefore, that the moisture in the air rather than that upon the ground influenced

the snails. Their extreme sensitiveness was shown by their anticipation of a weather change from dry to wet, eight to twelve hours before visible signs were given, but what seemed more remarkable was the general withdrawal to shelter of all the snails during a rain period two to three hours before a final clearing of the atmosphere.

A village neighbor kept alive all summer a fine large *P. albolabris* in a small window garden. "Alby's" mistress declared that he was a most reliable barometer and that she could safely accept his weather predictions. The mornings he selected for a stroll beyond the limits of his garden were sure, she alleged, to be followed by thunderstorms in the afternoon.

I also observed that upon certain fair days the board sidewalks were covered with *Cochlicopa lubrica*, hundreds being crushed by pedestrians. I was finally able to verify my theory that these tiny mollusks left their damp retreats beneath the boards from six to eight hours before rain. Indeed, I used the sign frequently to my advantage to regulate my collecting rambles farther afield.

I was unable to discover that the small and minute species living habitually under bark and among debris was affected by weather changes, though I have little doubt that closer observation would show them to be considerably influenced by the amount of moisture in the air. The one very noticeable exception to this was in the case of *Strobilops*. I learned to look for them only in the driving rain, when they all left their usual stations beneath the bark of fallen trees to crawl about in the open.

NOTE ON LUCINA (MILTHA) CHILDRENI GRAY AND ON A NEW SPECIES FROM THE GULF OF CALIFORNIA.

BY WILLIAM HEALEY DALL.

In my synopsis of the Lucinacea (1901, p. 812) on the authority of Dr. Carpenter (Suppl. Rep. Brit. Assoc. for 1863, pp. 552, 620), I stated that the *Phacoides (Milttha) childreni* Gray, was a native of the Gulf of California and that the original ascription of it to Brazil was an error. I am indebted to Dr. H. von Ihering of the Museu Paulista, Sao Paulo, Brazil, for the means of correcting this statement, which proves to be mistaken.

The shell was first described as *Lucina childrenæ* by Gray in the *Annals of Philosophy*, for 1825, p. 136. Nearly at the same time he referred to its unequal valves in the *Zoölogical Journal*, 1, p. 221. In the autumn of the same year Sowerby figured the interior of a right valve in part xxvii of his "Genera" under the name of *Lucina childreni*. Only in 1828, in the supplement to Wood's *Index Testaceologicus*, was the shell called *Tellina childreni* and figured on supplementary plate 1, figure 1.

The shell was recently collected at Pernambuco by Senor Alfredo de Carvalho and sent to Dr. Von Ihering, who forwarded a specimen to the National Museum, thus confirming Gray's original locality. On comparison with specimens from Cape St. Lucas, named by Carpenter, it became evident that we had to do with two very similar but distinct species. The rarity of the shell is doubtless responsible for the delay in discovering the mistake.

The Brazilian species will of course keep the name given by Gray. To the Cape St. Lucas form we may give the name of *Phacoides (Mittha) xantusi* in honor of its discoverer.

The differences are only apparent on a close scrutiny. The *P. xantusi* seems to be a smaller species when adult, more rounded, more equivalved and with a shorter ligament. It has a more or less bifurcate and vermiculate radial sculpture, that of *P. childreni* being finer, more regular and more distinctly divided into fine continuous radial grooves and a microscopic minor sculpture between them.

As in many other Lucinacea, directly under the beaks there is a small impressed area. In *P. xantusi* this in the right valve projects so as to fill an excavation in the other valve and is so much impressed as to make the beak appear sharper and more produced and to distinctly arcuate the two cardinal teeth. In *P. childreni* the area is smaller, less impressed, not markedly extended toward the other valve and the teeth remain straight. Outside this area a narrow lunule, concentrically striated and bounded by an incised line, rises almost vertically with a length of 19 mm. and a height of about 2 mm. In the Californian species the lunule is very small and bent vertically downward so that in the closed valves it is excavated and not projecting and has a length of about 6 mm. It is almost wholly confined to the right valve. If my specimens fairly represent the species, the posterior area in the Brazilian shell is proportionately

shorter than in the Californian and the basal margin much more produced.

It may be noted that all the figures, including that of Reeve in the *Iconica* (*Lucina* pl. iii, fig. 12, 1850), represent the Brazilian species. The group is represented by nine species in the Tertiary of the Southern United States and Lower California, from the Claibornian up to the Pliocene. It is interesting to find that the Florida Pliocene, *P. caloosana* Dall, though smaller, has the upraised lunule like that of Brazil; while the Pliocene, *P. jounnis* Dall, of San Juan, Lower California (opposite Guaymas), resembles the recent *P. xantusi* in having the folded lunule, only, in this case, the margin is more deeply infolded and the shell heavier, more elongate-oval, and about one-fourth smaller. It measures 55 mm. in height by 51 mm. in width; *P. xantusi*, 71 x 65 mm., and *P. childreni*, 86 x 77 mm.

FURTHER NOTES ON THE SPECIES OF *MARTESIA* OF THE EASTERN COAST OF THE UNITED STATES.

BY CHARLES W. JOHNSON.

Since the publication of my article on the species of *Martesia* of the Eastern United States, I find I have overlooked two important facts, involving one, and possibly two species. The first is *Martesia* (*Martesiella*) *fragilis* Verrill and Bush (*Proc. U. S. Nat. Mus.*, xx, p. 777, pl. 79, f. 10, 1898). For this species the above new subgenus is proposed, "which differs from *Martesia* in having a well-defined, elongated, median, dorsal plate, posterior to the umbos, in addition to the shield-shaped one over them." This seems to be a typical *Martesia* for the "elongated median, dorsal plate" (metaplast) is present in all the species. The description of the shell, "umbonal plate" (protoplast), and the figure would indicate that it is very close to or identical with a small specimen of *M. striata* Linn. The "specimens were found in a piece of wood floating near Station 2565, N. lat. 37° 23', W. long. 68° 8'," about 500 miles off the coast of North Carolina.

The second and more important omission was kindly pointed out by Dr. Dall, who in a recent letter says: "I read your paper in the last *NAUTILUS* with much interest, but I cannot agree with you in regard to the *Pholas semicostata* of Lea, for which I proposed the

genus *Scyphomya* some years ago. It is entirely distinct from *Martesia* and nearer *Zirfaea* in some of its characters, but very distinct from either. I have Carolinian specimens, but the shell appears to be rare."

The genus *Scyphomya* was proposed in the Trans. Wagner Free Inst. Science, vol. iii, pt. iv, p. 822, 1898, and while I consulted this work I overlooked it from the fact that Dr. Dall places this genus in the sub-family *Terediniinæ*, and I only went over that portion pertaining to the genus *Martesia*. From the original description, and the figure alone one would feel doubtful in defining the species. I therefore followed Tryon and left it in the synonymy under *M. striata*.

NOTES ON SOME PREOCCUPIED NAMES OF MOLLUSKS.

BY W. H. DALL.

Prof. Cockerell has kindly called my attention to the fact that the name *Parmulina* proposed by me Oct. 1, 1902, for a section of *Circe*, had been used in the same year for a Rhizopod by Penard. Investigation showing that the latter author had several months' precedence in publication, the name *Parmulophora* is proposed for the mollusk.

In the same work in which *Parmulina* was proposed, I note the overworked name of *Quadrula* used for a Rhizopod. Rafinesque precedes all others in the use of this name, which he applied to a naiad, but it has been used for a Rhizopod, an insect and a crustacean.

I noticed while looking up the data in the case of *Parmulina*, that the name *Patinella*, applied in 1870 by me to *Patella magellanica* and its allies, had been previously used by Gray, in 1848, for a polyp. In place of it for the limpet, I suggest *Patinigera*.

A NEW OREOHELIX.

BY T. D. A. COCKERELL.

Oreohelix strigosa metcalfei, n. subsp.

Shell with max. diam. 20 to 21 mm., alt. about 11 mm.; periphery with a strong but rather obtuse keel, just below which is a single brown band; umbilicus broad, not contracting rapidly within; the

greyish-olivaceous cuticle is confined to the apical whorls in the adult: the "costulation" of the apical whorls is evident, and the oblique striation of the last whorl above is very coarse and prominent.

Mountains near Kingston, New Mexico (O. B. Metcalfe). One living adult and many dead shells, adult and young. Accompanied by *Ashmunella*, *Holospira*, *Vitrea*, *Helicodiscus*, *Vallonia* and *Cochlicopa*.

NAMES IN THE PUPILLIDÆ.

BY W. H. DALL.

In the January NAUTILUS (page 105), Dr. Pilsbry discusses this subject, and incidentally states that in my notes upon it in the February number I corrected some errors, but complicated the question "by a few new ones." I beg to submit, with all deference to Dr. Pilsbry, that it is not I who have introduced the new errors.

A more careful examination of Risso, Draparnaud and Pfeiffer, would have shown him that *Jamina muscorum* (Drap. not L.) Risso is, as I stated, following Pfeiffer and other European authorities, *Pupa minutissima* Hartmann, and not *muscorum* Linné.

