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THE NAUTILUS

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THE NAUTILUS.

VOL. XVII.

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No. 1.

TO OUR READERS.

With the present issue, the *publication office* of THE NAUTILUS is changed from the Wagner Institute, Philadelphia, to the Boston Society of Natural History, Boston, Mass. This change is in consequence of the appointment of MR. JOHNSON, the Business Manager and Junior Editor, to the curatorship of the Boston Society. All subscriptions, advertisements and other business communications should hereafter be addressed to MR. JOHNSON, at the Boston Society; while MSS. for publication should be sent to DR. PILSBRY, at the Academy of Natural Sciences of Philadelphia. Books and papers for review may be sent to either or both of the editors.

^{Co}
MONTANA SHELLS -PYRAMIDULA STRIGOSA.

MORTON J. ELROD.

The various forms of *Pyramidula strigosa* give a series of exceedingly interesting and widely varied structure. The series found in western Montana shows plainly the result of different environment. The different forms of *strigosa* vary from the large shells along Flat-head Lake, measuring 24.34 mm. in diameter, to the very small specimens described below. On July 15, 1900, the ascent of Sinyaleamin mountain was made. At height of 8,500 feet an alpine variety was found among the loose rock. There was very little vegetation. No trees were near. They had been left 500 feet below. An occasional scrubby plant and the lichens of the rocks afford the food. Ten days

later an ascent was made of McDonald's Peak, fifteen miles further north in the range. At height of 7,500 feet a hunt was made for the shells, and the first were found at 7,800 feet, continuing until nearly 8,500, when the rocks were so large and so steep it was useless to search for them.

Finding specimens on the high slopes of two peaks in the same range, at about the same altitude in each case, seems to indicate that they are not found lower. At this altitude the summer is short. The months of June, July, August, with possibly a little of September, is the period of activity. Snow was not far from the specimens found. In one case, only a few feet from the shells was a large snow bank.

The slope on McDonald on which they were found lies to the west. The shells here would receive the sun early in the forenoon, and the last rays as the sun sank behind the hills would strike the ridge on which they were living. The conditions were much more favorable than on Sinyaleamin peak. The snow melts sooner, the ridge is broader with more pulverized rock and more vegetation. The absence of snow tempers the winds. The altitude is a few hundred feet lower, which might make a difference.

Search was made for an hour or more for the shells. A large shell vial was filled, a couple of dozen live ones being placed in a separate vial. Living specimens on both McDonald and Sinyaleamin peaks were proof that they live there at the present. The summit of McDonald is too rough and broken, without soil or vegetation, for shells to live. None were found.

As these shells show decided differences from any yet collected, they are here given as a separate variety, and description follows. They seem distinct enough to mark a separate species.

Pyramidula strigosa Gld., var. *alpina* n. var.

Shell small; brownish-gray, tending toward light horn color, in dead shells turning to pearly white; lustre somewhat silky; shell flat, little elevated; lines of growth, under hand lens, fine, an occasional increment of growth giving the appearance of sculpturing; suture well impressed, the periphery well rounded; aperture nearly circular, slightly obovate, somewhat higher than wide; markings as in *strigosa*, the upper band continuing in the spire, gradually disappearing; umbilicus medium, circular, deep, subcylindric.

Large diam., 7-10 mm., average of ten specimens, 8.91 mm.; greatest depth, 3-5 mm., average of ten, 4.34 mm.; aperture, 3.65-4.38 mm., average of eight, 3.99; whorls, 4-4.50 mm., average of ten, 4.26 mm.

Specimens taken at 8,500 feet, on Sinyaleamin mountain, Mission Range, Montana. Also taken on McDonald Peak, same range. Alt. 7,800 to 8,500. Types at the University of Montana.

The averages from the seven localities where shells have been collected show very conclusively the effect of altitude on the size of the shells. Increase in altitude diminishes the length of the season, the amount of heat received, the amount of food supply, and the chances of life. The result is to stunt or dwarf the animals attaining the heights. This is plainly shown in the sizes of shells at the different altitudes. As greater altitudes are reached, shells reduce in diameter, in depth, in the size of the aperture and in the number of whorls. Young specimens taken from the adults at Flathead Lake had shells with 2.25 to 2.50 whorls. If all the young at different altitudes start with the same number when born, the reduction of shell growth in spirals is easily deduced. The very significant observation is that a few hundred feet in altitude shows a corresponding reduction in size of the shells. The smallest shells are but three-eighths the diameter of the largest, one-third of the depth, have an aperture two-fifths as large, and have but two-thirds the number of whorls. The relative proportions of the largest, from Flathead Lake, to the smallest, on Sinyaleamin mountain, are seen from the following approximate ratios:

	Largest shells.	Smallest shells.
Large diam. to depth	11 to 7	14 to 7
Depth to width of aperture	28 to 22	20 to 22
Large diam. to aperture	23 to 11	21 to 11

This story, in brief, as brought out by study, is as follows: *Pyramidula strigosa*, var. *cooperi*, from some source got into the Flathead Lake region. At this altitude, 3,000 feet, it flourished and grew, but the slow-moving animals migrated. As they ascended the mountain sides, following the streams to the banks of the lakes, and then ascended the wooded slopes the difficulties in securing food for existence became more of a problem. The shorter season required more hardy animals. Stunting or accidental variation produced smaller individuals, which would not require so much food on account of the

reduced size. The ascent of the mountain continuing, the reduction in size became more pronounced, resulting in the specimens as found. The shells at high altitude are less than one-half the size in any dimensions, as a consequence being less than one-eighth in volume. Present collecting shows that all but the two extremes have been by some perchance killed, although later search may produce the intervening specimens. But in many places in the mountains of western Montana shells of medium size are found at from 5,000 feet to 6,000 feet or higher.

Pyramidula strigosa Gld., var. *Cooperi* W. G. B.

This species abounds along the banks of Flathead Lake and along the banks of lakes in the Mission mountains. At Sinyaleamin Lake, in this range, altitude about 3,800 feet, they were not uncommon, but could not be called abundant. Associated with it, but occurring in very small numbers, was *Polygyra townsendiana* Lea, var. *ptychophora* A. D. Br., and *Pyramidula solitaria* Say. At McDonald Lake, in the same range and fifteen miles further north, the species was abundant, in common again with the *Polygyra* and *P. solitaria* Say. Here some two quarts were secured by a day's search among the dead leaves and under decaying logs. To gather them was to crawl on hands and knees among the dense growth of small trees and underbrush, the interlacing dead branches being a constant hindrance as well as a menace to clothing. Many live ones were secured. A large series was gathered which had evidently been killed and eaten by squirrels. As the pine squirrel, *Sciurus richardsoni* Buck, was rather abundant; he is charged with the damage, though it is not unlikely the little chipmunk, *Tamias* sp., takes a part in the work. This collecting was in July, 1900.

The shells were generally opened at the apex of the spire, a large opening being made. An occasional shell was punctured at some other place, but not many. The enemy seems to have discovered how and where to strike in order to secure the meal with the least effort. *Pyramidula strigosa* var. *Cooperi* had the larger number of shells thus injured—fifty-four. Of *Pyramidula solitaria* fifty were found cut by animals, and but three of *Polygyra townsendiana* var. *ptychophora*. The two former were much more abundant, and *cooperi* more conspicuous than *solitaria*. *P. townsendiana* were quite difficult to find, and the small number of injured shells shows how

this affects their mortality through foes. Being of the same color as the decaying leaves and moss, and for the most part under logs and debris, they seem to escape their enemies more readily than the two species of *Pyramidula*.

Along the banks of the Flathead Lake, near the University of Montana Biological Station, this species was also found in rather large numbers. In July, 1899, numbers of shells were found containing young. While they were in colonies, yet the specimens were much scattered, and it required much care and search to find them. The search was usually made after a rain, which was the most suitable time for finding them, but at the same time the conditions made the work very disagreeable.

Pyramidula strigosa Gld., a small variety.

Shells entirely different from those mentioned in the preceding paragraph are found on most of the lower slopes of western Montana. They fit in between *cooperi* and *alpina*, but are not found associated with either variety. Nowhere does it seem abundant. The small size is probably due to the shortness of the season at which the animals can live. By July the hills and mountain slopes have become dry and parched, although in this month there are occasional light showers. Their dimensions, in millimeters, are as follows for ten specimens taken at 5,000 feet: Large diameter, 11.95 to 16.73, average 13.83; depth, 5.30 to 7.40, average 6.12; aperture, 4.72 to 6.67, average 5.57; number of whorls, 4.8 to 5.4, average 6.15.

Pyramidula strigosa Gld., var.

A series of shells was collected on the Tobacco Root range by Earl Douglass and E. H. Murray, which the writer has examined. Another series was taken by Prin. P. M. Silloway, of Lewistown, Fergus county. These are the only collections of *strigosa* made in the State east of the Rocky Mountains, so far as the writer knows. They are immediately recognized as differing from those west of the divide. The sculpturing is coarser and they look thicker and more earthy. They are decidedly greater in depth than those found on the higher slopes west of the divide. They differ in these particulars also from the high altitude form *alpina*. In general shape they are much like *cooperi*, but very much smaller. The dimensions in mm., average of ten specimens, are as follows: From Tobacco Root mountains, altitude 7,000 feet. Large diameter, 15.21; depth, 9.30; aperture, 7.06;

whorls, 5.05. From Lewistown, altitude 4,792 feet. Large diameter, 16.80; depth, 11.78; aperture, 7.66; number of whorls, 5.28.

From the above it will be seen that the specimens at higher altitude are diminished in size, as also in the number of whorls in the shell, as is the case of those west of the main range.

The following table of comparisons of ten average specimens will give a better idea of the differences than can be given in any other way:

	Altitude.	Large Diam.	Depth.	Aperture.	No. whorls.
Flathead Lake	3,000	23.12	13.96	10.85	6.01
McDonald Lake	3,300	22.16	12.98	10.66	5.99
Sinyaleamin Lake . . .	3,800	21.82	12.28	10.24	5.75
Lewistown	4,792	16.80	11.78	7.66	5.28
Mt. Lo Lo	5,000	13.83	6.12	5.57	5.15
Tobacco Root Mts. . .	7,000	15.21	9.30	7.06	5.05
McDonald Peak	7,800	10.17	4.79	4.25	4.47
Sinyaleamin Peak . . .	8,500	8.91	4.34	3.99	4.26

In examining the preceding table, it will be remembered that the specimens from Lewistown and the Tobacco Root mountains were taken east of the continental divide, all the others from the west slope. The series ranges from 3,300 to 8,500 feet altitude. There is a gradual diminution in each measurement, the smallest and highest specimens showing about one-third the dimensions of the lowest and largest, with the whorls diminished almost two, or nearly one-third.

The two collections from the east side of the range show the same reduction, but the series is much smaller. I thought there was an error in the altitude of those from the Tobacco Root range, but as Mr. Douglass insists there is not, it appears that conditions there must differ from those prevailing elsewhere in the State.

WRITINGS OF JAMES G. COOPER, M. D., ON CONCHOLOGY AND PALAEO-
ONTOLOGY, WITH LIST OF SPECIES DESCRIBED BY HIM.

COMPILED BY WILLIAM J. RAYMOND.

Abbreviations: Proceedings of the California Academy of Sciences, first series: Pr. C. A. S.; second series, Pr. C. A. S. (2).

Bulletin of the California Academy of Sciences : Bull. C. A. S.
American Naturalist : Am. Nat.

American Journal of Conchology : Am. J. Conch.

An asterisk denotes that the species was discovered by Dr. Cooper. In addition to the species named in this list, more than eighty were discovered by Dr. Cooper and described by Newcomb, Carpenter and Gabb in 1863 and 1864.

1. Report of Explorations and Surveys for a Railroad to the Pacific Coast, Washington, 1860, XII, Part 2. Report upon the Mollusca Collected on the Survey, by William Cooper, with notes by J. G. Cooper, pp. 369-386. Also published in The Natural History of Washington Territory, by J. G. Cooper, M. D., and Dr. G. Suckley, U. S. A., 4to, pp. xiv, 497, New York, 1859.

**Chrysodomus middendorffi* n. sp. (William Cooper).

**Nassa gibbsii* n. sp.

**Ancylus caurinus* n. sp.? (No description.)

**Planorbis planulatus* n. sp.

Also Pac. Railroad Rep., I, 219-221, 1855, Natural History Report. Incidental references to Mollusca.

2. Notice of Land and Freshwater Shells collected by Dr. J. G. Cooper in the Rocky Mountains, etc., in 1860. By T. Bland and J. G. Cooper, Ann. Lyc. Nat. Hist. N. Y., VII, 1-9, Pl. IV, 1861.

**Helix mullani* n. sp.

**Helix polygyrella* n. sp.

3. On some New Genera and Species of California Mollusca. Pr. C. A. S. II, 202-207. 1863.

Strategus n. gen.

**Pleurophyllidia californica* n. sp.

**Strategus inermis* n. sp,

**Doris montereyensis* n. sp.

**Æolis opalescens* n. sp.

**Doris sanguinea* n. sp.

**Æolis iodinea* n. sp.

**Doris alabastrina* n. sp.

**Tritonia palmeri* n. sp.

**Doris sandiegensis* n. sp.

4. *Strategus* (preoccupied) changed to *Navarchus*. Pr. C. A. S., III, 8.

5. On New or Rare Mollusca Inhabiting the Coast of California. Pr. C. A. S., III, 56-60, fig. 14. 1863.

Neaplysia n. subgen.

**Triopa catalinæ* n. sp.

**Aplysia californica* n. sp.

**Dendronotus iris* n. sp.

**Doris albopunctata* n. sp.

**Æolis barbarentis* n. sp.

6. On the New Genus of Terrestrial Mollusca Inhabiting California. Pr. C. A. S., III, 62-63, fig. 15. 1863.

**Binneya notabilis* n. gen., n. sp.

7. Descriptions of New Species of Marine Shells from the Coast of California, by Wm. M. Gabb. Pr. C. A. S., III, 1865. Described by Dr. Cooper, page 188.

**Gadinia (Rowellia) radiata* n. subgen., n. sp.

8. Description of a New California Helix, with notes on others already described. Pr. C. A. S., III, 259-261. 1866.

**Helix sequoicola* n. sp.

9. On a New Species of Pedipes Inhabiting the Coast of California. Pr. C. A. S., III, 294-5, fig. 29. 1866.

**Pedipes unisulcata* n. sp.

10. The West Coast Helicoid Land Shells. Pr. C. A. S., III, 331-9. A synopsis of 55 species.

11. Geographical Catalogue of the Mollusca found west of the Rocky Mountains, between 33° and 49° north latitude. Pamph. 4to, 40 pages. San Francisco, 1867. 795 species named, with geographical range.

12. Cronise's Natural Wealth of California. San Francisco, 1868. Chapter on Zoology by J. G. Cooper, M. D. 55 species of Mollusca, mainly edible, pages 499-501.

13. The Fauna of Montana Territory. Papers in six issues of Am. Nat. on Mammals, Birds, Reptiles, Fishes; and the Shells of Montana, vol. II, 486-7. 1868-9. 24 species enumerated, with notes.

14. On a New Californian Terrestrial Mollusc. Am. J. Conch., IV, 209, 210, Pl. 18, figs. 1-3. 1869.

Ammonitella yatesii n. gen., n. sp.

15. On the Distribution and Localities of West Coast Helicoid Land Shells, &c. Am. J. Conch., IV, 211-240. 1869.

16. Notes on the Fauna of the Upper Missouri. Am. Nat., III, 294-9. 1869. Includes list of 7 Mollusca.

17. The Naturalist in California. Am. Nat., III, 182-9 and 470-481. Incidental references to the Mollusca. 1869.

18. The West Coast Fresh-Water Univalves, No. 1. Pr. C. A. S., IV, 93-101. A synopsis of 43 pulmonate species. 1870.

**Ancylus caurinus* W. Cp. is here described. See No. 1.

**Planorbis occidentalis* n. sp.

19. On a New Californian Helicoid Land Shell. Am. J. Conch., V, 196-7, Pl. 17, fig. 8. 1870.

Daedalochila harfordiana n. sp.

20. Notes on West Coast Land Shells, No. II. Am. J. Conch., V, 199-219. 1870. Additions to paper No. 15, with classification of the Helices of the West Coast.

21. Notes on Mollusca of Monterey Bay, California. Am. J. Conch., VI, 42-70. 1870. A list of 197 species, with notes.

22. Additions and Corrections to the Catalogue of Monterey Mollusca. Am. J. Conch., VI, 321-2.

23. Note on *Gadinia* and *Rowellia*. Am. J. Conch., VI, 319, 320.

24. Note on *Waldheimia pulvinata* Gld. Am. J. Conch., VI, 320.

25. Monterey in the Dry Season. Am. Nat., IV, 756-8. References to the Mollusca.

26. Catalogue of the Invertebrate Fossils of the Western Slope of the United States. Part II. San Francisco, 1871. 30 pages. Intended merely as a check-list and for labels, supplementing the Geographical Catalogue of 1867.

27. On Shells of the West Slope of North America. No. 1. Pr. C. A. S., IV, 150-6, notes on 51 species; No. II, IV, 171-5, notes on 34 species.

28. On New Californian Pulmonata, etc. Proc. Acad. Nat. Sci., Phila., 1872, 143-154, Pl. 3.

**Limax (Amalia) hewstoni* n. sp. **Assimineea californica* n. sp.

**Limax campestris* Binney, var. **Alexia setifer* n. sp.

occidentalis n. var.

**Arion?* *andersoni* n. sp.

**Ariolimax californicus* n. sp.

**Lysinoe diabloensis* n. sp.

**Ariolimax niger* n. sp.

29. On the Law of Variation in the Banded California Land Shells. Pr. C. A. S., V., 121-5, Pl. VII, VIII. 1873.

30. Note on *Alexia setifer* and its Allies. Pr. C. A. S., V., 172. 1873.

31. California During the Pliocene Epoch; in the Miocene Epoch; The Eocene Epoch in California; Note on Tertiary Formation of California. Pr. C. A. S., V, 389-392, 401-404, 419-421, 422. 1874.

32. The Origin of California Land Shells. Pr. C. A. S., VI, 12-14. 1875.

33. On Shells of the West Slope of North America. No. III. Pr. C. A. S., VI, 14-27. 1875. Notes on about 75 species. See No. 27.

34. The Age of the Tejon Group, California. Am. Jour. Sci., 3d ser., vol. 14, 321-2. 1877. From Pr. C. A. S., Nov., 1874.

35. Notes on Some Land Shells of the Pacific Slope. Proc. Am. Phil. Soc., XVIII, 282-288. 1879. Notes on about 30 species.

36. On Fossil and Sub-Fossil Land Shells of the United States, with Notes on Living Species. Bull. C. A. S., I, No. 4, 235-255. 1885.

37. West Coast Pulmonata; Fossil and Living. Bull. C. A. S., II, No. 7, 355-376 and map; Bull. C. A. S., II, No. 8, 497-514; Pr. C. A. S. (2), I, 11-24. 1887.

38. Catalogue of Californian Fossils. Cal. State Mining Bureau, 7th Ann. Rep. State Mineralogist, 221-308. 879 species of Mollusca, with geographical range of those in the list now living. 1888.

39. Fresh-Water Mollusca of San Francisco County. Zoe, I, 196-7. 1890.

40. The Value of Fossils as Indications of Important Mineral Products. 9th Ann. Rep. State Mineralogist, 284-6. 1890.

41. Notes on the Subalpine Mollusca of the Sierra Nevada, near lat. 38° (with Plate I), by W. J. Raymond. Additional Notes and Descriptions of New Species by J. G. Cooper, M. D. Pr. C. A. S. (2), III, 61-69 and 70-91. 1890.

Primella n. subgen. (of *Sphærium*).

Sphærium raymondi n. sp.

Ancylus caurinus W. Cp., var. *subalpinus* n. var.

Planorbis subcrenatus Cpr., var. *disjectus* n. var.

42. On Land and Fresh-Water Shells of Lower California. No. 1. Pr. C. A. S. (2), III; 99-103. 1891.

Bulimulus inscendens W. G. B., subsp. *bryanti* n. subsp.

Rhodea californica Pf., subsp.? *ramentosa* n. subsp.

43. The same, No. 2. Pr. C. A. S. (2), III, 207-217. 1892.

Bulimulus inscendens W. G. B., var. *beldingi* n. var.

Bulimulus sufflatus Gld., var. *insularis* n. var.

Columna ramentosa J. G. C. replaces *Rhodea* subsp. *ramentosa*.

Columna ramentosa J. G. C., var. *abbreviata* n. var.

Helix areolata Pf., var. *exanimata* n. var.

44. The same, No. 3. Pr. C. A. S. (2), III, 338-344, Pl. XIII, XIV. 1893. Fuller descriptions and figures of species named in 1 and 2.

Melaniella? eiseniana n. sp.

Planorbis anitensis n. sp.

Planorbis peninsularis n. sp.

Helicodiscus lineatus Say, *sonorensis* n. subsp.

45. The same, No. 4. Pr. C. A. S. (2), IV, 130-143, Pl. V, VI. 1894.

Bulimulus (pallidior?) vegetus Gld., var. *vegerspiza* n. var.

Melaniella tastensis n. sp.

46. The same, No. 5. Pr. C. A. S. (2), V, 163-5. 1895.

Bulimulus decipiens n. sp.

Pliocolumna n. gen.

47. Catalogue of the Land and Fresh-Water Mollusca of Lower California. Zoe, III, 12-25. 1892.

48. Catalogue of Californian Fossils. Bull. No. 4, Cal. State Mining Bureau, 65 pages and Pl. I-VI. 1894. See No. 38.

Part II. Bibliography and References. Includes many titles of papers on Recent Shells. Part III. Additions to the Catalogue of Californian Fossils Obtained since 1888. Part IV. Remarks on Fossils Collected by Dr. S. Bowers. Part V. Descriptions and Figures of New Species. Thirty-seven new species Cretaceous and Cretaceous B (or Eocene). See p. 7.

49. Catalogue of West North American and Many Foreign Shells. Printed for the State Mining Bureau. Also a complete list of Mollusca known to inhabit the West Coast of North America, from Sitka, Alaska, to Cape St. Lucas, and inland to the Rocky Mountains, north of Mexico. 1894.

50. On Some Pliocene Fresh-Water Fossils of California. Pr. C. A. S. (2), IV, 166-172, Pl. XIV. 1894.

Margaritana subangulata n. sp.

51. Catalogue of Marine Shells, collected chiefly on the eastern shore of Lower California. Pr. C. A. S. (2), V, 34-48. 1895. List of 191 species.

52. On West Mexican Land and Fresh-Water Mollusca. Pr. C. A. S. (2), V, 166-9. 1895. Seventeen species and varieties.

53. On Some New Cretaceous (and Eocene?) Mollusca of California. Pr. C. A. S. (2), VI, 330-337, Pl. XLVII, XLVIII. 1896.

Sistrum cretaceum n. sp.

Triplicosta n. subgen.

Littorina subobesa n. sp.

Pholadomya (Triplicosta) pro-

Calliostoma lignitica n. sp.

gressiva n. sp.

Sigaretus costotus n. sp.

No. 48. Bull. 4, Cal. State Mining Bureau. Cretaceous and Eocene species :

<i>Terebra wattsiana</i> n. sp.	<i>Fusus supraplanus</i> n. sp.
<i>Surcula crenatospira</i> n. sp.	<i>Mitra simplicissima</i> n. sp.
<i>Surcula monilifera</i> n. sp.	<i>Stomatia intermedia</i> n. sp.
<i>Surcula inconstans</i> n. sp.	<i>Calliostoma kempiana</i> n. sp.
<i>Pleurotoma perkinsiana</i> n. sp.	<i>Tornatella normalis</i> n. sp.
<i>Pleurotoma decipiens</i> n. sp.	<i>Bulla assimilata</i> n. sp.
<i>Drillia ullreyana</i> n. sp.	<i>Tornatina erratica</i> n. sp.
<i>Mangilia suturalis</i> n. sp.	<i>Siphonaria capuloides</i> n. sp.
<i>Cordiera gracillima</i> n. sp.	<i>Astarte semidentata</i> n. sp.
<i>Cancellaria irelaniana</i> n. sp.	<i>Crassatella lomana</i> n. sp.
<i>Ancilla (Oliverato) californica</i> n. subgen., n. sp.	<i>Cucullæa bowersiana</i> n. sp.
<i>Bitium longissimum</i> n. sp.	<i>Corbula triangulata</i> n. sp.
<i>Cerithium fairbanksi</i> n. sp.	<i>Mytilus dichotomus</i> n. sp.
<i>Potamides carbonicola</i> n. sp.	<i>Crenella santana</i> n. sp.
<i>Potamides davisiana</i> n. sp.	<i>Megerlia dubitanda</i> n. sp.
	<i>Waldheimia imbricata</i> n. sp.

Miocene and Pliocene species :

<i>Agasoma barkerianum</i> n. sp.	<i>Anodonta (nuttalliana) lignitica</i> n. var.
<i>Trophosycon kernianum</i> n. sp.	
<i>Limnæa contracosta</i> n. sp.	<i>Amnicola yatesiana</i> n. sp.
<i>Planorbis pabloanus</i> n. sp.	

GENERAL NOTES.

A NEW BRITISH VITREA.—In the last (April) number of the *Journal of Conchology*, Mr. B. B. Woodward describes a new *Vitrea* from Cheshire, *v. rogersi*. It stands near *v. alliaria* and *v. helvetica*, and has been identified also as *v. glabra*. It is named for the late Mr. T. Rogers of Manchester, who first (1870) found British specimens.

ERRATA.—Owing to the absence of both editors from Philadelphia during the printing of the April number, some typographical errors escaped correction on the proofs. On p. 136, 4th line, the first word should be *Hiezian*. In the second paragraph on p. 137, the second word should be *largillerti*, and the 16th line from bottom of same page should begin with a capital M. On p. 139 the term *Pelecypods* is misspelled. There are also some other like errors.



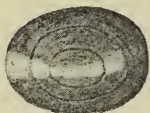
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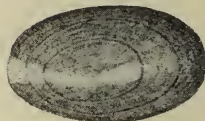
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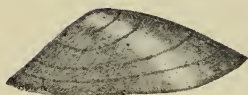
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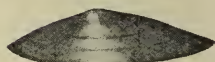
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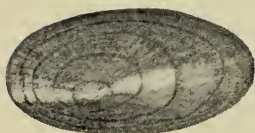
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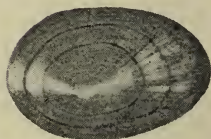
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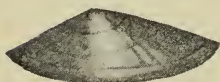
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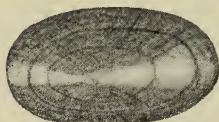
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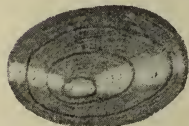
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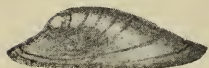
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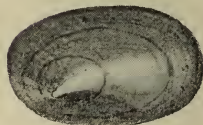
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THE NAUTILUS.

VOL. XVII.

JUNE, 1903.

No. 2.

^{Col.}
NOTES ON EASTERN AMERICAN ANCYLI.

BY BRYANT WALKER.

An attempt to determine the *Ancyli* of Michigan leads necessarily to a critical study of all the species described from the States east of the Mississippi. The following notes embody the results of the investigation, and are published in the hope of stimulating a more active interest in this most perplexing and little understood group.

The amount of material examined has been considerable. In addition to that in my own collection, which includes the Jas. Lewis, DeCamp and Lothrop collections, I have had the entire collections of Dr. V. Sterki, Dr. R. J. Kirkland, A. A. Hinkley, Jas. H. Ferriss and Geo. H. Clapp, and through the kindness of Dr. Pilsbry a suite of seventy-three trays from the collection of the Philadelphia Academy of Natural Sciences. I am also indebted to Dr. Pilsbry for examining the type of *Ancylus haldemani*, which corrected my previous conception of that species, and established the validity of the species described as *A. kirklandi*. I am also under obligations to Messrs. Frank C. Baker and Henry Hemphill for valuable material.

The lack of authentic examples of many of the rarer species has been a source of great embarrassment. But by process of elimination and careful study of the original descriptions, it is believed that in most cases the difficulty has been successfully overcome.

In studying the *Ancyli* well cleaned specimens are the prime requisite. They can then be easily separated in the two sections

characterized by the smooth or striate apex. In differentiating the species in these groups, the shape and contour of the shell are the main elements to be relied upon, the sculpture of the surface being an exceedingly variable factor, which, by itself, cannot in most cases be considered a specific character. As in all fresh-water forms, a very large degree of variation must be allowed for. But in spite of this, it is believed that nearly all the described species should be allowed to stand, and, although in certain instances it is not always possible to determine the exact specific relations of particular specimens, yet, as a rule, the lines between the different forms can be drawn with a reasonably satisfactory degree of certainty.

Bourguignat, in his "Notice sur le genre *Ancylus*," in 1853 (J. de C. IV., p. 63), divided the genus into two subgenera: *Ancylastrum*, with the apex inclined to the right, and *Velletia*, with the apex inclined to the left.

Clessin (1882), in the *Conchlien Cabinet*, considered these two groups to have only a sectional value. He also restricted *Ancylastrum* to the Eurasian species which group around *A. fluviatilis*; and with the exception of *A. fragilis* and *oregonensis*, which he referred to *Velletia*, and the large western *A. newberryi* and *patelloides*, which he placed in a new genus, *Lanx*, included all the North American species in a separate group, *Haldemania*, which he characterized as follows: "Shell conical, apex not bent backwards and only slightly removed from the centre-line of the shell, aperture round or oval. Type *A. obscurus* Hald."

Unfortunately *Haldemania* is preoccupied, having been used by Tryon in 1862 (*Proc. P. A. N. S.*, 1862, p. 95) for the group of *Viviparidæ* now known as *Lioplax*, so that his very appropriate name cannot be retained.

As has already been shown (*NAUTILUS*, XVI., p. 85), the North American species included in Clessin's *Haldemania* are divided into two natural groups, characterized by the presence or absence of apical sculpture. These groups are, at least, of sectional value, and must be recognized.

Owing to the uncertainty which still prevails as to just what Haldeman's *obscurus* really is, and the consequent inability to say with accuracy to which group that species belongs, it does not appear desirable to retain *obscurus* as the type of either section. Whenever an examination of Haldeman's type shall definitely determine where

the species belongs, *Haldemania* can be written as a synonym of that group. Until this is done, the matter must rest in abeyance.

Leaving the position of the western species, which are outside the scope of this paper, for future consideration, I propose to divide the eastern American species of *Ancylus* into two sections, characterized as follows :

1st. *Lævapex*, sec. nov.

Shell usually depressed, apex obtuse or sub-acute, smooth. Type : *A. fuscus* Ads.

2. *Ferrissia*, sec. nov.

Shell usually elevated, apex acute, radially striate. Type : *A. rivularis* Say.

Section Lævapex.

This section includes all the larger species of *Ancylus*, which are characteristic of the lakes and slow-flowing streams of the northern States, the Mississippi Valley and Florida. They are usually found on the reeds, dead leaves and submerged timber in such localities, and are rarely, if at all, found on stones, dead shells, etc., in rapidly flowing streams, where they are replaced by the species of the section *Ferrissia*. With the exception of *A. diaphanus* and, possibly, *A. obscurus*, the species of this group seem to be wholly lacking in the mountain streams of the Appalachian region between the Ohio river and Florida.

I. ANCYLUS FUSCUS Adams (1840). Pl. I., figs. 1-9.

Adams' description calls for a large depressed, elliptical shell, moderately curved at the sides, with a moderately prominent, obtuse apex, slightly behind and to the right of the middle ; $7\frac{3}{4}$ mm. long, $4\frac{1}{2}$ wide and $1\frac{1}{4}$ high. No mention is made of the outline of the slopes. Haldeman states that all these are rectilinear, while Gould describes the shell as regularly convex. None of these authors refer to the surface sculpture. But subsequent writers have assumed that the surface was smooth.

Specimens answering these requirements are common, and show that the species has an extensive range from Massachusetts west, at least, to the Mississippi Valley and south to New Orleans. I have not seen any specimens from Kentucky, Tennessee, the South Atlantic or the Gulf States east of Louisiana.

The very limited amount of material examined from Massachu-

sets, none of which is typical in size, does not show any considerable variation in the contours of the shell. But in the west, where it is an abundant species, there is considerable variation in this respect.

In 1896 (NAUTILUS, IX., p. 139), Dr. Pilsbry described a shell similar in shape, though narrower and higher, with the surface ornamented with "very fine, somewhat irregular, radial striæ, more distinct toward the periphery" as *A. eugraptus*.

The large amount of material examined has forced me to the conclusion that *eugraptus* is only a ribbed form of *fuscus*. In almost every considerable number of specimens, all the variations can be found from those with a smooth surface, through those with the surface more or less radially rippled, to those with the fine ribs of typical *eugraptus*. This variation in the sculpture is not confined to the western specimens. In two sets of *A. fuscus* from Winchester, Mass., in different collections, which, so far as shape and contour is concerned, are entirely typical, the surface varies from the typical smooth *fuscus* to examples with as well developed ribs as the majority of the western *eugraptus*. Nor are the western specimens of *eugraptus* uniformly higher and narrower than the typical eastern examples of *fuscus*. While, perhaps, they average higher than the eastern specimens, they vary insensibly from the depressed form of typical *fuscus* to elevated specimens higher than the typical *eugraptus*, so that I have not seen my way clear to separate the eastern from the western form on any substantial difference in shape.

Assuming the Massachusetts form to be typical *fuscus*, it may be described as a depressed, oval or slightly obovate shell, with the left side more arcuate than the right; anterior and right slopes straight, posterior and left slopes slightly convex; apex very obtuse, not rising above the general outline of the shell, smooth, slightly behind and to the right of the middle. Translucent horn-color, shining. Surface with faint growth lines, otherwise smooth or with irregular and discontinuous transverse ripples which tend to form irregular radial riblets.

From central New York to the west there appears to be a much greater degree of variation. The shells tend to become narrower and more elevated, and with a greater convexity to the left slope. But throughout the peculiar, rounded, obtuse apex remains as a valuable specific characteristic in differentiating it from *A. kirklandi*, *diaphanus* and *obscurus*.

One peculiar form can, I think, be traced directly to the habitat of the animal. In nearly every lot of western shells are to be found a number of specimens, very narrow and elongated, with both of the lateral sides decidedly convex and with the sides nearly parallel. When placed on a flat surface the shell rests on the middle of the side and the ends are elevated and arched, giving a trough-shaped appearance to the shell, when placed apex downward. Now, *fuscus* is a dweller upon reeds and other aquatic vegetation. When it lives on the flat side of a reed or leaf it grows normal in shape and the peritreme touches the surface all the way around. But when it lives on a round reed such as *Scirpus lacustris*, which is narrower than the full grown shell, it adapts itself to its position and grows to fit the reed, the ends following the convex surface of its support and the sides lapping down around the reed itself.

The dimensions of the specimens figured are as follows :

Fig. 1. Length 5.5, width 4, alt. 1.25 mm.

Fig. 4. Length 7.25 width 4.5, alt. 1.75 mm.

Fig. 37. Length 8.25, width 4.5, alt. 3 mm.

Variable within the limits above specified, nevertheless, *A. fuscus* is a consistent and well defined species, which need not be confused with any of its allies. It differs from *A. kirklandi* by its more depressed and more regularly oval shape and more nearly central, more obtuse, less prominent and less eccentric apex; from *A. diaphanus* by its elongated, oval shape and more obtuse apex and from *A. obscurus* by its more depressed, less acute and more central apex and straight posterior outline.

Var. *eugraptus* Pilsbry (1896), Pl. I., figs. 10–15.

Typically slightly narrower and considerably higher than the typical *fuscus*, but subject to great variation in this respect. Figures 10–12 from New Orleans and 13–15 from Reeds L., Kent Co., Mich., represent the extremes. Surface with “very fine, somewhat irregular radial striæ, more distinct toward the periphery.”

Type: length 6, width 4, alt. 1.8 mm.

Fig. 10. Length 7, width 4.75, alt. 1.8 mm.

Fig. 13. Length 7.25, width 4.25, alt. 2.25 mm.

II. ANCYLUS DIAPHANUS Hald. (1841). Pl. II., figs. 13–18.

This is a well marked species and, in all the localities where the typical form is found, seems to be very constant in its characters and

subject to less variations than many of the other species. For this reason I hesitate to refer to it the more elliptical forms from the western States, which are usually referred to it, but which seem to me rather referable to *A. kirklandi*, and until a larger amount of material shall have demonstrated the identity of these shells with the typical form, prefer to restrict the species to the author's type, "distinguished by its circular and flattened form and central inconspicuous apex." As thus limited, it is found in the Delaware river at Easton, Pa., the Ohio river at Pittsburg and Edgeworth, Pa., the Illinois river, the Tennessee river at Knoxville, Tenn., and the Holston river, Tenn. The specimens from the last locality are those quoted without identification by Lewis in his paper "On the Shells of the Holston River" (A. J. of C., VI., p. 222), and later referred to "*haldemani*?" (Proc. P. A. N. S., 1872, p. 110). Haldeman's description, though brief, is quite to the point, and leaves little to be added. It may be said, however, that the apex is smooth, the surface smooth or delicately shagreened with fine transverse ripples, which in none of the specimens examined become sufficiently raised or connected to be called ribs; the anterior and left slopes are slightly convex, the posterior and right nearly straight; the left side is usually more arcuate than the right and often decidedly so, the general shape, however, even then remaining subcircular. There is some little variation in height as shown by the figures, and, in the more elevated examples, the shell is less circular, the anterior and left slopes become more decidedly convex and the apex rather less central, being, as it were, tipped backward by the more rapid growth and greater convexity of the anterior portion of the shell. The largest examples seen are from the Ohio river at Edgeworth, Pa., collected by Mr. George H. Clapp. Those from the Holston and Tennessee rivers are decidedly smaller, the example measured from the Holston being exactly typical in size.

Fig. 13. Length 7, width 5.5, alt. 2 mm.

Fig. 16. Length 7.5, width 5.5, alt. 2.5 mm.

Holston River. Length 5.5, width 4.5, alt. 2 mm.

Tennessee River. Length 5, width 4, alt. 2.

Explanation of Plate I.

All the figures are drawn on the same scale. The outline figures are transverse sections through the apex or point of greatest altitude.

Figs. 1-3. *A. fuscus* Ads., Winchester, Mass.

Figs. 4-6. *A. fuscus* Ads., Grand River, Kent Co., Mich.

Figs. 7-9. *A. fuscus* Ads., Black Lake, Ottawa Co., Mich.

Figs. 10-12. *A. fuscus eugraptus* Pils., New Orleans, La.

Figs. 13-15. *A. fuscus eugraptus* Pils., Reeds L., Kent Co., Mich.

Figs. 16-18. *A. obscurus* Hald., Volusia Co., Fla.

Figs. 19-21. *A. excentricus* Mor., Barton Creek, Travis Co., Tex.

(To be Continued.)

TWO NEW SPECIES OF EOCENE FOSSILS FROM THE LIGNITIC OF ALABAMA.

BY T. H. ALDRICH.

UMBRACULUM (EOSINICA) ELEVATUM n. sp. Fig. 1.

Shell small, outline ovate, depressed conic, substance rather thin, apex partially immersed, pointed backwards to the left. Surface of shell with numerous radiating folds, strongest at the margin, gradually becoming weaker and dying out some little distance from the apex, a few concentric striæ or growth lines showing one-fourth the distance down from the apex; interior smooth, polished, rather pearly, the apical point marked by a rounded pearly protuberance; interior margin fluted. Longest diameter, 18 mm., width 12 mm., height 5 mm.

Locality. Wood's Bluff, Ala., lignitic stage.

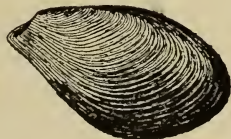
The type is in the State Museum. This shell resembles a limpet,

FIG. 1.



UMBRACULUM ELEVATUM.

FIG. 2.



GASTROCHÆNA STRIATULA.

and has some of the characters of *Tylodina* Raf., but I consider it an *Umraculum* somewhat like *U. plicatum* Martens from Cuba. The interior of our species is very different. It should be placed in a

new subgenus, *EOSINICA*, which may be described as ovate-conic, radially ridged, interior smooth, terminating in a rounded protuberance and interior margin generally crenulated.

