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CONCHOLOGISTS.



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THE NAUTILUS.

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No. 1.

UVANILLA REGINA, A NEW LOCALITY.

BY ROBT. E. C. STEARNS.

A few days since, Mr. Charles H. Lawrence, who resides on Boyle Heights in this city, submitted to me for identification a specimen of this fine species which he collected about Christmas, 1895, on San Clemente Island, latitude $32^{\circ} 55' N.$, longitude $118^{\circ} 30' W.$ This find of Mr. Lawrence's carries the species so far to the north as to include it in the faunal list of California proper. The preliminary description of *U. regina* was published in the THE NAUTILUS for December, 1892, and was subsequently described more fully in the Proc. U. S. Nat. Museum, Vol. XVI, 1893, pp. 350-51, from a specimen collected by Capt. J. D. Porter, of San Diego, Cal., on Guadaloupe Island off the coast of Lower California in latitude $29^{\circ} N.$, longitude $118^{\circ} W.$

As this easily recognizable species is exceedingly rare at this date, it may be well to note that examples are contained in the collections of the National Museum (No. 125314), of Henry Hemphill and Miss Cooke, San Diego, and of Mr. Lawrence, above-named. The Hemphill and Cooke specimens are part of the lot collected by Capt. Porter.

In my paper on "The Shells of the Tres Marias and Other Localities along the Shores of Lower California and the Gulf of California," this form is listed, as the island of Guadaloupe belongs to Mexico.

In Dr. J. G. Cooper's "Catalogue of Marine Shells collected chiefly on the eastern shore of Lower California," etc., published in

the Proc. Cal. Acad. Sciences (Series 2, Vol. V, p. 36), he makes the following remarks concerning my "Tres Marias, etc.," list: "Out of 294 in the catalogue, about 200 occur in the Gulf and several others on the west coast. It is not, therefore, as complete a list of Gulf shells as we might expect from collections made by the U. S. Fish Commission Steamer 'Albatross,' with its facilities for dredging and collecting otherwise." As my paper does not purport to be a list of the "Albatross" collections in the regions under consideration, but only includes incidentally such species as were collected by the "Albatross" naturalists at a few points only, viz., "Baelenas and Pichelinque Bays, etc., so far as the same have been worked up at this date," as is distinctly stated, further comment is unnecessary.

Los Angeles, Cal., April 5, 1897.

ON A NEW FORM OF POLYGYRA FROM NEW MEXICO.

BY W. H. DALL.

Polygyra rhyssa Dall, n. sp.

Shell of six rounded whorls, dark yellowish-brown, the suture rather deep and the spire low but not flattened; nuclear whorls nearly smooth, the rest of the shell rather coarsely obliquely striated, the last fourth of the last whorl with rather sharp elevated riblets with wider interspaces and a marked constriction behind the reflected peristome; umbilicus small, deep; periphery above the middle of the whorl rounded, the entire surface more or less distinctly finely spirally striate; aperture subcircular, oblique, with a reflected and rather solid peristome with a small obscure thickening on its basal part, a light wash of callus over the body, and slightly within the aperture a small oblique elongated parietal denticle. Major diameter 17, minor diameter 14; height 9 mm.

White Mountains of New Mexico, Ashmun.

This species is about the size of *P. chiricahuana* Dall, from which it differs by its strong sculpture, somewhat larger umbilicus, more distinct suture and oral armature. The form of the mouth resembles that of *P. pseudodonta* Dall, but the basal thickening of the lip is not notched and the shell is decidedly larger, more coarsely sculptured and somewhat darker in color. It forms another illustration of the effect of insulation on the mountain peaks by arid lowlands

in producing differentiation in a single type of shell. *P. levettei*, *chiricahuana*, *ashmuni*, *pseudodonta* and *rhyssa* are obviously offshoots of a common stock.

CONCHOLOGICAL NOTES FROM LOUISIANA.

BY LORRAINE S. FRIERSON.

Being, so far as I know, the only student of conchology in Louisiana, perhaps a few notes may be of interest.

My station consists of an arm of Red River (Bayou Pierre), a lake and numerous creeks.

In these waters occur about 50 species of Mollusca, of which 30 are Unionidæ. An interesting fact, and one which I have never seen mentioned, is the sharp line of separation between the forms found in the creeks and those growing in the Red River waters.

In the creeks are found 5 Unios and 2 Anodontas. While in the Red River waters are found 25 Unionidæ. No creek shell grows in Red River waters (with but two exceptions noted below) and no species living in Red River waters are ever found in the creeks.

At the junction of a creek with the river occurs a zone where *no mollusca can be found*. The exceptions noted are *U. texasensis* Lea, which, while pre-eminently a *creek* shell, is found *sparingly* in Red River waters. Another possible exception is in the case of *U. declivis* Say. This shell is found abundantly in the creeks, and grows to a large size. A rather rare shell is found in the Red River waters which is said by our authorities to be a form of *U. declivis* Say known as *tetralasmus* Say or *geometricus* Lea.

Declivis proper never occurs in the Red River waters, nor does *tetralasmus* ever grow in creek waters. Perhaps this fact will help show that these shells are really distinct species and not synonyms.

The most variable and, perhaps, the most abundant Unio is *U. multiplicatus* Lea. West of the Mississippi drainage this shell merges into *U. eightsii* Lea, and here, at the middle ground, a mixture of types is seen. An interesting shell is sparingly found here, close to its extreme southern limit, probably. It is a dwarfed, almost "run out" form of *U. donaciformis* Lea. Another "Yankee down south" is a very small but brilliantly colored *Anodonta suborbiculata* Say. It is found in the soft, deep mud of Edwards' Lake, and disputes its territory with *Anodonta virens* Lea. *A. imbecilis*

also grows with these, but does not live in the *mud*, but escapes this by growing in the fissures of the cypress trees, a prisoner for life, by choice.

Thus far my researches have been productive of one new species, *U. friersoni* Wright, and the extending of habitat of three shells. But I hope to accomplish much more in the future, which, if successful, will be given to the readers of THE NAUTILUS.

Frierson Mill, De Soto Parrish, Louisiana.

CONTRIBUTION TO A KNOWLEDGE OF UNITED STATES UNIONIDÆ.

BY S. HART WRIGHT.

(*Concluded.*)

Unio Swordianus sp. nov.

Shell oval, massive, very inequilateral, rounded before, highly arched above and rounded at base, very bluntly pointed behind. Sides flattish, constricted slightly or not at all, and the umbonal ridge usually obsolete. Epidermis brownish or somewhat horn-colored, rayless, and the surface roughened with close growth-lines. Ligament darkened, heavy, short and much elevated. Beaks pointed, small and very low. Beak cavity shallow, extending slightly under both cardinal and lateral teeth, thus making it very broad and with obtusely rounded sides. Cardinal teeth double in the left valve, single in the right and smoothish, or crested and short. Lateral teeth heavy, slightly curved, wide apart, arising from a thick dorsal plate. The cardinal of right valve with an oblong groove at its base. Cicatrices distinct; dorsal cicatrices confluent into an oblong groove under the dorsum. Pallial impression deep and denticulate. Nacre usually pure white, often more or less with waxy discolorations or mottlings or even dirty white. Width 4 inches, length 2, diameter $1\frac{5}{8}$.

Habitat: Powell's Creek, Lee Co., Va.

Remarks: Affinity, *U. bursapastoris* B. H. Wright and *U. abacus* Hald. Our shell differs from the first in having a lighter epidermis, an arched dorsum, shell cavity greater, beak cavity very much less, being nearly extinct, and the posterior dorsal area narrower and very abrupt in its descent. From *U. abacus* it differs in the beak cavity, and is much more inequilateral. Ten specimens were obtained from the collector, Mr. T. F. Sword, for whom it is named.

Unio Diazensis sp. nov.

Shell small, oval, thin, bluntly or truncately pointed behind, and biangulated there; rounded obliquely in front, the curve meeting the dorsal line with a distinct angle. Epidermis reddish-brown, lighter above on the first growth, finely and obscurely striate with minute scales, more apparent near the base. Lines of growth distant, about two. Rays nearly obsolete, or, if present, seen faintly on the anterior end, or on the first growth. Umbonal ridge well-defined, rather narrow. Posterior slope rather *broad* and raised into a keel. Dorsal line nearly straight. Umbos small, broad and not raised. Beaks with a double series of granular undulations. Dorsal plate thin. Shell cavity rather deep and broad. Beak cavities slight. Cardinal teeth very small and light, more or less compressed. Lateral teeth very narrow, *slim* and nearly straight. Anterior cicatrices distinct; posterior confluent. Cardinal of right valve single. Dorsal scars under the plate. Nacre salmon or coppery. Width $1\frac{1}{2}$ inches, length $\frac{7}{8}$, diameter $\frac{1}{2}$.

Habitat: Lake Diaz, Volusia Co., Florida.

Remarks: In 1887 we gathered about 2,000 of these little thin shells in Lake Diaz, no other *Unio* being found in that lake, except *U. amygdalum* Lea. They were always found in white sand, with clear and rather shallow water, and nearly all of one size. Affinity, *U. fuscatus* Lea, from which our shell differs in being smaller, less transverse, more inflated, having a much higher umbonal ridge well marked, while in *U. fuscatus* the ridge is nearly or quite obsolete. From *U. coruscus* Gould the Diaz shell differs in having always *thin* lateral teeth, a *thin* dorsum and smaller cardinals and a high keel, and is always a thinner shell. It differs from *U. fryanus* B. H. Wright in being much less polished, lighter, less solid, fewer rayed, greater umbonal ridge and more attenuated in front. In a "Check List of N. A. Unionidæ," published in 1888, a species of *Unio* was listed as "*U. diasensis*," but was never published, and therefore does not preoccupy the *similar* name now given above.

Note.—Types of all the above species will be sent to the National Museum and duplicates of the types to the Academy of Natural Sciences of Philadelphia.

ERRATA.—In THE NAUTILUS, X, No. 12, page 136, first line, for "triangular, clavate," read "triangular-clavate." Eighth line, for "narrower," read "narrow." Page 137, ninth line above the bottom, for "groove in the," read "groove under the."



LIST OF MOLLUSKS COLLECTED IN MALDONADO BAY, URUGUAY, BY
DR. WM. H. RUSH, U. S. N.

BY HENRY A. PILSBRY.

In the NAUTILUS for September, 1896, a list may be found of the non-marine mollusca collected in Uruguay and Argentine Republic by Dr. Rush. Descriptions of the new species mentioned in that paper have been published in subsequent numbers, and in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1896, pp. 360-365, and plates 26, 27, and Manual of Conchology, 2d ser., Vol. XI.

The marine shells obtained by him while with the South Atlantic Squadron were nearly all taken in Maldonado Bay, dredged in from three to six fathoms of water, the limpets, etc., from the shore excepted. The few forms collected elsewhere than at Maldonado and vicinity have the localities indicated below. In this connection it may be mentioned that the squids which jumped aboard the Yantic, as described by Dr. Rush in NAUTILUS, VI, p. 82, turn out to be *Ommastrephes Bartramii*. Among the forms enumerated below and in the several published lists of shells from this general region, it is somewhat remarkable that some groups usually rather numerous, such as *Rissoiðæ*, are not represented. The occurrence of a number of northern species is also noteworthy. There are also in the series collected about a dozen forms found only in poor condition and not yet identified. The descriptions of new species will shortly appear, with figures, in Proc. Acad. Nat. Sci. Phila.

GASTROPODA.

Aemæa onychina Gould. Gorriti Island, Maldonado Bay. This bay was the type locality of *Patella mülleri* Dkr., a synonym of Gould's species.

Bittium sp.

Bullia cochlidium Kien.

Bullia globulosa Kien. Maldonado Bay. Very heavily calcified fossil specimens occurred in the wall of fort at the Mus. La Plata, Argentine Republic.

Bullia Uruguayensis n. sp. Shell somewhat like *B. globulosa* Kn., but more slender, the spire much longer. Surface smooth except for two to four spiral impressed lines separated by convex low cords, just below the impressed suture, and fine spiral striæ on the

base; growth-lines fine and slight. Light flesh colored. Whorls about $6\frac{1}{2}$, the first globose, the second and third with rather coarse longitudinal folds, which persist longer at the upper part of the whorl; remaining whorls convex, foldless; the last whorl oval, regularly convex, contracted below, with a wide arcuately striate siphonal fasciole bounded above by a strong narrow spiral rib. Aperture a little over half the alt. of shell. Columella broadly concave above, having a strongly twisted fold below, which projects at the junction of the short basal canal with the cavity of the aperture, sloping strongly to the left below the projecting fold; anterior notch wide. Parietal callus rather thin, spreading far forward.

Length 22.5, diam. 12 mm.

Maldonado Bay. This species is certainly not the young of *B. cochlidium*, although in my opinion d'Orbigny's fig. 25 of plate 61 of the Voy. Am. Mérid. was drawn from a specimen of the form here described. The characters of columella and sculpture also incline me to consider the present species distinct from *B. Lamarckii* Kiener (Iconogr., pl. 3, figs. 6, 6).

Chlorostoma (Omphalius) corrugatum Koch. *Trochus patagonicus* Orb. is a synonym.

Columbella avara Say.

Columbella obesa var. *decipiens* C. B. Ad.

Columbella sertulariarum d'Orb.

Crepidula aculeata Gmel.

Cylichnella bidentata Orb.

Fissuridea patagonica d'Orb.

Halistylus columna Dall.

Halistylus circumstriatus n. sp. Similar to *H. columna* in size and contour, but the whorls are encircled by numerous impressed brown lines. *H. pupoideus* (Cpr.) Dall, of California, (Proc. U. S. Nat. Mus., xv, 1892, pl. 19, f. 2) is a third species of this interesting group. It is spirally sculptured like *circumstriatus*, but has very convex whorls, and there are other differences.

Natica Isabelleana d'Orb.

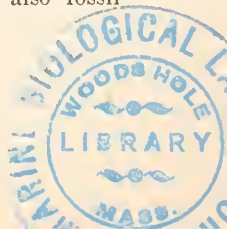
Natica maroccana Dillw. (?). Worn young shells.

Ocenebra cala n. sp.

Olivancillaria auricularia Lam. Maldonado Bay; also fossil specimens in the Fort wall at La Plata Museum.

Olivella Puelchana d'Orb.

Scala elegans d'Orb. (probably).



Scala tenuistriata d'Orb.

Siphonaria Lessoni Blainv. Gorritti Island, Maldonado Bay.

Triforis sp.

Turbonilla interrupta Totten.

Turbonilla sp. Specimens worn.

Turbonilla dispar n. sp.

Turbonilla uruguayensis n. sp.

Urosalpinx Rushii n. sp.

POLYPLACOPHORA.

Chætopleura Isabellei d'Orb. Maldonado Bay, with the following.

Chætopleura Tehuelcha d'Orb. Maldonado Bay. Carpenter's *Ch. armillata* (Man. Conch., xiv, p. 39) described from Gorritti Island, is a synonym.

PELECYPODA.

*Azara*¹ *labiata* Maton. Pond near Maldonado.

Azara labiata var. *nimbosa* Sowb. Pond near Maldonado; brackish or nearly fresh water.

Corbula caribæa d'Orb.

Corbula Iheringiana n. sp.

Corbula Lyoni n. sp.

Corbula patagonica d'Orb.

Crassatella (Eriphyla) lunulata Con.

Crassatella (Eriphyla) maldonadoensis n. sp.

Cytherea rostrata Koch.

Diplodonta semiaspera Phil. (*Lucina semireticulata* Orb.).

Donax hanleyanus Phil.

Lyonsia hyalina Conrad.

Lyonsia sp. A nearly equilateral species, new to me.

Lucina squamosa Lam.

Mactra isabelleana d'Orb.

Mulinia near *lateralis* Say.

¹ Carlos Maria de Pena has called attention to the fact that padre Dámaso A. Larrañaga, a naturalist of Montevideo, in his "Memoria Geologica sobre la formacion del Rio de La Plata, deducida de sus conchas fosiles," written in 1819 (? published in 1821), created the genus *Matonia* for *Mya labiata* of Maton, thus antedating d'Orbigny's name *Azara*. I have not seen the work, and would decline to make a change until the proper publication and date of *Matonia* is made positive. See *Anales del Mus. Nac. de Montevideo*, I, 1894, p. 1.

There were also worn valves of several other *Mastridae* collected. *Mesodesma arechavalettoi* (Ihering MS.) Pilsbry. Maldonado Bay, Uruguay (young); Mar del Plata, Argentina.

Mytilus darwinianus Orb.

Mytilus edulis L. (? *platensis* Orb.).

Mytilus canaliculus Hanl.

Nucula puelcha d'Orb. *N. uruguayensis* E. A. Smith does not seem to differ materially from this species.

Ostræa puelchana d'Orb.

Pecten nucleus Born, var. ?

Pecten sp. undet.

Pectunculus longior Sowb.

Petricola like *pholadiformis*, but less strongly sculptured. One valve.

Plicatula ramosa Lam.

Semele (*Abra* ?) *uruguayensis* n. sp.

Tagelus gibbus Spengl. (*platensis* Orb.).

Tellina uruguayensis E. A. Smith.

Thracia Rushii n. sp.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

The name of Miss Zeola Downing, Long Beach, California, is added to the membership roll of our Chapter.

When last heard from Miss Anna Goodsell of San Diego, California, was in Cairo, Egypt, after having visited many countries in the Orient.

FRESH WATER SHELLS IN THE NORTHEAST OF MAINE.

[From the report of Mr. Olof O. Nylander. From the Transactions of the Isaac Lea Conchological Chapter for 1896].

This article is devoted to the fresh water shells found in the Fish River Lakes and Aroostook River, northeast of Maine. After securing a good supply of provisions, tent, boat and apparatus needed for a long collecting trip in the forest region, a man was employed to accompany us through the journey, and a man with a team to haul me the distance of 25 miles to Cross Lake on the Fish River.

Arriving at Cross Lake my work was immediately to collect and my companion's duty throughout the journey to prepare the tent, cut wood and cook, and other duties connected with camp life in the woods.

At the Cross Lake inlet the following were collected: *Unio complanatus*, *Margaritana undulata*, *Anodonta fragilis*, *Sphærium sulcatum*, *Pisidium compressum*, *P. variabile*, *P. n. sp.*, *Planorbis campanulatus*, *P. bicarinatus*, *P. deflectus*, *Limnæa emarginata*, *L. desidiosa*, *Pomatiopsis cincinnatiensis*, etc.

The second place visited was on the west side about 2 miles south from the inlet. *Planorbis trivolvis* was obtained in a place that appeared to be covered with water only in the Spring. *Ancylus parallelus* was found in large numbers, and a lot of good large specimens of *Limnæa emarginata* in two feet of water. They seemed to feed on vegetation on the rocks. A little further down on the west side was a small stream in which a lot of *Sphæria* and *Pisidia* were obtained. *Unio complanatus* Sol., *Margaritana undulata* Say and *Anodonta fragilis* Lam., are found all over the Fish River Lake, and need not be referred to as of especial interest to any locality.

On the east side where some large hills rise from the lake a small lot was obtained by dredging; nearest the shore *Pomatiopsis cincinnatiensis* were plentiful in 15 feet of water; *Campeloma decisum*, of small size, *Pisidium variabile* and *P. compressum* were found from the shore to 25 feet, showing some variation in forms. On the shore *Succinea ovalis*, and, near by, in the woods under rocks, *S. avara* were found. Also *Conulus fulvus*, *Strobila labyrinthica*, *Zonites exiguus*, *Carychium exiguum* and fragments of *Pupa* or *Vertigo*.

The south end of Cross Lake afforded the best dredging ground, and some time was spent here. *Pomatiopsis cincinnatiensis* Lea, was very plentiful, and *Valvata tricarinata* Say, *V. sincera* Say, were collected from 5 to 20 feet. *Planorbis trivolvis*, *P. campanulatus*, *P. bicarinatus*, *P. deflectus* and *P. hirsutus* were not plentiful.

One of the most interesting collecting grounds is Square Lake, which is the largest and handsomest lake in Aroostook Co. At the inlet from Cross Lake the bottom is covered with large and fine specimens of *Limnæa emarginata* and the var. *Mighelsi*. *Planorbis parvus* (?) Say, *Planorbis* sp.?, a peculiar specimen, *P. campanulatus*, a form of small size, *P. bicarinatus*, *Physa ancillaria* Say, are plentiful in this place, but nowhere else in this region to my knowledge. The shore is covered with dead shells of the above named species.

From the inlet at the northeast of Square Lake, the east side was followed to the south, a distance of about 8 miles. The wind blowing prevented us from doing any dredging, and the bottom is generally stone.

In the south end of the lake the bottom is covered with fine sand and afforded very fine dredging ground for 2 or 3 square miles. From the shore to 10 feet deep *Pomatiopsis cincinnatiensis* was very common, and a few specimens of *Pisidium* were found from 10 to 25 feet. *Valvata tricarinata* and *V. sincera* were found, but beyond the depth of 25 feet all the shells seemed to disappear, and the dredge was filled with nothing to collect. The western shore of the lake is rocky and the only place visited is Limekiln Point, where I have spent a good deal of time in past years. This very interesting locality of the Upper Silurian limestone of the Lower Helderberg group, contains many fine specimens of fossils, many of them peculiar to this locality. A very fine collection has been found at this place. * * * From Limekiln Point to Eagle Lake every part was carefully surveyed, yet nothing of special interest appeared. Eagle Lake is the longest of Aroostook Lakes, being about 18 miles long and 1 wide. In one place I could not reach bottom with a 100 foot line.

Along the north shore I obtained the same species as I found in Cross and Square Lakes, and from the deep water I obtained only rocks and gravel, and not a fragment of a shell. Where the south branch of Fish River enters Eagle Lake, in a sand bar, a lot of fine living specimens of *Sphærium striatinum* Lamk., and *Margaritana undulata* were collected. Throughout the thoroughfare to Portage Lake *Sphærium striatinum* is plentiful. * * * * Nothing new was added. A good deal of hard work was done dragging the boat through the rapids and over rocks and ledges to Portage Lake.

Portage Lake is in parts surrounded by high hills and a very attractive place for tourists. The western part is a good finding place for mollusks. *Pomatiopsis cincinnatiensis* Lea, is obtained somewhat larger in size as it approaches deep water; *Planorbis companulatus* and *P. bicarinatus* are also of large size, and the angles of the whorls in *bicarinatus* are very sharp. *Planorbis deflectus* is found at the bend of the lake, very large, from 8 to 9 mm.; *Valvata tricarinata* and *V. sincera* are also of good size.

Near the south and east corner of the lake a colony of good, large specimens of *Campeloma decisum* in 6 inches of water were found. This

was the first place I had any opportunity to see them in any number in the north of Maine. From this place I had intended to go to Big Fish Lake, about 20 miles west from Portage Lake, but some of my provisions were spoiled by hot and rainy weather and I was not able to obtain any from the farmers, therefore at the south of the lake I engaged a team to transport us to Aroostook River, a distance of 10 miles, over a good road.

Aroostook River is rapid and rocky the whole distance from Ashland to Caribou, and shells are seldom found. *Margaritana margaritifera* Lin., are found among the rocks in from 5 to 6 feet of water; a dozen living specimens were obtained in the distance of 40 miles. *Anodonta fragilis* lives in the small streams which empty into the river. *Planorbis bicarinatus* and *Physa heterostropha* are sometimes plentiful. *Sphaerium truncatum* and a few *Pisidia* have been found. *Campeloma decisum* were collected in two places, and *Ancylus tardus* Say, was found on rocks in a place near Caribou in the summer of 1895.

After three weeks have been spent in the woods it is pleasant to arrive at home again. The specimens collected during this trip have not all been identified.

In past years I have received valuable assistance from Professor H. A. Pilsbry. Mr. Bryant Walker, of Mich., sent me a dredge which has been of great value, and Dr. V. Sterki has kindly determined *Pupidae*, *Vertigos* and *Pisidia*. My thanks are due to these gentlemen.

TO SUBSCRIBERS.

We wish to impress upon our readers that subscriptions to THE NAUTILUS are payable *in advance*, and that we do not discontinue until notified. Were it not that some subscribers forget to pay at the end of the year it would not be necessary to thus emphasize the terms of subscription. What is a small matter to each individual reader, becomes in the aggregate a large one to us. Our deficit in publishing Vol. X has been somewhat less than in the previous year, but is still more than we can afford to lose. Our screed upon this topic in January seems to have been misunderstood by some cautious persons we have heard from, who for fear THE NAUTILUS would be discontinued, kept their dollars! With this kind of support we could not have continued another month; but stalwart friends of the cause in Massachusetts, Michigan and California said "THE NAUTILUS shall not stop; we will stand by if needed." With this assurance we enter upon another volume.

All who are in arrears are requested to "pay up" *this month*.
H. A. P. & C. W. J.



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No. 2.

HELICINA DYSONI.

BY CHARLES T. SIMPSON.

While collecting shells in the Island of Utila, on the north coast of Honduras, I frequently visited a Brickly Thatch palm grove¹ which lay on the south shore. The Brickly Thatch is a curious, small palm, with straight, slender stems, a little larger than one's wrist, and about twenty feet in height, surmounted by a crown of shining, fan-shaped leaves. The bases of these trees are slightly enlarged, and they stand on a cone of stilted roots, which, with the soil and rubbish among them, fill the conical space almost solid. They grow thickly to the exclusion of all other vegetation, and the curious bunches of roots completely fill the space on the ground and make it quite difficult and awkward to get around. Under the almost twilight of this dense copse I found excellent collecting, and I there discovered *Colobostylus andrewsæ*, *Cylindrella bourguignatiana* and several other new species. Among other shells I kept finding specimens of the pretty little *Helicina dysoni*, but always dead and generally faded. An enterprising collector is never satisfied with dead shells, and I searched everywhere to find this mollusk alive—under the dead, fallen palm leaves, in what rubbish lay around, on the stems of the palms, and among their tough, matted roots—but in vain, and I finally concluded that the colony, of which these were remnants, had either died out or migrated.

One day I visited a part of the grove that I had not seen before, a spot at its edge, and here I found a single living tree which had

¹ *Thrinax radiata*.

fallen over. I was interested in the crown of it from a botanical standpoint, and on examining the flowers and leaves I found a half a dozen or more of the snails I so much wanted on the under side of the latter. Then I looked up over head and saw, to my astonishment, that there were thousands of them. I had been walking day by day under a firmament of palms that was literally star-spangled with the pretty *Helicina dysoni*. It was like the story of the navigators who were perishing with thirst while sailing in the fresh water off the mouth of the Amazon.

But finding the *Helicinas* was one thing and getting them was quite another. I tried to shake the trees, but so thickly did they stand that their tops touched each other everywhere, and I might as well have tried to shake the post of a piazza. Then I started to climb one of them, but the hard, sharp fibres of the wood filled my hands and tore my clothes, and I gave that up. I looked for a pole but there was none to be had. The mangrove scrub between me and the sea was all short and crooked, and I found nothing suitable in the heavy tropical forest north of me, so I went home to the ship that night with the dozen or so I had captured, and a few dead shells. The next day I came by way of some clumps of a curious little palm, with slender stems an inch or more in diameter, growing in low ground and crowned with feathery leaves. I found a straight one among these, some 15 or 16 feet long, cut it and trimmed it with my pocket-knife, and when I reached the palm grove I soon had a shower of *Helicinas* falling around me. One soon tires of collecting anything that is very abundant, and in a little while I had all I cared for.

The moral of this little sketch, if it has any, is that in collecting it is necessary to look everywhere, even in the most unlikely places, and my experience has been that the collector who never allows anything to escape his eyes is, as a rule, the most successful.

DESCRIPTION OF A NEW SPECIES OF ACTAEON FROM THE QUATERNARY BLUFFS OF SPANISH BIGHT, SAN DIEGO, CALIFORNIA.

BY ROBERT E. C. STEARNS.

Actaeon Traskii.

Shell small, conical above, rounded below, rather solid, glossy; sculptured by numerous fine impressed lines or grooves which be-

come wider toward the base of the body whorl, making the sculpture of this part of the shell lirate; the liræ sometimes slightly grooved; otherwise sculptured by sharp, close set incremental threads, these are subordinate to the spiral sculpture. Color dull cream-white with two obscure rufous bands on the body whorl. Spire short, obtusely conical; whorls six; sutures distinct, narrowly channelled; aperture about two-thirds the length of the shell, sharply angulated above, rounded and effuse below, finely lirate and glossy within, with a thin glazing on the body whorl. Outer lip simple. Columella short, with a fold curving around to and thickening the edge of the lip below, which is moderately produced.

Length of shell 11 millimetres.

Length of body whorl 9 millimetres.

Breadth 6 millimetres.

The foregoing description is based on a single example in the collection of Mr. Homer Hamlin, of Los Angeles, Cal. The above form was collected by me in the same locality in the fall of 1887 the specimens are now in the U. S. National Museum.

It is a more robust and solid shell than the related species *punctoæolatus* Cpr., which occurs in the same locality, and which is found living in many localities along the shore from Monterey, southerly. I have named the above for the late Dr. John B. Trask, one of the founders of the California Academy of Science, and a pioneer in natural history investigations on the West Coast.

Los Angeles, Cal., March 15, 1897.

NOTES ON AGRIOLIMAX.

BY T. D. A. COCKERELL.

The accompanying figures were drawn by the writer several years ago, and sent to Mr. W. G. Binney, who kindly had them engraved along with others which were published in the Supplements to Terr. Moll., vol. V. These three, however, were not published, and it is thought well to present them at this time.



Fig. 1 represents the head and anterior part of the mantle of a specimen of *Agriolimax agrestis* (L.) collected by Mr. Pilsbry in Philadelphia in 1889. The mantle is bilobed in front, and the specimen represents the monstrosity *bilobatus* Férussac.



FIG. 2.

Fig 2 represents the jaw of a specimen of *Agriolimax campestris* var. *hyperboreus* (Westerlund), collected by Prof. H. F. Wickham at Soda Spring, Yakima Co., Wash., in 1889.



FIG. 3.

Fig. 3 represents a parasitic worm, believed to be a *Leptodera*, from *A. campestris* var., collected by Prof. H. F. Wickham at Quincy, Calif., 1889.

DESCRIPTIONS OF THREE NEW EULOTÆ (HELICES) FROM
CENTRAL ASIA.

BY C. F. ANCEY.

I. *Cathaica Funki* n. sp.

Shell much depressed, openly and rather widely umbilicated, of a somewhat solid substance, opaque, bluish-white, paler beneath and also above the periphery, more or less spotted with a few punctiform and pellucid dots beneath, a little shining, but not much so above. Spire greatly flattened, generally scarcely raised, barely convex, apex obtuse, corneous or dark colored. Whorls 5, convex, regularly increasing, furnished with oblique smooth lines of growth, somewhat irregular; the last whorl barely and gently deflected in front, subdepressed above, more or less roundly angled above the middle, the angle being very obtuse and obsolete towards the aperture; more convex around the umbilicus. Aperture oblique, well rounded, scarcely lunate, ample, margins not remote. Peristome simple, widened, briefly expanded, chiefly at the columellar edge, moderately thickened at the base and columella, not reflected.

Greater diam. 16-17; lesser $13\frac{1}{2}$ -14; height $7\frac{3}{4}$ -8; of aperture $6\frac{3}{4}$ - $7\frac{1}{2}$ mill.

Karghalik, Central Asia (*teste* E. Funk).

Some years ago, I received this new species under the unpublished name of *Helix Funki* "Böttg.", and do not think it was ever described since. In form it is like *Helix obvia* Hartm., but the shell is of the same type and has the same characters of aperture as *Helix stoliczkana* Nevill, of Yarkand; it, however, lacks the two straight brown bands of that species, in which they are a constant feature, and is more shining and less rugose. The style of color is quite similar to that of *Helix rubens*, although paler, at least as regards the three specimens now before me.

From the same source and locality (Karghalik), I also obtained the form I have described as *Bul. kuschakewitzi*, var. *Funki*.

II. *Pseudiberus uniformis* n. sp. = *Helix plectotropis* (in parte) von Mart. et al = *H. plectotropis* var. *uniformis*, Ane. olim.

This is the so-called variety that I had formerly looked upon (Le Naturaliste, 1887, p. 167) as a variety of Martens' *Helix plectotropis*. At that time I had a single specimen of the latter, but I now have more of the typical form (from Lake Tssyk-Kul and Karghalik) for comparison, so that I consider *uniformis* a very distinct, although allied form. Altogether it comes from a different district (Arassan Culak) and appears to be very constant. The characteristic features having already been described by myself in the paper I alluded to, I shall simply say that *uniformis* is a paler and more depressed shell than *plectotropis*, with a wider umbilicus and much more acute keel.

III. *Pseudiberus anisopleurus* n. sp.

Shell rather thin, of a greenish-horn color, coarsely sculptured, somewhat shining, closely related in form, size and shell characters to Nevill's *mataianensis*, found in the Dras Valley, region of Ladak, but of different and uniform color. Spire convex, not much elevated, obtuse. Whorls 5, convex, furnished with broad, distant and irregular ribs, closer and more regular on the under side, but never obsolete. Suture furnished with an appressed keel, canaliculate above. Body whorl briefly, but not abruptly falling in front, convex above the inserted keel, more so below, the keel somewhat irregular, margined on both sides, especially above where the impressed line is very conspicuous. Umbilicus medium-sized. Aperture oblique, transversely oval, livid within, scarcely angular internally, barely lunate. Peristome white, moderately thickened, expanded, reflected below, chiefly towards the umbilicus. Margins not remote, connected by a thin shining callosity.

Great. diam. $14\frac{1}{2}$, less. $12\frac{1}{2}$; height 8, of aperture $6\frac{1}{2}$ mill.

Locality unknown, but judging from its very well marked affinities, this fine new species for which I am indebted to my friend Dr. A. Vayssiere, is undoubtedly from Central Asia. At a glance, I had mistaken it for *mataianensis*, which is known to me from the description and figure only, but am now satisfied it is very distinct. The color, sculpture and characters of the suture are not the same. In the latter respect the present *Pseudiberus* is more like the true *P. plectotropis*, but the color is equally different, the size smaller and the ribs larger and much less numerous and regular.

NOTES ON THE CLASSIFICATION OF THE UNIOS.

BY CHAS. T. SIMPSON.

In 1834, Dr. Jared P. Kirtland published the statement that the sexes of the North American Unios were distinct, and that the shell of the female was characterized by a swelling in the post-basal region, which was wanting in that of the male.¹ He seems to have thought at that time that all the American species were thus distinguished, but in a later publication he stated that he believed that about two-thirds of the American species have differentiated shells.²

This was corroborated by Dr. Isaac Lea,³ who showed that this enlargement of the shell of the female was for the purpose of holding the charged oviducts, which, in such forms, were found in the posterior part of the outer branchiæ. Lea, at various times, described the soft parts of some 250 species of *Naiades*, mostly North American Unios, and in a considerable number of these he found that the embryos occupied the entire outer branchiæ, while in four species—*Unio multiplicatus* Lea, *U. rubiginosus* Lea, *U. subrotundus* Lea and *U. kleinianus* Lea—they filled all four leaves of the branchiæ.

In a statement made before the Boston Society of Natural History,⁴ Agassiz proposed to divide up the *Naiades* into genera founded on the differences of structure of the animal as well as the characters of the shell, and to include under one genus a number of species of Unios, some of which (including *U. alatus* Say, the first one in the list) have the post-basal inflation of the female shell, and others in which it is lacking. Subsequently he used the name *Lampsilis*, of Rafinesque, with *L. cardium* Raf. as a type, and he gives in his list under this genus a number of species, all of which have the differentiated shells, and carry the young in the posterior part of the outer branchiæ.⁵

In THE NAUTILUS, for December, 1895, Dr. V. Sterki published the results of his observations on American Unios, and gives some

¹ Observations on the Sexual Characters of the Animals belonging to Lamarck's family of Naiades. Am. Jl. Sci. and Arts, XXVI, 1834, p. 117-120.

² Remarks on the Sexes and Habits of some of the Acephalous Bivalve Mollusca. Proc. Am. Assn. Adv. Sci., 1851, p. 85.

³ Description of New Freshwater and Land Shells. Tr. Am. Phil. Soc.

⁴ Proc. Bost. Soc. Nat. Hist., III, 1848-51, p. 356.

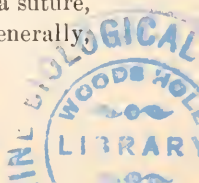
⁵ Ueber die Gattungen unter den Nordamerikanischen Najaden. Arch. für Naturg., 1852, pp. 41-52.

very interesting statements regarding their anatomy. He places those species in which the young are carried in the posterior part of the outer branchiæ, and the female shell is inflated in the post-basal region, in a group designated as A, which he states, as a rule, have bright shells, and are gravid from late summer to winter. In group B all four branchiæ are charged throughout their length; the shells are generally dull colored, and do not show marked differences between male and female.

In my earlier attempts at classifying the *Naiades*, I based my arrangement almost wholly on shell characters. I did this because in the splendid collections of the National Museum we had either the types or authentic specimens of a very large proportion of the known, valid species, and because I was anxious to see whether a classification could be based on the shells alone that would be supported by the evidence of the anatomy. I have since then examined the soft parts of a large number of species, and carefully tabulated the results of the work of Lea and others, and I am exceedingly gratified in being able to say that in almost every case the characters of the animal and shell seem to essentially agree. In a few instances, the evidence of the former has thrown important light on relationships which could not be determined with certainty from shell characters alone, and *vice versa*. In some cases, where there at first seemed to be a contradiction, more careful study has shown essential agreement.

