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THE  
NAUTILUS.

A MONTHLY JOURNAL  
DEVOTED TO THE INTERESTS OF  
CONCHOLOGISTS.



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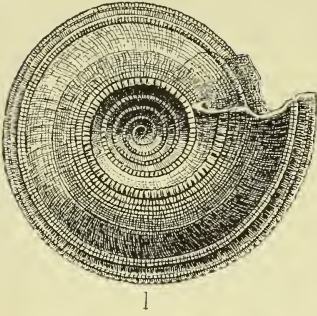
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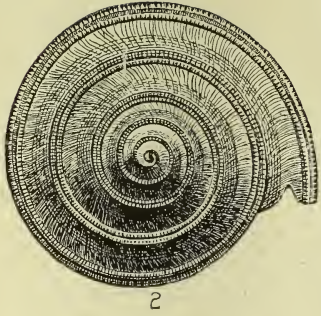
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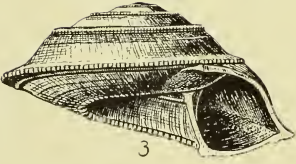




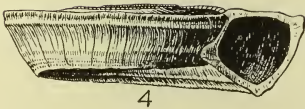
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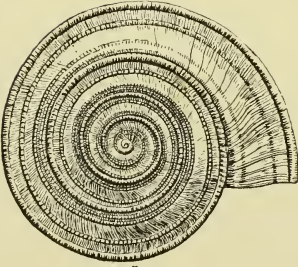
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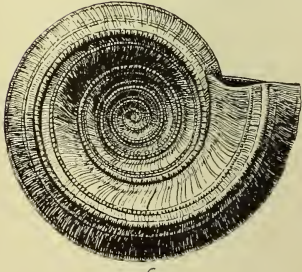
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# THE NAUTILUS.

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MAY, 1895.

No. 1

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## DESCRIPTIONS OF TWO NEW EOCENE SOLARIIDÆ FROM ALABAMA.

BY T. H. ALDRICH.

*Solarium elaboratum* Conrad vir bimixta. Plate I, figs. 1, 2, 3.

Shell elevated, peripheral margins minutely beaded, flattened, acute; umbilical rib very small and placed close to suture, umbilical carina prominent and beaded. Base very finely striated with a strong beaded rib close to the periphery. Spiral ornamentation approaching *Solarium cupola* Heilpr. Max. diam. 15 mm., alt. 7 mm.

Locality: Matthews' Landing beds near Rosebud, Wilcox Co., Ala.

This variety, while belonging to the acutum-elaboratum section, has a combination of characters approaching other sections. The drawings executed by Dr. McConnell, of Washington, show this form so beautifully it is scarcely necessary to describe it.

Prof. W. H. Dall, in Trans. Wagner Free Inst. Science, Vol. 3, part 2, p. 323, Dec. 1892, has divided the Eocene *Solariums* into four sections, and, by letter to me, has lately added a fifth, viz.: Section DINAXIS Dall. "Spire flattened, with the circumference of shell forming the periphery; the umbilicus wide, nearly funicular, with thread-like spiral ribbing or none, the umbilical carina simple or finely granular, forming the base of the shell." This new section includes *S. alabamense* Dall, and the following new species.

*Solarium planiforme* n. sp. pl. I, figs. 4, 5, 6.

Shell flat, whorls six, apical one smooth, the balance with a beaded spiral boundary followed closely by a smaller spiral likewise beaded, two faint spirals near suture; lines of growth fine, coarser nearer aperture, the side of the body-whorl forming an acute angle with the top and nearly a right angle with the base; the side is slightly convex, with a granular raised line immediately below the periphery and two fainter ones near the base; the basal keel beaded; umbilicus wide, marked with two or three beaded lines. Aperture wedge-shaped, narrower at junction with body-whorl. Max. diameter 19 mm., elevation 6 mm.

Locality: near Rosebud P. O., Wilcox Co., Ala., in Matthews' Landing beds.

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#### A MONTH WITH THE MICHIGAN FISH COMMISSION.