GASTROCHÆNA STRIATULA n. sp. Fig. 2.

Shell small, substance thin, ventral opening large, ovate anteriorly and pointed at posterior with its margin turned outward towards the anterior end of shell. The shell is pointed anteriorly, rounded posteriorly with surface closely concentrically striated. Widest part of valve 6 mm., length 10 mm.

Locality. Wood's Bluff, Ala. This specimen was found imbedded in a coral, and unfortunately was broken. The cavity is rounded and smooth. It is rather wider and shorter than usual in this genus.

Part of type in my collection, balance in State Museum.

NEW PISIDIA.

BY V. STERKI.

Pisidium ohioense n. sp.

Mussel minute, equipartite, well inflated, elliptical in outline; beaks in the middle, rather broad, rounded, prominent over the hinge line; superior margin little curved or almost straight, with slightly marked, rounded angles at the scutum and scutellum; the other margins rounded or the posterior subtruncate; surface somewhat shining, horn colored, very finely and irregularly striate, usually with a few coarser lines of growth; shell thin, translucent; nacre glassy-transparent, muscle insertions slightly marked; hinge fine, plate narrow, cardinal teeth fine, lamellar, the right slightly curved, abruptly thickened and bifid at the posterior end, the left anterior longitudinal, almost straight, the posterior slightly oblique or longitudinal and parallel with the anterior and extending to over about its middle; lateral teeth comparatively stout, their cusps pointed, the outer ones of the right valve small but well formed; ligament rather stout.

Size: Long 2.5, alt. 2-2.1, diam. 1.5 mill.

Long 2, alt. 1.6-1.7, diam. 1.2-1.4 mill.

Long 1.8, alt. 1.5, diam. 1.3.

Young: Long 1, alt. 0.8, diam. 0.3 mill.

Habitat : A pond near Garrettsville, Portage Co., Ohio ; a brook near Indian mounds, and a very small stream, Kent Co., Michigan.

In December, 1901, Mr. Geo. J. Streator collected several hundred specimens, most of them immature and young. They were regarded as a new species and named, but not published, waiting for more materials. Since then Dr. R. J. Kirkland has secured over three hundred specimens from the first named place in Michigan, and half a dozen from the latter. Last March Mr. Streator has again found a number of examples at Garrettsville, O. Most of the specimens were incrustated with a ferruginous or blackish coating, sometimes very thick.

This *Pisidium* is remarkable for the position of the beaks, which are not posterior, a feature also found with *Pis. medianum*. The species is somewhat variable in regard to size and shape ; the largest specimen seen was 2.7 mill. long, and moderately inflated. There is a more different form, found among the Ohio and Michigan specimens, averaging smaller, 1.7–2.0 mill. long, comparatively shorter, well inflated, with the anterior part a trifle longer than the posterior, the anterior end subangular, the supero-anterior slope being slightly marked, and the color is somewhat lighter.

In one specimen of the more typical form from Michigan, the beaks are low, flattened on top, or rather impressed, and with concentric, elevated ridges around the flattened areas, somewhat like those of *Pis. ferrugineum* Pr.

Pis. mainense n. sp.

Published as *Pis. walkeri* St. var. *mainense* St. in the NAUTILUS, XII., p. 79. Since then numerous specimens were collected in Michigan by Dr. R. J. Kirkland from Reed Lake, Green Lake, Pine Island Lake and Little Bostwick Lake, and proved distinct from *P. walkeri*, which is widely distributed and fairly constant. *Pis. mainense* is considerably smaller, less elongate, less oblique, the anterior and posterior parts are less disproportionate in size. The hinge is of rather the same character as that of *walkeri*, but in the specimens examined from both Maine and Michigan, the left anterior cardinal tooth is rather longer, and the cusps of the laterals are more abrupt, especially so in the left valve.

Size : Long 3, alt. 2.6, diam. 2.

Long 3.5, alt. 3, diam. 2.3.

Long 3.7, alt. 3.1, diam 2.2 (L. Bostwick Lake).

The original specimens had been collected at several places in Aroostook Co., Me., by Mr. Olaf O. Nylander.

Pis. costatum n. sp. (fossil).

Mussel small, somewhat oblique, strongly inflated, with three or four concentric, prominent ridges on each valve; beaks rather posterior, large, much projecting over the hinge margin, flattened on top with a sharp, prominent concentric ridge around the flattened part; outline of the valves rather oval or ovoid, with the supero-anterior slope somewhat less curved, the anterior end subangular and the posterior end subtruncate; surface with fine, irregular striæ and lines of growth between the ridges; shell rather thin; hinge rather short, stout and compact, plate moderately broad, and short, cardinal teeth well formed, the right slightly curved, thicker at the posterior end, the left anterior large, almost straight, ascending obliquely and the lamella strongly curved up, its posterior part projecting over the inferior edge of the plate; the posterior rather parallel with the anterior and extending over about two-thirds of the latter; lateral teeth close to the cardinals and the ligament, short, those of the right valve stout, pointed, the outer ones very slight, especially so the anterior, the grooves short and deep, the left laterals moderately stout, high, pointed; ligament short and strong.

Size: Long 2.5, alt. 2.1 (with the beaks), diam. 2.3 mill.

Fossil in a marl bed at Monitor, Bay Co., Michigan, in company with other *Pisidia*, collected and sent for examination by Mr. Bryant Walker.

This species seems to stand near *Pis. ventricosum* Pr., but its beaks are less posterior, and the outlines are rather different. It also resembles *P. scholtzii* Cless. as described and figured, with the flattened beaks. This feature, however, does not seem to be constant. In two specimens of *P. scholtzii* which I owe to the kindness of Mr. Clessin, the beaks are slightly "calyculate," but not flattened on top. Also in a few younger valves of *P. costatum*, the beaks are less flattened, and the ribs slighter.

♣ A PROPOSED STUDY OF GONIOBASIS.

LAWRENCEBURG, IND., MAY, 1903.

EDITORS OF THE NAUTILUS:

For many years I have been under the impression that the infor-

mation that now exists and is at the command of the conchologist, in reference to the genus *Goniobasis*, both in the form of labeled collections and literature, is in such shape as to be practically useless to the average collector for the following reasons :

1st. That the local collectors and students have in their collections recorded species and varieties of species, many of which are entirely due to local surroundings, and which should not be recognized, as they now are, as distinct species. These have never been brought together in numbers sufficient to allow of a proper estimate as to their value as separate species.

2d. That the individual study of this family, in many cases without the means of comparing large numbers of so-called species and varieties, has resulted in much confusion and caused a prevalent erroneous conception of their value as species.

3d. That the great difficulty which the study of this family presents, the liability to error, and the dislike of any one to publish work which may afterwards prove to be wrong, has deterred many from putting forward their individual information, which would be of great value when used in connection with a mass of similar information from other sources.

With these facts before me, I believe that some step ought to be taken to at least do something to throw additional light on this large genus of North American mollusks.

My idea is as follows ; Take George W. Tryon's *Strepomatidæ* of North America, use his list of the *Goniobasis* as a basis, and build up a monograph of the genus on the foundation and along the lines laid down by him.

Many "species" very closely related in geographical distribution are named as such simply from a variation of color, a variation which exists in almost every known species to a greater or less degree.

With a large collection of my own, with the opportunity of examining several others of fair dimensions and containing large series of *Goniobasis*, and with a tolerably large proportion of the existing literature at hand, I am satisfied that with the generous help of others interested in this matter I may undertake the task, hoping that some good end may be obtained. I propose to send out to all students of the subject lists of all the described species of the genus *Goniobasis*, requesting them to correct such lists to the best of their judgment and ability, and to supply me by exchange or loan with

sufficient material, and with such information as may tend to satisfactorily solve all questions that may arise. By this means I might hope to accumulate sufficiently ample and valuable information to serve for the eventual publication of an up-to-date work on the subject.

Yours truly,

A. C. BILLUPS.

PUBLICATIONS RECEIVED.

NOTES ON PROSOBRANCHIATA, NO. I, LOTORIUM. — By H. Leighton Kesteven. Proc. Linn. Soc. of New South Wales, 1902, Pt. 3, pp. 443–483, pl. xvii.

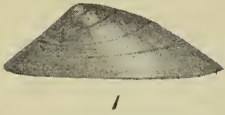
This interesting paper again brings before us the old genus *Triton*, which, being pre-occupied, has long been abandoned in Mollusca, but regarding a substitute there seems to be a very diversified opinion. The author has gone thoroughly over the ground, adopting *Lotorium* Montfort, as proposed by Harris (Catl. Tertiary Moll. in Brit. Mus., Pt. 1, 1897).

Montfort's names are the earliest that can be considered (Conch. Syst., ii, 1810). *Aquillus* (type *M. cutaceus* Linn.) appears on page 579, and *Lotorium* (type *M. lotorium* Linn.) on page 583. The right to amend *Aquillus* to *Aquilus* and to discard it on grounds of uncertain etymology is questionable; still its similarity to *Aquila* makes the name less desirable than *Lotorium*, and as only a few pages intervene between the two names, it seems a small matter to discuss, still strict ruling would probably make *Aquillus* the generic name.

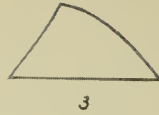
The author does not agree with Dr. Dall and Simpson (Moll. of Porto Rico, p. 416), who by elimination makes *Septa* Perry, 1811, the type genus of the family *Septidæ*, and recognizing three other genera, *Ranularia* and *Lampusia* Schumacher, 1817, and *Lotorium* Montf.

The author's statement that, "the whole of the species included by Tryon in *Triton* (*sensu strictu*), *Simpulium*, *Cymatium* and *Gutturium*, form one natural genus," is apparent to any one who has made a study of all the species based solely on conchological characters.

From the figure of Perry's *Septa rubicunda*, and the habitat "New Holland" assigned, I should consider it *T. australe* Lam. and not *T. nodiferus* Lam. The apices of twenty-nine species are described and figured.—C. W. J.



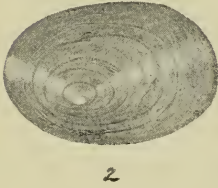
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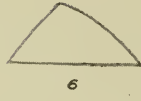
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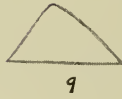
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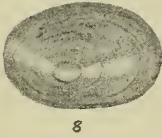
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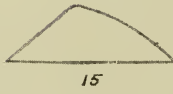
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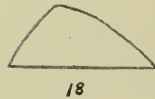
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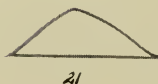
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THE NAUTILUS.

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No. 3.

C^o
NOTES ON EASTERN AMERICAN ANCYLI.

BY BRYANT WALKER.

III. ANCYLUS OBSCURUS Hald. (1844). Pl. I, fig. 16-18.

I am in great doubt as to the identification of this species. Haldeman's type, a single specimen, came from the Nolachucky River, below Greenville, Tenn. It has been cited from Jamaica by Adams, from St. Thomas and Porto Rico by Shuttleworth and from Guadeloupe by Fischer. The citations of Crosse (J. de C., xl, p. 38) and of Dall and Simpson (U. S. Fish Com. Bull., i, p. 371) of this species in their catalogues of Porto Rico mollusca, are based wholly on the original citation of Shuttleworth. Both Bourguignat and Clessin question the West Indian localities and Mazé in his "Catalogue révisé des mollusques terrestres et fluviatile de la Guadeloupe," etc. (J. de C., xxxi, p. 29, 1883), states that he had neither found it there himself nor seen it in any of the local collections. More recently, Dr. W. H. Dall has quoted it from several localities in Florida (Proc. U. S. Nat. Mus., 1885, p. 273).

Haldeman compares the type with *A. rivularis* and *haldemani* and his outline figure justifies the comparison.

Clessin's description is substantially taken from Haldeman, the dimensions given being the same. But his outline figure is quite different and he has modified his description to agree with his figure, placing the apex in the last third of the length and calling it "very obtuse" instead of following the author's statement "apex but slightly projecting, rather more than one-third of the shell posterior." He

quotes no other localities than those of Haldeman, Adams, Shuttleworth and Fischer. His figure is so decidedly different from Haldeman's that it would seem to have been drawn from an actual specimen, but he does not so state. He also compares *obscurus* with *diaphanus*, saying that it differs only by its more posterior apex.

Pilsbry, in his description of *A. eugraptus* (NAUT. ix, p. 139), compares that species with both *fuscus* and *obscurus*.

These are the only references to *obscurus* that I have been able to find. The only specimens I have seen, which are at all referable to this species, are in the collection of A. A. Hinkley, from Volusia county, Florida, and are said to have been identified by Dr. Dall. There are eleven specimens in this lot, of which six are *A. peninsulae*, the remainder are quite different and may be *obscurus*. At the time Dr. Dall's paper was published, *A. peninsulae* had not been described and, if these specimens were identified by him, the mixture of the two forms raises a query not only as to which form he identified with *A. obscurus*, but also in regard to the identity of the specimens referred to that species from the several Floridan localities quoted in his paper. Both of the forms represented in the Hinkley lot are characteristic, wide, depressed *Lævapices* and such as would be expected from a lake country, being closely related to *A. fuscus*. As has already been stated, the only species of *Lævapex* from the region from which Haldeman's type came, that has been clearly identified, is *A. diaphanus*. With that exception, all the *Ancyli* seen from that region belong to the section *Ferrissia*. This fact, taken in connection with Haldeman's figure and his comparison of *obscurus* with *rivularis* and *haldemani*, raises a very serious doubt in my mind whether the Floridan specimens referred to have been correctly identified. It certainly seems remarkable that so acute an observer as Haldeman should have made such a comparison, if he had before him a shell similar to those of the Hinkley lot.

I regret that I have not been able to have Haldeman's type examined critically in regard to the apical characters. When that is done, I should not be at all surprised if it proved to be a genuine *Ferrissia*. In the meantime, it seems best to describe and figure the Hinkley shell, as it may be represented in other collections under this name, leaving the question of its identity with Haldeman's species for future determination. When cleaned, the shell is a light yellowish horn-color, shining, very thin, fragile and transparent;

depressed, quite regularly oval in shape, the left side being rather more arcuate than the right; apex subacute, though not much elevated behind the middle of the shell and decidedly turned to the right; the anterior slope is nearly rectilinear, the right and left somewhat convex above, concave below and flattening out toward the periphery; the posterior slightly concave; surface with the lines of growth faint but quite regular, slightly rippled transversely or with fine radial ribs (in two of the five specimens examined, radial ribs are developed as strong as in *A. fuscus eugraptus*). Length (fig. 16) 6.5, width 4.5, alt. 1.5 mm.

It will be observed that while this shell is larger and more depressed than the typical *obscurus*, the proportion of the length to the breadth is almost exactly the same. The longitudinal outline, however, is much nearer to Clessin's figure than it is Haldeman's.

The affinities of this form are with *A. fuscus*, *kirklandi* and *peninsulæ*. It is, however, more closely related to *kirklandi* than to the others and possibly may prove to be a southern development of that species. It differs, however, by its more depressed, narrower and more regularly oval shell, and the peculiar concavo-convex outline of the lateral slopes. From *fuscus*, it differs decidedly in contour by reason of the more posterior, more prominent and more excentric apex and the peculiar lateral slopes. The shape and color are so entirely different, that there is no reason to confuse the ribbed form with *A. peninsulæ*, which is found associated with it.

IV. ANCYLUS EXCENTRICUS Morelet (1851). Pl. 1, fig. 19-21.

This species is the sole representative in the United States of a group of general distribution in the West Indies, Mexico and Central America, characterized by the prominent, rather obtuse and very excentric apex and, usually, well-developed radial ribs over the surface. The only recorded localities are Comal Creek, New Braunfels, and Barton Creek, Travis county, Texas. Specimens from the latter locality, collected by Singley, are before me and are larger than those from Comal Creek, cited by Pilsbry (NAUT. iii, p. 64), and agree almost exactly with the dimensions given by Morelet, the size of the specimen figured being, length $7\frac{1}{8}$, width $4\frac{1}{2}$, alt. 2 mm. *A. excentricus* is so entirely different in shape from all other North American species that there is no possibility of confusing it with any of them. Another peculiarity of this species is the depression of the

apex. In all other North American species the apex is the point of greatest altitude, but in *excentricus*, the highest point of the shell is anterior to the apex.

There is some question as to the specific validity of this form. Bourguignat (J. de C. iv, p. 175) considered it to be only a variety of *A. radiatus* Guilding, characterized by the apex being slightly more acute. And in this, he has been followed by Clessin (Conch. Cab., Ancylus, p. 67). Crosse and Fischer (Miss. Sci. Mex., ii, p. 37) state that it differs from *radiatus* by its thinner shell, more pointed and more excentric apex and the absence of the radiating striæ, and on this account prefer to recognize it as distinct, although admitting that the two forms are very close to each other. Von Martens (Biol. Cent. Am., p. 402) also describes the shell as "without radial sculpture" and considers it distinct. Pilsbry, in his notice of the New Braunfels specimens, however, mentions slight indications of most delicate riblets radiating from the apex. All of the five specimens from Barton Creek have the radial ribs more or less developed. In most of them the ribs are stronger along the antero-lateral slopes, the median portion being nearly smooth or only slightly rippled. In one example, however, the well-developed ribs extend over the entire anterior slope.

Under these circumstances, the approximation of the Texan shells to *A. radiatus* seems very probable. Whether this is also the case with the typical form from Guatemala, must remain uncertain until authentic material can be critically studied. I have not been able to make any comparison of the Texan specimens with *radiatus*.

V. ANCYLUS PENINSULÆ Pilsbry & Johnson (1896). Pl. II,
figs. 19-21.

This beautiful species, which is readily distinguished by "its large size, broadly oval and depressed form, blunt apex and the dense radial striation," is apparently peculiar to the inland waters of Florida, where it seems to be very generally and abundantly distributed. In addition to the original locality, the St. John's River, specimens have been seen from Volusia and Manatee counties and from Lake Jessup, which indicate a general range over the state. It is possible that some of the localities cited by Dall for *A. obscurus* (Proc. U. S. Nat. Museum, 1885, p. 273) belong to this species.

VI. ANCYLUS KIRKLANDI n. s. Pl. II, figs. 1-12.

Shell large for the genus, thin, translucent, horn-colored; broadly oval or obovate, sides nearly equally curved, ends broadly rounded; quite elevated; apex subacute, behind and to the right of the middle, and decidedly turned to the right; posterior and right slopes straight or slightly concave, anterior slope quite convex, left slope decidedly convex; surface with the growth lines regular and distinct and more or less rippled by transverse wrinkles, which frequently tend to form feeble, irregular radial riblets.

Fig. 1 (type): Length 8, breadth $5\frac{1}{2}$, alt. 2.5 mm.

Grand Rapids, Mich.: Length 9.25, breadth 5.5, alt. 2.5 mm.

Grand Rapids, Mich.: Length 8.25, breadth 5, alt. 2 mm.

Hardy, Arkansas: Length 6.50, breadth 5, alt. 2 mm.

Fig. 4: Length 6, breadth 4.50, alt. 2 mm.

Fig. 7: Length 5.75, breadth 4, alt. 2 mm.

Fig. 10: Length 5.25, breadth 3.25, height 2 mm.

This fine large species is a well-defined one and has wide range, extending from Trenton, N. J., west to Hardy, Ark. The specimens from the last locality were cited as *A. haldemani* by Pilsbry (Proc. P. A. N. S., 1900, p. 457), and, from this identification, that species was placed among those with smooth apices in the NAUT. xvi, p. 88. A recent examination by Dr. Pilsbry of the type of *A. haldemani* has shown that that species has a striate apex and, therefore, does not belong in *Lævapex* at all. *A. kirklandi* is distinguished by its large size, decidedly elevated shape and its prominent, subacute apex, which is decidedly turned to the right. There is some considerable variation in shape, as shown by the above measurements, some examples being more elongated with nearly parallel sides. There is also considerable difference in height. But in all cases the subacute, prominent apex and the convex, left slope are characteristic, and always distinguish it from *fuscus*, in which the apex, even in the more elevated examples, is always bluntly rounded and the left slope scarcely convex.

Kirklandi is more nearly related to the Florida shell herein referred to as *obscurus* than to any other species, but differs by its broader form, greater elevation, more acute and more eccentric apex and greater convexity of the left lateral slope.

The finest specimens of *kirklandi* come from Grand River, Kent county, Mich., where they have been collected in great abundance

by Dr. R. J. Kirkland, after whom the species is named. The Arkansas specimens collected by Ferriss are nearly as large. Toward the east the species seems to diminish rapidly and uniformly in size to an extent which would almost justify their recognition as a varietal race. Ohio specimens (fig. 4), collected in considerable numbers by Dr. V. Sterki, are uniformly smaller than the type, while those from Roaches Run, opposite Washington, D. C., and the Potomac River at Alexandria, Va. (figs. 7-10), are still smaller than those from Ohio. A single example in the collection of the Phil. Academy from Trenton, N. J., is similar to these, but slightly larger. Were it not for the intermediate character of the Ohio shells, these specimens would probably be considered a distinct species, characterized by their small size, proportionately higher and narrower shell and more convex anterior slope. But as shown by the figures, the larger and wider Virginian shells grade indistinguishably into the Ohio form, as that does into the immature specimens of the still larger typical form. That this difference in size is a local peculiarity is shown by the fact that in the considerable amount of material collected by Dr. Sterki, both in Ohio (several localities) and in the Potomac and its tributary, Roaches Run, near Washington, not a single specimen was obtained which by its greater size would seem to indicate that the balance of the specimens obtained were immature shells. There are also several trays in the Academy's collection from "Washington" similar to those collected by Dr. Sterki. From Michigan and several other western localities, occasional small and medium sized, high, narrow specimens have been noticed which, though larger, seem indistinguishable from the corresponding eastern form (fig. 10). But these do not seem to be persistent varieties in any one locality, being usually associated with the usual form of *kirklandi*; but rather sporadic individuals which for some reason have failed to develop normally. It is the occurrence of such specimens, together with the inability to find any marked specific character in the eastern forms, except the difference in size, that has caused me to refrain from giving them varietal rank until additional material shall give a better opportunity to pass upon the exact relations to these various forms.

PLATE II.

Figs. 1-3. *A. kirklandi* Walker (type), Grand River, Kent Co., Mich.

Figs. 4-6. *A. kirklandi* (var.), Tuscarawas R., New Philadelphia, Ohio.

Figs. 7-9. *A. kirklandi* (var.), Roaches Run, opp. Washington, D. C.

Figs. 10-12. *A. kirklandi* (var.), Roaches Run, opp. Washington, D. C.

Figs. 13-15. *A. diaphanus* Hald., Ohio R., Edgeworth, Pa.

Figs. 16-18. *A. diaphanus* Hald., Ohio R., Edgeworth, Pa.

Figs. 19-21. *A. peninsulæ* P. & J., Volusia Co., Fla.

G^o
DESCRIPTIONS OF NEW JAPANESE LAND SHELLS.

BY H. A. PILSBRY AND Y. HIRASE.

Japonia sadoensis n. sp.

Shell umbilicate, conic, dull dark brown; sculpture of very delicate, thread-like oblique striæ, widely and irregularly spaced, and numerous regularly spaced spiral cuticular threads, which bear rather long hairs, very easily rubbed off, being preserved only on the latter part of the last whorl in some specimens, wholly lost in others. Whorls $4\frac{1}{2}$, very convex, the last tubular. Aperture oblique, circular, the peristome thin, continuous, in contact with the preceding whorl for a very short distance above; columellar margin slightly expanded. Alt. 4, diam. 4.7 mm.

Niibo-mura, Sado. Types no. 84768 A. N. S. P.

This species is clearly distinct from *J. barbata* and *citharella* Gld., described from Oshima in the Riukiu group, and *J. musiva* Gld., of unknown locality. Dr. von Möllendorff has recognized Gould's *J. barbata* in specimens collected by Mr. F. W. Eastlake in the Hakone mountains (Journ. Asiat. Soc. Beng. liv, 1885, p. 67); this gives another Japanese locality for the genus, but in view of the geographic separation, I think that the Hakone form will prove different from that described by Gould from Oshima.

Chloritis tosanus n. sp.

Shell umbilicate, slightly convex above, convex beneath, very thin, fragile and chestnut-brown; densely sculptured with very short, darker, curved hairs, arranged in oblique lines as usual, but a little

irregular in some places. Whorls $4\frac{1}{2}$, very convex, separated by a deep suture, the last whorl large, rounded at the periphery and beneath. Aperture broadly lunate, slightly oblique. Peristome thin and unexpanded, suddenly dilated and recurved at the axial insertion, half covering the umbilicus. Alt. 10, diam. 17 mm.

Shiujo-mura, Tosa. Type no. 84415 A. N. S. P., from no. 1015 of Mr. Hirase's collection.

It is similar to *C. perpunctatus*, but nearly twice the size. In *C. fragilis* the hairs stand about twice as far apart as in this species, which is the first *Chloritis* from Shikoku Island.

Kaliella xenica n. sp.

Shell minutely perforate, pyramidal, much higher than wide, the spire with nearly straight lateral outlines and very obtuse apex; thin, yellowish, faintly and finely striate. Whorls $6\frac{3}{4}$, slightly convex, the last obtusely angular at the periphery, convex beneath. Aperture broadly lunate, the peristome thin, columellar margin reflexed. Alt. 3.7, diam. 2.7 mm.

Shukunegimura, Sado. Type no. 84762 A. N. S. P., from no. 1041 of Mr. Hirase's collection.

This species resembles *K. præalta* in general shape, but its outlines are noticeably more convex, the apex is more obtuse, and there are fewer whorls. (Xenikos, strange.)

♪ A PROPOSED STUDY OF GONIOBASIS.

BY A. A. HINKLEY.

The article in the June NAUTILUS, under the above heading, by Mr. A. C. Billups, was read with interest. It is time something should be done to bring this interesting group of shells out of the present chaotic condition. The work will be difficult, owing to more or less variations in all the species and the wide geographical distribution of some, together with the meager description often given and sometimes drawn from only two or three specimens; added to this, some of the types are inaccessible or lost.

There are twenty-four species of *Goniobasis* listed in G. W. Tryon's monograph on *Strepomatidæ* as being found north of the Ohio River or in that stream, viz.:

G. intersita Hald.	G. infantula Lea.
G. suturalis Hald.	G. louisvillensis Lea. ³
G. costifera Hald.	G. pulchella Anth.
G. cubicoides Anth.	G. gracilior Anth.
G. spartenburgensis Lea.	G. translucens Anth.
G. iota Anth. ¹	G. interlineata Anth.
G. tecta Anth.	G. ohioensis Lea.
G. gibbosa Lea. ²	G. brevispira Anth.
G. depygis Say.	G. semicarinata Say.
G. livescens Menke.	G. haldemani Tryon.
G. milesii Lea.	G. informis Lea. ⁴
G. lithasioides Lea.	G. virginica Gmel.

The specific value of some of the above is doubtful, and to settle points in question will require large series of specimens, preferably from the localities where the types were found. I would suggest that any one who can do so, collect such a series, including all stages of growth, make a note of the situation where found, and send the same to Mr. Billups, if he decides to go ahead with the work.

I am sure some new species will be found, but I hope no specimens will be described as new until their validity is well established.

If the different groups of the *Strepomatidæ* could be studied as thoroughly as *Io* has been by Mr. Chas. C. Adams, a large share of the doubtful species could be eliminated. There are other species which show nearly as great a variation as the *Io*; for instance, *Pleurocera canaliculatum* Say has a wide variation in form and varies from a smooth surface to one with two well-developed grooves on the body-whorl. *Angitrema armigera* Say is also quite variable in both form and tubercles, some specimens having a row of double tubercles on the periphery of the body whorl. I am strongly of the opinion that the specimens described by Dr. Lea as *Meseschiza grosvenorii* were young *Ang. armigera* Say; his description and figure fits many of the young of that species, excepting for the notch, which is probably abnormal, as Tryon held. *Angitrema duttoniana* Lea and *Lithasia downiei* Lea may only be variations of *Ang. armigera* Say; specimens I have collected in Tennessee seem to indicate it.

¹ Ohio? see Amer. Jour. of Conchology.

² Described from two specimens and said to be a "remarkable species."

³ Described from two imperfect specimens.

⁴ Described from two specimens.

I would like to see an interest taken in this neglected group of mollusca.

DESCRIPTIONS OF NEW SPECIES OF ACHATINELLIDÆ FROM THE HAWAIIAN ISLANDS.

BY D. D. BALDWIN.

Amastra henshawi n. sp.

Shell dextral, imperforate or subperforate, solid, ovately conical, apex subacute; surface lusterless, striated with somewhat irregular lines of growth; embryonic whorls under a lens showing very delicate radiating sulcations. Color varies from light to very dark brown, the upper whorls generally much darker than the body whorl; the lower whorls with traces of a deciduous, brown epidermis. Whorls 6, somewhat convex, the last one with a light carination at the periphery; suture well impressed. Aperture ovate, a little oblique, livid white within; peristome acute, slightly thickened within, extremities united with a thin, livid-white parietal callosity; columella white, flexuous, abruptly terminating in a thin lamellar plait.

Length 18, diam. 10 mm.

Habitat: South Kona, Island of Hawaii.

Found in damp woods at the roots of ferns and nearly buried in trash, at altitudes of from 1,800 to 4,000 feet.

We take pleasure in dedicating this shell to Prof. H. W. Henshaw, formerly of the Smithsonian Institution, Washington, D. C. He discovered both this and the following species. The Professor is at present a resident of Hilo, Island of Hawaii, and his explorations are contributing largely to our knowledge of the land fauna of this island.

Amastra saxicola n. sp.

Shell dextral, imperforate, rather solid, elongately ovate-conic, apex subacute; surface lustreless, sculptured with delicate growth lines; embryonic whorls smooth and polished. Color reddish-brown, tending to lighter shade on the middle whorls; apex pearly white; destitute of the usual fugacious epidermis of this genus. Whorls 7, slightly convex; suture well impressed. Aperture ovate, a little oblique, pinkish within. Peristome simple, acute, not thickened within, extremities joined by a very thin, pinkish parietal callosity;

columella white, flexuous, terminating in a moderately-developed lamellar plait.

Length $20\frac{1}{3}$, diam. 10 mm.

Habitat: Kau, Island of Hawaii.

This shell seems to live among and under rocks to an unusual degree. It is found on old lava flows attached to the under side of rocks, or in loose soil and trash at the base of bunch grass growing on lava flows. The locality is very arid.

Amastra senilis n. sp.

Shell fossil, dextral, deeply perforated, the perforation penetrating to the apex; moderately solid, globose with a short conical spire, apex acute; surface sculptured with coarse, irregular growth lines, with a few irregular cross striæ or ridges on the three lower whorls; embryonic whorls under a lens exhibiting delicate and regular sulcations. Color of the living shell unknown. Whorls 7, convex. Aperture sinuately oval, a little oblique; peristome simple, acute, not thickened within, extremities joined by a thick parietal callosity; columella terminating in a slight, flexuous fold.

Length 23, diam. 18 mm.

Habitat: Hamakua, Island of Hawaii.

This and the following species were discovered and sent to me by Mr. Eugene Horner, of Paauala, Hawaii. They were found at a place called Palihoukapapa on the Hamakua slope of Maunakea, at an elevation of 4,000 feet. The shells were imbedded in the earth about one foot below the surface.

Prof. Henshaw reports other similar localities on the island of Hawaii where there are extensive deposits of fossilized land shells about a foot below the surface of humus. Nearly all the known genera of Hawaiian land shells are represented in these deposits by species, some still extant, others probably now extinct. The deposit of earth above the fossilized shells indicates several hundred years antiquity.

Amastra fossilis n. sp.

Shell fossil, dextral, minutely perforated, somewhat solid; elongately conical, apex rather acute; surface striated with somewhat irregular growth lines; embryonic whorls under a lens exhibiting very delicate and regular sulcations. Color of living shell unknown.

Whorls 7, slightly convex. Aperture oblique, ovate; peristome simple, very thin, columellar margin slightly expanded over the umbilicus; columella terminating in a flexuous thread-like plait.

Length 18, diam. 9 mm.

Habitat: Hamakua, Island of Hawaii.

This shell in shape resembles some of the forms of *Amastra turritella* Fer., which is found on the island of Oahu.

NOTES AND NEWS.

We have lately learned, through Mr. Charles Hedley, of the death of two New Caledonian conchologists—RICHARD ROSSITER, on January 16, 1903, aged 62 years, and JULIEN BERNIER, March 3d, at the age of 55 years. Both died at Noumea. Rossiter formed a large collection of shells, and supplied the types of many new forms to the editors of the *Journal de Conchyliologie*, to John Brazier, of Sydney, N. S. W., his brother-in-law, and to Dr. W. D. Hartman, of West Chester, Pa. His collection will probably be acquired by the Colonial Museum at Noumea. Julien Bernier was Clerk to the local Parliament of New Caledonia, and founded the "Musée Colonial" at Noumea. Some of his material has been described in the *Journal de Conch.* and elsewhere. *Placostylus bernieri* Hartman, and various other species discovered by him, preserve his memory.

A NEW PLEUROTOMARIA.—Mr. Y. Hirase, of Kyoto, Japan, has recently discovered a new species of *Pleurotomaria*, related to *P. beyrichi*, from which it differs in having much more numerous, distinctly beaded spiral cords. In shape and color it resembles *P. beyrichi*. The new form will be described under the name *Pleurotomaria hirasei*.—H. A. PILSBRY.

ASHMUNELLA THOMSONIANA COOPERÆ.—I have just found this form living in abundance at Pecos, New Mexico. The greatest diameter of five specimens measured is 16, 15, 15, 15, 15½ mm., thus averaging larger than the original specimens. The basal tooth is single, with at most a faint indication of doubling.—T. D. A. COCKERELL.

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No. 4.

TWO NEW MOLLUSKS FROM THE WEST COAST OF AMERICA.

BY WILLIAM HEALEY DALL.

The National Museum has received through the kindness of Mr. J. S. Arnheim, of San Francisco, several interesting shells collected by Capt. William Noyes, of San Francisco, of which two appear to be undescribed.

Sigaretus noyesii n. sp.

Shell depressed, mottled purplish brown above, pale or nearly white below, pale purplish with two obscure revolving brown bands internally, nucleus minute, two-whorled, translucent, subsequent whorls two, rapidly enlarging; surface with obvious incremental lines, and faint, very fine, partially obsolete, spiral striation; covered with a yellowish silky periostracum; suture distinct but not impressed; axis rather widely pervious, body with a slight, transparent coat of callus; pillar lip hardly thickened or reflected, general form gibbous; alt. 10, major diam. 36, minor diam. 26 mm.

Gorgona Islands, Colombia, in the Gulf of Panama.

This species is a West American analogue of *S. maculatus* Say, of the east coast, which is more solid, more convex, with much more conspicuous spiral sculpture, and has the coil of the whorls impervious or nearly so.

Tonicia arnheimi n. sp.

Shell small, back rather rounded, girdle narrow, naked, yellow brown; color pale pink with pale brown dotting, two white lines en-

closing a dark brown streak on the dorsal keel of the intermediate valves; eye spots with a metallic silvery lustre; anterior valve with seven, posterior with eight notches, the teeth radially striate; intermediate valves with one lateral notch on each side; interior coloration pinkish white with a magenta axial streak; sculpture much like that of *T. crenulata* Sowerby, but central areas with much sparser riblets and no defined central smooth area, the sutural crenulations stronger and forming a wider band, the pleural rugæ mostly fore and aft in direction, the second valve larger than the rest and with a more conspicuous mesial smooth area. Interior with sinus square not denticulate. Anterior and posterior plates with obscurely radial pustules and very numerous eyes. Length 15, lat. 7, height 4 mm. in the dried animal.

Noyes Cove, Narborough Island, Galapagos Group, in 20 fathoms; Capt. Noyes.

This species is clearly of the group of *T. crenulatus* but is separated by sufficiently distinct characters. The brilliancy of the eye spots, each situated in a deep, minute pit, is very remarkable. There are on this small creature nearly 1000 of them.

PLEISTOCENE MOLLUSKS OF WHITE POND, NEW JERSEY.

BY FRANK C. BAKER.

The Chicago Academy has recently received from Dr. Stuart Weller, Paleontologist of the University of Chicago, a collection of Pleistocene mollusks from the marl beds of White Pond, near Marksboro, New Jersey. The material consists of about a quart of mixed shells, which, when studied quantitatively, gave some interesting results. *Valvata* and *Ammicola* made up ninety-five per cent. of the entire lot, the former being forty-five and the latter fifty per cent. Of the remainder, *Planorbis bicarinatus* made up two per cent., *Planorbis campanulatus* one per cent., and the rest of the species the other two per cent. *Aplexa* was the rarest, there being but two specimens in the entire lot.

I am indebted to Mr. Bryant Walker for assistance in determining some of the material. The list of species is as follows:

Pisidium compressum Prime. Normal.

Annicola limosa Say. Very variable and abundantly represented.

Annicola galbana Haldeman. This characteristic fossil is very abundant in the White Pond formation. It shows some variation in the height of the spire, but seems to be easily separated from *A. limosa*. Several monstrosities of galbana were found in this collection; two were scalariform and the others (6) had the spire variously contorted, like the forms of *Planorbis complanatus* figured by European conchologists. One specimen had the spire almost concealed by the gibbous last whorl. Monstrosities seem to be rare, as only eight were found in a lot of over two thousand specimens.

Valvata tricarinata Say, var. *confusa* Walker. This is nearly as abundant as the *Annicolas*. Only a small percentage of the specimens were typical *confusa* with two well-defined keels, the majority having the basal keel strongly developed, the upper part of the whorl being rounded. In some specimens the two keels are so strong that they form elevated ridges.

Physa ancillaria Say. Not uncommon.

Aplexa hypnorum Linne. Two specimens of a small *Aplexa* which seems referable to *hypnorum* are in the collection.

Planorbis campanulatus Say. Typical, but not abundant.

Planorbis bicarinatus Say. Many specimens of this species show a tendency to form spiral lines, similar to those on var. *striatus* Baker.

Planorbis deflectus Say. Common and typical.

Planorbis exacutus Say. But one specimen of this species was found.

Limnæa galbana Say. Not common.

Limnæa humilis Say. Not common.

Succinea retusa Lea. Not common.

ON CATALOGUING A COLLECTION OF SHELLS.

BY MRS. M. BURTON WILLIAMSON.

When I began to catalogue my shells I used a ledger blank book, but in time the book looked untidy, as the space was not sufficient for the addition of species new to the collection that from time to time

were added to it. Then I copied the whole list, leaving space for the introduction of species not listed. But in some cases the blank spaces were not needed while more space was required for families and genera not represented in the book. Again I copied the entire catalogue, excepting the west coast species which I listed on cards to form a card catalogue. In time this second book began to look far from neat, so I tried a new plan. I used "Ward's Catalogue of the Mollusca," marking with a small mark such species as I had, and inserted blanks between the printed leaves for species that were not found in the price list; but this made the pamphlet rather bulky and also necessitated my looking over two lists, the printed one and the written one, in order to find if I had certain species. The plan was satisfactory at first, then I thought out a better one which I will give you.

I used a patent cover for blank leaves such as students use for laboratory notes, examination papers, etc., in colleges and schools. I bought paper the proper size for the cover, about eight by ten inches. This paper had holes stamped out at the right place for the metal clasps to be inserted. I use ruled paper, as names and localities are quickly seen on the same line, but this is a matter of taste, as dots can mark the space between names of shells and their localities.

The classification is a matter of choice. I use the same as that found in "Tryon's Structural and Systematic Conchology" for marine shells, excepting the west coast shells, for which I use another classification. My reason for using Tryon's is, if I get a shell from a family new to me I know where to list it immediately by referring to the Systematic Conchology, for by constantly studying and referring to this work I have become tolerably conversant with the classification.