It would be presumptuous in me to attempt for myself a synonymy of the ancient species of common European land shells, which have been worked over with the utmost care for a century by a long line of distinguished students. I did not attempt it, but relied on such respectable authorities as Gray, Draparnaud, and especially Pfeiffer, than whom no one was more careful, erudite, and familiar with the subject. In working out the details of the nomenclature of *Pupillidæ* (a work still in MS.), involving a great amount of labor, I have, as a rule, adopted Pfeiffer's conclusions as to specific identity as entitled to greater weight than any others.

The result of a careful historical search through the whole applicable literature differs in important particulars from Dr. Pilsbry's table in the January number. It is, of course, true, that Pfeiffer, like other people, is not infallible, nevertheless conclusions based on his identifications deserve a certain amount of respect, and should not be stigmatized as *new* errors, even if some doubt continue to exist in occasional instances.

Risso identified his species by Draparnaud's posthumous monograph and its figures, occasionally citing Ferussac and Playfair, and,

under *Jaminea*, only once any older author. Hence the identifications of Draparnaud's names and figures, which seem to be sufficiently certain, settle definitely the place of Risso's names. This results in the following table for *Jaminea*:

Risso's names.	Pfeiffer's identifications.
<i>J. muscorum</i> Drap.	<i>minutissima</i> Hartmann.
<i>marginata</i> Drap.	<i>muscorum</i> Linné.
<i>edentula</i> Drap.	<i>edentula</i> Drap.
<i>secale</i> Drap.	<i>secale</i> Drap.
<i>tridens</i> (L. Gmel.) Drap.	<i>tridens</i> Müller.
<i>granum</i> Drap.	<i>granum</i> Drap.
<i>sulculata</i> Risso.	unidentified.
<i>trilamellata</i> Risso.	"
<i>heterostropha</i> Risso.	<i>quadridens</i> Müller.
<i>quinquelamellata</i> Risso.	<i>quinquedentata</i> Born.
<i>septudentata</i> Risso.	<i>avenacea</i> Brug.
<i>heptodonta</i> Risso.	unidentified.
<i>multidentata</i> Risso.	<i>polyodon</i> Drap.
<i>niso</i> Risso.	<i>niso</i> Risso (doubtful).

Pfeiffer (Nomenclator, p. 356, No. 108) identifies *J. edentula* Risso positively with *Pupa edentula* of authors, but under *obscurus* also enters the name with a query, probably by some transposition of index slips, since the figure cited by Risso cannot represent *obscurus*, which is elsewhere well figured by Draparnaud. This results in the inclusion of *Sphyradium* and the exclusion of the *Ena* of Dr. Pilsbry's table.

Alæa of Jeffreys was proposed for dextral *Pupillidæ*, but as this distinction is practically valueless, we have to fall back on his list of species and proceed by elimination to get the group which will bear the name permanently.

The table of equivalents for his original list is as follows in their original order:

Jeffreys' names (1830).	Pfeiffer's identifications.
1. <i>Pupa marginata</i> Drap.	= <i>muscorum</i> L. not Drap.
2. " <i>nitida</i> Jeffreys.	= <i>edentulum</i> Drap.
3. " <i>revoluta</i> Jeffreys.	= <i>edentulum</i> var.
4. " <i>cylindrica</i> Jeffreys.	= <i>minutissima</i> Hartmann.
5. " <i>vulgaris</i> Jeffreys.	= <i>pygmæa</i> Drap.
6. " <i>pahustris</i> (Leach MS.) Jeffreys.	= <i>antivertigo</i> Drap.

Of these 1 = *Pupilla*, 1831; 2 and 3 = *Sphyradium*, 1837; 5 and 6 = *Vertigo* Müller, 1774; leaving only 4, *minutissima*, which becomes the type. All the eliminations antedate Gray in 1847, who named *palustris* (= *antivertigo*) as type too late. Herrmannsen says that *muscorum* and *antivertigo* are the types, and that Beck restricted it to *antivertigo*. The latter statement is an error, as Beck did not restrict the group at all, or name any type, giving a heterogeneous list much like that of Jeffreys.

The correction of *hordeacea* "Gabb" to *hordeacea* "Sterki, not Gabb," may be allowed in view of the data given by Dr. Pilsbry, but, in a general way, when a species, not of the writer's own, is mentioned by an author without further data as type of a new group, it is, I think, essential not to "go behind the returns," as any other way must lead to hopeless confusion.

My notes in the article referred to, were condensed from some hundred pages of synonymic data, and no attempt was made to give more than the barest outline of the cases cited. But in every case good reasons can be adduced for the position taken, though no one is less ready to claim infallibility than the present author.

THE PUPILLIDÆ OF RISSO AND JEFFREYS.

BY HENRY A. PILSBRY.

The first attempt at a difficult and involved problem often falls short of a complete solution, through the omission of some obscure or apparently irrelevant factor bearing upon the matter; but the work done clears the way for another student to approach the task more advantageously. A discussion like the present one upon the Pupæ is not properly to be called a controversy. It is a symposium, to which various students bring their several portions of fact, observation and deduction, to the end that harmonious structure may be built more symmetrical than any formed by a single effort.

My former paper upon *Pupillidæ* (NAUTILUS, January, p. 105), was faulty in two respects: first, in ascribing "new errors" to Dr. Dall, for I propose to show that the errors largely antedate his work, and second, in my failure to give at length my reasons for certain identifications of some of Risso's names. These reasons I will pro-

ceed to give, so far as they relate to species about which there is any difference of opinion.

Dr. Dall's identifications of Risso's list of species of *Jamnia* agree with those given by me except for the following four species:

Risso's name.	Dall's table (p. 115).	Pilsbry's table (p. 105).
(1) <i>J. muscorum</i> .	<i>minutissima</i> Hartm.	<i>P. muscorum</i> L.
(2) <i>J. marginata</i> .	<i>muscorum</i> L.	<i>P. umbilicata</i> Dr.
(3) <i>J. edentula</i> .	<i>edentula</i> Drap.	<i>B. obscurus</i> Müll.
(4) <i>J. quinquelamellata</i> .	<i>quinquedentata</i> Born.	<i>P. cinerea</i> .

My reasons for the names given in the third column follow :

(1). *J. muscorum*. The identity of this shell is at first sight not very clear. Risso refers to Drap., who (very badly), figures *P. minutissima* under the name *muscorum*; but Risso's description does not at all fit *minutissima*, nor does the size given. Bourguignat, who examined the Risso specimens, refers them positively to the *P. muscorum* of L., as understood at the present time, and the description agrees with this species. Risso's specimens would fall in the form "*unidentata*," Risso describing it as with a very small posterior lamella.

The evidence obtained by a careful study of the original work therefore shows that Risso did not have *P. minutissima*.

(2) *J. marginata*. Risso gives three references: "Drap. 61, 6, iii, 36, 38. Ferruss. 59, 475. Playf. 59, 9, iii, 23, 24," all of them pertaining to forms of *muscorum* L. "Playf." is not Playfair, as might be supposed, but Risso's curious conception of the name *Pfeiffer*; the work referred to being Carl Pfeiffer's *Systematische Anordnung und Beschreibung deutscher Land und Wasser-Schnecken* (1821). Pfeiffer is elsewhere referred to as "Pleyfel!"

Risso says that the peritreme is provided with a *long acute lamella posteriorly on the right*. This cannot be made to fit any form of *muscorum*, but applies perfectly to *umbilicata* Drap.; and Bourguignat referred Risso's specimens, which he examined, to that species.

(3) *J. edentula*. This is described by Risso as with *eight whorls*, toothless aperture, and *ten mm. long*, so it clearly is not *Sphyradium edentulum*, as Dall supposes. It is obvious that the reference to Draparnaud's *P. edentula* was an error. These and the other characters given by Risso agree with *Buliminus obscurus* (*Ena obscura*),

which occurs at Nice ; and Bourguignat, who examined Risso's collection, has recorded this identification.

(4) The last of the four cases is only a nominal disagreement, the two names referring to one and the same species. I used that of *cinerea* Drap. because grave doubt has been cast upon the identity of Born's *quinquedentata* with the form so named by many later authors, while "*Pupa cinerea*" is a common name for the form in collections.

This disposes of all the cases in question, and so far as I can see, the name *Jaminia* will be retained for Risso's second species *J. marginata* Risso = *Pupa umbilicata* Drap. It will be noted that Dall, in his first article, also selects Risso's second species as type, but as he was misled by a wrong identification of *marginata* Risso, he did not use the name for the same group. *Jaminia* is a genus of the "European system" with no species in America. It has a great superficial resemblance to *Pupilla*, but with some extraordinary characters certainly entitling it to generic rank.

I am not concerned to show whether or not Pfeiffer correctly identified Draparnaud's figures, but I fully share Dr. Dall's confidence in his general accuracy. While there is no doubt that Risso, like everybody else at that time, identified his shells largely by Draparnaud's volume, yet his names do not rest for identification solely upon the references to Draparnaud any more than Binncy's species rest upon the references he cites. Primarily, *they rest upon the descriptions given by Risso himself.* To identify Risso's species by the references to Draparnaud's figures presumes absolute accuracy of identification on Risso's part. Therefore, in discrediting the identifications as given by Dr. Dall, I am not questioning Pfeiffer's reliability in the least. I am simply recording a few of the mistaken identifications of Risso, who, it is acknowledged by all who have used his work, was careless to a degree.