There are certainly two great groups of North American Unios. In the first the shell is generally, though not always, covered with a hard, smooth, bright epidermis, which is often rayed or marked with patterns of attractive color. It is rarely sculptured with anything beyond slight concentric ridges, and in only a few instances has it any ridge on the posterior slope, and, with possibly one or two exceptions, the outline is never arcuate, even in old age. The female shell is usually decidedly swollen in the posterior basal region to accommodate that part of the outer branchiæ which contains the embryos. The beak sculpture is generally delicate, consisting, for the most part, of close, fine, paralld ridges, which have a tendency to fall into an anterior and posterior loop, the latter sharp pointed below.

The embryos are contained in the posterior part of the outer branchiæ. The ovisacks are distinct, being separated by a suture, and the whole marsupium is rounded below, projecting generally,



especially when filled with young, below the inner gill. A slight fold commonly runs around it near the base, and parallel with it, which is often seen even when the whole is distended with young. The specialized marsupium of this group may be easily detected, even when it is empty, and when full it is a most beautiful object, the bases of the ovisacks being often rounded and colored. There are three or four, perhaps more, groups of this great division; one typified by such oblong, smooth forms as *Unio anodontoides*, *luteolus*, *cariosus* and *levissimus*; another in which the inflated part of the shell is of different texture from the rest, is often distinctly marked out, and sculptured with radiating ridges ending in teeth at the edge, including *Unio perplexus*, *sulcatus*, *brevidens* and the like; a third containing short forms with a distinct posterior ridge and remarkably painted epidermis, such as *Unio securis*, *donaciformis* and, perhaps, *caperatus* and *dromus*.

This great group is certainly entitled to generic rank, and the divisions I have indicated may perhaps be made into subgenera. I believe that the name *Lampsilis*, proposed by Rafinesque, and afterwards used by Agassiz, may be applied to this genus.

The second great group contains forms in which there does not appear to be any special differentiation in shells due to sexual characters, and which are true Unios. In fact I consider the question as to the distinction or separation of the sexes in the true Unios and Anodontas far from being settled, although it is one which has been fought over since the time of Leuwenhoek until the present. A number of excellent authorities have declared, after making many careful dissections, that the sexes of these forms were separate; others equally capable have concluded that they were united, others that the earlier stage was that of a male and later on a female, while still others claim to have found the sexes united in some individuals and separated in others.

The shells of this great group are usually rather dull in color externally, they often have a decided posterior ridge, and generally become arcuate in outline in old age. The beak sculpture, as a rule, is rather coarse and irregular, in most cases consisting of a few nearly straight bars, which are thickened where they pass over the posterior slope. At the extreme anterior and posterior dorsal portions of the young shell there are often found fine, radiating ridges, which sometimes pass below into the heavy, horizontal undulations. The embryos are distributed throughout the whole length of the

gills, the branchiæ when distended with them being perfectly smooth outside, and looking like pads. There seem to be two great groups of these forms, one characterized by simple, oval or oblong shells destitute of any strong sculpture, and probably carrying the young, as a rule, only in the outer branchiæ, and this includes in the United States such forms as *Unio gibbosus* Bar., *U. tetralasmus* Say, *U. buckleyi* Lea, *U. crassidens* Lam. and *U. complanatus* Sol., and these are probably closely related to the European species. The other group has short, rather solid, often inflated shells, with a wide, heavy hinge plate, and it includes nearly all the pustulous, and all the plicate sculptured forms. Lea found the inner and outer gills filled with embryos in four of these species: *U. multiplicatus* Lea, *subrotundus* Lea, *kleinianus* Lea, and *rubiginosus* Lea, and it is probable that, under favorable conditions, all or most of these species carry young to some extent, in the inner as well as the outer gill, though so far as I have observed the inner gill is never so compactly filled as the outer, and it is quite probable that with unfavorable conditions the former may not be used as a marsupium.

Besides these there are a few aberrant forms which may be, as Wetherby has suggested, "geological remnants," such as *Unio phaseolus* Hild., *U. irroratus* Lea, and *U. cornutus* Bar., having remarkable modifications of the branchial uterus or marsupium. These three species will probably have to stand as the types of as many genera.

But little is known concerning the anatomy of the foreign *Unios*. The soft parts of all the European species have been examined, I believe, and descriptions which go into the minutæ, so far as color and trifling peculiarities of form are concerned, have been published, but which give no idea of vital characters or structure. From all that I can learn the anatomy of the European forms is very much like that of the circumboreal *Unio margaritifera*, which is much like that of *Unio gibbosus*, *crassidens*, *tetralasmus* and the like. Of the Oriental and African forms I know almost nothing. I have examined the soft parts of gravid specimens of *Unio gabonensis* Kuster from Tropical West Africa, and found that in them the embryos filled the inner branchiæ alone.

It has been surmised that there was a close relationship between the Australasian *Unios* and those of South America. The shells of the species of the two faunas agree very closely in all characters; in being destitute of rays, and having a uniform olive-green epider-

mis and a slightly concentrically sculptured surface, simple outlines, rather dull, bluish-white nacre, compressed cardinals and imperfectly radial beak sculpture. Lea examined gravid specimens of *Unio peculiaris* Lea, and *firmus* Lea from South America, and found that only the inner gill was filled with embryos. Suter reported the same thing from an examination of *Unio menziezi* Gray from New Zealand. I recently received some fine alcoholic specimens of that species from him, and on examining them found, to my astonishment, that they agreed with Lea's descriptions of the soft parts of the South American forms as exactly as if they were the very animals that he had described. In all three species the outer gill is greatly produced below in the middle, the anal opening is destitute of papillæ, and there is no super anal opening at all, characters which are conspicuous in the South American species. I had previously placed these Australasian and South American Unios in a subgenus by themselves, for which I used the name *Diplodon*, applied by Spix to some Brazilian forms,⁶ but I am satisfied that they are entitled to generic rank, and Spix's name may be used for the group. I do not believe that they belong to the same phylum with the *Unio gabonensis* which, from conchological characters, seems much more closely related to the forms of Southern India. This seems to add another link to the chain of evidence which goes to prove a relationship between the faunas of Australasia and South America, and it is a question whether this relation came about on account of migration, by way of an Antarctic land way from one continent to another, or whether the two faunas are remnants of an earlier and generally distributed northern fauna that was driven south and superceded by more modern forms. The Unios of South America and Australasia are simple forms, both anatomically and conchologically. Long ago Ihering predicted that the earliest Unios would be found to have radial beak sculpture; and two of the fossil species recently described by the writer⁷ from what are supposed to be the Triassic freshwater beds of Texas have that which is strictly radial. In the Australasian and South American forms the beak sculpture is imperfectly radial, the central rays curve together and generally coalesce, and in some

⁶ The Classification and Geographical Distribution of the Pearly Fresh-water Mussels. Proc. U. S. Nat. Museum, XVIII, 1896, p. 302.

⁷ Description of Four New Triassic Unios from the Staked Plains of Texas. Proc. U. S. Nat. Museum, XVIII, 1896, pp. 381-385.

cases they are slightly broken. In some of the Indian and African forms this sculpture becomes irregularly rayed and zig-zagged; in the European forms it becomes somewhat concentric and often broken, while in *Lampsilis* we have the farthest departure from the simply radial, that is, the rays are all looped and joined in the center, where they are drawn up towards the beak. This genus has without doubt the most highly developed animal of any of the Unios, and is, in all probability, the most modern. I have seen no extinct forms which certainly belong to it, and it was probably developed in North American waters, to which it is still confined.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

COLLECTING IN MONTEREY BAY.

(Extract from the report of Mrs. E. H. King. From the Transactions of the Isaac Lea Chapter for 1896.)

In the month of September I spent two weeks at Monterey Bay, and collected shells on about three miles of shore-line, rocky headlands and sandy beaches. Along the shore I found many patches of soil literally packed with fossil shells. In the black soil they are soft and crumple easily, but in the sand hills near the light house they are quite firm. *Haliotis rufescens* Swains, is the most abundant, but there are also great numbers of *H. cracherodii* Leach, and a variety of limpets; also *Chlorostoma funebre* A. Ad. I found in the sand hills a large perfect shell of *Purpura canaliculata* Duclos, much larger than any of the live shells I have seen.

We go down on the rocks as the tide goes out, take our lunch with us, and work until the tide rises and compels us to return. The first shells we find are the Littorinas, so very plentiful that large spaces and crevices are full of them. Two species abound *L. planaxis* and *L. scutulata*. There also the limpet appears, *Acmæa spectrum* is the highest, but is also found low down, and larger near low water. Next were *Acmæa patina* Esch., and *A. scabra* Nutt., then appears *A. persona* and *A. pelta* Esch. *Lottia gigantea* Gray, is very near low water mark, and a few large specimens of nearly all the others, the lower on the rocks they were the larger were their thin shells. Here also I found a few shells of *Gadinia reticulata* Sby.

Aemæa asmi was numerous on *Chlorostomas*. *A. mitra* Esch. and *A. rosacea* Cpr. were found on the sandy beaches.

Monoceros lapilloides Conr., are quite abundant in the crevices of rocks constantly washed by the tide, and in the same localities a few *M. engonatum* Conr. Here also in the roaring breakers were large quantities of *Purpura saxicola* Val. There seem to be three well defined varieties, white with many large varices, almost black with small varices, and smooth with bands of brown. Among the rocks and in little pools of water were large quantities of *Chlorostoma funebre* A. Ad. They seem to be of two varieties, one plain and smooth and the other with a crinkled band around the body-whorl. The latter most abundant and largest in size. *Chlorostoma brunneum* Phil., is in the same locality but not nearly so numerous. Many of the *C. brunneum* are dead shells inhabited by the hermit crabs. In the same pools were *Calliostoma costatum* Mart. but numbers of them dead and the hermit crab in possession of the premises. A few *C. canaliculatum* Mart. and *C. annulatum*, were also found but they were not such fine shells, as those washed upon the shore by the storms of winter. Low down on the rocks in the roaring waves were found some *Haliotis cracherodii* and some fine sea urchins. With the *Haliotis* we found a large beautiful *Rupellaria lamellifera* Cour. The mussels are very abundant in some places, literally darkening the rock. I think I found four species; *Modiola modiolus* L., *M. recta*, *Mytilus edulis* and *M. californianus* Conr. *Crepidula adunca* Sby., was very abundant on the shells of *Chlorostoma* and *C. navicelloides* Nutt. in the apertures of dead shells. I found a number of *Chitons* but have not yet been able to classify them.

On the beaches I found many species of shells that I have never found alive, *Olivella biplicata* Sby., *Conus californianus* Hds., *Nassa mendica* Gld., *Amphissa corrugata* Rve., *Astyris gausapata* Gld., *Marginella jewettii* Cpr., *Lacuna unifasciata* Cpr., *Bittium quadrifilatum* Gld., and many others.

On the large beach at Monterey I found many rocks containing dead shells of borers, *Parapholas californica* and *Pholadidea penita*. In deep quiet pools at Point Pinas I found beautiful starfish. Some of a deep orange color, others dark red, some dark purple, others pale yellow. I saw some beautiful Anemones differing from any I had seen, they were eight or ten inches in diameter, and beautifully iridescent, the play of colors resembling a great opal with greenish lights. The holidays ended, and reluctantly I said good-bye to the beautiful bay.



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SYNOPSIS OF THE PINNIDÆ OF THE UNITED STATES AND WEST INDIES.

BY WM. H. DALL.

In revising the Tertiary *Pinnidæ* it became necessary to examine the recent species and their synonymy. As certain changes in the accepted nomenclature appear necessary, the following synopsis may be useful.

Family PINNIDÆ.

Genus PINNA Linné, 1758.

Valves medially sulcate.

Pinna rudis (Linné) Chemn., (+ *pernula* Reeve non Chemn.); Bermuda, Bahamas.

Pinna carnea Gmelin, (+ *pernula* Chemn. non Reeve; + *degenera* Link, 1807; + *flabellum* (Lam.) Reeve, 1858; + *varicosa* (Lam.) Orb., 1853; + ? *bullata* (Swains.) Reeve, 1858).

Florida Keys, north to near Hatteras and south to Trinidad; also in the Red Sea.

Genus ATRINA Gray, 1847.

Valves entire.

Atrina rigida Dillwyn *apud* Solander, 1817, (+ *pectinata* Born non Linné; + *seminuda* Lam., 1819, non Reeve; + *alta* Sby., 1835; + *subviridis* Reeve, 1858; + *dorbiguyi* Hanley, 1858; + *carolinensis* Hanley, 1858; + *ramulosa* Reeve, 1858; + *seminuda* Holmes, 1859; + *muricata* of American authors, but not of Linné or Reeve).

Cape Fear, North Carolina, to the northern shores of South America.

Atrina serrata Sowerby, 1825, (+ *squamosissima* Phil., 1849; + *seminuda* Reeve, non Lam.; + *muricata* Holmes, non Linné or Reeve; + *seminuda* of American authors, not Lam.).

Cape Hatteras, North Carolina, to Guadeloupe, West Indies.

The type of *serrata* was a very young shell with finely developed sculpture. The true *Pinna muricata* (L.) Reeve, is probably an Oriental species, it is not at present known from America.

ON TWO SO-CALLED "BULIMI" FROM THE NEW HEBRIDES.

BY C. F. ANCEY.

Several years ago, Dr. Wm. D. Hartman described and figured two very interesting land shells from Segon Island, New Hebrides Archipelago, under the names of "*Bulimus*" *ruga* and "*Bulimus*" *Bernieri*. The English diagnoses and illustrations of these appeared in the Proceedings of the Academy of Natural Sciences of Philadelphia, 1890, page 284, plate III, figs. 1 and 2. These shells were until quite recently known to me from the figures and descriptions quoted above, but I succeeded when in Paris in December, 1896, in procuring specimens. My opinion was they were not at all "Bulimi" as suggested by Dr. Hartman, but modified forms of the *Diplomorpha* type. I now think there can be but little doubt they belong to the latter genus. The texture of shell, outline and external characters are not dissimilar, and in the best preserved specimens of *Diplomorpha ruga* and *bernieri* both have the throat tinged with blood-red color as in the typical *D. layardi*, although the describer mentioned the fact in one of them only. No epidermis remains on the shells, not very numerous indeed, observed by me, but it may be very deciduous, and its absence gives the shells a rough and uneven appearance. I am indebted to Mr. Ph. Dautzenberg for a nice example of *bernieri*, and the shell is somewhat straw-colored like *ruga*. Of the latter, I procured two specimens, one much larger than the type, the other, on the contrary, considerably smaller. The parietal denticle is wanting in the species under consideration, as well as in *Diplomorpha delatouri*.

Segon Island, the locality where *ruga* and *Bernieri* were found, is, I believe, in the Espiritu Santo group, that is, in the northern

portion of the Archipelago, but is not on the maps accessible to me.

Mr. Crosse, in his recent paper on the New Caledonia land and freshwater shells published in the "Journal de Conchyliologie," said that "*Helix*" *singularis* and its allies, represent in that fauna the New Hebrides *Diplomorpha*, but I fail to detect so great an analogy. It is right to observe, by the by, that *singularis* is really found on Aneitum, one of the New Hebrides; Mr. E. L. Layard sent me two specimens from there, much smaller than any one I ever saw from New Caledonia, but otherwise quite the same. I must add that the true *Pseudopartula* (type *Helix galericulum* Mousson), has nothing to do with this Melanesian group, and are evidently related to *Amphidromus*. Montrouzier's name *Drapar-naudia* should be applied to *singularis* and *sinistrorsa*. The affinities of the genus are difficult to state until the soft parts are examined.

I avail myself of the opportunity of adding three species to the list of New Caledonian species of Mr. Crosse who certainly overlooked them, viz., *Helicina nehoueensis*, *bourailensis* and *saxoviana*, all of Hartman.

A NEW CANCELLARIA FROM THE ALABAMA EOCENE.

BY T. H. ALDRICH.

Cancellaria lanceolata n. sp.

Shell elongated, whorls seven, first three nuclear and smooth, the others cancellated and having three strong revolving lines, the middle one much the larger, the costæ numerous and fine. Whorls are shouldered, suture deeply marked; body whorl with seven or eight revolving raised lines. Aperture oblong, outer lip serrated by the raised lines, nearly smooth within. Columella lip without callus, bearing two or more folds, part of the raised lines passing into the aperture to form them; canal short, oblique, slightly twisted, no umbilicus. Length $7\frac{1}{2}$, diam. $3\frac{3}{4}$ mm.



Locality.—Choctaw Corner, Ala. Woods Bluff horizon.

This little shell has some resemblance to *C. pulcherima* H. C. Lea, but Mr. C. W. Johnson, of the Wagner Free Institute of Science, has compared the two and finds the above distinct. The

specimens are not fully matured. One of the two specimens has been presented to the "Lea Collection," in the Academy of Natural Sciences of Philadelphia.

ON A COLLECTION OF MOLLUSKS FROM GRAND TOWER, ILLINOIS.

BY FRANK C. BAKER.

During the latter part of April and first part of May, Mr. Frank M. Woodruff spent two weeks collecting birds in Jackson and Union Counties, Illinois, and incidentally picked up a number of mollusks, and the general conditions of the locality, and the small number of shells collected seem to warrant a few notes. This locality is situated on the Mississippi River, north of Big Muddy River, in the southwestern part of the State.

Of the localities visited Mr. Woodruff says: "The shells were found in a rocky glen or cleft in the center of the chain of high precipices known by the names of Fountain Bluff, Devil's Bake Oven and Backbone. This cleft or ravine begins about three-quarters of a mile from the face of the cliff and gradually descends in a northwesterly direction until the bottom is reached, and one may stand upon a broad shelf of rock ten feet from the ground, with high overhanging cliffs of bare rock on both sides. A stream of clear spring water flows down this ravine and falling over the high shelves of rock has formed numerous round pools or basins. I was surprised to find no shells in the stream, and could only collect a few specimens of *Limnæa humilis*, which I found clinging to the wet moss under the falls. The balance of the shells were found under the moss and old logs at the base of the cliff. Fountain Bluff is five miles from the town of Grand Tower, and is three miles long from north to south and about one and a half miles wide. According to Worthen's Geology of Illinois, the Backbone or ridge is formed by an uplift of Devonian strata which is tilted to an angle of about 25°, and dips to the northeast. The bluffs consist of Chester limestone and sandstone overlaid by conglomerate. The top of the bluff is covered with a rich growth of timber, among which are Willow, Sweet Gum, Qupele tree, Sycamore, Cottonwood, Honey Locust, Hock Berry, Box Alder, Red Birch, White Ash, Black Ash, Red Oak, Mulberry, Persimmon, White and Black Oak, etc., are the most common."

Thirteen species were obtained, and may be noted as follows:

1. *CIRCINARIA CONCAVA* Say. A number of large and typical specimens of this species were collected and kept alive for a long time on the writer's desk. On May 18th two individuals were noted in coitu, the coitus lasting from 8 o'clock A. M. to 6 o'clock P. M. During this time both animals were perfectly quiet, the eye peduncles and tentacles drawn into the head and the foot contracted to form a rounded oval. During the coitus the heart, which normally beats about 75 times per minute, was reduced to 19 very slow and long beats. The foot of the snail taking the active part was partly covered by the passive snail, and the former's head was slightly lifted. The specimens measured about 15 mill. in greatest diameter.

2. *VITREA ARBOREA* Say. A few specimens of this species were obtained under and in rotting logs. All were perfectly typical.

3. *OMPHALINA FULIGINOSA* Griffith. The specimens obtained were rather dark in color and about half grown, the umbilicus wide and deep.

4. *POLYGYRA (MESODON) ALBOLABRIS* Say. But a single specimen of this species was obtained alive, and that was very large, measuring 34 mill. in greatest diameter. The animal was kept in captivity for several weeks, and was more active than any of the other species of *Mesodon* that the writer has studied. It was started at the bottom of a book case door four feet long and reached the top in about half an hour. The examination of the lingual membrane gave 45-1-44 teeth with ten perfect laterals. In this membrane the 38th tooth was abnormal in having three well formed cusps of equal size, instead of a bifid inner cusp.

5. *POLYGYRA (MESODON) EXOLETA* Binney. Several typical specimens of this species were collected, among which there was one without the parietal tooth. The lingual membrane of one specimen gave 47-1-47 teeth with eight perfect laterals. The marginals were very variable, some being with and some without side cusps. It is probable that several teeth were torn away from this membrane, although there could not have been the normal number given by Binney, 60-1-60.

6. *POLYGYRA (MESODON) THYROIDES* Say. All specimens were of the normal form.

¹ For the change in names of several of the genera and species here listed, see Pilsbry, Proc. Phila. Acad., 1894-97, where adequate reasons are given.

7. *POLYGYRA* (*TRIODOPSIS*) *TRIDENTATA FRAUDULENTA* Pilsbry. A single specimen of this subspecies was collected by Mr. Woodruff. Its radula differed considerably from that given in Binney's Manual of American Land Shells (p. 292), where 40-1-40 teeth with 12 perfect laterals is given. The present specimen had 27-1-27 teeth with 11 perfect laterals. The 17th tooth had a bifid inner cutting point, but all before it were simple. The 13th tooth showed a decided modification. The jaw was as usual, with 12 rather stout ribs.

8. *POLYGYRA* (*TRIODOPSIS*) *INFLECTA* Say. The specimens collected were of the usual form.

9. *POLYGYRA* (*STENOTREMA*) *MONODON FRATERNA* Say. The specimens examined had 31-1-31 teeth on the lingual membrane with 10 perfect laterals, and the 13th tooth had a bifid inner cutting point.

10. *POLYGYRA* (*STENOTREMA*) *HIRSUTUM* Say. The specimens obtained were of the normal form. One specimen measured 8½ mill. in greatest diameter. The radula was as given by Binney, 22-1-22 teeth with 10 perfect laterals, and the jaw had eight ribs.

11. *PYRAMIDULA ALTERNATA* Say. The specimens collected are rather coarsely striated (or ribbed) and approach var. *mordax* Shuttl., but the ribbing is not quite as strong as in that variety.

12. *PYRAMIDULA PERSPECTIVA* Say. Among the specimens obtained was one measuring 10 mill. in greatest diameter.

13. *LIMNÆA HUMILIS* Say. A number of specimens were collected in the moss under a waterfall. Mr. Woodruff reports finding all the specimens out of the water.

It was remarkable that so few species of mollusks were found, and also that the species were so few in individuals. Mr. Woodruff says that a part of the region is made up of sandstone and conglomerate, and this may account for the great paucity of molluscan life. Mr. Woodruff searched diligently many times, particularly for the smaller forms, and states that at no time did he find more than one shell at one time, all seeming to live solitary lives.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

Through the courtesy of Mr. Herbert Lowe, the writer had the pleasure of meeting our former member, Mr. Edward W. Roper of

Revere, Mass. Mr. Roper is now in Pasadena, Cal. He was one of the founders of our chapter. One of his contributions to the Transactions of the chapter in its early days was an interesting paper on "Studies in the Genera *Sphærium* and *Pisidium*," in 1889.

Mr. J. J. White, of Rockledge, Florida, has gone to Frankfort, Mich. for the summer months. The Vol. of Transactions should be sent to him at the latter address.

One of our valued members, in a letter, tells of a unique way in which devil-fish are caught by some foreigners. The following is an extract from the letter, written from San Diego County, Cal.; "We met two men and a woman, apparently Portuguese and from La Playa, who were making a collection of devil-fish. One of the men carried a pail of lime water, and when they came to a devil-fish residence, he would pour half a pint or so of the lime water into the hole, and await developments. And they would come every time, too. It would be a very short time till the devil-fish would come squirming out of his hole, to get away from the lime, and be picked up by the men, thrown down on the rocks two or three times, until he was partially stunned, and then put with his fellows in a pail carried for the purpose. We watched the proceedings two or three times, and G. asked what they were going to do with them; 'eat them, they are fine,' was the astounding answer. It sounded like the biggest kind of a joke, but the people did not look or act so." As the Chinese are said to eat these mollusks there is no doubt they were in earnest. How they could locate the Octopus in each hole, is, to the writer, a mystery.

FLORIDA SHELLS.

[Extract from the report of Mr. J. J. White. From the Transactions of the Isaac Lea Conchological Chapter for 1896.]

Business calling me to Miami and Palm Beach in July, I determined not to let so fine an opportunity for collecting pass without improving it. After concluding my business at Miami and Coconut Grove, I started out to hunt for the beautiful *Orthalicus undatus* Brug. and *Liguus fasciatus* Müll., but much to my regret was soon compelled to stop my search on account of the myriads of mosquitoes which infested the dense hummocks in which I was searching. I only succeeded in finding three live *Orthalicus* and one dead *Liguus* and some live *Helix varians*. Hoping for

better success I started out on the waters of Bay Biscayne, and was well repaid for doing so by discovering a colony of seventeen *Pyrrula papyratia*. They were all moving along, a compact body, to the northward, and it was one of the finest sights I have ever seen while collecting. The animals were beautifully marked with crimson and brown spots. Their eyes were large and black, and their long, flat heads and necks were light gray. It seemed hard to have to take them from their native element and kill them for their shells.

Four very fine *Cypræa exanthema* were found clinging to some mangrove roots, while close by on some rocks, several feet above the water, was a colony of hundreds of *Tectarius muricatus* and among them a handful of small *Nerita versicolor*. Already having a good supply of *Tectarius* at home, I only collected a few of the largest, and the *Neritas*. *Littorina lineata* covered the rocks everywhere, but I did not molest them. One very fine *Arca noae* was soon added to those already in the basket. Some fine *Arca ponderosa* were also found. *Fulgur perversum*, *F. carica*, *F. pyrum* were quite plentiful, but they were only small ones, so only a few of each were taken.

My time being limited, I had to get back to Miami to take the train for Palm Beach, on Lake Worth—Lake Worth being my old and favorite collecting place. It would be difficult to find a better collecting place, for its size, than the flats around Lake Worth Inlet. Lake Worth is a fine body of salt water lying parallel with the Atlantic Ocean, and separated from it by a narrow strip of land which, in some places, is only a very few rods in width. It is twenty-two miles long and averages from one-half to three-quarters of a mile in width. The sands washing in from the ocean have formed a large flat inside the lake at the inlet, and it is there we do our collecting. I have spent many days there very profitably. In the two days spent there in July I collected about three hundred *Strombus pugilis* in all stages of growth; *Strombus accipitrinus*, *S. bituberculatus* and *S. gigas* to be had for the taking. I also found, in limited numbers, *Lucina tigrina*, *L. pennsylvanica* and *L. divaricata*, *Dosinia elegans*, *Dolium galea*, *Cassis canaliculatus*, *C. testiculus*, *Cardium magnum* and *C. isocardia*, while on every hand *Nassa vibex*, *Cerithium minimum*, *C. muscarum*, *C. literatum*, *C. floridanum*, *Neritina virginea* and *Iphigenia brasiliensis* were found by the thousands.

On the rocks on the north side of the inlet were found numbers of *Purpura hemastoma* and *P. hemastoma* var. *undata*. The rocks

there are literally covered with *Siphonaria lineolata* and *Littorina lineata*. One thing was very noticeable to me while collecting there, and that was the great numbers of *Strombus pugilis*. While living on the lake for seven years, I only found six living ones in the lake, and now there are thousands. The largest, *S. gigas*, are fast disappearing.

While on the flats at the old inlet, one mile below the present inlet, I discovered a colony of *Cerithium minimum* which attracted my attention by their distorted growth, and I at once collected half a pint of them. The spot where they were located was somewhat higher than the main flat, and at low tide would be exposed for several hours at a time. Whether this exposure caused this strange growth, or some other condition of immediate surroundings, I am at a loss to determine. I took especial pains to examine those at the present inlet, and I failed to find the distorted ones there, although they, at times, are exposed to the sun at low tides.

I found some *Calistas* on the mud flats east of Pitt's Island, a mile north of the inlet, which were new to me. On sending them to Professor Pilsbry they proved to be *Calista varians*, and are said to be the first reported from Florida. Suites of these have been sent to the Academy of Natural Sciences at Philadelphia and to the Smithsonian Institution and to some members of the Chapter, and so the list was soon disposed of. I also found a nice suit of *Venus cribraria*, which was also given to the Smithsonian Institution. I came away from Lake Worth well pleased with the results of two days' collecting.

During the past year I have made thirty-seven exchanges with persons in all sections of the country, and have added four hundred and twenty different varieties to my collection. My correspondence with the members of the Chapter has been pleasant, and all the exchanges very satisfactory. (Mr. White's generous offer to send shells to the members of our Chapter was published in THE NAUTILUS for February: By this time the stock would be exhausted).

NOTES AND NEWS.

SINISTRAL AMPULLARIA.—It may be of interest to readers of the NAUTILUS to know that in the collection of *Ampullaria* of the Academy of Natural Sciences of Philadelphia, numbering about an hun-

dred species, but one sinistral individual was found, of the species *A. conica* Wood. It is a clearly defined *Ampullaria*, and could not be confounded with the genus *Lanistes*.—*Jennie E. Letson*.

HELICINA RABEI, n. sp. Shell lenticular, acutely carinated low-conic above; yellowish- or fleshy-white or red variously banded and figured; surface finely sulcate spirally. Whorls $3\frac{1}{2}$, flat above, the last convex below the acute peripheral keel. Aperture subtriangular, oblique, dark red within, at least in part; peristome well expanded, white; axial callous heavy, rugose, varying from dark reddish-brown to translucent white in color. Alt. 6.3, greatest diam. 11, lesser 8.7 mm. Another specimen measures, alt. 5.2, diameters 9 and 7.5 mm. Pelew Is. (Dr. Rabe). This acutely keeled and spirally lirate species is remarkably variable in coloration. Types, no. 68,854 coll. A. N. S. P., presented by Mr. John Ford.—*H. A. Pilsbry*.

RECENT PUBLICATIONS RECEIVED.

Professor Wm. H. Dall's Report on the Mollusks collected by the International Boundary Commission of the United States and Mexico, 1892-1894 (Proc. U. S. Nat. Mus., 1896, issued in 1897), is one of the most important documents yet published upon the inland mollusk fauna of the southwest. It treats of a region rarely visited by snail collectors, and consequently but little known, and places the conchology of the region on a solid basis. The region north of Mexico, between the Rio Grande and the Colorado, seems to be a prolongation northward of the fauna of the mountains of northern Mexico, rather than a southern extension of that of the Great Basin west of the Rocky Mountains. It presents features due to contributions from the Californian and Mexican regions, the latter predominating, with a few stragglers from the north. The plains are almost uniformly arid and frequently alkaline, and nearly all the Pulmonates were collected at the upper levels of the various mountain ranges near the boundary. *Epiphragmophora* extends into the region, being represented in Arizona and New Mexico by four species, of which two, *arizonensis* and *hachitana* are new. The *Polygyra levettei* groups proves to be prolific in species, five, of which four are described by Dall, being found. The classification of *Holospira* proposed in the last volume of THE NAUTILUS is fully set forth

and new species figured. *Cionella lubrica* and *Pyramidula strigosa* are among the northern species occurring in the Boundary region. The discussion of the Boundary fauna is followed by an extended treatment of the Lower Californian *Bulimuli*, in which a number of obscure matters are righted. In conclusion is given a list of marine mollusks from the termination of the international boundary and from San Clemente Island.

Evidence is adduced indicating that within comparatively recent geologic time, probably Post-Pliocene, Mexico has been almost insulated from the Continent north of it.

The *Journal de Conchyliologie* for April, 1896 (issued about April 7, 1897), contains an important article on *Pleurobranchus* and related genera, by Prof. A. Vayssière, of Marseilles.

Dr. R. Ellsworth Call has added a valuable paper to the scant literature of American cave faunas in his *Notes on the Flora and Fauna of Mammoth Cave, Ky.* (*American Naturalist*, May, 1897). The only mollusk found by him in the cave is a *Carychium*, considerably like *C. exiguum*, which he describes as *C. stygium*. About 150 examples were collected in "Mammoth Dome," on the wet surfaces of old bridge timbers, which have been lying undisturbed for forty or fifty years.

Dr. Heinrich Simroth gives a preliminary communication upon Russian slugs,¹ based upon the study of materials in the Zoological Museum of the Imperial Academy and the Senckenberg Museum at Frankfurt. The Caucasus Mountain region is the district of greatest peculiarity, having a number of special types. Simroth truly says that for the satisfactory working out of the species and their inter-relationships, the investigation of the genitalia and intestinal tract suffice; but for the understanding of the genera and their phylogeny, the other organs, especially the heart, pallial region, kidney and lung must be examined, a condition very rarely fulfilled. The *Testacellida* and *Arionida* are briefly commented on, and the following genera of *Limacidae* noted: *Agriolimax*, *Paralimax*, *Lytopelta*, *Gigantolimax*, *Metalimax*, *Monochroma*, *Parma-cella*. *Metalimax* and *Monochroma* are new, the former near *Paralimax*, but differing in the male genitalia; the latter is near *Limax*, but the eye-retractor does not pass between branches of genitalia,

¹Annuaire du Mus. Zool. de l'Acad. Imp. des Sci. de St. Petersburg, 1896.

etc. It is hoped that nothing will hinder the timely completion of this important work.

Another thorough anatomical paper, "*Beitrag zur Kenntniss der Coniden*," by Dr. R. Bergh, has appeared (Nova Acta der K. Leop.-Carol. Deutschen Akad. der Naturforscher, LXV, No. 2). It is a well illustrated work on the soft anatomy of one of the most prominent families of marine Gastropods, the *Conidæ*, which, like many other groups, has long been well known conchologically, but only slightly anatomically. *C. Pealii* is the only United States species investigated.

In their "Diagnoses d'Esp. Nouv. de Pélécy-podes et de Gastéropodes" (Bull. Soc. Zool. France, 1897), by Ph. Dautzenberg and H. Fischer, a good many species from the eastern Atlantic dredged by the "Hirondelle" and "Princesse Alice," are described but not figured. *Amphirissoa*, *Basilissopsis* and *Aliceia* are new genera. Species of *Turcicula*, *Cocculina*, *Cetoconcha* and other interesting genera are included. Mons. H. Fischer seems to be following in the footsteps of his distinguished father. In M. Dautzenberg he has an experienced and able collaborator.

Mr. Charles Hedley has recently described and figured a second fine species of *Thersites* from New Guinea, *T. septentrionalis*. It is more elevated than *T. broadbenti*, more like the Queensland *T. etheridgei* (Rec. Austr. Museum, III, No. 1). In conjunction with Dr. Arthur Willey, the same author describes a new *Astralium* of the subgenus *Guildfordia*, from New Britain. It is some 45 mm. in diam., and resembles the well-known *A. triumphans* from Japan.

Messrs. Melvill and Ponsonby have contributed to the Annals and Magazine of Natural History for June, 1897, another article upon Land and Fresh Water Mollusca from South Africa. New species of *Achatina*, *Ennea*, *Pupa* and other genera are described, and also a species of *Hapalus*, a Bulimoid group not hitherto found so far south.

An interesting paper by Mr. Harold Heath (Proc. Acad. Nat. Sci. Phila.) demonstrates the possession of small but well developed tegmenta upon the valves of young Californian *Cryptochiton Stelleri*. There are also small "sutural tufts," homologous with those of *Acanthochites*. A good plate illustrates these and other features.



THE NAUTILUS.

VOL. XI.

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No. 4.

NOTE ON LANDSHELLS FROM THE MALAY PENINSULA.

BY W. H. DALL.

The National Museum has received an interesting small lot of landshells from Dr. W. L. Abbott, collected in the vicinity of Prang, on the Malay Peninsula. One of them appears to be new, and particularly elegant. The others have been identified by the aid of Mr. Charles T. Simpson and Professor H. A. Pilsbry. The list is as follows :

- Ariophanta retrorsa* Gould.
- Planispira hardouini* De Morgan.
- Hemiplecta Leechi* De Morgan.
- Macrochlamys resplendens* Phil.
- Macrochlamys diadema* Dall, n. sp.
- Helicarion lineolatus* von Martens.
- Amphidromus sinensis* Benson, small var. ?
- Amphidromus xiengensis* L. Morelet.
- Amphidromus* sp. indet. (immature).
- Cyclophorus Nevillei* von Martens.
- Cyclophorus Pfeifferi* Sowerby.
- Cyclophorus Cantori* Benson.
- Leptopoma vitreum* Lesson.
- Vivipara quadrata* Benson.

Nanina (*Macrochlamys* ?) *diadema* n. sp.

Shell translucent yellow-brown, polished, depressed, with six and a half whorls, of which the apical two and a half are pale and smooth, the remainder show a deeply channeled suture outside of

which the whorl rises abruptly, its rounded crest cut into rounded nodules like the joints of a millipede by deeply incised lines in harmony with the lines of growth; there are about 38 of these divisions on the last whorl; the incisions override the crest and extend nearly to the periphery, becoming gradually fainter; periphery and base marked only by incremental lines, rounded, with a minute perforate umbilicus, over which a small portion of the inner lip is bent; peristome thin, sharp, the body showing hardly any callus; max. diam. 16, min. diam. 13, alt. 10 mm.

This elegantly sculptured species seems to differ much from any yet described. Its nearest relatives are *M. compluvialis* Blanf., and *M. convallata* Benson, which have a channelled suture, but do not have the transverse sculpture cutting the crest of the enclosing whorls. The types are in the National Museum.

ON A NEW HOLOSPIRA FROM TEXAS.

BY W. H. DALL.

Holospira (*Haplostemma*) *Hamiltoni* n. sp.