I wrote only on one side of the paper when making out this new list, and paged only this side. This left a blank opposite each page to be used if the page became full. This blank page I numbered alphabetically to correspond with the numbered page. For example, if I required the blank leaf opposite page 5, I numbered it 5^a, and if I found it necessary to add new leaves at this place they would be paged 5^b, 5^c, 5^d, etc. on the left page, on the right 5¹, 5², 5³, etc. The possibility of adding new leaves, one after another, or of taking out and rewriting the leaves is the strong feature in favor of using these covers. The use of the alphabet, or as much of it as is needed

in conjunction with the figures, makes repaging from time to time unnecessary when the book is enlarged.

At the front of this catalogue I have an index of genera arranged alphabetically. By indexing according to genera much space is saved and it does not take much time to refer to the page for species if one does not remember just where the species may be found in the classification.

For the use of beginners I will tell how I list specimens on a page. After leaving space at the left hand of each page for the binding of the leaves with the metal clasps, I write the name of the shell, by whom named and the locality all upon one line, keeping the locality of each species at the extreme right hand of the page. At the left hand I write the initials or some letter to indicate from what source the shell or shells were received, also the number of specimens. Above the name of the genera and species I write the name of the family in large letters. I use red ink for this, as the family name is more prominent in this way. As noted before, if the space for the specific name becomes too crowded I write upon the opposite page the name of the specimen I desire to list, indicating this upon the page where the others are listed. As they are listed specifically according to the alphabet the place assigned to it upon the blank page is the same as upon the page that is filled.

For West Coast shells, as before mentioned, I use cards. When a new specimen is listed upon a new card it is placed with the names of the rest of the genus. Any data desired are written upon each card. I got my cards cut and a hole punctured in each one by the thousand.* All cards for the specific name are the same size, those for the families and genera have an offset at the top. That is, a raised margin was left at the top of each card, these were raised sometimes at one end sometimes at the other end, and others had the margin in the center. When genera are listed upon a few cards the raised margins would hide each other if they were not placed at a little distance from each other, but if one generic name is at the extreme right hand of the row of cards in the box or drawer, another in the middle, still another at the extreme left hand, these generic names are readily detected by the eye, whereas if they followed one another all in a row some would be hidden from sight.

* It is best to use the cards of the Library Bureau, as they are of uniform size and quality.

NEW NORTH AMERICAN PISIDIA.

BY V. STERKI.

Pisidium ashmuni n. sp.

Mussel somewhat elongate, moderately inequipartite, scarcely oblique, moderately inflated; superior and inferior margins moderately curved, supero-anterior slope curved down to the rounded anterior end situated well below the median line; posterior end subtruncate, with more or less of an angle at the scutum; beaks somewhat posterior, rather broad, rounded, moderately elevated over the hinge margin; surface shining, with microscopic, shallow, rather regular, crowded striae, and one or a few impressed lines of growth: color pale horn, shell translucent, thin; hinge slight, plate narrow; cardinal teeth rather long, fine, lamellar, the right curved with its anterior end much shorter and situated much higher up on the plate than the posterior which is somewhat thickened; left anterior of the same shape as the right, rather hook-like at its anterior end, the posterior oblique, slightly curved and passing over about two-thirds of the anterior; lateral teeth rather long, produced far beyond the pointed cusps; outer laterals of the right valve slight but distinct; ligament rather slight.

Size: Long. 2.8, alt. 2.3, diam. 1.6 mill.

Long. 2.3, alt. 1.9, diam. 1.4 mill.

Most specimens are intermediate.

Habitat: San Rafaels, New Mexico, collected by Rev. E. H. Ashmun, in whose honor the species has been named.

Pis. ashmuni ranges under the *abditum* group. It is easily recognized, being of about the same size with *Pis. splendidulum* St. It is more elongate and its beaks are broader.

Pisidium danielsi n. sp.

Mussel slightly inequipartite, moderately and regularly inflated, outlines nearly short oval; all margins well curved, or the posterior subtruncate, anterior end rounded, rather below the median line; angles at the scutum and scutellum not marked in most specimens, slightly so in some; umbones little posterior, low, slightly projecting over the hinge margin, moderately broad, each with a depression below the apex and above a slightly raised, concentric ridge; surface with somewhat coarse, subregular and sharp striae, and a few coarser

lines of growth, rather dull and microscopically rugulose; color grayish white to yellowish horn, in some specimens slightly plumbeous around the beaks; shell moderately thick, nacre white, muscle insertions distinct but not impressed; hinge rather stout, plate rather broad; right cardinal tooth strongly curved over a deep excavation, its posterior part thickened and grooved to bifid, the left anterior strongly curved and rather massive, placed rather high up on the plate, the posterior oblique, curved, its anterior part reaching to or over the middle of the anterior; lateral teeth stout, the cusps rather short, the outer ones in the right valve rather small but well formed; ligament strong.

Size: Long. 4.5, alt. 3.9, diam. 2.6 mill.

Habitat: Marsh from a spring on Lake James, Steuben Co., Indiana, numerous specimens collected by Mr. L. E. Daniels, of the Indiana Geological Survey, in whose honor the species is named. During the season of 1902 Mr. Daniels has collected many and interesting *Pisidia* and *Sphæria*, especially in northern Indiana, a section from which very little had been known.

The present species has some resemblance with—typical—*Pis. strengii*, but in the latter species the outlines are more angular, the beaks narrower and more prominent and rounded, the striation is finer, and the hinge slighter. *Pis. danielsi* is of special interest. From the features of the surface, the beaks and the hinge, there is no doubt but that it ranges under the same group with *P. compressum*, *kirklandi*, *cruciatum*, *fallax*, etc., although the rounded outlines, the low beaks, and the moderate and regular convexity would suggest rather the contrary at first sight. Young specimens, however, have an unmistakable similarity of the outlines with those of *Pis. compressum* Pr. In some of the specimens the beaks are broader, and the depression and ridge are less marked or almost obsolete, just as it is with certain forms of *Pis. compressum*.

Pisidium obtusale C. Pfr.

At the same place as the preceding Mr. Daniels has collected numerous specimens which are distinct from all North American species described, but exactly like *Pis. obtusale* from several places of Europe, and appear to be identical with that species. They are rather large and almost globular; long. 3.6, alt. 3.1, diam. 2.6 mill. It is to be expected that the same will be found also at other places.

NOTICES OF NEW JAPANESE LAND SHELLS.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota (Euhadra) euterpe n. sp.

Shell umbilicate, depressed, the upper surface low-conic, lower surface convex. Last $1\frac{1}{2}$ whorls *white under a thin yellow cuticle*, which is in part worn off in the type specimen; the *periphery marked with a narrow dark chestnut band*, the edge of which appears above the suture of the penultimate and last whorls; the inside of the umbilicus of the same dark color; *inner whorls red-brown*, the apex whitish. Surface rather glossy, rather closely plicate-striate above, somewhat smoother below the periphery. Whorls 6, slightly convex, regularly and slowly increasing, the last scarcely descending in front, *distinctly angular at the periphery*, the angle almost disappearing just below the lip. Aperture oblique, lunate, white and showing the brown band within, peristome *reddish-brown*, a little thickened within, the upper margin slightly expanded, the outer and basal margins reflexed, columellar margin dilated. Alt. 24, greater diam. 39, lesser 34.5 mm.

Prov. Kunchan, Riukiu. Type no. 1078 of Mr. Hirase's collection.

This very handsome *Euhadra* belongs to the group of *E. mercatoria*. It is similar to that species in the umbilicus and shape of the peristome, and the slow, regular increase of the whorls; but it differs from *mercatoria* in the depression of the whole shell, the more angular periphery, the finer and closer sculpture, and in coloration. Only one specimen has been received.

Eulota (Plectotropis) marginata n. sp.

Shell broadly and openly umbilicate, convexly low-conic above, convex beneath, solid and strong; light brown, surface lustreless, sculptured with irregular growth-wrinkles only. Whorls 7, but slightly convex, slowly and regularly increasing, separated by a slightly impressed suture which is distinctly margined above. Last whorl slightly descending in front, acutely carinate at the periphery, the keel *narrowly impressed on both sides*; base convex, not angular around the umbilicus, but very suddenly curving into it. Aperture oblique, nearly as high as wide; the peristome slightly thickened

within, white, noticeably grooved at the position of the keel, below which it is more thickened, expanded and narrowly reflexed. Alt. 14, diam. 27, width of umbilicus 6.5 mm.; width of aperture 11, oblique alt. 10.5 mm.

Kunchan, the northern province of Riukiu Island. Type no. 84924 A. N. S. P., from no. 1080 of Mr. Hirase's collection.

A large, solid species, with the keel margined on both sides, and projecting a trifle at the suture.

Eulota (Aegista) friedeliana var. *peraperta* n. v.

Differs from *friedeliana* from Nagasaki, the type locality, in the more widely open umbilicus and the noticeably smaller aperture in shells of the same size. Alt. 9, diam. 17 mm.; width of umbilicus 5.5 mm.

Isshochi, Higo. Type no. 84925 A. N. S. P., from no. 343a of Mr. Hirase's collection.

Eulota (Plectotropis) conomphala n. sp.

Shell umbilicate, depressed, low-conic above and below the acute peripheral keel. Thin, light brown, nearly lustreless, slightly striated with growth lines, and showing very fine, close, rather indistinct spiral lines under a lens, obsolete in places. On the upper surface there are sparse, short cuticular processes, easily rubbed off. Whorls $6\frac{1}{2}$, slowly widening, nearly flat, the keel of the last whorl bearing a fringe of cuticular filaments, triangular at their bases. Base angular around the deep, conic umbilicus. Last whorl very little descending in front. Aperture oblique, the upper margin of the peristome simple, basal margin thin, very narrowly reflexed; columellar margin dilated above. Alt. 9.5, diam. 19.5 mm.

Yakujima, Osumi. Type no. 84926 A. N. S. P., from no. 905a of Mr. Hirase's collection.

A very distinct, thin species, noticeably bi-conic in shape, and angular around the regularly conic umbilicus. It is an interesting addition to the fauna of Yakujima.

Hirasea planulata n. sp.

Shell imperforate, discoidal with rounded periphery and level upper surface. Yellowish brown, dull and very densely, very finely radially striate above, becoming smooth and glossy beneath. Spire

almost level, but the inner whorls are very slightly sunken. Whorls $5\frac{1}{2}$ to $5\frac{3}{4}$, convex, slowly widening, the last falling a little to the aperture and noticeably contracted at the lip; the base impressed in the middle as usual. Aperture nearly vertical, narrowly crescentic, the lip thickened within by a strong white rib. Alt. 1.8, diam. 3.5 mm., or a little smaller, alt. 1.4, diam. 3.2 mm.

Hahajima, Ogasawara. Type no. 82976 A. N. S. P., from 849b of Mr. Hirase's collection.

This was formerly thought to be a small form of *H. biconcava*, but the study of additional specimens of both show *H. planulata* to be constantly smaller, with a nearly level spire, while in *biconcava* the spire is conspicuously sunken.

Kaliella incensa n. sp.

Shell almost imperforate, depressed, the spire very low, conic, the base convex, periphery rounded in fully mature shells; thin, yellow, translucent and smoothish, under a strong lens seen to be minutely and closely striate obliquely above, the striæ decussate on the earlier whorls, the base smooth.

Whorls $3\frac{3}{4}$, but slightly convex, the last nearly double the width of the preceding. Aperture slightly oblique, lunate, the peristome thin, columellar margin suddenly dilated and reflexed near the axial insertion. Alt. 1.6, diam. 2.8 mm.

Hakusan, Kaga. Types no. 84788 A. N. S. P., from no. 973a of Mr. Hirase's collection.

A small species with few rather wide whorls, the last one rapidly widening. The columellar lip is more oblique than usual. It might be placed in *Microcystina*, but it has the sculpture of *Kaliella*. (*Incensus*, unrecorded.)

Kaliella harimensis var. *sadoensis* n. var.

This variety is somewhat larger than *K. harimensis*. It also resembles *K. okiana*, but the columellar margin is less widely dilated. It is from Shukunegimura, Sado; types no. 84764 A. N. S. P., from no. 1034 of Mr. Hirase's collection.

GEORGE T. MARSTON.

We regret to announce the death of our friend and correspondent, George Terence Marston. He was born in Chicago, Jan. 31, 1867. When he was five years of age his father died and his widowed mother moved to De Pere, Wisconsin. He attended the public schools and graduated from the high school at the age of fourteen years. He immediately found employment in a bank at De Pere, but was soon called to a position of higher responsibility in a bank at Green Bay. Here his ambition and temperamental intensity of nature led him to overwork, and after a few years he resigned his position and sought to regain his health by a vacation at the seaside.

He came to Quincy in 1891 and was employed in the bank of the State Savings Loan and Trust Company. His clear mind, industry, mastery of the principles of business and a rare talent for the accurate and systematic management of details, made him a valued and trusted man.

Though compelled to devote himself to business, his special delight was in scientific studies, especially conchology. He had collected and had in his cabinet specimens of nearly every species found in Wisconsin, and cherished a hope of some day being able to have the time to prepare a work on the mollusks of that State.

His last work was in photographing the embryological development of the snail, with some very good results. Among his contributions to the NAUTILUS was an article on the occurrence of *Helicina occulta* Say, in Brown county, Wis.

He was married to Helen E. Collins, daughter of W. H. Collins, Oct. 3, 1898, who with two children survives him.

GENERAL NOTES.

REVIEW OF THE CLASSIFICATION OF THE CYRENACEA. By William H. Dall. Proc. Biol. Soc., Wash., vol. xvi, pp. 5-8, 1903.

In working over the *Cyrenacea* for the Memoir on the Tertiary Fossils of Florida, Dr. Dall found the nomenclature and classification of this super-family in much confusion, and while the details are

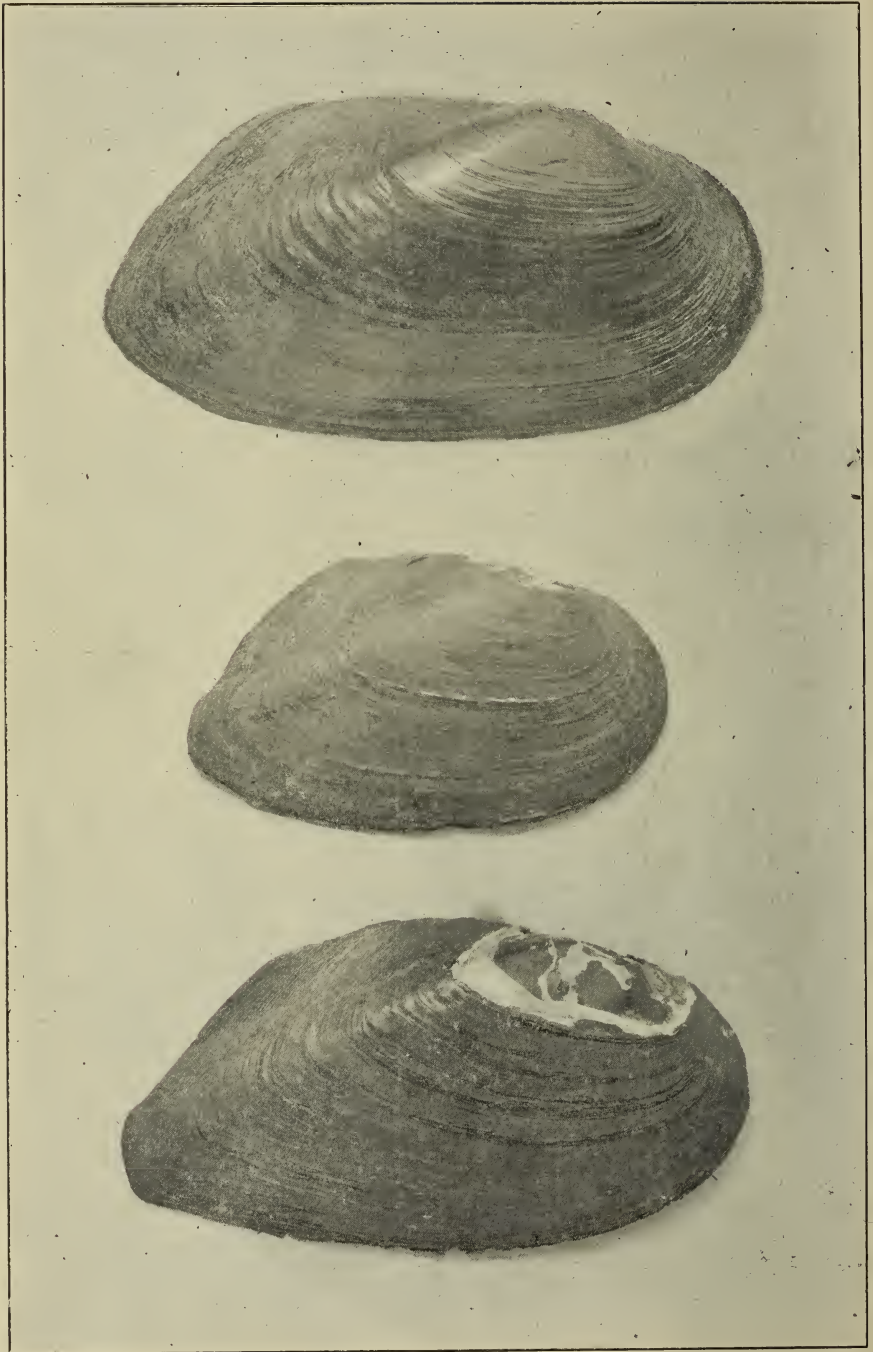
reserved for the memoir a synopsis of the arrangement adopted has been given in this pamphlet, which deals with the families of *Cyrenidæ* and *Sphæriidæ*.

In the *Cyrenidæ* twenty-three proposed genera, subgenera and sections are listed and type specimens with synonyms are given; to these Dr. Dall has added one new genus and four new sections. Of the genus *Donacopsis* Sandberger, 1872, he says: "I suspect this to be merely a subdivision of *Cyrena*."

Of the family *Sphæriidæ* fourteen genera, subgenera and sections are listed with type specimens. Section *Cyclocalyx*, subgenus *Cymatocyclas*, and subgenus *Tropidocyclas* are new. The three types are *Pisidium scholtzii* Clessin, *P. compressum* Prime, and *P. henslowianum* Sheppard.

"*Pera* Leach, and *Euglesa* Leach, 1852, are synonymous with *Corneocyclas* s. s.," and *Galileja* Costa; *Euglesia* Leach, 1840; *Pisum* Gray, 1847, not Megerele, 1811; *Cordula* Leach; *Fluminina* Clessin; *Cycladina* Clessin, and *Rivulina* Clessin, are, according to Dr. Dall, not separable from *Pisidium* s. s.—MRS. M. BURTON WILLIAMSON.

LAND SHELLS OF CURAÇAO.—In Mr. Smith's useful review of the land shells of this island (Proc. Malac. Soc., London iii, 113) several species seem to have been overlooked: *Cionella gloynii* and *Succinea gyrata*, both described by Gibbons in the Journal of Conchology II, pp. 135, 136, plate I, *Stenogyra octonoides*, *Pupa fallax*, and *Drymæus multilineatus* noticed on p. 136; also Man. Conch. XIII, p. 29. Perhaps *Cionella gloynii* belongs to Mr. Smith's group *Neosubulina*. Another species, "*Macroceramus inermis* Gundl.," is also reported. The dentition of some of these specimens has been examined by Binney, and proves to be like that of *M. gossei*, so that the Curaçao shell is a member of the genus *Microceramus*. It is no doubt distinct from the East Cuban *Mac. inermis*, and may be related to or identical with *Pineria bonairensis* Smith. The latter is probably a *Microceramus*, but I have not seen specimens. Mr. Gibbons' note adds six species to the fauna of Curaçao, raising the total number now known to twelve.—H. A. PILSBRY.



FRIERSON : UNIO DECLIVIS AND U. TETRALASMUS.

THE NAUTILUS.

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No. 5.

THE SPECIFIC VALUE OF UNIO DECLIVIS, SAY.

BY L. S. FRIERSON.

The synonymy of *Unio tetralasmus* Say, given by R. E. Call in the Transactions St. Louis Academy of Sciences, vol. vii, 1895, page 52, has been very generally followed; wholly by some, and partially by others. Mr. Call says: "It preserves its specific character so generally that it is a matter of great surprise that so many synonyms should fall under it. The study of the figures, descriptions and localities above indicated will furnish convincing evidence of identity. Of the total number [of synonyms] listed seven came from Louisiana and contiguous territory; of these seven, five are from the same state (*Louisiana*) and of those five two are from the same bayou." I have faithfully studied the descriptions, etc., above indicated, together with the shells themselves in their native habitat, Louisiana, with the result that I find *U. declivis* Say, to be readily recognizable as a perfectly distinct species from the balance of this group, with *U. geometricus* Lea, as a synonym (according to Dr. Lea himself). *Unio declivis* is, moreover, very rare as compared with the rest of the group, and generally misunderstood. In order that students may recognize the shell it is figured herewith, and the following specific differences noted:

First. It never attains the extreme size of *U. tetralasmus* as shown by the following measurements, based on adult specimens of each:

U. declivis, length 85, height 45, diameter 35 mm.

U. tetralasmus, length 133, height 70, diameter 50 mm.

Second. The beaks of *U. declivis* are more nearly *terminal* than in *U. tetralasmus* (both Say and Lea mention this fact in describing the species).

Third. The color of the nacre of *U. declivis* is "purplish" (*vide* Say and Lea), while that of *U. tetralasmus* is always white, very frequently dull, with large blotches of olive-brown. This is an invariable characteristic of the thousands I have collected.

Fourth. *U. tetralasmus* Say, is rounded or bluntly pointed posteriorly, with a rounded or obsolete posterior ridge; while *U. declivis* when *perfect* is much more acutely *rostrate* posteriorly, as noted by Mr. Say, with a "subcarinated" posterior ridge.

Finally, these species inhabit different stations, *U. declivis* being found in *rivers* (Say's type and Lea's *U. geometricus* both came from Bayou Teche, a navigable stream) while *U. tetralasmus* invariably lives in the "small streams and ponds of the South," as stated by Conrad. An apparent exception being Lea's *U. symmetricus* which he said came from (Alexandria, La.) the Red River; but he procured his shell at second hand from Dr. Hale, who no doubt was in error, as he assuredly was in the case of other shells said to have come from the same river. These shells can live in localities where, from three to six months at a time, there is *absolutely no water*; in fact living shells have been thrown out by the plowshare, and hundreds have been seen killed by fire sweeping over the dried-up ponds. (See plate III, middle figure.) *This ability to withstand droughts is no doubt a cause for the misunderstanding of the group.*

Mr. Simpson, in his "Synopsis of the Naiades," says: "and if there were no connecting links, it would be easy to make half a dozen species out of it." If the species happens to grow in constant waters, they form more or less perfect shells, and are easily seen to be distinct species. But on account of their drought-resisting abilities and the preference for *small* streams in the case of the *tetralasmus* crowd, it may easily be seen that a *majority* of the adult shells have had to resist droughts and live through a succession of dormant stages. During these dormant periods, the mantle of the animal is partially withdrawn and the deposition of the epidermis and columnar layers ceases, but the inner nacre is still deposited. The mantle is especially withdrawn from the *end* of the prominent *rostrated* portion of

U. declivis. In consequence there are produced in this way many variations and malformed specimens.

A colony of *rough*, black and corroded *U. tetralasmus* was taken from a stream across which a boy could jump, and planted in a railroad tank of fifteen acres, newly made by the K. C. S. R. R. Two years after, one of their progeny was taken from this tank, with a yellow, smooth epidermis as hard and glossy as glass, and as distinct from *U. declivis* as *luteolus* is from *ligamentinus* (see pl. iii, upper figure).

In this connection, the writer would remark that in an article published several years ago (NAUTILUS XI, 3), under the caption "Conchological Notes from Louisiana," he spoke of the above-mentioned difference in habitat of *U. declivis* and *U. tetralasmus*. But at that time all of his specimens were named according to prevalent tradition, and he exactly *reversed* their names.

Like many other young collectors, the writer has in this way sent out numbers of shells with erroneous names, and helped to make confusion worse confounded. He hopes herein to correct at least one of these errors, and at the same time to render justice to that most excellent naturalist, Thomas Say.

By comparing the figure with that given by Conrad in his Monography, page 45 (and on which Mr. Call's synonymy is based, no doubt,) it will be seen that the shells of *U. declivis* and *U. tetralasmus* are utterly unlike.

EXPLANATION OF PLATE III.

Upper figure. *U. tetralasmus* Say. R. R. tank, De Soto, La.

Middle figure. *U. declivis geometricus* Lea. Dried bed of Lake Connisnia, La., showing stunting and periodicity of growth induced by successive droughts.

Lower figure. *U. declivis* Say. Bayou Plaquemine, La., at Church Point.

A NEW SPECIES OF METZGERIA.

BY WILLIAM HEALEY DALL.

The genus *Metzgeria* Norman, has hitherto been known from a single species, the *pusilla* of Sars or *alba* of Jeffreys. This is reported from the coast of Norway and the northeastern North At-

lantic in relatively deep water. A second species from the Santa Barbara Channel, California, has lately reached me.

Metzgeria californica n. sp.

Shell small, translucent white, with a pale straw-colored, dull, wrinkled and rather conspicuous periostracum; nucleus small, smooth, white, obliquely inclined, of nearly two whorls; there are four or five rounded subsequent whorls separated by a deep, not channelled, suture; sculpture of about nine rather prominent, rounded axial ribs extending from suture to suture and on the last whorl to the base, separated by wider interspaces and crossed by numerous subequal spiral threads, covering the whole shell, their wider interspaces striated by the incremental lines. Aperture about half as long as the shell, the outer lip sharp, the throat smooth and white; the pillar white, not callous, with three distinct, oblique plaits beside the slightly raised margin of the canal, these are only visible from the side of the aperture; anteriorly the pillar is tortuous, slightly recurved, open and rather wide. Length of shell 14, of aperture 7; width of shell 6 mm.

This species is easily discriminated from *M. pusilla* by its deeper sutures and more convex whorls, and by having a more tortuous pillar with three or four distinct oblique plaits instead of only two. On a direct view, at right angles to the plane of the aperture, the plaits are invisible, but are perfectly distinct from a point more laterally situated. The operculum is elongate-quadrate with apical nucleus. The shell, with other specimens from the same locality, was sent to the National Museum by J. H. Paine.

NOTICES OF NEW LAND SHELLS OF THE JAPANESE EMPIRE.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota (Euhadra) quæsita var. *decorata* n. v.

Smaller than *quæsita*, and much more coarsely sculptured with irregularly spaced, fold-like striæ, which are well raised and in part light yellow; the ground-color of the shell being either that of *quæsita* or of the form *perryi*, the types being of the dark pattern.

Alt. 22, diam. 35 mm. (Ōkuki).

Alt. 18.5, diam. 28 mm. (Chojamura).

Ōkuki and Chojamura, Mutsu. Types no. 84884 A. N. S. P., from no. 985a of Mr. Hirase's coll.

Eulota (Euhadra) connivens var. *diversa* n. v.

Shell resembling the smaller *E. connivens* var. *phæogramma* Anc., but larger, with the periphery strongly angular, like a thick *Plectotropis*. Alt. 18, diam. 25.3 mm.

Riukiu I. Type 84877 A. N. S. P. Collector unknown.

Eulota (Euhadra) submandarina var. *miyakejimana* n. v.

Shell similar to *E. submandarina*, but the whorls of the spire are flatter, less convex.

Alt. 18.6, diam. 25 mm.

Alt. 16.5, diam. 21.7 mm.

Miyakejima, Izu. Types no. 84879 A. N. S. P., from no. 1067 of Mr. Hirase's collection.

Eulota (Euhadra) submandarina var. *niijimana* n. v.

Decidedly smaller than *E. submandarina*; subangular at the periphery, with $4\frac{3}{4}$ to 5 whorls.

Alt. 12.3, diam. 17.5 mm.

Alt. 12, diam. 17 mm.

Niijima, Izu. Types no. 84880 A. N. S. P., from no. 1051 of Mr. Hirase's collection.

Ennea iwakawa var. *oshimana* n. var.

Differs from *E. iwakawa* in being much larger; from var. *yakashimæ* in the decidedly more slender form. Alt. 4.3, diam. 1.7 mm.

Oshima, Osumi. Types no. 84875 A. N. S. P., from no. 936 of Mr. Hirase's collection.

Like almost all of the species of Oshima, this is quite noticeably differentiated from the allied form of the main islands of Japan.

Tornatellina kitaiwojimana n. sp.

Shell perforate, globular, with short, very obtuse, conic spire; thin and fragile, transparent horn-colored, faintly and finely striate. Whorls $3\frac{1}{2}$, convex. Aperture large; columella bearing a prominent, squarish double fold; parietal wall bearing a small, rather short entering lamella. Length 2.7, diam. 2 mm. .

Kita-Iwojima, Izu. Types no. 84965, A. N. S. P., from no. 1094 of Mr. Hirase's collection.

An extraordinary species, very unlike any other yet known from the region. Kita-Iwojima is one of the Sulphur or Volcano Islands, a little group lying southwest of the Ogasawara group, and on a line with the Izushichito group, or "Seven islands of Izu." They were discovered by Bernard de Torres in 1543, and are governed by Japan from the Ogasawara Is. Volcanic forces are still active in this group, which is regarded by Yoshiwara as a continuation of the Fuji chain, rather than orogenically belonging to the Ogasawaran volcanic chain.

The following species of land shells have been found on Kita-Iwojima :

Tornatellina inexpectata Pils.

Tornatellina kitaiwojimana Pils.

Tornatellina hataiana Pils.

Opeas gracile ogasawaranum Pils.

Kaliella præalta var. *izushichitoensis* n. v.

Shell smaller than *K. præalta*, with decidedly stronger peripheral angle. Brown, somewhat transparent.

Miyakejima, Izu. Types no. 84961, A. N. S. P., from no. 1060a of Mr. Hirase's collection. Also, Niijima, Izu, no. 1060 of Mr. Hirase's collection.

Kaliella nesiotica n. sp.

Shell conic, with very slightly convex lateral outlines, obtuse summit, acutely thread-carinate periphery and slightly convex base; transparent brown. Whorls fully 6, slightly convex, parted by a suture in which the fine thread-like keel ascends. Sculpture of extremely minute, rather widely-spaced hair-striæ. Aperture basal, squarish, the columellar margin reflexed above. Alt. 3.6, diam. 3.2 mm.

Miyakejima, Izu. Types no. 84964, A. N. S. P., from no. 1072 of Mr. Hirase's collection.

Near *K. crenulata* Gude, but the excessively fine hair-like striæ are much more widely spaced in this species.

Sitala niijimana n. sp.

Shell minutely perforate, with conic spire, obtuse apex, strongly

angular periphery and convex base; thin, fragile, and of a pale, somewhat transparent horn-color. Surface faintly marked with growth-wrinkles, and under very strong magnification, showing an excessively minute, close decussation of radial and spiral lines. General outlines of the spire straight. Whorls $3\frac{1}{2}$, convex. Columella reflexed above. Alt. 2, diam. 2.3 mm.

Niijima, Izu. Types no. 84963, A. N. S. P., from no. 1057 of Mr. Hirase's collection.

The rather acutely angular periphery is nearly in the middle of the height of the shell. It is referred to the genus *Sitala* on account of its spiral sculpture, which is, however, excessively minute.

NOTE ON THE FAMILY SEPTIDÆ.

BY W. H. DALL.

In the Report on the Mollusks of Porto Rico, I adopted for the family *Tritonidæ* of authors, the name *Septidæ*, and for the typical genus the name *Septa*, proposed by Perry in 1811. Perry's list of species comprised six, beside which he mentions the *Murex tritonis* of Linné (spelling the specific name *tritonis*, but his meaning is obvious). His genus was equivalent to the genus *Triton*, as used by authors of the first half of the 19th century. His largest and most conspicuous species, which he compares with *Murex tritonis*, belongs to the same group as the latter, which was generally accepted as the type of the old genus *Triton* and reserved for it by Montfort when he divided the genus, a year earlier than Perry. Therefore I accepted *Septa rubicunda* Perry (= *Triton nodiferus* Lam.) as the type of Perry's genus and applied the name to the congeneric species of Porto Rico, since *Triton* is preoccupied.

In an interesting and useful paper by H. Leighton Kesteven, referred to in the June number of the NAUTILUS, the author does not accept the name *Septa* because Perry's first species is a *Lotorium* and without argument is taken by Mr. Kesteven as type. He shows very clearly that the name cannot be used for *Lotorium*, but does not observe that I never proposed to so use it. I used it for the group of *Murex tritonis* L., which is generically distinct from the group of which *Lotorium* is a member, and which, as Mr. Kesteven shows,

has no other name at present which is valid. I was not obliged to take the first species of *Septa* as a type, knowing it to be a *Lotorium*, and did not. The species for which I used it had no valid generic name and *Septa* was applicable, and should, I think, be adopted.

ON SOME NEW LAND MOLLUSCA FROM MIDDLE AMERICA.

BY C. F. ANCEY.

I. *Streptostyla Sumichrasti*, n. sp.

S. Sumichrasti, Crosse & Fischer, in coll. Sallé.

Testa cylindraceo-oblonga, tenuis, nitidissima, obsolete et flexuosa substriatula, læte fulvo cornea, concolor sed ad apicem obtusulum pallidior. Spira gradata, conoideo-attenuata. Anfractus $6\frac{1}{2}$ convexiusculi, sutura canaliculata divisi, ultimus elongatus, latere dextro leviter planulatus. Apertura subauriformis, superne longe attenuata, basi subdilatata; lamina columellaris tenuis, vix callosa, elongata, spiraliter torta, basi antice vix truncata. Peristoma obtusiusculum, flexuosum, medio antice dilatatum, basi recedens.

Long. 29, diam. 13, alt. $19\frac{1}{2}$ mill.

Hab. in isthmo Tehuantepec, reipublicæ Mexicana (coll. Ancey, Dautzenberg, Jousseume).

A fine large species related to the smaller *S. lurida*, Shutt. and *S. Bocourti*, Cr. & Fisch., but much more slender than the latter and of a more graceful oblong shape than the former. This is surely distinct from any species I examined in the collection of the late A. Sallé, now in the possession of Mr. Ph. Dautzenberg.

II. *Streptostyla clavulata*, n. sp.

Testa parvula, primo aspectu Ferussaciiis ex grege *F. procerulæ* similis, tenuis, nitida, obsolete vix striatula, verisimiliter statu recenti pallide cornea, sed emortua albido-hyalina, cylindraceo-oblonga, oblongula. Spira producta, regulariter attenuata, obtusa, apice magno. Anfractus $6\frac{1}{4}$, subplanulati, sutura appressa, parum distincta, infra pellucido marginata divisi; ultimus cylindraceo-oblongus, basi subattenuatus. Apertura superne angusta, basi dilatata, lamina columellaris brevis, parum valida, subcallosa, leviter

spiraliter torta, basi antice truncatula. Peristoma obtusum, medio antice flexuoso-productum, basi recedens.

Long. $8\frac{2}{3}$, lat. 3, alt. apert. 4 mill.

Hab. in America centrali (?).

A small elongate shell, quite unlike any other I am acquainted with and resembling a Ferussacia. I am indebted for a specimen to Mr. Ph. Dautzenberg, who procured two examples in a lot of loose miscellaneous shells from various localities.

**A PARTIAL LIST OF THE MARINE MOLLUSKS OF SAN SALVADOR,
BAHAMAS.**

BY FRANK COLLINS BAKER.

The following partial list of San Salvador shells is based on a collection exhibited at the World's Columbian Exposition, and now in the Field Columbian Museum, by whom it was referred to the writer for identification.

San Salvador, or Watling Island, is one of the Bahama Islands, and lies just north of the Tropic of Cancer. Its molluscan fauna is like that of the West Indies and Florida. The specimens are mostly beach shells.

Arca barbata Linne.	Cerithium literatum Born.
Lucina dentata Wood.	Trivia pediculus Linne.
Lucina pennsylvanica Linne.	Trivia quadripunctata Gray.
Submarginula octoradiata Gmelin.	Lambidium oniscus Linne.
Acmæa punctulata Gmelin.	Tritonium chlorostomum Lamarck.
Fissurella barbadensis Gmelin.	Pyramidalla dolabrata Linne.
Fissurella fascicularis Lamarck.	Columbella ovulata Lamarck.
Nerita tessellata Gmelin.	Columbella mercatoria Lamarck.
Nerita versicolor Lamarck.	Olivella nivea Gmelin.
Nerita peloronta Linne.	Conus mus Hwass.
Neritina pupa Linne.	Conus verrucosus Hwass.
Hipponyx antiquatus Linne.	Bulla occidentalis A. Adams.
Polinices lactea Guilding	Melampus flavus Gmelin.
Natica canrena Lamarck.	Cerion sp.
Tectarius muricatus Linne.	

NOTES, NEWS AND REVIEWS.

THE USE OF THE GENERIC NAME *HELICOSTYLA*.—In the discussion of the nomenclature of "*Cochlostyla*," it has not been noticed that Mörch, in 1865, used the name *Helicostyla* to include *Axina*, *Corasia*, *Helicobulimus*, etc. He gives a new name *Pythohelix* for the species *bohollensis* and *fulgetrum* and misspells *Orustia* ("Onistia") and *Corasia* ("Coracia"). See Journ. de Conchyl., 1865, p. 385.—H. A. P.

THE ZOÖLOGICAL RECORD, Vol. xxxix, 1902. Mollusca. By E. R. Sykes, B. A., assisted by E. A. Smith, I. S. O., pp. 85. The total number of titles recorded is 611; this of course including many papers purely palæontological. As in the preceding records compiled by Mr. Sykes, the summaries relating to Anatomy and Distribution are especially full, and cannot fail to be of the utmost utility to many students. Thus, on p. 45, references to all articles dealing with inland mollusks of the United States may be found. It may be well to call attention here to a slip, whereby the species of *New Mexico* are placed under "Neotropical, Mexican Region," p. 44, and omitted from "American Region." While New Mexico has a "Lower Austral" element in *Holospira*, this genus has occurred only in a few places in the extreme south, and the fauna as a whole is overwhelmingly "nearctic." Again, Washington, Oregon and Bahamas are put in the "Transatlantic Province" (p. 50), whereas the two former should have been placed in the "Californian," and the latter in the "Caribbean." The systematic part seems to be very well done; though in treating the Pelecypoda, a further classification would certainly facilitate reference. The several parts of the Record may now be purchased separately, the Mollusca for 4, the Brachiopoda 1 shilling.¹ They will be found well worth the price, even to the local naturalist, for the information on what is being done the world over in the study of mollusks.

NOTES ON POLYPLACOPHORA OF THE CONCHYLIEN CABINET.—The monograph on this group, by S. Clessin, has now progressed

¹From the Zoölogical Society, 3 Hanover Square, London.

far enough to show the general quality of the work. The figures are all bad copies, as well as most of the descriptions; and such classification as there is is only right by accident; such cases being readily accountable for by the law of chances. If it were only a reasonably careful compilation, the work might still have a certain value; but it abounds with minor blunders, such as "*Chiton sowerbyanus*" for *C. sowerbyanus*, "Port Jankson," "*Chiton goodalii*," etc.; but perhaps the most amusing case in the part just issued is that of *Chiton sulcatus* Wood. This is renamed *Chiton Woodii* Cles., and said to be from "Lord Woods Insel der Gallopagos." The new name is of course quite unnecessary, because *Ch. sulcatus* Wood dates from 1814, some years prior to any other use of that specific name. The new name *Chiton (Callochiton) Carpenteri* Cles. (p. 64), is a synonym of *Callistochiton pulchellus* Gray, besides being pre-occupied, see-p. 25 of the same work. When the monograph on Scaphopoda in the *Conchylien Cabinet* was issued, I thought that for blunders and general inadequacy it could not be surpassed; but the work on Chitons, by the same author, promises to be a close second.—H. A. P.