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BY BRYANT WALKER, DETROIT, MICH.

---

In 1893, the Michigan Fish Commission, in co-operation with the University of Michigan, inaugurated a systematic biological examination of the Great Lakes, with special reference to the work of the Commission in replenishing the rapidly decreasing fisheries of the State. The headquarters of the field-party for 1894 was established at Charlevoix, the well-known summer resort, on the east coast of Lake Michigan, and formerly a fishing station of considerable magnitude. Through the kindness of Prof. Henry B. Ward, the Director-in-charge, the writer was invited to spend his vacation with the party as conchologist. In addition to the usual methods of collecting along the shore and from small boats, considerable dredging was done in the deeper waters of both Lake Michigan and Pine Lake. A three days' trip to the Beaver Islands at the northern end of Lake Michigan, was one of the most interesting episodes of the summer, and one most fruitful in its results, as it was, undoubtedly, the first time the islands had been visited for scientific purposes. The unusual facilities enjoyed by the expedition in the line of deep water dredging, have afforded many noteworthy additions to the fauna of the State in all classes of the invertebrata and especially in the mollusca; and, at the suggestion of the editors of THE NAUTILUS, the following summary of the results obtained has



been prepared in advance of the formal report of the summer's work.

Owing to the sandy nature of the soil, so characteristic of that portion of the State, and the long-continued drought which prevailed during last summer, terrestrial mollusks were not so numerous, either in species or individuals, as might naturally have been expected. The characteristic feature was the occurrence of many species, especially of the *Zonitidae*, peculiar to the northern region. Thus *Zonites ferreus* Mse., *binneyanus* Mse., and *exiguus* Stimp., *Vitrina limpida* Ged., and *Helix harpa* Say, are not found in the southern part of the State. *Patula asteriscus* Mse. and *Strobilops virgo* Pils., also northern forms, were interesting additions to our fauna. The local and rare (in this State) *Helix sayii* Binn., an essentially northern form, also occurred, indicating its probable range across the northern part of the State, as all the examples heretofore known to the writer have been from the counties bordering on Lake Huron. A few specimens of the albino variety of *Patula alternata* Say, were found associating with the typical form. Two forms of *Helix albolabris* Say were noted, occurring side by side, the one quite typical in shape and color, but rather below the average size and with a very thick and broadly-reflected lip; the other larger and much inflated, with a thin, dark purplish brown shell, having the narrowly reflected lip more or less deeply tinged with purple; a very beautiful form, not seen elsewhere. The only Pupa found was *P. contracta* Say, while *Vertigo* was represented by four forms, *V. ovata* Say, *bollesiana* Mse., *ventricosa elatior* Sterki, and *pentodon* Say. In addition to the universally-distributed *Succinea obliqua* Say and *avava* Say, was found the elongated form of *S. ovalis* Gld., common in the northern part of the State, which has been doubtfully referred to the *S. higginsi* Bld. (see NAUTILUS, VII, p. 127). In all, thirty-one species of land-snails were found, of which two were new to the fauna of the State.

Among the fresh-water pulmonates, many interested forms occurred. The most noteworthy of them was a single example of a deep water form of *Limnæa stagnalis* L., dredged from ten metres depth in Lake Michigan, at High Island Harbor in the Beaver Islands. It is about 23 mm. in length, exceedingly fragile, of a pure translucent white, and, though somewhat larger and differently proportioned, appears to be analogous to the var. *Bottnica* of Clessin from Sweden. At the same locality occurred a small globose form

of the same genus which may be new. Also a small white *Physa* which is provisionally referred to *P. gyrina* Say. A small elongated *Limnæa* of the *reflexa* group from the same locality, seems to be the *L. lanceata* Gld. No less than seven different species of *Limnæidae*, six of operculates, and many *Pisidia* were brought up by one haul of the trawl from this prolific locality. In a small lake near the south end of Beaver Island, which was simply swarming with animal life, were found the finest specimens of *Limnæa ampla* Migh. yet seen from Michigan. The largest example collected measured  $28\frac{1}{2}$  mm. in length and 19 mm. in breadth, the aperture being  $19\frac{3}{4}$  mm. long and 13 mm. broad.