Shell slender, polished, spindle-shaped, pinkish-white, with a darker livid apex, and about 13 whorls; nucleus blunt, smooth, later three whorls delicately obliquely striated, central whorls smooth, last whorl with delicate oblique riblets with wider interspaces; aperture projected, rounded, subangular at the right posterior corner, the lip entire, reflected, the pillar rather wide; the last whorl flattened and attenuated. Lon. 19, max. diam. 5 mm.

Collected in the Rio Grande Mts., Brewster Co., Texas, at a height of 3,500 feet, living on *Selaginella lepidophylla* Spring, by Mr. James M. Hamilton, and presented to the National Museum through Dr. R. W. Shufeldt.

This species is very much like *H. (Metastoma) semistriata* Stearns, externally, differing in its smaller and more slender shell and finer and more delicate sculpture of the later whorls near the aperture.

QUARTER-DECKS AND JINGLES.

BY ROBERT E. C. STEARNS.

Several years ago, in the course of a conversation with Captain J. W. Collins, of the U. S. Fish Commission, relating to the various

materials used by the oyster planters for collecting the spat or forming spawning-beds, certain shells were mentioned by him that were systematically collected and sold to the oystermen. These shells were locally known by the names given in the above title. On looking into the matter, the "Quarter-decks" proved to be *Crepidula fornicata* Linné, and the "Jingles" a species of *Anomia*, presumably *A. simplex* Orbigny. As popular names go, these are not so bad, for there is a peculiar jingle produced by *Anomia* valves when many are shaken together, and the septum in *Crepidula* considered in connection with the boat-like shape of the species, *C. fornicata*, suggests a partially decked vessel.

The abundance of these forms in the region referred to, is indicated by the following data kindly furnished (July, 1889) by Dr. H. M. Smith, of the Fish Commission, on "The Fertilization of Certain Shell-fish at Greenport, N. Y., locally known as 'Jingles' and 'Quarter-decks.'"

Since 1880, these shells have been extensively used for the purpose of forming spawning-beds for oysters, the idea of so employing them having originated with Captain James Monsell, of Greenport. The shells are taken with dredges between the first of October and the first of July, and are sold by the fishermen to dealers at the rate of four cents a bushel. At times they bring more, according to the demand. A law prohibiting the taking of them between the first of July and the first of October went into effect in 1888. The shells lie on the docks until July, when they are taken to the planting grounds and sold to the oystermen. Unlike the scallops used for the same purpose, the jingles and quarter-decks are not opened when caught.

The *Crepidulas* or quarter-decks being gastropods (univalves), no opening is possible, and the two pieces or parts of the bivalve *Anomias* or jingles, readily separate when dead and dry. The scallop or Pecten shells (*P. irradians* Lam.) are opened in order to extract the meats, the sales of which yielded the men engaged in the scallop-fishery of Massachusetts, Rhode Island and Connecticut, principally the two first States, in the year 1892, \$114,695, the product of 137,284 bushels of this species of *Pecten*. The emptied shells, a residual product, are utilized as before indicated.

"Investigations by an agent of the U. S. Fish Commission show that in 1887 there were taken 130,000 bushels of 'quarter-decks' and 'jingles' valued at \$5,200. In 1888 the output of the fishery

was 110,000 bushels, valued at \$4,400, while the catch in 1889, up to and including the 19th of June, was 75,000 bushels, valued at \$3,000."

The marvellous abundance in certain localities of the various species above named, is, aside from the economic value of the fishery, of exceeding interest to the naturalist. What proportion of the total quantity, 315,000 bushels of jingles and quarter-decks, belong to the latter species, *Crepidula*, is not stated; probably much less than half, and quite likely not more than a quarter; presumably the quarter-decks are attached to, or are adherent upon, the jingle or *Anomia* shells, domiciliares upon the valves of the latter species, the same as the West American species.

Crepidula rugosa is a domiciliare on the shells of *Pecten æquisulcatus* Cpr., the Californian analogue of *P. irradians*. It is not at all infrequent to find from three to six individuals of the West Coast *Crepidula* on a single specimen of the *Pecten*.

Beside the use of oyster, clam, scallop, quarter-deck and jingle shells for forming spawning-beds, the oystermen in some instances and in some places, are utilizing old tin cans as catchment objects for the spat to fasten upon. What with the packing of adult oysters at the canneries and the entrapping of the innocent unsophisticated fry on old tin pots and cans, the situation may be said to look to an old man in a balloon, or a young man "up a tall tree," like canning the oysters at both ends.

Los Angeles, Cal., June, 1897.

NEW UNIOS.

BY BERLIN H. WRIGHT.

Unio Pinei sp. nov.

Shell wide or oblong, moderately and uniformly thin, dorsal and ventral margins usually parallel, subtruncate or obliquely rounded before, biangular and truncated behind. Epidermis reddish-brown; olive above, polished and thickly covered with unequal rays. Beaks scarcely elevated above the dorsum, and surrounded by four or five fine concentric, undulating ridges. Ligament thin, reddish, long and depressed. Greatest diameter in the centre of the shell. Beak cavities slight. Cavity of the valves ample and tray-shaped. Nacre

brilliant and copper-colored, very iridescent and remarkably corrugated; the upper third being stained darker. Lateral teeth equal, long, slender, slightly curved and extending fully to the cardinals. Cardinal teeth inclined to be double in both valves, compressed, oblique and serrulate. Cicatrices well impressed, showing the prismatic layers, the anterior ones being roughened in the posterior portion and widely distinct, and the posterior ones confluent. Pallial lines obscure. Dorsal notch long and shallow. Width 3 inches, length 1.5 inches, diameter 1 inch.

Habitat.—An unnamed lake in Witthacoochee River region of Hernando Co., Florida.

Type in National Museum.

Remarks.—It is difficult to assign a place to this shell, partaking as it does of the features of several members of the *Buckleyi* group. It has the subtruncate anterior of *U. coruscus* Gould, and approaches that species in nacre, which in our shell is of a deeper and richer tint, and is not so pointed behind, is more inflated, straighter dorsum, lighter teeth, more rayed and has a red instead of a blackish epidermis, and attains a much greater size. From *U. Hinkleyi* B. H. W., it differs in the abrupt anterior, sides more rounded, darker nacre, and in the reddish, instead of black epidermis. It is in every way more gracile than *U. Buckleyi* Lea, and is not so pointed behind. Nor has it the ponderous umbos, arched dorsum and rounded base of that species.

Sixty specimens of all ages have been observed, showing a remarkably perfect uniformity of characters. It is named for the discoverer, Mr. George Pine, of Aripeka, Hernando Co., Florida.

(To be Continued.)

MELANIA YOKOHAMENSIS, N. SP.

BY W. D. HARTMAN.

Shell elongate, conic, gradually tapering to an acute apex. Whorls 7, suture lightly impressed; surface smooth, with obscure spiral lines, color yellowish-green; aperture white, opercle brown, oval and corneous. Length 35 mill., width 13 mill.; width of aperture 6 mill., length of aperture 10 mill.

Locality.—Yokohama, Japan, B. Schmacker collector.

This shell was given me by Mr. Schmacker several years ago. Some sent Dr. Brot, of Geneva, were pronounced new at the time.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

May 28th, the volume of Transactions was forwarded from San Diego east. Since that date the General Secretary has received no word regarding it.

SEEING EYES.

[From the report of Mrs. E. A. Lawrence. From the Transactions of the Isaac Lea Chapter for 1896].

Lowell says, "Eyes are not so common as people think, or poets would be plentier," and, what he has said of poets, could be said with equal truth of naturalists. Nature, to ninety-nine per cent. of the human family, is a closed book, not because she is not willing to have her pages opened, but because people have no eyes to see with. Thoreau could find in his back-door yard, or, on the shore of Waldon Pond, the material for printed volumes. It was not because these places had more of interest in them than similar places elsewhere, but it was because Thoreau had trained his eyes to see. How many people, of all those who yearly visit our sea-shore, have seeing eyes? They will tell us of the beauty of the foam-capped waves, or the brilliant tints of the water at sunset; but they will pass with unseeing eyes on careless feet over myriads of living creatures, creatures so wonderful in their mechanism, so beautiful in their form and coloring, and so cunning in their instincts, that they show to the observer the perfect workmanship of the great master, Nature.

About two years ago, I began to view the sea-side world through open eyes, and in that time I have collected over two hundred species of mollusca in the vicinity of San Pedro Bay. This past year I found beneath shelving rocks the little *Megetabennus bimaculatus* Dall, and nestling in hollows in the rough rocks I found a number of *Gadinia reticulata* Cpr.; the latter are so nearly the color of the

rocks that it takes sharp eyes to discern them. Upon goose barnacles I found a small *Aemœa* which I hoped might be a new species, but I found my eyes were not very wide open even after a year's experience in the opening process, for I sent the *Aemœa* to Dr. Dall and he said they were only a small variety of the *A. pelta*. But in classifying my shells I have made two varieties of them, as I think there is enough difference in them to warrant such division.

Going down on the sand one day at low tide, I saw a small upheaval of the sand, and since I have been travelling the world with seeing eyes, I always investigate these tiny mounds, and, this time, I was rewarded by finding a *Tornatina culcitella*, and a diligent search soon revealed several of these cunning little creatures. With these are *T. inculta* and *T. carinata*. While out in a boat among the kelp I found a number of *Lacuna unifasciata* and some *L. porrecta*, these latter were three-eighths of an inch long. Among the tiny shells, seeing eyes are called into requisition, and I find the aid of a strong lens often necessary to bring out their distinctive features. The tiny *Marginella (Volvarina) varia* is more beautiful than a *Cypræa spadicea*, and yet the blind world never finds them hidden away under stones, and covered with their thin tents, which are quite a protection for them, as it hides their shining surface and makes them much less conspicuous. The *Turbonillas*, the *Odosomias*, the *Mitromorphus* and many others have enriched my cabinet, and opened my eyes to the wonders and beauty of small things this past year.

When I began to classify, I had many a struggle with the different authorities, and many a despairing appeal I sent to our General Secretary, who never failed to come to my relief, and I have much to thank her for, inasmuch as she has given me light where before I dwelt in darkness. * * * * To sum up the year's work, no greater gain has come to me than has come by the opening of my eyes, and the knowledge I have gained by seeing. The earth has taken on new beauty and the sea has opened some of its wonderful storehouse and bidden me enter, and all nature beckons me with kindly finger to further discoveries by the aid of seeing eyes.

NOTES AND NEWS.

NAUTILUS POMPILIUS IN SOUTHERN NEW SOUTH WALES.—What surprised me most was to find large numbers of rather broken speci-

mens of *Nautilus pompilius* thrown up in Eden Bay. It is difficult to conceive how they get there; it is an enormous expanse to be drifted away from any of the Pacific Isles. Can it be possible that they are eaten by whales and that the shells is extruded as excrement? I make this suggestion because great schools of whales come in there, it is said, to rub themselves on the coarse gravel bottom of the bay.—*Dr. J. C. Cox, in letter to Editor.*

PARTULA: NOTES AND CORRECTIONS.—*Partula eximia* Hartm. = *P. macgillivrayi*.

P. Brazieri Pse. is a good species.

The type example of *Partula neweenitiarum* was lost with the vessel on its return to Mr. Garritt at Tahiti.—*W. D. Hartman.*

A NEW SPECIES OF HEMPHILLIA.—In examining the slugs referred to *Hemphillia glandulosa* in the collection of the Academy of Natural Sciences, we found that two species have hitherto borne this name. The true *H. glandulosa* is a small slug, with distinctly papillose mantle; the pedal line hardly rises at the tail, and the caudal gland is surmounted by a conspicuous horn. The other form, which we call *H. camelus*, is much larger, the mantle is not papillose, and the pedal groove rises abruptly and conspicuously at the tail, and there is no noticeable horn there. Types from Old Mission, Idaho, collected by Hemphill. The species are easily separated by external characters, but the internal anatomy shows even more important differences, which will be described and figured in the second installment of our "Revision of American Slugs," now in preparation.—*H. A. Pilsbry & E. G. Vanatta.*

RECENT PUBLICATIONS RECEIVED.

An apparently very thorough monograph of the *Cephalopoda* of the Gulf of Naples, by Guiseppe Jatta, has appeared in the "Fauna and Flora des Golfes von Neapel" (23d monograph). The illustrations are incomparably magnificent.

Mr. Felix Bernard¹ has detected a stage of shell-growth in bivalves earlier than the prodissoconch, which he proposes to call *protostracum*. He finds the protostracum on the summit of the prodissoconch. The Glochidium stage in Unionidæ is its equivalent.

¹ *Compt. Rend. Acad. Sci. Paris*, Vol. 124, p. 1165; *Natural Science*, July, 1897, p. 10.

A CLASSIFIED CATALOGUE OF AMERICAN LAND SHELLS, WITH
LOCALITIES.

BY HENRY A. PILSBRY.

Almost a decade has elapsed since the publication of the "Check List of American Land Shells" (Proc. Acad. N. S. Phila., 1889), and the frequent calls for copies of that list since the reprint edition was exhausted, as well as the progress of the science during that period, have induced the editors of THE NAUTILUS to offer a new list covering the same ground.

In the nomenclature of this list we have admitted changes shown to be necessary; and in the classification have frequently forsaken the old roads for paths lately "blazed out," and as yet not much travelled.

Additions and corrections of any kind will be gratefully received.

Class GASTROPODA.

Subclass STREPTONEURA.

Order PROSOBRANCHIATA.

Suborder *Tenioglossa*.

Family CYCLOSTOMATIDÆ.

Genus CHOANOPOMA Pfeiffer, 1847.

Subgenus *Ctenopoma* Shuttleworth, Pfr., 1856.

1. CHOANOPOMA BAHAMENSE Shuttl. Key West, Fla. (Dr. W. H. Rush). Also Bahamas.

Genus CHONDROPOMA Pfeiffer, 1847.

2. CHONDROPOMA DENTATUM (Say). Key West and Naples, near Gordon's Pass, Fla. Also Cuba.

Family TRUNCATELLIDÆ.

Genus TRUNCATELLA Risso, 1826.

3. TRUNCATELLA CARIBÆENSIS 'Sowb.' Rve. Key Largo and Anclote Key, Fla. Also West Indies.

4. TRUNCATELLA CARIBÆENSIS PULCHELLA Pfr. Marco and Cedar Keys, Fla. Also Bermuda, Cuba, Yucatan, etc.

5. *TRUNCATELLA BILABIATA* Pfr. Key West, Key Largo, Biscayne Bay, Micco, Indian River, Furguson's Pass, Marco, Cedar Keys, Fla. Also Bermuda, Cuba, etc.

6. *TRUNCATELLA STIMPSONI* Stearns. False Bay, near San Diego, California.

7. *TRUNCATELLA CALIFORNICA* Pfr. San Diego, California.

[Note.—*T. subcylindrica* "Gray" has been reported from Florida. The identity of the species is doubtful, and the occurrence in Florida of the form so-called by Pfeiffer, equally so].

Suborder *Rhipidoglossa*.

Family HELICINIDÆ.

Genus *HELICINA* Lamarek, 1801.

8. *HELICINA CHRYSOCHEILA* Binney. Texas, near mouth of the Rio Grande. Also State of Tamaulipas, Mexico.

9. *HELICINA ORBICULATA* Say. St. Simon's I., Ga., Chattanooga, Tenn., Eureka Springs, Ark., Stone Co., Mo., southward to southern Florida, and southwest to the Rio Grande; type locality near mouth of the St. John's River, Florida. [*H. Hanleyana* Pfr. is a synonym].

9a. *HELICINA ORBICULATA TROPICA* 'Jan' Pfr. Texas, mainly south and southwest. An ill defined race.

10. *HELICINA OCCULTA* Say. Western Pa. to Minn., south to Tenn. Distribution markedly discontinuous and local. Allegheny Co., Pa.; Athens, Ill.; near Iowa City and Eldora, Iowa; Winona, Minn.; Sheboygan, Whitefish Bay near Milwaukee, and near Du Pere, Wis.; Lexington and at Natural Bridge, Va.; Harriman and South Pittsburg, Tenn. An abundant fossil of the Post-Pliocene Loess formation in eastern and central Iowa, the adjacent parts of Ill., western Ia. and E. Neb.; also fossil at New Harmony, Ind., the type locality.

[Note.—*H. subglobulosa* Poey, a Cuban species introduced into United States works on the evidence of specimens found at Key Biscayne and Fort Dallas, Fla., many years ago, has not yet been shown to be actually living in Florida].

Subclass EUTHYNEURA.

Order PULMONATA.

Suborder *Stylommatophora*.

(Superfamily *HOLOPODA*).Family **HELICIDÆ**.Subfamily **Helicinæ** (*vel Belogona*).(*Belogona Siphonadenia*).Genus **HELIX** Linné, 1758.Section *Helicogena* Férussac.

11. **HELIX ASPERSA** Müll. Charleston, S. C.; New Orleans; Santa Barbara, Santa Clara and San Jose, Cal. Imported from Europe.

Section *Tachea* 'Leach,' Turton, 1831.

12. **HELIX NEMORALIS** Linn. Burlington, N. J.; Lexington, Va.; ? Baraboo, Sauk Co., Wis. Imported from northern Europe.

13. **HELIX HORTENSIS** Müll. Labrador; Anticosti I.; Barachois, Gaspé region; Nova Scotia; Casco Bay, Me.: Eagle, House, Kettle, and Nantucket Is., Mass.; also New Bedford, Marblehead, Manchester and Magnolia, Mass.

Genus **HYGROMIA** Risso, 1826.Section *Fruticicola* Held, 1837.

14. **HYGROMIA HISPIDA** (L.). Halifax, N. S.; Montreal. A species of northern Europe, imported.

15. **HYGROMIA RUFESCENS** (Penn.). Quebec and Levis, Quebec, Canada. A species of northern Europe, imported.

Genus **HELICELLA** Férussac.Section *Trochula* Schlüter, 1838.

16. **HELICELLA TERRESTRIS** (Penn.). Charleston, S. C. A native of southern Europe.

Subgenus *Cochlicella* Risso, 1826.

17. **HELICELLA VENTRICOSA** (Drap.). Sullivan's I., S. C. Imported from Europe.

Subgenus *Theba* Risso, 1826.

18. **HELICELLA CANTIANA** (Montagu). Quebec. A native of northern and central Europe.



(Belogona Euadenia).

Genus **GLYPTOSTOMA** Bland & Binney, 1873.

19. **GLYPTOSTOMA NEWBERRYANUM** (W. G. Binn.). Los Angeles, Cal., to Todos Santos Bay, Lower Cal., and about 40 miles inland.

Genus **LYSINOE** H. & A. Adams, 1855.

20. **LYSINOE HUMBOLDTIANA** (Val.). Altuda, Texas. Also Mexico.

Genus **EPIPHRAGMOPHORA** Doring, 1875.Subgenus *Monadenia* Pilsbry, 1895.

21. **EPIPHRAGMOPHORA FIDELIS** (Gray). Humboldt and Shasta Co., Cal., to Vancouver I.

21a. **EPIPHRAGMOPHORA FIDELIS**, *f. flava* Hemph.21b. **EPIPHRAGMOPHORA FIDELIS** *f. minor*.

21c. **EPIPHRAGMOPHORA FIDELIS SUBCARINATA** Hemph. Humboldt Co., Cal. This is directly intermediate between *fidelis* and *infumata*.

21d. **EPIPHRAGMOPHORA FIDELIS INFUMATA** (Gld.). Coast counties of Cal. from Siskiyou to Alameda.

22. **EPIPHRAGMOPHORA MORMONUM** (Pfr.) Shasta Co. to Tulare and Santa Barbara Co., Cal.

23. **EPIPHRAGMOPHORA HILLEBRANDI** (Newc.) Calaveras, Tuolumne and Mariposa Cos., Cal.

24. **EPIPHRAGMOPHORA CIRCUMCARINATA** (Stearns). Near Turloch, Stanislaus Co., Cal.

Subgenus *Helminthoglypta* Ancy.

25. **EPIPHRAGMOPHORA DUPETITHOUARSI** (Desh.). Monterey, Cal.

26. **EPIPHRAGMOPHORA SEQUOICOLA** (Coop.). Santa Cruz Co., Cal.

27. **EPIPHRAGMOPHORA AYRESIANA** (Newc.). Santa Cruz, San Miguel, San Clemente and Santa Rosa Islands.

28. **EPIPHRAGMOPHORA TRASKI** (Newc.). Los Angeles to Ft. Tejon and to San Luis Obispo, Cal.

28a. **EPIPHRAGMOPHORA TRASKI PROLES** Hemphill. Fraser's Mills, Tulare Co., Cal.

(To be Continued.)



THE NAUTILUS.

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No. 5.

BOLINAS, CALIFORNIA; THE CONCHOLOGISTS PARADISE.

BY WILLIARD M. WOOD.

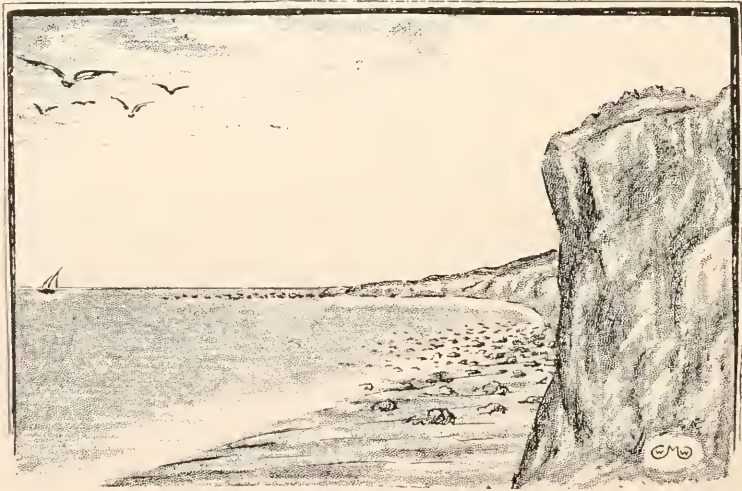
Aqui estoy otravez!

Once more I have reached the rocky shores of dear old historic Bolinas. I could never tear myself from this antique Spanish town by the Ocean. How I love to hear the mighty waves beat wildly against the solid rocks, and see the lofty yellow bluffs which rise so majestically from Neptune's enchanting home.

Annually, during the summer months, I find that I am—like the proverbial Snail, wending my way, through exquisite redwood forests and inhaling the salubrious mountain air. The point of destination is alway Bolinas. Bolinas, thou art and ever shall be my Mecca.

This year, Mr. George E. Townsend and the writer concluded to pitch tent and camp upon one of the smaller bluffs, by the side of a delightful rippling creek, within a stone's throw of the beach which is used for bathing purposes, in lieu of making the hotel our headquarters during our stay. We also decided to "tramp it," and as each possessed a good pair of strong limbs, the start was made from San Anselmo Station, Marin County. The distance from the station to Bolinas is estimated at about twenty miles. Ten miles of this number is entirely devoted to up hill climbing, and so steep, that in portions where there is no shelter from the sun as it sends forth its penetrating rays, one becomes quite exhausted, especially when one is principally confined in a down town office, pondering over innumerable books and papers, and not used to mountain climbing.

While going toward the "Summit," how truly beautiful were the rustic wooden bridges over which we passed, and the cool-looking, shaded, rainbow-tinted and trout laden streams. How the saucy big blue jays scolded when we ventured too close to their nesting places! Then there were numerous tiny golden-breasted wild canaries; how beautifully they did sing! The peacock-green throated humming-birds were busy flying hither and thither, abstracting the honey from the delicately scented flowers. Cotton-tails would occasionally be seen running frantically across the broad road and hiding among the heavy brush, so that they would not fall victims to the many hawks and red-necked buzzards which appear at all times to hover overhead.



The beach, bluffs and Duxbury Reef.

Several times we came across a flock of mountain quail. The minute we were observed by them, they would take to the wing. The noise caused by their flying resembled greatly an immense buzz saw revolving with great rapidity and cutting through heavy timber.

When we reached "the ridge," we were rewarded by a superb view of the surrounding country. Not a particle of fog was within sight. The atmosphere was as clear as crystal. The view covered an expanse of scenery which could not be emulated for picturesque variety. Mountains, forests, lakes, valleys, rocks, straits and capes, cities, towns and villages spread themselves in a magnificent panorama.

The ten mile descent of the mountain on its western side was comparatively easy as the road was in excellent condition. The weather has been delightful since we have been here and trust that it will continue so throughout our stay.

Although the ground on the mountain's side was quite dry, careful searching with the aid of a short limb of a tree, raking deeply among the fallen leaves, revealed to us, quantities of the following Helicies, all with the living animal within.

Helix arrosa, *nickliniana*, *Polygyra armigera* and *Selenites Vancouverensis*. No fresh-water shells were found in the streams and pools on the way over. In fact, I do not believe there are any in the vicinity of this place, for I have been unable to secure a single specimen during the past six years.

The tides so far, have been very good and several species have been added to my collection, which are entirely new to me.

The beach from the bluffs near the channel (entrance to the Bay of Bolinas) out to the dangerous reef—Duxbury reef—is at intervals composed of billions of particles of shells, ground so fine that the casual observer would naturally suppose they were grains of sand. Certain spots I have seen on the beach are almost wholly composed of these diminutive bits to a depth of about five or six inches.

The reef upon which I had formerly seen attached thousands of immense *Chlorostoma funebre* and fairly good sized *Chrysodomus dirus* are now almost destitute of the above named species. The reason of their disappearance is unknown to me. The species observed attached to the rocks and the blue clay at the present date are *Monoceros engonatum* and *Litorina scutulata*. *M. engonatum* predominating. Of *Chlorostoma brunneum*, I have gathered hundreds at previous visits, from a point just a short distance from the reef in a north-westerly direction. Not one in a living state have I found since arriving.

Strolling up the sandy beach in the early morning, (4.30) until we reached the stretch of mossy rocks which had been left bare by the retreating tide, we secured dozens of the common edible clam, *Tapes staminea*, which is sold by the sackful in the markets of San Francisco. These were brought back to our camp and served at breakfast.

The Bay of Bolinas, which at one time was quite commodious, is now almost completely filled with sand and mud. The channel, no

doubt will soon be closed and not even the smallest boat will be able to enter this once beautifully situated bay.

When low tide occurs in the bay, the "necks" of thousands of *Schizothærus Nuttalli* may be seen projecting an inch or so out of the gray mud. Although the shells themselves are buried quite deeply under the surface, it is with difficulty that these huge specimens may be obtained. Think of gathering clams almost the size of dinner plates. We managed to secure several splendid specimens. The "necks" when fully extended are about three feet long. It requires several persons with rubber boots, shovels and pails to "catch" one, as they will withdraw their "necks" quickly and bury themselves out of view and reach, if disturbed. The strength of one person is required to hold the neck on the surface while another person digs around it and bails out the fast in-coming mud and water. It is indeed hard work to capture one of them, but well worth the trouble and time spent over them.

The Bay also produces thousands of dead, yet fresh-looking specimens of *Macoma secta*. These are found either upon the surface or an inch or two below, imbedded in the soft mud. Hundreds were secured and after having given them a thorough washing, they were packed away carefully in cotton batting.

Living *Cryptomya californica* in considerable numbers seem to be washed upon the mud flats. They range in size from a pin head to a quarter of a dollar.

When low tide occurs at the reef, one may dig in the clay for borers and be rewarded with several species. The clay is fairly alive with them.

Occasionally I have found cast up on the beach by the waters, fine examples of that immense "rock oyster" *Hinnites giganteus*. Several contained the living animal. One specimen picked up measures almost ten inches in diameter. Who says we do not have large oysters! The beach is covered with great numbers of worn valves. The young shells are easily mistaken for *Pecten hastatus* and I have often been fooled in this respect. Fresh, full grown specimens are very hard to obtain.

What do you suppose to-day—the glorious fourth of July—brought forth? Two most interesting species that I have found up to date. I had not searched for these and they were entirely a surprise to me. Doubly welcome are my new friends on this day. We were sitting lazily upon the pebbly beach watching the waves as

they washed upon the shore. Suddenly a larger wave than those which I had been accustomed to see, rushed forward and with a mighty splash, broke within a few feet of us. The water and foam crept so quickly in our direction that my shoes were soon filled with the cold sea-water. With a quick spring, I was upon my feet and hurrying from the scene of the unfortunate event. When returning to the spot where we had left a stick half buried in the sand, I came across unexpectedly two valves of *Semele rubrolineata* and a most delicate and perfect fresh-looking specimen of *Mytilimeria Nuttalli* Conr.

How truly patriotic were the little shells to come and cast themselves at my very feet, upon this eventful day. The rose colored radiations on the *Semele* were beautiful and looked like many sky-rockets going heavenward.

Among the species collected which are not mentioned above, are as follows :

Acmæa asmi, *mitra*, *patina*, *pelta*, *persona*, *spectrum*, *incessa*, *instabilis*, *Adula fulcata*, *stylina*, *Amphissa corrugata*, *Amycla carinata*, *Bittium filosum*, *Calliostoma costatum*, *Cardium corbis*, *Cerostoma foliatum*, *Chama pellucida*, (valves only) *Chlorostoma montereyi*, *Pfeifferi*, ? *Crepidula adunca*, *navicelloides*, *Entodesma saxicola*, *Lithophagus plumula*, *Fissuridea aspera*, *Haliotis fulgens*, (large but poor specimens, washed ashore) *Hipponyx tumens*, *Kellia Laperousii*, var. *Chironii*, *Lacuna unifasciata*, *Lazaria subquadrata*, (valves), *Litorina planaxis*. *Lunatia Lewisii*, (half a foot in length) *Lyonsia Californica*, *Macoma nasuta*, *inquinata*, *Siliqua patula*, *Mytilus Californianus*, *Nassa fossata*, *Cooperi*, *Margarita pupilla*, *Ocenebra lurida*, *interfossa*, *Olivella biplicata*, *Petricola carditoides*, *Pecten hastatus*, (valves) *Pholadidea penita*, *parva*, *Platyodon cancellatus*, *Parapholas californica*, *Placunanomia macroschisma*, (valves) *Purpura crispata*, *lima*, *saxicola*, *ostrina*, *Saxicava arctica*, *Saxidomus aratus*, *Tapes staminea*, *tenerrima*, *runderata*, *Tellina Bodegensis*, (valves) *Zirphæa crispata*, *Cryptochiton Stelleri*, (seven inches long) *Ischnochiton Cooperi*, *Mopalia Hindsii* and *mucosa*.

I have not gone carefully over the species collected—doubtless many others might be included in this list—but the above will serve to show the rich molluscan fauna of this certainly delightful peninsula. The territory worked over by me cannot be more than four miles square. The specimens collected already number many thousands and the rate at which they are being gathered, who knows but

it shall require the chartering of the small schooner now lying in the channel, to carry them down to the City!

Deseo que el lugar que ha sido tan atractivo y productivo en lo pasado para el que se suscribe para siempre permanezca inmutable.
 Bolinas, Cal., July 4th.

NOTE ON A CALIFORNIAN HELIX.

BY HENRY A. PILSBRY.

In the "Manual of American Land Shells" Mr. Binney figured a shell from San Pablo as a form of "*Arionta californiensis* var. *ramentosa* Gld." It would seem that the same form has been subsequently described by both Dall and myself, although until recently collating materials for the new catalogue of U. S. land shells, I had entirely forgotten that I had ever noticed the form in question. The published references are as follows:

- 1885.—"A smaller form of this variety [*i. e. ramentosa*] from San Pablo," W. G. Binney, Man. Amer. L. Sh., Bull. 28 U. S. Nat. Mus., p. 133, f. 108 (no description).
- 1895, Feb. 2.—*Epiphragmophora californiensis* v. *contracosta* Pilsbry, Guide to the Study of Helices, Man. Conch. (2), IX, p. 199 (a nude name).
- 1895, Oct. 1.—*Epiphragmophora californiensis* var. *contracosta* Pilsbry, Nautilus IX, p. 72 (description).
- 1896, Apr. 23.—*Epiphragmophora Arnheimi* Dall, Proc. U. S. Nat. Mus. XVIII, p. 6 (no description; refers to Binney's figures).
- 1897, Jan.—*Epiphragmophora Arnheimi* Dall, Proc. U. S. N. M. XIX, p. 375 (full description).

As will be seen from the above, the form was recognized by myself in 1894 when reviewing the Helices for the "Guide" but the number in which the name appears although printed in 1894, was not issued until February, 1895, and it was in no way defined at that time; the brief diagnosis then prepared being overlooked for some months, finally appearing in October, 1895. I do not know when the form was first recognized by my friend in Washington, but from the notorious tardiness of the Proceedings of the Nat. Mus., and the fact that a partial abstract of Dall's article appeared in NAUTILUS for Sept., 1895, and was furnished by him a month or two

earlier, it is likely that Prof. Dall recognized the form after the publication of the nude name in *Man. Conch.*, but before it was scantily clothed with a description in the October NAUTILUS.

Dall's first notice of the form referred merely to Binney's figures; but lately he has given an account of it which leaves nothing to be desired save an equally good notice of the soft anatomy.

NEW UNIOS.

BY BERLIN H. WRIGHT.

Unio Buxtoni sp. nov.

Shell very transverse or wide, subcylindrical, moderately and uniformly inflated, subsolid, bluntly pointed and attenuated behind, obliquely rounded in front and straight on the dorsum. Epidermis olive-black and obscurely rayed throughout. Growth lines obscure. Umbos depressed. Beaks pointed and very small, with two or three distant, nodose undulations. Umbonal ridge rounded or subangular. Beak cavities slight; cavity of valves ample. Lateral teeth straight, slender, thin and long, the inner one thicker and higher, and both extending to the cardinals, which are erect, short, with many curved ridgelets on the upper faces, double in the left and single in the right valves. Cicatrices slightly impressed but well defined, the anterior ones distinct, the smaller ones being crescent-shaped, which divides occasionally into *two* separate pits; posterior ones confluent and much elongated; dorsal ones well impressed and in the beak cavity. Pallial line distinct, at which the coruscations end. Nacre uniform and of a brilliant copper tint. Width $2\frac{1}{2}$ inches, length $\frac{3}{4}$ inch, diameter $\frac{5}{8}$ inch.

Habitat.—Lakelets of Marion Co., Florida.

Type in National Museum.

Remarks.—Affinity, *U. Waltoni* B. H. Wright, and *U. nasutulus* Lea. From the former it differs in being smaller, more solid, cylindrical, darker colored, more prominent umbonal ridge, not sub-emarginate at base, and in having a more prolonged dorsal line behind. Behind, and in size and structure, it reminds one of *U. nasutulus*, which never has an upturned keel in front as in our shell, and has a livid nacre.

We have great pleasure in naming this species for our good friend and naturalist, Mr. William W. Buxton, of Milo Centre, N. Y., whose company has so often enlivened our collecting excursions.

Unio Suttoni sp. nov.

Shell oblong, roughened by growth lines and solid, sides dilated almost to the extremities, and slightly constricted near the middle of the base. Base slightly convex or subemarginate, bluntly pointed behind and very abruptly rounded or subtruncate before and slightly arched above. Epidermis reddish or pale olive, with *very* obscure rays or rayless, slightly wrinkled on the posterior dorsal area or smooth. Beaks depressed and umbos flattened or slightly rounded. Umbonal ridge obtusely rounded and elevated from beak to base. Cavity of the shell ample and quite uniform; cavity of beaks slight. Nacre heavy, and varying from satin white to dark copper color, and slightly thinner behind. Cardinal teeth erect, somewhat compressed and bluntly notched. Lateral teeth long and slightly curved, rather slender and compressed. Width $2\frac{1}{4}$ inches, length $1\frac{1}{2}$ inches, diameter $\frac{3}{4}$ inch.

Habitat.—Lake near Candler, Marion Co., Florida.

Type and forms in National Museum.

Remarks.—This is an exceedingly variable species like the type of the group to which it belongs, *U. Buckleyi* Lea. It may always be distinguished from that species by the greater fullness in the posterior portion, and has a slight constriction where that is usually enlarged. It may be distinguished from *U. Ferrissii* Marsh, by its greater and more uniform inflation, straighter base, more obtuse umbonal angle, and is in every way a more massive shell. Fifty specimens have been received from Mr. B. Sutton, of Candler, Marion Co., Florida, for whom we name the species.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

After the General Secretary had forwarded the MS. for THE NAUTILUS for August, she received a letter from Mr. A. H. Gardner notifying her *in re* the vol. of Transactions. Mr. J. J. White, and Mr. M. Leon Walker have also reported. At this writing Aug. 10 the vol. is in Mass. The Secretary appreciates the notification when the book has been forwarded.

It is not too early to canvass for our next General Secretary. The present one would nominate Dr. W. S. Strode, Lewiston, Ill. for General Secretary for 1898. Dr. Strode has been a valued member for years.

PURPURA LAPILLUS L.

(Extract from the report of Mrs. D. J. Wentworth. From the Transactions of the Isaac Lea Chapter for 1896.)

No shell is more common on our New England shores than *Purpura lapillus* Linné, and yet, no shell of this region has to me, at least, so much of interest connected with it.

Purpura lapillus is an humble but most worthy descendant of the aristocratic Muricidæ, and surely the Murex is an aristocrat among shells, with its beautiful forms, dainty sculpturing, delicate coloring, and its long traditions of usefulness and importance.

Plain in its general aspect, as it certainly is, *Purpura lapillus* has nevertheless, much in common with its more highly favored relations. It is an old member of an ancient race, fossil remains of *Purpura lapillus* are found in the Red Crag deposits of Europe.