Zweiter Beitrag zur Binnen-conchylien des Miocäns von Oppeln in Schlesien.—Von Prof. Dr. A. Andreae. Hildesheim, Dec., 1902. In this further study of a Miocene land-shell fauna, Prof. Andreae brings out several novelties of unusual interest. The new group *Gyalina* contains *Hyalinia (G.) roemeri* n. sp., a form very similar to our *Helicodiscus lineatus*. There is a new species of *Strobilops*, described under the name *Strobilus*. Also several interesting *Helices*. *Adelopoma martensi* n. sp., is a minute *Diplommatina*-like form, in which relation is found with South American species described under the genus *Adelopoma* of Doering, ranging from Argentina to Guatemala. In this connection it may be well to call attention to the fact that forms of the same genus occur in eastern Asia. "*Diplommatina*" *pusilla* Mart. of Japan, and its variety *omiensis* Pils., which are placed by Kobelt (*Tierreich, Cyclophoriden*) in *Cylindropalaina*, really have all the shell characters of *Adelopoma*. Also *D. anurensis* Mouss. (*Journ. de Conchyl.*, 1887), from Vladivostock, which is apparently identical specifically with *pusilla* Mart. Another German Miocene species, *Diplommatina dietzi* Flach, is referred by Dr. Andreae to *Adelopoma*. The distribution of the genus

is somewhat similar to that of *Clausilia* and the Belogonous Helices—European, Oriental and South American.—*H. A. Pilsbry*.

A BIOLOGICAL RECONNOISSANCE IN THE VICINITY OF FLAT-HEAD LAKE [MONTANA].—By Morton J. Elrod. (Bulletin Univ. of Montana, No. 10.) A synopsis of work in all branches of Zoölogy done at the Biological Station of the University of Montana. Besides a good many notes on mollusks throughout the text, there is a catalogue of Montana shells (pp. 170–174), and illustrations of a series of varieties of *Pyramidula strigosa* (plate xxvii) and *P. Elrodi* (pl. xxxii).

CLASSIFICATION OF THE BRITISH SPECIES OF THE GENUS SOLEN L., etc. By H. H. Bloomer (Journal of Malacology, x, 1903). Mr. Bloomer, continuing the series of articles upon the anatomy of *Solen*, gives us a description and illustrations of *Ceratisolen legumen*, *Solecurtus strigillatus* and *S. candidus*. The former has much in common with *S. ensis*, while as would be expected, *Solecurtus* differs in many respects. Respecting the true Solens, Mr. Bloomer looks upon "*Solen vagina* as a more primitive form, and *Ensis ensis* and *E. siligua* as more specialized forms." *Cultellus pellucidus* coming somewhere between. He finds anatomical differences between *Solen* and *Ensis*, sufficient to call for the generic separation of the latter group, which until very recently has been considered a subgenus of *Solen*. These careful, comparative studies in Pelecypod anatomy are valuable and worthy of imitation.

MRS. MARY P. OLNEY.

We have recently learned with great regret, of the death of Mrs. Mary P. Olney, of Spokane, Wash. Mrs. Olney was a devoted lover of nature, and notwithstanding her advanced years, has taken a very active interest in the study of mollusca. Interesting notes such as: "Odor of snails," "Young *Pyramidula strigosa*," etc., were frequently contributed to THE NAUTILUS, and one form, *Polygyra mullani* var. *OLNEYÆ*, was dedicated to her.

THE NAUTILUS.

VOL. XVII.

OCTOBER, 1903.

No. 6.

A NEW GENUS OF TROCHIDÆ.

BY WILLIAM HEALEY DALL.

In dredging between Oahu and Molokai in the Hawaiian Islands, in depths varying between 220 and 436 fathoms, sandy and rocky bottom, the U. S. Fish Commission steamer "Albatross" obtained a number of specimens of a large deep-water gastropod shell, occupied by hermit crabs and completely covered by the extended basal membrane of a large *Actinia*. It is not uncommon to find gastropod shells covered by sponges or hydroid zoophytes, commensal with a Paguroid crab, and it often happens that the zoophyte grows beyond the margin of the aperture forming a shield for the growing crab, to their mutual advantage; since the crab in such cases does not have to seek a new habitation on the ground that the old one has become too small for him, while his movements prevent the zoophyte from becoming smothered by the mud, as might happen if the crab sought another domicile and left the old one lying on the bottom. In such cases the lime of the original shell is often gradually absorbed, though the sponge or zoophyte retains more or less of the original form. In the present case, however, the original shell appears to be normally so deficient in lime as to be practically of a flexible, horny consistency and chiefly composed of a rather tough, thick layer of conchioline. In order that it may retain its shape, it is necessary to keep it in alcohol, as in the case of *Torellia* and some forms of *Velutinidæ*.

STYLOBATES n. g.

Shell depressed-turbinate, few whorled, feebly calcified, with a deep, funicular umbilicus bordered by a carina; surface wrinkled in harmony with the incremental lines; aperture ample, interrupted by the body whorl, the pillar lip straight, the outer lip and base continuously arcuate; the suture appressed. Animal? operculum?

Stylobates æneus n. sp.

Shell large, flexible, with three rapidly-enlarging whorls, which are moderately convex above, descending to a well-marked but not deep appressed suture; base convex, the margin of the umbilicus carinate, its cavity straight-sided and funicular; last whorl expanded at the aperture, which has a thin, simple margin, straight at the termination of the umbilical coil, slightly angular at the intersection of the umbilical carina, the lips above separated for a short distance on the body whorl; shell of yellowish-gray color (in alcohol) with a well-marked, brassy lustre; sculpture of small, irregular wrinkles harmonizing with the lines of growth; outer lip somewhat sinuous and gently excavated at the periphery; upper margin of the aperture advancing beyond the lower. Maximum diameter about 75, minimum 40, height 35, diameter of umbilicus about 10 mm.

Habit, station 3893 of the U. S. Fish Commission steamer "Albatross," in the Hawaiian Islands. There are occasional minute granulations on the surface which may, however, be merely individual peculiarities. The soft parts and operculum are as yet unknown.

This large and peculiar shell does not closely resemble any other deep-water form yet recorded. While its proper classification must remain unsettled until the soft parts are obtained, its general form and habit recall several of the *Trochidæ*, and bear a curious superficial resemblance to the New Zealand land shell formerly known as *Helix* (now *Paryphanta*) *busbyi*.

DISTRIBUTION OF JAMAICAN SPECIES OF COLOBOSTYLUS.

BY P. W. JARVIS.

In this group there are thirteen clearly marked species:

- | | |
|----------------------------------|---------------------|
| Colobostylus interruptus (Lam.). | C. nuttii Pils. |
| C. humphreyanus (Pfr.). | C. albus (Sowerby). |

<i>C. thysanoraphe</i> (Sowerby).	<i>C. banksianus</i> (Sowerby).
<i>C. jayanus</i> (Ads.).	<i>C. yallahensis</i> (Ads.).
<i>C. redfieldianus</i> (Ads.).	<i>C. tectilabris</i> (Ads.).
<i>C. bronni</i> (Ads.).	<i>C. lamellosus</i> (Ads.).
<i>C. chevalieri</i> (Ads.).	

Colobostylus interruptus (Lam.) (Area No. 12). Living specimens of this species are very rare, and only occasionally found on the Dallas mountains, but weather-beaten shells are very abundant on Long and Dallas mountains, lying to the north of Kingston. In Mr. Henry Vendrye's list of Jamaican Land and Fresh-Water Shells, it is classed under *Choanopoma*.

Colobostylus humphreyanus (Pfr.) (Area No. 4) inhabits a very wide area, from the Cockpit country in St. Elizabeth and Trelawny, westward to "Silver Spring," in Westmoreland. The differences between specimens from distant localities are very slight and there seems to be no tendency to vary amongst individuals.

Colobostylus thysanoraphe (Sow.) (Area No. 6) occurs on the high mountains in the center of the island. Fairly abundant in the Cave Valley district.

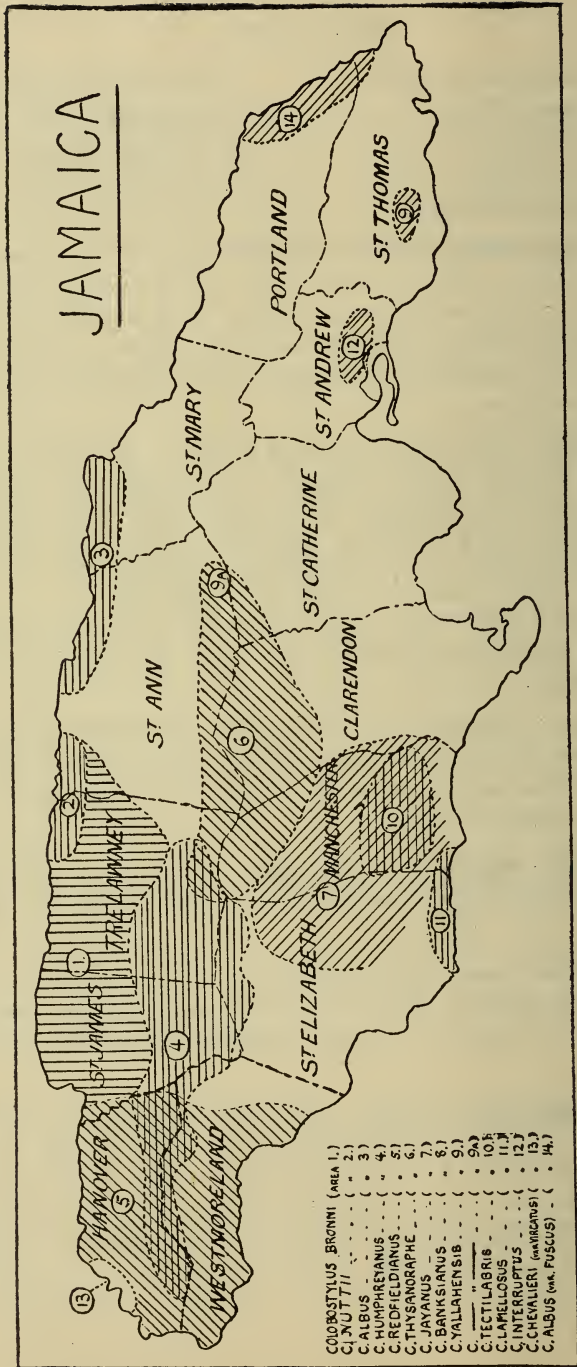
Colobostylus jayanus (Ads.) (Area No. 7) is common throughout Manchester. This species is somewhat nearly allied to *C. thysanoraphe*. I have not yet found either any intermediate varieties or both species in one locality.

Colobostylus redfieldianus (Ads.) (Area No. 5) occurs in the two parishes of Westmoreland and Hanover. Varies considerably in size and color.

Colobostylus bronni (Ads.) (Area No. 1). The metropolis of this shell is the highland parts of St. James and Trelawny where it abounds, it is common in smaller numbers throughout these two parishes.

Colobostylus chevalieri (Ads.). The typical form of this very pretty shell occurs somewhere in the mountains near Montego Bay. I have not yet found it. Dr. F. A. Sinclair, who has kindly given me specimens, did not take note at the time of the exact locality. The varieties *album* and *virgatum* of Adams, are found together at Green Island in Hanover (Area No. 13).

JAMAICA



- COLOBOSTYLUS BRONNI (AREA 1.)
- C. J. TUTTII (" 2.)
- C. ALBUS (" 3.)
- C. HUMPHREYANUS (" 4.)
- C. REDFIELDIANUS (" 5.)
- C. THYSANORAPHE (" 6.)
- C. JAYANUS (" 7.)
- C. BANKSIANUS (" 8.)
- C. YALLAHENSIS (" 9.)
- C. " (" 9A)
- C. TECTILABRIS (" 10)
- C. LAPELLOSUS (" 11)
- C. INTERRUPTUS (" 12)
- C. CHEVALIERI (incl. BRAYSI) (" 13)
- C. ALBUS (var. FUSCUS) (" 14.)

DISTRIBUTION OF THE SPECIES OF COLOBOSTYLUS.

Colobostylus nuttii Pils. (Area No. 2), is found on the Coast mountains at Braco, near Duncans.

Colobostylus albus (Sowerby) (Area No. 3). The typical forms of this species inhabit the coast mountains from Port Maria to St. Anns Bay and for a few miles inland. The var. *fuscus* of Adams, comes from the John Crow hills in Portland (Area 14).

Colobostylus banksianus (Sowerby) (Area No. 7). This species has its headquarters in Manchester and spreads for a considerable distance across the borders of St. Elizabeth and through the Cockpit country.

Colobostylus yallahensis (Ads.) (Area No. 9). The types of this species came from "Roaches Gully," on Creighton Hall Estate, in St. Thomas; it is also found at one or two other places on the Yallahs hills. This species also crops up at Schwallenburg (Area 9 A) on the slopes of Mount Diablo, in St. Anns. I do not know of its having been found anywhere else than in these two small areas.

Colobostylus tectilabris (Ads.) (Area 10), inhabits the central and southern parts of Manchester. It is widely distributed over this area but not common.

Colobostylus lamellosus (Ads.) (Area No. 11) is found on the mountains of the South Coast of St. Elizabeth.

A NEW JAMAICAN COLOBOSTYLUS.

BY HENRY A. PILSBRY.

Colobostylus nuttii n. sp.

Shell narrowly umbilicate, turbinate conic, similar in general shape to *C. chevalieri* (C. B. Ad.); surface very finely, densely and regularly striate throughout, the striæ more spaced and sharper on the early whorls, exactly as in *C. albus*. Coloration various, but usually consisting of a wide, purplish or purple-brown belt, leaving a pale or whitish band below the suture and around the umbilicus; the penult. whorl or whorl and a half bicolored, the lower part dark, the upper whitish; the upper whorl always purple-black. 3 to 3½ very convex whorls remain, the summit being truncate. The aperture is vertical, chest-

nut-brown within, at least in large part, not quite circular, being a little longer than wide, and with the inner margin less arcuate than the outer. Peristome moderately broad, with a low, brown, raised inner rim, and whitish or white expansion, which is dilated into a slightly recurved or concave lobe above, adnate to the preceding whorl; it is also a little dilated at the columellar margin. The umbilicus is smooth within, but rarely shows faint traces of a few spiral cords.

Length 17, diam. 13 mm.

Length 15, diam. 11 mm.

The operculum is white externally, slightly concave, rather coarsely wrinkled tangentially, and with about $2\frac{1}{2}$ whorls after the blackish nucleus, which is situated at about the lower third, and much nearer the columellar than the outer margin. The edge is very deeply grooved, the sides of the groove smooth or nearly so.

Braco, Trelawny, in northwestern Jamaica, the types collected by Mr. George Nutt, and sent by Mr. P. W. Jarvis.

This species differs from *C. chevalieri* in the sculpture of fine vertical striæ, the obsolescence of spiral cords around the umbilicus and in coloration. *C. albus*, which has similar sculpture and operculum, differs in the narrow lip, not dilated above. The latter species is the most nearly related form known to me.

Sometimes the wide median color zone is split by a lighter peripheral tract; or it may be reduced to a narrower belt below the periphery.

NOTES ON THE MOLLUSK FAUNA OF SAN NICHOLAS ISLAND.

BY HERBERT N. LOWE.

San Nicholas, the most bleak and barren bit of land in the whole group of the Santa Barbara Islands, lies apart from its more favored sister islands, sixty-five miles from the mainland. It is a small island, barely nine miles long, by four or five wide, without a vestige of a tree of any kind, and very little of the cactus, which grows in such quantities on the other islands. About half its area is a great desert of shifting sands where lie the bleaching bones of an extinct race of Indians which inhabited the island many years ago. Many

strange and interesting implements of stone, bone and shell have been found, showing very skillfull workmanship.

On this favored spot it was the writer's good fortune to spend three weeks in scientific research during the month of February, 1902. The marine shells are all of rare occurrence, with the exception of *Acmæa gigantea*, *Haliotis cracherodii* and *Mytilus californianus*, which grow on the rocks by the thousand. The red "abalone," *Haliotis rufescens*, used to be very abundant on the island, as was also the giant *Cryptochiton stelleri*, but are now of very rare occurrence. The smaller species, such as *Ocenebra circumtexta*, *Marginella varia*, *Gadinia reticulata*, *Mitromorpha filosa*, *Megatebennus bimaculatus* and a few of the smaller *chitons* were found under stones in little sheltered inlets away from the heavy surf.

The remainder of the coast line is composed alternately of great ledges of smooth rocks and strips of smoother sand beach. Unlike the other islands, with their steep cliffs jutting off abruptly into deep water, San Nicholas is low, lying with bluffs sloping gradually to the water's edge, with shallow water a long distance from shore. A belt of kelp, in places more than a mile wide, surrounds the island, making a landing very difficult. A fair idea of the marine species inhabiting the coast may be obtained from the bleached shells found on the old Indian camp grounds, as they seemed to have eaten molluscs of every description, principally the *Haliotis*, fragments of which cover the mounds by the million, and the iridescent shells reflecting the rays of the sun in a gorgeous and dazzling play of color, present a picture long to be remembered.

The following is a list of marine species found on the Indian mounds:

<i>Cypræa spadicea</i> Gray.	<i>Cryptochiton stelleri</i> Midd.
<i>Trivia solandri</i> Gray.	<i>Cardium quadrigenerium</i> Con.
<i>Krato vitelina</i> Hds.	<i>Cardium biangulatum</i> Sby.
<i>Acmæa gigantea</i> Gray.	<i>Rupellaria lamellifera</i> Con.
<i>Acmæa mitra</i> Esch.	<i>Lucina californica</i> Con.
<i>Acmæa pelta</i> var. <i>nacelloides</i> Dall.	<i>Venus fordii</i> Yates.
<i>Chlorostoma brunneum</i> Phil.	<i>Hinnites giganteus</i> Gray.
<i>Chlorostoma montereyensis</i> Kien.	<i>Pecten æquisulatus</i> Cpr.
<i>Chlorostoma funebre</i> A. Ad.	<i>Tapes staminea</i> Con.
<i>Gadinia reticulata</i> Cpr.	<i>Norrissia norrissii</i> Sby.

<i>Lucapina crenulata</i> Sby.	<i>Monoceros lapilloides</i> Com.
<i>Fissuridea aspera</i> Esch.	<i>Olivella boetica</i> Cpr.
<i>Pachypoma inequale</i> Martyn.	<i>Oliva biplicata</i> Sby.
<i>Pomaulax undosus</i> Wood.	<i>Purpura saxicola</i> Val.
<i>Ocenebra circumtexta</i> Stearns.	<i>Mytilus californianus</i> Con.
<i>Fusus barbarensis</i> Trask.	<i>Haliotis rufescens</i> Swain.
<i>Mitra maura</i> Swains.	<i>Haliotis cracherodii</i> Leach.
<i>Cancelluria cooperi</i> Gabb.	<i>Haliotis corrugata</i> Gray.
<i>Ischnochiton conspicuus</i> Cpr.	<i>Natica</i> sp.

The reefs where the *Acmæa gigantea* have their home, jutting out between the sand beaches, are, after every storm, temporarily covered over with sand. At such times a large quantity of sand gets under the mantle of the *Acmæa*, causing little nodules to be formed on the inside of the shell, from the size of a pinhead to that of a small bean. The shells were of unusual thickness, to withstand the continual pounding of the surf.

As I have previously stated, the island is almost destitute of vegetation, making the land shells few and far between. The only species were: *Helix tryoni*, found alive in small numbers; *H. feralis*, one fresh specimen and occasional dead ones; *H. sodalis*, none but dead and bleached ones. I should probably not have obtained any live *Helices* had it not been for a rain storm which came on while I was on the island, when the tiny creatures seemed to sprout as it were from the bowels of the earth. After every rain storm there comes a fierce, drying, west wind, which makes the snails "hunt their holes" in a hurry, and any unfortunate *Helix* not under cover is made short work of by the scorching winds and sand blowing upon them. About the only food for the snails is a low-growing salt bush, at the roots of which they burrow in the dry season. At the east end of the island are found the few scattering live *Helices* with comparatively few dead shells, while at the west end of the island the dead and bleached shells lie by the thousand on the great stretches of shifting white sand. As there is no vegetation whatever at that end of the island, and the prevailing winds, in the opposite direction, makes it impossible for them to have been driven there by that agency, it remains an unanswered question how came these myriads of dead and bleached shells in this sand desert?

At the west end occasional springs of fresh water drip from over-

hanging ledges of rock to little pools on the sand beach, and then flow to the great ocean without having benefited the island in any way. In these little pools a few small stunted *Physas* were found.

During the winter season the island is the rendezvous of Japanese fishermen, who catch lobsters for the Los Angeles market. They also make a business of hunting *abalones* at low tide. The meats are cleaned from the shells, boiled in salt water and spread on the flat rocks to dry, when they are sacked up and shipped to Japan and China, and considered a great delicacy by the celestial epicures. The shells are sent to Los Angeles and made into pearl buttons, souvenir spoons and various "curios" to tempt the pocket-book of the tourist.

NEW JAPANESE MARINE MOLLUSKS.

BY HENRY A. PILSBRY.

Phasianella tristis n. sp.

Shell imperforate, globose turbinate, thick and solid, dark reddish-brown, the apical whorl whitish; smooth. Spire short. Whorls 3, rapidly increasing, the last rounded. Aperture more than half the length of the shell, oblique, rounded-ovate; columellar margin regularly concave, flattened and callous. Alt. 3.6, diam. 3 mm.

Rishiri, Kitami. Types no. 85222 A. N. S. P., from no. 1367 of Mr. Hirase's collection.

Near *P. oligomphala*, but the aperture is less oblique, the shell more solid and of a more sombre color.

Gibbula affinis var. *cognata* n. v.

Differs from *G. affinis* of the Viti Is. in having the larger spiral cords more equal and regularly spaced, the apical whorls rose-colored. Riukiu I.

Gibbula vittata n. sp.

Shell narrowly but openly umbilicate, conic, fleshy-brown, striped longitudinally with white, the white stripes about half as wide as the darker ones. Surface nearly lusterless. Whorls subangular above

the middle of the upper surface, the last also angular at the periphery; sculptured with narrow spiral cords, of which there are four between the peripheral angle and the shoulder, the surface nearly smooth or with one cord above the shoulder. Base with about nine spiral cords. Whorls nearly 6. Aperture oblique, rounded, angular at the base of the columella, smooth within. Columella straightened in the middle. Umbilicus smooth and white within. Alt. 6, diam. 5.3 mm.

Riukiu I. Types no. 82037 A. N. S. P., from no. 1318 of Mr. Hirase's collection.

Gibbula incarnata n. sp.

Shell perforate or closed, turbinate, coral-red, uniform or with some paler or whitish spots at the periphery, a small area around the columella white. Sculptured with nearly smooth spiral cords as wide as their intervals, nine in number on the penultimate whorl. On the somewhat flattened base there are about 8 finer cords. Spire conic, the apex obtuse. Whorls 5, convex, the last subangular around the base. Aperture oblique, irregularly rounded, smooth within. Columella wide and calloused. Alt. 5.3, diam. 5.

Kumihama, Tango. Types 82141 A. N. S. P., from no. 1323 of Mr. Hirase's collection.

Monilea (Rossiteria) nucleolus n. sp.

Shell depressed globose-conic, narrowly umbilicate; white with an interrupted buff zone above, and conspicuously variegated with squarish black-brown spots, of which there is a row of broad ones below the suture (three or four on a whorl), a row of smaller ones just above the periphery, and another on the base. Besides these, there is an irregular articulation or dotting of dark brown on the spiral cords. Surface glossy, sculptured with numerous very low and subequal, nearly smooth, spiral threads, almost obsolete on the base, but reappearing at the border of the umbilicus; and showing under a lens, subregular, close, longitudinal grooves, almost obsolete, but visible near the suture and umbilicus. Whorls 5, convex, the last well rounded. Aperture oblique, the columellar margin deeply concave in the middle; columella abruptly truncate at the base. Outer lip bevelled to a sharp edge, thickened and spirally lirate within. Alt. 5.6, diam. 6.3 mm.

Compared with *M. nucleus* Phil., this species differs in being smaller, with the whole sculpture much fainter, subobsolete. It is also more depressed, and the umbilicus widens more at the opening.

Clanculus gemmulifer var. *pallidus* n. v.

Differs from *gemmulifer* by its pale, yellowish-brown tint, with roseate apex, and some indistinct, paler, radial flames; only a few of the liræ having sparse black beads, each between two white ones.

Kashiwajima, Tosa. Types no. 85221 A. N. S. P., from no. 9106 of Mr. Hirase's collection.

MISS S. F. PRICE.

We learn with deep regret of the death, at her home at Bowling Green, Ky., on July 3d, of Miss Sadie F. Price. Miss Price was born at Bowling Green. Her parents were Alexander M. and Marie Price. For many years Miss Price had been actively interested in the flora of her State, upon which she published a number of articles, among them a useful illustrated work, "The Fern Collector's Handbook." Ornithology also claimed her attention, and in the last dozen years she became interested in mollusks, and becoming acquainted by correspondence with conchologists working upon inland species, she collected assiduously and successfully, publishing a list of her local collections in this journal for November, 1900. Miss Price assisted upon the Kentucky exhibit at the Columbian Exposition, where she exhibited plants and a series of paintings of the birds of Kentucky, which attracted much attention. Like a true naturalist, Miss Price passed on to many pupils the love of nature. She is survived by her sister, Miss Mary Price, with whom she had lived for many years.

GENERAL NOTES.

HELIX HORTENSIS AT PERCE, P. Q.—Dr. John M. Clarke reports this species as very common in the limestone regions at Perce, Gulf of St. Lawrence. A specimen sent is of the five-banded form.—H. A. P.

PROF. T. D. A. COCKERELL, of East Las Vegas, New Mexico, has removed to Colorado Springs, Colorado.

REV. A. B. KENDIG, of Brookline, Mass., has sold his large collection of land shells to the Franklin and Marshall College, Lancaster, Pa.

THE largest fresh-water pearl on record was found at Genoa, Wisconsin, by seventeen-year-old Frank Hastings while he was fishing. It weighs 185 grains and is pure white. It measures $\frac{1\frac{5}{8}}$ of an inch in diameter. A local dealer bought the pearl, just as it was when it came from the shell, for \$2,675.—*Cleveland Leader*.

MRS. S. L. WILLIAMS, of Chicago, has recently added to her large and beautiful collection of *Cypræidæ* a specimen of *Cypræa broderipii* Gray. We believe this is the only specimen in America.

PUBLICATIONS RECEIVED.

A NEW LAND SHELL FROM CALIFORNIA. By Paul Bartsch (Proc. Biol. Soc. Wash., xvi, pp. 103, 104, 1903). *Sonorella walcottiana* is described from Palm Springs, San Diego Co., where it occurred in crevices of rocks.

ON SOME ADDITIONAL FOSSILS FROM THE VANCOUVER CRETACEOUS, WITH A REVISED LIST OF THE SPECIES THEREFROM. By J. F. Whiteaves. (Geological Survey of Canada, Mesozoic Fossils, vol. i, part 5, pp. 309-415, plates 40-51.)

This part is similar to the one published in 1879, consisting of a report of the many collections received since that time. Some 27 species of *Cephalopoda* are recorded, including six new species. The *Gastropoda* are represented by 35 species, 12 of which are new. *Scaphapoda* two species, and *Pelecypoda* 48 species, 10 being new to science. The synonymy and bibliography is given in full and the illustrations are excellent. The work is a valuable contribution to American palæontology.—C. W. J.

THE NAUTILUS.

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No. 7.

SOME NOTES ON THE GENUS FULGUR.

BY CHAS. W. JOHNSON.

In the very interesting and valuable paper, "Studies of Gastropoda II, Fulgur and Sycotypus," by Amadeus W. Grabau (Amer. Naturalist, August, 1903), the author has again brought to generic rank the name of *Sycotypus*. No stronger evidence is brought forth to uphold this view than that already given, viz., the character of the protoconch, as pointed out by Conrad. Dr. Dall and others consider the condition of Conrad's specimens to have been pathologic, while the many tertiary forms seem to completely bridge all distinguishing conchological characters, leaving only the ciliated periostratum, a feature which is lost in the fossils and in *Fulgur pyrum* is often obsolete or wanting. Still *Sycotypus*, as a rule, forms a recognizable group, very convenient in tracing the origin of many of the species.

Has the protoconch of *F. pyrum* been studied? It may have no bearing on the subject, but it is interesting to note that while the egg-capsules of *F. canaliculatum* are readily distinguished from *F. carica* and *F. perversum* by having a single-keeled edge, those of *F. pyrum* are biangular, resembling those of *F. perversum* in miniature.

In tracing the ancestral relations of the various so-called species, Mr. Grabau has brought out many points which deserve careful consideration. Every one who has made a study of the tertiary species probably has a different view in regard to the relationship of the various forms, and these views should be freely given and the consensus of opinion adopted.

All agree that the Eocene *Levifusus* is probably the immediate

ancestor of *Fulgur*, the latter being first represented in the Oligocene and Lower Miocene by *F. spiniger* and its several varieties, and in the middle Miocene by *F. fusiformis*.¹

From this form was probably derived, as Mr. Grabau states, "the large and ponderous *Fulgur maximum* Conr.," which apparently, through the varieties *tritonis* and *filosum*,² leads to the recent *F. carica* and its variety *eliceans*. On the other hand, the sinistral form undoubtedly evolved from *F. maximum* in the upper Miocene much earlier than Mr. Grabau's table would imply, and by forms such as *F. adversarium* and *F. obfilosum* leads directly to the recent *F. perversum*, and its rare variety *kieneri* Phil. presenting exact parallels to the *F. tritonis filosum* and *F. carica eliceans* series, thus strengthening the theory of a common ancestry. During the Pliocene, *F. perversum* seems to have extended and found more favorable conditions further south, for it is really more plentiful and better developed in the Caloosahatchie than in the Waccamaw beds. On the gulf coast at the present time it is more abundant than on the Atlantic, while *F. carica* is not found at all in the Gulf of Mexico.

In the Caloosahatchie beds there appeared a new form, *F. rapum* Heilp., probably derived from *F. perversum* (as such forms of *perversum* as Mr. Grabau has called *obrapum* would indicate) and apparently representing a reversion to the *maximum* type.

I would not consider *obrapum* to be sinistral *rapum*, neither would I consider *obfilosum* to be a sinistral *filosum*; for while admitting a common ancestry, the immutability of the recent *perversum* and *carica* has given us reason to believe that the same stability has existed since they originated. To admit the mutability of sinistral and dextral forms only makes "confusion worse confounded." *F. rapum*, through the form *tritonoides* Grabau, leads to the recent *F. coarctatum* Sowerby of the Gulf of Mexico, an extremely rare shell which may possibly be extinct. The long anterior canal of the monstrosity *F. candelabrum* Lam., as figured by Kiener, indicates a position here, rather than under *eliceans*.

¹ In a bed which overlies the Chipola and having an out-crop in a mill-race two miles east of Argyle, Fla., I found this species, identical with specimens from St. Mary's, Md.

² *F. filosum* did not originate in the upper Miocene, as indicated by Mr. Grabau's table; *F. maximum*, *tritonis* and *filosum* are all associated with *F. incile* at Yorktown, which moreover is the type locality for *filosum*.

The *Sycotypus* group probably originated, as Mr. Grabau suggests, with such forms as *F. burnsii*, *perizonatum* and *tampaensis* in the Upper Oligocene (Lower Miocene?) and *F. coronatum* and *rugosum* in the Middle Miocene. It seems rather a doubtful conclusion to refer to *F. rugosum* as the direct ancestor of *F. canaliculatum*. I have not seen the "Faison variety" of *F. canaliferum* referred to, but I am inclined to consider *F. alveatus* and *incile* as intermediate forms and to trace the line of ancestry of *F. canaliculatum* and *pyrum* through the same formations in which I trace *F. carica* and *perversum*, viz., the Miocene of Virginia and North Carolina and the Pliocene of the Waccamaw and Caloosahatchie.

The typical *F. incile* of Yorktown seems to have evolved into two forms in the Duplin county beds; the one, *F. conradii*¹ Tuomey and Holmes, leads to the so-called *canuliferum* Conr., the type of which is the *F. canaliculatum* T. & H., from the Waccamaw, and in no way separable from the recent form. The other form, derived from *incile*, represents a very mutable species, and to the various forms had been applied the names of *F. carolinensis*, *excavatus*, *elongatus* and *pyriformis*. These exhibit, however, all gradations and extend through the Pliocene to the recent *F. pyrum* Dillw.

F. concinnum does not belong to the "Middle Miocene." The type locality is Sampson Co., N. C., and I found it also along the Cape Fear River, ten miles above Elizabethtown, Bladen Co., in a bed typically Duplin. I do not know the forms which Conrad described as *amœnum* and *Kerrii* and a study of the form from Walker's Bluff, N. C., might throw additional light on the subject.

THE GREATEST AMERICAN PLANORBIS.

BY HENRY A. PILSBRY.

Planorbis magnificus n. sp.

The shell is very large and high, sinistral as usual, the upper or spire half yellow or pale brown, the lower or umbilical half dark brown. Surface glossy, finely marked with growth-lines, and usually some spiral series of minute long granules, as in many species of pond

¹That *F. conradii* represents an intermediate form between *incile* and *canaliculatum* is clearly shown by a series in the Joseph Willcox collection of Fulgurs, presented to the Academy of Natural Sciences, Philadelphia.

snails (but without thread-like striæ such as *Planorbis trivolvis* has). Spire narrow, deeply sunken, with steep sides; the summit of the whorls acutely angular. Umbilicus deeply funnel shaped, the base of the whorls so narrowly rounded as to appear almost angular. Whorls nearly 5, the last very large, rounded at the periphery, somewhat flattened and sloping above, more convex below it. Aperture but slightly oblique, irregularly ovate, angular or subangular above, broadly rounded below, the peristome slightly expanded.

Diam. 36, height 24.5 mm.

Diam. 34, height 22 mm.

Lower Cape Fear River in the vicinity of Wilmington, North Carolina, collected by Mr. Wm. P. Seal.

This species is remarkable not more for its size than for the great width, far exceeding any other species. It differs from *P. trivolvis*, *ammon* and their allies in the surface sculpture and narrower umbilicus. *Planorbis corpulentus* Say is also somewhat related, but its differential features will be obvious in a comparison with Mr. Bryant Walker's illustrations and description of that species, NAUTILUS XIII, p. 133, plate 3 (April, 1900).

OBSERVATIONS ON THE BYSSUS OF UNIONIDÆ.

BY L. S. FRIERSON.

Recently, while collecting young or very small *Unionidæ*, two species were obtained having a byssus. Seven or eight specimens of *Lampsilis texusensis* Lea, were taken so provided, and one specimen of *Lampsilis fallaciosus* Simpson. The *L. texusensis* varied from one-eighth to one-half inch in length, while the *L. fallaciosus* was five-eighths of an inch long.

The size of the shell and the length of the byssus did not appear to bear any constant ratio, nor did the size (or diameter) of the byssus vary. The most of the *texasensis* and also the *fallaciosus* were taken by means of a combination flour scoop and sieve such as is used in our kitchens. This was used to scrape up the bottom, and then the mud washed out leaving the larger stuff behind. In this way the original position occupied by the shells could not be ascertained; but several specimens were taken attached to sticks, and these were hanging suspended in the water clear of the bottom.

The byssus was attached to the soft parts at about one-fourth distance from the anterior to the posterior end.

One of the *texasensis* had a byssus cylindrical in shape, about half the diameter of a human hair laid alongside for comparison. But that of the others and also of the *fallaciosus* was roughly ribbon-shaped, and resembled a flat piece of "molasses pulled-candy," both in texture and in contour. While wet they were very elastic, but exceedingly brittle when dry, appearing to be of the same composition as the ligament of the shell. These ribbons were irregularly twisted, now to the right, now to the left, as well as vertically undulatory. This gave them a sort of spiral spring effect which was quite noticeable.

The proximal end, when separated from the soft parts by slight traction, was bulb-shaped and attached to a style-like process which occasionally could be drawn from between the valves. My appliances were not equal to the task of determining whether this process was an outgrowth of the foot or of the mantle. The distal ends were attached to quite a little raft of heterogeneous material, and I believe that this "raft" serves to make a float, analogous to the balloons by which spiders sail through the air in the autumn months. None of them seemed to be directly fastened to any large body such as sticks or old shells, but merely entangled with the moss or algæ growing on the sticks, etc. The lengths of these byssi were about three to eight inches.

Several very small *Quadrulas* were taken. But no byssus was noted on any of them. Could this feature be a characteristic of *Lampsilis* and closely allied genera?

A NEW GUPPYA FROM FLORIDA.

BY HENRY A. PILSBRY.

Guppya miamiensis n. sp.

The shell is perforate, almost exactly like *Guppya gundlachi* in shape, size and color; glossy and smooth, with *no trace of spiral lines*, even under high magnification. Alt. 1.5, diam. 2.3 mm., whorls $3\frac{3}{4}$.

Miami, Dade Co., Florida. Types no. 77083 A. N. S. P., collected by S. N. Rhoads, 1899.

In Mr. Rhoads' list of Miami shells, published in a former num-

ber of this journal, this was listed as *G. gundlachi*. Mr. Geo. H. Clapp, who obtained some of Rhoads' specimens, directed my attention to its distinctness. *G. gundlachi* occurs at a neighboring locality, Lemon City, Fla., as well as throughout the St. John's valley, and in west Florida—probably extending all over the peninsula. It was collected by Mr. Singley at Hidalgo, Texas, and is a well-known West Indian and Mexican species. *G. gundlachi* is invariably characterized by the presence of a sculpture of very minute regular and close, spiral striæ, as mentioned in the descriptions of Pfeiffer, von Martens and others, and as I have confirmed in numerous specimens from Florida, Texas, Mexico and the West Indies.

NEW LAND SNAILS OF THE JAPANESE EMPIRE.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota luhuana yakushimana n. var.

Shell small with conic spire, yellowish red-brown or bright yellowish green, indistinctly streaked with darker or sometimes with two or three bands faintly indicated; wrinkle striate with dense fine spiral lines as usual. Whorls $5\frac{1}{2}$, the last very deeply descending below the periphery of the preceding whorl. Umbilicus very narrow and rapidly contracting within. Aperture nearly horizontal, the upper and lower margins subparallel; peristome narrowly reflexed, thickened within.

Alt. 17.5, diam. 23, width of umbilicus 2 mm.

Alt. 17, diam. 23, width of umbilicus 2.5 mm.

Yakushima, Osumi. Types no. 85752 A. N. S. P., from no. 895 of Mr. Hirase's collection.

This race has the small, contracted umbilicus of *E. l. nesiotica*, but it differs in the very small size and conic spire.

Ganesella moellendorffiana n. sp.

Shell openly umbilicate, depressed, with low conic spire, the base concave around the moderately open umbilicus, one-tenth the diameter of the shell; thin, reddish brown, with a narrow, darker band above and a pale band at the periphery. Surface glossy, weakly marked with growth-wrinkles and densely engraved with minute, spiral lines. Whorls 6, convex, very slowly and regularly increasing, the last but

very slightly descending anteriorly, very slightly angular in front, becoming rounded. Aperture lunate, moderately oblique; peristome thin, narrowly reflexed. Alt. 20.5, diam. 29.6, width of umbilicus 3 mm.

Amagisan, Izu. Type no. 85753 A. N. S. P., from no. 1140 of Mr. Hirase's collection.

This is one of the finest of the *japonica* group of species, resembling *G. jacobii* in contour, but much larger, with a comparatively wider umbilicus and darker in color. It is named in honor of Dr. O. von Moellendorff, in whose untimely death malacology has lost one of the most acute and industrious authorities upon Oriental snails.

Pristiloma japonica n. sp.

Shell minute, imperforate, discoidal, the upper surface very low, conoidal, base convex, periphery rounded; pale yellow, somewhat translucent, glossy and almost smooth, very faintly striate radially above. Whorls $5\frac{1}{3}$, slowly widening, slightly convex, the base impressed in the center. Aperture nearly vertical, narrowly lunate, the outer lip acute and thin, strengthened a short distance within by a white, callous ridge, showing as a buff streak outside; columellar margin narrowly reflexed at the insertion. Alt. 1.5, diam. 2.7 mm.

Toya, Kuziro, in eastern Yesso. Types no. 85754 A. N. S. P., from no. 1146 of Mr. Hirase's collection.

It is impossible to say whether this is really a *Pristiloma* until the jaw and teeth can be examined; but from the close resemblance of the shell to *P. lansingi*, the generic reference seems probable. There is no Oriental group to which it could properly be referred, to my knowledge. It is a new generic type for Japan.

NEW PISIDIA.

BY V. STERKI.