The *Limnæidae* of Pine Lake, which empties into Lake Michigan at Charlevoix, were also extremely interesting. The bottom of the lake is composed almost wholly of marl, except where it has been covered by a thin coating of sand washed in from the shores, and, as a consequence, both plant and animal life exist under very unfavorable circumstances. The level of the lake seems to have been lowered by the canal made by the U. S. Government to connect it with Lake Michigan, and the former lake terrace is now largely exposed, and, in many places, quite dry. In the numerous pools, however, which are left along the shore, the *Limnæa catascopium* Say is found in great abundance and almost infinite variety. It varies in shape from the comparatively slender form usually found in the Great Lakes to the globose form described as *L. pinguis* by Say, and seems, in many cases, to run very close to that of *L. ampla* Migh. The Pine Lake examples have usually a very thick, solid opaque shell, and a large proportion are more or less distorted, the most common effect of their unfavorable environment being apparently to induce a very abrupt and rapid expansion of the outer lip, which, in most cases, is accompanied by a heavy callous deposit all round the aperture. The dredge also brought up from the marl of the bottom some other curiously distorted forms of *Limnæa*, whose specific position has not yet been satisfactorily determined. The curious *Planorbis multivolvis* Case also occurred here, rarely alive, but in great abundance among the dead shells along the shore. There is reason to suppose that these shells came largely from the marl deposits under the lake. It also seems probable that this species will prove to be only a form of *P. campanulatus* Say, peculiar to localities where the marl is found. At any rate, all the localities in this State, from which it is now known, are alike in this



respect, and specimens were found in places where the marl was less abundant, which seem to connect the two forms.

Along the Lake Michigan shore, among the stones, *Physa ancil-laria* Say occurred, exhibiting a very heavy, solid, opaque shell. The same form is found plentifully at Mackinac Island, and seems to be one of the most characteristic forms of the region. A heavy malleated form of *Limnæa emarginata* Say is associated with it in both localities. *Limnæa desidiosa* Say and *Physa integra* Hald. were found plentifully in similar localities.

In one of the smaller inland lakes near Charlevoix, the dark red form of *Planorbis excavatus* Say, recently distinguished as var. *rubellus* by Sterki, was found. The typical form of the same species, as well as *P. bicarinatus* Say and *parvus* Say, occurred abundantly in the deep-water dredging at High Island. The great similarity of the Limnæid fauna of northern Michigan to that of Maine was again manifested in the discovery, in a small mill-pond near Charlevoix, of the ecarinate form of *P. bicarinatus* recently distinguished by Mr. Pilsbry as var. *arostookensis*. The only species of *Ancylus* met with was the *A. parallelus* Hald., which was common among the lily-pads in all the smaller lakes. Among the operculates there was little of special interest. *Goniobasis livescens* Mke., as usual in the lake region, was abundant everywhere, and in Lake Michigan was found in thirty feet of water. *Valvata tricarinata* Say and *sincera* Say were also abundant in deep water, and the latter species from High Island was unusually large and fine, and might be referred to the form described as *V. striata* by Lewis. The *Campolomae* were also abundant. The slender northern form described by Lea as *C. milesii*, however, was found only in one lake on Beaver Island. The Lake Michigan form was *C. decisa* Say. The Amnicolae were exceedingly abundant, the two larger forms *A. limosa* Say and *lustrica* Pils. occurring everywhere. *A. grana* Say was found at High Island only, as was also a single specimen of *Bythinella obtusa* Lea. One of the few disappointments met with was the failure to find the deep water form, *A. sheldoni* Pils., originally found in the deep water of Lake Michigan, at Racine, Wis. The only novelty among the *Unionidae* was the occurrence of *Unio borealis* Gray, in a small lake on Beaver Island. This is another addition to our fauna, and, I believe, the most western locality yet cited for the species, which, as Mr. C. T. Simpson, to whom I am indebted for the identification, suggests, is apparently only a form of *Unio luteolus* Lam. The