Dr. Dall, in using Risso's list, considers it necessary to point out what his species really are in terms of Pfeifferian nomenclature. But it seems to me that the very foundation of the subsequent structure is involved in getting at the actual identity of the species in question. Otherwise conclusions based upon the list are without permanence. The names can either be taken as they stand in Risso, or they can be really corrected. No half-way correction of the list of species goes to the root of the matter. There probably cannot be found a zoologist of experience in the world who will support the

method of identifying Risso's species by means of Pfeiffer's identifications of Draparnaud's figures, as opposed to the method by the study of Risso's own descriptions.

In my opinion, any sound work based upon Risso must begin with a study of his descriptions, specimens in hand. In the case of non-marine forms, the task has been materially lightened by Bourguignat, who examined and reported upon Risso's collection; but even with this, it is safest to check up all points with the shells and descriptions themselves.

In the matter of *Alæa* Jeffreys, a few words may not be amiss. I hold that when an author distinctly indicates a certain group by his diagnosis, the mere inclusion of some heterogeneous species should not be allowed to totally pervert his intention. This is common law, and good law too. Now Jeffreys defines *Alæa* as having short lamellæ in the mouth (making no provision for toothless forms in his diagnosis); and he expressly states that *Alæa* is separated from *Vertigo* because the shell is dextral (the type of *Vertigo* being sinistral).

Now there are still authors who hold that the dextral *Vertigines* need a subgeneric or sectional name, and from the time of Gray (1847) to the last Catalog of Westerlund (1890) the name *Alæa*, with the type *antivertigo* has been more or less constantly in use. I do not think that Dr. Dall can brush aside these facts by stigmatizing the distinction for which the name has always stood as "practically valueless," and proceed to fasten a totally new significance upon it. Quite a respectable company of conchologists of high rank, including Pfeiffer (in the *Nomenclator Hel. Viv.*), find use for *Alæa* in the sense established by Gray, as set forth in my former note.

I do not wish to be understood to break a lance in support of the value of *Alæa* as a division of *Vertigo*; but a division adopted by Pfeiffer and other high authorities is at least entitled to respectful consideration. It seems inadvisable to use the name of such division for a totally different group, at all events until malacologists recognize a Supreme Authority who shall pronounce once for all upon what distinctions are "practically valueless,"—a consummation remote from this contentious generation.

The facts are, in short, as follows: (1) Jeffreys regarded the toothed forms of his list as typical of his group. Gray in 1847 selected one of these, *P. antivertigo*, as type, that species never be-

fore having been selected as a genotype. (2) This usage has obtained currency by numerous authors, while the name has never been used in any other sense. (3) Dall (1904) ignores this use of the name, and selects a new type which disagrees wholly with the original diagnosis, though included by Jeffreys in the original list of species.

The cases of *Jamimia* and *Alæa* are now respectfully submitted for the judgment of conchological and nomenclatorial experts.

NOTES AND NEWS.

We regret to announce the death of Rev. E. H. Ashmun, which occurred at San Rafael, California, Dec. 21, 1904. We hope to give a further notice next month.

MR. FREDERICK PRICE MARRAT died at Liverpool, England, on November 7, 1904, at the age of 84. "For more than 40 years Mr. Marrat had been connected with the Liverpool Museum, where he worked in conjunction with the late Mr. T. J. Moore and the Rev. H. H. Higgins, a trio of enthusiastic museum workers who contributed so greatly to the building up of the magnificent collection in the Liverpool Museum. Mr. Marrat paid special attention to the geological, mineralogical and conchological collections, his most intimate work being connected with conchology, not only the conchological collection in the Liverpool museum being named by him, but also similar collections in various museums, and also in private houses. He was the principal authority on the genus *Oliva*, of which he acquired a very extensive series, and contributed monographs to Reeve's *Conchologica Iconica* and to Sowerby's *Thesaurus Conchyliorum*, as well as to many periodicals and other publications on the mollusca."—(*Museums Journal*, Dec., 1904.)

PUBLICATIONS RECEIVED.

MOLLUSCA OF SOUTH AFRICA (PELECYPODA). By G. B. Sowerby (From "Marine Investigations in South Africa, Vol. iv). Thirty-three new species are described and figured on two plates.



EDWARD H. ASHMUN.

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EDWARD H. ASHMUN.

Rev. Edward Houghton Ashmun, was born at Tallmadge, Summit Co., Ohio, March 12, 1853. Most of his boyhood was spent there, his father being a farmer. When seventeen he moved with his father to Weeping Water, Nebraska. As time went on, he became strongly impressed with a desire to enter the ministry, and toward that end went to Tabor College, at Tabor, Iowa, where he graduated in 1879, and entered the Yale Divinity School, finishing in 1882. He was pastor of the Congregational Church at Syracuse, and Beatrice, Nebraska, after which he was called to the Boulevard Church in Denver, Colorado, which became very prosperous under his ministry. In 1892 he was appointed to the position of Home Missionary Superintendent of Arizona and New Mexico, in which position he remained six years, and then Pastor Superintendent of Arizona for two years, residing at Jerome, Arizona.

It was during his residence in the southwest that Mr. Ashmun became interested in studying the land shells of that region, and made many rare and interesting discoveries. Collecting in this arid region is laborious and rarely as remunerative as in the more fertile sections. The molluscan fauna is largely confined to the higher mountains, the only situation where there is sufficient moisture for snail life; species are thus widely separated and insulated by the lower and arid wastes, thus presenting as many interesting problems in distribution as exist in true insular faunæ. Under the above conditions lives a group of snails, with shells like those of *Polygyra*, but anatomically very distinct, and nearer related to *Sonorella*,

which on the other hand is related to *Epiphragmophora*. To this group of shells Messrs. Pilsbry and Cockerell, gave the name of *Ashmunella** in recognition of his valuable field work. Mr. Ashmun also discovered a number of new Pupidae, etc. as shown by the following list of new species collected by him in that region:—

<i>Bifidaria perversa</i> Sterki.	<i>Ashmunella rhyssa</i> Dall.
<i>Bifidaria quadridentata</i> Sterki.	<i>Ashmunella mioryssa</i> Dall.
<i>Bifidaria ashmuni</i> Sterki.	<i>Ashmunella ashmuni</i> Dall.
<i>Bifidaria hordeacella parvidens</i> Sterki.	<i>Ashmunella pseudodonta</i> Dall. <i>Ashmunella pseudodonta capita-</i>
<i>Pupilla sonorana</i> Sterki.	<i>nensis</i> A. & C.
<i>Pupilla sonorana tenella</i> Sterki.	<i>Agriolimax ashmuni</i> Pils. & Van.
<i>Pyramidula cockerelli</i> Pils.	<i>Sonorella ashmuni</i> Bartsch.

Mr. Ashmun's article on "Collecting in Arizona and New Mexico" (THE NAUTILUS, xiii, p. 13, 1899) is very interesting and gives a good idea of the difficulties which attend collecting in that region. Conjointly with Prof. Cockerell he described a new subspecies of *Ashmunella* (*A. pseudodonta capitansensis*). It was collected on the Capitan Mts., New Mexico, at an elevation of 8,200 feet. (NAUT. xii, p. 131, 1899).

During his last year in Arizona his health began to fail, and he moved to Idaho, hoping that the change would benefit him, but after two years as pastor of the church at Weiser, he had to give up his charge, and after a time was obliged to go to a sanitarium, where he remained ten weeks and was apparently cured of the stomach trouble with which he had been suffering. He was advised to live out of doors as much as possible for two years, and was appointed to investigate the mosquito pest at San Rafael, California. This seemed to furnish the outdoor life he needed, and he improved for a time, but in the fall caught a cold and finally had to give up. He was threatened with paralysis from the first, and it seemed that his nerve exhaustion was complete. He again went to a sanitarium, but nothing could be done. He died December 21, 1904, and was interred at Santa Rosa, California.

He was married in 1890 to Miss Anna L. Lyman, daughter of the Rev. Addison Lyman of Kellogg, Iowa, who with a son, Henry G. Ashmun, a bright boy of twelve, survives him, and to whom we tender our sincere sympathy.

C. W. J.

* The NAUTILUS, XII, p. 107; Proc. Academy Nat. Science for 1899, p. 188, and for 1900, p. 107.

SOME NEW SPECIES OF MOLLUSKS FROM CALIFORNIA.

BY WILLIAM HEALEY DALL.

In assorting some mixed material from California a number of new species were noted; and, as it has become necessary to refer to some of them by name, the following preliminary diagnoses are given.

Leda ambliia n. sp.