This species is remarkable for its variation in solidity of shell, form, sculpture size, coloring and habitat. It varies in thickness from three-sixteenths of an inch to a shell so thin one could easily perforate the outer lip with a pin. In form they vary from a short broad shell with obtuse spire and flattened whorls to a long shell with acute spire and convex whorls,

In some the coarse revolving ridges are barely discernable, while in others they are very prominent. The faint lines of growth which intersect the revolving ridges of this shell are, in some specimens, brought into marked prominence by rows of ruffles or scallops, and this sculpturing undoubtedly gave Lamarck reason for naming this variety *Purpura umbilicata*. Many of the solid shells have rows of nodules or teeth within the aperture on the outer lip,

These solid shells are usually grayish-white or white outside, with reddish-purple, yellow or white apertures; but the thinner shells are often brown, orange or lavender, and these colors are frequently banded with white. I have never seen two specimens banded just alike. The orange and white combinations are especially pretty. The variety called by Lamarck *P. umbilicata*, so far as I have observed, are always a greyish-white on the outside, with a reddish-purple aperture. This variety I have found only in a brackish river where they are often seen crawling about in the mud, and their color is so nearly the color of the mud on which they are found that it undoubtedly serves to protect them from the ravages of their enemy. Associated in this river with *Purpura lapillus*, and much resembling it in size, color and general shape, is the *Urosalpinx cinerea*. The usual habitat of the *Purpura* is in the nooks and crevices of rocks. Why do these river shells choose the mud?

Purpura lapillus is an arctic species and ranges from Norway to New York. It is found on the coast of Europe, where, according to Sowerby, it grows much larger than on our own coast.

This species confines his daily rambles to that part of the shores left bare by the tides, seldom venturing below low water mark. There on the rocks or other hard substances he finds his favorite food, the succulent barnacle, sometimes varying his diet with a choice bit of *Mytilus edulis*, to obtain which he will bore through the shell. Finally the mussel becomes so weakened that its valves fly open, when the *Purpura* promptly accepts the more favorable opening and proceeds to gorge himself with the delicious morsel, after which he will lie inactive waiting for a return of appetite. Limpets, Littorinas, clams, mussels, etc., are said to find a place on his menu.

From time to time throughout the year the *Purpura* deposits its eggs enclosed in little vase like capsules. These capsules may be found in clusters attached to the undersides of rocks. In confinement it takes about four months for these eggs to mature and then the young do not immediately leave the capsule, seemingly preferring to try their strength a little before venturing on the broad ocean. The young hatched in captivity instinctively leave the water every day, remaining out about the time it takes for the tide to ebb and flow.

A few years ago while fishing I had occasion to crack some *Purpura* for bait. After cracking their shells I placed the snails in my handkerchief to keep them safely until needed. I soon found that the snails had stained my handkerchief with bright purple spots which repeated washings only served to render more brilliant. Thus I was reminded of the Tyrian purple of the ancients, and led to fancy that perhaps in a somewhat similar manner, the dye was discovered. In later years this dye was manufactured in Ireland but so little was obtained from each animal, and other cheaper dyes being discovered, our humble shell-fish were left to die a natural death, and are now useful only to amateur fishermen and so-called "queer people," or "cranks" who go around collecting shells and studying them.

Purpura lapillus commonly called "dog winkle" by the English, has many scientific names, among which are *Buccinum lapillus*, *Tritonium lapillus*, etc. But what is a name? The *Purpura lapillus* under whatever name he has crawled or sailed has a long, interesting honorable history; has during his day and generation been useful and ornamental in the world, doing his duty faithfully according to the light given him and making no pretensions to superiority, and who of us can do better than that?

28b. *EPIPHRAGMOPHORA TRASKI CUYAMACENSIS* Hemp. Cuyamaca Mt., San Diego Co.

28c. *EPIPHRAGMOPHORA TRASKI TULARENSIS* Pilsbry. Fraser's Mills, Tulare Co.

29. *EPIPHRAGMOPHORA CARPENTERI* (Newc.). Coronado Is., and vicinity of San Diego, Cal. Probably a subspecies of *E. traski*. Original locality, "Tulare Valley," perhaps erroneous.

30. *EPIPHRAGMOPHORA INDIOENSIS* (Yates). Indio, Riverside Co., Cal.

31. *EPIPHRAGMOPHORA ROWELLII* (Newc.). Fort Grant, Arizona.

32. *EPIPHRAGMOPHORA ARIZONENSIS* Dall. Banks of Santa Cruz River, Tucson, Arizona.

33. *EPIPHRAGMOPHORA MAGDALENENSIS* (Stearns). Johnson Canyon, near the Panamint Valley, and near Resting Springs, Southern California. Also State of Sonora, Mexico.

34. *EPIPHRAGMOPHORA HACHITANA* Dall. Fort Huachuca, Huachuca Mts. and Tucson, Arizona; below San Quentin, Lower California; Peloncello Mts., top of Hachita Grande Mt., Grant Co., near Carrizollilo Springs, New Mexico; and at some adjacent localities south of the international boundary.

35. *EPIPHRAGMOPHORA COLORADOENSIS* (Stearns). Grand Canyon of the Colorado River, Arizona, opposite the Kaibab plateau, elevation 3,500 feet; also Inyo and San Diego Cos., Cal.

36. *EPIPHRAGMOPHORA ARROSA* (Gld.). Coast counties from Humboldt to Santa Cruz.

36a. *EPIPHRAGMOPHORA ARROSA f. holderiana* Cooper. E. side San Francisco Bay.

36b. *EPIPHRAGMOPHORA ARROSA f. stiversiana* Cooper. Marin Co.

36c. *EPIPHRAGMOPHORA ARROSA f. marinensis* Pils. Marin Co.

36d. *EPIPHRAGMOPHORA ARROSA EXPANSILABRIS* Pils. Humboldt Co., near Eureka.

37. *EPIPHRAGMOPHORA EXARATA* (Pfr.). Santa Cruz Co. to Marin Co., Cal. Probably intergrades completely with the preceding.

38. *EPIPHRAGMOPHORA CONTRACOSTÆ* Pilsbry. Byron Hot Springs, San Pablo, and Pt. Isabel, Contra Costa Co.; Nachoguero Valley. (*Epiphragmophora Arnheimi* Dall is the same).

39. *EPIPHRAGMOPHORA CALIFORNIENSIS* (Lea). Monterey, Cal.

39a. *EPIPHRAGMOPHORA CALIFORNIENSIS NICKLINIANA* (Lea). Santa Cruz Co., north (? to Mendocino Co.).

39b. EPIPHRAGMOPHORA CALIFORNIENSIS ANACHORETA (W. G. B.).

39c. EPIPHRAGMOPHORA CALIFORNIENSIS RAMENTOSA (Gld.). Napa Co. to Santa Clara Co.

39d. EPIPHRAGMOPHORA CALIFORNIENSIS BRIDGESI (Newc.). San Pablo.

39e. EPIPHRAGMOPHORA CALIFORNIENSIS DIABLOENSIS (J. G. Coop.). San Francisco to Yolo Co.

40. EPIPHRAGMOPHORA TUDICULATA (Binn.). Tulare Co., (typical form).

40a. EPIPHRAGMOPHORA TUDICULATA CYPREOPHILA (Newc.). Calaveras, Tuolumne, Merced, Tulare and Los Angeles Cos.

40b. EPIPHRAGMOPHORA TUDICULATA SUBDOLUS Hemph. San Jacinto Valley, San Diego Co.

40c. EPIPHRAGMOPHORA TUDICULATA UMBILICATA Pils. San Luis Obispo Co.

40d. EPIPHRAGMOPHORA TUDICULATA TULARENSIS Hemph. Fraser's Mills, Tulare Co.

Subgenus *Micrarionta* Ancey, 1880.

41. EPIPHRAGMOPHORA GABBI (Newc.). San Clemente Island.

41a. EPIPHRAGMOPHORA GABBI FACTA (Newc.). Santa Barbara and San Nicholas Is.

42. EPIPHRAGMOPHORA RUFICINCTA (Newc.). Santa Catalina Island.

43. EPIPHRAGMOPHORA INTERCISA (W. G. B.). San Clemente and Santa Cruz Is. Forms *minor*, *elegans*, *nepos* and *albida* Hemph. and *callojunctis* Pils. have been named.

43a. EPIPHRAGMOPHORA INTERCISA REDIMITA (W. G. B.). San Clemente Is. Color varieties *castanea* and *hybrida* Hemph. have been named.

44. EPIPHRAGMOPHORA KELLETTII (Forbes). Santa Catalina Island. Color forms *castanea*, *nitida*, *multilineata*, *frater*, *californica*, *forbesi*, *bicolor*, *tricolor*, *albida* Hemph. have been named.

44a. EPIPHRAGMOPHORA KELLETTII STEARNSIANA (Gabb.). San Diego, southward, on the mainland.

45. EPIPHRAGMOPHORA TRYONI (Newc.). Santa Barbara and San Nicholas Is. Color varieties *varius*, *nebulosa*, *fasciata*, *californica* and *albida* Hemphill.

45a. EPIPHRAGMOPHORA TRYONI SUBCARINATA Hemphill. Santa Barbara I.; fossil.

(To be Continued.)



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No. 6.

NEW LAND SHELLS FROM MEXICO AND NEW MEXICO.

BY W. H. DALL.

Holospira (*Haplostemma*) *Cockerelli* n. sp.

Shell small, pupiform, blunt-tipped, with two smooth nuclear and about a dozen subsequent whorls; those following the nucleus are rather strongly obliquely ribbed with close set fine riblets which become fainter over the main body of the spire and reappear again on the last whorl; aperture entire, simple, rounded, but a little angular at the posterior outer corner; the umbilicus closed, the spire gradually enlarging to the eleventh whorl, then slightly attenuated. Alt. 12.5, max. diam. 3.2 mm.

Found in the débris of the Rio Grande at Mesilla, New Mexico, by Prof. Cockerell.

This is the second species of *Haplostemma*, and one of the smallest, if not the smallest, *Holospira* yet recorded. It forms an addition to the fauna of the United States.

Eucalodium hippocastaneum n. sp.

Shell of moderate size, with 8 (decollate) whorls, the penultimate the largest, thence gently tapering to the decollate apex; surface very dark chestnut brown covered with fine, slightly wavy, close set riblets accompanied by fine axial wrinkles near the sutures, a few irregular spiral threads occasionally appear, suture distinct, umbilicus closed, a faint keel below the periphery of the last whorl, aperture simple, rounded, the peristome slightly thickened, not reflected. Alt. 32, max. diam. 9.2, aperture 8 mm.

The species is near *E. Boucardii* Sallé from Cordova, but differs by smaller size, darker color, less sharp sculpture and the presence of spiral lines.

From San Sebastian, Jalisco, Mex., E. W. Nelson.

Coelocentrum astrophorea n. sp.

Shell pale yellow brown, decollate, with 15 remaining whorls, the first six of which taper, while the rest are subequal; suture distinct minutely channelled, or with a sharp edged thread on each side of it, surface polished with concavely flexuous small ribs with wider interspaces, on which is visible obscure spiral striation; last whorl keeled below, projecting, aperture rounded triangular, slightly reflected, simple; axis large, pervious except at the base; within the whorl with a medial keel on each side of which it is excavated and vertically ribbed, while from the junction of keel and ribs small spines like the rays of a star project into the lumen of the whorl. Alt. 30, max. diam. 7, aperture 4·7 mm.

From Encarnacion, Hidalgo, Mex., E. W. Nelson.

Though the spines are obviously merely an evolution from the usual nodes, they are remarkable and hitherto unrecorded in any species.

Schazicheila hidalgoana n. sp.

Shell trochoid depressed with a rather pointed spire and nearly five whorls; white with extremely fine close-set rounded riblets in harmony with the lines of growth; nucleus rounded, smooth; suture very distinct, slope of the spire flattened a little, periphery obscurely keeled; aperture rounded-triangular, outer lip reflected with a shallow sinus at its posterior extremity, rounded below with a thick body callus (on which is a keel for the edge of the operculum) uniting the lips; umbilicus covered by a thin callus, base moderately rounded; operculum (lost)? Alt. 8·5, mag. diam. 12, min. diam. 9·5, aperture 6 mm.

Found at Encarnacion, Hidalgo, Mex., by Nelson.

This species is obviously distinct from any of those heretofore described in this very limited genus.

ON TWO NEW SPECIES OF AMPHIDROMUS.

BY C. F. ANCEY.

Amphidromus Fultoni Anc.

Shell sinistral, short, ovate-conic, minutely perforate, thin, obliquely striate, subangulate at the periphery, chiefly at the begin-

ning of the last whorl. Spire rather briefly conic, apex dark brown; whorls 6, the first ones distinctly, the last barely, convex; apical whorls white, lower of a pale lemon color; the third ornamented with two faint series of pale brownish and very small spots; the last with a narrow yellow zone below the suture, circumscribed by an indistinct, broad, white band, and furnished with two fine brown revolving lines more or less evanescent towards the aperture, the upper one at the periphery, the other around the yellow umbilical area. Aperture oblique; columella straight, thin, expanded, white. Lip thin, white, slightly expanded.

Length $23\frac{1}{2}$, diam. 14, length of aperture 11 mill.

Locality: Cochiuchina.

This, as well as the following, are members of the group of *A. flavus* Pfeiffer, according to Mr. Hugh Fulton, who kindly examined the specimens and declared them to be new species. From the former it differs in being shorter, in having 6 whorls only, a dark colored apex, two narrow revolving bands on the last whorl, and other particulars. Named in honor of Mr. Fulton, who has very thoroughly and carefully monographed this difficult genus.

Amphidromus Eudeli Anc.

Shell sinistral, rather solid, oblong-conic, obliquely striate, narrowly rimate; spire conic, apex dark brown; whorls 7, convex, the first ones dull white, the fourth and lower ones cream, with oblique bluish-gray stripes, interrupted at the middle on the penultimate and preceding whorls, and evanescent at the suture; last half whorl bluish-gray, with a cream-yellow band and umbilical area of the same tinge; a narrow infra-sutural line of a reddish-brown color on the last and penultimate whorls. Aperture small, oblique, expanded, interior grayish. Columella thick, reflected, paler at the upper part. Lip thickened, dark brown externally, purple inside, particularly so near the umbilicus.

Length 28, diam. 14, length of aperture 11 mill.

Locality: near Binh-Dinh, Annam, in forests (E. Eudel).

This is allied to *A. zebrius* Pfeiffer, from Siam, but is apparently larger and more solid, and differs in having a purple peristome; externally black-brown, and several striking characters.



NEW SPECIES OF TERTIARY MOLLUSCA FROM VANCOUVER ISLAND.

BY JOHN C. MERRIAM.

The species here described have already been mentioned by the author as being new forms in a short paper¹ on the age and general character of two Tertiary faunas from the southern coast of Vancouver Island.

These faunas were referred to two horizons occurring at different localities, one at Carmanah Point at the entrance to the Strait of Fuca, the other near Muir and Coal Creeks in the Sooke district. The horizon at the first-named locality was temporarily designated as the Carmanah Point beds, and is correlated with Conrad's Astoria Miocene, excluding the lower portion of his series which has been supposed to be Eocene. The second horizon was named the *Sooke beds*, and is, as nearly as can be determined from the study of the known fauna, of *Middle Neocene* age.

The material on which the descriptions are based was collected by Dr. C. F. Newcombe, of Victoria, B. C., who has kindly permitted the author to study the extensive collections which he has made at both of the above-mentioned localities.

Cytherea Newcombei n. sp.

Shell subquadrate to oval, high, moderately thick, truncated anteriorly. Beaks not prominent. Lunule faintly marked. Surface ornamented with numerous, irregularly placed growth lines and ridges. On some well-preserved specimens a large number of very faint radial lines are visible. Length of large specimen 70 mm., breadth 55 mm. Hinge of right valve with three cardinal teeth and a short pit for the anterior lateral tooth of the opposite valve. This pit for the reception of the anterior lateral tooth is shallower and much shorter than in the following species.

Locality: Sooke beds, Vancouver Island.

Cytherea vancouverensis n. sp.

Shell oval, narrowly rounded anteriorly. Beaks prominent. Lunule well marked. The somewhat weathered surface of the shells ornamented by numerous, irregularly placed growth ridges. Length of type specimen 62? mm., breadth 48 mm. Hinge of right

¹ Note on Two Tertiary Faunas from the Rocks of the Southern Coast of Vancouver Island. Bull. Geol. Dept. Univ. of Calif., Vol. 2, No. 3.

valve with three cardinal teeth and a long, deep tooth pit for the reception of the anterior lateral tooth of the left valve. Pit between the two anterior cardinal teeth of right valve ordinarily narrower and deeper than in *C. Newcombei*.

Locality: Sooke beds, Vancouver Island.

Patella geometrica n. sp.

Shell large and heavy, up to 50 mm. or more in length, suborbicular. Apex elevated, well forward. Surface ornamented by about twenty broad, strong, radial ribs, which are much wider than the interspaces. Radial ribs crossed by numerous, prominent, narrow, sometimes leafy, transverse ridges.

Locality: Sooke beds, Vancouver Island.

Turritella diversilineata n. sp.

Shell medium size. The imperfect type specimen shows seven flattened whorls, which are strongly bevelled below. Flattened sides ornamented by five revolving ribs of which the lowest, standing on the angle of the whorl, is much stronger than the others. On some of the whorls there are indications of revolving sculpture on the bevelled surface between the lowest rib and the suture.

Locality: Carmanah Point, Vancouver Island.

Nassa Newcombei n. sp.

Shell between 25 and 30 mm. in length. Whorls five, with a well marked shoulder, ornamented by numerous longitudinal and transverse ribs which give the middle portion of the whorls a tessellated appearance. The upper revolving rib, which forms the angle of the shoulder, is stronger than the others and is usually separated from them by a distinct groove. On the last whorl the transverse ribs (about 25) are dominant on the upper portion, excepting the shoulder, and are latticed by the less conspicuous revolving sculpture. On the lower portion of the whorl the transverse ribs disappear, leaving the well-defined revolving ribs uninterrupted.

Bullia buccinoides n. sp.

Shell ovate, whorls five. Spire short. Suture partially or entirely covered. Aperture with strong anterior notch. Outer lip thin, sharp; inner lip with broad callus. Length 25-30 mm.

Locality: Sooke beds, Vancouver Island.

University of California, August, 1897.



EDITORIAL CORRESPONDENCE.

MARSHFIELD, OREGON (COOS BAY), Aug. 23, 1897.

My Dear Pilsbry:—Though I have had good success as far as fossils are concerned, it has been the wrong season for land shells in southern Oregon. Everything is three inches deep in impalpable dry dust, and even the trees are dusty. Barring a few *Helix fidelis* and *vancouverensis* in aestivation and an occasional *Ariolimax*, I have seen nothing in the woods, and the rare brooks here are curiously bare of insect or molluscan life.

Since coming to the sea coast I have been too busy to do more than note the commoner species on the beaches, and observe a few items of distribution. The eastern clam, *Mya arenaria*, has become acclimated, and is one of the best and most abundant bivalves. It was introduced unintentionally with seed oysters from the East. The Pacific oyster, *O. lurida*, is not now found living in the bay, but specimens (which may have been brought here from other places) occur sparingly in the Indian shell heaps. Unexpected was the presence of *Nassa fossata* in numbers, I think not before reported so far north. A rarity of the rocks at Cape Arago is the black abalone, *Haliotis cracherodii*, of which this must be nearly, if not quite, the northern limit. Among rubbish on the beach were a dead specimen of *Mitra maura*, and a valve, also dead and worn, of *Tivela crassatelloides*. These I suspect to be ballast specimens. The beaches offer a poor collecting ground, even Littorinas are scarce. I noted the following species of shells near the entrance of the bay, though winter collecting would doubtless afford a longer list:—

Acmæa patina, *pelta*, *persona* and *nitra*; *Olivella biplicata* and *bætica*; *Purpura crispata*, *decemcostata* and *ostrina*; *Littorina scutulata*, *Priene oregonensis*, *Nassa fossata*, *Fissuridea aspera*, *Cryptochiton stelleri*, *Katherina tunicata* and *Mopalia muscosa*; *Mya arenaria*, *Entodesma saxicola*, *Cardium nuttalli*, *Saxidomus squalidus*, *Tresus nuttallii*, *Tapes rigida*, *Petricola carditoides*, *Saxicava arctica*, *Macoma nasuta* and *inconspicua* (pink and white varieties), *Siliqua patula*, *Hinnites giganteus*; a fragment of *Pecten caurinus*, and in holes in the sandstones *Pholadidea penita*, *Parapholas californica*, *Zirphæa crispata*, *Adula stylina* and *Kellia laperousei*.

Yours very truly,

W. H. DALL.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

The annual reports will be due in December. Promptness in sending reports will be appreciated by the General Secretary. The annual dues are due in December. The election of President and General Secretary is held in the same month.

Our President, Prof. Josiah Keep, conducted a class in conchology at Pacific Grove this last summer.

COLLECTING AT BALLAST POINT.

(Extract from the report of Mrs. L. T. From the Transactions of the Isaac Lea Chapter for 1896.)

On Thursday, Dec. 31, 1896, at 8 A. M., our family started out to finish up the year by collecting shells on that day. We went to San Diego—a ten minutes' trip by rail—and then took a naphtha launch for somewhere, we were not sure where, until we could take our bearings, and see what places were possible to us.

Out past the ships from England and Australia we made our way, and could soon see the row of little settlements, if such they may be called, along the north end of the bay. Farthest to the east is Roseville, then La Playa, Quarantine, Ballast Point, and farthest to the west, Pt. Loma, a promontory, five hundred feet high, surmounted by its lighthouse.

As we studied our geography lesson, it was decided that our boat should drop us at Quarantine and call for us at 3.30 P. M., at Ballast Point, a distance one and one-half miles if you ride, and two miles or more if you walk.

About 10.30 we set our foot on the beach at Quarantine, and, a few minutes later, having eaten our lunch to get it out of the way, we began to work. At high tide the walk we contemplated would have been impossible, as the water comes quite up to the bank, which, much of the way, is a high and precipitous cliff. But the tide was going out rapidly, and not only making a pathway, but uncovering for us what we had come to see. Mr. T., with his Zoology class in mind, walked along at the water's edge, watching closely for all kinds of animal life.

I walked up on the just uncovered beach, seeing what I might capture. My first prize proved to be a "giant key-hole," *Lucapina*

crenulata, animal and shell still in partnership. As this was the first one I had seen alive, I was more delighted than if I should have been over the discovery of a continent. I have all the continents I want, but am always ready for another giant key-hole.

Having all paid our respects to our new acquaintance, and recovered somewhat from the shock of finding something we really wanted, we gently put him to rest in the pail of sea water carried by the "zoologist," and we proceeded on our way to other "finds." Not many minutes later another *Lucapina* met my delighted gaze, and with fewer demonstrations than before, he was seized and sent at once to join his brother.

By this time we had come to the bed of mussels, clams and oysters which had begun to be exposed to view. We had reason to look for rock oysters, *Hinnites giganteus*, in that section of the country. but as collecting them had never been much in our line before, it took us some time to learn how to find them. They were so muddy and looked so much like other things for which we had no use, that we could'n't always be sure of what we were getting, till afterward. While Mr. T. wrestled with that problem, I amused myself by springing pleasant surprises on cup and saucer limpets, *Crucibulum spinosum*, and transferring them to my basket from their happy homes on stones, old shells, broken glass, etc. As this was a new kind of limpet for me to collect alive in any quantity, and of good size, I laid in a good supply. Occasionally specimens of *Lutricola alta*, *Semele decisa*, *Sanguinolaria Nuttallii*, *Psammobia rubro-radiata*, *Bulla nebulosa* and *Haminea virescens* were found along here.

A little further on we began to find quantities of *Heterodonax bimaculatus*, of a larger size than we had found in San Pedro Bay, of various colors, purple, salmon, white and striped, every one too beautiful to leave!

A few minutes before time for our return boat, our most exciting capture was made, that of a devil fish, presumably 18 inches or more from tip to tip (he would'n't lie still to have his measure taken). He was ruthlessly torn from the hole under a stone where he was domiciled, and, in spite of his writhes and wriggles, was consigned to the sea water pail, which by this time was filled to overflowing with star-fish, sea-cucumbers and the not to be overlooked giant key-holes. Now the star-fish were respectfully invited to take a back seat in some of the numerous bags, etc., which we have learned to carry for just such emergencies, that his majesty, the devil fish,

might have their room. Ashamed of himself, as he well might be (or was it only a becoming modesty which impelled him?) he immediately began to squirm his way to the very bottom of the pail, and there he remained for the home trip.

Then with heavy loads but light hearts, we found our way to the light house on Ballast Point, where our launch soon called for us. As we went down to the water to step on board, Mr. T., who led the way, saw directly in his path, as if waiting for him, our third *Luca-pina*. Back to San Diego, six miles, we went, and by six o'clock were at home, and preparing to put in formalin "pickle" for future use, the finds of the day.

GENERAL NOTES.

A few months ago I received from H. Rolle, Berlin, two specimens of *Achatina crawfordi* Melv. One of the shells was broken when received, and noticing that there appeared to be something loose inside, I investigated, and got out three embryonic shells about 8 mm. in diameter. As the *Achatinidae* are said to be oviparous, this was quite a surprise to me, and I thought a note of it might be of interest to you. As there was no sign of a "calcareous shell," it would appear that this species, at least, is viviparous.

—*Geo. H. Clapp.*

POLYGYRA MEARNsii Dall, has been found by Prof. J. D. Tinsley in the Organ Mts., New Mexico, high up in Filmore Cañon, one dead shell. I am responsible for the identification.

T. D. A. Cockerell.

Dr. Lorenzo Yates, of Santa Barbara, Cal., has a short article on the shells of Santa Barbara Channel in the August number of the "Overland Monthly."

PUBLICATIONS RECEIVED.

Messrs Ph. Dautzenberg and H. Fischer have issued their final report on mollusks obtained by the dredgings made by the "Hiron-delle" and the "Princesse Alice," 1888-1896.¹ A useful table of the stations precedes the report on species. The operations were nearly all conducted around the Azores Is. New species are de-

¹ Mém. de la Soc. Zool. de France, X, 1897.

scribed of the genera *Pleurotoma* (sensu latissimo), *Cerithiella*, *Amphirissoa* (a new Rissoid genus with continuous, reflexed peristome), *Basilissopsis* (a new genus resembling *Basilissa*, but not pearly, etc.), *Eulima*, *Niso*, *Turbonilla*, *Turricula*, *Cyclostrema*, *Cocculina*, *Puncturella*, *Acmea*, *Alicia* (name preoccupied), *Isomonina* (new group of *Anomiidae*), *Chlamys*, *Amussium*, *Myrina*, *Arca*, *Leda*, *Malletia*, *Cardium*, *Axinus*, *Diplodonta*, *Cuspidaria*, *Verticordia*, *Thracia* and *Poromya*. All the new forms are figured, but the phototypes are not so clear in detail as we could desire, being decidedly inferior to those illustrating "Les Mollusques Marins du Roussillon," for example. Otherwise the work seems well done in every respect.

In treating the *Scalidae* and the genus *Mathilda* obtained by the same expedition,² Mr. Dautzenberg has the able assistance of Mr. E. de Boury, well known for his studies on *Scalidae*. Thirteen species are recorded, of which seven are new.

BREEDING SINISTRAL HELICES.—Arnold Lang, in Vierteljahr-schr. Naturf. Ges. Zürich, XLI, 1896, Jubelband, p. 448, gives the results of two experiments to ascertain whether as a rule sinistral individuals of normally dextral snails produced sinistral or dextral young. The experiments were conducted two consecutive years, once with seven, another time with nine individuals of *Helix pomatia*. They were completely isolated; and the result was only dextral young. No less than 241 young were obtained from the lot of seven.

Edwin Grant Conklin, Professor of Comparative Embryology in the University of Pennsylvania, has published in the Journal of Morphology for April, 1897, an elaborate work on the Embryology of *Crepidula*, with especial reference to the "cleavage of the ovum, the formation of the germinal layers and definitive organs, and the axial relations of the ovum to the larval and adult axes." The work is too extensive for abstract here, being, in fact, one of the most thoroughly worked out studies in "cell lineage" yet produced in America, and especially valuable for the attention given to the later stages with the object of tracing the individual blastomeres of the cleaving egg onward to the germ layers. The interesting observations upon the natural history of *Crepidula* forming part of the prefatory portion of Prof. Conklin's memoir, we hope to reprint later.

² Same volume.

Genus **CEPOLIS** Montfort, 1810.

Section *Hemitrochus* Swainson, 1840.

46. **CEPOLIS VARIANS** (Menke). Key West; Lower and Upper Matacumbe Keys; Biscayne Bay. Also New Providence, Inagua, etc., Bahamas.

Genus **ACANTHINULA** Beck, 1846.

The systematic position of this genus and of *Vallonia* is unknown.

Section *Zoögenites* Morse, 1864.

47. **ACANTHINULA HARPA** (Say). Northern tier of States from Maine to Minnesota; Canada; Bering Island (Vega); also Sweden, Kamchatka, etc.

Genus **VALLONIA** Risso, 1826.

48. **VALLONIA PULCHELLA** (Müll.). Montana eastward, from Canada to, or nearly to, the Gulf of Mexico. Europe.

49. **VALLONIA EXCENTRICA** Sterki. Quebec and Maine to Maryland, west of Ohio; also Europe.

50. **VALLONIA COSTATA** (Müll.). Quebec to Washington, west to Colorado, Europe.

50a. **VALLONIA COSTATA MONTANA** Sterki. Rocky Mts.

51. **VALLONIA ALBULA** Sterki. Quebec, Manitoba, British Columbia.

52. **VALLONIA PARVULA** Sterki. Illinois to Nebraska, south to Indian Territory (*V. americana* Ancey is the same).

53. **VALLONIA GRACILICOSTA** Reinh. Mingusville, Mont.; Fort Berthold, Dakota.

54. **VALLONIA CYCLOPHORELLA** Ancey. Washington to Montana, south to New Mexico.

55. **VALLONIA PERSPECTIVA** Sterki. Northern Alabama and Tennessee to Iowa; Mingusville, Montana.

Subfamily **POLYGYRINÆ** (vel **Protogona**).

Genus **PRATICOLELLA** v. Martens, 1892.

56. **PRATICOLELLA BERLANDIERIANA** (Moricand). Texas, Anderson and Bosque Counties southward; also Mexico.

57. **PRATICOLELLA GRISEOLA** (Pfr.). Southern-central Texas; also and mainly Mexico, as far south as Vera Cruz.

Genus **POLYGYRA** Say, 1818.

(Typical Section).

58. *POLYGYRA CEREOLUS* (Mühlf.). Florida Keys and the adjacent mainland.

58a. *POLYGYRA CEREOLUS CARPENTERIANA* (Bld.). Florida, mainly on the west coast.

59. *POLYGYRA SEPTEMVOLVA* Say. Central and northeastern Florida.

59a. *POLYGYRA SEPTEMVOLVA SANCTIJOHANNIS* Pils. Valley of the St. John's River.

59b. *POLYGYRA SEPTEMVOLVA VOLVOXIS* (Pfr.). St. Simon's I., Georgia, to Florida and west to New Orleans, La., and Galveston, Texas. (*Poly. febigeri* Bld. is a synonym).

59c. *POLYGYRA SEPTEMVOLVA FLORIDANA* Hemphill. Oyster Bay, Florida.

* * *

60. *POLYGYRA AURICULATA* Say. Indian River region and St. John's valley to Cedar Keys.

60a. *POLYGYRA AURICULATA MICROFORIS* Dall. Johnson's Sink, Alachua Co., Fla.

61. *POLYGYRA UVULIFERA* (Shuttl.). Florida, Key West and Cape Sable north to Tampa Bay; Lake Apopka.

62. *POLYGYRA AURIFORMIS* (Bld.). Comal, Bexar and Burleson Counties, Texas, east to Uniontown, Ala. and Georgia.

63. *POLYGYRA ESPILOCA* ("Rav." Bld.). Sullivan's I., S. C. and St. Simon I., Ga., west to New Orleans, La. and Indianola, Texas.

64. *POLYGYRA POSTELLIANA* (Bld.). Coast counties of Georgia to Baldwin, Florida.

65. *POLYGYRA AVARA* Say. Valley of the St. John's River, Florida.

66. *POLYGYRA PUSTULA* (Fér.). South Carolina and Lee Co., Ga., south to St. Augustine and Cedar Keys, Florida.

67. *POLYGYRA PUSTULOIDES* (Bld.). St. Simon I., Ga., west to eastern Tennessee and Jackson Co., Ala.

68. *POLYGYRA LEPORINA* (Gld.). Henry Co., Indiana, through Ky. and Tenn. to Ga.; Cape Girardeau and Barry Counties, Mo., south and southwest to Ft. Gibson, Ind. Terr., and Anderson, Lee, Washington, and Ft. Bend Counties, Texas. The only typical *Polygyra* extending north of the Ohio River.

(To be Continued.)



THE NAUTILUS.

VOL. XI.

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No. 7.

NEW SPECIES OF MEXICAN LAND SHELLS.

BY W. H. DALL.

Helix (*Lysinoe*) *Queretaroana* n. sp.

Shell large, rugose, with a pale yellow-brown periostracum over a livid whitish, finely granular surface; whorls five, sloping above, with a well marked suture, to a rather elevated narrow apex; below rounded; nuclear whorl and a half smooth, perhaps with microscopic punctuations when unworn; the rest of the surface rugose from irregular incremental lines and densely covered with minute rounded pustules; apex with a few darker flecks on the whitish ground, but otherwise the shell is destitute of color pattern and entirely without banding; aperture ample, oblique, outer lip simple, not reflected, internally somewhat thickened by a livid rose-colored callus; inner lip rose color, reflected, nearly covering a small perforate umbilicus; throat brownish, deeper just below the suture on the body whorl, a thin callus connecting the somewhat incurved outer lip with the pillar; base turgid, rounded. Alt. 37, max. diam. 39, min. diam. 32 mm.

Pinal de Amoles, Queretaro, Mexico, E. W. Nelson.

This fine species is related to *H. Humboldtiana*, from which it is easily distinguished by its color, more pointed spire and less depressed apex. The rose color of the interior becomes less bright with time.

Helix (*Lysinoe*) *sebastiana* n. sp.

Shell large, moderately depressed, of four and a half whorls, with a well marked suture; nepionic whorls two, smooth, plum colored;

subsequent whorls obliquely flattened above, full and rounded below; surface marked only with incremental lines and irregular minute vermiculations in general harmony therewith; color a dark plum hue, which where covered by the brownish epidermis appears nearly black; at the periphery a narrow white or yellowish band, above it two narrower, nearly equidistant smaller ones, that nearer the suture more or less obscure on the last whorl; the whitish bands are visible inside the aperture, the rest of the shell is dark; aperture ample, produced above, the lip slightly thickened, the pillar broadly reflected over a moderate umbilicus. Alt. 30, max. diam. 40, min. diam. 32 mm.

This species is more depressed than *H. eximia*, and has one less whorl, a darker base and less reflection of the peristome. The granulation is rather sparse and very irregular.

Near San Sebastian, Jalisco, Mexico, Nelson.

Polygyra Nelsoni n. sp.

Shell dark brown, of five and a half rather depressed whorls; suture distinct, surface with well-marked even riblets, separated by wider interspaces, except on the nepionic shell which is smooth, and of two whorls; periphery above the middle of the whorl, base rounded with a deep subcylindrical umbilicus; aperture depressed above, with a wide, reflected, white peristome; basal lip with two well developed teeth and wide callus on the inner edge of the peristome outside of the outer tooth; body with a long sigmoid or nearly V-shaped tooth nearly parallel with the basal lip. Alt. 7.2, maj. diam. 14.5, min. diam. 12.0 mm.

With the last. This species differs from *P. matermontana* Pils. (from Colima) by its coarser ribbing, larger size and smaller umbilicus, the peristome is also more oblong. *P. plagioglossa* Pfr. is smaller with a rounder aperture. A smaller relatively more elevated variety, *collisella*, alt. 7, maj. diam. 11, min. diam. 9.5 mm., was found at San Sebastian and La Laguna, Jalisco, by Nelson. The latter is on the Sierra de Guanacatlan.

DESCRIPTION OF A NEW VARIETY OF LAND SHELL FROM IDAHO.

BY HENRY HEMPHILL.

Helix devia variety *Clappi* Hemphill.

Shell very much depressed; light horn-color; striæ of growth very fine with occasional coarser ones at irregular intervals on some

of the specimens; epidermis thin, a little brownish in color, and appearing very minutely hirsute in some shades of light under a strong pocket lens; whorls about five, the last flatly convex not descending at its termination, or very little in the largest specimens; spire depressed, very little elevated above the plane of the shell; suture distinct and well defined; aperture transversely lunar, a little flattened beneath; peristome reflected, moderately thickened, with a faint, long lamellar basal deposit on its inner edge, sometimes absent; parietal wall bearing a small white rather sharp-pointed denticle just within the aperture and near the termination of the upper lip, rarely absent; lower surface of the shell flatly convex, with a deep broad umbilicus showing a portion of the penultimate whorl.

Greater diam. of the largest specimen, 15, lesser 12 mm.

Greater diam. of the smallest specimen, 11, lesser 9 mm.

Height of the largest specimen, 5 mm.

Height of the smallest specimen, 3 mm.

Habitat, Salmon River Mts., Idaho.