*Anodonta* occurred with their usual abundance and perplexing variety so characteristic of the inland lakes of Michigan. Possibly, owing to the unprotected character of the shore near Charlevoix, but few were found in Lake Michigan. *A. footiana* Lea, however, was found at Fisherman's Island near Charlevoix and also at St. James' Harbor, Beaver Island, where *A. subcylindracea* Lea and *ferussaciana* Lea also occurred. But it was among the *Corbiculidae* that the most interesting finds of the expedition were made. Both species and individuals were exceedingly abundant. Indeed, there can be no doubt that the smaller *Pisidia* form one of the most important portions of the food of the whitefish. The *Sphaeria* were most abundant in the inland waters where *S. simile* Say and *striatinum* Lam. were found in profusion nearly everywhere. *S. rhomboideum* Say and the beautiful little *S. rosaceum* Pme. also occurred in one of the smaller lakes. A fine, new species, about the size of *S. occidentale* Pme. was dredged from 25 metres off Grand Traverse Bay. A larger form not yet satisfactorily determined was brought up from a lesser depth off the south end of Beaver Island. The *Pisidia* are now in the hands of Dr. V. Sterki, who has kindly consented to examine and determine them, so that the entire list cannot be yet given. But I am enabled to state that there are, at least, twelve species represented, of which seven are new to the State, including four species new to science. At High Island *Pisidia* were particularly abundant. A fine triangular form, as large as *P. virginicum* Bgt., proves to be the *P. idahoense* Roper. At the same place, Dr. Sterki's recently-described species, *P. punctatum*, also occurred. A most interesting find was that of a form which Dr. Sterki informs me cannot be distinguished from the *P. milium* Held., of Europe. This, I believe, is the first instance in which a species of this family has been proved to be an inhabitant of both continents. The other species found were *P. variabile* Pme., *abditum* Hald., *compressum* Pme., *rotundatum* Pme. and *ventricosum* Pme. In all, ninety-three species of mollusca were obtained, of which eleven species and three varieties were new to the fauna of the State, one species new to this country, and five species new to science.

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#### 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 Isaac Lea Conchological Chapter of the Agassiz Association is

a corresponding chapter. It is composed of men and women interested in the study of shells. It also has a juvenile section composed of boys and girls. It is a working chapter, or society, as every member is expected to send an annual report of work done by him. These reports and such papers as the members may furnish are known as the transactions of the society. Each year the volume of transactions, in manuscript, is forwarded from one member to another until each member has read the book, but as some time must necessarily elapse before all the members of the chapter can receive it, the editor of THE NAUTILUS has kindly consented to allow space for extracts from the transactions in THE NAUTILUS each month. Each member in this way can have a copy of the annual reports to himself.

The Chapter is officered as follows:

President, Prof. Josiah Keep, Mills College, Cal.

General Secretary, Mrs. M. Burton, Williamson University, Los Angeles County, Cal.

#### SECRETARIES OF SECTIONS :

Section A.—Marine shells of the West Coast, Prof. Keep, Mills College, Cal.

Section B.—Marine shells of the East Coast, Mr. A. H. Gardner, Box 84, Fort Hamilton, N. Y.

Section C.—Land shells east of the Rocky Mountains (Sec. not yet chosen).

Section D.—Fresh water shells east of Rocky Mountains, Dr. W. S. Strode, Lewiston, Ill.

Section E.—Land and fresh water shells west of Rocky Mountains (Secretary not yet chosen).

Section F.—Fossil shells, Hon. Delos Arnold, Pasadena, Cal.

Section G.—Juvenile Section, Mrs. Mary P. Olney, Spokane, Wash.

Section H.—Microscopic shells (Secretary not yet chosen).

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#### A STUDY OF FOSSIL SHELLS.

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Report of Josiah Keep. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1894.

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Two years ago last summer, as I was returning to California from the Atlantic Coast, I had occasion to stop for a number of hours in the city of Cincinnati. By far the cheapest and most satisfactory

way to explore a city is to get on a street car and ride until you are told to get off, and then try another line in like manner.