U. S. Fish Commission station 4517, Monterey Bay. Shell chalky under a polished dark olive-green periostracum, compressed, rostrate, concentrically and feebly irregularly striate, with obscure microscopic radial lines; lunule narrow, lanceolate; escutcheon, long, wide smooth and slightly concave, the valve margins rising slightly in the median line; valves bluntly rounded in front, bluntly truncate behind, the rostrate portion not set off from the body by any constriction, and the radial subangular lines which bound the rostral area are feeble and obscure; interior whitish, with a deep subumbonal impression, a very shallow and obscure pallial sinus, very short siphons, 12 or 13 anterior, 18 or 19 posterior normal hinge teeth, with a narrow, backwardly oblique socket for the resilium. Lon. of adult shell 18.0; alt. 9.5; diam. 5.5; vertical of the beaks behind anterior end, 7.0 mm. This has much the general form of *L. leonis*, Dall, but wants the prominent sculpture and is of a different color.

Magilia perattenuata n. sp.

Monterey Bay, 10-45 fms., Woodworth. Shell small, very slender, with one smooth turgid nuclear, and six smooth normal whorls; the whorls are but slightly convex, whitish, the suture very distinct, its posterior margin slightly overhanging or dominant; aperture narrow, short, simple, the outer lip slightly concavely waved between the periphery and the suture, canal short, a little recurved, relatively rather wide. Lon. of shell 9.5; of last whorl 3.75; max. diam. 2.5 mm. A single specimen sent by Mr. Woodworth is broken and dead, but its characters are not shared by any other species from the Coast as far as now known.

Admete woodworthi n. sp.

Monterey Bay; 10-45 fms., Woodworth. Shell small, thin, whitish, with a yellow-brown periostracum, five normal, sculptured, and one

smooth, turgid nuclear whorl, gradually increasing, subtabulate by a prominent spiral thread at the shoulder while young, rounded at the last whorl, with 8 or 9 obscure riblets on the upper part of the spire, which are obsolete on the last whorl and a half; spiral sculpture of rounded threads, with wider flattish, somewhat irregular interspaces; peristome continuous with a slight notch or sulcus near the end of the nearly straight pillar, and with no umbilicus; there are two obscure plaits on the pillar, which is not marked by any umbilical chink or fissure; aperture with the external sculpture modifying the margin, but no lirations. Lon. of shell 9.0; of aperture 4.0; max. diam 4.5 mm.

This is less strongly sculptured, more slender and with a less arcuate pillar than any of the other *Admetes* of the coast, and belongs in the group half way between such *Cancellarias* as *C. modesta* and *Admete gracilior* Carpenter. It has very much the form of *C. circumcarinata* Dall, on a smaller scale and with a more acute spire.

Erato albescens n. sp.

U. S. Fish commission station 4431, California. Shell whitish, thin and polished, with four whorls; the spire low and nearly covered with a thin glaze extending from near the aperture; shell bluntly pyriform with a wide mouth, smooth pillar, the outer lip thickened, obscurely marginate externally, with about nine obscure distant denticulations internally, pillar short, twisted, with a flaring edge and almost gyrate axis; the body with a thin wash of callus, but, in the type no sign of pustulation. Lon. of shell 15.0; of aperture 13.5; max. diam. 10.0 mm.

This succeeds *E. vitellina* Hinds as the largest species of the genus and is a much thinner and lighter shell, beside differing in color.

Scissurella (Schizotrochus) kelseyi n. sp.

California at U. S. Fish Com. Station 4353, also off San Diego.

Shell large for the genus, trochiform, white, with about four rounded whorls, sculptured with fine (forwardly convex) arcuate threads or raised lines, which above the fasciole are spirally microscopically striate, and on the base, with somewhat regularly spaced and stronger spirals; the fasciole is narrow, slightly above the periphery, bounded by two sharp, very thin, elevated keels; the slit

extends about one-fifth of the circumference of the last whorl. The aperture is nearly circular, interrupted for a short distance by the body, the inner lip slightly reflected over a small umbilicus; the operculum is multispiral and pale yellow. Alt. of shell 6.0; of aperture, 3.0; max. diam., 5.5 mm.

This species is somewhat like *S. umbilicata* Jeffreys from the North Atlantic, but is larger, more strongly sculptured and more elevated proportionately. It is the second species of the family to be described from the Pacific Coast; the other *Schismope rimuloides* Carpenter having been reported from San Diego and Mazatlan. It is named in honor of Prof. F. W. Kelsey, of San Diego, to whose interest in the local mollusks we owe several additions to that fauna.

CRITICAL NOTES ON THE SMALLER LYMNÆAS.

FRANK COLLINS BAKER.

The small forms of *Lymnæa*, which have been included under the names of *humilis* and *desidiosa*, have been little understood by American conchologists, at least two good species being included in *humilis*. A recent somewhat exhaustive study of these small forms has led the writer to conclusions diametrically opposed to those held by Binney and Tryon and most subsequent students of fresh-water mollusks.

In pursuing these studies, the types of Say's and Lea's species in Philadelphia and Washington have been examined, and in addition the collections of the Philadelphia Academy of Natural Sciences, the Smithsonian Institution, Mr. Bryant Walker, Detroit, Michigan, Mr. Henry Hemphill, San Diego, California, Mr. J. H. Ferriss, Joliet, Illinois, and the Chicago Academy of Sciences have been studied. My thanks are due to the above-named gentlemen for the use of their collections, and also to Dr. W. H. Dall, Dr. H. A. Pilsbry, Mr. Paul Bartsch and Mr. E. G. Vanatta, for much valuable assistance and kind criticism.

Lymnæa humilis Say.

Lymnæus humilis Say, Journ. Phil. Acad., II, p. 378, 1822.

Lymnæa griffithiana Lea, Proc. Amer. Phil. Soc., II, p. 33, 1844.

Lymnea linsleyi DeKay, N. Y. Moll., p. 72, pl. iv, fig. 74, 1843.

Lymnea lecontii Lea, Proc. Phil. Acad., p. 112, 1864.

In this species American conchologists have confused several seemingly valid species. Say's types (two specimens) preserved in the Philadelphia Academy, came from South Carolina and agree fairly well with Binney's figure 99, in Land and Fresh-Water Shells of North America. The South Carolina specimens are a trifle narrower and less rotund than specimens from the north. *Humilis* is of good size, with regularly rounded whorls, a broadly conical spire, impressed sutures, 5-5½ whorls, aperture elongate-ovate and a trifle less in length than the spire. The last whorl is somewhat inflated, and the umbilical chink very distinct, being more open in some specimens than in others. The surface is marked by lines of growth, and in some specimens from Maine by elevated spiral ridges. The fine impressed sculpture of some *Lymnæas* (as *columella*) is absent in this species, as well as in the others mentioned below. Typical measurements are as follows :

Length 9.00 ; width 4.75 ; aperture length 4.50 ; width 2.75 mill.
(Say's type.)

Length 8.50 ; width 4.00 ; aperture length 4.50 ; width 2.75 mill.
(Chicago.)

Length 7.50 ; width 4.25 ; aperture length 3.50 ; width 2.50 mill.
(Maine.)

Small forms of *Lymnæa cubensis* Pfeiffer, resemble *humilis* ; *cubensis* has a wider, more solid shell, a more open umbilicus, and the expansion of the columella is broader and of a different form, as is also the aperture.

^x *L. humilis* is found from Maine to California, and from Canada to Mexico.

Lymnæa parva Lea.

Lymnæa parva Lea, Proc. Amer. Phil. Soc., II, p. 33, 1841.

Lymnæa curta Lea, Proc. Amer. Phil. Soc., II, p. 33, 1841.

This is a very small species, in fact the smallest of the *Lymnæas*. It differs from *humilis* in its diminutive size, and in the very different form of the shell, which is solid, translucent, turreted ; color light brown or yellowish-white ; whorls 4½-5 ; these are more convex than in *humilis*, caused by the more deeply impressed sutures ; the spire forms an acute pyramid in some specimens, and a broad

pyramid in others, and is considerably longer than the aperture; the aperture is roundly elliptical and almost continuous, differing markedly in this respect from *humilis*; the inner lip is more erect in the present species, which causes the umbilicus to be round, deep and open. The umbilical region is gracefully rounded. Typical examples measure as follows:

Length 6.00; width 3.00; aperture length 3.00; width 1.75 mill. (Indiana.)

Length 6.00; width 3.00; aperture length 2.50; width 1.25 mill. (Penn.)

Length 5.50; width 3.00; aperture length 2.75; width 1.50 mill. (Ills.)

This species is widely distributed, being found from Maine to California and from Canada to Mexico.

Lymnæa desidiosa Say var. *modicella* Say.

Lymnæus modicellus Say, Jour. Phil. Acad., V, p. 122, 1825.

Say described this species from two specimens which are still preserved in the Philadelphia Academy. It would seem to be distinct enough to be recognized at least as a variety of *desidiosa*, to which it is more closely allied than to *humilis*. The principle characteristics are the short, dome-shaped spire, the regular elongate-ovate aperture and the large size of the last whorl as compared with the spire. The umbilical chink is narrowly open and there is a small plait on the columella. Typical specimens measure as follows:

Length 8.50; width 4.75; aperture length 4.75; width 2.75 mill. (Say's type.)

Length 7.75; width 3.25; aperture length 4.50; width 2.25 mill. (Berry Lake.)

Length 7.00; width 3.50; aperture length 4.50; width 2.00 mill. (Berry Lake.)

The range of this form, as far as known, is from Ontario to Oregon and south to Texas. It has been found in Big Payette Lake, Idaho, at an altitude of 5,000 feet above the sea level.