Pis. complanatum n. sp. Mussel inequipartite, slightly oblique, moderately inflated; superior margin short, somewhat curved, with rounded, more or less projecting angles at the scutum and scutellum; posterior part short, truncate, passing with a rounded angle in the inferior margin, which rises in a strong curve to the rounded-angular anterior end; supero-anterior slope not well marked, slightly curved;

beaks rather posterior, projecting over the hinge margin, slightly bulging anteriorly and posteriorly, flattened laterally; surface with very fine, almost regular striæ and a few faint lines of growth, with a slight, silky gloss; color light to brownish-horn; shell scarcely translucent; nacre thin, with the muscle insertions visible but not impressed; hinge slight to moderately stout, plate rather narrow, right cardinal tooth curved, occupying the whole width of the plate, its anterior end abruptly thick and grooved or bifid, its ends are connected by the sharp, inferior edge of the plate, thus forming a groove; left anterior cardinal tooth short, curved or angular, the posterior quite short, small, oblique; lateral teeth moderately stout, with short, pointed cusps, the outer ones of the right valve quite small but distinct; ligament short, comparatively stout.

Long. 3.2, alt. 2.8, diam. 1.8 mill.; long. 2.7, alt. 2.4, diam. 1.6 mill.

Habitat: Little Black Creek and lakes in Muskegon Co., Michigan, sent by Mr. Bryant Walker.

This species is different and distinct from all our *Pisidia*. It somewhat resembles *P. ultramontanum* Pr., but is much smaller, its beaks are narrower, of different shape and more prominent. Some of the specimens from the creek are higher over the beaks and in the posterior part, and thus the mussel is of a rather different shape. In others, the beaks are less flattened, laterally.

Pis. rowelli n. sp. Mussel well inflated, elliptical-ovate in outline, angles at scutum and scutellum slightly projecting, broadly rounded; posterior margin just perceptibly subtruncate, supero-anterior slope slightly marked; beaks a little posterior ("in normal position"), large, rounded, projecting over the hinge margin; surface shining, slightly and irregularly striate, with a few coarser lines of growth; horn colored to brownish over the beaks, usually with a lighter zone along the margins, not sharply defined; shell translucent, rather thin; hinge slight, plate rather narrow; right cardinal tooth angular, with its posterior part thicker and grooved, left anterior short, triangular, placed high up on the plate, the posterior much longer, oblique, curved; lateral teeth with rather short, abrupt cusps in the left valve; the outer ones in the right valve small; ligament slight.

Long. 7.5, alt. 6.2, diam. 4.5 mill.

Habitat: Near Sisson, at the foot of Mount Shasta, California, collected by Rev. J. Rowell.

This large and beautiful *Pisidium* cannot be mistaken for any other species. It seems to be related to *abditum* Hald., and some of the old-world *Pisidia*. Young specimens are very little inflated, and of a light, almost whitish color.

Pis. cuneiforme n. sp. Mussel inequipartite, oblique, moderately to rather well inflated, mostly so near the beaks; hinge margin slightly curved, the angles at the scutum and scutellum projecting; anterior part considerably longer, attenuated, somewhat cuneiform, and directed downward, the end rounded, supero-anterior slope well marked, straight or slightly curved; posterior part short, subtruncate; beaks moderately large and slightly elevated over the hinge margin; surface finely and irregularly striate, pale to yellowish horn-colored, or whitish, dull to shining; shell opaque to subtranslucent, thin; hinge slight, short, plate narrow; cardinal teeth placed far towards the anterior, well formed; the right curved, its posterior part slightly thicker and grooved; the left anterior well curved, the posterior slightly so, almost longitudinal and above the anterior, long; right lateral teeth slight, cusps low and rounded, the outer ones well formed; in the left valve the cusps are short, high, abrupt, pointed; ligament slight.

Long. 2.8, alt. 2.4, diam. 1.8 mill.

Habitat: Michigan and Minnesota. In Michigan: Byer's trout pond, Kent Co.; Blue Lake and Green Creek, Muskegon Co.; Hess Lake, Newaygo Co.; Lake Michigan, at High Id. Harbor. Clearwater River, Stearns Co., Minn. Collected by Messrs. Bryant Walker, H. E. Sargent and R. G. Kirkland.

Specimens were received in 1895, and again in '98 and '99, and then regarded as representing a distinct species. Yet the number of specimens from each place being limited, it seemed advisable to wait for more materials.

Pis. cuneiforme has some resemblance with *P. subtruncatum* Malm. and (var.) *cuneatum* Blz., of Europe; but the beaks are broader, less elevated; the surface striation and appearance are different, and the young of both show more differences between each other than the adult. Of our North American species, it has resemblance only with some forms of *P. compressum*, but our species is much smaller and its anterior part is longer, comparatively. Young and half-grown specimens are comparatively shorter, less inequipartite and less oblique.

A well-marked feature of the hinge is, as it seems, the relative position of the teeth, the distance between the cardinals and posterior lateral cusps being twice as long as that between the cardinals and anterior laterals. In other species, *e. g.*, *Pis. compressum*, *variabile*, *noveboracense*, that difference is much less marked, and in *P. virginicum* the cardinals are about equidistant from the laterals.

NEW LAND SNAILS FROM SOUTH AMERICA.

BY C. F. ANCEY.

Epiphragmophora orophila Anc.

Testa umbilicata, umbilico margine columellari fere prorsus ob-
tecto, depressa, solidula, subnitida, fusco-olivacea, supra medium
fascia fulva cincta, supra oblique et irregulariter striata, striis rugi-
formibus, subtus exilioribus, præterea passim et minute malleata
atque spiraliter infra impressiuscula. Spira convexa, obtusa, late
subconoidea. Anfractus $5\frac{1}{4}$ convexi, sutura impressa, in ultimo sub-
irregulari discreti, ultimus relative magnus, antice sat breviter de-
flexus. Apertura obliqua, transverse oblonga, intus fuscula, fascia
transmeante. Peristoma album, incrassatum, anguste expansum,
basi reflexum et intus dilatatum, ad columellam late supra umbilicum
eversum, marginibus sat remotis, basali declivi.

Diam. $29\frac{1}{2}$, min. 24, alt. 16 mill.

Hab. in Andibus Peruvix.

This shell, received by MM. Sowerby and Fulton as *E. clausom-
phalos* (?), Dev. & Hupé, is quite unlike the latter, but is related to
a species of smaller size that one of these gentlemen sent me some
years ago as *E. Farrisii* Higg., or rather *E. Higginsi* Pfr., the former
name being preoccupied. However it does not seem to correspond
with the original diagnosis. The present species is larger, its sur-
face is rough but of a plain brown color, ornamented with a brown
band and the umbilicus is nearly closed.

Epiphragmophora Turtoni Anc.

This I have described in the journal as probably Bolivian, but
subsequently my friend Mr. Gude has described from Paraguay an
N. Dormeri, which appears to be very close to it and of which I have
seen the type in his collection. Both are probably from the same

country. *E. turtoni* is larger, a trifle more depressed, and is furnished with a single median brown band. Otherwise the two species are very much alike.

Porphyrobaphe sarcostoma, n. sp.

Testa imperforata, solida, ovato-oblonga, nitida, striis incrementi lævibus oblique notata, in parte infera ultimi anfractus obsolete et superficialiter lineis spiralibus vix impressa, sub epidermide lutescente fuscula vel cinereo-fulva, atque strigis seu lineis undulatis vel fulguratis crebre picta, præterea obscure saturatius 3 vel 4-fasciata, fasciis ob lineas persæpe interruptis, duabus primis in anfractibus superis continuatis, apice pallido. Spira conoidia, modice elongata, obtusa. Anfractus $6\frac{1}{2}$ convexiusculi, duo primi microscopice punctati, ultimus regulariter oblongus, ad aperturam brevissime ascendens. Sutura parum profunda, inferne (an casu fortuito?) impresso marginata. Apertura subobliqua, elliptico-oblonga, intus cœrulescenti-albida, fauce nitida, fusco-carnea; superne angulata, postice ad basin columellæ tantisper subangulata. Columella intus plica supera mediocri alba oblique ascendente munita, postea subarcuata. Peristoma callosum, crassum, undique breviter expansum et reflexum, albido-carneum, ad basin dilute fuscum, marginibus callo valido ejusdem coloris junctis.

Long. 74, lat. 31, alt. apert. (oblique, cum perist.) $33\frac{1}{2}$ mill.

Hab. in Colombia (?).

I saw only one example of this beautiful species and it is in my collection. I can compare it with no other, the color of lip and throat being a striking feature.

(*To be continued.*)

MRS. HENRIETTA H. T. WOLCOTT.

We regret to chronicle the death of Mrs. Henrietta H. T. Wolcott, of Dedham, Mass., following a severe accident. She passed away after much suffering, October 8th, in the 78th year of her age. Mrs. Wolcott was deeply interested in the study of nature, was a proficient botanist, and of late years interested in Conchology. A wide traveler, she was never happier than when engaged in gathering interesting material suitable for educational purposes; and many small, well-

chosen school collections were given by her to educational institutions and public schools. In the course of her travels she frequently obtained new or rare specimens which she shared with cordial pleasure with those students to whom they were of special interest. Her last contribution of this kind was the *Sonorella Wolcottiana* from Palm Springs, in the desert region of southeastern California. Philanthropic work also claimed much of her attention, to which she brought a mind clear and sensible, broadened by experience of many years at home and in distant countries. Mrs. Wolcott was the daughter of Joseph and Eleanor Eustis, of Boston, and the widow of the late John W. Wolcott. She leaves a son and two daughters, besides many, not bound by ties of relationship, yet who will remember her as a friend, benefactor, or co-laborer.—W. H. D.

NOTES AND NEWS.

SHELLS OF DOUGLAS CO., CENTRAL WASHINGTON.—Prof. R. E. Snodgrass collected a small series of shells at Grand Coulee, Blue Lake, in July, 1902, comprising the following species.

“Pyramidula” strigosa Gld. (small var.).	Planorbis trivolvis var. horni Tryon.
Agriolimax campestris Binn.	Planorbis parvus Say.
Succinea nuttalliana Lea.	Physa triticea Lea.
Succinea gabbi Tryon.	Pisidium compressum Prime,
Limnæa nuttalliana Lea.	Pisidium sp. undet.
Limnæa adelinæ Tryon.	
Limnæa near sumassi Bd.	

This locality must be near or at the western limit of *P. strigosa*. Specimens are in the coll. of the Washington Agricultural College at Pullman, Wash., and that of the Academy at Philadelphia.—*H. A. Pilsbry*.

SCHISMOPE RIMULOIDES (Cpr.) at *San Diego*.—This species was described by Carpenter as a *Scissurella*, from Mazatlan. In examining some specimens sent some years ago as “*Vanikoro?*” by Henry Hemphill, I found that they were the species named above. I do not know that this genus has been reported from California hitherto.—*Pilsbry*.

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A NEW CALIFORNIAN TRIVIA.

BY WILLIAM J. RAYMOND.

During the summer of 1901 the University of California, with the financial aid of friends in Los Angeles, maintained a Marine Biological Laboratory at San Pedro, California, and carried on biological exploration along the coast from Redondo to Newport, around Catalina Island, and from Los Coronados Islands to La Jolla in the vicinity of San Diego. The large gasoline launch "Elsie" was chartered for the summer and equipped with apparatus for the study of the physical environment of marine life, including depth, temperature and salinity of water and character of bottom. Collections of specimens were made within the regions named, from shore-line to an extreme depth of 100 fathoms. For this purpose the launch was provided with a winch and rope, dredges, trawls, tow-nets and receptacles for the preservation of the specimens. The molluscan collections, which were large and interesting, were placed in the writer's hands for identification and report. In advance of a complete report it is desirable to put certain observations on record, among them the descriptions of new species encountered. A previously known but undescribed species of *Trivia* is:

Trivia ritteri n. sp. Shell small, white, form ovate, inflated, anterior extremity slightly produced, spire completely covered, but rather prominent, base convex, outer lip margined, strongly sculptured with about twenty, smooth, sharp ribs, much narrower than the interspaces which are nearly flat and scarcely roughened by irregular rugæ parallel to the axis of the shell, no sulcus, the ribs continuing

unchanged in width across the back, except that occasionally a few ribs near the spire are interrupted at the median line; a few short intercalary ribs are usually present on the sides of the shell; aperture rather wide, armed with 17 to 18 denticulations on the outer lip, and 14 to 16 on the inner. Two extreme specimens in size measure: length 11.5, breadth 8.6, height 7.2 mm.; length 9.2, breadth, 6.5, height 5.7 mm.

Catalina Island, 60 fathoms (Cooper); Monterey (Dall); Cortez Bank, 54 fathoms (Dall); Catalina Island near Avalon, 40 fathoms (Sta. 21, U. C. M. B. L.); off San Pedro, about 50 fathoms (Sta. 83, U. C. M. B. L.).

A dead specimen and a fragment of a second, collected more than thirty years ago by Dr. Cooper, as cited above, but wrongly identified as *Trivia sanguinea* Gray, are now in the museum of the University of California. If the admission of *T. sanguinea* to the Californian fauna rests solely upon this identification, the name should be removed from our lists. See Cooper's Geographical Catalogue of the Mollusca Found West of the Rocky Mountains, 1867, No. 626.

To Dr. Dall is owing the citation of localities which considerably extend the known range of *T. ritteri*. A specimen was submitted by Dr. Dall to Mr. J. Cosmo Melvill, of Manchester, England, who considered it new after comparison with *T. multilirata*, *europæa*, *candidula*, *pellucidula*, etc. In the character of the ribs it somewhat resembles *T. buttoni* Melv., but differs in color, being white instead of straw-colored, in having about twenty instead of fourteen ribs, and in its size, the latter species being 5.5 mm. in length. *T. ritteri* differs from *T. europæa* in the ribs, which in the former species are less numerous, sharp, and much narrower than the interspaces, while in the latter they are more rounded and wider. The shell of the latter is also more inflated. From *T. panamensis* Dall, the present species differs in much greater size and more numerous ribs. It gives me great pleasure to dedicate this beautiful species to Professor William E. Ritter, in charge of the University of California Marine Biological Laboratory at San Pedro, 1901.

ANNIE M. LAW.

For much of our knowledge of the mollusk fauna of east Tennessee and western North Carolina we are indebted to two ladies, Miss

ANNIE M. LAW and MRS. GEORGE ANDREWS. Before them, RUGEL had made a beginning in this beautiful but difficult mountain country. Until FERRISS and his friends began their explorations, these three enthusiasts were the only naturalists to exploit the region for land mollusks.

Miss Law¹ came from distinguished English ancestry. Her parents were John and Ann Law, of Carlisle, England. Her uncle, Richard Law, was governor of Malta. Other relatives who rendered services to the State were Chief Justice Lord Ellenborough, the Bishop of Bath and others. The Law family records were destroyed during the Civil War, so that the exact date of Miss Law's birth cannot be ascertained; but her father, John Law, came to America about 1850, Miss Law being about nine years old at that time.

"Mr. Law located some nine miles from the town of Maryville, Blount county, Tenn., a wild, mountainous country, though there was a watering-place about two miles distant where the *elite* of the South came through the summer for health and rest. Otherwise our neighbors were illiterate. There were no schools or churches, so that our parents were our teachers and companions. My father died in 1852 or '53. During his lifetime on the farm, my sister would ride into Maryville and recite Latin and algebra to Dr. Anderson (the founder of Maryville Theological Seminary) once or twice a week. Then moving into the town, she still continued these studies. She passed the examination for teaching school, and received a certificate at the age of thirteen. Being large for her age, she was given a school. She was proficient in music and gave lessons.

"Through Col. W. G. McAdoo, of Knoxville, she was introduced to Dr. James Lewis, of Mohawk, N. Y., who wished her to collect shells. She had from childhood a taste for shells, mineralogy, entomology, botany, in fact everything connected with nature. She began a correspondence with Dr. Lewis about 1868, which continued until his death. She had also a number of other correspondents in America and abroad.

"I might write a long story about some of her trips while collecting. After being in California four years, she returned to Tennessee and spent several months there. On one occasion, Dr. Lewis wished some

¹ The following account is from data and a biographical sketch furnished by Mrs. Fannie Law Andrews, Miss Law's younger sister.

particular shell from Bald Mountain in the Great Smoky Mountains. She procured a young man friend and two horses, and setting out from Concord, Knox county, went to the top of the Big Bald and procured the shells desired. They had to spend the night there. During the night there was a terrific thunder-storm far beneath them. She never enjoyed a trip more. Another trip she made in Monroe county was from Jalapa to Telico Plains. The distance was not great, but it was a bitter cold morning, the banks of the river covered with ice. She wore rubber boots, and wading in, got beyond her depth; but she got the shells. On this trip, I was her companion. As there was no house on the side I was on, I followed with bare feet. She suffered very much, not having dry footwear; but we soon reached a comfortable fire at a friend's, dried our things and were made comfortable. My sister never seemed to think of her own comfort when engaged in the search for shells. Many such exposed trips she made, the effects of which I think undermined her health.

“When she returned to California the second time, I was with her. We came by way of Mohawk, N. Y., visited the family of Dr. Lewis, and had the pleasure of seeing his collection. We also made a flying trip to Florida, visiting Jacksonville, St. Augustine, Palatka and Silver Springs. Wherever we were, she collected shells.”

In California, Miss Law made her home at Watsonville, Santa Cruz county, with her sister, Mrs. Andrews, until her death, January 12, 1889.

Among the species discovered by her are *Gastrodonta acerra*, *Vitrinizonites latissimus*, *Polygyra chillhoweensis* and *P. lawi*.

NOTE ON MUREX MARCOENSIS SOWERBY.

BY FRANK COLLINS BAKER.

In the *Journal of Malacology*, volume 7, p. 162, Mr. G. B. Sowerby has described a *Murex marcoensis* from Marco, Florida. This form was previously noted by Dr. W. H. Dall and the writer of this note, it being considered by them a color variety of *Murex messorius* Sowerby. Dr. Dall, in speaking of *Murex messorius* says (*Bull. Mus. Comp. Zool.*, v. 18, p. 196), “The Florida specimens are often of a deep rose-pink.” In *Trans. Acad. Sciences*, St.

Louis, the writer remarked on p. 377, "Dr. W. H. Dall has characterized a variety *rubidum*, from Cedar Keys, Florida, the shell being of a deep pink color." The writer was in error in stating that Dr. Dall had characterized the variety *rubidum*, he having simply referred to the rose color.

The history of this variety will therefore stand as follows :

1889. Dall : *Murex messorius* (Sowb.) Reeve, pink variety, Bull. Mus. Comp. Zool., v. 18, p. 196.

1897. Baker : *Murex messorius* (Sowb.) Reeve, var. *rubidum* "Dall," Trans. Acad. Sci., St. Louis, v. 7, p. 377.

1900. Sowerby : *Murex marcoensis*, Journ. of Malocology, v. 7, p. 162.

If the two forms are the same, which I have no reason to doubt, it will stand as *Murex messorius* var. *rubidum* Baker.

NEW LAND SNAILS FROM SOUTH AMERICA.

BY C. F. ANCEY.

Porphyrobaphe galactostoma Anc.

P. galactostoma Anc. in Bull Soc. Malac. Fr., 1890, p. 153 (juv.).
P. yatesi Pfr. var. *albolabris* Dohrn, in Cat. Staudinger.

Testa imperforata, solidula, subglutinosa nitens, oblongo-attenuata, vix lineis incrementi notata, epidermide luteo-virenti induta, fasciis 4 badiis (supera angusta, infera late sed parum distincta), strigis fulguratis luteis interruptis in ultimo anfractu eximie picta, fasciis 2 superis in anfractibus prioribus conspicuis. Spira conoidea, regulariter attenuata, apice obtuso, pallide lutescenti-albo, microscopice punctato-rugoso seu vermiculato. Anfractus $6\frac{1}{4}$ convexiusculi, sutura lineari, albida, infra linea fusca marginata, ultimus oblongus, ad aperturam breviter ascendens. Apertura subobliqua, inferne distincte recedens, elliptico-oblonga, utrinque angustata, ad basin columellæ angulata, nitide lactea, fauce alba. Columella superne late calloso-plicata, postea fere recta, cum basi sinulum latum efficiens, expansa et dilatata. Peristoma candidum, callosum, late expansum et reflexum, nitidum, marginibus callo eximie candido junctis.

Long. 78, lat. 33, alt. apert. (oblique cum perist.) 38 mill.

Hab. Eastern Peru (fide Staudinger).

This is closely allied to *P. sublabeo* Anc., *P. vicaria* Fult., and *P. Yatesi* Pfr., all from Peru, but is remarkable for its pure white reflected lip. It was originally described from a juvenile specimen, imperfect in several respects.

Porphyrobaphe victor Pfr.

I secured an authentic specimen of *P. Augusti* Jous. (Bull. Soc. Zoöl. de France, 1887, p. 1, pl. III, fig. 10), and cannot see that it differs from Pfeiffer's species.

Bulimulus Blanfordianus, n. sp.

Testa anguste et obtecte rimata, oblongo-attenuata, parum solida, lineis incrementi grossiusculis, sub suturam pliculosis, infra et prope aperturam lævioribus, et striis exilibus, in ultimo anfractu parum conspicuis crebre sculpta, castaneo-fulva, punctulis luteis parvis passim notata, apice nudo, pallide fusciscente. Spira conica, lateribus convexis, acutiuscula. Anfractus $6\frac{1}{4}$ convexiusculi, ultimus oblongus, subattenuatus. Apertura distincte obliqua, intus nitide cœrulescens, ovalis, supra attenuata. Peristoma simplex, obtusum, margine dextro regulariter convexo, basali rotundato, columellari dilatato, perforationem fere omnino tegenta, adnato, lacteo, dextro et columellari callo cœrulescente junctis. Columella intus pliciformis, spiraliter recedens.

Long. 55, lat. $25\frac{1}{2}$, alt. apert. $27\frac{1}{2}$ mill.

Hab. Iquico, Bolivia, 3500 met. above the sea (fide Fulton).

A very large *Bulimulus*, respectfully dedicated to Mr. W. T. Blanford, the well-known writer on Indian shells. It is closely allied to *Bulimulus anthisanensis* Pfr., from Ecuador, but is much larger and more capacious. In that respect it resembles *B. inca* d' Orb., more than any other species from the same country, but the two species are clearly distinct.

A NEW SCISSURELLA FROM PATAGONIA.

BY PAUL BARTSCH.

Scissurella dalli spec. nov.

Shell minute, moderately elevated, whorls increasing uniformly and rapidly in size from the extreme apex to the aperture. Nepionic

whorls one and one-half, not enlarged, dextral, translucent, shining, without sculpture. Post-nepionic whorls two, decidedly inflated, with the slit about half way between the suture and the periphery, open only in about one-twelfth of the last turn, marked on the rest as a narrow, moderately deep, depressed groove, which is bounded on each side by a raised thread. The remaining ornamentation of the whorls consists of feeble, raised, equally-spaced, axial riblets, which follow the curve of the outer lip. These riblets are best developed between the suture of the whorls and the slit, becoming enfeebled toward the periphery and quite obsolete on the base. In addition to these, a few ill-defined spiral lirations manifest themselves under high magnification between the suture and the slit. Suture strongly impressed. Periphery of the last whorl well rounded. Base rather depressed and somewhat concave toward the umbilical region, marked by the faint continuation of the axial riblets and many exceedingly fine spiral striæ. Umbilicus narrow, deep, bounded by a weak basal fasciole. Aperture large, broadly pyriform with continuous peritreme, posterior angle obtuse, somewhat patulous anteriorly; outer lip thin; columella oblique, thin; parietal wall distinct, reflected upon the body whorl, partly closing the umbilicus.

The type is in the U. S. Nat. Museum collection, No. 171400, and comes from the Gulf of St. George, Patagonia. It measures, long. 0.8 mm., diam. 1.4 mm.

GENERAL NOTES.

VITRINA DEPOSITING EGGS.—You may be interested to know that on November 8th, and again to-day (November 15th), I found *Vitrina limpida* Gld., depositing their eggs. The eggs are white, almost round, some of them being slightly pointed at one end, and about 1 mm. in diameter. They are laid in bunches of six or eight, under rotting wood on the ground.

In the ten years during which I have been watching this "colony," I have never seen a young shell, but think the eggs are hatched in the early spring, the snails reaching maturity in the autumn. From October to January is their active season, and during those three months they can be found moving around on any pleasant day. Have found them very active when the temperature was below 40°.—GEO. H. CLAPP, EDGEWORTH, PA.

PUBLICATIONS RECEIVED.

MOLLUSKS OF OUR SOUTHEASTERN COAST.—The United States National Museum has recently published a reprint of its Bulletin No. 37: "A preliminary catalogue of the shell-bearing marine mollusks and brachiopods of the southeastern coast of the United States, with illustrations of many of the species," by William Healey Dall. The first edition of this work, published in 1889, having become exhausted, the reprint has been found advisable to meet the requests for copies.

The body of the reprint is a verbatim copy of the earlier edition, but the usefulness of the work has been much increased by the addition of 21 new plates, containing 188 figures.

It is a classified list of the shell-bearing marine mollusks found between Cape Hatteras and Mexico. For each species the author has indicated the extreme northern and southern range, and some of the more important intermediate localities; the range in depth; the range in time, and its occurrence in Europe, if it be known to occur there. The average length of specimens of part of the species is given. 95 plates, containing many hundreds of excellent figures, illustrate a great many of the species. The reprint is obtainable by those properly entitled to receive it.—W. B. M.

LIST OF BRITISH NON-MARINE MOLLUSCA.—By B. B. Woodward (Journal of Conchology, x, pp. 352-367, Oct. 1, 1903). British conchologists have been among the most conservative in matters of nomenclature and taxonomy. For many years it seemed that no material innovation from the arrangement in Jeffrey's British Conchology could obtain recognition in the non-marine mollusks of the tight little isle. In the last few years all this has been changed. The great progress of malacological science abroad and the revival at home, signalized by the formation of the liveliest Malacological Society in the world, has finally lead to the revision of the British list now before us. The general classification followed is that of Fischer, but greatly modified in details of family and generic divisions. A few points of especial interest to American conchologists may be mentioned here. The name *Vitrea radiatula* is preferred to that of *V. hammonis*. Mr. Woodward concludes that "there is a costate form of *Vallonia* in America distinct from the

costate variety of *V. pulchella* present in Britain, and I recommend that until it can be demonstrated more conclusively than has at present been done that there are two British species, the costate form be classed as a variety of the typical *V. pulchella*." The name *Tachea* being preoccupied for a genus of birds, *Cepæa* Held is substituted. The nomenclature of "Buliminus" is discussed, and that name is replaced by *Ena* of Leach, and the family name is changed to *Enidæ*. *Pupa* is discussed at length. It appears that that name was first used for species of *Actæon* and *Cerion*, and finally by Draparnaud for what is now known as *Pupa*. Mr. Woodward concludes that *Jaminia* Risso, 1826, is the earliest available name for the *Pupa muscorum* group.

In the Basommatophora, *Phytia myosotis* replaces the familiar *Alexia*, preoccupied in Coleoptera, and *Ovatella* takes the place of *Leuconia*, being earlier. *Planorbis glaber* Jeffr. is definitely separated from the American *P. parvus*. Mr. Woodward disputes the propriety of Dall's course in substituting *Corneocyclas* for *Pisidium*, but otherwise the generic nomenclature of bivalves calls for no special comment.

Mr. Woodward uses the emended forms "*Dreissensia*," "*Vivipara*," "*Aplecta*" and "*Assemania*," a course against the general usage in this country.—H. A. PILSBRY. .

ON SOME MOLLUSCA KNOWN TO OCCUR IN INDIANA.—By W. S. Blatchley and L. E. Daniels (27 Ann. Rep. Dept. Geology and Nat. Resources of Indiana for 1902). This paper of 100 pp. is supplemental to the report on Indiana mollusks by Dr. R. E. Call, published in 1899. Some 92 species are added to the fauna of the State, a large number of them being figured and all described. Some little known or new forms are among those illustrated, such as *Succinea calumetensis* Calkins, *Limnæa woodruffi* Baker, *Ancylus shimckii* Pils., *Lithasia obovata biconica* and *Goniobasis indianensis* Pils., various *Pisidia* described recently by Sterki, *Lampsilis blatchleyi* Daniels, etc., so that the report is of general interest to those studying our inland mollusks.

The same Annual Report includes A CHECK LIST OF INDIANA MOLLUSCA WITH LOCALITIES, by L. E. Daniels. 277 species have been ascertained to occur within the State.

CONTRIBUTIONS TO THE TERTIARY FAUNA OF FLORIDA.—By Wm. H. Dall. Trans. Wagner Free Institute of Science, Philadelphia, vol. iii, pt. vi.

This constitutes the concluding part of Dr. Dall's extensive work. The entire volume (iii) comprising 1654 pages and 60 plates, constituting the most valuable and exhaustive treatise on the American Tertiary fauna ever presented, and forming a work indispensable both to the conchologist and palæontologist.

Parts I and II are devoted to the Gastropoda, and the remaining parts to the Pelecypods, Part III being given up entirely to a new classification of the latter. All the parts as they have appeared have been reviewed in the pages of THE NAUTILUS.

The present work takes up the family *Veneridæ*, with a history of the various generic names employed; most of the changes in nomenclature have, however, been noted in the "Synopsis of the Veneridæ" (Proc. U. S. Nat. Mus., xxvi, 335), but this work in many cases covers the ground more thoroughly, giving the complete generic and specific synonymy of many of the recent forms which extend into the tertiary. 41 new species are described.

In the family *Lucinidæ* there are 33 new species, and in the *Chamidæ* seven. The subgenus *Echinochama* Fischer is given generic rank. The family *Carditidæ* is also well represented in the tertiary, 18 new species being described. The *Cyrenidæ* contains several new forms, the section *Cyrenodonax* Dall., the type of which, *C. formosana* Dall, n. sp., "Recent in Formosa, at the mouth of the Tamsui River," is described in a foot-note. *Miodontopsis* is proposed for *Miodon* Sandberger 1870, not of Carpenter, 1865. *Igeria* Roissy is adopted in place of *Galatea* Brug. (*Galathea* Lam.) 1803, not Fabr. 1793. Type *G. radiata* Lam.

In regard to the small fresh-water forms usually referred to the *Cyrenidæ*, Dr. Dall says: "While closely related, it seems more convenient to place *Sphaerium* and *Corneocyclas* (= *Pisidium* Pfeiffer) in a separate family," *Sphaeriidæ*.

Crassatellites Krüger 1823, which supplants *Crassatella* Lam. 1801, not of Lam. Prodome 1799, is largely represented in the American tertiary. The recent *C. floridana* Dall, described from a young shell, proves to be the same as *C. gibbesii* T. & H. *Crassinella* Guppy is given only subgeneric standing. *C. lunulatus* Conr. is restricted to the fossil, the recent form being *C. mactracea* Linsley.

The *Astartidæ* number 22 species, of which seven are new. *Cyclas* Bruguiere 1798 (1st species *Venus islandica* Linn.) replaces *Cyprina* Lam. 1818, and is located with *Trapezium* and *Coralliophaga* in the family *Pleurophoridæ*. *Pandora carolinensis* Bush is considered the same as the Miocene *P. arenosa* Conr. *Laternula* Bolten 1798 = *Anatina* Lam. 1809.

TO the readers of THE NAUTILUS the many recent changes in nomenclature may, perhaps, be better understood by the following extract from the author's preface: "In the years which have elapsed since this Memoir was begun, the subject of zoölogical nomenclature has been much discussed and the general consensus of opinion seems to trend towards the acceptance of names for which no diagnosis was originally supplied, provided the species cited under them are identifiable. This change from the British Association rules of 1842 is responsible for much unnecessary overturning of formerly accepted names with no visible benefit to science, but since it appears to express the will of the majority, it seems useless to oppose it, and in Parts IV-VI it has been complied with, except in the case of the anonymous auctioneer's catalogue, known as the 'Museum Calonni-anum.' This compilation from a manuscript of Hwass, edited by Da Costa, and printed for the auctioneer, George Humphrey, has usually been credited to the latter. I confess, my desire to settle the nomenclature on a firm basis, though great, has not been equal to the acceptance of these anonymous, undefined, worthless names, which would involve the loss of much that is fundamental in the nomenclature of mollusks. I still hope that the common sense of naturalists will find a way—if necessary, an arbitrary way—to eliminate this publication from authorized sources of nomenclature. The 'Museum Boltenianum' stands on a different footing, and the principal change which its acceptance involves in the earlier part of this work is the substitution of the name *Busycon* for the more familiar *Fulgur*."

The part closes with a "Discussion of the Geology," followed by descriptions of the several stages or horizons and lists of the species recognized in each, also a summary in tabular form, showing the relations of the faunas to one another. Some idea of the amount of labor involved in preparing this great work may be derived from a foot-note on page 1552: "It may be of interest to note that during the progress of this work approximately eight thousand three hundred and fifty species have been discussed or compared, and eight

hundred and sixty new forms described. More than fifty new group-names, from sections to genera, have been proposed, and more than five times as many reduced to the rank of synonyms as unnecessary or belated. The number of species known at present between the beginning of the Oligocene and the present fauna is between three and four thousand, probably less than half as many as will eventually be obtained and discriminated."

The richness of the tertiary fauna is clearly shown by the lists of species, the bed of the Caloosahatchie River alone containing 639 species, of which 48 per cent. are recent and 28 per cent. are peculiar to the bed. From the Chipola beds 333 species are recorded, about one-half being peculiar to it, thirty-five species surviving to the existing fauna. The Oligocene marl of Bowden, Jamaica, is also very productive, thus far yielding 435 species, of which 12 per cent. appear to be identical with recent species.—C. W. J.

A LIST OF SPECIES OF MOLLUSCA FROM SOUTH AFRICA, forming an appendix to G. B. Sowerby's Marine Shells of South Africa. By EDGAR A. SMITH (Proc. Mal. Soc., London, v, 354-402, pl. xv). This valuable fauna list enumerates 390 species, including over 300 species not in Mr. Sowerby's work. Nine species are described as new. The region covered includes only the coasts of Cape Colony and Natal. It may be of interest to know that the so-called *Fulgur africanus* Sowb., based on a half-grown shell in poor condition, is a *Fusus*; a figure given of the adult shell shows a columellar callus detached from the whorl at the lower part, forming an umbilical rimation.—C. W. J.

DESCRIPTIONS OF SIXTY-EIGHT NEW GASTROPODA FROM THE PERSIAN GULF, GULF OF OMAN, AND NORTH ARABIA SEA. By JAS. COSMO MELVILL and ROBT. STANDEN. (Ann. and Mag. of Nat. Hist., Ser. 7, vol. xii, pp. 289-324, pl. xx-xxiii.)

This paper contains some very interesting forms, among them two species of the genus *Homalaxis*, a species of *Scissurella*, one *Kleinella*, and a *Fluxina*. All of the species are excellently figured.—C. W. J.

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GUNDLACHIA AND ANCYLUS.

BY WM. H. DALL.

During the last ten years I have frequently announced to acquaintances and assistants interested in conchology, my belief in certain propositions hitherto unsupported by proof, bearing on the so-called genus *Gundlachia*, viz :

1. That *Gundlachia* is merely an *Ancylus* which has under favorable circumstances been able to form a calcareous epiphragm and survive the winter, which ordinarily kills the great mass of individuals, and, while retaining the shell of the first year, to secrete an enlarged and somewhat discrepant shell during its second summer.

2. That not all *Ancylus* necessarily have the ability to do this, but the practice may have developed in certain small species; and in tropical regions where the dry season takes the place of winter it is possible that survival may become more or less habitual with some of these species, though evidence of this is still needed.

On no other hypothesis could I account for the fact that single specimens, or a small lot of specimens on a single occasion (after a specially favorable season?), of *Gundlachia* have been reported from various parts of the world and described as species, but which nobody has been able to find a second time or in any considerable numbers. Also that the young *Gundlachia* cannot be distinguished from an *Ancylus* and usually resembles some common species of *Ancylus* of the same ponds in which the *Gundlachia* appears; while the only species which have been repeatedly collected as *Gundlachia*

come from tropical or southern countries. There is nothing distinctive in the radula or soft parts of *Gundlachia*, as far as yet observed, to separate it from the analogous *Ancylus*.

A paper which, for the first time, brings to bear on this hypothesis facts which seem to render it sufficiently acceptable to publish, has been contributed by Erland Nordenskiöld to the *Zoölogische Anzeiger*, XXVI, pp. 590-593, July, 1903, with seventeen figures. In this paper to which the reader may profitably refer, a process such as my hypothesis assumes is fully illustrated in *Ancylus moricandi* d'Orbigny, from the Chaco region of Brazil, up to the point of the completion of the epiphragm and the determination of the identity of the forms bearing it with the typical first-year *Ancylus*. The formation of the second-year shell or *Gundlachia* by these individuals, alone remains to be demonstrated to establish the hypothesis as a fact.

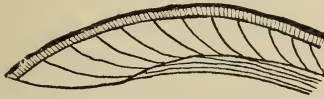
NOTES ON THE STRUCTURE OF THE SHELLS OF UNIO.

BY L. S. FRIERSON.

The shells of *Unio* are stated by most authors to be composed of three layers, known as the "epidermis," the "columnar" or "prismatic" layer, and the "nacreous," or simply called the "nacre." As a matter of fact, however, these shells are composed of four layers, the nacre being composed of two distinct layers. These may be readily noted in a polished section of some thick-shelled species, and especially if a species be chosen, such as *Obovaria retusa Lamarck*, showing the two layers in different colors. A clearer idea of the two layers may be obtained if the secreting "mantle" be studied. This part of the animal, though called by a single name "mantle" really is composed of two distinct portions, and should have two names. That portion extending from the beaks to the pallial line is thin, and one is tempted to say structureless, while from the pallial line to the margin, it is thickened, and plentifully supplied with nerves and muscles. The extreme edge of this is thickened, and secretes both the epidermal and columnar layers. From this edge to the pallial line is secreted a layer of nacreous material which may be called the extra-pallial layer. If a section of any thick-shelled species be made, it can easily be seen that the

elements of growth of this layer are *diagonal* to the general surface of the shell. From the pallial line to the beaks is deposited the fourth, or intra-pallial layer—the elements of which are parallel to the general surface. The sectionized shell will show the extra-pallial layer wedge-shaped, with the apex at beak, and base occupying the distance from the pallial line to the margin, while the intra-pallial layer is also wedge-shaped, with its apex at the pallial line.

Because the pallial line is composed of very many small muscle-scars disposed in a line, if the two layers could be separated, a sur-



face would be exposed “radially ridged.” Sometimes, by decay, this separation is effected, partially, near the beaks, and the “false beaks” so exposed are strikingly “radially ridged”—so much so as to deceive an expert like Dr. Lea. If a thick-shelled *Unio* like *Quadrula trigona* be burnt, this structure can be very readily demonstrated.

It is not impossible that this appearance of decayed or fossilized *Unios* has given rise to the opinion, as stated by Mr. Chas. T. Simpson, that the primeval *Unios* were provided with “radial beak-sculpturing.” The difficulty experienced by every collector of obtaining living shells showing beak-sculpturing, and the *a priori* improbability of fossil shells retaining this very perishable character, lends an air of probability to the above theory, which may be further strengthened by the curious fact that *no* North American *Unio* retains the slightest tendency to show their beaks so sculptured.

LAND SHELLS OF MT. DESERT, MAINE.

BY H. S. COLTON.

On Mt. Desert Island last summer I found land shells in six localities. At Hall's Quarries I found *Zonitoides arboreus* near the shore at the edge of the woods. From Seal Harbor I received *Vitrea hammonis* Strom, *Pyramidula striatella* Anth., *Helicodiscus lineatus* Say and *Carychium exiguum* Say. At Coryledge point under boards within a yard or two of the place where the beach began, I found

Pupa muscorum in untold numbers, *Cochlicopa lubrica* Müll, *Vitrea hammonis* Strom, *Zonitoides arboreus* Say and *Succinea obliqua* Say. At Southwest Harbor Village, under planks, by the road-side I found:

<i>Vitrea hammonis</i> Ström.	<i>Vertigo ventricosa</i> Morse.
<i>Zonitoides arboreus</i> Say.	<i>Sphyradium edendulum</i> Drap.
<i>Zonitoides milium</i> Morse.	<i>Cochlicopa lubrica</i> Müll.
<i>Vitrina limpida</i> Gld.	<i>Pyramidula striatella</i> Anth.
<i>Euconulus fulvus</i> Müll.	<i>Vallonia excentrica</i> Sterki.
<i>Strobilops labyrinthica</i> Say.	