Acting on this principle I hailed an electric car and was soon hurrying along the streets, up one hill and down another, and then over level stretches till I arrived at the "Burnett Woods" park. I did not need to be told to get off here, for the condition of things was evident, and this was, without doubt, the best place to spend the hot hours of mid-day. I was delighted with the place at once. What grand old trees were there, beeches and oaks and walnuts, majestic specimens with huge trunks and great spreading limbs.

Strolling across the little hills and valleys which make up the park, I came at last to a huge excavation where a new street was being cut out and an old one widened. A gang of prisoners, under the eye of armed guards, were working there in the hot sun. Some were shoveling away the loose soil, others were breaking up hard strata with their picks and bars, while still others were down to bed-rock, and were drilling holes for blasting.

The rock looked interesting, and I drew near to a cliff which had been partly carried away, and was delighted to find that the rock was full of fossils. In some places it was literally made up of shells and corals, and, so perfectly were they preserved, that you might trace every mark of sculpture on the shell, and observe its outline as perfectly as if it had just been brought up alive from the ocean.

Most of the shells were those of brachiopods, a class of mollusks that now exist but sparingly, though in ancient times they must have been as thick as the leaves of a forest.

How I longed for increased facilities for transportation on that July day. I wanted to take away at least a barrel of the fine specimens! They lay all around me, and it almost broke my heart to leave some fine pieces of stone studded over with those choice relics. But when I lifted one of those pieces and found that it weighed many pounds, I was reluctantly compelled to carefully put it down and content myself with a few fragments that were not too large for my coat pockets. One of these fragments is before me as I write.

What a story these old relics tell to one who is able to interpret their language. How many ages have passed away since each pair of these shells contained a living occupant, a creature without gills, indeed, but supplied with a pair of feathery arms which it stretched out and waved in the warm waters of the Silurian sea. When its little life was over, the shell sank down in the mud and was quickly filled and covered with the soft ooze.



All this took place when the ocean rolled over what is now the State of Ohio; before there was any coal, long before there were any Appalachian Mountains, and so long before the creation of Adam, that the time since the first man seems but a little while in comparison.

Century after century went slowly by, the land gradually rose, and the ocean slunk away.

Then came a time when uncouth monsters ranged over the soil; then a period of ice and desolation; then the age of man. But through all these uncounted millions of years, one little shell was quietly waiting—waiting a thousand thousand years, until the blast of the convict gang threw it up to the surface, and the sun shone down upon it, and a human being rejoiced to find it there. Could it speak, how it would inquire what had become of the ocean. Simple little shell, you have had a long sleep, but the world has been awake and astir all the time.

Perhaps this paper seems little like a conchological report, but, during the past year, most of my work with shells has been, not with modern species, but with fossils. I have been arranging a geological cabinet, and have been putting into their places molluscan species, from the little *Lingula cuneata* of the Lower Silurian rocks, down to those species which are now living along the coast.

How important it is for any one who desires to understand the noble science of geology, to first learn as much as possible of its handmaid, conchology. The shells of mollusks are the most enduring of fossils. They are the seals impressed upon the stony documents of the distant past, by which the scholar can tell you, often in a moment, the age in which those documents were written, and what of value you will be likely to find therein.

It may not be scientific, but I love to imagine that the mollusks which secreted these shells are alive once more. I question them concerning the past, concerning their contemporaries and their surroundings. I open the Devonian drawer of fossils and ask those revived mollusks to tell me concerning the "Age of Fishes." The little *Pupa vetusta* of the Carboniferous Age tells me a story of its life in the "dim watery woodlands" of the Coal Period.

Ammonite and Hippurite discourse concerning the "Age of Chalk;" the giant *Ostrea* details the quiet story of Tertiary times, and, finally, a little *Olivella*, such as now sports in the sands of the beach, tells me how it came to be buried in a little hill that has evidently been raised from the ocean in comparatively recent times.

And so the great story of life is narrated; a story so wonderful, so interesting, so full of suggestion of a great and wise Creator, that I take up the burden of life once more, encouraged, instructed, broadened, helped!