The forms described by Dr. Lea as *L. plica*, *planulata*, *exigua* and *rustica* seem to be absolute synonyms of *desidiosa*, some of these being, in all probability, immature forms. The types of *exigua* and *rustica* are not in existence, so far as known. They are not in the Philadelphia Academy nor in the Smithsonian Institution.

A NEW SPECIES OF PISIDIUM.

BY V. STERKI.

Pis. atlanticum, n. sp.

Mussel of medium size, somewhat inequipartite, oblique, short, angular, rather well inflated: superior margin, moderately to rather strongly curved, with the angles at the scutum and scutellum projecting and more or less rounded; supero-anterior slope well marked, steep, slightly curved to almost straight, anterior end a rounded angle situated low; posterior part high, posterior margin (squarely) truncate to subtruncate to rounded, inferior well curved; beaks somewhat nearer the posterior end, rounded, prominent over the hinge margin, rather variable; surface dull to somewhat shining, with striae very fine and crowded over the beaks and somewhat coarser towards the margins; color straw or whitish to pale horn to grayish or brownish; shell opaque to more or less translucent, rather thin, nacre glassy to whitish; inner surface densely rugulose within the pallial line, muscle insertions distinct; hinge rather slight, curved, plate narrow; cardinal teeth: the right curved to angular, its posterior part thicker and grooved, the left anterior short, angular, the posterior oblique, short, slightly curved, thin, less projecting than the anterior; lateral teeth rather slight, the inner cusps of the right valve not pointed, the outer quite small, those of the left valve pointed, not very abrupt; ligament slight.

Size: long. 4.3, alt. 3.8, diam. 2.6 mill.

Size: long. 4.5, alt. 3.9, diam. 3.1 mill.

Habitat: New York to Florida and Mexico: Cedarville, N. Y., sent by Mr. Walter Webb (No. 4853*), Lynchburg, Va., sent by Mr. J. B. Henderson, from Sanderson Smith (No. 654), Lake Jessup, Fla., sent by Mr. Bryant Walker (No. 3002); pools near Wetumpka, Ala., sent by the same, collected by Mr. Smith in 1904 (No. 4963), De Kalb, Bowie Co., Tex., collected and sent by Mr. Jas. H. Ferriss (No. 466), Texolo, Vera Cruz, Mexico, sent by Dr. H. A. Pilsbry (No. 4746). From most places there were good numbers of specimens, young to full-grown. Although evidently all of one species, the specimens show considerable variation in regard

* Of my collection of Cycladidae.

to size, shape, relative size and prominence of the beaks, striae and appearance of the surface, color, translucency or opacity of the shell. Some of the full-grown examples are straw-colored all over, others horn or grayish with a broad or narrow light zone along the margins. None of the different forms can be regarded and described as typical and the others as varietal since they are connected by intergradations. In younger specimens, the superior margin is generally less curved, the anterior and posterior more so than in the adult. The rugosity of the inner surface of the shell is like that of *Pis. noveboracense*, although microscopical, much coarser than e. g. in *P. variabile* Pr. and *compressum* Pr.

Pis. atlanticum seems nearest related to *P. noveboracense*, but the mussel is shorter, its posterior part comparatively higher, the supero-anterior slope is steeper and the color is different.

SOME NOTES ON BERMUDIAN MOLLUSKS.

BY OWEN BRYANT.

Dr. Pilsbry, in his article on "The Air-breathing Mollusks of the Bermudas" in Transactions of the Connecticut Academy (Vol. X, part 2, p. 493, Sept., 1900) says: "From the data supplied by Prof. Verrill's expedition and that of Prof. Heilprin, it seems that *Vallonia pulchella*, *Cecilioides acicula*, *Agriolimax lævis* and *Physa acuta* rest upon single records now nearly twenty years old, and they may not have permanently colonized; but as none of them are conspicuous forms, and no special collectors of land shells have sought for them, the merely negative evidence is inconclusive."

In this connection it is interesting to note that *Physa acuta* Drap., was found by Mr. Davis and recorded in the NAUTILUS (Vol. XVII, p. 125, Mar., 1904). *Cecilioides acicula* Müll. and *Vallonia pulchella* Müll. were found by Mr. Addison Gulick and myself on the grounds of the Hotel Frascati, while studying at the Bermuda Biological Station in July and August, 1903. A careful search would very likely reveal *Agriolimax lævis* Müll.

Vallonia pulchella (Müll.).

First recorded by Jones, 1876. (The Visitor's Guide to Ber-

muda, by J. M. Jones. Halifax, 1876, p. 138). It occurs also in the lists of Bland, 1881 (In Wallace's *Island Life*, p. 256) and of Heilprin, 1889 (*The Bermuda Islands*, p. 182).

I found it scarce under loose stones on the grass near the Frascati.

Cecilioides acicula Müll.

First recorded by Bland in 1861 (*Annals of the Lyceum of Natural History of N. Y.*, VII, p. 351). Also recorded by Jones in 1876.

I first found a dead shell of this species in looking over some red earth at the laboratory. Later I discovered thirty-five or more on the ground under an overhanging stone about 100 feet from the first locality. Most of these were either alive or recently dead. The soft parts were drawn up above the body whorl. It probably lives in the grass.

For the identification of this species I am indebted to Mr. Paul Barch who kindly compared specimens with those in the National Museum.

Zonitoides arboreus (Say).

This species is apparently unrecorded; a considerable number were on the under side and in the crevices of a large rotten log in a bamboo thicket near the Frascati. They are somewhat lighter and yellower than New England specimens.

Vitrea lucida (Drap.)

The first mention of this species is made by Prof. A. E. Verrill (*Trans. Conn. Acad.* Vol. xi, pt. 2, p. 733, fig. 81), who says: "The fresh shells of this species were found in large numbers by Mr. A. H. Verrill in March 1901, in a garden at Hamilton but none were living. The last whorl of many of the shells was distorted and rough, as if the conditions had been unfavorable for some time before death. Perhaps the weather was too dry. It is doubtful therefore whether it has succeeded in establishing itself permanently in the islands. It is a native of southern Europe."

I found this species very abundant in the Botanical Garden, at Hamilton. They were on the ground and under leaves in flower beds, and beside a wall where shrubs and vines were growing. Many were alive though a large proportion showed the distortion which Professor Verrill speaks of and which is well shown in the figure he gives.

Vitrea lucida seems now to have become a part of the fauna of the Bermudas.

In closing I take pleasure in acknowledging my indebtedness to Mr. A. Gulick for his kind assistance in the determination of the species named above, and to Dr. Pilsbry for the final determination of *Vitrea lucida* and *Zonitoides arboreus*.

NOTES.

PENNSYLVANIAN SNAILS AND THE STATE ZOOLOGIST.—In the last Monthly Bulletin of the Division of Zoology of the Pennsylvania State Department of Agriculture (Vol. II, no. 8), Prof. H. A. Surface, the State Economic Zoölogist, remarks (p. 245): "Since very little has been written concerning the molluscan life in Pennsylvania, we may at some future time prepare a Bulletin upon this particular subject," etc., etc. As most of the common non-marine mollusks of the Eastern States were described by Thomas Say from Pennsylvanian examples, and there have been articles bearing on our mollusks published at pretty short intervals for almost a century, we had somehow gotten the idea that a good deal had been "written concerning molluscan life in Pennsylvania." To be told that all that conchologists have done upon Pennsylvanian mollusks in a hundred years looks "very little" in the official eye of the State Zoologist, is discouraging. He must be looking for something the size of the Encyclopedia Britannica. We are on the watch for that promised Bulletin.

Californian Nudibranchs.—The publication of Dr. MacFarland's preliminary account of the Dorididæ (sens. latiss.) of Monterey Bay (Proc. Biol. Soc., Wash., Feb., 1905), is an event of no little importance to malacology. Out of twenty species, fifteen are new, three belonging to new genera. Two of the new genotypes I had in hand in 1901, and prepared descriptions; but I learned by correspondence with Dr. MacFarland that he had them earlier, and had studied their anatomy. I can, however, cite localities extending their range far southward. *Hopkinsia rosacea*, MacF., was collected by Miss V. Thomas at La Jolla, Aug. 3, 1901. The specimen was apparently immature, being only about 12 mm. long, with only 5 branchial plumes. Its color was a brilliant crimson, the dorsal pro-

cesses somewhat paler, and tipped with white. *Laila cockerelli*, MacF., was taken by my wife as far south as La Jolla, while Mrs. Oldroyd showed me one dredged at San Diego by Prof. Kofoid.—
T. D. A. COCKERELL.