This interesting form belongs to a large and very variable, but closely related group of shells that has a wide geographical range, some of its members inhabiting every state and territory of the United States, and even passing beyond its limits. The west coast forms of this group revolve around *Helix devius* Gld., as a common centre, and radiate from it in every direction, greatly but gradually diminishing in size, increasing, decreasing, diminishing and varying in the number, size and form of the apertural denticles, and with all the intermediate stages of a broad open, to a closely sealed umbilicus. Our new variety differs from all the other known forms of this group of shells, by the combination of its very depressed spire, basal lamellar deposit, and its large umbilicus. Its nearest ally is variety *Blandi*, from which it is separated by the basal deposit and larger umbilicus.

I take much pleasure in dedicating this form to my young friend, Mr. Geo. H. Clapp, of Pittsburg, Pa., an intelligent student and enthusiastic collector of American land shells.

NOTES ON SLUGS.

BY T. D. A. COCKERELL.

My esteemed friend, Mr. Pilsbry, in conjunction with Mr. Vanatta, has favored us with the first part of a "Revision of North

American Slugs," which is, in all respects, a most valuable and timely production.

As might be supposed, the authors find it necessary to criticise their predecessors in the study—just as, no doubt, their successors will criticise them. But whatever criticism may be offered, it will always be recognized that they put our slugs on a sounder basis than before, supposing that they finish the work so well begun.

Nevertheless, if they are not careful, they are liable to be troubled by the the shades of the departed; and they have, in fact, woke out of his malacological grave the present writer, who has a few posthumous observations to make herewith.

Ariolimax californicus.

In Nov., 1889, Mr. H. F. Wickham sent me two examples of this species, which he found at Los Gatos, California. I have before me the drawings I then made of their internal anatomy, which agree with those of Messrs. Pilsbry and Vanatta, except that the epiphallus is less swollen and the retractor penis is not so broad. The epiphallus is clearly shown running to the end of the so-called "flagellum" of the penis; so that this point in the anatomy, which our authors seem to think they were the first to observe, was known to me long ago. Of course they could not be supposed to know anything about an unpublished observation, but had they carefully examined the literature, they would have read Simroth's statement: "Herr Cockerell fand, nach brieflicher Mittheilung, dass ein echtes Flagellum nicht vorhanden ist, sondern dass das vas deferens sich bis zu dessen blinden Ende verfolgen lässt." (Malak. Bl., N. F., XI, p. 114). They might also have observed fig. H, pl. V, of W. G. Binney's 3d Suppt., which, though rather rough, is practically correct. Binney himself says the vas deferens "enters the penis at the end of the flagellum below the bulb," (Man. Amer. Land Shells, p. 100), which cannot be considered far wrong. Simroth's figure in Mal. Bl. is, however, unquestionably wrong as to this matter, supposing that he had real *californicus* before him.

Our authors assume that *californicus* f. *maculatus* is really *columbianus*, on the wholly insufficient grounds that they have never seen spotted *californicus*. Yet they may be correct, as I never had a spotted *californicus* I could dissect. My notes on the British Museum specimens are as follows:—

"*Ariolimax californicus*, from W. G. Binney. Big spot on mantle. 45 mm. long.

"*Ariolimax columbianus*, from W. G. Binney, 45 mm. long.

"Really, there is no external difference between these slugs!—at least, nothing specific. *Californicus* is more keeled, and has a narrower sole (sole lat. of *cal.* 11, of *columb.* 13 mm.). Sole of *columb.* is unicolor grayish ochre, that of *calif.* has lateral tracts grayer; both are transversely wrinkled. Reticulations on body appear to me to be the same. In color both are ochreous, *columb.* has black mottling on body (v. *maculatus* Ckll.); *calif.* has similar black marbling on body, but mantle, instead of being unicolor, has a large black spot, diam. 6 mm., over place of shell (v. *maculatus*, nov.). This spot on mantle is in fig. of *columb. mac.* in Binney, Pl. vi, f. A." (Ckll. MSS.).

Ariolimax costaricensis.

Here again our authors must be convicted of hasty judgment. They complain that there is nothing in the description to identify the slug, except the locality; but they overlook the peculiar olivaceous color. British Museum slugs are not permitted to be dissected, and I gave the best account of the creature I could under the circumstances. It is to *californicus* much what *Parmacella* var. *olivacea* is to *P. maculata*, or *Anadenus schlagintweiti* to *A. altivagus*. Whether it is a good species or only a color variety cannot at present be determined, but at least it will be easily recognizable.

Prophysaon.

In their introductory remarks, our authors allude to the difficulty of identifying West Coast slugs. I believe this difficulty is by no means a serious one, if one is familiar with the literature, and will exclude certain forms which are probably not distinct. The following table may help to separate the recognized species of *Prophysaon* :—

- (1.) Epiphallus stout, sausage-shaped. A pale dorsal stripe.
 - a. Ochreous species, *P. pacificum* (incl. *flavum*).
 - b. Grayish species, *P. andersoni* (incl. *hemphilli*).
- (2.) Epiphallus banana-shaped, but tapering at the end. No pale dorsal stripe, . . . *P. caeruleum* (Epiphallus rather slender, flattish, tapering, somewhat curved. Shell 2 mm. long, narrow, white, shiny).
- (3.) Epiphallus slender, gradually tapering to a point. Body with a blackish dorsal band.

- a. Jaw ribbed, *P. fasciatum*.
 b. Jaw only striate, . . . *P. humile*. (Until more material of *humile* is seen, it cannot be made sure that the jaw-character is a specific one.)

My present opinion is that *Phenacarion* must be merged in *Prophysaon* s. str.

In order to further elucidate some of the forms of *Prophysaon*, I give below some of my notes, made years ago, but not published at the time.

Prophysaon hemphilli W. G. Binney (as *Phenacarion*).

This must not be confounded with *P. hemphilli* B. and B., which I consider specifically identical with *andersoni*. I know little more about it than may be gathered from Mr. Binney's account. Mr. Binney sent me one from near the mouth of the Chehalis River, and I noted at the time: looks like type *foliolatus* in alcohol. Sole pale yellowish white. Edge of foot dark, with darker transverse lines. Body bluish-gray, tapering; mantle more brownish.

Prophysaon foliolatum (*Arion foliolatus* Gld.).

Comparing this with *P. hemphilli* B. & B., I noted:—Sole white, oblique transverse grooves visible. Transverse dark streaks on edge of sole more strongly marked, alternating strong and weak. Body exactly the same color (in alcohol) as *hemphilli* B. & B. Pale dorsal line very slightly indicated. Reticulations practically as in *hemphilli*, but foliations more distinct. Mantle not so dark and brownish-tinged; bands represented by subcoalesced black marks; black spots scattered about. As I wrote in *An. Mag. N. Hist.*, 1890, "it is most difficult to separate *P. foliolatum* and *Proph. hemphilli* (i. e. *andersoni*) specifically." An alcoholic example of *hemphilli* differed from *foliolatum* as under—

Prophysaon hemphilli B. & B.

Sole slightly yellowish, only wrinkled transversely. Marks on edge of sole quite similar, but not so well marked. Body purplish mouse-color, i. e., gray with a lilac tinge. Mantle dark, with indistinct "smoke colored band." Body tapering. No mucus pore. A pale dorsal line is barely indicated just behind mantle to half length of back. Slug 42 mm. long.

Prophysaon andersoni (Cooper).

An alcoholic from Olympia was described thus:—Twenty-four mm. long. Sole yellowish-white. Oblique grooves as in *foliolatus*. Markings on edge of sole as in *hemphilli* B. & B., but not so dark. Body same color as *hemphilli*, but paler at sides; in fact, white above sole at sides. Reticulations as in *hemphilli*, showing out lilac-gray on the whitish sides. Pale (rather brownish) dorsal line. No indication of any keel. Body much less tapering than in *hemphilli*. No mucus pore. Mantle smaller and more rounded at ends than in *hemphilli*, decidedly brownish, its edges pale. There are indistinct subdorsal bands on mantle. Otestis imbedded in liver; in *fasciatum* it is visible without moving liver.

A living *P. andersoni* from Haywards, California, sent by Dr. Cooper, agreed with the above, but differed in its mantle, which was not brown but grayish, heavily marbled with dark gray dorsally, so as to appear almost uniform blackish, and at sides with dark gray or blackish marbling showing out plain on the pale ground. The surface of the mantle is beautifully beaded-granular. The pale dorsal line is brownish tinged, thus differing from the rest of the body.

The epiphallus of *P. andersoni* v. *suffusa*, from Chehalis, Wash., is very stout, shorter than that of typical *andersoni*.

Prophysaon humile.

A Cœur d'Alene example, compared with *fasciatum*, differs thus:—Sole gray instead of yellowish. Transverse wrinkles not oblique. Grooves on edge not dark. Reticulation practically the same. Dorsal band on body much reduced. Ground color grayish.

Prophysaon fasciatum.

Specimens in alcohol were sometimes tinged with scarlet, but I could not be sure whether this was natural or due to some accidental staining.

In conclusion, I hope it will not be supposed that all the characters above given are believed by the writer to be specific. The purpose is, simply to point out differences between the specimens which have been differently named, without deciding how far those differences are specific. In my Check-List of Slugs, and elsewhere, I have indicated my opinion about the species as such.

Mesilla, New Mexico, Sept. 15, 1896.



ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

For the benefit of our new members I will say that while the *Popular Science News* is the official organ of the Agassiz Association, THE NAUTILUS is the official organ of our Conchological Chapter.

Please bear in mind the annual reports and dues are to be sent in next month. This department is made up from the reports of our members. Let us make this year's volume of Transactions the best we have ever had.

The volume when last heard from had just been forwarded by Mr. Hilles Smith to Mr. James H. Lemon, Toronto, Ontario. The book has "gone the rounds" rather slowly this year.

COLLECTING DURING THE SUMMER OF '96.

[Extract from the report of Mr. H. Howe. From the Transactions of the Isaac Lea Chapter for 1896].

During the summer months I collected around San Pedro and Long Beech. A very pretty and rather rare shell is the *Actæon punctoculatus* Cpr., commonly called the "barrel shell." It may be found alive during June, July and August, at the roots of the eel-grass where it comes to breed. The eggs are almost microscopic and are laid in coiled masses about one inch in length, which is twice the size of the entire Mollusk shell and all. The *Actæon* (also called *Rictaxis*) lives in deep water and can only be collected during the breeding season.

In August I made a trip to Anaheim Landing in company with a friend, also a collector. As the low tide occurred at four o'clock in the morning (and we live about ten miles away) we had to start at two o'clock in the morning. On arriving at our collecting ground we set to work and soon had excavated several fine *Glycymeris generosa* and *Schizothaerus Nuttalli*. These are about the hardest shells to collect that I know of, for they live from two to three feet down in the mud. In the soft clay we dug out some fine *Pholis pacifica* and *Zirphæa crispata*, *Bulla nebulosa* and *Pecten æquisulcatus*, were very large and plentiful. At this place I found my first live *Nassa perpinguis*. When hunting for the burrows of

the Glycimeris, unless an expert, one is apt at the end of his search, to be very much disgusted at finding instead of the desired mollusks, nothing but a "sea cucumber."

At San Pedro I secured a dozen or more living specimens of *Chrysodomus Kelletii*, brought in from deep water by a fisherman, and, collected on the mud-flats a few *Trophon Belcheri* and a large *Maetra Hemphillii*.

In the pholas bed at San Pedro I found some large specimens of *Adula stylina* and *Lithophagus plumula*, three young *Parapholas Californica* and a few specimens of *Nettastomella Darwinii*, a little borer about three-fourths of an inch long and gaping widely at the posterior end.

After a heavy tide at Long Beach one may collect occasional specimens of *Periploma planiuscula* Sby., *Clidiophora punctata* and odd valves of *Raeta undulata* and *Yoldia Cooperi*.

While on a camping trip this summer to Maliban Ranch, a rocky strip of sea coast about twenty miles north of Santa Monica, I collected my first specimens of *Lasea rubra*. It is a tiny bivalve about the size of a pin-head, and the smallest Pelecypod on this coast. I found them on the byssus of *Mytilus Californicus*. On the same rocks with, and feeding on the *Mytilus* I found a fine series of *Purpura saxicola* the largest and most beautiful I have seen. In color they varied from white and orange to jet black, some striped, some plain, others smooth, and still often slightly roughened. I think this is about the only place in Los Angeles County where *Purpuras* are to be found. (Two or three collectors have found *Purpuras* at Portuguese Bend, in Los Angeles County. *Purpura saxicola* and *Purpura lima* var. *emarginata*, are synonymous terms used for one of our California *purpuras*. The shell figured in "West Coast Shells" as *P. lima* refers to another shell.—M. B. W.).

NOTES AND NEWS.

In *L'Echange* for June, 1897, p. 46, Mr. Locard establishes a new genus *Assiminopsis* for the new *A. abyssorum*, from the Atlantic south of Portugal in 1,205 metres depth. It is probably Rissoid.

M. Jules Mabille's "Observations sur le genre *Bulla*" in Bull. Soc. Philomathique de Paris, 1895-96 (published in 1897), is prac-

tically a monograph of the group, although there are numerous omissions. *B. ampulla* is split into several species formerly (and justly) regarded as varieties. *B. vernicosa* Gould is described as new under the name "*B. secunda*." *B. adamsi* Mke., which has already had several synonyms, figures as "*B. subaustralis* sp. nov." *B. dubiosa*, habitat unknown, and *B. delorti*, Japan, are also described as new. The first is certainly well named. In all 23 species are mentioned, this number including several not entitled to that rank. In the monograph published in Manual of Conchology, 1894, there are 32, not counting "bad" species.

In his "*Contributions a la Connaissance des Mollusques Terrestres et d'Eau Douce de Kaméroun*,"¹ Mr. Adolf d'Ailly has made a substantial addition to the rather meagre literature of west African land shells. The shells described were collected by three Swedish naturalists, Mr. P. Duzén and Drs. Y. Sjöstedt and J. R. Jungner. The Cameroon fauna is rich in species of *Ennea*, 17 being enumerated, 8 of them new. The Zonitoid genera *Helicarion*, *Zonitarion*, *Thapsia* and *Trochozonites* are represented by numerous species with many new forms. In the *Achatinide* a new genus, *Ganomidos*, is proposed for *Achatina Shuttleworthi* Pfr. and *A. Barriana* Sowb. The genus *Petitia* Jousseume (of tautologic fame) is recognized for *Achatina pulchella* Martens, of which *Petitia Petitia* Jous. and *Ach. Smithi* Sowb. are reckoned synonyms. *Pseudachatina*, *Perideris* and *Limicolaria* are well represented. M. d'Ailly has independently arrived at the conclusion that the sculpture of the embryonic shell is frequently a character of high value in the Pulmonate snails. Five well-drawn lithographic plates illustrate the new species described.

VALLONIA PARVULA AND PUPA HOLZINGERI.—In the October NAUTILUS just received to-day I notice that *Vallonia parvula* Sterki, is not given as occurring east of Illinois. In the summer of 1891 I discovered this species on Put-in Bay Island, Lake Erie. The specimens were submitted to Dr. Sterki, and determined by him. Associated with it was *Pupa Holzingeri* Sterki, which is also a Mississippi Valley form. The occurrence of these two species so far east may be of interest to you.—BRYANT WALKER.

¹ In Bihang till K. Svenska Vet.-Akad. Handl. Bd. 22.

POLYGYRA PLICATA Say. Kentucky, Tennessee and the adjacent parts of Georgia and Alabama. *Helix hazardi* Bld. is synonymous. The name *plicata* was not preoccupied in *Polygyra*, to which genus Say originally referred this species.

POLYGYRA DORFEULLIANA Lea. Washington to Cooke Counties, Texas, through Indian Territory, Ark., La. to the Coosa River, Ala., north to Arkansas City, Kansas, Benton County, Mo., and Kentucky opposite Cincinnati.

POLYGYRA DORFEULLIANA SAMPSONI Wetherby. Texas, Indian Terr., Mo., Ark.

POLYGYRA FASTIGIATA Say. Henry Co., Ky. to Montgomery and Franklin Counties, Tenn. *Helix fastigans* Lucy Say in Bld., is a synonym.

POLYGYRA JACKSONI (Bld.). Indian Territory, Ark., and Mo. north to Camden Co.

POLYGYRA JACKSONI DELTOIDEA Simpson. Fort Gibson, Indian Territory.

POLYGYRA TROOSTIANA Lea. Tennessee, Kentucky.

* * *

POLYGYRA OPPILATA (Moric). Cedar Keys (Binney). A southern Mexican and Yucatan species, the occurrence of which in Florida requires confirmation.

POLYGYRA MOOREANA (W. G. Binney). Central and southern Texas.

POLYGYRA MOOREANA THOLUS (W. G. B.). Washington County, Texas.

POLYGYRA BICRURIS (Pfr.). Brownsville and mouth of Rio Grande River, Texas. A Mexican species.

POLYGYRA VENTROSULA (Pfr.). A species of northwestern Mexico, reported from Texas by Binney.

POLYGYRA VENTROSULA HINDSI (Pfr.). Texas, according to Binney.

POLYGYRA MATERMONTANA Pils. Texas; also Sierra Madre, Mexico.

POLYGYRA TEXASIANA (Moric). Indian Territory and throughout Texas.

POLYGYRA TRIODONTOIDES (Bld.). Barry Co., Mo., Indian Territory, southwestern Louisiana, south to Corpus Christi, Texas.

POLYGYRA LATISPIRA Pils. Western Texas.

POLYGYRA ARIADNÆ (Pfr.). Texas, on the Rio Grande, according to Binney.

POLYGYRA HIPPOCREPIS (Pfr.). Near New Braunfels, Comal Co., Texas.

POLYGYRA LEVETTEI (Bld.). New Mexico, Santa Fé Canyon, near Santa Fé; Arizona, near Tucson; Fort Huachuca, Huachuca Mts.

POLYGYRA LEVETTEI THOMSONIANA Aucey (var. *orobæna* Anc. is probably not distinct).

POLYGYRA CHIRICAHUANA Dall. Arizona near Tucson, Fly Park, Chiricahua Mts., Cochise Co., at 10,000 ft. alt.; New Mexico, Jemez Mts. near Bland, and at Jemez Sulphur Spring, 8-10,000 ft. above the sea.

POLYGYRA ASHUNI Dall. Bland, New Mexico.

POLYGYRA PSEUDODONTA Dall. White Oaks, New Mexico.

POLYGYRA RHYSSA DALL. White Mountains of New Mexico.

POLYGYRA MEARNSHI Dall. Huachuca Mts., Arizona, and Hachita Grande Mt., Grant Co., New Mexico, at 8,000 to 9,400 ft. altitude. Also Filmore Canyon, Organ Mts.

Section *Triodopsis* Rafinesque.

POLYGYRA TRIDENTATA (Say). Canada to Michigan, south to northern Alabama.

POLYGYRA TRIDENTATA JXTIDENS Pils. Southern New York to North Carolina and West Virginia.

POLYGYRA TRIDENTATA EDENTILABRIS Pils. Cumberland Mts.

POLYGYRA TRIDENTATA COMPLANATA Pils. Burnside, Ky.

POLYGYRA FRAUDULENTA Pils. (*Helix fallax* of authors, not Say). Ontario, Canada, to Michigan and Illinois, south to Georgia.

POLYGYRA FALLAX (Say). (*Helix introferens* Bld.). Eastern Pennsylvania and New Jersey from Philadelphia southward to Fanning Co., Ga.; Holston Valley, Tenn.; W. Va.

POLYGYRA FALLAX OBSOLETA Pils. Newbern, N. C.

POLYGYRA HOPETONENSIS (Shuttl.). Newbern, N. C. to Georgia Sea Is. and Mayport, Fla., west to Cedar Keys, Fla.

POLYGYRA VANNOSTRANDI (Bld.). Aiken, S. C.; Augusta, Ga.; Jacksonville, Fla.

POLYGYRA VULTUOSA (Gld.). Eastern Texas and Indian Terr., north to Pettis Co., Mo.

POLYGYRA VULTUOSA HENRIETTE (Mazyck). Angelina, Lee and Robertson Counties, Texas.

POLYGYRA VULTUOSA COPEI Weth. Hardin Co., eastern Texas, Calcasieu Parish, La.

POLYGYRA VULTUOSA CRAGINI (Call). Neosha and Bourbon Counties, Kansas; Eureka Springs, Ark.; Wood Co., Texas.

(To be Continued.)



THE NAUTILUS.

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No. 8.

NEW WEST AMERICAN SHELLS.

BY W. H. DALL.

Sigaretus Oldroydii Dall, n. sp.

Shell large, thin, naticoid, with a short spire and 3-4 inflated whorls; color pale brown, livid on the spire, fading to waxen on the base; surface sculptured with extremely fine wavy spiral striæ; aperture ample, oblique, the outer lip thin, a little patulous, the body covered with a thin callus, the pillar lip obliquely cut away, wide near the junction with the body, the basal part of the margin receding; umbilicus large, pervious, its walls covered with a thin, silky, brown wrinkled epidermis. Alt. 35, diam. 37 mm.

A single specimen in deep water off Catalina Id., Cala., collected by Mr. and Mrs. T. S. Oldroyd.

This species is easily distinguished from any other recorded, by its very thin shell, naticoid form and wide pervious umbilicus.

Pecten Palmeri Dall, n. sp.

Shell thin, orbicular, compressed, equilateral, white to yellowish-brown, with concentric or zig-zag narrow bands or flecks of dark rose color; 15 strong ribs rounded in the young, mesially keeled and longitudinally threaded in the adult, separated by narrower channelled interspaces, each with a mesial thread; all crossed by lamellose, concentric, rather sparsely distributed elevated lines; sub-margins and ears closely radially threaded with imbricated threads. Both valves similarly sculptured; alt. 47.5, lat. 53, diameter about 20 mm.

A number of valves collected near the head of the Gulf of Cala. by Dr. E. Palmer some years ago.

Pecten Randolphi Dall, n. sp.

Shell small, thin, glassy, unsculptured, except by minute "camp-tonectes" striation which covers both valves, and more or less obscure concentric undulations which are most distinct on the right valve near the umbo, and in some specimens altogether absent; hinge straight and short, anterior ears distinct, posterior ears not defined by any fold or sinus, outline suborbicular, valves compressed, especially the right one; right anterior ear with six small imbricated radii above, below a wide, transversely striated fasciole derived from a well marked byssal sinus; ctenolium with four or five functional spines. Alt. 27·5, lat. 26, diam. 5 mm.

Off Destruction Island, State of Washington, in 516 fathoms, bottom temperature, 38° Fahr., U. S. Fish Commission.

This species was obtained at a number of stations, from Bering Sea to West Mexico, in 225 to 1005 fathoms. It is named in honor of Mr. P. B. Randolph, of Seattle, who has done excellent work on the Puget Sound fauna.

Pecten Davidsoni Dall, n. sp.

Shell small, suborbicular, compressed, waxen white, the left valve with 21 rounded ribs, surmounted by (when not worn off) continuous rows of minute subglobular scales, the interspaces wider, flat and perfectly smooth, ears very small, the anterior with five or six imbricated radii; sculpture obsolete near the umbones; right valve sculptured with faint concentric impressed lines over the whole surface, and distally with numerous minute, obsolete, fine, scaly riblets; posterior ear transversely striated, very small, anterior one with four or five scaly radii, a well marked sinus leaving an imbricated fasciole and no ctenolium. Interior polished, the left valve fluted internally in harmony with the external ribs. Alt. 14, lat. 14, diam. 3·5 mm.

On the Davidson Bank, Alaska, in 280 fathoms, green mud, and north of Unalashka, in Bering Sea, in 351 fathoms, sand; U. S. Fish Commission.

This little shell resembles somewhat *P. (Propeamusium) alaskensis* Dall, externally, but wants the radiating liræ internally, is smaller, and has faint radiating sculpture on the right valve, which is wanting in *P. alaskensis*.

NOTE ON TWO SPECIES OF HELICINA.

BY C. F. ANCEY.

1. *Helicina Rabei* Pils., recently described in the NAUTILUS from specimens collected by Dr. Rabe, must be the same as the previously described *H. rufocallosa* Anc., based on the examples long ago distributed by Dr. J. D. E. Schmeltz, of the Museum Godeffroy, under the erroneous name of *H. Fischeriana*¹ Montr. (which may be identical with "*H. Picheriana*" of Paetel's Catalogue). The species is from Peleliu, Pelew Islands, and the color is very variable. The type specimen is grayish with a red basal callosity, but I have, since I published *H. rufocallosa*, procured other specimens having different shades of coloring.

2. *Helicina Funcki* Pfeiffer, originally described from New Granada (Funck), is also found at Greytown, Nicaragua. It has also been detected on Monkey Hill, near Colon, Isthmus of Panama, by Mr. Aillaud. The size of the two specimens collected in the latter spot is different, one of them being considerably smaller and tinged with pink-red on the last whorl.

OXYCHONA UNMASKED.

BY H. A. PILSBRY.

Those who have interested themselves in South American land shells will recall the group *Oxychona* of Mörch, containing a few acutely keeled, trochus-shaped Brazilian species, the best known of which is *Helix bifasciata* Burrow.

In Costa Rica and southern and eastern Mexico there are some similar *Helices* which had been placed in *Geotrochus*, *Corasia*, etc., but which the present writer in 1889² transferred to *Oxychona*. This disposition also commended itself to von Martens, who in 1893,² adopts the same view. In my "Guide to the Study of *Helices*," 1894, no doubt was expressed regarding the alliance of the

¹ The true *Fischeriana* is a larger shell, allied to *rufocallosa* (= *Rabei*) and is probably confined to the islands near eastern New Guinea.

² Man. Conch. (2), v, p. 128.

³ Biol. Centr. Americana, Moll., p. 152.



Brazilian and Mexican species, and by the kindness of Professor Gwatkin, of Cambridge, England, who supplied a mounted preparation, I was enabled to figure the jaw and teeth of *Helix bifasciata*, the type of *Oxychona*, and up to this time, the only species of the group to be dissected. At that time I called attention to the resemblance in dentition between *Oxychona*, *Papuina*, *Polymita* and other arboreal Helices, ending with an allusion to the teeth of *Otostomus* (now known as *Drymæus aurisleporis*). Recently while studying the *aurisleporis* group of Bulimi, I was again struck with the extreme resemblance of their radulæ to that of *Oxychona*. Now; since my former examination of *Oxychona*, the study of Bulimulid groups has been revolutionized by the discovery of extremely characteristic generic and subgeneric characters in the sculpture of the nepionic shell, as the part formed within the egg is called; so that I at once examined the apex of the *Oxychona*. *The lens revealed in H. bifasciata and the other Brazilian species, the minutely "grated" sculpture of Drymæus!* This combination of the very characteristic and peculiar nepionic sculpture of *Drymæus*⁴ with the equally characteristic dentition, conclusively show that *Oxychona* is a *Drymæus* masquerading as a *Helix*. The Central American and Mexican species referred to *Oxychona* have *smooth apices*, very different from the Brazilian group. There can be little doubt that these are true Helicidæ; and as they must now be cut adrift from *Oxychona*, I propose to reinstate for their reception the group name *Leptarionta* Crosse & Fischer, based upon *Helix bicincta* Pfr. This will stand as a genus, and may still be left in my group *Belogona euadenia* (dart bearers with true glands), next to *Lysinoe*, until more is known of the soft parts. At least one of the species, *L. trigonostoma*, is known to have a serrate keel on the tail like *Lysinoe*.

Figures of the apices of *Oxychona* and its Bulimulid allies may be found in the current volume of the Manual of Conchology. The evidence supplied by Semper, Hedley and myself that true Helices often appear disguised as Bulimi, now finds its counterpart in the *Bulimulidæ*, in such Helicoid species as *Bulimulus eremothauma* Pils., and that worst cheat of all, *Drymæus (Oxychona) bifasciatus* Burrow.

⁴ *Drymæus* includes not only the *Aurisleporis* group and the flaring lipped Bulimuli like *serperastus*, but also "*Bulimulus*" *dormani* and *multilineatus* among Floridian species, either of which, if unworn, will show the apical sculpture alluded to under a sufficiently strong lens. See NAUTILUS, IX p. 114.

ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

A number of good reports have been promised. The volume of Transactions has been forwarded by Mrs. Mary P. Olney to Mrs. Drake, who will forward it to Mrs. King at Napa, Cal. By that time all our members will have received it.

In the November NAUTILUS Mr. Herbert Lowe's name appeared as "Howe" in the article on "Collecting During the Summer of '96."

The following nominations have been made for the officers of the Chapter for 1898: for President, Prof. Josiah Keep; for General Secretary, Dr. Wm. S. Strode.

Dr. William Healey Dall has named a new shell collected in Alaskan waters *Crenella Leana*, in honor of Dr. Isaac Lea, for whom our Chapter was named. The shell, a little bivalve, is described in a Bulletin issued by the Natural History Society of British Columbia, entitled "*Notice of Some New or Interesting Species of Shells from British Columbia and the Adjacent Region*," by William Healey Dall, Hon. Curator Dept. of Mollusks, U. S. National Museum. The Bulletin contains 18 pages, 2 plates, with 38 figures, and an index to all species mentioned in the text. Of the 30 species figured in this pamphlet, 27 are Dr. Dall's species, 23 are new species and 4 have been described by him but not figured in THE NAUTILUS. *Ledu taphria* Dall, known on the West Coast as *L. celata* Hinds (non Conrad) is figured.—The October NAUTILUS for 1896, contains a note on this species.—The genus *Malletia* is for "the first time recorded from the northwest coast of America."

MORNING TIDES.

[From the report of Mrs. M. L. Beck. From the Transactions of the Isaac Chapter for 1896].

One bright day in June I was told we were to go collecting the next day at San Pedro, and as the tide would be low at half past three in the morning, we would have to go to the beach the evening before and stay all night at the cabin on the island. * * We ate supper, and while two of us got things ready for the night, the

rest went out on the breakwater to admire the scene. The high tide by moonlight was exquisitely beautiful.

At three o'clock, after having breakfasted, we started out to collect while the moon was still shining brightly on the water. The tide was so low it seemed to me we could have walked over to San Pedro. Mrs. O. and I lingered back of the other collectors, and soon she picked up a *Ranella californica* Hds., a fine specimen which now has a corner in my cabinet. How I did wish I could find one. I poked around with my trowel and suddenly I struck a lump; picking it up, it proved to be a perfect specimen of *Pleurotoma carpenteriana* Gabb, four and a quarter inches long. As I was afterward told, the only live one found in the bay. After returning to the cabin we put it in water, and when disturbed it exuded a purple fluid.

We walked to Dead Man's Island and found a number of *Actæon punctocelatus* Cpr. in the pools, *Marginella Jewettii* Cpr., *Phasianella compta* Gld. clinging to the sea grass on the rocks; plenty of *Fissurella volcano*, *Chlorostoma aureotinctum* and *Littorina planaxis* all along the breakwater. On our way back to the cabin we collected *Haminea virescens* Sby., *Bulla nebulosa* Gld., *Conus californicus* Hds. and *Nassa tegula* Rve. We also brought home a good many Chione, from which we made delicious soup.

In July we went to Alamitos Bay, five miles from Long Beach; it was another fine low tide. This time seven of us went in a wagon at four o'clock in the morning. We found *Crucibulum spinosum* Sby. on oyster shells, *Cerithidia californica* and *Melampus olivaceus* crawling up the grass stalks near the edge of the water, *Edalia subdiaphana*, *Angulus variegatus*, *Liocardium substriatum* and *Donax flexuosus* living as it seemed in harmony together, also *Amiantis callosa* Conr., *Tapes staminea* Conr., *Olivella batika* Cpr., and many other shells.

NOTES AND NEWS.

MOLLUSCAN FAUNA OF FRESHWATER LAKES IN CENTRAL CELEBES.—Herrn P. and F. Sarasin direct attention to the remarkable molluscs which live in the large and deep inland lakes of Celebes. The forms they were able to capture point to the existence of a fauna perhaps as interesting as that of the Lake of Baikal.

The authors begin with the new Gasteropod *Miratesta celebensis*, for the reception of which it seems necessary to establish not only a new genus, but a new family (Miratestidæ). The structure, which is briefly described, shows a combination of characters distinctive of various families. The animal is nearest the freshwater Pulmonates, especially the Limnæidæ, as is suggested by the *Planorbis*-like structure of the radula, the nervous system without chiastoneury, the hermaphroditism, and the absence of an operculum. But any very close affinity is impossible, as is shown by the large gills, the very peculiar pouched feelers, and the structure of the shell. Distinct relations may, perhaps, be found in the so-called Thalassophilæ (*Amphibola* and *Siphonaria*). In any case, the family is phylogenetically old, near the base of the freshwater Pulmonates.

Bulletin 142 U. S. Geol. Survey, 1896, contains a valuable paper upon the geology and paleontology of northwestern Louisiana by T. Wayland Vaughan. A number of new mollusks from Lower Claiborne and Jackson stages of the Eocene are described and figured.

Mr. Charles Schuchert has given a very useful "Synopsis of American Fossil Brachiopoda, including Bibliography and Synonymy" in Bull. No. 87, U. S. Geol. Survey, 1897. The geological distribution, terminology, biological development and classification are discussed, and a valuable chapter contributed by Prof. Charles E. Beecher treats of the morphology of the brachia, a subject which in Beecher's hands has assumed great importance as an index of phylogeny and rank.

Mr. Félix Bernard has given a very thorough account of the anatomy of *Chlamydoconcha Orcutti* Dall, in *Annales Sciences Naturelles (zool.)*, iv, 1896, pp. 221-252, with 2 plates.

A NEW PLICATE UNIO.

BY BERLIN H. WRIGHT.

Unio Walkeri sp. nov.

Shell solid, ovate, inflated at the umbos, rough, plicate-nodulose on posterior slope and indistinctly so anterior to the umbonal ridge; gradually fading out near the centre of the disk. Umbonal ridge uniformly rounded below and sharply angulate above. Epidermis nearly black; transmitted light showing a light-colored texture. Very faintly marked anterior to the umbonal angle with broad, widely separated, interrupted rays. Posterior margin bluntly rounded or somewhat disposed to biangulation, uniformly rounded before, dorsum arcuate, base nearly straight or emarginate, cavity uniform, moderate and scarcely extending under the dorsal plate. Teeth solid, single in the right and double in the left valve. Anterior cicatrices barely distinct. Thinner behind, showing the plica-

tions through. Nacre livid or bright pink. Width 2 in. length 1 in. diam. $\frac{5}{8}$ in.

Habitat: Suwannee River, Madison Co., Florida.

Remarks: A large series of this peculiar shell shows considerable variation in strength of, and area covered by the plications, sharpness of the umbonal ridge and color of nacre. It cannot, however, be mistaken for any other species. Its natural place is between *Unio subtentus* Say and *Unio penicillatus* Lea. We name it in honor of our esteemed conchologist Mr. Bryant Walker of Detroit, Mich.

POLYGYRA FERRISSI n. sp.

BY H. A. PILSBRY.

Shell resembling *Polygyra dentifera* Binn. in size and general form. Imperforate, thin, glossy, last two whorls of a very bright chestnut color, becoming light green on the earlier whorls. Spire very low, convex. Whorls $4\frac{3}{8}$, all rather convex, the first minutely rugose, granulate, following whorls of the spire slowly widening arcuately striate and sparsely granulate, the granules oblong, generally upon the striae; last whorls rapidly widening, a trifle constricted behind the peristome, very little descending in front, sculptured with fine, rather low striae of growth and very fine, sub-obsolete close spiral impressed lines; base very little impressed at the center. Sutures well impressed throughout. Aperture oblique, wide-crescentic; peristome white, shading through pink to a broad purple band at the margin, *very broad and flatly reflexed*, appressed over and closing the umbilicus; parietal wall with a transparent film between the lips, and bearing a small oblique tooth nearer to the termination of the outer than to that of the basal lip.

Alt. 13, greatest diam. 21.5, least 18 mm.

Alt. 11, greatest diam. 20, least 16.5 mm.

Klingman's Dome and Mirey Ridge, Great Smoky Mountains (between Tenn. and N. C.).

Mr. Jas. H. Ferris found this very beautiful *Helix* during his summer journey in the Great Smoky range this year, with the banded form of *Polygyra Andrewsæ*, a very dark, unicolorated form of the same, *P. Clarkii* of extraordinary size, and other interesting snails.

P. Ferrissi is intermediate between several very distinct *Helices*. It has the convex green and granulate inner whorls of *P. subpalliatæ* Pils., the fragile substance and flat, wide lip of *P. dentifera* Binn., and the sculpture of the last whorl somewhat like *P. appressa perigrapta* Pils.

The combination of these characters, together with the deep, rich reddish chestnut color of the body-whorl, emphatically negative a reference of the specimens to any of these species. The half-grown shell, 14 mm. diam., has an umbilicus 1 mm. wide and is very obsoletely angular at the periphery.

96. POLYGYRA RUGELI (Shuttl.). Wythe Co., Va., south to Columbus, Ga., and west to Clinton, Ark.

97. POLYGYRA INFLECTA (Say). Pennsylvania west of the Allegheny Mts., west to Illinois, south to Sea Islands of Georgia, Alabama, Mississippi and Indian Territory.

98. POLYGYRA EDENTATA (Sampson). Boston Mts., Washington and Crawford Counties, Arkansas (*Triodopsis edentula* W. G. Binney is the same).

* * *

99. POLYGYRA DEVIA (Gld.). Vancouver Is. and Puget Sound region south to 46° N. Lat.

99a. POLYGYRA DEVIA HEMPHILLI (W. G. B.). Kingston and Old Mission, Idaho; Spokane, Wash. (synonyms are *Helix binominata* Tryon, *H. mullani* var. *olneye* Pilsbry).