THE ANNUAL REPORTS PRESENT A VARIETY.—As the members of the Isaac Lea Chapter are found from Maine to San Diego, Cal., and while some live on the sea coast, others dwell near lakes and rivers, while others again reside far from any body of water, the annual report of work done by each member is varied. Some members have had years of experience, while others, perhaps, give us their first years' experience in collecting and studying molluscan forms of life; but each report is interesting, and, from month to month, we hope to give one or two reports of the members of our Chapter. This month our members will be interested in Professor Keep's paper on fossil shells. After reading it, our juvenile members will be glad to learn that Professor Agassiz, in his "Geological Sketches," tells about the Silurian fossils of Cincinnati, Ohio, and what he says about the fossil beds adds new interest to the report of our President.

University P. O., Los Angeles Co., Cal.

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AN UNDESCRIBED MERETRIX FROM FLORIDA.

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BY WM. H. DALL.

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*Meretrix simpsoni* n. s.

Shell small, plump, concentrically grooved, but somewhat irregular in sculpture, smoother toward the beaks; varying in color externally from pure white to livid bluish overlaid with streaks or zig-zag brown lines, the interior from pure white to deep bluish purple; the most common color variety much resembles Sowerby's figure of *C. hebræa* Lam. (Thesaurus, pl. 134, figs. 143-4), but with the posterior end more rounded, the hinge teeth more compressed and smaller, and with a well-developed pallial sinus reaching to the vertical of the beaks; the lunule is smooth, long-ovate, marked off by an incised line, but not differentiated by color or otherwise from the adjacent parts of the shell; the escutcheon is obscure.

Alt. 15·0; lon. 18·0; long. of post-umbonal part 11·0; diam. 8·0 mm. Habitat from Curaçao and St. Thomas, West Indies, to Cedar Keys, Florida, from low water to 26 fathoms; Chas. T. Simpson and other collectors, in the U. S. Nat. Museum.

This is probably the species which has been identified by Antillean collectors with *Circe* (*Lioconcha*) *hebræa* (Lam.) Sowerby, but it is a smaller shell and a true *Meretrix*, represented by specimens from seven localities in the Museum collection and noted in Bull. 37, U. S. N. M., p. 56, No. 285 in 1889.

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#### NOTES AND NEWS.

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UNIO ELLIPSIS AND U. TENUISSIMUS.—I have never seen *Unio ellipsis* Lea and *tenuissimus* Lea noted from Grand Rapids, Mich. I wish to report the finding of 23 specimens of *ellipsis* and 24 of *tenuissimus* in Grand River, about two miles south of the city; they were taken by me last summer.—W. MILLER, Grand Rapids, Mich.

MR. WM. B. MARSHALL, formerly on the zoological staff of the N. Y. State Museum, at Albany, is now in Washington as an assistant in the Dept. of Mollusks.

DR. WM. H. DALL leaves Washington on the 16th of May to spend the summer in Alaska in field work.

MESSRS. USELMA C. SMITH AND ROBERTS LEBOUTILLIER, of Philadelphia, have returned from a naturalizing trip to Jamaica.

GONIOBASIS VIRGINICA Gmel. occurred in considerable numbers in the stomach of a specimen of the American Golden Eye (*Clauionetta clangula americana*) from a Philadelphia market, which I examined March 28.—H. W. FOWLER, Phila.

MR. EDW. W. ROPER, of Revere, Mass., has returned from Jamaica, where he has spent the winter. Good success in collecting shells and ferns is reported.

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#### NEW PUBLICATIONS.

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MISSION SCIENTIFIQUE AU MEXIQUE, etc., *Etudes sur les Mollusques Terrestres et Fluviales*, par MM. P. Fischer and H. Crosse (Vol. II, pt. 7). The present part contains the remainder of the *Unionidæ*

and the *Cyrenidæ* (*Corbiculidæ*). Like those which have preceded, the execution of the plates is superb, and the text is prepared with the attention to detail and accuracy characteristic of its authors. Many species of *Unionidæ* described by Morelet are herein for the first time illustrated, as well as those of Crosse and Fischer. This part completes the work, but one more will be issued containing additions to the fauna, being supplementary to the entire work.