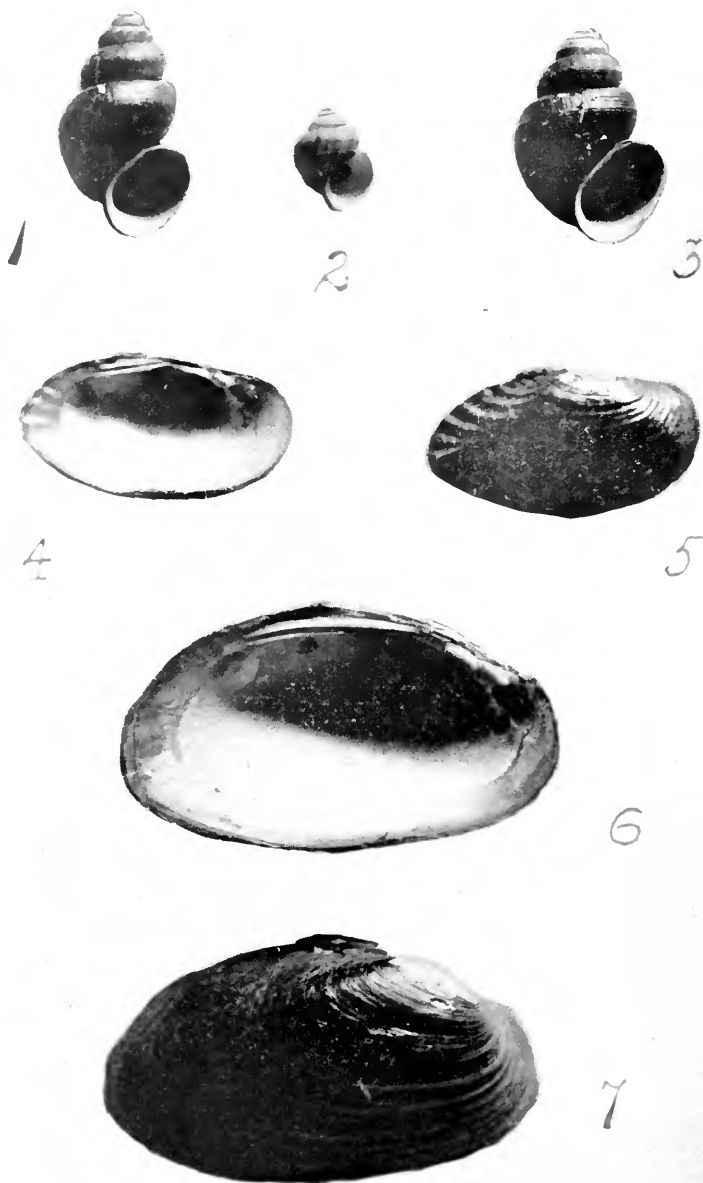
PUBLICATIONS RECEIVED.

A PRELIMINARY ACCOUNT OF THE DORIDIDE OF MONTEREY BAY, CALIFORNIA. By F. M. MACFARLAND. (Proc. Biol. Soc. of Washington, XVIII, pp. 35-54, Feb. 2, 1905.)

It is with pleasure that we announce the publication of this paper. The nudibranchs have been sadly neglected on the Pacific coast, and we shall look forward with much interest to the series of systematic and morphological papers soon to appear. The present paper contains the descriptions of 20 species, including three new genera (*Montereina*, *Laila* and *Hopkinsia*) and the following new species: *Montereina nobilis*, *Discodoris heathi*, *Rostanga pulchra*, *Cudlina marginata*, *C. flavomaculata*, *Doriopsis fulva*, *Aegires albopunctatus*, *Laila cockerelli*, *Triopha maculata*, *T. grandis*, *Polycera atra*, *Acanthodoris hudsoni*, *A. brunnea*, *Ancula pacifica*, *Hopkinsia rosacea*.—C. W. J.

DESCRIPTION OF TWELVE NEW SPECIES AND ONE VARIETY OF MARINE GASTROPODA FROM THE PERSIAN GULF, GULF OF OMAN AND ARABIAN SEA. By JAMES COSMO MELVILL. (Jour. Malacology, XI, pp. 79-86, pl. vii, 1904.)

MARYLAND GEOLOGICAL SURVEY, MIOCENE.—This magnificent work on the Miocene of Maryland, consists of a volume of text of 543 pages (pp. 130 to 401 being devoted to mollusca), and another volume of 126 plates, 69 of which contain illustrations of mollusca. The introductory chapters are by Drs. Wm. B. Clark, Geo. B. Shattuck and Wm. H. Dall; while the systematic portion represents the work of several specialists. The Cephalopoda, Gastropoda, Amphineura and Scaphopoda are described by Dr. G. C. Martin, the total number of forms described being about 220, of which 68 represents new species or varieties. A new subgenus of *Cancellaria* (*Cancellariella*) is proposed. The Pelecypoda are described by Dr. L. C. Glenn, 185 species are recorded, of which 32 are new. Most of the beautiful drawings represent the work of the late Dr. J. C. McConnell.
C. W. J.



THE NAUTILUS.

VOL. XVIII.

APRIL, 1905.

No. 12

LIST OF SHELLS FROM NORTHWESTERN FLORIDA.

BY BRYANT WALKER.

In the fall of 1902, Messrs. G. F. & B. H. King of Mimsville, Ga., to whom we are indebted for the discovery of several new species of *Unionidæ* recently described in the Nautilus, took a wagon trip of more than one hundred miles from their home into western Florida. No land shells were collected. The list of fluviatile species, however, though not large, is of considerable interest, especially as there are practically no records from that part of the state. Entering Florida at Neal's Landing, the Chipola River was struck at Marianna. From there the route continued southwesterly to Econfine on Econfine Creek. No *Unionidæ* were found in the Econfine, but in a tributary called Moccasin Creek, several species occurred. The Chipola River is a branch of the Flint River. Econfine Creek flows directly into St. Andrew's Bay.

Ampullaria depressa Say, Chipola River.

Vivipara georgiana Lea, " "

Campeloma genicula Con., " " and Mud Creek, a tributary of the Econfine.

Lioplax pilsbryi, n. sp. Pl. ix. figs. 1, 2 and 3.

Chipola River (type locality), Econfine Creek, and Mud Creek, Fla.

Shell elevated, turreted, imperforate, rather thin, olive-green above, becoming almost black on the body whorl with numerous dark

strigations: whorls seven, ventricose, moderately increasing above, rapidly so toward the base, those of the spire carinated with a sloping shoulder, lower whorls sub-carinate, flattened above and strongly shouldered; lines of growth strong, decussated by numerous, closely set, elevated, transverse lines; suture very deep; aperture rather large, very oblique, regularly oval, sides nearly parallel, regularly rounded above and below; outer lip thin, drawn back above and somewhat sinuous; inner lip closely appressed throughout.

Alt. (Fig. 1 apex eroded) 30, width 18 mm.

“ “ 2 “ 28 “ 20 “

This fine species, the largest yet known of the genus, was found in some abundance in the Chipola River. Only a few occurred at the other localities.

It differs from all the described forms in its size and peculiar combination of characters. Young specimens of about five whorls, except in being imperforate, slightly wider and more strongly transversely striate, closely resemble striate specimens of *L. subcarinata* in shape, the shouldering and carination of the whorls being almost exactly the same. But with increase of growth the shape becomes entirely different and the mature shell in general appearance approaches Lea's *L. elliottii*, but differs from that species in being very much larger, proportionately wider, with the lower whorl more flatly shouldered, with transverse raised lines and imperforate axis.

I take great pleasure in naming it after Dr. Pilsbry.

Goniobasis catenaria Say. Chipola River and Econfine Creek.

“ *dooleyensis* Lea. “ “ “

This species is apparently one of the characteristic forms of the Flint river drainage system. Originally described from Vienna in Dooley County, Ga., the Messrs. King have found it in great abundance in Rawle's Spring and Dry Creek, Early County, and in the Chickasawhatchee Creek, Baker County. From Mr. A. C. Billups, I have also received it from the Flint River. On the present trip it was found in both the Chipola and Econfine.

UNIONIDÆ FROM THE CHIPOLA RIVER.

Medionidus kingii B. H. Wr.

Lampsilis paulus Lea.

“ *subangulatus* Lea.

Lumpsilis cluibornensis Lea.

“ *lienosus* Con. Not typical; referable to Lea's *caliginosus*.

“ *lienosus unicosatus* H. B. Wr.

“ *vibex* Con. (approaching var. *nigrinus* Lea.)

Anodonta gibbosa Say,

Unio singularis B. H. Wr.

“ *arctatus tortivus* Lea. Very abundant and extremely variable.

“ *coruscus* Gld.

“ *nigellus* Lea var.? Very close to some forms of the variable *arctatus tortivus* Lea.

“ *curvatus* Lea, a single young shell is thus named by Mr. W. A. Marsh Sr. It is quite similar to young specimens of the Moccasin Creek form referred to *obnubilis (nolani)* by Mr. Marsh, but differs in being rather more elongated, more pointed and less broadly rounded posteriorly.

Unio chipolaensis, n. sp. Pl. ix. figs. 6 and 7.

Shell ovate, not very thick, somewhat inflated in the umbonal region, evenly rounded before and biangulate behind with a slight emargination just above the superior posterior angle; dorsal margin decidedly curved, basal margin slightly but regularly curved, epidermis smooth, chestnut-colored, darkening to black on the umbos, with several darker lines indicating arrested periods of growth. Umbonal slope well rounded towards the beaks, but flattening out and becoming slightly biangulate posteriorly. Beaks prominent, apparently incurved when perfect. Cardinal teeth compressed, crenulate; those in the left valve are nearly in a straight line. Lateral teeth rather long, slender and slightly curved. Cicatrices distinct. Cavity of the beaks large and rounded. Nacre salmon-color, darker anteriorly.