99b. POLYGYRA DEVIA MULLANI (Bld. & Coop.). Near Coeur d'Alène Mission, Coeur d'Alène Mts., Idaho; west side of Bitter Root Mts., Wash.

99c. POLYGYRA DEVIA HARFORDIANA (W. G. B.). Salmon River, Idaho (*H. salmonensis* Tryon and *H. commutanda* Ancey are synonyms).

99d. POLYGYRA DEVIA CLAPPI (Hemph.). Salmon River, Idaho.

99e. POLYGYRA DEVIA BLANDI (Hemph.). Salmon River, and Post Falls, Idaho.

99f. POLYGYRA DEVIA OREGONENSIS (Hemph.). Eastern Oregon.

100. POLYGYRA SANBURNI (W. G. B.). Kingston and Old Mission, Idaho.

101. POLYGYRA COLUMBIANA (Lea). Sitka to Santa Cruz, Cal.

101a. POLYGYRA COLUMBIANA LABIOSA (Gld.). Coeur d'Alène Mts., Idaho; Deer Lodge Valley, Montana.

102. POLYGYRA ARMIGERA (Ancey). San Francisco, Cal., to Vernon, B. C.

103. POLYGYRA ROPERI Pilsbry. Redding, Shasta Co., California.

104. POLYGYRA LORICATA (Gld.). Eldorado to Fresno Co. west to Sonoma Co.

* * *

105. POLYGYRA PROFUNDA (Say). Western New York to Minnesota and Wyandotte Co., Kansas, south to Lee Co., Va., and Vicksburg, Miss.; not east of the Allegheny Mts. in Pennsylvania and Maryland.

106. POLYGYRA SAYII (Binn.) Quebec, Ont., northern Maine and Mich., south to Great Smoky Mts., N. C.

106a. POLYGYRA SAYII CHILHOWEENSIS (Lewis). Mountains of east Tennessee and western North Carolina.

107. POLYGYRA KIOWAENSIS (Simpson). Kiowa Station, Limestone Gap and near Eufaula, Indian Territory.

107a. POLYGYRA KIOWAENSIS ARKANSÆNSIS Pils., near Hot Springs, Ark.

108. POLYGYRA TOWNSENDIANA (Lea). Del Norte Co., Cal., to Seattle, Wash.

108a. POLYGYRA TOWNSENDIANA PTYCHOPHORA (Brown). Deer Lodge, Montana, west through northern Idaho to Spokane, Wash., and in northern Oregon west to the Dalles. There is a color form, *castanea* Hemph.

* * *

109. POLYGYRA ALBOLABRIS (Say). Canada to Kansas, Arkansas and Georgia. The form *dentata* Walker occurs in Michigan, etc.

109a. POLYGYRA ALBOLABRIS ALLENI Wetherby. Arkansas.

109b. POLYGYRA ALBOLABRIS MARITIMA Pils. New Jersey shore. Var. *traversensis* Leach ms. from Michigan is scarcely distinguishable.

109c. POLYGYRA ALBOLABRIS MAJOR (Binn.) Northern Alabama and eastern Tennessee to North Carolina and Macon, Ga.

110. POLYGYRA EXOLETA (Binn.). Western New York and Pennsylvania to Illinois and Missouri, south to Virginia, Georgia and Alabama.

111. POLYGYRA MULTILINEATA (Say). Western New York to Minnesota and Iowa; Wyandotte, Ks.

112. POLYGYRA DIVESTA (Gld.). Vernon Co., Miss., to Indian Terr.; Louisiana, Arkansas and Barry, Jasper and Dade Counties, Mo.

113. POLYGYRA ROEMERI (Pfr.). Central Texas, Fort Worth to Bexar Co.

114. POLYGYRA WETHERBYI (Bld.) Whitley and Pulaski Co., Ky., and Roane County, Tenn.

115. POLYGYRA DENTIFERA (Binn.). Province of Quebec, Canada, southwest to Swaim Co., N. C.

116. POLYGYRA FERRISSII Pilsbry. Mirey Ridge and Klingman's Dome, Great Smoky Mts.

117. *POLYGYRA SUBPALLIATA* Pils. Roan Mt. region to Cranberry, N. C.

118. *POLYGYRA PALLIATA* (Say). Ontario to Michigan, south to Georgia and Louisiana.

119. *POLYGYRA OBSTRACTA* (Say). Ohio and Indiana south to northwestern Georgia and Batesville, Ark.

119a. *POLYGYRA OBSTRACTA CAROLINENSIS* (Lea). South Carolina; northern Alabama, and adjacent parts of Tennessee and Georgia.

119b. *POLYGYRA SARGENTIANA* (Johnson & Pilsbry). Near Woodville, Alabama. *Helix sargenti* J. & P., not Bld., is a synonym.

119c. *POLYGYRA APPRESSA* (Say). Western Pennsylvania and Scott Co., Virginia, west through Ohio, Indiana, Illinois and Missouri, south to Arkansas and Kentucky.

119d. *POLYGYRA APPRESSA PERIGRAPTA* Pils. Tennessee and adjacent parts of bounding States N., E. and S.

* * *

120. *POLYGYRA ELEVATA* (Say). Western New York to Wisconsin, south to northwestern Georgia and Missouri; Wyandotte, Kansas. The form with a brown band has been called *f. cincta* Taylor. Chattanooga and Knoxville, Tennessee.

121. *POLYGYRA CLARKII* (Lea). Cherokee and Clay Counties, N. C., E. Tennessee, N. W. Georgia.

122. *POLYGYRA PENNSYLVANICA* (Green). Western Pennsylvania to Illinois, S. to Monroe Co., Virginia, and Tennessee.

* * *

123. *POLYGYRA ANDREWSÆ* (W. G. Binn.). Roan and Great Smoky Mts., Tenn., Habersham Co., N.-E. Ga., and Bibb Co., Central Ga.

124. *POLYGYRA THYROIDES* (Say). Canada to Minnesota, south to St. Simons I., Ga., and Texas.

124a. *POLYGYRA THYROIDES PULCHELLA* Klll. Toronto, Canada.

124b. *POLYGYRA THYROIDES BUCCULENTA* (Gld.). Louisiana and Texas. Hardly recognizable as a variety.

125. *POLYGYRA CLAUSA* (Say). Western Pennsylvania to Minnesota, south to Wyandotte, Kansas, Jackson Co., Ala., and Sea Islands of Georgia.

126. *POLYGYRA WHEATLEYI* (Bld.). Mountains of western N. C.; Habersham Co., Ga.

127. *POLYGYRA CHRISTYI* (Bld.). Mountains of Cherokee, Swain and Rutherford Counties, N. C.

128. *POLYGYRA MITCHELLIANA* (Lea). Western Pennsylvania, Ohio and Kentucky, Monroe Co., Va., and Cherokee Co., N. C.

129. *POLYGYRA DOWNIEANA* (Bld.). Whitley Co., Ky.; eastern half of Tennessee.

130. *POLYGYRA LAWÆ* (Lewis). Hayesville, Clay Co., N. C.; Monroe Co., Tenn.; Houston, Hall and Habersham Counties, Ga.

130a. *POLYGYRA LAWÆ TALLULAHENSIS* Pils. Tallulah Falls, Georgia.

131. *POLYGYRA MOBILIANA* (Lea). Mississippi to Baldwin, Florida, along the Gulf.

132. *POLYGYRA JEJUNA* (Say). Savannah, Ga., S. to Indian River and No Name Key; west to Pensacola, Florida.

Section *Stenotrema* Rafinesque.

133. *POLYGYRA SPINOSA* (Lea). Eastern Tennessee, N. Alabama, and northwest Georgia.

134. *POLYGYRA LABROSA* (Bld.). Northern Alabama, Arkansas, southern Missouri.

135. *POLYGYRA EDGARIANA* (Lea). Mountains of Tennessee and Alabama.

136. *POLYGYRA EDWARDSI* (Bld.). Fayette or Greenbrier County, W. Va., Laurel, Whitley and Pulaski Counties, Ky.

137. *POLYGYRA BARBIGERA* (Redf.). Habersham and Hall Counties, Ga.; Cherokee Co., N. C., also Alabama.

138. *POLYGYRA STENOTREMA* (Fér.). Henry Co., Ill. to Virginia, south to Georgia, southwest to Indian Territory.

138a. *POLYGYRA STENOTREMA SUBGLOBOSA* Pils. Woodville, Alabama.

138b. *POLYGYRA STENOTREMA DEPILATA* Pils. Thunderhead Mt.; near Nashville, Bellevue and Johnson City, Tenn.

139. *POLYGYRA HIRSUTA* (Say). Canada to Minnesota, south to Wyandotte, Kansas, and Jackson Co., Ala. (also reported from near Guaymas, northwestern Mexico).

139a. *POLYGYRA HIRSUTA ALTISPIRA* Pils. Magnetic City, Roan Mountain, and Black Mountains, N. C.

140. *POLYGYRA MAXILLATA* (Gld.). Mountains of Tennessee, Alabama and Georgia (near Columbus).

141. *POLYGYRA MONODON* (Rack). Canada to Minnesota, south to North Carolina and San Antonio, Texas.

(To be continued.)



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SOME NEW EOCENE FOSSILS FROM ALABAMA.

BY T. H. ALDRICH.

Anomia navicelloides n. sp.

Shell thin, pearly, with lines of growth on the outer surface of the superior valve, very nacreous and shining within, the upper valve having a distinct beak, not marginal. Surface bearing traces of broad radial color bands; interior showing three cicatrices, the larger one with semicircular lines and fine striations crossing them.

Breadth of superior valve 13 mm., width 23 mm.

Locality.—Near Choctaw Corner, Ala., Wood's Bluff horizon. Has very much the appearance of a *Navicella*, which has suggested the name. Only the upper valve so far discovered.

Odontostomia matthewsensis n. sp.

Shell small, medium thickness, smooth, whorl six, spire rather blunt, suture impressed; aperture rather narrow, with one strong fold on the columella, also partly reflected and rather pointed at base.

Length $3\frac{1}{2}$ mm., width 1 mm.

Locality.—Matthews Landing, Alabama.

Cancellaria annosa n. sp.

Shell small, spire obtuse, whorls four, shouldered, strongly cancellated, nodular at junction of lines, the revolving line below the suture more strongly nodular than the others; outer lip expanded, nodular within; columella with two folds.

Height $2\frac{1}{2}$ mm., breadth $1\frac{1}{2}$ mm.

Locality.—Matthews Landing, Alabama Rv., Alabama. While the type specimen is a young shell, yet the characters are very distinct from any other species known.

Cancellaria graciloides n. sp.

Shell broadly fusiform, spire elevated, whorls 6-7, rounded, slightly shouldered, cancellated, first three smooth, on the others the revolving lines are numerous, strongly defined; lines of growth smaller and much finer than the revolving lines, suture deeply impressed, outer lip expanded, strongly nodular within, columella with three folds, aperture pointed and canaliculate at base.

Height 12 mm., width 7 mm.

Locality.—Gregg's Landing, Alabama Rv., Alabama.

Cancellaria graciloides var. *bella* n. var.

Characterized by strong, rounded varices, as many as three on the body whorl. Shell is smaller than the type.

Height 10 mm., width 6 mm.

Locality.—Gregg's Landing, Alabama Rv., Ala.

A PROPOSED CENSUS OF MICHIGAN MOLLUSCA.

BY BRYANT WALKER.

At the Annual Meeting of the Michigan Academy of Science in December, 1895, a suggestion was made that the conchologists of the State should form a "Section of Conchology" for the purpose of united work in that department.

A circular of inquiry elicited such favorable responses, that in the spring of the following year a temporary organization was effected with a membership of fourteen as noticed in the NAUTILUS for April, 1896. At the present time the membership includes every active collector in the State so far as known. Practical work being the object of the Section, it was decided, as a preliminary step to the complete knowledge of the fauna of the State, to undertake the compilation of all the known localities for every species known, or supposed to belong to it. A form of blank was prepared for distribution upon which the individual reports should be made, and another upon which these reports should be tabulated. A special map of the State has also been printed showing the principal river and lake systems upon which it is proposed to spread these tabulated

results, and thus form a permanent record, which should show at a glance all that was known of the distribution of every species belonging to the State. These maps it was believed would be of value in studying the various questions which might arise in regard to the present distribution of the fauna and the means by which it has been brought about. Up to the present time there have been filed twelve reports, which include all the private collections of the State and nearly all the public museums. The collection of the University of Michigan is now being worked over and arranged by Mr. H. E. Sargent, and the report from the Kent Scientific Institute of Grand Rapids is expected during the coming winter. As soon as these are received, the Section will be in possession of all existing data to be obtained from State sources in regard to the extent and distribution of the molluscan fauna.

These reports aggregate more than 4,500 entries, and include nearly every species that has ever been quoted from Michigan.

It is proposed also that every member of the Section shall annually file a supplemental report containing such additional information as he can supply. In this way it is expected that the records of the Section will be continually kept up to date, and at all times afford the collectors of the State and others interested in the subject, not only a correct statement of what is actually known of the State fauna, but also indicate in what sections of the State field work should be done and what species require further investigation.

The value of this work has already been demonstrated by a series of charts which have recently been completed showing the distribution of the *Unionidae*. Some of the results deduced from them were quite unexpected, and are believed to be of great value in determining the manner in which geological and geographical factors have influenced the present range of many of the species. This will be made the subject of a special report to the Academy at its Annual Meeting.

It has been suggested that there are undoubtedly in the cabinets of many of the readers of the NAUTILUS interesting material from Michigan, a record of which would be a valuable addition to the data now in the possession of the Section. In all probability a large amount of collecting has been done in the State at one time or another by those who were not residents, and whose collections are not represented in any of the reports thus far received. It is very desirable that every possible source of information should be made

available for the work in progress, and the members of the Section will be very grateful for any assistance they may receive from their brethren of other States.

In behalf of the Section of Conchology, I would therefore earnestly request that all collectors, who have any Michigan shells in their collections, would furnish a list of the species and localities, which may be filed for permanent record. Blanks will be gladly furnished for that purpose to any one who will address the writer at 18 Moffat Building, Detroit, Michigan.

ON A NEW SPECIES OF VITREA FROM MARYLAND.

BY WM. H. DALL.

The land shell fauna of the north-eastern U. S. has been so thoroughly searched, and by so many collectors, that we do not expect the addition to it of good and valid new species, unless among the minuter forms like *Vallonia*. However, as if to prove that hope may spring eternal in the conchological breast, a new species with undoubtedly distinct characteristics has come to hand from Maryland.

Vitrea Raderi n. sp.

Shell depressed, four-whorled, smooth except for faint rather regularly spaced incremental lines above, of a pale waxen whitish color; spire hardly raised above the last whorl, which is much the largest; periphery evenly rounded, suture appressed, base moderately rounded, the umbilical slope of the last whorl somewhat flat-tish; umbilicus very wide, exhibiting all the volutions; aperture wider than high, the upper margin slightly in advance of the lower lip, the two connected by a thin wash of callus over the body. Alt. 1.5, max. diam. 4.0, min. diam. 3.0 mm.

Received from Prof. Howard Shriver, as collected at Cumberland, Md., in the summer of 1897; a single specimen.

The nearest relative of this species is *Zonites wheatleyi* Bland, which is a larger shell with higher spire, more rounded whorls and a much smaller and more steep sided umbilicus. It may be mentioned that the figure of *Vitrea wheatleyi* in Binney, Bull. 28, U. S. Nat. Mus., is inaccurate in representing the umbilicus as wider than it really is in that species. The large form of *Z. wheatleyi* referred

to by Binney (p. 222) as collected by Hemphill at Clingman's Peak, North Carolina, is doubtfully identical with Bland's type, and should take the varietal name of *V. clingmani*, which may eventually prove of specific rank.

The present species is named in honor of Mr. Rader, an interested student of the land shells of Cumberland, at the request of Prof. Shriver. The type is in the National Museum.

A NEW UNDULATE UNIO FROM ALABAMA.

BY BERLIN H. WRIGHT.

Unio triumphans sp. nov.

Shell sub-triangular, with an elevated wing which is connate at its point, coarsely and interruptedly undulate over the entire disk, except on the extreme anterior and superior parts where pustulations and lacerations replace them. Disk gradually and uniformly flattened out to the margins from the highest point near its centre: the indistinct umbonal ridge dividing the disk area into two nearly equal parts. Substance of the shell moderately thick; thicker before. Epidermis dead black. Greatest diameter in the center of the shell. Dorsal notch very long and deep. Cavity of the beaks deep. Posterior cicatrices confluent; anterior ones distinct. Lateral teeth short and distant from the cardinals which are depressed. Nacre dull white in front and a bright coppery tinge behind, and very iridescent. Width 4 inches, length 5 inches, diameter 2 inches.

Habitat, Coosa River, St. Clair Co., Alabama.

Type in National Museum.

Remarks: For several years we have had old specimens of this shell and could not place them satisfactorily with any known form. In a recent collection of one thousand shells from this vicinity we found twenty specimens of all ages which at once made its novelty apparent.

The natural place we assign the species is between *U. boykinianus* Lea and *U. multiplicatus* Lea, and it also possesses characters of *U. undulatus* Barnes. Compared with the first, our shell is more winged and therefore more triangular in outline; the ridges are fewer, not so prominent and more broken, like *Unio undulatus*

Barnes, and the umbonal ridge is not as well defined; the laterals are shorter and the shell is more transverse; the undulations cross the umbonal elevation instead of running parallel with it and the beaks are less prominent. Compared with *U. multiplicatus* Lea our shell is subtriangular in outline instead of trapezoidal, always more winged and shorter, and the laterals are also shorter; the posterior slope is more gradual and the umbones are not flattened, and are more depressed than in that species, the highest point being nearly in the centre of the disk where there is quite a prominence; the cardinals are more depressed and the pustulations extend more generally over the anterior portion.

In old specimens the sculpture diminishes almost to smoothness except in the superior parts, the umbonal elevation becomes obsolete and the shell is more elongated. Twenty specimens of all ages have been compared with specimens of corresponding ages of all the allied species, and comparisons with the type forms in the National Museum have been made through the kindness of Mr. Charles T. Simpson.

MODIOLA PLICATULA LAMARCK—AN EXTINCT LOCALITY.

BY R. E. C. S.

Fifty years ago, more or less, that part of the city of Boston which includes the Public Garden and the grand array of fine avenues and streets that reach out east and west, north and south, and form what is locally known as the Back-Bay Section, was a portion of a larger territory, some six hundred acres, of wet and dry marsh and mud flats, that extended from Charles Street at the foot of "Boston Common," to Roxbury. A considerable portion of this region was inhabited by a peacefully disposed and quiet community. In numbers this community, certainly if counted, would have made a bigger showing than the census of human bipeds that constituted the population of Boston at that time. Though numerous, they were not influential and had no social status among the best people of "Modern Athens."

This may have been owing to the fact that *their* ancestors did not come over in the Mayflower, or later with Winthrop and Saltonstall. No, they were here, or their forefathers were, long before the advent of the "Pilgrim Fathers;" they had an older claim, prior-

ity of settlement and occupancy, than any white man. Their title was aboriginal, and they were and had been, from time immemorial, permanent residents "to the manner born." Whether their lack of social position was due to the fact that they did not recognize the merits of "baked beans and brown bread," "cod-fish balls" and "pumpkin pie," etc., as gastronomic delicacies, or were unable to sing "pennyroyal hymns" through their noses—having no noses to sing through—can only be surmised, as they were not given to gossip or backbiting, but always maintained a discreet and dignified silence. While they were the only permanent residents, they often had transient visitors. Various salt-water birds frequented the region at certain times in the year. Yellow-legs, doe birds, curlew, teal duck and other species were pretty certain to make a short visit whenever a "northeaster" was brewing.

The locality now known as Copley Square, with its impressive buildings, Trinity Church, the Art Museum and the new "Old South," was good hunting ground in those days. Most people, including many credulous or unsophisticated Bostonians, honestly regard these church edifices as erected for religious purposes, and think, too, that the "Museum of Fine Arts," of which they are very proud, is intended to foster and encourage the work of painters and sculptors. No one will deny such persons the right of opinion, even if it does rest upon a hallucination; on the other hand a fellow may be pardoned who sees in these "places of worship" simply funeral monuments sacred to the memory of the thousands of harmless mollusks, *Modiola plicatula*, that were buried alive in a so-called Christian city in the nineteenth century, with no one to say a word in their behalf. And the Art Building! What of that? It may be regarded as commemorative of the fact that the spot whereon it stands was good hunting ground in days long since gone by, and that hereabout my father (of blessed memory) and myself oftentimes successfully pursued ornithology for gastronomic purposes.

In course of time, it is highly probable, suitable tablets will be placed in front of the principal buildings bearing the following inscription:—

"The region hereabout was formerly inhabited by a branch of the great aboriginal family MODIOLA. The members of the local tribe, PLICATULA, were peaceful in their lives, simple in their habits, never told lies, never talked back to old people, and met their fate without a murmur.

"Keep their memory green."



ISAAC LEA DEPARTMENT.

[Conducted in the interest of the Isaac Lea Conchological Chapter of the Agassiz Association by its General Secretary, Mrs. M. Burton Williamson.]

As the annual election of officers for 1898 is not held until the last Wednesday in December, the results of the election will not be published this month. Next month the newly-elected General Secretary will have charge of this department.

RECORD OF A LOST YEAR.

[Extract from the report of Mrs. M. T. B. From the Transactions of the Isaac Lea Chapter for 1896].

This year I have found no shells new to my collection, but have learned more about some of the old ones. *Conus californicus*, which I found at Newport, Cal., last year in the mud bottom of the bay, I find among the rocks, clinging to the sea weeds. These last are bright and shining, while those from the bay have an epidermis. A learned friend, to whom I refer all my difficulties, thinks the epidermis is worn off by the action of the water and rocks. But I found them in a deep cut in the rocks, where the high tide covered and the low tide left them—a very sheltered place. We are not credited with two species on our California coast, yet I find two which differ in color and size—one is brown, mottled with lighter spots, the other is plain, paler in color, and reaches double the size of the spotted one. The operculum of *Conus* is the merest excuse, just a thread, and not half the length of the aperture.

Under the same rocks I found *Leptothyra*, with rough, limy surface, but with such exquisite operculi, shelly white, with a spiral line in brown. And then there were the pretty little *Corbula luteola* and *Carditamera subquadrata*, the last place I should have looked for bivalves.

I have become interested somewhat in sea-slugs, and have tried to make water-color drawings of some of them, as I know of no way to preserve them without destroying their color.

Two rare shells have come under my observation during the year, both from Newport, and both were Trophons. *Pecten hastatus*, which is called a northern species, is occasionally found here also, and, though I have seen but few of the northern shells, those I have seen are not nearly so brilliant as those from Newport Beach.

141a. *POLYGYRA MONODON FRATERNA* (Say). Pennsylvania to Texas.

141b. *POLYGYRA MONODON ALICLÆ* Pils. Calcasieu Parish, S.-W. Louisiana.

141c. *POLYGYRA MONODON CINCTA* Lewis. Hayesville, N. C.

142. *POLYGYRA LEAI* (Ward). Ohio and Michigan to Minnesota, south to Nashville, Tennessee, and Neosho Co., Kansas.

143. *POLYGYRA GERMANA* (Gld.). Astoria, Oregon, to Vancouver Island.

Genus **POLYGYRELLA** Binney, 1863.

144. *POLYGYRELLA POLYGYRELLA* (Bld. & Coop.). Coeur d'Alène Mts., Idaho. A variety *montanensis* Ancey is described from Deer Lodge Valley, Montana.

145. *POLYGYRELLA HARFORDIANA* (Coop.). Fresno Co., California, in the "Big Tree" District, 6500 feet above the sea.

Subgenus *Ammonitella* Cooper, 1869.

146. *POLYGYRELLA YATESI* (Coop.). Calaveras Co., California, at Murphy's and Cave City.

Subfamily *Sagdinæ* (*vel Teleophallogona*).¹

Genus **THYSANOPHORA** Streb. & Pfeffer, 1880.

147. *THYSANOPHORA INCRUSTATA* (Poey). Corpus Christi, Galveston and Hidalgo, Texas. Also Cuba.

148. *THYSANOPHORA HORNII* (Gabb). Fort Grant, Arizona; summit of Hachita Grande Mt., Grant Co., New Mexico; also Yaqui River, Mexico.

149. *THYSANOPHORA VORTEX* (Pfr.). Marco, near Cape Sable, and Key West, Florida. Also Bermuda and West Indies.

150. *THYSANOPHORA INGERSOLLI* (Bld.). Colorado, at high altitudes: San Juan, Custer and Mesa Counties; Fly Park, Arizona.

150a. *THYSANOPHORA INGERSOLLI CONVEXIOR* (Ancey). Logan Canyon, Utah; Weston, eastern Oregon.

151. *THYSANOPHORA PLAGIOPTYCHA GRANUM* (Streb.). Archer, Alachua Co., Evans' plantation, Rogers River, and vicinity of Lake Worth, Florida. Also eastern Mexico and Yucatan, and typical *plagioptycha* from Porto Rico.

¹ This subfamily should have preceded the *Polygyrinæ*.

152. *THYSANOPHORA DIOSCORICOLA CÆCA* (Guppy). Lake Worth to St. Augustine in eastern, and near Hillsborough River in western Florida; Hidalgo, Texas. Also Trinidad, and typical *dioscoricola* from Jamaica.

Family **BULIMULIDÆ**.

Genus **BULIMULUS** Leach, 1815.

Subgenus *Orthotomium* Crosse & Fischer.

153. *BULIMULUS DEALBATUS* (Say). Southern North Carolina, west to Kentucky, Central Missouri and Kansas; south to Alabama and the Rio Grande.

153a. *BULIMULUS DEALBATUS RAGSDALEI* Pils. Texas: Cook and Montague Co. on the Red River, and at Comstock, etc., on the Rio Grande.

153b. *BULIMULUS DEALBATUS MOOREANUS* (Pfr.). Texas; mainly from Fort Worth to De Witt and Uvalde Counties. [This is the shell generally known as "*B. schiedeanus*" in American collections].

153c. *BULIMULUS DEALBATUS SCHIEDEANUS* (Pfr.). Western Texas; mainly Mexican, Texas specimens being still rare in collections.

154. *BULIMULUS ALTERNATUS MARIE* (Alb.). Texas: two or three tiers of counties north of the Rio Grande, from Corpus Christi to Frio and Valverde Counties. The typical *alternatus* has not yet been found north of the Rio Grande.

Genus **DRYMÆUS** Albers, 1850.

155. *DRYMÆUS SERPERASTRUM* (Say). A Mexican species, said to occur also north of the Rio Grande in Texas.

156. *DRYMÆUS DORMANI* (W. G. Binn.). St. Johns River Valley and east coast; also West Florida, south to Caloosahatchee River.

156a. *DRYMÆUS DORMANI ALBIDA* Wright. Eastern Fla.

157. *DRYMÆUS MARIELINUS* (Poey). S. Florida; Upper Matcumba Key, N. to Micco on the east coast.

158. *DRYMÆUS FLORIDANUS* (Pfr.). Florida.

159. *DRYMÆUS HEMPHILLI* (Wright). East Florida, between Mosquito Lagoon and the Atlantic; Lake Helen, Volusia Co.

Section *Mesembrinus* Albers.

160. *DRYMÆUS MULTILINEATUS* (Say). Key West, Bahia Honda Key and Lower Matacumba Key, and north to Marco on the west coast of Florida; also Venezuela.

Genus **ORTHALICUS** Beck, 1837.

161. *ORTHALICUS UNDATUS* (Brug.). Key West to the neighborhood of Bay Biscayne, Florida; also West Indies, Jamaica, etc.

162. *ORTHALICUS MELANOCEILUS FLORIDENSIS* Pils. Florida, near Cape Sable; Pavilion Key.

Genus **LIGUUS** Montfort, 1810.

163. *LIGUUS FASCIATUS* (Müller). Southern Florida; Key West, Lignum Vitæ and Grassy Keys, to Key Biscayne; on the Gulf Coast from Cape Sable to Goodland Point, near Marco. There are numerous color varieties.

Family **UROCOPTIDÆ** Pilsbry.

Genus **UROCOPTIS** Beck, 1837.

Section *Cochlodinella* Pils. & Van., 1898.

164. *UROCOPTIS POEYANA* (Orb.). Key West and adjacent keys; Miami Country, Florida.

165. *UROCOPTIS JEJUNA* (Gld.). Near mouth of Miami River, Florida.

Genus **MACROCERAMUS** Guilding, 1828.

Section *Microceramus* Pils. & Van., 1898.

166. *MACROCERAMUS PONTIFICUS* (Gld.). Key West to Key Biscayne, and northward to Tampa, Florida.

167. *MACROCERAMUS FLORIDANUS* Pilsbry. Sarasota Bay and Goodland Pt., Florida (= *M. Gossei* of authors part, not of Pfr.).

168. *MACROCERAMUS TEXANUS* Pilsbry. New Braunfels, Texas (= *M. gossei* auct. part, not of Pfr.).

Genus **HOLOSPIRA** Von Martens, 1860.

Section *Holospira* s. s.

169. *HOLOSPIRA GOLDFUSSI* (Mke.). Texas, on the Blanco and at New Braunfels, Comal Co.

Section *Haplostemma* Dall.

170. HOLOSPIRA MEARNsii Dall. Top of Hachita Grande Mt., Grant Co., New Mexico.

171. HOLOSPIRA HAMILTONI Dall. Rio Grande Mts., Brewster Co., Texas, 3,500 ft. elevation.

172. HOLOSPIRA COCKERELLI Dall. Débris of Rio Grande River at Mesilla, New Mexico.

Section *Eudistemma* Dall.

173. HOLOSPIRA ARIZONENSIS Stearns. Dos Cabezas, Arizona.

Section *Distomospira* Dall.

174. HOLOSPIRA BILAMELLATA Dall. Hachita Grande Mt., New Mexico.

Subgenus *Metastoma* Strebel & Pfeffer.

175. HOLOSPIRA ROEMERI (Pfr.). New Braunfels, Comal Co., Texas.

176. HOLOSPIRA CROSSEI Dall. Top of Hachita Grande Mt., Grant Co., New Mexico.

177. HOLOSPIRA PASONIS Dall. Mule Canyon, El Paso Co., Texas, 4,000 ft. alt.

178. HOLOSPIRA PILSBRYI Dall. Arizona or New Mexico, exact locality unknown. State of Puebla, Mexico.

Genus *CERION* (Bolt.) Moreh, 1852.

179. CERION INCANUM (Binn.). Florida Keys and mainland at Cape Florida. (A specimen of the Cuban *C. mumiola* has been found at Tortugas, but probably it was accidentally imported in some manner. No indigenous land shells are known from the Tortugas.)

Family PUPIDÆ.

Genus *STROBILOPS* Pilsbry, 1892.

(=*Strobila* Morse, 1864, not of Sars, 1835, Acalepha, nor of Sod., 1837, Lepidoptera, nor *Strobilus* Anton, 1839, Mollusca).

180. STROBILOPS LABYRINTHICA (Say). Most of the eastern U. S., southwest to Texas.

180a. STROBILOPS LABYRINTHICA STREBELI (Pfr.). Jackson Co., Ala.; Northern Florida; Eastern Mexico.

(To be continued.)



THE NAUTILUS.

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No. 10.

UNIO (LAMPSILIS) AMPHICHÆNUS, N. Sp.

BY LORRAINE S. FRIERSON.

Shell large, oblong oval, thin, slightly inflated, gaping for one-half its length at the anterior and basal part, and at the upper part of the posterior end, and covered with a shining, black or brownish epidermis which is decidedly wrinkled in places; growth lines strong and irregular; beaks but slightly prominent; hinge line evenly curved; hinge teeth but feebly developed, there being a single, compressed, rather sharp cardinal in the left valve of the young shell which becomes blurred and shows a tendency to split up in the older shells, and two rather short, faint laterals, the inner of which is the stronger; these being placed at the extreme posterior end of the hinge plate, with one cardinal, and sometimes a faint one above it, and a single, compressed, short lateral in the right valve; laterals ending abruptly at the posterior end, with the inner edges slightly curved upwards; area between the teeth narrow and rounded; muscle scars distinct, and quite deep for so thin a shell; posterior retractor scar completely united with the adductor, dorsal scars to the number of five or six extending in a row from the cavity of the beaks just behind their greatest projection towards the anterior base; pallial line showing a tendency to break up into several lines, and distinct traces of a posterior sinus; nacre clouded, varying from deep violet to bluish and white.

Length 106, height 63, diam. 36 mm.

Habitat, Sabine River at Logansport, Louisiana.

This is one of the most distinct and remarkable Unios in the United States. In its general structure, the hinge characters, the row of dorsal cicatrices, the incipient pallial sinus, and the gaping shell it shows relationship with *Unio tenuissimus*, and its naere is something like that of this species, but the female shell is considerably swollen in the post-basal region, and it reminds one a little of a short, compressed, female *Unio rectus*. The posterior opening, however, is its most remarkable character, commencing about midway up the end of the shell, and extending nearly to the ends of the laterals. This gap ends abruptly above, and less so below; the edges of the shell are reflected outwards, and considerably lamelated, and in old shells the remains of former reflected apertures may be seen. The opening in a fully adult shell is about one-fourth of an inch wide and one and one-fourth inch in length, and is as distinct as that of *Schizothærus nuttalli* of the west coast of the United States, and occupies about the same relative position that it does in this marine bivalve. It may possibly group with *Unio tenuissimus*, but it is quite likely that it will have to be made the type of a new group, related to that species, to the *alatus* and *tampicoensis* groups.

I desire to thank Mr. Chas. T. Simpson for the valuable aid given in the preparation of the above description and remarks.

NOTES ON QUEBEC PUPIDÆ AND OTHER SHELLS.

BY A. W. HANHAM, WINNIPEG, MAN.

My Quebec *Pupidæ* have just been looked over and separated for me by Dr. V. Sterki, to whom I am under many obligations for this labor of love. As a result my list of species, as far as these small things are concerned, requires some corrections and additions.

The following are the species taken, instead of as recorded on page 101, of the last volume of THE NAUTILUS:—

Pupa armifera Say. As already recorded.

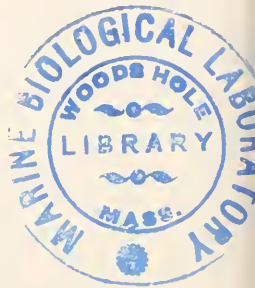
Pupa pentodon Say. As already recorded.

Sphyradium edentulum Drap. Not uncommon; Isle d'Orleans and St. Joseph's de Levis.

Vertigo ovata Say. As already recorded.



UNIO AMPHICHÆNUS FRIERSON.



Vertigo gouldii Binn. The most abundant species taken. Common on mossy rocks at St. Joseph's and St. Romauld's (this species was confounded with *bollesiana*).

Vertigo ventricosa Morse. Nearly as common as *gouldii*, and taken at St. Joseph's and St. Romauld's, as well as on the Island.

Vertigo curvidens Gould. As already recorded.

Vertigo milium Gould. Very rare.

Vertigo pygmæa Drap. Single example.

Vertigo tridentata Wolf. Single example.

A noticeable absentee from the above list is *Pupa contracta*, which however no doubt occurs in the Province.

Carychium exiguum Say. As already recorded.

Carychium exile Ad. One example.

Polygyra leai Ward. Referring to the valuable catalogue of North American land shells now appearing in THE NAUTILUS, I am glad to see that this shell has been recognized as a distinct species, for such I have always considered it. The species extends into Canada. In the spring of 1891, at Brantford, Ontario, in drift along the Grand River, I noticed plenty of dead shells, but never came across any living ones until October. On the 9th and 10th of that month, shortly before leaving for Quebec, I got over 200 specimens from a small corner of swampy land—overgrown with reeds and bushes—adjoining a sluggish stream. *Zonites ligerus* was in even greater abundance. Besides these species (rare in Canada) were taken: *Selenites concava*, *Vitrina limpida*, several small species of *Zonites*, *Pupa contracta*, *Succinea avara* and *ovalis*, and a very handsome small form of *S. obliqua*, *Pomatiopsis lapidaria*, etc. A richer spot could hardly have been found. From a steep bank not far back from the stream, I got a number of pairs of *Polygyra monodon*, but no *P. leai*, and I did not find the former species with *P. leai* down below. The chief object of this note is to show the Canadian record.

DESCRIPTION OF A NEW UNIO.

BY BERLIN H. WRIGHT.

U. reclusus sp. nov.

Shell ovate-triangular, smooth, polished above, nearly equilateral, somewhat inflated. Substance of the shell moderate and quite uniform in thickness. Epidermis finely striate, rayless, brownish, with

two or three distant growth lines. Beaks prominent and surrounded by four or five coarse, sharp, widely separated irregular undulations. Ligament reddish, short, thin and scarcely elevated above the dorsum. Dorsal margin slightly elevated; anterior margin gracefully rounded, base uniformly and slightly curved; posterior margin pointed. Posterior area abrupt with two slightly raised lines formed of irregular elevations from beak to margin. Umbos gracefully and uniformly rounded; greatest diameter in the centre of the disk. Nacre sky-blue throughout, sometimes darker within the pallial line. Beak cavities slight and abrupt. Cicatrices well impressed, smooth and distinct. Cardinals solid, prominent, double in the left valve and single in the right valve, laterals double in the left valve and disposed to be double or tripartite in the right valve and joined to the posterior cardinal by a distinct elevation of the dorsal plate.

Width $1\frac{1}{4}$ in., length 1 in., diam. $\frac{5}{8}$ in.

Habitat: Ocklocknee River, Leon County, Florida.

Type in National Museum.