The great majority of the species that I found were in Sea Wall and McKinley Villages. These two villages were about three miles apart. Here the conditions were the same. New board-walks were being built along the road and the planks of the old one were thrown into the gutter and into the adjoining fields. I found the following under these boards or in the grass near the boards:

<i>Sea Wall Village.</i>	<i>McKinley Village.</i>
<i>Vallonia excentrica</i> Sterki, abun.	<i>Vallonia excentrica</i> Sterki.
<i>Pupa muscorum</i> L., abundant.	<i>Vertigo ventricosa</i> Morse.
<i>Cochlicopa lubrica</i> Müll, abun.	<i>Cochlicopa lubrica</i> Müll.
<i>Vitrina limpida</i> Gld. abun.	<i>Vitrina limpida</i> Gld.
<i>Vitrea hammonis</i> Ström.	<i>Vitrea hammonis</i> Ström.
<i>Euconulus fulvus</i> Müll.	<i>Euconulus fulvus</i> Müll.
<i>Zonitoides arboreus</i> Say.	<i>Zonitoides arboreus</i> Say.
<i>Zonitoides exiguus</i> Stimp.	<i>Agriolimax agrestis</i> L.
<i>Agriolimax compestris</i> Binn.	<i>Agriolimax compestris</i> Binn.
<i>Pyramidula striatella</i> Anth.	<i>Pyramidula striatella</i> Anth.
<i>Helicodiscus lineatus</i> Say.	<i>Helicodiscus lineatus</i> Say.
<i>Succinea obliqua</i> Say.	<i>Succinea obliqua</i> Say.
<i>Succinea avara</i> Say.	<i>Succinea avara</i> Say.
<i>Acanthinula harpa</i> Say.	<i>Acanthinula harpa</i> Say.

I visited a number of islands but explored only a few carefully. I spent an hour on the evergreen woods of Suttons and found a few *Zonitoides arboreus* Say. An hour on Baker's Island, an hour on Black Island and six hours on Little Goat's Island, revealed me nothing. On Little Ram Island, a rock about a hundred feet long covered with about three feet of soil which supports a number of dead spruce trees, I got *Zonitoides arboreus* and *Succinea obliqua* under some dead wood. On Greening's Island, where I lived and explored

most carefully, I discovered two specimens of *Succinea avara* Say under a board in a swamp. On Little Cranberry Island, under boards near the woods, I found :

<i>Cochlicopa lubrica</i> Müll.	<i>Agriolimax compestris</i> Binn.
<i>Vitrea hammonis</i> Ström.	<i>Pyramidula striatella</i> Anth.
<i>Euconulus fulvus</i> Müll.	<i>Succinea avara</i> Say.

With the exception of the places where the board-walk was being repaired, land shells were the most plentiful on great Cranberry Island. The island is shaped like the letter G and is about four miles long. I explored the western part of the island or the back of the G most carefully. The western shore is composed of ledges of solid rock behind which lies an extensive bog. Where the rock wall is low the surf has built "sea walls" by piling up cobblestones, making a steep beach back of which lies the swamp. This swamp and the higher places near the shore are covered with grass, on top of which the sea in times of storm has cast old planks, stumps, boxes and all kinds of rubbish. It was under these that the shells were found. There was one exception however. *Pyramidula alternata* Say, I found under stones. I found them within a foot of where the vegetation ended and the rocks began that went down to the sea. Indeed all the species enumerated below were found within twenty feet of the beach. Sprinkled through the grass are the shells of *Buccinum undatum*, *Littorina* and *Mytilus edulis*. Some have been washed up, others have been carried by the crows and gulls. It has been suggested that it is owing to the abundance of calcium carbonate in the soil due to these decomposing shells that land shells are so very abundant at the edge of the sea.

<i>Vallonia costata</i> Müll.	<i>Agriolimax compestris</i> Binn.
<i>Pupa muscorum</i> L.	<i>Pyramidula alternata</i> Say.
<i>Cochlicopa lubrica</i> Müll.	<i>Pyramidula striatella</i> Anth.
<i>Vitrea hammonis</i> Ström.	<i>Helicodiscus lineatus</i> Say.
<i>Zonitoides arboreus</i> Say.	<i>Succinea obliqua</i> Say.
<i>Euconulus fulvus</i> Müll.	

Little Duck Island lies about eight miles to the southward of Mt. Desert and is the most isolated that I visited. It is about a half a mile in diameter and is half covered with a dense growth of woods, principally spruce. Half is bare of trees and is covered with coarse grass, granite ledges out-cropping here and there. Between the woods and the field there is an area of trees. It was here under

sticks that I found nearly everything. I did however find *Zonitoides arboreus* Say and two specimens of *Helix hortensis* and *P. alternata* Say away from any trees. A year ago *Succinea obliqua* was found in great abundance around a spring, but I did not notice them there this year. This year I found them in the area of dead wood.

Pupa muscorum L.

Helix hortensis Müll!

Cochlicopa lubrica Müll.

Pyramidula alternata Say.

Euconulus fulvus Müll.

Pyramidula striatella Anth.

Zonitoides arboreus Say.

Helicodiscus lineatus Say.

Vitrea hammonis Ström.

Succinea obliqua Say.

NEW LAND SNAILS FROM SOUTH AMERICA.

BY C. F. ANCEY.

Bulimulus ephippium Anc.

Testa anguste et profunde perforato (perforatio supra columellari margine oblecta), conoideo-ovata, tenuissima, papyracea, sericea, parum micans, pallide fulvo-lutea, concolor, obsolete et oblique pliculosa, plicis parum regularibus. Spira regulariter conoidea, apice obtusiusculo, microscopice spiraliter striato atque longitudinaliter undulato. Anfractus 6 convexiusculi, sutura impressa, ultimus amplus, initio vix subangulatus, subattenuatus, antice leniter et longiuscule deflexus. Apertura ovata, superne subattenuata et angulata. Peristoma tenue, brevissime expansiusculum, haud reflexum, margine columellari late in trianguli forma dilatato, callo parietali nullo.

Long. $20\frac{1}{2}$, diam. 12, alt. apert. (oblique) $11\frac{1}{2}$ mill.

Hab. Bahia, Brazil (teste H. Fulton).

This is a member of the Eudiptus section.

Bulimulus goniotropis, n. sp.

Testa angustissime perforata, pyramidata, fulvo-cornea, concolor, tenuis, microscopice et confertim spiraliter impressa, striis vix perspicuis, haud profunde incisus, lineis incrementi obliquis subnotato, nitidula. Spira regulariter conica, producta, lateribus rectis, apice sat minuto, oblique et flexuose costulato et striis microscopicis spirilibus sculpto. Anfractus 7 planiusculi, regulariter crescentes, sutura appressa linea impressa marginata divisi, ultimus medio angulatus, infra convexo-declivis, supra angulum vix convexus. Apertura ob-

liqua, emarginato-ovalis, extus haud angulata. Peristoma subincrassatum. Undique breviter patens, ad basin et columellam magis dilatato-expansum, marginibus distantibus, supero strictiusculo, columellari supra perforationem in trianguli forma reflexo.

Long. $20\frac{1}{2}$, lat. $11\frac{1}{2}$, alt. apert. (oblique) $10\frac{1}{2}$ mill.

Hab. Espirito Santo, Brazil.

In texture like *B. pileiformis* Moric., but in general form more like *B. perlucidus* Spix.

Odontostomus squarrosus, n. sp.

Differt a peraffini *O. exeso*, Spix, impressionibus testæ magis numerosis, parvulis, minus elongatis, testa subinde minus undata, plica columellari debiliore, dente supero marginis dextri magis oblique sito, minore ac minus lato; cæterum *O. exeso* simillima. An ejus varietas?

Long. $39\frac{1}{2}$, lat. $14\frac{1}{2}$, alt. apert. (perist. incluso), $18\frac{1}{2}$ mill.

Hab. Brazil.

Odontostomus glabratus, n. sp.

Testa oblongo-fusiformis, perforata, solidula, nitidula, lævigata, obsolete sed in anfractibus prioribus distinctius suboblique striatula, alba, cinereo irregulariter multinotata et strigata. Spira conoideo-attenuata, apice sat minuto, sub lente costulato. Anfractus 9 convexiusculi, sutura impressa, simplici discreti, ultimus ovato-oblongus, ampliusculus, latere dextro depressus et late scrobiculatus, basi parum attenuatus. Apertura superne angulata, subovalis, fere recta, ringens, scilicet: dente lamelliformi parum crasso in pariete, plica columellari supera oblique intrante, dente basali uno sulco extero correspondente et dentibus 2 in margine dextro, primo parvulo, secundo majore, in medio sito. Peristoma expansum, prope insertionem strictiusculum, postea leviter angulatum, marginibus remotis, callo incrassato junctis.

Long. 25, diam. 9, alt. apert. $8\frac{1}{2}$ mill.

Hab. Sierra de Cosquina, Argentina.

Intermediate, as it were, between *O. Wagneri* Pfr., and *leptodon* Mart.

Odontostomus Deraini Anc.

Testa rimato-perforata, fusiformis, subnitida, sordide alba, corneo vel cinereo (statu emortuo) conspersa et irregulariter strigata, con-

fertim et oblique rugoso-plicata, rugis infra magis lævibus. Spira elongata, conoideo-attenuata, producta, apice obtuso, sat parvo, quasi subtruncato, sub lente microscopice costulato. Anfractus 9, convexiusculi, sutura impressa, ultimus oblongus. Apertura irregulariter ovalis, supra angulata, basi ad columellam leviter angulata, parum obliqua, ringens, scilicet: dente lamelliformi magno, compresso in pariete, plica columellari supera oblique intrante, subquadrata et mediocri; dente basali acuto, scrobiculo extero profundo correspondente; et dentibus 2 in margine dextro, primo minutissimo, secundo majore plicæ columellari opposito. Peristoma initio strictum, tum undique expansiusculum, subincrassatum, album, marginibus callositate junctis.

Long. 22, diam. $6\frac{3}{4}$, alt. apert. 7 mill.

Hab. Sierra de Cosquina, Argentina.

Allied to *O. Riojanus* Doering, but larger and with different aperture.

Odontostomus gemellatus Anc.

The ground color is brownish in fresh specimens, not white as in the type (a bleached example). A small tooth is sometimes present just above the large columellar plate. The apex is like in *O. punctatissimus* Lea.

Porphyrobaphe sarcostoma Anc.

Since I sent the diagnosis of *Porphyrobaphe sarcostoma*, I have seen the figures given in the *Manual of Conchology* of some varieties of *P. Yatesi*, and acknowledge that my specimen was an extreme form of Pfeiffer's species.

DESCRIPTIONS OF NEW JAPANESE LAND SHELLS.

BY H. A. PILSBRY AND Y. HIRASE.

Japonia toshimana n. sp.

Shell narrowly umbilicate, turbinate, covered with a dark brown cuticle, roughened by delicate wide-spaced thread-like or lamellar striæ and two series of long curved bristles near the periphery. Spire conic. Whorls nearly 5, the first $2\frac{1}{2}$ rounded, the next subangular in the middle, the last obsoletely biangular, fringed at the angles. Aperture slightly oblique, circular, the peristome simple

and thin, in contact with the preceding whorl for a short distance above. Alt. 5, diam. 5 mm.

Toshima, Izu. Types no. 85755 A. N. S. P., from no. 1133 of Mr. Hirase's collection.

This species is larger and more conspicuously fringed than *J. sadoensis*, and darker colored. It does not correspond to any of the species described by Gould.

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

This form is *almost flat above*, though the individual whorls are convex. The last whorl is *angular at the shoulder*, and very convex beneath. The *umbilicus is extremely wide* and shallow, its width contained $2\frac{1}{2}$ times in that of the shell.

Alt. 5.5, diam. 17, width of umbilicus 7 mm.; whorls $5\frac{3}{4}$.

Alt. 6, diam. 16. width of umbilicus 6 mm.; whorls $5\frac{1}{2}$.

Amasaki, prov. Tosa. Types no. 85770 A. N. S. P., from no. 1108 of Mr. Hirase's collection.

Eulota (Eulotella) commoda var. *izuensis* n. var.

The shells of this race are similar to *E. commoda* from Kayabe, Ojima except in having a much narrower umbilicus. Alt. 5.5, diam. 7, umbilicus 1 mm. wide.

Oshima, Izu. Types no. 85790 A. N. S. P., from no. 1138 of Mr. Hirase's collection.

Eulota (Plectotropis) shikokuensis var. *hadaka* n. var.

Differs from *Plectotropis shikokuensis* by having comparatively few long low tubercles in place of the dense clothing of scales of *shikokuensis*, and there is no peripheral fringe.

Irazuyama, Tosa. Types no. 85802 A. N. S. P. from no. 1099 of Mr. Hirase's collection. (*Hadaka*, naked.)

Eulota endo n. sp.

Shell narrowly umbilicate, depressed-globose with low conic spire; chestnut brown, glossy, smooth except for slight growth-lines. Spire conoidal, the apex obtuse. Whorls 5, slowly and gradually increasing, a little convex, the last convex peripherally, very slightly descending in front. Aperture oblique, rounded-lunate, the peristome thin, narrowly expanded, the columellar margin dilated and white. Alt. 5.7, diam. 7 mm.

Seta, Omi. Types no. 85784 A. N. S. P., from no. 1113 of Mr. Hirase's collection.

This small, pea-like species differ from *E. commoda* (A. Ad.) by its much less convex whorls (*Endo* a pea).

Trishoplita mesogonia var. *minima* n. var.

This race differs from *T. mesogonia* in being much smaller, with the peripheral angle decidedly weaker. It is thin, pale brown or brownish corneous, with a tendency to be paler below the suture, and frequently with some whitish spots there; whorls $5\frac{1}{2}$.

Alt. 6.5, diam. 8.5 mm.

Alt. 6, diam. 8 mm.

Tokushima, Awa (Shikoku). Types no. 84713 A. N. S. P., from no. 832 of Mr. Hirase's collection.

Macrochlamys izushichitajimana n. sp.

Shell minutely perforate, depressed, with low conoid spire and a distinct peripheral angle in front, the last whorl becoming rounded on the latter part; very thin, brown, somewhat translucent. Surface somewhat glossy, sculptured with irregular, low, coarse wrinkles along the growth-lines above, smoother and more glossy beneath. Whorls $4\frac{3}{4}$, slowly and regularly increasing. Aperture lunate, the lip simple and acute, with a small triangular dilation at the axial insertion.

Alt. 3.8, diam. 6 mm.

Miyakejima, Izu. Types no. 85944 A. N. S. P., from no. 1058a of Mr. Hirase's collection. Also occurs on Nijima, Hirase's no. 1058, the specimens being slightly smaller with $4\frac{1}{2}$ whorls, and a little paler.

This species is related to *M. semisericata*, but it is larger with more elevated spire, rougher surface and a distinct peripheral angle.

Macrochlamys decens n. sp.

Shell minutely perforate, depressed, biconvex, the spire low conoidal, the periphery obtusely angular, and the base convex; thin, amber-brown, somewhat translucent. Surface somewhat glossy, with slight, irregular sculpture of fine growth-wrinkles. Whorls fully 6, convex, very slowly and regularly increasing. Aperture lunate, the peristome simple and acute, with a small triangular dilation at the axial insertion, the columella noticeably thickened within. Alt. 3.3, diam. 5.3 mm.

Omi-mura, Echigo. Types no. 85782 A. N. S. P., from no. 1119 of Mr. Hirase's collection.

This species of the *Discoconulus* group is larger than most other Japanese forms of that type, and has more numerous closely-coiled whorls than the related species.

Punctum infans n. sp.

Shell depressed, openly umbilicate, chestnut brown, the inner whorls corneous: sculptured with irregular, low and curved, rather widely spaced, obliquely radial wrinkles, which are nearly obsolete beneath, where a faint, close and fine spiral striation may be seen. Spire flattened, the inner whorls projecting slightly. Whorls 3, the last wide, obtusely angular at the periphery, much more convex beneath. Peristome thin and acute. Alt. 1, diam. 1.9 mm.

Hachijo, Izu. Types no. 85781 A. N. S. P., from no. 1067a of Mr. Hirase's collection.

This shell is more angular than the allied *P. amblygonum*. The generic reference is uncertain.

Kaliella sororcula n. sp.

Shell minutely perforate, trochiform, the spire conic with very slightly convex lateral outlines and obtuse apex, base convex; thin, brown, nearly lusterless above, the base somewhat glossy. Whorls nearly 6, convex, the last with an acute, thread-like peripheral keel, which may usually be seen in the suture of the preceding whorls. Aperture oblique, rather narrow. Peristome thin and acute, the columellar margin arcuate, narrowly reflexed and thickened. Alt. 3, diam. 4.8 mm.

Amasaki, Tosa. Types no. 85771 A. N. S. P., from no. 1109 of Mr. Hirase's collection.

With the shape of *K. (?) ceratodes* Gude, this species lacks the brilliant gloss of that, the surface being dull, like the much larger *K. gudei* Pils. and Hir., and it is seen to be faintly striatulate under a strong lens.

PUBLICATIONS RECEIVED.

THE PALEONTOLOGY AND STRATIGRAPHY OF THE MARINE PLIOCENE AND PLEISTOCENE OF SAN PEDRO, CALIFORNIA.—By Ralph Arnold (Mem. Cal. Acad. Sciences III, 1903). 4to, 420 pp., 37 plates. This important work, which has engaged Mr. Arnold's attention for some years, consists of three parts, of which Part I is devoted to general descriptions of the Pliocene and Pleistocene beds, their stratigraphy and faunal relations. Mr. Arnold concludes that during the latter part of the Pliocene the climate was much colder than at present, 18.5 per cent. of the species of the

Deadman Island Pliocene being now found living only to the north, many of them not south of the Puget Sound district. During the Pleistocene, warmer climate ensued, the upper San Pedro beds indicating more tropical conditions than those now prevalent. The marine Pleistocene has been found to be enormously developed on the West Coast.

Part II, the descriptions of species, occupies the greater portion of the volume. Nearly all of the species are fully described, and illustrated by good pen-drawings. Since most of the forms are still living, the full descriptions and illustrations will render the work of great use to students of the recent shells of the West Coast; and it should have a wide circulation among West Coast conchologists. Many new forms are described, a large proportion of which will doubtless be found to be also recent. The nomenclature is fairly brought up to date, but there are some exceptions which one might reasonably expect to see corrected, such as the retention of *Trophon belcheri* in "Chorus," the use of "Ranella" for *Gyrineum*, of "Hipponyx" for *Amalthea*, and of "Phorcus" for *Chlorostoma pulligo*. Neither of the species *bimaculata* and *callomarginata* belongs to *Clypidella*, as was shown over ten years ago. The Chitons seem to have gone astray as to family classification. The two species of *Planorbis* described and figured are incorrectly named. In the *Scaphopoda*, Mr. Arnold admits *Dentalium hexagonum* Sby. and *D. pseudo-hexagonum* Dall, placing *D. neo-hexagonum* S. & P. in the synonymy of both. The fact is that *hexagonum* is an oriental species not found in California, and *pseudo-hexagonum* is a MSS. name, not before published. The common Californian species is rightly known as *D. neo-hexagonum*. Similarly, *Cadulus fusiformis* S. & P., a species published and figured some years ago, is placed in the synonymy of the hitherto undefined MSS. name "C. nitentior Cpr." The figure and description given fix the name *nitentior* on what seems to be the tube of a serpulid annelid. Notwithstanding these and various other oversights, the nomenclature is in the great majority of species abreast of the times. Among many interesting facts brought out, is the absence of *Haliotis* before the Pleistocene in Californian strata. The plates illustrate not only the fossils, but also characteristic views of the principal terranes.

Part III, bibliography, gives a useful list of works dealing with West Coast mollusks, including a complete bibliography of the writings of Dr. R. E. C. Stearns.—H. A. P.

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SHELL COLLECTING DAYS AT FRENCHMANS' BAY.

BY DWIGHT BLANEY.

It is with the desire to return some of the pleasure the writer has derived from the interesting accounts of collecting trips which have appeared in the NAUTILUS, that the following description of a dredging trip in Frenchmans' Bay, Maine, has been written :

Taking a calm morning, with the tide nearly at low-water mark, we start off in a small scow in tow of our fifty-foot steamer. A calm day is to be preferred, as the labor is much reduced, a rough sea making it very uncomfortable in the pitching scow.

The scow is fitted with seats, and gives us plenty of room to coil the 100 fathoms of rope, places for pails, tubs and sieves, with safe corners for glass jars of sea water. We usually dredge in what we know as good fishing-ground, as more shells are found in such places, though all kinds of bottom are tried.

The dredging stations for the day are planned beforehand and we look forward with no little anticipation to the hauling up of the dredge.

We are always hoping to find alive the *Pecten islandicus*, *Thracia conradi*, or the *Aporrhais occidentalis*, as we have only dredged dead specimens before; and the chance of adding new species to our collection keeps us continually hard at work.

To-day we try first, some hard bottom off the northern end of Long Porcupine Island and the first haul brings in about a dozen fine live specimens of the large scallop, the *Pecten tenuicostatus*. This

great scallop, six or seven inches in diameter, is good eating, and we lay them aside to appear later in a different form on the breakfast table. The large stones and dead shells are looked over carefully and we find attached to them the *Crucibulum striatum*, and the Chitons, *Tonicella marmorea*, *Tachydermon albus*, and the *Tachydermon ruber*. On a previous trip we dredged a single, fine specimen of the *Hanleya mendicaria*. This rare Chiton is usually found in much deeper water than the bay.

The remaining sand and mud is now poured into large sieves with handles and looked over carefully. We find alive the beautiful *Margarita obscura*, *Margarita undulata* and *Margarita cinerea*. These are not uncommon, however, and are hurried into the glass jars of water, to be studied later under the microscope. We are always glad to find the *Scalaria groenlandica*, though we find few alive. Many kinds of *Bela* are found, among which are the common *Bela incisula*, also the *Bela scalaris*, *Bela harpularia*, *Bela pleurotomaria*, and the more rare *Bela violacea* and *Bela gouldii*. Also in this section we find the *Velutina haliotoidea*, *Trichotropis borealis*, and the *Lunatia groenlandica*, and the *Trophon clathratus*.

The contents of the sieves are now washed over the side of the scow; the mud washed away and the cleaned sand and shells poured into pails, labelled with the station, depth of water and character of bottom, to be looked over after being dried at home.

A great many specimens are in this way obtained, and much material collected to be separated on rainy days.

We move on now a quarter of a mile to a station with muddy bottom at 25 fathoms, where in a few hauls of black, sticky mud we find numbers of *Leda tenuisulcata*, *Yoldia thraciaeformis* and *Yoldia saporilla*, with quantities of *Astarte undata*, *Cardita borealis*, a few of the *Cardita novangliae*, *Cardium pinnulatum*, *Thracia truncata*, also, of course, great numbers of *Nucula proxima*, *Nucula delphinodonta* and *Nucula tenuis*.

Another haul nearer shore, on harder bottom, brings us *Rissoa carinata* and *Rissoa exarata*. Here also we find the *Chrysodomus decemcostatus*, the *Sipho stimpsonii* and *Sipho pygmaeus*, and a few young *Serripes groenlandicus*, with the pretty zig-zag markings which disappear in the older specimens.

The material is also washed and sifted after being picked over, and with aching backs we rest in the scow as we go ploughing

through the water on the way home. It is by no means easy work hauling the dredge, leaning over the side of the scow to wash the contents of the sieves, and we have narrow escapes from sea-sickness on rough days.

Outside the islands, in deep water, we have dredged the *Dentalium striolatum*, valves of the *Panomya norvegica*, *Mya truncata* and *Liocyma fluctuosa*, and alive the *Menestho albula*, *Admete couthouyi*, *Puncturella noachina*, *Lepeta caeca*, *Modiolaria nigra*, *Modiolaria discors* and *Modiolaria corrugata*, also the *Cardium islandicum*.

On arriving home, the material collected is spread in the sieves to dry in the sun, and we find it difficult to wait until it is dry enough to bring into the work room. It is only by careful picking over that the smaller species are obtained and it is in this way that we get good series of the *Rissoidæ*. The *Rissoa*, or rather *Cingula castanea*, *Rissoella eburnea*, *Turbonella nivea*, *Turritella acicula*, and *Turritella erosa*, *Molleria costulata*, *Retusa gouldii* and *Retusa petenuis*, and the *Diaphana debilis*.

Many live specimens are put into shallow dishes, and under the microscope it is most interesting to watch the *Margaritas*, *Belas*, *Lunatias* and the active *Yoldias* moving about.

A day's dredging thus means a good deal of work, and after all comes the labelling and putting in the cabinet, last but not least of a day's dredging.

OBSERVATIONS ON THE GENUS QUADRULA.

BY L. S. FRIERSON.

In his admirable Synopsis of the Naiades, Mr. Chas. T. Simpson says (page 766), that although he had examined thousands of animals of the *plicata* group of *Quadrula*, he had never seen but a single one having eggs in the gills, and that other students had found them equally barren. In NAUTILUS (vol. xv, no. 4, p. 39), H. von Ihering speaks of the specimen of *Q. heros* Say, examined by Lea, and of the specimen seen by Sterki, and he seems to be rather doubtful whether *Quadrula* (of this group at all events) *always* carry eggs in all four gills. My observations of late have been singularly lucky in this respect and will, I think, settle this point. The first specimen

found gravid by me (of this group) was a *Q. trapezoides*, May 10, 1901. Since that time I have opened and examined dozens of gravid specimens. They are gravid from May to September, after which I have never found eggs in their gills. Of *Quadrula perplicatus* Conrad, I have taken but two specimens, June 7, 1901, and August 19, 1903. In one the gills (all *four*) were but one-half filled with eggs, the *lower half* of each gill being empty. The other was a normal *Quadrula*. *Quadrula heros* had never been taken gravid by me until October 8, 1903, a young specimen proved to be in that condition. Its gills (four) were packed full of uncountable ova. These, under the microscope, were perfectly spherical and undeveloped, showing that they were recently extruded from the ovary.

On November 24, 1903, a batch of about fifty were brought me by a negro, to be sent to Mr. Chas. Conner, of Philadelphia. After packing fifteen or twenty for him, the remainder were opened, and to my surprise, fully half were gravid. Mr. Conner reported several of his also gravid. Most of these eggs were not yet developed into glochidia, several specimens having eggs in the "mulberry stage."

January 7, 1904, out of seven specimens opened, four proved to be gravid. These were full of glochidia, but they did not seem to be perfectly developed or ready to be extruded, being very sluggish.

These observations prove two points: First, that the *plicata* group belongs safely to *Quadrula*, as defined by Mr. Simpson, and that the specimen noted by Sterki and H. von Ihering must have been abnormal. Secondly, that the *seasons* of ovulation are different in different species of the same group, *Q. trapezoides* being a summer breeder, while *Q. heros* is an autumn or winter breeder.

THE MOLLUSKS OF CEDAR LAKE, INDIANA.

BY FRANK COLLINS BAKER.

Some months ago, the Monon Railroad invited the writer to visit Cedar Lake, Indiana, to witness the seining of the lake for "pirate" fish, such as carp, gars and pickerel. Incidentally a collection of the mollusks was made, which seems of more than passing interest. The lake is a body of cold water, of considerable extent and of great depth in places. The species collected are as follows:

Valvata tricarinata Say.

Valvata tricarinata var. *confusa* Walker.

Valvata bicarinata Lea.

Valvata bicarinata var. *normalis* Walker.

A quantitative study of the *Valvatas* collected is very interesting. 275 specimens were collected, of which 117 were typical *tricarinata*, 104 *bicarinata* var. *normalis*, 31 *tricarinata* var. *confusa*, 21 *bicarinata*, 1 specimen was 4-carinate and 1 specimen of *bicarinata* was almost ecarinate.

The most common forms of the carinate *Valvatas* would seem to be *tricarinata* and *bicarinata* var. *normalis*; typical *bicarinata* seeming the rarest.

Amnicola limosa Say. Common.

Amnicola walkeri Pilsbry. A single specimen of this very distinct species was found, but a careful search of the lake would probably reveal a number of specimens. It is one of the most characteristic of the fresh-water mollusks.

Planorbis campanulatus Say. Very common.

Planorbis bicarinatus Say. Common.

Planorbis exacutus Say. Apparently rare, as only two specimens were found.

Planorbis parvus Say. Very common.

Limnæa caperata Say. Fairly common.

Limnæa humilis Say. Not common.

Physa heterostropha Say. Not common.

Physa gyrina Say. Not common.

Succinea retusa Lea. Common.

A NEW FLORIDIAN AMNICOLA.

BY H. A. PILSBRY.

Amnicola augustina n. sp.

Shell narrowly umbilicate, brown or olive-brown, smooth, ovate-conic; spire convexly conic, the apex rather obtuse. Whorls $4\frac{3}{4}$, quite convex, separated by deeply-impressed sutures. Aperture about half as long as the shell, broadly ovate, obtusely angular above; peristome acute, continuous, dark-edged, adnate to the preceding

whorl for a short distance above. Operculum as usual in the genus. Length 3.2, diam. 2.2, longest axis of aperture 1.6 mm.

A small stream near St. Augustine, Florida. Types no. 58088, A. N. S. P., collected by Charles W. Johnson.

This species is larger than *A. floridana* Ffld., with a longer spire and more obtuse apex. It was collected in some quantity by Mr. Johnson many years ago. It was at first identified as *Bythinella tenuipes* Couper, and so recorded in NAUTILUS iii, p. 137; but further investigation has shown that it belongs to a different group of species.

NOTES ON THE NOMENCLATURE OF THE PUPACEA AND
ASSOCIATED FORMS.

BY W. H. DALL.

The publication of Mr. Woodward's list of British land shells and certain work on which I have been engaged, have recently drawn my attention to this subject, which I have found so involved and so imperfectly represented in many publications on the group as to lead me to a tolerably thorough investigation, some of the results of which are here expressed.

I take it as axiomatic that (1) the type of a group must be one of the species mentioned when the name of the group was first published; (2) that in consolidating several old genera one of the old names and not a new one must be employed for the consolidated group; (3) that when a heterogeneous group is subdivided, its name must be retained for one of the resulting subdivisions; and (4) that we are under no obligation to accept the first species of a list as the type of a group for which no type has been selected by the original author, but that we should accept the decision of the first subsequent author who undertakes to select types from the original list in revising it.

In the following notes only the question of nomenclature is considered, the validity of the sections is left to the specialist in this difficult group. In matters of specific synonymy, I have depended on L. Pfeiffer, Pilsbry and Sterki.

Isthmia Gray, 1821. The sole example cited is *Vertigo pygmæa* Drap., which must be regarded as the type. *Staurodon* Lowe, 1852, and *Dexiogyra* Stabile, 1864, are synonymous.

Jaminea Risso, 1826; not Brown, 1827. Brown cites the name as of Bruguiere, but I have found no reference to this origin of it elsewhere. Risso's group is heterogeneous, and was intended for the large Pupae in which the body whorl interrupts the peristome, while for the small species of *Vertigo*, etc., with a continuous peristome, he proposed a genus *Saraphia*, none of the species contained in which can be positively recognized. Risso's first species is *Vertigo minutissima* Hartmann, which should properly have been placed in *Saraphia*. Those which agree more or less with his diagnosis have since been separated into a number of groups in the following order chronologically: *Abida*, *Sphyradium*, *Eucore*, *Torquatella*. There are also three unidentifiable species. Risso's second species was the last to be separated and should have been reserved for *Jaminia*, of which *Torquatella* must be regarded as a synonym. This type is *Turbo muscorum* Linné, not Draparnaud.

Chondrus, Cuvier, 1817, not of Lamouroux, 1813. Cuvier's *Chondrus* was divided into two groups not named and with no type cited. In 1821, Gray cited *Pupa cinerea* Drap., as an example, but Cuvier's name is pre-occupied in Polyps. The next name for this group is *Torquilla* Studer, 1820, type *P. secale* Drap. *Torquilla* had been used by Brisson in 1760 for a bird. Now Brisson is a non-binominal writer and his genera have only been adopted by an arbitrary over-riding of the rules of nomenclature. Nevertheless I am inclined to believe that such arbitrary acts are sometimes beneficial to science and to be praised rather than blamed, when the occasion is suitable, and the consensus of opinion of the specialists in the department affected, practically unanimous. Rejecting *Torquilla*, the next name in order is *Abida* Leach, in Turton, 1831, sole example cited *P. secale*, which must be regarded as the type. Several other names have been proposed to take the place of *Chondrus* by too hasty writers, such are *Granaria* Held, 1837, *Pupella* Swainson, 1840, *Chondrina* Reichenbach, 1847; while further subdivisions of the type are *Sandahlia* and *Granopupa* Westerlund, 1887.

Alæa Jeffreys, 1830. This heterogeneous group, beside species of *Isthmia* and *Jaminia*, contained originally *Pupa edentula* Drap., afterward separated as *Sphyradium* and *Pupa minutissima* Hartmann, which must be taken as the type.

Pupilla Leach, in Turton, 1831. Two species are cited, one being already the type of *Jaminia*, the other, namely, *P. umbilicata* Drap.,

necessarily becomes the type of *Pupilla*. *Gastrodon* Lowe, 1852, not of Rafinesque, 1815, and *Reinhardtia* Boettger, 1878, are synonymous. *Lauria* Gray, 1840, was proposed for *P. umbilicata* and *P. anglica* Fér.; if *Lauria* is retained at all it must be for the latter, in which case *Leiostyla* Lowe, 1854, is synonymous.

Eucoire Agassiz, in Charpentier, 1837, was proposed for *P. tridens* and *P. quadridens* Drap. *Gonodon* Held, Dec., 1837, *Chondrula* Beck, 1838, and *Chondrulus* Westerlund, 1890, appear to be synonymous.

Sphyradium Agassiz, 1837, has been adopted for *P. edentula* Drap., by the process of elimination; *Paludinella* Lowe, 1852, not of Pfeiffer, 1841; *Edentulina* Clessin, 1876, not of Pfeiffer, 1855; and *Columella* Westerlund, 1876, are synonymous. *Sphyradium* (*ferrari*) Hartmann, 1840, has been named *Coryna* by Westerlund, 1887. *Sphyradium* Martens, in Albers, 1860, is a synonym of *Orcula* Held.

Faula H. and A. Adams, 1855, not of Blanchard, 1850, was renamed *Fauxulus* by Schaufuss in 1869. *P. capensis* Kurr, appears to be the type.

Ptychochilus Boettger, 1880, founded on *Pupa tantilla* Gould, seems to have priority over *Nesopupa* Pilsbry, 1900. *Bifidaria* Sterki, in Pilsbry, 1891, contained two species, *P. contracta* Say and *P. servilis* Gould. *P. contracta* being taken as type by Sterki in 1892, for his section *Albinula*, *P. servilis* must be considered the type of *Bifidaria* s. s., and not *P. hordacea*, for which Sterki's *Eubifidaria*, 1893, will stand, if the sections are valid otherwise.

DESCRIPTIONS OF NEW JAPANESE LAND SHELLS.

BY H. A. PILSBRY AND Y. HIRASE.

Eulota chishimana n. sp.

Shell umbilicate, depressed globose, with conic spire, rather thin, pale yellow, becoming white on the spire, the last whorl encircled by three bands, that at the periphery dark chestnut and sharply defined, the others much paler, reddish-brown, and indistinctly defined, one in the middle of the base, the other on the upper surface, ascending the spire midway between sutures on the penult. whorl, or obsolete except on the last whorl. There are also one or two dark

oblique streaks indicating places of growth-arrest. Sculpture of irregular, rough and coarse wrinkles in the direction of growth lines, and under the lens, irregular fine spiral lines are seen. The spire is much smoother than the last whorl. Whorls about 6, moderately convex, regularly increasing, the last rounded peripherally, not descending in front. Aperture not very oblique, lunate, white and conspicuously banded within. Lip broadly reflexed, strengthened by a narrow callous ridge within, the face flat or concave, the thin outer portion dark flesh colored, the ridge lighter or white. The peripheral band extends to the lip-edge.

Alt. 20.5, diam. 26.5 mm.

Alt. 19.5, diam. 25 mm.

Kunashiri Island, in the Chishima (Kuril) chain. Types no. 86324 A. N. S. P., from no. 1153 of Mr. Hirase's collection.

This fine *Euhadra*, of a type unknown in the main island of Japan, is the first to be reported from the Kuril chain. Other land shells from Kunashiri will be described in a future communication.

Vitrea radiatula var. *radiata* n. var.

This variety is smaller than *radiatula*, and of a pale reddish-brown tint, not greenish. It is decidedly larger than *V. radiatella* (Reinh.), and less depressed. Alt. 2, diam. 4 mm.

Tōya, Kuziro, in eastern Yesso (Hokkaido). Types no. 85788 A. N. S. P., from no. 1147 of Mr. Hirase's collection.

Alycæus awaensis n. sp.

This shell is larger and more elevated than *A. reinhardti*, pale brown. Sculptured with spaced riblets, which on the swollen last half whorl became fine and densely crowded. The neck is moderately contracted and smooth. The aperture is circular, lip thin, narrowly reflexed. There are sometimes some spiral striæ on the spire, not visible in all specimens. Alt. 3.8, diam. 2.6 mm.

Hiyama, Awa, Island of Shikoku. Types no. 84958 A. N. S. P., from no. 1083 of Mr. Hirase's collection.

Succinea ikiana n. sp.

A species of the *S. avara* group, but more solid than that species and of a bright amber color. Whorls 3, very convex and parted by deep sutures. Sculpture of irregular, coarse wrinkles. Aperture ovate, the upper insertion of the outer lip arcuate.

Length 8.5, diam. 5, length of aperture 5 mm.

Length 7, diam. 3.6, length of aperture 4 mm.

Wataramura, Iki. Types no. 85747 A. N. S. P., from no. 1148 of Mr. Hirase's collection.

Vertigo japonica n. sp.

Shell minute, oblong, about equally obtuse at both ends; brown, nearly smooth. Whorls 5, parted by deep sutures, the last whorl tapering downwards, impressed by a deep furrow terminating above the middle of the outer lip. Aperture irregularly ovate, contracted by four teeth: a long parietal lamella, a strong columellar lamella and two short, deeply-placed palatal plicæ. Peristome thin, very narrowly expanded, the outer lip projecting forward and bent inward at the upper third, at the termination of the external furrow. Alt. 1.7, diam. 1 mm.

Ikusagawa, Ojima. Types no. 85746 A. N. S. P., from no. 1143 of Mr. Hirase's collection.

This species from southern Yesso is related to *V. hirasei* from Kyūshū, but differs from that species in having much larger teeth. Both belong to a group of Vertigines which lives throughout the whole northern part of the Holarctic region.

Nesopupa tamagonari n. sp.

Shell extremely short and broad, very obtuse at both ends, chestnut-brown, nearly smooth, somewhat glossy. Whorls $4\frac{1}{2}$, rapidly increasing, parted by slightly-impressed sutures; the last whorl forming more than half the length of the shell, tapering downwards, bearing a strong crest or ridge close behind the outer lip. Aperture small, squarish-oval, obstructed by six teeth: a long, entering parietal and a much shorter angular lamella; a deeply-placed columellar lamella; a small, tubercular basal plica, and two short but high lamellar palatal plicæ. Alt. 1.3, diam. 1 mm.

Chichijima, Ogasawara. Types no. 85745 A. N. S. P., from no. 855a of Mr. Hirase's collection.

A peculiar, almost globular *Nesopupa*, related to *N. dedecora*, but shorter, with a weaker crest, which is nearer to the lip. (*Tamagonari*, egg-shaped.)

This is the second Ogasawaran species of a Polynesian genus, discovered by Mr. Hirase's collectors. These little strangers are per-

haps the only exclusively Polynesian element in the snail fauna of the Bonin Islands. *Tornatellina* also is doubtless a group of Polynesian origin, though in the ages of its existence it has spread to the borders of the Pacific, from New Zealand to the Japanese islands.