Length 32, width 56.5, diam. 22 mm.

Chipola River, Fla.

This species is a member of group of *U. buckleyi* and is distinguished by smooth, chestnut epidermis, entirely without rays, but ornamented with concentric dark bands such as occur in *Pleurobema chattanoogaensis*, inflated umbonal slope, prominent beaks and biangulated posterior extremity with a slight emargination above. It is related to some forms of *U. burtchianus* B. H. Wr. but differs in

being less elongated and more inflated with more prominent beaks. The color both of the epidermis and nacre is also quite different.

Messrs. Frierson and Marsh, to whom specimens have been submitted, agree that it is distinct from any described form, and Mr. Simpson remarks that it "looks more or less like two or three species, but I cannot refer it to anything." Mr. B. H. Wright suggests that it is close to some forms of *U. confertus* Lea, but both in shape and color, which is remarkably constant in all the specimens seen, it seems sufficiently distinct.

UNIONIDAE FROM MOCCASIN CREEK, A TRIBUTARY OF THE
ECONFINE RIVER.

Lampsilis anodontoïdes floridensis Lea.

" *lienosus* Con. (*caliginosus* Lea).

" *vibex* Con. (*rutilans* Lea).

Unio downiei Lea, var.

" *arctatus tortivus* Lea.

A very large, heavy, inflated form similar to Lea's *tetricus*, longer but not so swollen as that figured by Simpson in Proc. U. S. Nat. Mus. xv. Pl. lxiv. figs. 3 and 4. Associated with this form is another more compressed, strongly rayed and with umbonal slope, decidedly biangulate, which Mr. Simpson thinks is also referable here. Mr. Marsh considers this identical with Wright's *notani*, a synonym of the following species.

Unio obnubilis Lea. Two specimens smaller, thicker and apparently quite distinct from the last-mentioned form are referred to *santeensis* Lea, by Marsh, to which Simpson somewhat doubtfully assents.

A NEW SPECIES OF MEDIONIDUS.

BY BRYANT WALKER.

Medionidus simpsonianus n. sp. Pl. ix. figs. 4 and 5.

Shell small, rather thin, somewhat inflated, elliptical, inequilateral, strongly plicate on the posterior slope. Epidermis dark yellow, smooth, polished, covered with dark green pencilled rays which tend to break into a net-work of angular lines covering the entire surface. Anterior end compressed, rounded, and slightly elevated above the

line of the hinge superiorly; posterior extremity obtusely rounded, the tip being nearly on the median line of the shell; posterior ridge somewhat angled; dorsal slope covered with strong sub-concentric, somewhat irregular ridges extending from the posterior ridge to the margin; basal margin regularly curved; hinge margin nearly straight, slightly angled between the cardinal and lateral teeth. Cardinal teeth crenulate, erect, rather compressed, those in left valve nearly on the same line; lateral teeth slender, straight and nearly smooth. Anterior cicatrices well impressed, posterior cicatrices distinct, dorsal cicatrices under the plate behind the cardinal teeth. Beak cavity rather shallow, cavity of the shell deep and uniform. Nacre bluish-white, rather thicker anteriorly.

Length 36; height 19, width 13 mm.

Habitat, Calvary, Ga.

Only three specimens of this little species were received, and these, unfortunately, without any information as to the stream where they were found.

This species belongs to the "*conradicus*" group of *Medionidus* as defined by Simpson, and is most nearly related to *M. penicillatus*. But it differs decidedly from all the described species in the compression of the anterior end, the elevation of the superior-anterior margin and the regularly rounded posterior margin, which is equally curved above and below, the tip being nearly on the median line and not depressed toward the basal margin as in all the allied species. The ridges on the posterior slope are quite as strong, but not so numerous as in *M. kingii*.

It is named in honor of Mr. Charles T. Simpson, whose recent retirement from active conchological work has been a source of regret to all interested in American Conchology.

A NEW LOCALITY FOR CERION INCANUM.

BY CHARLES T. SIMPSON.

I have just returned from a visit to "Baker's Haulover," the narrow strip of land between the extreme upper end of Biscayne Bay, Florida, and the Atlantic. This strip may be twenty rods wide, is low and covered with mangroves on the inner side, and next the ocean is sand-bank twelve or fifteen feet high with shore grapes, low

shrubs, grass and weeds. On the sandy part I found immense numbers of dead shells of *Cerion incanum* and a diligent search revealed a few living examples on grass close to or even on the sand. As the weather for the past few days had been unusually cold, I thought it possible that it might be buried in the sand, and digging around the roots of bunches of grass I unearthed the species alive by thousands. In some cases a double handful would be buried around a small bunch of grass. Many of the specimens had a thin, almost transparent epiphragm at the aperture, while occasionally it was deeper seated, thicker and white.

The apex is rather conical, the apical whorls are corneous, while the last whorl has strong irregular wide-spaced riblets and a dark base, often outlined by a revolving bluish stripe. The body of the shell is a uniform bluish-white, and occasionally a specimen has the base of nearly the same color. In a somewhat wide experience of collecting this species, I have never seen it so abundant. Associated with it were a few *Polygyra carpenteriana* and rarely a *Glandina truncata minor*.

In the Manual of Conchology, Vol. xiv. p. 215, Pilsbry states that Mr. S. N. Rhoads found five specimens of the *Cerion incanum* on Virginia Key, but that he thought they had probably been drifted there, and Pilsbry believes this key to be the extreme northeastern limit of the species. "Baker's Haulover" is eight or nine miles north of the extreme northern end of Virginia Key and is on the mainland. I followed up the beach from the "Haulover" for a half mile perhaps, but there seemed to be no diminution in the numbers of specimens at the farthest point reached.

Lemon City, Florida.

Jan. 29, '05.

SEXUAL DIMORPHISM IN STROMBUS PUGILIS LINNE.

BY HAROLD SELLERS COLTON.

Sexual dimorphism does not seem to be common among the Gasteropoda. It can occur only in the sub-class Streptoneura, in which the sexes are separate. Cases are seldom reported. When they are, they are hidden amid a mass of facts in some large work. I find that sexual dimorphism has been noticed in *Margarita helicina*¹ and

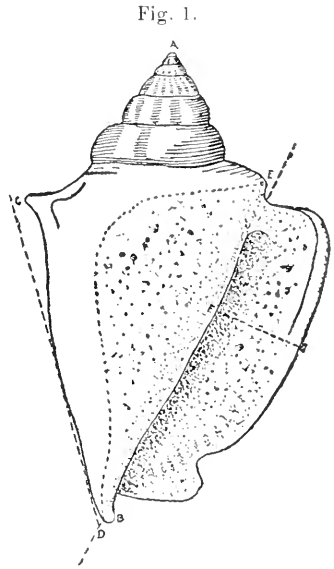
¹ Dwight Blaney, Proc. Boston Society of Nat. Hist., Vol. XXXII., No. 2, p. 38, 1904.

*Buccinum undatum*¹ by Morse, in *Crepidula*² by Conklin, in *Rissoa aculeus*³ and *Littorina littorea*⁴ by Jeffreys, and in *Fulgur carica* by Burnett Smith.⁵ As far as I can find out, no one has reported it in *Strombus pugilis*.

The material was collected to determine if the variety *alatus* was but a case of sexual dimorphism, and if not was there any such difference. I collected most of the individuals after a severe "norther" in the latter part of January which had cast them up in moderate numbers on the beach of Sand Key near Clearwater Harbor, Florida. Of those I examined, nineteen were males and nine were females.

The variety *alatus* differs from the type in that it lacks the characteristic tubercles on the body whorl. Forty-four per cent of the females and twenty-six per cent of the males showed a tendency to be smooth. Of these observations and the ones to follow, the probable error is so very large, on account of the small number of individuals at hand, that only where the differences are pronounced, are the results of value.

On the material at hand I made the following measurements;-(Fig. 1) the length AB, the width CE, the angle at the apex, the columellar angle, and the aperture FG. On account of the ornamentation of the shell, the width CE and the apical angle were found to be so variable as not to be favorable for comparison. The ratio of AB to FG was in the case of females larger than in the case of the males. If this be true, and I have too few individuals to be sure of it absolutely, a very interesting feature is shown. The



¹ E. S. Morse, 1876, Proc. Boston Society of Nat. Hist., Vol. XVIII.

² E. G. Conklin, Jour. of Morphology, 1897, Vol. XIII., No. 1.

³ Jeffreys, British Conchology, Vol. IV., p. 38.

⁴ *Ibid.*, Vol. III., p. 343.

⁵ Burnett Smith, 1902, Proc. Acad. Natural Science of Phila., Vol. LIV., p. 507.

aperture of the male is larger than that of the female. This is true also in *Nautilus pompilius*.¹

The average columella angle CDE is for males 37.4° and for females 40.4° . The columella angle of the females is larger than that of the males. This is characteristic, and it is possible to separate the males from the females in a large series at a glance with very few errors. One male, however, showed the female angle and one female the male angle.