Remarks:—This anomalous little shell was taken with *U. kleinianus* Lea, *lienosus* Con., *kirklandianus* Wright and *floridensis* Lea. It does not seem to group well with any known species, though the the beak sculpture indicates a relationship with *U. forbesianus* Lea. In some respects it reminds one of *U. macrodon* Lea, but it is more inflated, not as solid usually, darker in epidermis, rayless, with deeper beak and shell cavities. The lateral teeth are longer, higher and end more abruptly, besides being double or tripartite in the right valve. The very young show slight traces of broad, distant rays. It certainly groups with *U. forbesianus* Lea, but is easily distinguished from the young of that species by its want of rays, lighter epidermis, rounded base, rounded umbonal angle, flattened umbos and it is smoother on the posterior area.

NEW PISIDIA.

BY DR. V. STERKI.

Pis. singleyi n. sp.

Mussel small, rather high, somewhat oblique, ventricose, beaks prominent, also in the young, rounded but narrow on top, slightly posterior, vertical section broadly heart-shaped; superior margin moderately curved, rather short, scutellum slightly, scutum well

marked; anterior part somewhat angular with the end rounded; posterior end rounded or slightly truncate, inferior margin regularly curved; shell thin, translucent, colorless to pale horn; surface very finely, almost regularly striated, somewhat shining; interior surface with fine but well marked, crowded pits, visible from the outside; hinge rather fine, plate narrow, cardinal teeth rather short but high, lamellar, the right one almost straight and longitudinal in its anterior part, thickened in the posterior and curved downward beyond the level of the plate; those of the left valve little curved, the inferior somewhat the larger and projecting downward over the edge of the hinge plate; lateral teeth rather small and thin, pointed in the middle and rather abrupt, in the right valve the anterior much the largest, slightly projecting inward.

Long. 2.5, alt. 2.3, diam. 1.7 mill. (Texas).

Long. 3.3, alt. 2.8, diam. 2.4 mill. (Mexico).

Habitat: Texas, Mexico.

In shape, color and striation, it has some resemblance with *P. punctatum*, but the latter is much smaller, its surface is microscopically rugulose, dull, and the hinge comparatively stouter.

It was first seen in drift materials from the Guadalupe River, Comal Co., Texas, collected and kindly sent by Mr. J. A. Singley in 1892, represented by a fair number of specimens in all stages of growth. Then in drift from the same river, sent by Mr. Wm. A. Marsh, a few young specimens. Another lot from the Guadalupe River is in the U. S. National Museum (No. 134,010, Gurley), and under the same head must be ranged one from Itzlan Creek, Guadalupe, Mexico, (No. 102,215). Of the largest specimen of them the dimensions are given above. The species is named in honor of Mr. J. A. Singley.

FIGS. *splendidulum* n. sp.

Mussel small, well inflated, rather ovoid in outline, scutum and scutellum rather well marked, the former often prominent; beaks slightly posterior, somewhat prominent, moderately large, rounded; color pale to deep horn, surface polished, with very fine, somewhat irregular striæ; shell thin, transparent; hinge rather fine but well formed, plate narrow; cardinal teeth longitudinal, lamellar, the right one rather long, slightly curved, most so at both ends, more or less thickened at the posterior end, and often with a groove; the two in the valve nearly equal, parallel, little curved, the superior is anterior for about one-third of its length; lateral teeth compara-

tively strong, all projecting into the interior of the mussel, pointed; ligament rather long.

Long. 2·8, alt. 2·4, diam. 1·7 mill.

Hab.: Maine, Virginia, Michigan.

At Caribou, Aroostook Co., Me., mainly in the Barren Brook, Mr. Ol. O. Nylander collected, and sent me for examination in different lots, more than three thousand specimens. Mr. H. W. Winkley collected some near Saco, Me., and in Mr. J. B. Henderson's collection are a few lots from Old Orchard, Me. Mr. L. H. Streng sent in different lots about 1200 specimens collected near Grand Rapids, Michigan; and the writer has found it rather common in the Potomac River at Washington, D. C., as well as in different runs and ditches in Virginia near the National Capital.

Our species cannot be mistaken for any other *Pisidium*. In shape it has some resemblance with *P. abditum* and *politum*; but its small size, the color and transparency of the shell, the shape of the cardinal teeth, will readily distinguish it. In size, color and transparency of the shell, and the polished surface, it resembles *P. ventricosum* and *vesiculare*; but both the latter are much more inflated, their beaks are quite posterior and larger. It is, however, rather variable in size and coloration, and the striation of the surface.

(*To be concluded*).

ELWOOD PLEAS.

It is with sincere regret that we record the death of our old friend and correspondent, Mr. Elwood Pleas, of Dunreith, Henry Co., Indiana, which occurred on December 31, 1897. He was born May 4, 1831, and the greater portion of his life was spent in Henry County. For a number of years he was Editor of "The Newcastle Courier" and the old files of this and other papers bear ample evidence of his earnest ability as an editor. His most interesting articles were those pertaining to his favorite study, Natural History. Mr. Pleas was well known to many readers of THE NAUTILUS, his principal contribution being "Shells of Henry Co., Indiana," (Vol. VII, page 65). In this article he recorded 123 species and varieties of land and fresh water shells found by him within a radius of five miles from his home.

IN THE NAUTILUS (Vol. V, page 2), Mr. Wm. A. Marsh described two new Unios collected by him, of one of which, *U. Pleasii* Mr. Marsh says: "I name this shell after my friend, Mr. Elwood Pleas, of Indiana, who collected this species with many other rare shells in the interior of Arkansas."

Mr. Pleas also collected extensively through Alabama and western Florida. Being interested in geology he availed himself of the opportunity while in Alabama of securing a large collection of Eocene fossils. Mineralogy, botany and entomology also received a share of his attention, and in his death nature has lost a sincere lover, and science an earnest supporter.—C. W. J.

PUBLICATIONS RECEIVED.

CAMERIAN BRACHIOPODA: GENERA *Iphidea* AND *Yorkia*, WITH DESCRIPTIONS OF NEW SPECIES of each, and of the Genus *Acrothele*, by Charles D. Walcott, (Proc. U. S. Nat. Mus., XIX, 1897). *Iphidea* is a genus of small brachiopods belonging to the Neotremata of Beecher, possibly with characters that nearly place it in the Protremata. The species, of which 14 are known, range from the lowest known Lower Cambrian horizon to the upper portion of the Middle Cambrian. Five new species are described. *Yorkia* is a new genus of inarticulate brachiopods based upon a new species, *Y. Wanneri*, from the Lower Cambrian near York, Penna. Two new forms of *Acrothele* are also described.

DIE GEHAUSESCHNECKEN DES GALBERGES UND KRAHNBERGES BEI GOTHA, von L. Schmidt, (Gratis-Beiblatt zu den "Gothaer Neuesten Nachrichten," Oct. 1, 1897). A list of 38 species of land snails making substantial additions to the Thuringian mollusk fauna, the literature of which has been scant. The slugs have been omitted. Among the rarer species *Azeza menkeana* may be mentioned. There 24 Helices, including the Zonitidæ, all of them widely distributed species.

A STUDY OF THE FAMILY *Pectinidæ*, with a revision of the genera and subgenera, by A. E. Verrill, (Trans. Conn. Acad., X, 1897). The most elaborate study yet made upon the system of this family is the subject of Professor Verrill's paper. The earlier fossil groups are not fully considered. In the Cretaceous nearly all existing generic and sectional groups had appeared, and probably none has

been evolved since the Eocene. All of the larger forms have very numerous marginal tentacles on the mantle, corresponding somewhat to the external sculpture of the shell in position, and there is also a second inner row of "guard tentacles" on a raised inner pallial fold. The marginal tentacles are accompanied by a series of well formed pallial eyes, very lustrous when living, and having a crystalline lens. These are also arranged according to the ribs of the shell. In some of the deep sea forms there are but few eyes, and in some cases they are not pigmented. Pectens, as is well known, are good swimmers, although the very inequivalve typical forms are rather sedentary. This probably enables them to escape the attacks of crabs, fishes, etc., as well as boring gastropods, for it is certainly true that bored Pectens are rarely seen.

The nomenclature is thoroughly sifted, and the genera and subgenera characterized, 27 being recognized, of which 8 are new. The subdivision seems rather minute to one accustomed to the old order of things, but has doubtless been well considered. Of the genera, PECTEN restricted, scarcely occurs on our coasts. AMUSIUM is represented by a couple of deep sea forms, but the Oriental species is a well known shell. The subgenus *Propeamusium* contains small species such as Dall's *alaskensis*. CHLAMYS, type *islandicus*, is well represented, *C. irradians*, *dislocatus*, etc., belonging here to the subgenus *Equipecten*. *Lissopecten* is a new subgenus proposed for *C. hyalinus* Poli, and *Leptopecten* another for *C. monotimeris* of California. *Placopecten* is proposed for *P. clintonius* Say, also as a subgenus of *Chlamys*. LYROPECTEN contains *L. nodosus*, *subnodosus*, etc. PECTINELLA is a new genus for *P. sigsbei* Dall of the West Indies in deep water. CYCLOPECTEN is a new genus for *P. pustulosus* Ver. and many other small species, mostly of deep water. *Hyalopecten*, n. gen., type *P. undatus* Ver., contains small forms possibly related to the fossil genus *Syncyclonema*. PARAMUSIUM, type *P. Dalli* Smith, is another new genus.

Several new forms are described, with useful notes on others, among which we may mention with approval the rejection of Gmelin's misleading name *magellanicus* for the well known New England species. Verrill calls it *Chlamys (Placopecten) clintonius* Say. A very useful analytical key to the genera is given, and six well drawn plates illustrate important structural features and unfigured species.

181. *STROBILOPS VIRGO* (Pils.). Canada to Northern Alabama and west to Minnesota and Kansas.

182. *STROBILOPS AFFINIS* Pils. New York, Ohio, etc.

183. *STROBILOPS HUBBARDI* (Brown). Calhoun Co., Texas; Savannah, Ga.; Eastern and Northern Florida. Also Jamaica.

Genus **LEUCOCHEILA** Martens.

184. *LEUCOCHEILA FALLAX* (Say). Prov. Ontario, Canada, to Florida, and west to Minnesota, Texas and Arizona.

185. *LEUCOCHEILA MODICA* (Gld.). St. Simon's Island, Ga. to Florida; west to Cedar Keys and Ala.

Genus **BIFIDARIA** Sterki, 1891.

Section *Albinula* Sterki.

186. *BIFIDARIA ARMIFERA* Say. Ontario and Quebec, Canada, and nearly the whole U. S. east of the Rocky Mts.

187. *BIFIDARIA CONTRACTA* Say. Ontario, Canada, and the whole U. S. east of the Rocky Mts.; eastern Mexico.

188. *BIFIDARIA HOLZINGERI* Sterki. St. Cloud, Minn., Iowa, S. to Wichita, Kansas and Joliet, Will Co., Ill.

188a. *BIFIDARIA HOLZINGERI FORDIANA* Sterki. Wichita, Kansas.

Section *Bifidaria* s. str.

189. *BIFIDARIA HORDEACEA* Gabb. Arizona, New Mexico.

190. *BIFIDARIA PROCERA* Gld. Minnesota to New Mexico, and eastward.

191. *BIFIDARIA HORDEACELLA* Pils. Comal and Lee Counties, Texas; New Mexico.

192. *BIFIDARIA RUPICOLA* Say. Kansas and New York southward to Texas and Key West, Florida.

193. *BIFIDARIA SERVILIS* Gld. Florida; Cuba.

(An undescribed form of this group has been called *P. riograndensis* Sterki. Hidalgo, Texas).

194. *BIFIDARIA CORTICARIA* (Say). Ontario and Maine to Minnesota, south to South Carolina and Mississippi.

195. *BIFIDARIA HEBES* Ancy. New Mexico, Arizona, Nevada and Utah; type locality White Pine, Nevada. This is *P. arizonensis* W. G. B., not Gabb, and *P. gabbi* Dall. A form *saxicola*¹ Ckll. has

¹ Not *Pupa saxicola* Lowe nor *P. saxicola* Moq.-Tand.

been described from Round Mountain near Silver Cliff, Colorado.

195a. BIFIDARIA HEBES MEXICANORUM Ckll. Mesilla, New Mexico.

Section *Vertigopsis* 'Ckll.' Sterki.

196. BIFIDARIA PILSBRYANA Sterki. New Mexico, Arizona.

197. BIFIDARIA CINCINNATIENSIS Judge. Cincinnati, Ohio.

198. BIFIDARIA CURVIDENS Gld. Mass. to Minn.; Ontario and Quebec.

198a. BIFIDARIA CURVIDENS GRACILIS Sterki. Rhode Island, Ohio, Tennessee.

198b. BIFIDARIA CURVIDENS FLORIDANA Dall. Archer, Alachua Co., Florida.

199. BIFIDARIA PENTODON (Say). Ontario and Quebec, Canada, to Minnesota, south to Ga. and Texas; Lincoln Co., Nevada; Laggan, B. C. A form *curta* Sterki, occurs in Ohio.

Genus **PUPA** Draparnaud.

Subgenus **Pupilla** Leach, (=typical *Pupa*.)

200. PUPA MUSCORUM (L.). Prov. Quebec, Canada, New England, and the Northern tier of States from Maine to Montana; Colorado, Utah and Nevada. Also Europe. *Pupa sublubrica* Anc. is considered a synonym by Binney.

201. PUPA BLANDI (Morse). New Mexico, Utah, Colorado and western S. and N. Dakota. (Referred to *P. muscorum* var. *bigranata* Rossm. by von Martens; cf. also *P. signata* Mouss.). A form *obtusa* Ckll. is recorded from Custer Co., Colo.

202. PUPA SYNGENES Pils. New Mexico; Arizona; Montana.

203. PUPA STERKIANA Pils. San Diego Co., Cal.; Lower California.

Subgenus **Nearctula** Sterki.

204. PUPA CALIFORNICA (Rowell). San Francisco, etc., California.

204a. PUPA CALIFORNICA ELONGATA Sterki. San Clemente Island.

204b. PUPA CALIFORNICA CATALINARIA Sterki. San Clemente and Santa Catalina Is.

204c. PUPA CALIFORNICA DIEGOENSIS Sterki. San Diego, Cal.

204d. PUPA CALIFORNICA TRINOTATA Sterki. Monterey, Cal.

204e. PUPA CALIFORNICA CYCLOPS Sterki. Placer Co., Cal.

205. PUPA ROWELLI (Newc.). Middle portion of California, Oakland, Monterey, etc.

206. PUPA CORPULENTA (Morse). Vancouver Id.; Washoe Co., Nevada; North Park, Colorado.

207. PUPA CASTANEA Sterki. Lake Co., California.

208. PUPA DECORA (Gld.). Berkshire Hills, W. Mass. to Great Slave Lake. Rare and local.

208a. PUPA DECORA BOREALIS (Morel.). Bering Island.

209. PUPA CONCINNULA Ckll. Colorado at high elevations. (*V. ingersolli* Ancy, unpublished, with varieties *haydeni* and perhaps *accedens* Anc., are identical. Perhaps *P. montanella* Ckll. undescribed, belongs here).

210. PUPA COLORADOENSIS Ckll. Colorado, "mid-alpine."

211. PUPA HOPPII Möll. Greenland; (? Anticosti Island; Laggan, near summit of Rocky Mts.).

212. PUPA COLUMBIANA Sterki. Washington. Undescribed. An undescribed var. *utahensis* is mentioned by Dr. Sterki.

Subgenus *Sterkia* Pilsbry, 1898.

213. PUPA CALAMITOSA Pils. San Diego Co., Cal., and southward.

214. PUPA HEMPHILLI Sterki. San Diego Co., Cal., and southward.

215. PUPA CLEMENTINA Sterki. San Clemente Island, Cal.

Genus **VERTIGO** Draparnaud.

Subgenus **Angustula** Sterki.

216. VERTIGO MILIUM Gld. Hamilton, Ont., Quebec, and Maine to Minnesota, south to Florida and Texas.

Subgenus **Vertigo** Drap.

Section *Haplopupa* Pilsbry, 1898.

217. VERTIGO DALLIANA (Sterki). Lake Co., California.

Section *Bothriopupa* Pilsbry, 1898.

218. VERTIGO VARIOLOSA (Gld). Southern extremity of Florida.

Section *Vertigo* s. str.

219. VERTIGO BINNEYANA Sterki. Manitoba to Seattle, Wash., south to New Mexico.

220. *VERTIGO PYGMÆA* Drap. Quebec, New England and N. Y., south to Va., west to Columbus, Ohio. (= *V. callosa* Sterki, not of Reuss, Palæontographica, II, p. 30, 1849).

221. *VERTIGO RUGOSULA* Sterki. South Carolina, Gulf coast to Texas.

221a. *VERTIGO RUGOSULA ORALIS* Sterki (n. n. for *ovulum* Sterki preoc.).

222. *VERTIGO OVATA* Say. Eastern North America, Ont. and Quebec to Florida; Arizona, New Mexico.

223. *VERTIGO MORSEI* Sterki. Kent Co., Michigan; Northwestern Ohio.

224. *VERTIGO VENTRICOSA* (Morse). Quebec and Maine to Ohio.

224a. *VERTIGO VENTRICOSA ELATIOR* Sterki. New Philadelphia, Ohio; East Saginaw, Mich., Clearwater, Minn.

225. *VERTIGO GOULDII* Biun. Ontario, Quebec and Maine to Montana, south to N. J. and Md.

225. *VERTIGO APPROXIMANS* Sterki. Illinois.

226. *VERTIGO BOLLESIANA* (Morse). Maine to Indiana, south to Virginia and Tenn.; mainly in the N. E.

226a. *VERTIGO BOLLESIANA ARTHURI* Martens. Little Missouri, Dakota.

227. *VERTIGO TRIDENTATA* Wolf. Quebec and Maine to Minnesota, south to Illinois and Ohio.

228. *VERTIGO PARVULA* Sterki. Summit and Lake Counties, Ohio.

229. *VERTIGO OSCARIANA* Sterki. Florida to Texas; Tenn.

Family ACHATINIDÆ.

Genus *OPEAS* Albers, 1850.

230. *OPEAS MICRA* (Orb.). Fort Dallas, Florida; Charleston, S. C. West Indies and South America. *Stenogyra octonoides* is a synonym.

231. *OPEAS SUBULA* (Pfr.). Mobile, Ala. West Indies. (Introduced in some greenhouses North).

[*Opeas goodalli* (Mill.) and an undetermined *Opeas* have been found in Phipp's conservatory, Pittsburgh (Clapp); and the latter occurs also in Washington, D. C. (Lehnert). *Subulina octona* lives in Horticultural Hall, Philadelphia. Until naturalized out of doors, these can hardly be regarded as belonging to our fauna, any more than the animals of zoological gardens.]

THE NAUTILUS.

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No. 11.

MOLLUSCA CONTEMPORANEOUS WITH THE MASTODON.

BY BRYANT WALKER.

In THE NAUTILUS for March, 1891, (Vol. VI, p. 131) there is given a list of half a dozen species of fresh-water shells which were found associated with the remains of a mastodon discovered in Randolph County, Indiana. Through the courtesy of Mr. W. Hilles Smith of Niles, Michigan, I have recently had an opportunity of examining a quantity of material taken from the muck beneath the remains of a mastodon found near that city.

As the list of species is a considerable one it is of interest not only because of the circumstances, under which they were found, but also as a basis for comparison with similar finds from other localities.

As has been stated by others in reference to the mollusca formed fossil in the loess there is here, in most instances, little, if any, variation from the usual form of the species as they are found living at the present time.

The *Planorbis companulatus* Say and *bicarinatus* Say are both larger than the average size of the species as usually found. In the latter species there is a decided tendency towards a whorl narrow in proportion to its height, with a strong carina on both sides, resulting in a long narrow aperture in mature examples.

One of the most abundant species in the collection was *Valvata tricarinata* Say, which afforded some unusual forms. As is well known, this species is extremely variable in its sculpture, ranging though the bicarinate and uncarinate forms to that which is ecarinate. In this, however, all the specimens are strongly tricarinate and the variation is in the other direction and in the form of additional carinæ. This, in one instance, appears as a fourth carina on the body whorl about half way between the superior and peripheral carinæ in the normal shell. In another specimen, a fourth carina is sud-

denly developed upon the shoulder of the last whorl parallel with superior carina and at about one-third of the distance between it and the suture. The interval between the two being a groove, rather than a continuation of the flat surface of the shoulder. In a somewhat similar specimen there is no distinct carina developed, but simply a sharp edge, where the flattened surface of the shoulder is cut by the groove which encircles it just inside the superior carina. In two other examples, the suture of the last half of the body whorl is decidedly channelled, increasingly so as it approaches the aperture, with an indistinct elevation hardly sufficient to be termed a carina, bordering its outer edge.

Although these variations were found in only half a dozen specimens out of a considerable number, it is nevertheless worthy of notice, that in each instance the growth of the shell had been entirely normal until about the beginning of the last whorl. Then suddenly and apparently after a period of rest, such as hibernation, with a renewal of growth the change of sculpture begins. This would naturally seem to be the result of some change in the environment. But, whatever was its source, it was not sufficient, evidently, to affect the whole colony. However, as some of the examples are not fully grown, it may be possibly attributed to the same cause, which very shortly exterminated them all. Unfortunately, what that was, is purely a matter of conjecture.

The complete list of the species found is as follows:

<i>Zonites radiatulus</i> Ald.	<i>Annicola lustrica</i> Pils.
<i>Strobilops labyrinthica</i> Say.	<i>Campeloma integra</i> Say.
<i>Succinea ovalis</i> Gld.	<i>Campeloma obesa</i> Lewis.
<i>Carychium exiguum</i> Say.	<i>Campeloma subsolidum</i> Anth.
<i>Limnæa stagnalis</i> L.	<i>Pleurocera elevatum</i> Say.
<i>Limnæa desidosa</i> Say.	<i>Goniobasis livescens</i> Mke.
<i>Limnæa humilis</i> Say.	<i>Unio ventricosus</i> Bar.
<i>Physa ancillaria</i> Say.	<i>Unio spatulatus</i> Lea.
<i>Physa heterostropha</i> Say.	<i>Unio novi-eboraci</i> Lea.
<i>Physa integra</i> Hald.	<i>Unio pressus</i> Lea.
<i>Planorbis deflectus</i> Say.	<i>Margaritina rugosa</i> Bar.
<i>Planorbis parvus</i> Say.	<i>Margaritina deltoidea</i> Lea.
<i>Planorbis bicarinatus</i> Say.	<i>Anodonta subcylindracea</i> Lea.
<i>Planorbis trivolvus</i> Say.	<i>Anodonta Footiana</i> Lea.
<i>Planorbis campanulatus</i> Say.	<i>Sphærium simile</i> Say.
<i>Ancylus rivularis</i> Say.	<i>Sphærium striatinum</i> Lam.
<i>Valvata tricarinata</i> Say.	<i>Pisidium compressum</i> Prime.
<i>Annicola limosa</i> Say.	<i>Pisidium</i> sp.

HAWAIIAN CYPRÆIDÆ.

BY D. D. BALDWIN, HAIKU, MAUI, H. I.

In the following list of species reported from these Islands, those not known to me personally as Hawaiian are marked with an asterisk :

<i>Cypræa annæ</i> Roberts.*	<i>Cypræa nucleus</i> Linn.
<i>Cypræa annulus</i> Linn.	<i>Cypræa polita</i> Roberts.
<i>Cypræa arabica</i> Linn.	<i>Cypræa poraria</i> Linn.
<i>Cypræa argus</i> Linn.	<i>Cypræa reticulata</i> Mart.
<i>Cypræa carneola</i> Linn.	<i>Cypræa spadix</i> Migh.*
<i>Cypræa caput-auguis</i> Phil.	<i>Cypræa scurra</i> Chem.
<i>Cypræa caput-serpentis</i> Linn.	<i>Cypræa semiplota</i> Migh.*
<i>Cypræa childreui</i> Gray.	<i>Cypræa staphylea</i> Linn.*
<i>Cypræa cicercula</i> Linn.	<i>Cypræa sulcidentata</i> Gray.
<i>Cypræa erosa</i> Linn.	<i>Cypræa talpa</i> Linn.
<i>Cypræa erronea</i> Linn.	<i>Cypræa tessellata</i> Sow.
<i>Cypræa fimbriata</i> Gmel.	<i>Cypræa tigris</i> Linn.
<i>Cypræa helvola</i> Linn.	<i>Cypræa unifasciata</i> Migh.*
<i>Cypræa isabella</i> Linn.	<i>Cypræa ventriculus</i> Lam.
<i>Cypræa intermedia</i> Gray.	<i>Cypræa vitellus</i> Linn.
<i>Cypræa limacina</i> Lam.*	<i>Trivia exigua</i> Gray.*
<i>Cypræa lynx</i> Linn.	<i>Trivia grando</i> Gask.
<i>Cypræa madagascariensis</i> Gmel.	<i>Trivia globulus</i> Linn.*
<i>Cypræa mauritiana</i> Linn.	<i>Trivia insecta</i> Migh.
<i>Cypræa moneta</i> Linn.	<i>Trivia oryza</i> Lam.*
<i>Cypræa microdon</i> Gray.	<i>Trivia spherula</i> Migh.*

NEW VARIETIES OF UNIONIDÆ.

BY BERLIN H. WRIGHT.

U. gibbosus Barnes, var. *armathwaitensis* nov.

The chief distinguishing characters of this variety are: Broader behind, lateral teeth shorter, darker epidermis, beak cavity more pronounced and angular, longer, posterior cavity greater, nacre usually a brighter purple and it is never as large or as massive as the typical form.

Habitat.—A branch of the South Fork of the Cumberland River at Armathwaite, Fentress Co., Tenn. Type in National Museum.

Remarks.—Mr. E. F. Hassler collected a quantity of these shells

along with *Margaritana ravenelliana* Lea and they seemed to differ from *U. gibbosus* Bar. sufficiently to warrant making a variety of them, in which opinion Mr. Simpson of the National Museum concurred. Its place is between *U. subgibbosus* Lea and *U. gibbosus* Barnes and while it occasionally has the white nacre of the former species it is always larger but less massive, wider and has a darker epidermis.

It is also related to *U. stonensis* Lea and closely resembles that species except in epidermis and nacre. Only three specimens out of fifty had a pure white nacre, and those would be taken for *stonensis* but for the darker epidermis.

Margaritana marginata Say, var. *truncata* nov.

Shell abruptly truncated behind, and more produced in front, causing it to be nearly equilateral. More inflated and usually larger than the typical form.

Remarks.—This well marked variety was noted by Mr. Say and specimens were by him labelled in this name, but no description was ever published, so far as known. It occurs in eastern as well as western waters and into Virginia and Tennessee.

DESCRIPTIONS OF NEW PISIDIA.

BY DR. V. STERKI.

Pis. splendidulum Sterki.

Additional localities are: Upper Red Hook, N. Y., and New Philadelphia, Ohio.

Pis. abysserum Stimpson, n. sp.

Mussel small, moderately inflated, somewhat elongate and oblique (most specimens somewhat rhombic), superior and inferior margins moderately curved; scutellum slightly, scutum rather well marked; posterior end rounded or slightly truncated above obliquely in postero-anterior direction, merging into the inferior margin with one continuous curve; anterior end a rounded angle situated rather inferiorly; beaks slightly posterior, rather low, comparatively broad; color whitish to pale horn; surface polished, with fine, irregular striæ; shell very thin, translucent; hinge very fine, plate very narrow; cardinal teeth short, lamellar, thin, longitudinal, scarcely curved, the superior of the left valve little anterior, quite small or abortive; lateral teeth very thin, not high, the outer ones of the right valve scarcely perceptible or absent; ligament small.

Long. 2.4, alt. 2.0, diam. 1.4 mill., (long. 2-3 mill.); young, as contained in parent, 0.8 mill. long.

Habitat: Region of the Great Lakes, in deep water.—Lake Michigan: Racine, Wis., dredged (Mr. Geo. T. Marston); different places on the Michigan side, partly from a depth of 24 meters; Pine Lake, Mich., dredged; Green Lake, Wis., dredged; from stomachs of White Fish, Lake Michigan, all sent by Mr. Bryant Walker, in 1894, and partly since. They were believed to be a new form, but publication was deferred.

In March, 1895, Mr. Geo. T. Marston sent me two lots from dredgings, writing: "No. A. 208, *Pis. abyssorum* Stimpson, were from Dr. P. R. Hoy, Racine, Wis. He wrote me that they were first found in the stomachs of White Fish taken in Lake Michigan, near Racine, Wis., in 1870, by a party of gentlemen including Wm. Stimpson and himself. The party were investigating the food of White Fish, then unknown. I quote from Hoy's letter: 'In 1870 we dragged in Lake Michigan—Wm. Stimpson assisted—we got several of the *Pisidium* and three species of Crustaceans, all of which were new. Stimpson described the several new species—the names were published—I do not recollect where published—but the description was written out with the greatest care and were to be published in the Proc. of the Chicago Acad. Sc., of which Stimpson was secretary at the time. All were burnt at the time of the great fire.'" Mr. Marston subsequently had correspondence with several conchologists, but the matter remained unsettled. The two lots contained different forms of small *Pisidia* mixed up; but the most numerous and most conspicuous specimens represented the form now described under Stimpson's name. There is no absolute certainty that this is the same *Pisidium* the author had described, but it is the nearest in probability, and so to-day by the efforts of Mr. Marston, we can do justice to the deceased scientist. For the above description the writer is wholly responsible. The name (only) *Pis. abyssorum* has been published by Smith in his "Sketch of the Invertebrate Fauna of Lake Superior," according to a kind communication of Mr. Bryant Walker.

The form comes nearest *Pis. splendidulum*, in size and shape; but it is less inflated, the beaks are less prominent, the color is much paler (whitish), the shell thinner, and the hinge much finer and, as mentioned, partly defective.

Pis. pauperulum var. *Nylanderi* n.

Different from the type in the following points; it is comparatively

higher (as high as long, or nearly so), quite oblique; the beaks are very large; upper margin and hinge very strongly curved; color pale greenish horn; surface highly polished, with distinct, irregular lines of growth.

Known from Maine and New Jersey. It has been collected in Partridge Lake, in the thoroughfare between Partridge and Long Lakes, in Long Lake, Square Lake, all in Maine, with the dredge, in various depths down to 25 feet, by Mr. Olof O. Nylander. Also dredged in White Pond, N. J., by Messrs. Pilsbry and Rhoads, together with rather typical specimens of *pauperulum* and intermediate forms. The upper margin and hinge are as strongly curved as in *Pis æquilaterale* Pr. and some forms of *P. compressum* Pr. The beaks are so large as to make out almost the whole upper part of the mussel.

This *Pisidium* has been named after Mr. Ol. O. Nylander, who has so assiduously collected both recent and fossil mollusca of northern Maine.

New Philadelphia, Ohio., Jan., 1898.

PUBLICATIONS RECEIVED.

CATALOGUE OF THE HATFIELD COLLECTION OF SHELLS FROM THE LOYALTY ISLANDS, by James Cosmo Melvill and Robert Standen. Originally published in the *Journal of Conchology*, this paper has been reprinted as one of the Manchester Museum Handbooks. The Loyalty Islands belong to the New Caledonian group, and like that island are remarkably prolific in mollusk life. About 600 species, of which a score are new, are catalogued by Messrs. Melvill and Standen. Some idea of the wealth of the fauna may be obtained from the fact that there are 42 species of *Conus*, 53 mitras, 46 *Cypræa* and *Trivia* (among them *C. exanthema* L.¹ *Rashleighana* Melv., *sulcidentata* Gray, *aurora* (*aurantium*), *clandestina* v. *Artuffeli* Jous., *poraria* var. *albinella* (new), *Trivia childreni*, etc.). Other interesting species are *Turbo moluccensis* and the *Pleurotomidæ*, of which a large number of small species, including numerous new ones, occurred. Two excellent plates illustrate new forms. The work is very creditable to Mr. and Mrs. Hatfield, who collected the shells, as well as to the authors.

Mr. G. B. Sowerby announces the issue of a supplement to his "Marine Shells of South Africa."

¹ Probably not indigenous.

Subgenus *Melaniella* Pfr., 1859.

232. *OPEAS GRACILLIMA* (Pfr.). Key West, and near Miami River, Florida. Cuba, etc.

Genus *RUMINA* Risso, 1826.

233. *RUMINA DECOLLATA* (Linn.). Charleston, S. C. Introduced from southern Europe.

Genus *CÆCILIOIDES* (Fér.) Hermannsen, 1846.

234. *CÆCILIOIDES ACICULA* (Müll.). Florida (Bartlett, many years ago); Princeton, N. J. (A. D. Brown). Introduced from Europe.

Genus *COCHLICOPA* (Fér.) Risso, 1826.

235. *COCHLICOPA LUBRICA* (Müll.). Canada to D. C. and Alabama, west to Oregon. Also Palearctic. Commonly known in America as "*Férussacia subeylindrica* L."

235a. *COCHLICOPA LUBRICA MORSEANA* (Doherty). Hamilton Co., Ohio; Kenton Co., Ky.; Roan Mt., N. C.

(Superfamily *AGNATHA* Mörch.)

Family *GLANDINIDÆ*.

Genus *GLANDINA* Schum.

233. *GLANDINA TRUNCATA* (Brug.). Georgia Sea Islands to Florida, west to Louisiana and Mississippi. Forms *macer* Dall; *parallela* W. G. Binn., Florida. Form *bullata* Gld., Louisiana and Mississippi. Var. *ovata* Dall, Florida, is the same.

234. *GLANDINA TEXASIANA* (Pfr.). Brownsville, Texas. Probably a mere form of *truncata*.

235. *GLANDINA SINGLEYANA* W. G. B. South central and southern Texas. (*G. decussata* Desh. is a Guatemalan species).

236. *GLANDINA VANUXEMENSIS* Lea. Texas?; Mexico. *A doubtful member of our fauna.*

Family *TESTACELLIDÆ*.

237. *TESTACELLA HALIOTIDEA* Drap. Roxborough, Philadelphia, Pa. Introduced from Europe.

Family *CIRCINARIIDÆ* Pilsbry.

Genus *CIRCINARIA* (Beek, 1837) Pilsbry.

(*Macrocyclus* auct. not Beck; *Selenites* Fischer not Hope; *Haplotrema* Anc.).

238. *CIRCINARIA HEMPHILLI* (W. G. Binn.). Olympia, Walla-walla and Freeport, Wash.; also Oregon.

239. *CIRCINARIA CONCAVA* (Say). Ontario and Quebec, Canada, west to Minnesota, south to Kansas, Mississippi and Georgia.

240. *CIRCINARIA VANCOUVERENSIS* (Lea). Bolinas Bay, Cal., to Sitka, Alaska.

240a. *CIRCINARIA VANCOUVERENSIS OCCIDENTALIS* (Hemph.). Sonoma to Santa Cruz Co., Cal.; Kalama, Wash.

S. concavus var. *tenuis* Hemph., from Napa Co., is practically the same. Mr. Hemphill has described a var. *keepi* from near Oakland, Cal. I have not seen specimens.

241. *CIRCINARIA SPORTELLA* (Gld.). Klamath and Humboldt Co., Cal., to Vancouver I.

241a. *CIRCINARIA SPORTELLA HYBRIDA* (Ancey). Portland, Astoria. The Dalles and Douglas Co., Ore.; Olympia, Freeport, and Seattle, Wash.; Vernon, B. C.

(This is *M. vancouverensis* var. *hybrida* Anc., 1888, and *S. vancouverensis* var. *hybridus* Hemph., 1890).

242. *CIRCINARIA VOYANA* (Newc.). Shasta Co., Cal. to Puget Sound.

242a. *CIRCINARIA VOYANA SIMPLICILABRIS* Ancey. California.

243. *CIRCINARIA DURANTI* (Newc.). Santa Barbara Is. and coast range of southern California.

243a. *CIRCINARIA DURANTI CÆLATA* (Mazyck). San Diego, Cal. to San Tomas River, Lower California. (*Cælatura* W. G. B., Terr. Moll. V, 3d Suppl.).

243b. *CIRCINARIA DURANTI CATALINENSIS* (Hemph.). Santa Catalina Island.

244. *CIRCINARIA TRANSFUGA* (Hemph.). San Diego, Cal. to Todos Santos Bay, Lower California.

(Superfamily *AULACOPODA* Pilsbry.)

Family ZONITIDÆ.

Subfamily Zonitinæ Pilsbry.

Genus *OMPHALINA* Rafinesque.

245. *OMPHALINA KOPNODES* (W. G. Binn.). West Virginia to Ga. and Alabama.

246. *OMPHALINA FULIGINOSA* (Griff.). Ontario, west to southern Michigan, Indiana and Arkansas, south to Volusia Co., Fla.

246a. *OMPHALINA FULIGINOSA POLITA* Pilsbry. Mountain region of Eastern Tennessee and western North Carolina. Great Smokies; Monroe Co., Tenn.

247. *OMPHALINA FRIABILIS* (W. G. B.). Southern Illinois to Washington Co., Texas; northern Kentucky; Franklin Co., Tenn.

248. *OMPHALINA LÆVIGATA* (Pfr.). North Carolina to St. John's Valley, Fla., west to Arkansas and western Louisiana.

249. *OMPHALINA RUGELI* (W. G. B.). North Carolina, Roan Mt. to Cranberry.

250. *OMPHALINA SUBPLANA* (Binn.). Mts. between Tennessee and North Carolina.

251. *OMPHALINA INORNATA* (Say). Ottawa and Hull, Canada, to Georgia and Ohio.