Carychium pessimum var. *borealis* n. var.

Differs from *C. pessimum* in being smaller and less conic, more of an oblong shape. Harutori, Hokkaido. Types no. 85772 A. N. S. P., from no. 1144 of Mr. Hirase's collection.

LE PERE LAMBERT, S. M.

BY CHARLES HEDLEY.

Half a century ago, a little band of Marist missionaries landed in New Caledonia to convert to their faith the cannibal savages of that island. For years, lance or casse-tête daily threatened them with cruel death. They knew no society but the disgusting companionship of brutal savages. From the danger, hardships and squalor of their life, these cultured gentlemen turned for relaxation to the pleasant paths of science. To them we owe most of our knowledge of the fauna, flora, geology and ethnology of New Caledonia. One by one, Montrouzier, Thomassin, Rougeyron—this noble company of hero, pauper, saint and savant—have gone to their rest. The last patriarch, Father Pierre Lambert, died in Noumea, on November 3, 1903, aged 82 years.

He wrote a few short papers in the *Journal de Conchyliologie*, but he will be chiefly remembered as a collector. One of the finest of the cones bears his name, as does one of the largest *Placostylus*. Souverbie dedicated to him species of *Pecten*, *Melanopsis*, *Trochus*, *Euchelus*, *Xenophora*, *Mitra*, *Cancellaria*, *Pleurotoma*, *Rissoina* and *Eulima*, also the genus *Lambertia*.

Pere Lambert published a memoir on Ethnology—*Moeurs et Superstitions des Néo-Calédoniens*, Noumea, 1900, pp. vi, 360, with 60 illustrations. An important but little known book.

GENERAL NOTES.

ANCYLI ADHERING TO WATER BEETLES.—Two interesting examples of *Ancyli* attached to the elytra of water beetles, recently came under my observation through the kindness of Mr. Albert P. Morse, who collected them at Wellesley, Mass. One a *Dinutes* (whirligig beetle), collected April 26, 1900, has an *Ancylylus fuscus* Adams, 4 x 2.5 mm., situated dorsally and extending about equally over each elytron; whether it adhered with sufficient strength to prevent the beetle flying, can only be surmised. The habit of *Dinutes* in gyrating on the surface of the water, often in the bright sun-light for hours at a time, is not strictly conducive to the life of an *Ancylylus* thus situated, for it would be entirely out of water while the beetle was on the surface, although during the early spring the beetle probably spent most of its time beneath the water.

The other, a *Dytiscus*, collected in October, 1898, carried an *Ancylylus parallelus* Hald., 5 x 2.5 mm., near the end of the left elytron. Both cases present an interesting factor in the distribution of species, which probably in many instances accounts for the sudden appearance of mollusks in small, artificial ponds.—C. W. JOHNSON.

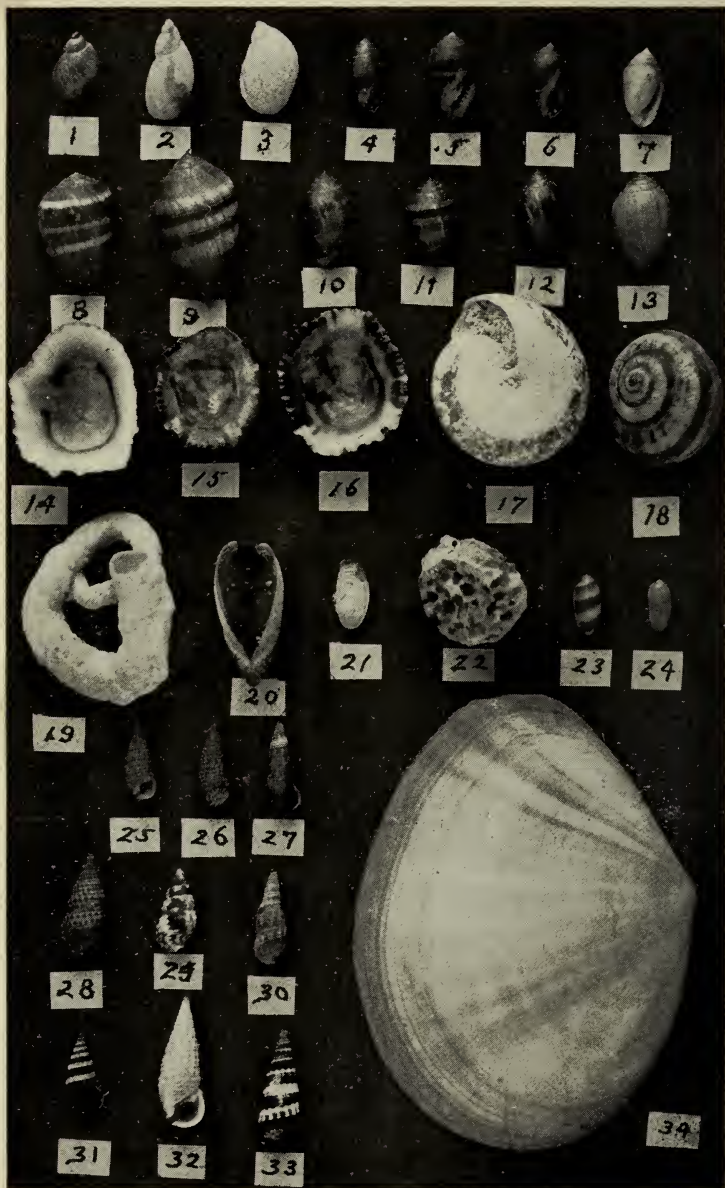
CLAM-OROUS CROWS.—The following newspaper clipping, if true, shows that the amiable, inoffensive clams of the Northwest coast are having a hard time of it, and are entitled to the sympathy of all conchologists without distinction of age, sex or color:

“Scare-crows are now placed upon slate roofs in Victoria, B. C. The crows, which swarm on the beach and dig for clams, fly over the buildings and drop the clams on the roof, by this means breaking the shells and leaving the meat free to be eaten. In many cases, when the clams were dropped, the slate would be broken.”

Such conduct on the part of the crows is certainly discreditable; they should be placed on the black-list.

Ill fare the clams to hungry crows a prey,
And brought to grief in such a crow-ill way.

The clam is probably *Saxidomus giganteus* Desh., quite common in the Vancouver region and the principal edible clam of both “Injuns” and white folks thereabout, and solid enough to break roof slates if not political ones, when dropped from a considerable elevation. *S. giganteus* is abundant between ordinary tide marks; it is great in soup; an excellent clam.—ROBT. E. C. STEARNS, *Los Angeles, Cal.*



DAVIS: BERMUDA SHELLS.

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HELIX HORTENSIS IN NEW ENGLAND.

BY REV. HENRY W. WINKLEY.

The following is a suggestion. I cannot say that I am convinced that it is a proof, but I offer these thoughts for what they are worth. We must associate *H. hortensis* with northern European forms rather than with the American land shells. Its distribution in New England is most singular, limited as it is to widely separated spots, mostly small islands of the east coast. It certainly cannot have had the same migration as *Polygyra* or *Pyramidula* or it would be distributed as they are. Undoubtedly at the close of the glacial period, the American types worked north and east into New England; but *H. hortensis* was not one of them. That it came from Europe is evident. Commerce-voyages of Norsemen or other explorers have been suggested. This theory becomes absurd when one examines the localities where *H. hortensis* lives. These places are not ports and never have been. Some of them are the last places a man would land, not the first. Let us now ask the question of an earlier migration. Circumpolar species exist. Other forms common to Europe and America would make an interesting study. That there was a pre-glacial period when forms migrated around the northern regions is a settled fact. Did *H. hortensis* come then and survive? The writer has been much interested in the glacial theory, and has done some field work on the New England area. That the glacier covered all of New England is an accepted fact, but when we say all, is there not a chance for exceptions. Along the southern coast we may point

to Long Island as a terminus. The sound is not deep and tides not great, this barrier would be and was crossed. The eastern coast is different. The trend of the ice, though slightly deflected towards the east, was in a southerly direction; comparatively little passed off the east coast. Add now a study of Greenland, as it is under continental glaciation conditions and probably exactly as New England was. Peary's exploration shows a range of animals like the musk-ox, arctic wolf and others at Independence Bay, and practically the extreme northern limit of Greenland, and this implies food on which they live. In other words, Greenland under a glacier yet has a shore line of animal and vegetable life. The distribution of *H. hortensis* fits the theory that it is a survivor. The present abodes are such that it could not have been carried from one to the other and not have found a home on the mainland more than it has. On the other hand Grand Manan, outer islands in Casco Bay, the extremity of Cape Ann and Cape Cod, are places that would be last resorts. A more exhaustive treatment of the subject would deal with elevation and subsidence, possible islands or land in the east now submerged. The stronger tides that would break up a mass of ice extending seaward. I leave these topics and present only the simple suggestion.

A NEW SPECIES OF PERIPLOMA FROM CALIFORNIA.

BY WILLIAM HEALEY DALL.

Periploma sulcata n. s.

Shell rotund, white, with the left valve flatter, thin, sculptured with numerous, close-set, irregularly concentric, more or less interrupted, low ridges, separated by subequal shallow interspaces; the surface is also microscopically shagreened, and there is a low rib extending from the beak to the lower margin of the ill-defined rostrum and an ill-defined furrow radiating from the beak toward the anterior base, in the right valve; beaks low, distinctly fissured; anterior dorsal hingeline rounded, posterior ditto, shorter, nearly rectilinear, forming with the elevated rib a subtriangular space which is free from the undulations which cover the rest of the shell; interior shining, hardly nacreous, the muscular impressions very small, the pallial line obscure; chondrophores prominent, spoon-shaped, extend-

ing obliquely forward, and with their connecting resilium sustaining a proportionately large triangular lithodesma; the chondrophores are supported behind by well-developed clavicular props, which are inserted posteriorly on the surface of the valve below the linear hingeline. Length 32, height 27, diameter of right valve 6 and of the left valve 4 mm.

This elegant shell, in a somewhat damaged condition, was thrown upon the beach at San Pedro, Cal., after one of the heavy winter storms and collected by Mrs. T. S. Oldroyd, to whom we owe so many additions to the fauna of this region.

This species is, we believe, the first *Periploma* known to possess an undulated sculpture, and bears to those of the ordinary type such a relation as that of *Cyathodonta* to *Thracia* or *Labiosa* to *Raeta*. The differences of sculpture and in the form of the lithodesma suggest that, as in the case above cited, *P. sulcata* is entitled to a sectional name for which *Halistrepta* is proposed.

A NEW DENTALIUM FROM CALIFORNIA.

BY WILLIAM J. RAYMOND.

Dentalium vallicolens n. sp.

Adult shell large, rather slender, moderately curved posteriorly, the latter half nearly straight; cream-white, often yellowish toward the mouth, shining where not eroded, earlier portion usually dull and chalky because of erosion; growth-lines fine, irregular, distinct, rarely an encircling groove due to repaired fracture; at the apex there are longitudinal, low, rounded, inconspicuous threads, of which seven or eight are more prominent and three to six in each interspace are less prominent; these die out, and fine, superficial striae appear, visible under the glass and continued to the mouth of the shell, seven or eight per millimeter of circumference; aperture simple, circular, mouth slightly oblique.

Two specimens measure: length 64.5, diam. of aperture 5.3, of apex 1.5, at middle 4.6, height of arch from chord 2.5 mm.; length 64.0, diam. of aperture 4.7, of apex 1.4, at middle 4.2, height of arch from chord 3.0 mm.

Young shell strongly curved, very slender for the first eight or ten millimeters of length, then rapidly enlarging; at first seven or

eight angled, the angles defined by sharp ribs with channeled interspaces, then passing into the sculpture of the adult by successive interpolations of secondary riblets, while the primary ribs lose in prominence and the section of the shell becomes circular.

Length 16.7, diam. of aperture 2.0, of apex 0.3, at middle 0.1, height of arch from chord 1.8 mm.

University of California Marine Biological Laboratory: Station 12, Vincente (or Redondo) Submerged Valley, Santa Monica Bay, 145 fathoms, temp. 45.5° F., bottom sand and mud; also scattering specimens from station 14 off Point Fermin, 100 fathoms, temp. 46°; station 70, La Jolla Submerged Valley, between 117 and 54 fathoms; station 79, off San Diego, 64 fathoms.

The Vincente submerged valley where this species was found in considerable numbers, is one of a series of such valleys described and mapped by Prof. George Davidson, of the University of California, in Proc. Cal. Acad. Sci., 3 Ser. Geology, Vol. 1, No. 2. Opposite Redondo the 100-fathom line marks the edge of a gently sloping, submarine plateau which extends seaward about seven miles. Outside of this plateau the bottom descends much more abruptly. The Vincente valley is nearly 300 fathoms deep and about one and one-half miles wide where it breaks through the edge of the plateau. It carries a depth of 100 fathoms to within one and one-half miles of the beach, thus bringing the colder water of greater depths, with its accompanying fauna, close inshore. It is probable that the *Dentalium* here described will be found in deeper water as marine exploration proceeds along the coast of southern California.

The sculpture of this fine, large species recalls *D. ceratum* Dall (Florida, Cuba, Barbados), but the former is larger, the adult shell is proportionately wider, the young is more attenuated at the apex, and the superficial striae are continued to the mouth, even on the largest specimens. At the length of Dall's species, *D. vallicolens* is more than twice as wide. The peculiar sculpture of the earlier portion and the striation of the latter, readily separate the present species from *D. pretiosum* and *D. indianorum*, even if the angled apex be lost, as is almost invariably the case in the adult. Erosion has in some specimens proceeded so far that patches only of the outer layer of shell are left. In others it seems to have attacked the shell beneath the outer layer so that longitudinal lines and encircling rings of opaque white appear beneath the outer, shining layer which then begins to scale off.

NOTES ON THE MOLLUSCA OF THE BERMUDA ISLANDS.

BY C. ABBOTT DAVIS, S. B.

Last July and August were profitably spent in collecting insects and mollusks among the three hundred beautiful islands now called the Bermudas. Like the Hawaiian group, they are chiefly interesting because of their isolated geographical position, being nearly 700 miles distant from any other land. Commerce, however, is rapidly changing the fauna and flora of Bermuda to such an extent that old records, *i. e.*, records of twenty years standing, are obsolete or unreliable. Large quantities of West Indian shells are constantly being brought to the island to sell to the unsophisticated traveller, and some of the stores actually sell these shells as Bermudian. Even the native colored boys are anxious to sell shells for "tuppence," and they are not particular about the historical side, so that one has to beware of all shells not collected *in situ*.

The expeditions of Prof. Helprin in the summer of 1888, and of Prof. Verrill in the spring of 1898 and of 1901, form the nucleus of most of the authentic published data. I had planned a trip to Bermuda for July and August 1903, but upon learning of the Bristol-Mark expedition, I decided to go with them, and the following notes are a part of the records of our trip.

In 1900, Dr. Pilsbry revised the "Air-breathing Mollusks of the Bermudas," and my research differs little except in minor details. For instance, he agrees with Mr. Smith that *Succinea bermudensis* Pfr., is *S. barbadensis* Guild., but states that the animals need a careful study. I agree with the latter statement and as proof of it illustrate three Bermudian forms. Fig. 1 is the common form, Fig. 2 was occasionally taken at Flatts, Fig. 3 is the fossil variety.

Physa acuta Drap., has not been recorded since G. Brown Goodes' record of 1888. We took it from rain-water tanks in Devonshire Swamp.

The variety *pulchella* Pfr., of *Truncatella caribæensis* Sowb., is always found *dead*. This, taken with the fact that this mollusk lives at the high-tide mark, and is therefore apt to be water-worn, makes *pulchella* simply a worn *caribæensis*.

In a lot of several hundred *caribæensis* received recently from the West Indies, there is a complete series showing the wear on these

shells, even to fresh transparent specimens. Prof. Verrill has lately added the following to Dr. Pilsbry's list :

Blauneria heteroclita Montg., *Hyalina lucida* Drap.

Pæcilonites zonata Verr. (Fig. 17), *Siphonaria henica* Verr.

My records add the following :

Carychium exiguum Say. (var.). Sub-fossil.

Vitrea cellaria Müll. Several at Hamilton.

Helix pisana Müll. Several at St. Georges (Fig. 18).

Planorbis dilatatus Gld. Dev. Swamps, (Brackish water).

Paludestrina tenuipes Cooper (var.). Eve's Pond.

The beautiful genus *Melampus* needs revision, and as I collected (personally) several quarts of these bewildering shells, I will attempt the following key to the Bermudian forms :

- A. Aperture narrow and short, shells small, pointed at both ends, greasy, brownish or blackish, no teeth (see Fig. 4).

M. bulloides Mont.

- B. Aperture wider and longer, at the extreme base a very prominent fold, shells larger, apex pointed, greasy, color brownish or purplish, with one or more revolving white or yellowish bands, row of teeth within the outer lip very numerous, (Fig. 5).

M. flavus Gmel.

1. Color plain brown or purple, no stripes, (Fig. 6).

Var. *purpureus* n. v.

2. Size and shape same as *purpureus*, immaculate white when alive, rare, found only at Hungry Bay, (Fig. 7).

Var. *albus* n. v.

- C. Aperture still wider, shell wide at the top, apex abrupt, two or more well developed teeth on the inner lip, often attaining to double the size of *flavus*, not green, (Fig. 8 is the Florida form).

M. coffeus Linn.

1. Larger, and apex more pointed than in *coffeus*, the row of teeth in outer lip very irregular and uneven, banded spirally, with brown and white, width of bands *very irregular*, (Fig. 9).

Var. *gundlachi*, Pfr.

2. Pilsbry says : " Scarcely if at all to be distinguished from the prior *M. gundlachi* Pfr., but not attaining so large a size." These are probably the juvenile *gundlachi*, the lack of color and lustre in the large ones being due to longer exposure and yet they look like another variety so the smaller ones are called (Fig. 10). Var. *redfieldi*, Pfr.

3. Size and shape same, but the revolving bands of light and dark color *alternate evenly*, (Fig. 11).

Var. *alternatus* n. v.

4. Smaller, darker, polished, beautifully mottled with more or less prominent *vertical* stripes, (Fig. 12).

Var. *verticalis* n. v.

5. Stout, *plain brown* form, with no markings whatever. (Fig. 13).

Var. *bishopii* n. v.

Named in honor of mine host Mr. Geo. A. Bishop, Supt. of Public Gardens, Hamilton, Bermuda.

As to *Siphonaria*, Verrill has described in the "Transactions of the Conn. Academy of Science," a species called *S. henica*. So far as is known, only one specimen—the type—is in existence. This was taken at Bailey Bay on the north shore. We collected over three pints of *S. alternata* Say, and found many of the var. *brunnea* Hanley, also two others.

2. Shell small (size 16 x 13 mm.), blackish, opaque *opalescent*, rare, Hungry Bay, south shore (Fig. 15). Var. *opalescens* n. v.

3. *Intermediate* in size and coloration between *brunnea* and *opalescens*. Very thin, translucent, always distinguished by radial black lines from apex to margin, covering the whole or a part of the inner surface. Common on the south shore at high-tide mark (Fig. 16).

Var. *intermedia* n. v.

There are undoubtedly many marine species which might be added to the published lists of Dall, Heilprin, Verrill, and others; but the great difficulty just now is to eliminate equivalent nomenclature. I have not seen records of the following species taken by us in Bermuda:

<i>Acmæa punctulata</i> Gmel.	<i>Ocinebra intermedia</i> Ads.
<i>Anachis catenata</i> Sowb.	<i>Nassa consensa</i> Rav.
<i>Alabina adamsii</i> Dall.	<i>Natica livida</i> Pfr.
<i>Asaphis deflorata</i> Linn.	<i>Nitidella cribraria</i> Linn.
<i>Bittium varium</i> Pfr.	<i>Olivella rosalina</i> Ducl.
<i>Chione beauii</i> Recl.	<i>Ostrea folium</i> Linn.
<i>Chione pygmæa</i> Lam.	<i>Pecten ornatus</i> Lam.
<i>Coralliophila abbreviata</i> Lam.	<i>Pitaria fulminata</i> Mke.
<i>Cypræacardia hornbeckiana</i>	<i>Purpura undata</i> Lam.
Mörch.	<i>Rissoina pulchra</i> Ads.
<i>Cythara simulata</i> Rve.	<i>Semela proficua</i> Pult.

Eulima gracilis Ads.

Spirula australis Lam.

Gastrochæna ovata Sby.

Tellina promera Dall.

(Fig. 20.)

Tellina sybaritica Dall.

Litiopa bombyx Kein.

Vermetus erectus Dall. This shell is quite common, but generally has the erect portion broken off, as in Fig. 19.

The following are undoubtedly new forms. Cotypes of each are deposited (with the *Melampus* and *Siphonaria*) in the museums at Washington, Philadelphia, Boston and Providence.

Gastrochæna mowbrayi sp. n. (Fig. 21).

This has often been mistaken for a juvenile *G. ovata*, (Fig. 20) as it resembles *ovata* in shape and color, but neither in size, nor habitat. In Bermuda *G. ovata* has an alt. of 20 mm. and bores a hole about 10 mm. in diameter in the solid brain-corals, or shell-rock.

On the other hand, *G. mowbrayi* is found in the dead or dying stems of the branch coral (*Oculina*) the entire stem of which could be put into a tube of *ovata*. *G. mowbrayi* occupies a cavity a little larger than the shell (which is about 6 x 3 mm., the cut showing an extremely large specimen) with a small opening to the outer surface of the coral. These shells are often grouped so closely together, as to undermine the strength of the coral, (see Fig. 22). Locality, Harrington Sound, dredged in 20 to 40 ft. Named in honor of Mr. Lewis Mowbray an enthusiastic Bermudian naturalist.

Tellina lævigata Linn., var. *stella* n. v.

T. lævigata is called the "sunset shell" by the natives, and it well deserves the name on account of its beautiful bands of orange or pink alternating with delicate yellow tints. About one out of twenty of these shells has diverging, radial pink rays (like *T. radiata*). For this nameless variety I propose the name *stella* (Fig. 34) collected at Flatt's Inlet.

Volvaria avena Lam., var. *southwicki* n. v.

Volvaria avena (Fig. 23) is common along the north shore of Bermuda, and is widely known and easily recognized by its conspicuous transverse orange bands, size 9 x 3 mm.

On Hamilton Beach I found a smaller constant variety (Fig. 24) which had a uniformly dark, mottled ground with no bands of color. Alt. 6 x 2 mm. This variety is named after my friend, Mr. Jas.

M. Southwick, Curator of the Roger Williams' Park Museum, Providence, R. I.

Key to the Bermudian Species of the Genus Cerithium.

The species of this genus were the hardest to revise owing to the fact that the descriptions being brief and often inaccurately figured, no two museums have them named alike. A generous use of the microscope is necessary to distinguish species, and while there are undoubtedly intergrades, the majority are I think, distinct species and not varieties. They are so dissimilar that they can be readily separated. Most of the species may be picked up in Bermuda by the thousand. I brought home at least a half bushel for study.

- A. Very small, jet-black inside and out, often decollate, nodules in *vertical rows of three dashes*. Bermuda form, Fig. 25; Haiti form, Fig. 26; white-tipped Florida form, Fig. 27.

C. minimum Gmel.

- B. Larger, stouter, plain black or dirty brown inside and out, spirals very uneven, nodules in vertical rows of *three dots* (Fig. 28).

C. nigrescens Mke.

- C. Shell stout, spirals uneven, *handsomely variegated* black and white or yellow and white, nodules in vertical rows of three dots (Fig. 29).

C. variabile Ads.

Note.—This shell has been called *erienne* Val., and even placed as a variety of *ferrugineum* Say, which it does not resemble in the least. (See the original figure and description of *ferrugineum* by Say.)

- D. Long, narrow, yellowish-brown, spirals very irregular, three vertical nodules united, forming vertical ribs, by far the rarest form in Bermuda (Fig. 30).

C. ferrugineum Say.

- E. Long, narrow, apex sharp, black with a white revolving band below the suture, the black band contains dashes and the white band dots, spirals regular, blackish inside (Fig. 31).

C. septenstriatum Say.

- F. Larger than any of the above, spirals regular. A whitish calcareous deposit distinguishes this shell (Fig. 32). When this covering is removed by acid or wear as in Fig. 33, it reveals a brownish interior with white bands on which the nodules are shaped like an exclamation point (!), the two upper dots being united. The apex is always very sharp.

C. albocoopertum sp. n.

Any other Bermudian records would be gratefully received by the writer, as he has in press a "Check-List of the Bermudian Mollusca."

GENERAL NOTES.

MOLLUSCA ON PIKE'S PEAK COLORADO.—Last fall I collected *Pupa muscorum* (L.), *Vallonia cyclophorella* Ancey, *Euconulus fulvus* (Müll.) and *Zonitoides arboreus* (Say) by the printing office on Pike's Peak, 10,000 ft. alt. I put them on record because of the altitude; the dominant vegetation of the place consists of *Achillea*, *Dasiphora*, *Fragaria*, *Salix*, *Rosa*, *Populus tremuloides*, *Carduus*, *Geranium*, *Epilobium*, *Delphinium*, *Arctostaphylos uva-ursi*, *Campanula*, *Potentilla*, *Allium*, *Pedicularis*, *Gentiana*, *Picea*, *Pinus*, *Juniperus*, *Antennaria*, *Artemisia*, *Pentstemon*, *Machaeranthera*, *Rudbeckia*, *Frasera* and *Calochortus*: nearly all circumpolar genera, it will be observed, the last five only being exclusively American. I have a note that I found also *Succinea avara*, but kept no specimens.—T. D. A. COCKERELL.

CHIONE CANCELLATA LINN. IN THE JERSEY CITY MARKET.—A strange shell in the market always interests the conchologist. A short time ago my brother gave me a *Chione cancellata* which he had found with some clams (*Venus mercenaria*) purchased of Mr. Brittain, a fish dealer on Bergen ave., Jersey City, N. J. He said there were several in the basket from which the clams were taken. Desirous of knowing whence they came, I inquired of Mr. Brittain where the clams were gathered and he said he believed they came from North Carolina.—SLOMAN ROUS.

THE MOLLUSCAN FAUNA OF ONE LOG.—On October 15th, I collected from the under side of an old log, 12 inches in diameter and 9 feet long, in the vicinity of Des Moines, Iowa, 634 living specimens of the following species:

- Polygyra albolabris* Say, 1.
- Polygyra appressa* Say, 140.
- Zonitoides arboreus* Say, 244.
- Zonitoides minusculus* Binn., 69.
- Conulus fulvus* Müll., 12.
- Succinea avara* Say, 5.

Corychium exiguum Say, 4.

Bifidaria pentodon Say, 1.

Bifidaria armifera Say, 143.

Strobilops labyrinthica Say, 3.

Agriolimax campestris Binn., 12.

Many other logs yielded abundantly of the same and other species.
—T. VAN HYNING.

MR. JAS. H. FERRISS is collecting shells and ferns in Arizona. He reports great success, and the specimens sent in give evidence that he has not lost the knack of finding the finest kinds of snails. There are several forms of *Sonorella*, *Ashmunella chiricahuana* and some new forms of the *levettei* type, two new species of *Oreohelix*,¹ one of them ornamented with whorls of hairs, besides the "small stuff."—H. A. PILSBRY.

VERTIGO ANDRUSIANA Pils. when fully adult has two teeth on the parietal margin, at least in some specimens, and a very minute tooth above the upper palatal plica. Until nearly adult, the basal fold is not developed.—H. A. P.

HELICOGONA ARBUSTORUM IN NEWFOUNDLAND.—Adult living specimens of this common British and European land snail were collected by Dr. Robert Bell in the middle of July, 1885, on grassy slopes facing the sea, near the narrows of St. John's Harbor, Newfoundland. So far as the writer is aware, this is the first time that this species has been found, in a living state, on the American side of the Atlantic. Dr. Bell says that many wrecks of vessels take place on this part of the coast, and that a little farther to the south of the locality where these snails were found, there is a small patch where the common heather (*Calluna vulgaris*) grows. This marks the spot, he adds, where an emigrant ship was stranded, and the beds of the emigrants, which were stuffed with heather, were taken ashore and emptied out.—J. F. WHITEAVES, in *The Ottawa Naturalist*, vol. xvii, no. 11, p. 192, Feb., 1904.

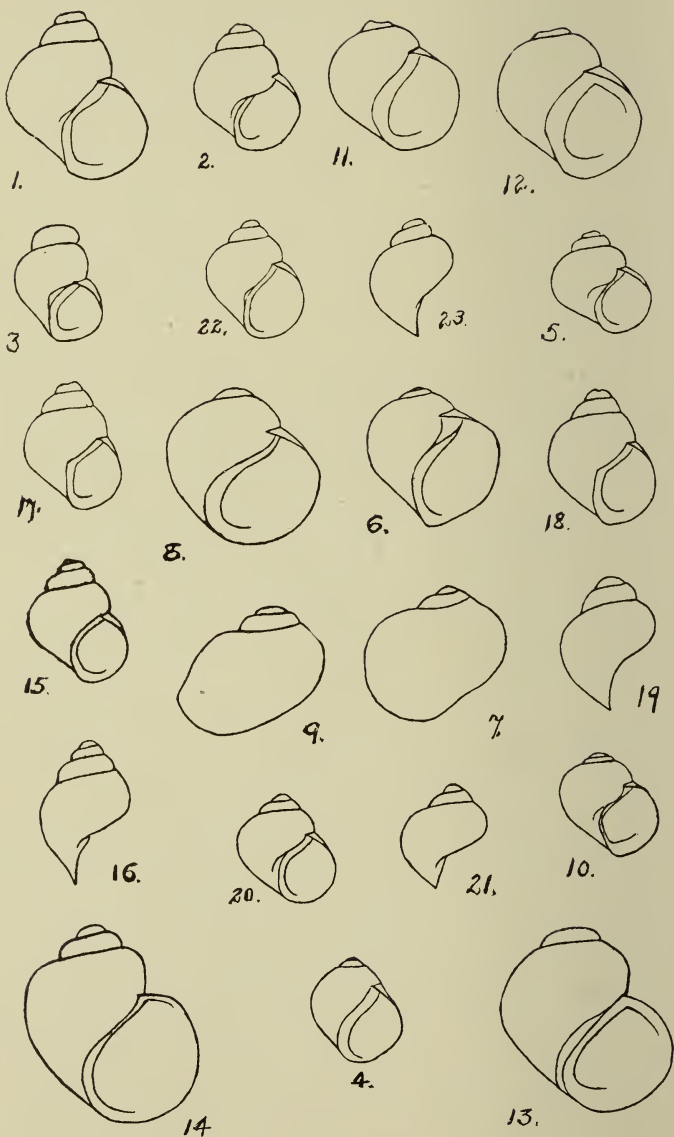
¹ *Oreohelix* is a new genus for the Rocky Mountain Helices of the *H. strigosa* group, hitherto wrongly placed in "Patula" or *Pyramidula*, from which they differ by the lack of pedal furrows.—H. A. P.

PUBLICATIONS RECEIVED.

SCIENTIFIC RESULTS OF THE TRAWLING EXPEDITION OF H. M. C. S. THETIS, MOLLUSCA Pt. II, SCAPHOPODA AND GASTROPODA.—By Charles Hedley (Memoirs Australian Mus. IV, pp. 327–402, plates 36–38). This interesting and valuable paper contains the descriptions of 37 new species and three new genera: *Epigrus*, *Myxa*, and *Fascinus*. The new forms together with many others are illustrated by 52 excellent figures in the text. The author has adopted *Calcar* Montfort, 1810, in place of *Astralium* Link, with the following note: “It is obvious that *Astralium* Link cannot honestly be said to have been published in 1807. Probably as a published name *Astralium* should date from Herrmannsen’s article in the Proceedings of the Zoölogical Society of London for 1851, p. 231. Unless the rules of the zoölogical nomenclature are to be broken, *Calcar* must be used instead of *Astralium*. *Cassidea* Brug. 1789 is used in place of *Semicassis* (Klein 1753, pre-Linnean) Mörch 1852.—C. W. J.

DIAGNOSES OF NEW SPECIES OF MOLLUSKS FROM THE SANTA BARBARA CHANNEL, CALIFORNIA. By William Healey Dall (Proc. Biol. Soc., Wash., Dec. 13, 1903, pp. 171–176).

In this interesting paper Dr. Dall describes ten new west-coast species. Of this number all, excepting *Mitra dolorosa* from the Gulf of California, were dredged at Santa Catalina Island during the summer of 1903, by Messrs. Lowe and Paine. One genus, *Macromphalina*, is new to the west coast. New species are: *Actæon* (*Rictaxis*) *painei*, *Clathurella lowei*, *Mangelia fancheræ*, *Mitra lowei*, *Mitra dolorosa*, *Murex* (*Ocenebra*?) *painei*, *Lunatia draconis*, *Macromphalina californica*, *Scala sawinæ* and *Ischnochiton biarcuatus*. As will be seen by the feminine endings two species are named for ladies. Besides the species from the Gulf of California, *Lunatia draconis* has been dredged at Drake’s Bay, Monterey and the Farallones Islands. Of the specific name *draconis* Dr. Dall says: “As Drake was long known to the Spaniards as ‘El Drako,’ I have named the species *draconis* in his honor.” *Scala sawinæ* has been dredged off the Coronada Islands, Avalon and at the Isthmus. The type is from the harbor side of the isthmus at Santa Catalina and was dredged by Dr. Dall in 1873. With these exceptions all the species were dredged off Avalon. Another new species of a genus not before known to inhabit the west coast was described by Dr. Dall in THE NAUTILUS. Sept., 1903, under the title, “A New Species of *Metzgeria*.” This species collected by J. H. Paine, Dr. Dall named *Metzgeria californica*.—Mrs. M. Burton Williamson.



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NEW SPECIES OF SOMATOGYRUS.

BY BRYANT WALKER.

Through the kindness of Mr. A. A. Hinkley, of Du Bois, Ill., I have had the opportunity of examining the *Amnicolidæ* collected on his recent trip to the Coosa river, and the larger portion of the species herein described are from his collection. The others have been received from the different sources stated in the descriptions.

The new species collected by Mr. Hinkley are remarkable for the diversity of form exhibited, which was quite unexpected in view of the very general similarity in that particular of the species already discovered. The collection also shows that the earlier collectors on the Coosa practically ignored the smaller forms in the more exciting pursuit of the peculiar *Pleuroceridæ* of the river, and that there yet remains much to be done before the molluscan riches of that wonderful stream will be exhausted.

The late Dr. Jas. Lewis in his "Fresh Water and Land Shells" (1876), lists four species of *Somatogyrus* as occurring in Alabama, viz:

S. aureus Tryon.

S. parvulus Tryon.

S. currierianus Lea.

S. subglobosus Say.

Having Dr. Lewis' collection in my possession, I am able to check up his determinations in the light of our present information. It is evident, from the condition of his specimens, many of which are not even washed, to say nothing of having the black and ferruginous deposits removed, with which they are frequently covered, that Dr.

Lewis had not given any critical study to the group, and that his determinations were at the best superficial. It is of interest therefore to consider his list *seriatim*, and to make such corrections as are necessary. *S. aureus*. Dr. Lewis confounded this species with *S. parvulus* Tryon and *georgianus* herein described. For the first error he is not wholly responsible, as the only genuine *parvulus* he had was received from Dr. Lea as *aureus*. His specimens from the "Tennessee River" and "Cahawba River" are *georgianus*. Those from the Coosa are partly *georgianus* and partly *aureus*. Those from the Alabama river are correctly named.

It may be added that *aureus* was found in the Coosa at Wetumpka by Mr. Hinkley, where it has also been collected by Mr. A. C. Billups. It is also in the Lewis collection from the Holston river, Tenn., the Etowah river, Ga., the Tennessee river, Jackson Co., Ala., and from Bridgeport, Ala. It was also collected by Dr. Pilsbry and myself in the Tennessee river at Knoxville, Tenn., on our return from the Pentadelphian expedition in 1901. I have it also from Decatur, Ala., collected by De Camp.

S. currierianus, Dr. Lewis' specimens from Decatur, Ala., are labelled "Type" and seem to be correct. See Pl. v, figs. 8 and 9.

S. parvulus. As stated above, the only specimens referable to this species (see Pl. v, figs. 22 and 23) from the Connesauga river, Ga., were received from Dr. Lea under the name of *aureus*. His specimens from the Tennessee river at Bridgeport, Ala., are immature *aureus*, as are also those from the Coosa.

S. subglobosus. There are no specimens under this name from the Coosa river in the Lewis collection. Those from the Alabama river, while differing somewhat in contour from the typical form of the Ohio valley, seem substantially the same.

The characteristic feature of the Coosa river species of *Somatogyrus* is the heavy flat columellar callus, which usually quite obliterates the umbilicus. This is present in nearly all the species. The former connection of the Coosa with the Tennessee drainage is shown by the occurrence of *S. subglobosus*, *aureus* and *georgianus* in both systems and the narrow, rounded columellar callus in *S. obtusus* and *umbilicatus*, which is characteristic of all the species of the Ohio and Tennessee drainage, except *S. georgianus* and the form referred to *S. currierianus* by Tryon in Mon. F. W. Univ. Moll., p. 62, Pl. 17, fig. 13.

All the figures are drawn on the same scale so that the relative size of the different species is represented on the plate.

Somatogyrus hinkleyi n. sp. Pl. v, figs. 1 and 2.

Shell globose-conic, imperforate or with a mere chink at the umbilicus, light horn-colored, smooth, growth lines scarcely evident. Spire elevated, apex obtuse. Whorls 4-4½, those of the apex convex, penultimate and body whorls more or less shouldered; suture deeply impressed; body whorl large, convex or in shouldered examples somewhat flattened at the periphery and obtusely angled below. Aperture large, rounded above, somewhat flattened at the base and decidedly angled at the junction of the lip with the base of the columella and angular at the upper insertion of the lip; lip simple, in aged examples somewhat thickened within. Columella heavy, callused, flattened and nearly straight, callus thinner on the parietal wall. Alt. 4¾, diam. 3¾ mm. Alt. 5, diam. 3½ mm.

Coosa river at Wetumpka, Ala. (type locality), five miles above Wetumpka, Wilsonville and Fort Williams' Shoals. Also Tallapoosa river at Tallassee, Ala.

This fine species was collected by Mr. Hinkley in considerable numbers at all the localities above mentioned, except at Tallassee, where only a single specimen was found. It occurred "on rocks in swift water, generally on the under side. Sometimes several individuals were found close together." It differs from all the known species in the elevated spire and conical form excepting *S. pennsylvanicus* and *virginicus* herein described, but those species are much smaller and decidedly different in contour. Young shells have the whorls decidedly convex, the shoulder not appearing until after the third whorl. The penultimate whorl shown in its entirety in half-grown specimens is usually quite quadrate, owing to the shoulder and flattening of the periphery. In mature specimens the shoulder tends to become less evident and often entirely disappears. I take great pleasure in naming this unusual form after its discoverer, Mr. A. A. Hinkley, whose recent trip to the Coosa was so fruitful in novelties.

Somatogyrus constrictus n. sp. Pl. v, fig. 3.

Shell small, conic, light horn-colored, smooth, except for the fine growth lines. Apex eroded in all specimens seen, the portion remaining consisting only of the last 2-2½ subcylindrical whorls, which are very convex with a deeply-impressed suture, the body whorl is

somewhat inclined to be gibbous. Aperture small for the genus and nearly round, obtusely angled above. Columella concave with a heavy, flat callus, which extends unbroken between the extremities of the lip leaving the umbilicus scarcely exposed. Lip simple, somewhat flattened along the basal portion and obtusely angled at its junction with the columella. Alt. 3, diam. $2\frac{1}{2}$ mm.

Coosa river, five miles above Wetumpka, Ala. (type locality), also at Wetumpka and near Wilsonville.

Only a few specimens of this species were found by Mr. Hinkley at any of the above localities, "never more than one in the same place, and always on the under side of rock in swift water." Unfortunately all the specimens are badly eroded so that it is impossible to give the apical characters. No young specimens that can be referred to the species were found. This species is remarkable for its elevated amnicoloid shape and deeply constricted whorls, but the heavy columellar callus reveals its generic affinities.