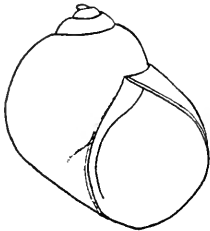
The results of these observations indicate that the relation of the variety *alatus* to the type is not of sexual character, that the aperture of the male may be a trifle wider than that of the female, but the columella angle is a true case of sexual dimorphism.

A NEW SPECIES OF SOMATOGYRUS FROM SOUTH ALABAMA.

BY T. H. ALDRICH.

SOMATOGYRUS WALKERIANUS n. sp.

Shell small, globose, rather solid, smooth, color greenish-yellow. Spire short, obtuse. The nucleus is obliquely placed, and projects markedly beyond the outline of the spire on the left side. Whorls about four, suture impressed. Body whorl large, slightly shouldered; outer lip slightly expanded. Inner lip thickened and rounding below into a rather narrow and deep groove, which runs up into the slightly perforate umbilicus. Aperture rather pointed above and rounded at the base. Alt. 4.25; diam. 4 mm.



LOCALITY.—Conecut River, Escambia Co., Ala., twenty miles east of Brewton, living on limestone rocks, rather common.

REMARKS.—This shell resembles a small *S. subglobosus* Say, but is not so strongly shouldered, has a much lower spire, and also the groove behind the pillar lip. Examples in cabinets of A. A. Hinkley and Bryant Walker. Type in my collection.

¹ Bather, 1895, Natural Science, Vol. VI., p. 411.

NEW SPECIES OF LYMNÆA.

BY F. C. BAKER.

Lymnæa owascoensis nov. sp.

Shell small, elongated, turreted, rather thin; color light horn; surface shining, marked by close-set lines of growth; in some specimens there is a tendency to form raised, keel-like ridges, as in malleated forms of *Lymnæa*; apex small, round, of the same color as the rest of the shell; whorls $5\frac{1}{2}$, shouldered, rather flat-sided; spire elongated, sharply conical; sutures deeply impressed; aperture roundly ovate, about two-thirds the length of the entire shell; outer lip thin, inner lip erect, causing the aperture to be almost continuous; columella rather broad, flattened, somewhat thickened by a callus but without a plait; umbilicus round, wide and deep, exhibiting one volution; the base of the shell is roundly flattened.

Length 8.50; width 3.50; aperture length 3.50; width 2.00 mill.

Length 8.75; width 4.00; aperture length 3.50; width 2.00 mill.

Habitat: Owasco Lake, N. Y., collected by Dr. Howard N. Lyon.

This distinct little shell may be known by its turreted shell, long spire and large, open umbilicus. Its nearest ally is *desidiosa*.

Lymnæa bryanti nov. sp.

Shell small, thin, robust, pointed; color light horn; surface rather dull, marked by rather indistinct lines of growth, but without impressed spiral lines; the base of the shell is marked by several indistinct spiral ridges, and the last whorl is malleated in some specimens; whorls $4\frac{1}{2}$ -5, rounded, roundly shouldered, rapidly increasing in diameter; the last whorl is large and quite convex; spire acutely conical, shorter than or as long as the aperture; sutures well impressed; aperture elliptical or elongate-ovate; columella a trifle thickened, without a plait, the callus turned back and appressed to the parietal wall as in *cubensis*; umbilicus distinct and rather widely open.

Length 7.50; width 4.00; aperture length 4.00; width 2.25 mill.

Length 6.50; width 4.00; aperture length 4.00; width 2.00 mill.

Length 6.50; width 4.00; aperture length 3.50; width 2.00 mill.

Habitat, Alameda Co., California. Collection of Mr. Bryant Walker.

This little shell is related to *cubensis* but is easily distinguished by its thinner shell, more pointed spire, less rounded whorls and more elongate aperture. The shape of the aperture and the form of the columella are different from those of *humilis*.

Lymnaea stagnalis var. *higleyi*, new variety.

Shell ovate with short spire and wide, spreading aperture which is twice the length of the spire; whorls rather flat-sided, the last somewhat shouldered; collumellar plait very large, thick, heavy, shining, white; aperture widely flaring, the upper part somewhat shouldered; umbilicus tightly closed by the closely appressed, reflected, columellar callus.

Length 50.00; width 30.00; aperture length 32.00; width 22.00 mill. (Ferriss).

Length 42.00; width 27.00; aperture length 27.00; width 19.00 mill. (Academy).

Length 38.00; width 22.00; aperture length 25.00; width 17.00 mill. (Walker).

Habitat; Michipecon Bay, North Shore, Lake Superior.

In a lot of specimens of *Lymnaea stagnalis* sent to the writer for examination by Mr. J. H. Ferriss, there were three specimens which differed markedly from any described American form of this species. The nearest variety seems to be Hemphill's *occidentalis*, but that form is decidedly more shouldered on the body whorl, the aperture does not flare and the spire is more "pinched." The color is a clear translucent whitish horn. The writer has seen no European variety exactly comparable with this variety.

It is named in honor of Prof. William K. Higley, Secretary of the Chicago Academy of Sciences.

GLOCHIDIA OF UNIO ON FISHES.

BY CHAS. H. CONNER.

A short time ago (Feb. 25, 1905), while hunting especially for fresh-water shrimps, I obtained some young minnows and sun-fish (*Eupomotis gibbosus*). Upon examination of the latter, I found several *Glochidia*, apparently of *Anodonta cataraeta* Say, clinging to the anal and caudal fins.

On Monday, Feb. 27th, I had the honor of submitting the specimens, *in situ* and intact, to Dr. Pilsbry and Mr. Vanatta, of the Academy of Natural Sciences, for verification, and they confirmed the discovery.

As no record of observed parasitism in America of *Glochidia* has been made in any scientific journal that I am aware of, it was a great pleasure to find them living, and confirm the observations made in Europe.

The fish were taken from the most eastern of the three connected ponds at Westville, N. J.

NOTES.

MARRATT AND THE CONCHOLOGIA ICONICA.—In the February NAUTILUS, p. 120, in the extract from "The Museums Journal," concerning the late F. P. Marratt, it is stated that he was the author of the monograph on *Oliva* in Reeve's "Conchologia Iconica." This is an error which might be corrected if you think it necessary.

When Lovell Reeve wrote that monograph in 1850, Marratt was unknown as a conchologist.

Of the "Conchologia Iconica" Reeve was author of Vols. I.—XIV., and as far as *Tornatella* in Vol. XV. The rest of that volume, commencing with *Pyramidella* to the end, and Vols. XVI.—XX. were the work of the late G. B. Sowerby.—EDGAR A. SMITH, British Museum (Natural History).

NOTE ON THE GENUS APOREMA DALL—This group, of which *Pholadonya arata* Verrill is the type was named in 1903. But I am informed that *Aporema* was used in 1890, by Scudder, for an insect, and the molluscan genus therefore requires a new name. I propose for it *Panacca*.—WM. H. DALL.

NOTE ON TRICHODINA ANCEY.—Inasmuch as the name *Trichodina*, proposed by Ancey in 1888 for an Achatinoid land shell (cf. Man. Conch. pt. 67, p. 182) was used in 1830 by Ehrenberg for a genus of Foraminifera, I would propose that it be replaced by *Petriola*.—WM. H. DALL.

THE GENUS VAUCHERIA PALLARY.—Mr. Pallary describes (Journ. de Conch. '04, p. 7.) a shell supposed to be that of a slug, under the name *Vaucheria tingitana*. M. Dautzenberg has recently received fresh specimens, which proved to be plates (the tergum) of *Pollicipes cornucopia*, a stalked barnacle of European seas. The supposed new genus therefore becomes a synonym of the Cirrhipede.

SNAILS IN SEPULCHRES.—While I was very recently conducting the exhuming of quite a number of Indian skeletons, within the corporate limits of Des Moines, Iowa, I found, very much to my surprise, several living specimens of *Zonitoides minusculus* (Binu.) and *Helicodiscus lineatus* (Say,) very snugly associating with the long dead and buried aborigines. They attracted my attention by being among some of the small white beads, which were about the same size and color. I would often pick up a shell for a bead. They were mingled with decayed fibrous roots, fragments of blankets etc., in among the bones, often in the crevices of broken and decayed bones. Everything was in a very advanced stage of decay, denoting in the neighborhood of seventy-five years' burial; the evidence showed that the bodies had been wrapped in blankets and buried in wooden boxes. In a number of instances the entire outfit, box and all, was reduced to a mere trace less than half an inch in thickness; others were two or three inches thick, and a few produced fairly well-preserved skeletons. All contained shells of the above-named species. The burials lay from eighteen inches to three and a half feet deep, in a very loose, fine, sandy, Pleistocene loam. If the snails were at home, as they apparently were, is not their association with dead mens' bones an unusual occurrence?—T. VAN HYNING, Supt. Mus. State Hist. Dept. Des Moines, Ia.

IN the last number of the Proceedings of the Malacological Society of London, Dr. von Ihering adds three new species to the genus *Tomigerus*, the first for many years.

A new species of Achatina, *A. morrelli*, is described by Mr. Preston, from the Zambesi river. It seems to be closely related to *A. capelloi*. Furtado—H. A. P.



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