252. *OMPHALINA ANDREWSÆ* Pilsbry. Great Smoky Mts., between Tennessee and North Carolina; Macon Co., Ga.

252a. *OMPHALINA ANDREWSÆ MONTIVAGA* Pilsbry. Thunderhead Mt.

Genus **VITRINIZONITES** W. G. Binney.

253. *VITRINIZONITES LATISSIMUS* (Lewis). Mountains between Tennessee and North Carolina.

Genus **VITRINA** Drap., 1801.

254. *VITRINA LIMPIDA* Gld. Canada and New England, west to Manitoba, south to Pittsburgh, Pa.

255. *VITRINA PFEIFFERI* Newc. California to B. C.; New Mexico, Utah, Colorado.

256. *VITRINA ANGELICÆ* Beck. Godhavn, Greenland.

257. *VITRINA EXILIS* Morel. Unalaska; Bering Id. A Kamchatkan species.

Genus **VITREA** Fitzinger.

258. *VITREA CELLARIA* (Müll). Seaports of Atlantic and Pacific coasts, Quebec, Portland, Me., Phila., Charleston, S. C., occasional in greenhouses inland, Allegheny City, Pa., Detroit, Mich., etc.

259. *VITREA DRAPARNALDI* (Beck.). Greenhouses, etc., Seattle, Wash., Oakland, Cal.

260. *VITREA HAMMONIS* (Ström). North Carolina to Colorado, northward throughout the northern states and British America; also Palearctic. (*Hyalina pellucida* Lehnert, *H. viridula* Mke., *H. radiatula* Ald., *H. electrina* Gld. are synonyms).

261. *VITREA WHEATLEYI* (Bland). Knoxville, Tenn., northern Alabama. (Indiana and Michigan, *Sterki*).

261a. *VITREA WHEATLEYI CLINGMANI* Dall. Clingman's Dome, Great Smoky Mts., N. C.

262. *VITREA RADERI* Dall. Cumberland, Md.

263. *VITREA PETROPHILA* (Bld.). Knoxville, Tenn.; Habersham Co., Ga.; Clarkesville, N. C.; Great Smoky Mts.

264. *VITREA BINNEYANA* (Morse). Quebec and Maine to northern Mich.; also reported from Vancouver Id.

265. *VITREA JOHNSONI* Dall. Seattle, Washington.

266. *VITREA WHITNEYI* (Newc.). Near Lake Tahoe, Cal.

267. *VITREA DIEGOENSIS* (Hemph.). Near Julian City, Cuyamaca Mts., San Diego Co., California.

Section *Striatura* Morse, 1864.

268. *VITREA FERREA* (Morse). Quebec, Ontario and Maine to Northern Mich., south to Ohio and North Carolina.

Section *Glyphyalina* Martens, 1892.

270. *VITREA INDENTATA* (Say). Dakota to New Mexico, Lower California and states of Jalisco and Morelos, Mexico, east to the Atlantic, Ontario to Florida.

271. *VITREA SCULPTILIS* (Bld.). Mountain region near the Tennessee and North Carolina boundary.

272. *VITREA CAROLINENSIS* (Ckll.). Mountain region along the North Carolina and Tennessee boundary; Monroe Co., Tenn.

273. *VITREA SUBRUPICOLA* (Dall). Clinton's Cave, Utah.

273a. *VITREA SUBRUPICOLA SPELEA* (Dall). Cave City, Calaveras Co., Cal.

Section *Paravitrea* Pilsbry, 1898.

274. *VITREA CAPSELLA* (Gld.). Virginia and Kentucky to Alabama.

275. *VITREA SIMPSONI* (Pils.). Limestone Gap, Indian Terr.; Mablevale, Ark.

276. *VITREA PLACENTULA* (Shuttl.). Great Smoky Mts., etc., Eastern Tennessee; Lexington, Va.; Hot Springs, Ark.

277. *VITREA LAWE* (W. G. B.). Eastern Tennessee.

Genus **CONULUS** Fitzinger, 1833.

(Not *Conulus* Klein, pre Linnaean, nor of Raf., 1815, a nude name).

278. *CONULUS FULVUS* (Müll.). All the States; British America, Palæartic.

278a. *CONULUS FULVUS DENTATUS* Sterki. Jackson Co., Ala.; Cincinnati, Ohio.

279. *CONULUS STERKII* Dall. New Philadelphia and Summit Co., Ohio; Mt. Lebanon, La.; Jackson Co., Ala.

280. *CONULUS CHERSINELLUS* (Dall). Calaveras Co., Cal.; Fresno Co.

Genus **GUPPYA** Mörch, 1867.

281. *GUPPYA GUNDLACHI* (Pfr.). Florida; Hidalgo, Texas; also West Indies and Central America.

Subfamily Ariophantinae Pilsbry.

Genus **ZONITOIDES** Lehmann, 1862.

282. *ZONITOIDES NITIDUS* (Müll.). British America and Northern States from New England to Washington; Pa.; Ohio; Ala. Also Europe.

283. *ZONITOIDES ARBOREUS* (Say). All the States; British America north to Great Slave Lake.

284. *ZONITOIDES DALLIANUS* (Simp.). Manatee Co. and Little Sarasota Bay, W. Florida.

Section *Pseudohyalina* Morse, 1864.

285. *ZONITOIDES LIMATULUS* (Ward). New York, Ohio, Michigan, Indiana, local and rather rare. (San Mateo, Cal., *Binney*).

286. *ZONITOIDES LATEUMBILICATUS* (Pils.). Near Woodville, Jackson Co., Ala.

287. *ZONITOIDES PATULOIDES* (Pilsbry). Thunderhead, Great Smoky Mts.

288. *ZONITOIDES SHIMEKII* (Pils.). Loess of Iowa (Extinct).

289. *ZONITOIDES SELENITOIDES* (Pils.). Mariposa Big Trees, Cal.

290. *ZONITOIDES MINUSCULUS* (Binn.). Ontario to Florida, west to Mont., Arizona and New Mexico.

290a. *ZONITOIDES MINUSCULUS ALACHUANUS* (Dall). Alachua Co., Fla.

291. *ZONITOIDES LEVIUSCULUS* (Sterki). Comal Co. and Hidalgo, Texas; Henry Co., Ind.; N.-W. Ohio; New Mexico.

292. *ZONITOIDES SINGLEYANUS* (Pils.). Comal Co., Central Texas; Woodville, Ala.

293. *ZONITOIDES EXIGUUS* (Stimps.). Quebec and Ontario, New England, N. Y., Mich.

294. *ZONITOIDES MILIUM* (Morse). Ontario to Florida, west to Indiana.

294a. *ZONITOIDES MILIUM PUGETENSIS* (Dall). Seattle, Wash.; Ballena, San Diego Co., Cal.

Genus *GASTRODONTA* Albers, 1850.

295. *GASTRODONTA INTERTEXTA* (Binn.). Ontario to Florida, west to southwestern Louisiana and Indiana. A carinated form occurs.

296. *GASTRODONTA ACERRA* (Lewis). Roan Mt., North Carolina, to Montgomery, Ala.; Indian Terr.

297. *GASTRODONTA DEMISSA* (Binn.). Western Pa. to Georgia west to Arkansas and eastern Texas.

297a. *GASTRODONTA DEMISSA BRITSHI* (Pils.). Hot Springs, Ark.

298. *GASTRODONTA CERINOIDEA* (Anth.). Virginia to northern Florida.

299. *GASTRODONTA LIGERA* (Say). Ontario to Michigan, Indian Terr. and Louisiana, south to Virginia and Tennessee.

300. *GASTRODONTA COLLISELLA* Pils. Lookout Mt., Roane, Knox, Monroe and Washington counties, Tennessee; Lexington, Va.

300a. *GASTRODONTA COLLISELLA PERCALLOSA* Pils. Near Chattanooga and Nashville, Tenn.

301. *GASTRODONTA GULARIS* (Say). Mountain region of eastern Tennessee, western North Carolina, northern Alabama and Georgia.

301a. *GASTRODONTA GULARIS CUSPIDATA* (Lewis). Monroe Co., etc., eastern Tennessee; Roan Mt.

302. *GASTRODONTA SUPPRESSA* (Say). Ontario and Michigan to Maryland.

303. *GASTRODONTA MACILENTA* (Shuttl.). Mountains near the Tennessee and North Carolina boundary.

304. *GASTRODONTA LASMODON* (Phillips). Eastern Tennessee, western North Carolina and northern Alabama.

305. *GASTRODONTA ELLIOTTI* (Redf.). Same distribution.

306. *GASTRODONTA INTERNA* (Say). Ohio to northern Florida, chiefly in Tennessee; West Virginia; northern Alabama.

Subgenus *Taxeodonta* Pilsbry, 1898.

307. *GASTRODONTA SIGNIFICANS* (Bld.). Fort Gibson, Indian Terr.; Union Co., Tenn.



THE NAUTILUS.

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DESCRIPTIONS OF NEW AMERICAN LAND SHELLS.

BY HENRY A. PILSBRY.

Punctum clappi n. sp.

Shell minute, openly umbilicated, yellowish-brown, with depressed, nearly level spire, and cylindroid whorls. Whorls $3\frac{1}{2}$, the earlier $1\frac{1}{2}$ smoothish, finely pitted, the last 1 or $1\frac{1}{4}$ whorls sculptured with elevated laminae running with the increment-lines, 30 to over 40 on the last whorl, the intervals closely striated and showing fine spiral striation; suture impressed, descending in front; umbilicus deep and open, its width contained between $3\frac{1}{4}$ and $3\frac{1}{2}$ times in greatest diameter of shell. Aperture short oval, higher than wide, somewhat oblique, but little excised by the previous whorl.

Alt. 1.1-1.2, greatest diam. 2 mm.

Seattle (Randolph) and Tacoma (Hemphill), Washington; Salem, Oregon (Hemphill).

My attention was called to this form some years ago, but its determination at this time is due to Mr. George H. Clapp, who insisting that the shells were neither *Punctum conspectum* nor *Pyramidula asteriscus*, induced me to review the group.

P. (Planogyra) asteriscus is even flatter above; the umbilicus is wider, one-third the diameter, and more open; the cuticular lamellae are more widely spaced and fewer, 19-25 on the last whorl, and the aperture is relatively smaller.

Punctum conspectum, which also occurs at Seattle, has a much more elevated spire, decidedly narrower umbilicus, less than one-fourth the diameter of the shell, and the aperture is different in shape, wider than high.

On some specimens of *P. clappi* the elevated lamellæ are in part subobsolete.

Dentition not yet examined, so that the species may turn out to be a *Planogyra* rather than a *Punctum*.

***Punctum californicum* n. sp.**

Similar to *P. conspectum* in the small, deep umbilicus and color. Spire somewhat more elevated; whorls fully 4, closely revolving, the last decidedly narrower than in *conspectum* (viewed from above). Surface lusterless, with fine, even, hair-like striation, and in places showing faint traces of spiral striæ. Umbilicus narrow and deep, its width contained $4\frac{1}{2}$ times in greatest diameter of the shell. Aperture wider than high, shaped much as in *P. conspectum*.

Alt. 1.14, greatest diam. 1.85 mm.

Fish Camp, Fresno Co., California.

***Gastrodonta (Taxeodonta) lamellidens* n. sp.**

Shell similar to *G. multidentata*, but larger, with an additional whorl, and instead of radial rows of teeth having partition-like radial barriers, generally three in the young, one, not far within, in the adult shell. Alt. 1.6, diam. 3.7 mm.

Thunderhead, Great Smoky Mts.

This is one of Mr. J. H. Ferriss' finds. It was only obtained in small numbers, but probably is abundant, overlooked on account of the small size. I have not heard of *G. multidentata* being found so far south as this.

***Gastrodonta collisella percallosa* n. var.**

Shell similar to *G. collisella* or a small *ligera* with globose base; having an extremely heavy callus within the outer and basal walls of the aperture, extending about one-third whorl inward; no lamella. Whorls $7\frac{1}{3}$. Size of *G. collisella*.

Mr. Geo. H. Clapp, of Pittsburgh, Pa., when in Philadelphia lately, called my attention to this form. Upon examining the collection of the Academy, two trays of it were found, one set collected by A. G. Wetherby (who also supplied Mr. Clapp's specimens), on the Tennessee river, 3 miles above Chattanooga, Hamilton Co., the other by G. A. Lathrop, at Nashville, Tenn. In correspondence with Mr. Wetherby some years ago, we mutually agreed that the shells were a small, heavily calloused variety of *G. ligera*; but upon reconsideration I am disposed to rank them rather with *G. collisella*.

A NEW SUBGENUS OF CORALLIOPHAGA.

BY W. H. DALL.

Oryctomya n. subg.

Shell with the form of *Coralliophaga*, the surface with radiating very fine lines of minute granulations as in *Eucharis*; hinge with one slender, transverse, more or less trifid cardinal in each valve, that in the left valve larger, and a slender almost linear tooth on the anterior lower surface of the nymph in each valve; an obscure projection on the cardinal margin in front of the cardinal in the left valve; no lateral teeth; pallial sinus short, angular, the adductor scars large and strong, the inner margins of the valves plain. Type *C. (O.) claibornensis* Dall.

This subgenus differs from *Coralliophaga* in its surface and dentition, and has the pallial sinus more distinct and angular. It has the boring habit, the valves are therefore often irregular, the younger ones are thinner, more regular, and with the adductor scars less evident. *Coralliophaga prima* Harris (Bull. Pal. IX, p. 60, pl. 13, figs. 4, 5, 1897), from the Lignitic, may be congeneric, but I have seen no specimens, and the dentition is different according to the description.

C. (Oryctomya) claibornensis Dall.

Shell elongate oval with low beaks, quite anterior, moderately inflated, somewhat mesially impressed; surface with incremental lines which in senile specimens sometimes become lamellose near the posterior end; radial sculpture of rows of small globular granules easily worn off and almost microscopic; ends rounded, the posterior broader; hinge teeth delicate, somewhat pedunculate and slender in the adult; pallial sinus not extending in front of the posterior adductor scar; pallial line in senile specimens radially striated.

Lon. 36, alt. 19, diam. 14 mm.

Claiborne sands, at Claiborne, Ala., Burns.

This species is readily recognized by its peculiar surface. It will be illustrated in a publication now in press.

NOTES AND NEWS.

HOW CAN HE CLEAN 'EM?—A collector asks "How can I get the livers out of my shells? Is there an acid that will eat liver and

let the shell alone; or, is there some absorbent that will contract when cool or in the process of drying that will bring it out? I have put my snails in boiling water, guessing at the cooking necessary for the different varieties, but often I cannot extract the whole animal, leaving a portion to discolor the spire."

For cleaning the exterior of water shells I find fine table salt about the correct thing. Rub it on with a piece of cloth or the hand. It has grit enough to remove lime, algæ and iron stains without being firm enough to scratch the epidermis. Often a weak solution of muriatic acid assists in removing iron stains and lime, and brightens the colors. Rinse thoroughly, and when dry rub over lightly with raw linseed oil.—JAS. H. FERRISS.

NOTES ON SOME PUPIDÆ.—The perusal of the account of the Pupidæ in the new Catalogue suggests the following comments. *Pupa montanella* (p. 119) is not *concinnulla*, but is a weak form of *pentodon*, found in Custer Co., Colorado. The name has never been sanctioned by a description, and should be dropped. *P. pentodon*, it may be remarked, was originally the type of *Vertigopsis*, as I had it in my MS.; but in NAUTILUS, January, 1893, Dr. Sterki takes *curvidens* as the type, and this must now hold good. Ancey's unpublished descriptions of his two forms of *P. ingersolli* are as follows:

"Var. (?) *haydeni* Anc. Testa præcedenti [*ingersolli*] statura formaque simillima, sed dentibus palatalibus 3 parallelis et æqualibus, elongatis, nec. 2, discrepans. Cunningham Gulch (Ingersoll)."

"Var. *accedens*, Anc., Testa typo similis, sed tuberculo parietali distincto prope dentem armata." (May, 1890). *Pupa sublubrica* is hardly *muscorum*; a figure communicated by Mr. Ancey shows, besides a strong parietal tooth, one on the outer wall, and also an obtuse one on the columella. The figure appears to me to represent a form of *blandi*. In May, 1890, Mr. Ancey (*in litt.*) states that *hebes* was near to *muscorum*, and criticised Binney for putting it under *arizonensis*; thus it appears probable that *gabbi* may stand. At that time (1890) a new name was proposed in MS. by Ancey for *arizonensis*, W. G. B., but it was not published. It may be as well to remark here that the name *Holospira ræmeri* var. *minor*, published (NAUTILUS, VI, 6) by Dr. Sterki, without description, belongs to W. G. Binney's var. β , Man. Amer. Land Shells, p. 422.—T. D. A. COCKERELL.

RECENT PUBLICATIONS.

APPENDIX TO MARINE SHELLS OF SOUTH AFRICA, by G. B. Sowerby (30 pp., 3 pl.). The total number of species is brought up to 1051 in this appendix. Among numerous new forms may be mentioned *Fulgur africanum*, a form resembling young *F. carica*; two fine Ancillas, a *Basterotia* and several new forms of *Scintilla* as of special interest. The rare *Voluta festiva* Lam. is also recorded.

ARMATURE OF HELICOID LAND SHELLS. Mr. G. K. Gude still continues his series of articles under this head in *Science-Gossip*. The extensive genus *Plectopylis* still furnishes species for description and illustration. In this group, as in many other genera of land snails, the most important characters for distinguishing species, and for their grouping, are to be seen only by cutting the shell to expose the peculiar system of internal barriers and teeth. In some species of *Plectopylis* these are wonderfully complex, forming truly a "crooked gateway." It must be said that in these papers Mr. Gude supplies a large amount of information not elsewhere to be found.

THE VARIATIONS AND MUTATIONS OF THE INTRODUCED LITTORINA, by Hermon C. Bumpus (Zool. Bulletin I, No. 5, p. 247, February, 1898). "The observations recorded in this communication were made for the purpose of ascertaining additional facts relative to the variability of 'introduced species.'"

Littorina littorea is selected for study. First collected at Bathurst on the Gulf of St. Lawrence in 1855, the southward migration of the species is traced to New Haven (1880). 10,000 shells were collected from ten American, and 3,000 from three English localities for measurement and weighing, the results being summarized as follows: "We may then conclude that the periwinkle, subjected to a new environment, and presumably emancipated from many of the restraining influences of natural selection, has become in any and all American localities:

"I and II, more variable in its stature. III, more variable in its course of growth. IV, more variable in weight. V, more variable in bulk. VI, more variable in limitations and boundaries of the color patterns.

"While presenting these extremes of variation, the American type of *Littorina littorea*, when compared with the European type, is more elongated, lighter in weight, more bulky, and the color markings are less pronounced."

308. *GASTRODONTA ANDREWSÆ* (W. G. B.). Mountains of North Carolina along the Tennessee boundary.

309. *GASTRODONTA MULTIDENTATA* (Binn.). Quebec and Ont. to Michigan, south to New York and Ohio.

310. *GASTRODONTA LAMELLIDENS* Pils. Clingman's Dome, Great Smoky Mts.

Genus **PRISTILOMA** Ancey, 1887.

311. *PRISTILOMA LANSINGI* (Bld.). Astoria, Oregon to Vancouver Island.

312. *PRISTILOMA STEARNSI* (Bld.). Oregon, Washington, British Columbia, Pt. Barrow, Alaska. (*Hyalina arctica* Lehnert, Science Record, June, 1884, is a synonym.).

Family LIMACIDÆ.

Genus **LIMAX** L.

313. *LIMAX MAXIMUS* L. Seaports and principal cities of east and west coasts. New Braunfels, Texas.

314. *LIMAX FLAVUS* L. Seaports and principal cities of the Atlantic seaboard, Boston to Charleston, S. C. (*L. variegatus* Drap. is the same).

Genus **AGRIOLIMAX** Mörch, 1868.

315. *AGRIOLIMAX AGRESTIS* (L.). Seaports of east and west coasts, often spreading well inland. There are many named color-forms.

316. *AGRIOLIMAX CAMPESTRIS* (Binn.). Entire U. S. Varieties *occidentalis* Coop., *montanus* and *castaneus* Ing., *ingersolli* W. G. B., *hyperboreus* West., and a number of color-forms have been described.

317. *AGRIOLIMAX HEMPHILLI* (W. G. B.). Julian City, Cal.; San Tomas, Lower Cal. A color-variety *pictus* Ckll. is described.

Genus **AMALIA** Moq., 1855.

318. *AMALIA HEWSTONI* (Coop.). Seattle, Wash. to San Diego Co., Cal. May be identical with the European *A. gagatea*.

Family ARIONIDÆ.

Subfamily Arioninæ Pilsbry.

Genus **ARION** Fér.

319. *ARION HORTENSIS* Fér. Boston and New Bedford, Mass.; Poughkeepsie, N. Y.; Seattle, Washington. Introduced from Europe.

Genus **PROPHYSAON** W. G. Binney.

320. **PROPHYSAON ANDERSONI** (Coop.). Middle California to Vancouver Island.

321. **PROPHYSAON FOLIOLATUM** (Gld.). Seattle, Olympia, and Puget Sound region, Washington.

322. **PROPHYSAON CÆRULEUM** Ckll. Seattle and Olympia, Washington.

323. **PROPHYSAON FASCIATUM** Ckll. Old Mission, Idaho: Chehalis and Seattle, Washington.

Genus **ANADENULUS** Cockerell.

324. **ANADENULUS COCKERELLI** (Hemph.). Cuyamanca Mts., San Diego Co., Cal.

Subfamily **Ariolimacinae** Pilsbry.Genus **HESPERARION** Simroth.

325. **HESPERARION NIGER** (Coop.). Neighborhood of San Francisco Bay.

326. **HESPERARION HEMPHILLI** (W. G. B.). Niles Station, Alameda Co., California.

Genus **APHALLARION** Pils. & Van.

327. **APHALLARION BUTTONI** Pils. & Van. Oakland to Santa Cruz, Cal. (*Ariolimax hecoxi* Weth., undescribed, is said to be the same).

Genus **ARIOLIMAX** Möreh.

328. **ARIOLIMAX COLUMBIANUS** (Gld.). Middle Cal. to British Columbia. The black-blotched form *maculatus* Ckll. occurs throughout the same range.

328a. **ARIOLIMAX COLUMBIANUS STRAMINEUS** Hemph. Santa Cruz Island, Cal.

329. **ARIOLIMAX CALIFORNICUS** Cooper. San Mateo, Santa Clara and Santa Cruz counties, California.

Genus **HEMPHILLIA** Binn. & Bld.

330. **HEMPHILLIA GLANDULOSA** B. & B. Puget Sound region to Astoria, Oregon.

331. **HEMPHILLIA CAMELUS** Pils. & Van. Old Mission, Idaho.



Genus **BINNEYA** Cooper.

332. **BINNEYA NOTABILIS** Cooper. Santa Barbara Island, Cal.; Guadelupe I., Lower Cal.

Family **PHILOMYCIDÆ**.

Genus **PHILOMYCUS** (Raf.) Fér.

333. **PHILOMYCUS CAROLINENSIS** (Bosc). Canada to Florida, west to Iowa and Texas.

Subgenus **Pallifera** Morse, 1864.

334. **PHILOMYCUS DORSALIS** Binn. New England and New York.

335. **PHILOMYCUS WETHERBYI** (W. G. B.). Whitley Co., Ky.

336. **PHILOMYCUS HEMPHILLI** (W. G. B.). Mt. Mitchell, N. C.; Lula, Hall Co., Ga.

337. **PHILOMYCUS PENNSYLVANICUS** Pils. Mountains of southern Pennsylvania.

Family **ENDODONTIDÆ** Pilsbry.

Subfamily **Endodontinæ** Pils.

Genus **PYRAMIDULA** Fitzinger, 1833.

Subgenus **Patula** Held, 1837.

338. **PYRAMIDULA ALTERNATA** (Say). Quebec and Ontario to Minnesota, south to Comal Co., Texas.

Forms *fergusoni* Bld. and *carinata* auct. are distinguishable.

338a. **PYRAMIDULA ALTERNATA MORDAX** (Shuttl.). West Virginia, East Tennessee.

339. **PYRAMIDULA CUMBERLANDIANA** (Lea). Marion and Franklin counties, Tenn.; Jackson Co., Ala.; n.-w. Georgia.

340. **PYRAMIDULA SOLITARIA** (Say). Ohio and central Mississippi Valleys, south to Arkansas; Northern Idaho, Eastern Oregon. The Western form has been called var. *occidentalis* v. Martens, but it has only slight differential characters.

340a. **PYRAMIDULA SOLITARIA LIMITARIS** Dawson. Waterton Lake, Rocky Mts., British America.

341. **PYRAMIDULA STRIGOSA** (Gld.). Rocky Mt. region and Great Basin, from State of Sonora, Mexico, north to Wyoming and Washington.

341a. **PYRAMIDULA STRIGOSA IDAHOENSIS** (Newc.). Idaho, between Idaho City and Cœur d'Alène.

341b. **PYRAMIDULA STRIGOSA NEWCOMBI** (Hemph.). North of Ogden, Utah. Form *wasatchensis* Hemph., near Ogden.

341c. PYRAMIDULA STRIGOSA BINNEYI (Hemph.). Box Elder Co., Utah. Forms *cooperi*, *multicostata*, *castanea*, *albofasciata* and *buttoni* Hemph., same locality. Form *gouldi* Hemph., banks of Bear River, north of Brigham City, Utah.

341d. PYRAMIDULA STRIGOSA (Gld.) typical. Spokane, Washington. Var. *parva* Hemphill is a synonym.

341e. PYRAMIDULA STRIGOSA JUGALIS (Hemph.). Salmon River, Idaho. Form *intersum* Hemph., same locality.

341f. PYRAMIDULA STRIGOSA SUBCARINATA (Hemph.). Rathdrum, Idaho. Includes forms *subcarinata*, *bicolor*, *luctea* and *picta* Hemph.

341g. PYRAMIDULA STRIGOSA COOPERI (W. G. B.). Colorado, etc. Form *globulosa* Ckll., Summit Co., *trifasciata* Ckll., Mesa Co., *confluens* Ckll., Custer, Garfield and Mesa Cos., *elevata* Ckll., Delta Co., *major* Ckll., Mesa Co., *minor* Ckll. near Egeria, Routt Co., all Colorado.

341h. PYRAMIDULA STRIGOSA IOWENSIS Pils. Loess at Iowa City, Iowa (extinct).

341i. PYRAMIDULA STRIGOSA CONCENTRATA Dall. Summits of the Hachita Grande and Huachuca Mts., New Mexico and Arizona.

341j. PYRAMIDULA STRIGOSA HAYDENI (Gabb). Utah. Form *hemphilli* Newc., Arizona, Nevada, Idaho, Utah and Colorado; form *gabbiana* Hemph., Near Salt Lake City; form *bruneri* Ancey (*oquirrhensis* Hemph.), Oquirrh Mts., Utah; form *hybrida* Hemph., near Logan, Utah.

Subgenus *Gonyodiscus* Fitz.

342. PYRAMIDULA PERSPECTIVA (Say). Minnesota to Texas, east to the Atlantic, but wanting from the Middle States east of the Alleghenies, and from New England, Canada.

343. PYRAMIDULA BRYANTI (Harper). Mitchell Co., N. C.

344. PYRAMIDULA STRIATELLA (Anth.). Ontario to Winnipeg, Manitoba, Montana and Vancouver Id., south to New Mexico and Arizona. Kern River region, Cal.

344a. PYRAMIDULA STRIATELLA CATSKILLENSIS Pils. Tannersville valley, Catskill Mts.

344b. PYRAMIDULA STRIATELLA CRONKHITEI (Newc.). Klamath valley, Oregon. Nevada and California.

Subgenus **Planogyra** Morse, 1864.

345. **PYRAMIDULA ASTERISCUS** (Morse). Quebec, Ont. and Maine (to Vancouver Island?).

Genus **HELICODISCUS** Morse, 1864.

346. **HELICODISCUS LINEATUS** (Say). Ontario and Quebec to Florida, west to Rio Chama and White Oaks, New Mexico.

347. **HELICODISCUS FIMBRIATUS** Wetherby. Tellico Plains, Tenn. A variety is reported from Indian Territory.

Subfamily Punctinæ (*Vel Polyplacognatha*).

Genus **PUNCTUM** Morse.

348. **PUNCTUM PYGMEUM** (Drap.). Quebec, Manitoba and northern States; Texas; California, Vancouver Id.

349. **PUNCTUM RANDOLPHII** (Dall). Seattle, Washington.

350. **PUNCTUM CONSPECTUM** (Bld.). Middle California to Vancouver Id. and Sitka.

350a. **PUNCTUM CONSPECTUM PASADENÆ** Pils. Pasadena, California.

351. **PUNCTUM CLAPPI** Pilsbry. Seattle and Tacoma, Washington; Salem, Oregon.

352. **PUNCTUM CALIFORNICUM** Pilsbry. Fish Camp, Fresno Co. Cal.

Genus **SPHYRADIUM** Charp.

353. **SPHYRADIUM EDENTULUM** (Drap.). Ontario to Vancouver Id. *Vertigo simplex* Gld. A longer cylindrical form, *alticola* Ingersoll, occurs in the Rocky Mts., Colorado, etc., and Mississippi valley Loess.

(Superfamily **ELASMOGNATHA**.)

Family SUCCINEIDÆ.

Genus **SUCCINEA** Drap.

(*Amphibia*.)

(The species of this section are variable and extremely difficult to define from the shells alone, and the soft anatomy is as yet practically unknown).

354. **SUCCINEA SALLEANA** Pfr. New Orleans and Alexandria, La.; Gloucester, N. J.

355. **SUCCINEA EFFUSA** "Shutt." Pfr. Florida.

356. *SUCCINEA SILLIMANI* Bld. Nevada, California.

357. *SUCCINEA HIGGINSI* Bld. Put-in-Bay, Lake Erie.

358. *SUCCINEA RETUSA* Lea. Canada to Montana, southward to Georgia. Includes *S. ovalis* Gld. not Say, *S. forsheyi* Lea, *S. wilsoni* Lea, *S. calumetensis* Calkins, *S. peoriensis* Wolf.

358a. *SUCCINEA RETUSA* MAGISTER Pils. Mississippi valley from Tennessee to Minnesota: Michigan.

358b. *SUCCINEA RETUSA* DECAMPI Tryon. Michigan.

359. *SUCCINEA NUTTALLIANA* Lea. Washington to California.

360. *SUCCINEA HAYDENI* W. G. Binn. Nebraska to Utah. A form *minor* W. G. B. is recorded from Great Slave Lake.

361. *SUCCINEA HAWKINSI* Baird. Lake Osoyoos, B. C.

(*Neritostomæ.*)

362. *SUCCINEA OBLIQUA* Say. Canada to Montana, south to Nebraska, Arkansas and Georgia.

362a. *SUCCINEA OBLIQUA* TOTTENIANA Lea. Canada to Middle States.

(*Campestris.*)

363. *SUCCINEA CAMPESTRIS* Say. Georgia and Florida. *S. inflata* Lea is a synonym.

363a. *SUCCINEA CAMPESTRIS* UNICOLOR Tryon. New Orleans, La.

364. *SUCCINEA LUTEOLA* Gld. Texas; western Florida to the Keys.

365. *SUCCINEA CONCORDIALIS* Gld. Lake Concordia, Texas.

366. *SUCCINEA GROSVENORII* Lea. Louisiana, Mississippi and Texas north through Kansas and Nebraska to Great Slave Lake; Colorado, Montana and Utah. Synonyms are *S. lineatu* Binn. not DeKay, *mooresiana* Lea, *greeri* Tryon. Forms *elongata* (Kremmling, Colo.) and *rufescens* Ckll. (Lee Co., Texas) are described.

(*Lucenæ.*)

367. *SUCCINEA AVARA* Say. Canada to Georgia, west to Minn., Mont., Utah, Texas, California. Forms *alba* Ckll., Custer Co., Col. *wardiana* Lea, *vermeta* Say, *compacta* Ckll., *major* Binn. are described.

368. *SUCCINEA AUREA* Lea. New York, Ohio. *S. haleana* Lea, Alexandria, La., is probably synonymous.

369. *SUCCINEA VERRILLI* Bland. Anticosti Island.

370. *SUCCINEA OREGONENSIS* Lea. San Diego to Oregon; Utah; Idaho.

370a. *SUCCINEA OREGONENSIS* GABBI Tryon. Utah, Wyoming, eastern Oregon.

371. *SUCCINEA RUSTICANA* Gld. Oregon, Cal., Nevada.

372. *SUCCINEA STRETCHIANA* Bld. Nevada, Idaho, Cal.

373. *SUCCINEA GROENLANDICA* Beck. Greenland.

(*Lautæ.*)

374. *SUCCINEA CHRYSIS* Westerl. Port Clarence, St. Michaels and Kadiak, Alaska.

374a. *SUCCINEA CHRYSIS AURELIA* Martens. Port Clarence, Alaska.

374b. *SUCCINEA ANNEXA* Westerl. Port Clarence, Alaska. These three are probably mere variations of one species. They belong to an Asiatic group of the genus. *S. chrysis* occurs also on the Siberian side of the strait.

Suborder *Teletremata* Pilsbry.

Family **VAGINULIDÆ.**

Genus **VAGINULUS** Fér.

375. *VAGINULUS FLORIDANUS* Biun. Florida Keys, Charlotte Harbor and Punta Rassa.

VAGINULUS ? Lobitos, Cal. (Stearns, as *V. olivacea*).

[NOTE.—The family *Onchidiidæ* belongs to this suborder, but as its species are not really terrestrial in habit, it is omitted from this list of land snails. The *Auriculidæ*, and especially *Carychium*, and *Pomatiopsis lapidaria*, might with greater propriety be included; but it has been thought best to omit them.]

UPON THE PRINCIPLES OF NOMENCLATURE AND THEIR APPLICATION TO THE GENERA OF RECENT MOLLUSCA, by J. Cosmo Melvill; being the Presidential Address delivered before the Conchological Society of Great Britain, September 19, 1896. This address embodies a very readable sketch of the history of nomenclature, from the pre-Linnæan authors to the present time, with a list of molluscan genera about the names of which difference of opinion exists, observations upon the nomenclature of certain genera, and suggestions for the betterment in the future of the existing condition of the subject.

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A MONTHLY
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OF CONCHOLOGISTS.



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JUNE, 1897.

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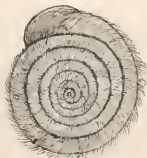
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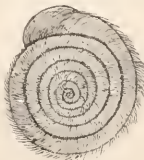
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OCTOBER, 1897.

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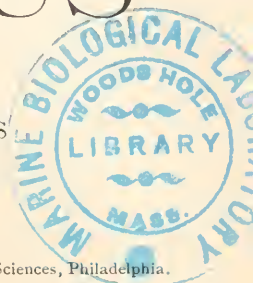
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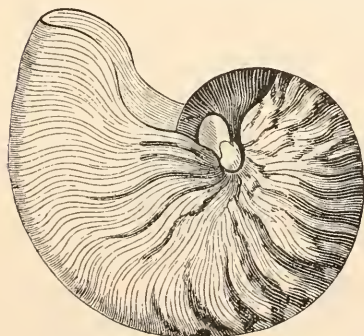
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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR :

H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

Vol. XI.

MARCH, 1898.

No. 11

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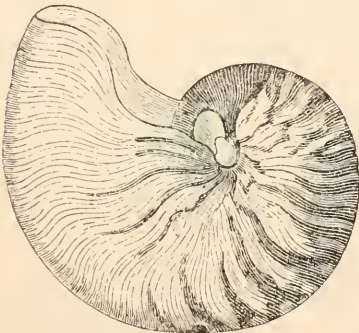
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APRIL, 1898.

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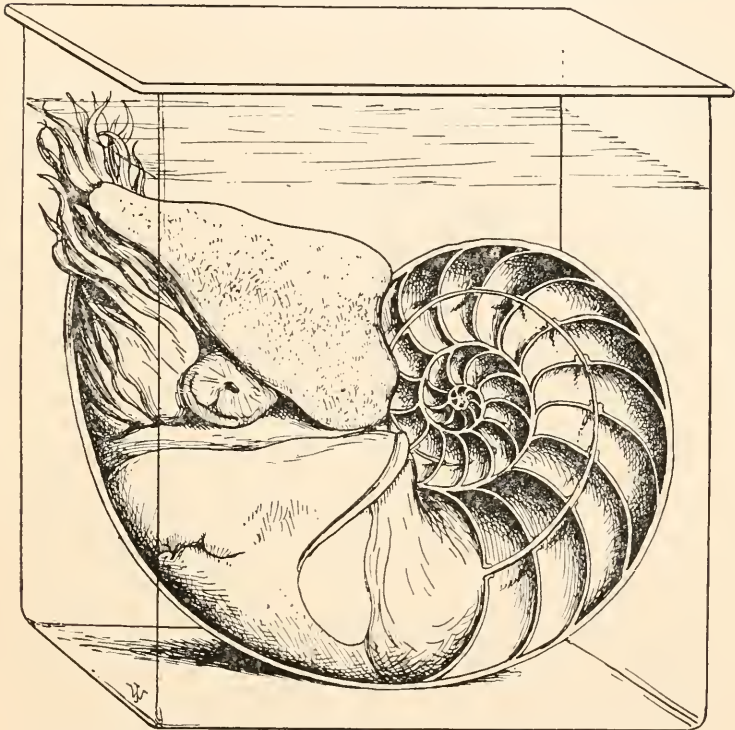
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