Somatogyrus nanus n. sp. Pl. v, fig. 4.

Shell very small, imperforate, conic-globose, pale greenish-yellow, smooth, shining. Spire very short and rapidly acuminate to the sub-acute apex. Whorls 3, those of the spire but slightly convex, separated by a shallow suture; the body very large, forming most of the shell, convex, somewhat flattened toward the suture. Aperture quite narrowly-angled above, widening and regularly-rounded below. Columella concave, flattened, with a heavy callous, which entirely covers the umbilicus and becomes thin and transparent on the parietal wall. Alt. $2\frac{3}{4}$, diam. $2\frac{1}{2}$ mm.

Coosa river, five miles above Wetumpka, Ala. (type locality), also at Wetumpka, Wilsonville and Fort Williams Shoals above Farmer, Ala.

This little species is apparently the most abundant form in the Coosa. It was "found in all places on rocks in swift water, scattered or collected in bunches of any number up to 25 or 30." It is well characterized by its small size and the short, acute apex, which with large body whorl and slightly-impressed suture, gives a peculiar mamilliform shape to the shell. The shells are almost invariably covered with a thin, greenish deposit, which under the microscope appears to consist of innumerable, oval granules, closely but irregularly agglutinated on the surface.

Somatogyrus umbilicatus n. sp. Pl. v, fig. 5.

Shell small, globose depressed, umbilicate, light greenish-yellow, smooth, except for the fine, rather unequal, lines of growth. Spire short, obtusely elevated. Whorls $3\frac{1}{2}$, those of the spire convex and separated by a well-impressed suture; body whorl large, gibbously convex. Aperture sub-circular, rather longer than broad, obtusely angled above and slightly flattened along the basal margin. Columella concave, narrowly reflected; columellar callus, moderately heavy, rounded, reflected over but not concealing the round, deep umbilicus, thin and transparent on the parietal wall. Alt. 3, diam. 3 mm.

Coosa river at Wetumpka, Ala. (type locality), also at Fort Williams Shoals above Farmer, Ala.

This species is remarkable for its depressed, valvata-like form and round, deep umbilicus, which readily differentiates it from all other known species of the genus. It does not appear to be very abundant at Wetumpka, and only a single example was collected at Fort Williams Shoals.

Somatogyrus coosaensis n. sp. Pl. v, figs. 6 and 7.

Shell small, globose, imperforate, light yellow, smooth, with very fine lines of growth. Spire very short, apex obtuse. Whorls $3\frac{1}{2}$, rapidly increasing, those of the spire but slightly convex and separated by a very shallow suture; body-whorl inflated, large and convex. Aperture large, very oblique, expanded and well rounded above, obliquely flattened at the base. Columella concave, with a heavy, flat callus, which entirely covers the umbilicus, but rapidly attenuates above the axis; parietal wall with a thin transparent callus. Lip simple, the upper extremity projected along the body whorl at its insertion, at which point it is abruptly curved in to meet the parietal wall and rapidly drawn back below, forming a decided angle where it unites with the base of the columella. Alt. $3\frac{1}{2}$, diam. 4 mm.

Coosa river at Wetumpka, Ala. (type locality), also five miles above Wetumpka, and at Fort Williams Shoals above Farmer, Ala. Very abundant at the first two localities, but only a single specimen was taken at the last. This species is about the size of *S. currierianus* (Figs. 8 and 9) to which it is closely related, but differs in the less elevated spire, slightly impressed suture, regularly rounded body

whorl, which is not shouldered as in that species, and in the decided angle at the junction of the columella with the basal lip. The bright honey-yellow color is eminently characteristic. It resembles young specimens of *S. crassus*, but differs in the particulars stated in connection with that species.

Somatogyrus obtusus n. sp. Pl. v, fig. 10.

Shell small, globular, narrowly umbilicate, greenish white, smooth, shining. Spire very short, apex obtuse. Whorls $3\frac{1}{2}$, those of the spire convex and slightly shouldered, separated by a well impressed suture, body whorl large, globosely convex. Aperture subcircular, rounded above, obtusely angulate below. Lip simple, meeting the body whorl at nearly right angles at its insertion on the parietal wall, expanded below and somewhat thickened within along the basal margin. Columella concave, narrowly reflected; columellar callus not very heavy, and rounded; parietal wall covered with a thin transparent callus. Umbilicus distinct, narrow, somewhat contracted by the reflected columellar lip. Alt. 3, diam. 3 mm.

Coosa river, just above the railroad bridge at Farmer, Ala.

Only eight examples of this distinct, little form were obtained, but they are very uniform, varying only in size. *S. obtusus* differs from nearly all the Coosa river forms in the narrow, rounded columellar callus and distinct umbilicus. In this respect it is allied to the species of the Tennessee and Ohio drainage, grouping around *S. integer*, but differs from them all in the obtuse apex, globular form and the decided angle at the junction of the columella with the basal lip.

Somatogyrus crassus n. sp. Pl. v, figs. 11 and 12.

Shell small, globose, very solid, imperforate, light greenish yellow, smooth, lines of growth very fine. Spire short, apex obtuse. Whorls about 4, those of the spire slightly convex, suture well impressed. Body whorl large, somewhat gibbous and swollen above. Aperture large, rounded above, somewhat flattened basally and obtusely angled at the junction of the lip with the columella. Lip simple, thickened within, by a deposit of callus. Columella concave, with a heavy, flat callus which extends from one extremity to the lip of the other, and entirely covers the umbilicus. Alt. (apex eroded) 4.25, diam. 4.25 mm.

Coosa river at Wetumpka, Ala. (type locality), also five miles above Wetumpka.

Only a single adult specimen was found. But quite a number of half-grown individuals occurred. This species differs from all the others known from the Coosa, except *S. georgianus*, in the solid shell, heavy columellar callus, thickened lip and in the inflation of the upper part of the body whorl. In these respects it resembles *S. georgianus*, but differs in size and in being imperforate, lacking the axial groove, less gibbous, and more globose. The apex is eroded in all the specimens so that the exact number of whorls could not be determined. The immature shells are about the size of *S. coosaensis* and somewhat resemble that species, but differ in the thicker shell, color, smaller and more regularly rounded aperture, which is scarcely angled at the base, the upper extremity of the lip is also less curved in at its insertion.

Somatogyrus georgianus n. sp. Pl. v, fig. 13.

Shell globose, turbinate, perforate, thick, solid, light greenish-yellow, smooth, except for fine growth lines. Spire short, obtuse. Whorls about four, those of the spire convex with a well-impressed suture, body-whorl large, very convex and inflated above. Aperture large, obtusely-angled above and broadly-rounded below. Columella concave with a very heavy, narrow callus, which extends to the upper insertion of the lip and is adnate to the body whorl only at its upper end, and below the narrow umbilicus is separated from the body whorl by a deep axial groove. Lip simple, but thickened within, its insertion on the parietal wall is below the periphery. Alt. (apex eroded) 5, diam. $4\frac{1}{2}$ mm.

Chattanooga river, Chattanooga Co., Ga. (type locality), also Tennessee river, Cahawba river and Alabama river, Ala. (Lewis Coll.).

A couple of indifferent specimens have been in my possession for several years, which were found among some *Pleuroceridæ* collected by R. E. Call. A larger suite in Mr. Hinkley's collection from the same source, and three lots from the Lewis collection have served to confirm the distinctness of the form. This species resembles *S. sargenti* (pl. v, fig. 14) in the inflation of the upper part of the body whorl, but differs in lacking the shoulder characteristic of that species and in the peculiar formation of the columella, which is unlike that of any other species except *S. pumilus* Con. and *S. trothis* Doh. It also resembles *S. crassus*, but is larger, the body whorl more elong-

ated and more inflated above and has an entirely different form of columellar lip. Dr. Pilsbry has kindly compared some of the Tennessee river specimens with the unique type of Conrad's *pumilus*, and writes that while *pumilus* has the same peculiar axial groove, it is smaller (alt. 3.9, diam. 3 mm.), different in color and has the aperture more oblique. Doherty's species is smaller, about the size of *S. integer*, and has the axial groove only slightly developed. The three species, however, form a natural group more closely related to each other than to the other species in the genus. Many of the specimens in the Lewis collection have the aperture rather more expanded below than in the typical form.

This species is apparently ovoviviparous. In four out of fifteen examples in the lot from the Tennessee river, young shells of about $2\frac{1}{2}$ whorls and about $1\frac{1}{2}$ mm. in height and breadth were found lodged behind the opercula of the adults in various degrees of extrusion. In two cases the young shells dropped out in the cleaning process, the outer edge of the operculum being forced out of its normal position to allow the passage of the young. In the other two, the young are further within the shell and the operculum is set in nearly its usual position. An interesting monstrosity, which apparently belongs to this species, occurred in the lot from the Cahawba river. Nearly the whole of the body whorl is encircled at the periphery by a strong carina. It appears from beneath the upper insertion of the lip and continues around the whorl about three-fourths of the circumference, when it rapidly subsides and entirely disappears before the lip is reached. There is no trace of it on the upper whorls that remain. The axial groove is bounded on the inner side by a sharp angle, which merges into the edge of the lip at the base.

Somatogyrus pennsylvanicus n. sp. Pl. v, figs. 15 and 16.

Shell small, obtusely conic, narrowly umbilicate, sometimes imperforate, light horn-color, smooth, with very fine growth-lines. Spire elevated, apex obtuse. Whorls about $4\frac{1}{2}$, convex, slightly flattened toward the suture, which is well impressed. Aperture ovate, less than half the length of the shell, angled above and rounded below, slightly flattened along the basal lip. Columella nearly straight with a rather heavy, but narrow, rounded callus, which is thin and transparent in the parietal wall. Umbilicus a mere chink or entirely covered by the callus deposit. Lip simple, somewhat thickened within, especially on the basal part. Alt. $3\frac{3}{4}$, diam. $2\frac{1}{2}$ mm.

Columbia, Pa.

About thirty specimens of this amnicola-shaped species were in the collection of the late Dr. G. A. Lothrop, labelled *Amnicola decisa*, but unfortunately with no indication from whom they were obtained. The large number of species from that locality in the collection would indicate that Dr. Lothrop had been in correspondence with some collector residing in that vicinity. At first sight, it would be taken for an *Amnicola*, but the columellar callus is decisive on its generic position, which is confirmed by the allied *S. virginicus* and by Mr. Hinkley's discovery of a somewhat similar elevated form (*S. hinkleyi*) in the Coosa. It is similar in shape to that form, but is smaller, the whorls more rounded, the columellar callus is narrower and rounded, and there is no decided angle at the junction of the basal lip with the columella. In shape it resembles also somewhat *S. virginicus* but differs in the particulars pointed out in connection with that species.

Somatogyrus virginicus n. sp. Pl. v, figs. 17, 18 and 19.

Shell small, globosely conic, imperforate, light greenish-yellow, smooth, shining, lines of growth very fine. Spire elevated, obtusely conic. Whorls about 4, those of the spire convex, with a well-impressed suture, body whorl subglobose, regularly convex. Aperture ovate, angled above and broadly rounded below. Umbilical region impressed, but covered by a rather broad, rounded columellar callus which becomes thinner and transparent on the parietal wall. Columella nearly straight. Lip thin and sharp. Alt. (fig. 18) $3\frac{3}{4}$, diam. 3 mm. Alt. (fig. 17) $3\frac{1}{2}$, diam. $2\frac{1}{2}$ mm.

Barnard's Ford, Rapidan R., Va. (W. J. Farrer Coll.)

This species in its elevated form resembles *S. pennsylvanicus*, and the two with *S. hinkleyi* form a natural group quite distinct in shape from all the other known species. It differs from the latter in its smaller size, more convex body whorl and narrow, rounded columellar callus, and from the former in being somewhat larger, less solid, more globose, thin lip, color and especially in the impressed umbilical area, which is one of the most distinctive specific characters. Like many of the *Amnicolæ*, there are two forms represented in the series, one being decidedly more slender than the other as shown by the figures, otherwise they are entirely similar. This is probably a sexual difference, but has not been observed in any other species of this genus.

Somatogyrus pilsbryanus n. sp. Pl. v, figs. 20 and 21.

Shell small, gibbous-globose, scarcely perforate, rather thin, light yellow-horn colored, smooth, lines of growth very fine. Spire short, conic, obtuse. Whorls $3\frac{1}{2}$, those of the spire convex, separated by a well-impressed suture, body whorl large, very convex, gibbous. Aperture large, widely ovate, obtusely angled above and regularly rounded below. Umbilical region impressed. Umbilicus a mere chink. Columella concave, with a heavy, flat callus, which becomes thin and transparent on the parietal wall. Alt. 3, diam. 3 mm.

Tallapoosa river, Tallassee, Ala.

This is another of the new species discovered by Mr. Hinkley. It occurred quite abundantly and is a well marked and distinct form. It is related to *S. parvulus*, Tryon (Pl. v, figs. 22 and 23), in general appearance, but differs in the wide, gibbous body whorl, more obtuse apex and in the heavy, flat, columellar callus, *S. parvulus* being more acutely conical, with the body whorl regularly rounded and with a narrow, rounded, columellar callus. Dr. Pilsbry has kindly compared it with the types of Tryon's species and concurs in its specific distinctness. I take great pleasure in naming it after him.

A NEW SUBSPECIES OF POLYGYRA TRIDENTATA.

BY H. A. PILSBRY.

Polygyra tridentata discoidea n. subsp.

The shell is larger than *tridentata*, more depressed, the spire usually nearly flat. Whorls $5\frac{1}{2}$, closely and sharply striate. Umbilicus more widely expanding at its opening, showing more of the preceding whorl. The aperture is more or less "dished," the parietal tooth directed towards the upper lip-tooth, which while varying somewhat in shape has a tendency to be rather wide and flat-topped. The lower lip-tooth is more acute, both being strictly marginal.

Alt. $9\frac{1}{2}$, diam. $20\frac{1}{2}$ mm.

Alt. 8, diam. 19 mm.

Alt. $8\frac{1}{2}$, diam. $18\frac{1}{2}$ mm.

Charleston Landing, Clarke Co., Southern Indiana. Cotypes in coll. A. N. S. P. and of L. E. Daniels.

During a recent visit, Mr. G. H. Clapp called my attention to the form of *P. tridentata* found around Cincinnati, and widely known in

collections. A recent sending from Mr. L. E. Daniels of the same race from a point further down the Ohio valley is made the occasion for describing it. The subspecies seems to be a characteristic and abundant form along the lower Ohio river, its range southwestward as well as up the river still remaining to be ascertained.

It resembles the large *P. tridentata complanata* in shape, but is invariably sharply striate and does not reach so large a size.

DESCRIPTION OF TWO NEW TERTIARY FOSSILS.

BY CHARLES W. JOHNSON.

Cancellaria rapella n. sp.

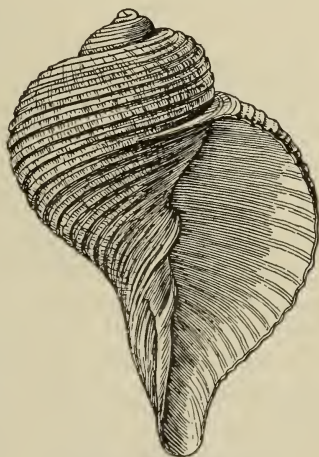
Shell very fragile, spire but slightly elevated, depressed and excavated near the suture, with three and one-half whorls including the protoconch, the latter smooth and consisting of one and one-half whorls; body whorl with about twenty-five spiral ridges, those on the central portion flattened and obsolete grooved, lines of growth prominent and on the spire give the interstices between the spirals a punctated appearance; columella with two prominent folds and a slight umbilical rimation. Length, 29 mm.

Miocene, Magnolia, Dauphin Co., North Carolina.

One specimen of this delicate shell was found while cleaning the marl from the interior of a large *Busycon maxima* var. *tritonis* Conr., collected by Mr. Joseph Willcox. It is related to *C. venusta* Tuomey and Holmes, but the shell is much thinner, spire less elevated and excavated near the suture. Type in the museum of the Wagner Free Institute of Science, Philadelphia.

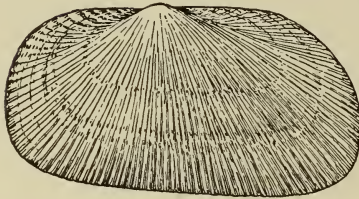
Linearia? divaricata n. sp.

Shell very thin, compressed, nearly equilateral, umbones smooth,



CANCELLARIA RAPELLA.

from which extend upwards of sixty radial ribs, those of the anterior



LINEARIA DIVARICATA.

and posterior diverging toward their respective margins, a few of the upper ones curving upward to the hinge line, the larger ribs frequently forked near the margin, lines of growth quite prominent. Length 15, alt. 8, diam. 4 mm.

Eocene (Lower Claiborne), Berryman's place, two miles northeast of Alto, Cherokee Co., Texas. Type in the Lea collection of the Academy of Natural Sciences, Philadelphia (Acc. no. 9706).

This interesting specimen represents both valves intact, the matrix filling the interior is quite hard and the shell so thin that an attempt to develop the hinge would undoubtedly destroy the specimen. I can therefore only refer it doubtfully to the genus *Linearia* until more material is obtained.

GENERAL NOTES.

OCURRENCE OF ZINC IN FULGUR.—In *Science* for January 29, 1904, P. 196, Mr. Harold C. Bradley, of Yale University, states that: "In the course of an investigation on the chemical physiology of certain invertebrates, undertaken under the direction of Dr. Lafayette B. Mendel, it was found that the ash of the hepatopancreas of the large carnivorous gastropod *Sycotypus canaliculatus* contains an element hitherto unobserved in such connection, namely zinc * * * samples of ash from *Sycotypus canaliculatus* gave approximately eleven per cent. and twelve per cent. respectively of ZnO."

"At the same time qualitative examinations were made of specimens dredged from various parts of Long Island Sound about New Haven and in all cases zinc was found in large quantities in the ash of *Sycotypus* and *Fulgur carica* * * * The significance of this unique occurrence of zinc in the economy of *Sycotypus* and *Fulgur* is still to be determined, as is the nature of the combination in which it exists. These points, together with the distribution of the element in other marine forms about the Sound, are at present being investigated."

THE SENIOR EDITOR OF THE NAUTILUS is on a collecting trip through Florida and Cuba. He will return the latter part of April.

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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. tryoniana* 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*) *pannosa* var. *awashimana* n. var.

This race is similar to *E. pannosa* 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 subdivesta* 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, Chisohima 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 striæ. 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. hachijoense* 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 Chichijima, 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 *Pyrula 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.

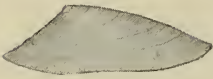
Specimens of this very distinct variety were found in a lot of shells received from Mr. Bryant Walker. They look like a widened-out variety *exilis* with a short spire. They have some relation to the variety *iowaensis*, but the spire is sharply conic, while in that variety it is dome-shaped.

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 *Hyrinæ* 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.



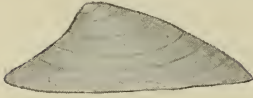
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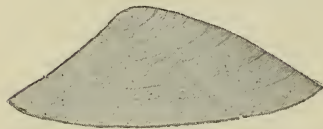
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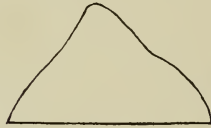
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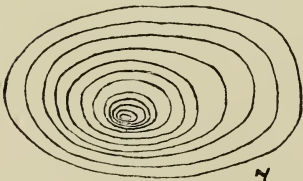
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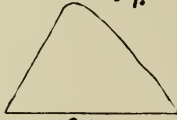
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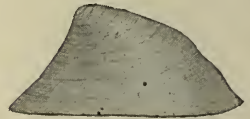
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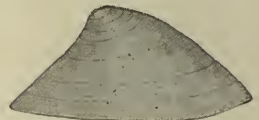
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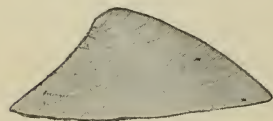
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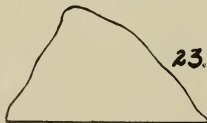
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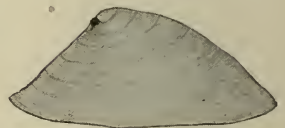
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THE NAUTILUS.

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. tryoniana* 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. " *tryoniana* 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 punctocæolata* 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 newcombiiana Gabb.
Callista (Clementia) subdiaphana Cpr.
Cancellaria cooperi Cpr.
Cardium biangulatum Sby.
Cardium quadriganarium Conr.
Calliostoma splendens Cpr.
Callisotoma variegatum Cpr.
Protocardia centifiloseæ 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.
Conus 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 neohectagonum 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 Corn.
Lucina nuttalli Conr.
Laqueus californica Koch.
 Found in large bunches attached to stones, dead shells and ascidians.
Laqueus jeffreysi Dall.
 Found with *L. californicus*, rare.
Leda acuta Cpr.
Leda hamata Cpr.
 A few live specimens of this interesting species.
Lepidopleurus crebricostatus Cpr.
Lepidopleurus mertensi Midd.
Leptochiton nexus 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.

Ocinebra lurida Midd. var.

Odostomia amianta D. & B.

Odostomia kennerleyi D. & B.

Opalia retiporosa Cpr.

Ovulum 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.

Pleurotoma 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 tenuisculptu 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.

Triviu ritteri Raymond.

Venericardia ventricosa Gld.

Verticordia ornata Orb.

Volvula cylindrica 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 *Clausilia*. 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. oscari* Thiesse (Btbg., Proc. Zoöl. Soc. 1883, p. 34, fig. 16) a somewhat distinct form of *Cl. schuchi*, v. Voith, perhaps entitled to specific rank, though Dr. Westermund (Fauna der in der Paläarktischen region lebenden Binnen-Conchylien, iv, p. 140) calls this a variety of *Cl. schuchi*.

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 nubilus 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 recluzianus* 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

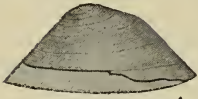
called it "*Cryptogramma arakana*." The correct form is used by Sowerby, on p. 33 of his Supplement to Marine Shells of South Africa.—H. A. PILSBRY.

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.



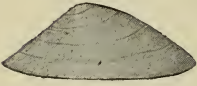
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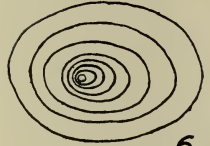
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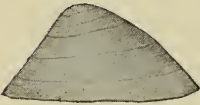
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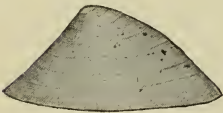
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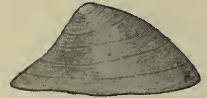
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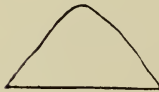
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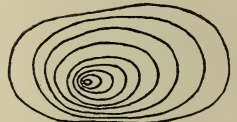
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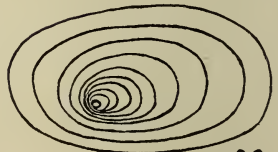
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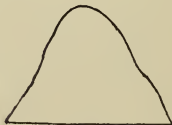
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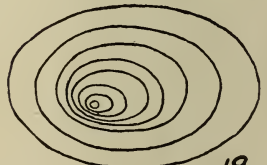
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THE NAUTILUS.

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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 $\frac{3}{20}$, 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 varietyally. 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	“ “ “	Tuscarawas 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. Striæ 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.

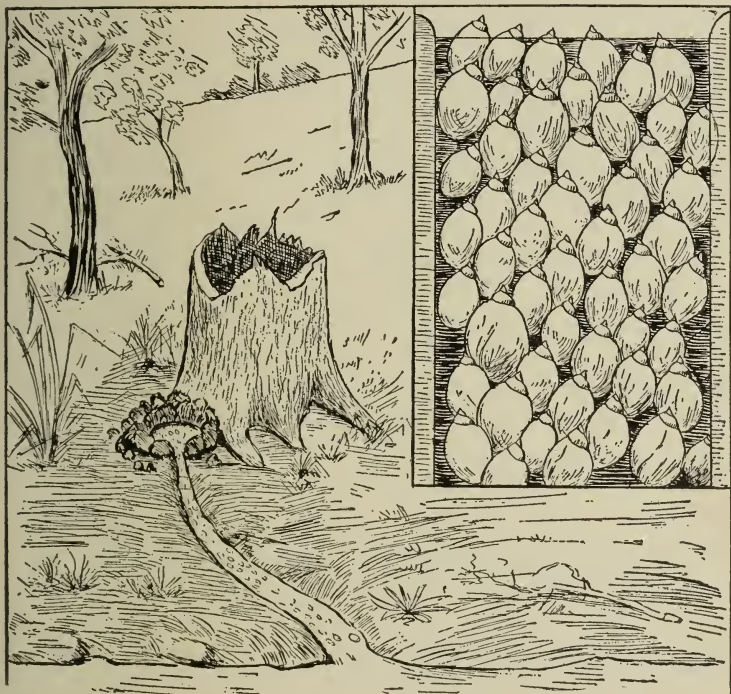
From above this shell has much the appearance of the large granulated variety of *O. lævigata* found with it, but it lacks the close ribs of that species, and the embryonic whorls are *smooth*, while in *lævigata* they are *sharply ribbed*. On the base the resemblance is less striking, as *lævigata* 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 striæ; 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-spined *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) friedeliana var. *vestita* n. var.

Differs from *E. friedeliana* 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* (*Amalia*) *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.
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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-

uals 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 PLEURO CERIDÆ.

Pleurocera annuliferum Con. Warrior, common.

- P. anthonyi* Lea. Wetumpka.
- P. canalitium* Lea. Wilsonville.
- P. dignum* Lea. Spring Creek, Farmer.
- P. excuratum* Con. Decatur. Except for the striæ there is no difference between this and *moniliferum*.
- P. formanii* 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. thornstonii* 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. hydeii* 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. wheatleyii 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 carinate, 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 striæ 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 *bimonilifera* 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.

Campeloma 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. *elator*, (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. *Euconulus 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 pygmæum* (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 morrhuana* 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 Arcas 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.

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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 trivolvis 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 scutissimus* Lea. Mulberry and Black Rivers.
U. ulatus Say. Decatur.

- U. anodontoides* Lea. Wetumpka.
- U. arctatus* 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. brumbyanus* Lea. Mulberry River, common.
- U. cahawbaensis* Lea. Mulberry River, common.
- U. cerinus* 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. metanever* 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. rumphianus Lea. Black Warrior and Mulberry Rivers.
U. securis Lea. Fort William Shoals, Wetumpka and Decatur.
U. sparus Lea. Mulberry River.
U. subblatus 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 subvexa 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., "Molluscs, 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* Mlldff. (see Gude, *Science Gossip*, iii, 180, 181, Dec. 1896, and Mlldff., *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.

THE NAUTILUS.

VOL. XVIII.

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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. juxtidentis*, 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 fraterna (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.

Philomycus 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 *Limnæa*.—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 SPHÆROSPIRA 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 SEPTIDÆ.

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 *Eugyrina* 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 Boltenianum* 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*, *Cassis 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 Lamarck 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 *Colubrariidæ*, 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, *Helotella 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-

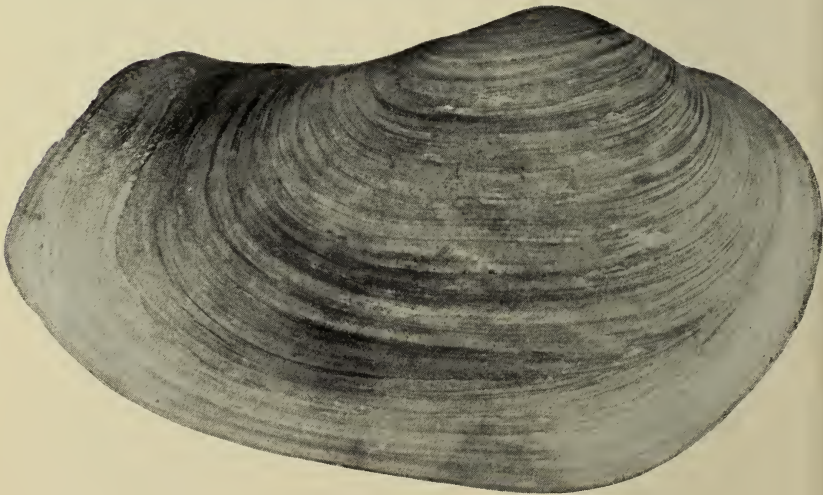
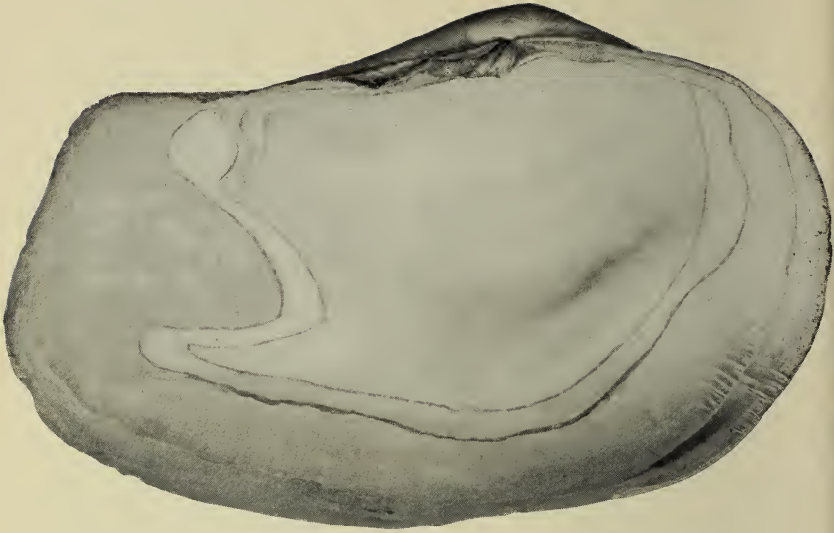
ecture of museum buildings to the cases for storage and display, and the installation and labeling of collections, are considered by Mr. Gratacap, whose practical experience in one of our largest museums gives his ideas a high value. The brochure is copiously illustrated.

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.

THE NAUTILUS.

Vol. XVIII.

NOVEMBER, 1904.

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 *Glycimeris 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 menurdi 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 Caloosohatchie, 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 ANCYLLI. 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. filusus* 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.

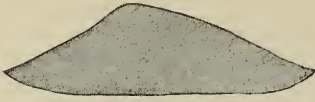
Haldeman's types of the species, for which he used the preoccupied name of *depressus*, came from the headwaters of the Holston River, in Washington County, Virginia, and are now in the collection of the Philadelphia Academy. Dr. Pilsbry has kindly furnished the accompanying outlines of the larger of 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.

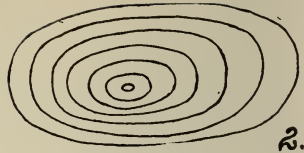
It is a well-marked form, and, as stated by Haldeman, differs from both *rivularis* and *tardus* in the obtusely rounded apex, which in the Doe River specimens is directed nearly straight backwards. In the type specimen, it is apparently more excentric. There is no indication in the Doe River specimens 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.

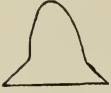
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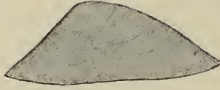
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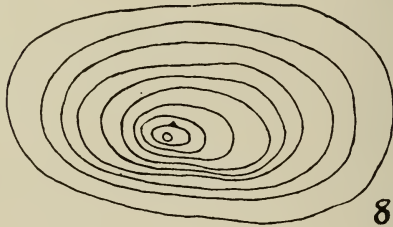
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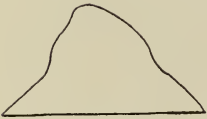
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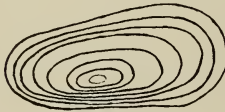
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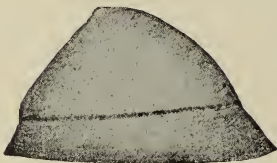
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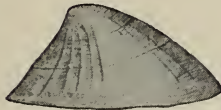
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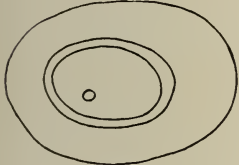
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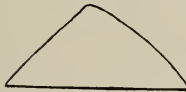
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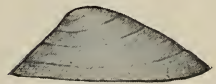
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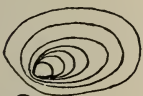
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15.



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 striæ 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 *elator*, 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. shimekii*, 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 *shimekii* is not present in this species, the right slope being nearly straight; this difference is particularly marked in the immature shells, which in *shimekii* 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. filusus* Con. Coosa River, Ala.
 Figs. 4-6, *A. filusus* Con. Coosa River, Ala.
 Figs. 7-8, *A. filusus* 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. shimekii* Pils. Deadman's Run, Neb.
 Figs. 20-22, *A. pumilus* Sterki. Tuscarawas 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.

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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 obsoletely 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-striæ, and very fine, subobsolete spiral striæ. 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.

Etorō, 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 tryoniana 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-striæ 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 altivaga*.

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* Linnæus, 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. HIRSUTA*.—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. ottonis* 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 Fusidæ 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 Conch. I, 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 noæ* 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. brunnea* 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 CYPRÆE 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 the typical form of *caurica* what *coloba* Melvill (= *gregori* Ford) is to *cruenta*." *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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ON AN INTERESTING FOSSIL UNIO FROM WISCONSIN.

BY GEORGE WAGNER.

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, Zoological 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. I, 204, 1844; Boston, Jour. Nat. Hist. V, p. 285, pl. 24, f. 1, 1845.

Pholas terediniformis Sowb., Proc. Zoöl. Soc. 1849, p. 161.

Pholas Beauiana 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 costæ; 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 striæ. Length, 14–18.

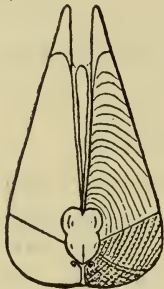


FIG. 1.

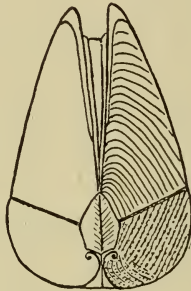


FIG. 2.

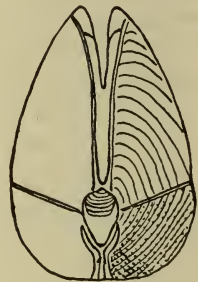


FIG. 3.

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 costæ, 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. cuneiformis*. This species has only been recorded from shells and limestone while *M. striatus* and *cuneiformis* 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 *Jaminia*, 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. *Jaminia*, Risso, 1826, contained species afterwards referred to *Alæa* (1830), *Abida* (1831), *Pupilla* (1831), *Eucoë* (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 *Eucoë*.

2. *Alæa*, 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. c., 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 *Jaminia* were provided for by 1831. If *Sphyradium* is distinct from *Alæa*, apparently the diagnosis of *Jaminia* prevents us from using that name for *Sphyradium*.

5. *Jaminia* 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 *Jaminia* 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 syngenes (Pilsbry).

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

Pupilla sterki (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 *Jaminia*] 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>Jaminia muscorum</i>	<i>Pupa muscorum</i> L.	<i>Pupilla.</i>
<i>J. marginata</i>	<i>Pupa umbilicata</i> Drap.	<i>Jaminia.</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>Eucore.</i>
<i>J. granum</i>	<i>Pupa granum</i> Drap.	<i>Abida.</i>
<i>J. sulculota</i>	Undetermined	<i>Abida.</i>
<i>J. trilamellata</i>	Undetermined	<i>Abida.</i>
<i>J. heterostropha</i>	<i>Bul. quadridens</i> Müll.	<i>Eucore.</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>Eucore.</i>

All of Risso's species of *Jaminia* that are recognizable belong to the subsequent groups *Ena* 1831, *Pupilla* 1831, *Abida* 1831, *Eucore* 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 Leh. 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 antivertigo* 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 *Bifiduria* were *Pupa contracta* Say and *P. servilis* Gld. from certain Mexican localities. For *P. contracta* Sterki subsequently (1892) proposed the section *Albinula*, 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. limatulum 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 (Miltha) 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 (Miltha) 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. joannis* 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. striatu* 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 *Teredininæ*, 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 *Jaminia 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 *Jaminia* :

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>septedentata</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>palustris</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 *hordacea* "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 *Jaminia* 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. Feruss. 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 Binney'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 *Jaminia* and *Alæa* are now respectfully submitted for the judgment of conchological and nomenclatorial experts.

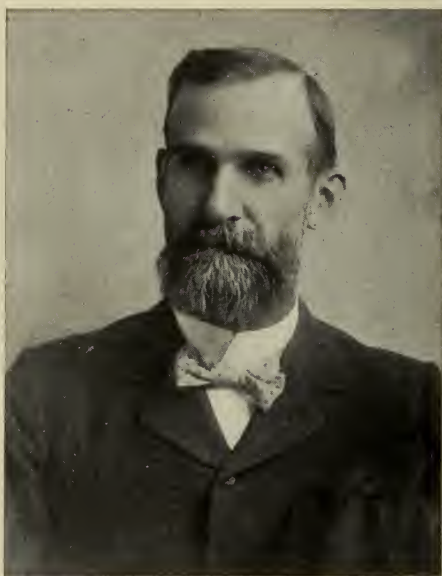
NOTES AND NEWS.

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.

THE NAUTILUS.

VOL. XVIII.

MARCH, 1905.

No. 11

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 Pupidæ, 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 miorhyssa</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>nensis</i> A. & C.
<i>Pupilla sonorana</i> Sterki.	<i>Pupilla sonorana tenella</i> Sterki.
<i>Pyramidula cockerelli</i> Pils.	<i>Agriolimax ashmuni</i> Pils. & Van. <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 ambli 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, subululate 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.

Lymnea griffithiana Lea, Proc. Amer. Phil. Soc., II, p. 33, 1841.

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, $5-5\frac{1}{2}$ 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.

L. humilis is found from Maine to California, and from Canada to Mexico.

Lymnæa parva Lea.

Lymnea parva Lea, Proc. Amer. Phil. Soc., II, p. 33, 1841.

Lymnea 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 $4\frac{1}{2}-5$; 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 striæ 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 Cycladidæ.

to size, shape, relative size and prominence of the beaks, striæ 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.

Ceciloides 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 DORIDIDÆ 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.



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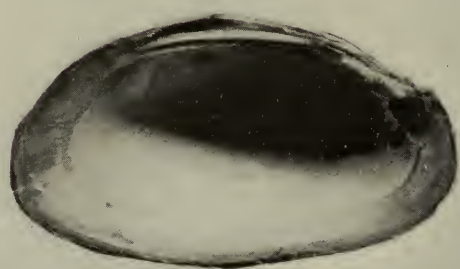
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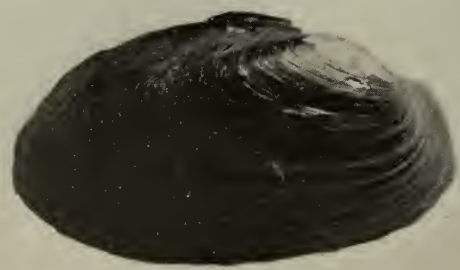
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THE NAUTILUS.

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 Econfina 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.

Vivapara 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. elliotii*, 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 Chickasawahatchee 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.

Lampsilis claibornensis 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 anodontooides 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 *nolani*, 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.

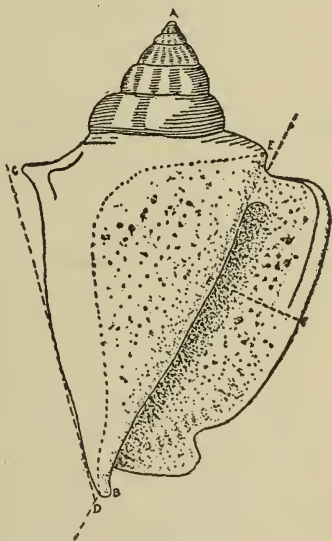
*Buccinum undatum*¹ by Morse, in *Crepidula*² by Conklin, in *Rissoa aculeus*³ and *Littorina littorea*⁴ by Jeffreys, and in *Fulgur carica* by Burnett Smith.⁵ As far as I can find out, no one has reported it in *Strombus pugilis*.

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

Fig. 1.



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; Michipecoten 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 cataracta* 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 tingitani*. 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* (Binn.) 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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