IN the *Proc. Linn. Soc. N. S. Wales*, VIII, Mr. Charles Hedley describes a new species of *Cæcum* (*C. amputatum*) from Sydney Harbor, Australia, and gives an interesting paper on *Gundlachia*. The latter we will reprint in a future number.

LISTE SYNONYMIQUE ET BIBLIOGRAPHIQUE DES MOLLUSQUES *Terrestres et Fluviales de la Nouvelle-Zélande*. By Henry Suter, with preliminary note on the affinities of the New Zealand mollusk fauna by H. Crosse. The land mollusk fauna of New Zealand has received much careful study during the past few years, and this catalogue of 86 pages, embodying the results of the studies of HUTTON, SUTER, HEDLEY, PILSBRY and others, is a complete epitome of progress to this time. It is prefaced by a note from the experienced pen of CROSSE, contains copious references, and a plate illustrating some interesting forms. The work is well-done and of great utility.

MONOGRAPH OF THE GENUS *STROPHIA*, by C. J. Maynard (Contrib. to Science II, Nos. 3 and 4). Mr. Maynard prefaces his descriptions by some interesting observations, *inter alia*, that *Strophia* is found in the Bahamas only on islands and keys where palms grow, and does not occur on any that are not, or have not been inhabited by man. The descriptions of many new species follow. The careful and exact record of localities for each species and subspecies, is a most commendable feature of the work. There can be no doubt that the forms are in many instances extremely local in distribution, a fact which we owe to Maynard's researches. The localities given in former works on the genus are in a large number of cases wholly untrustworthy. Maynard proposes a new subgenus *Multostrophia*, type *S. eximea* n. sp., for shells with small *Maynardia*-like tooth and very fine striations. Among the figures we notice that that of *S. cinerea* (p. 119) has the axial lamella on the outer lip, doubtless an error of the engraver.



# THE NAUTILUS.

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## PLEURODONTE BAINBRIDGEI AND OTHER JAMAICA SHELLS.

BY EDWARD W. ROPER.

It was the writer's good fortune, during a recent trip to Jamaica, to stumble on the metropolis of the large and interesting land shell, *Pleurodonte bainbridgei* Pfr., at Mandeville. The locality, a heavily wooded hill near the hotel, had been neglected until many hills more remote were searched, without revealing more than an occasional dead shell. The numerous low piles of limestone fragments upon the summit were turned over with great success, the prizes including several white specimens. The common run included black with splendid purple lip, dark brown with purple or brown lip, and light brown with lip of the same color. The largest specimen was 56 and the smallest only 42 millimetres long. Only two or three specimens were over 50 millimetres long, and the lot averaged smaller than those in other collections examined by the writer. There was no variation in shape, all being low depressed conical, with finely granulated surface, and all were banded, even the white shells being encircled with a very fine semi-transparent line. This does not correspond with the typical white form, var. *pretiosa*, which is proportionately much more elevated. The Mandeville white shells differ only in color from their black and brown fellows. All variations of color are liable to be found under the same rock heap, so that environment is not responsible for the col-

oration. Indeed, it is uncertain which is the type color. The veteran Jamaica conchologist, Mr. Henry Vendryes, believes, with Bland and others, that *pretiosa* is the type and the dark shells varieties. The genuine *Bainbridgei* is said to have come from Demerara, but this question of disputed nomenclature the writer will not attempt to solve. Associated with *Pleurodonte bainbridgei* at Mandeville were other interesting shells, including *Pleurodonte peracutissima*, *P. anomala*, *Stoastoma pisum*, the giant of the genus and the little *Guppya epistyliulum*.

At Port Antonio, *Pleurodonte acuta*, in shape near the type, *acutissima* Lam., but very black even to the lip, was found associated with *P. valida*. A form almost equally black, but with light lip, was found at Manchioneal. These shells were strikingly different from the varieties of *P. acuta* found in other parts of the island.

*Bulinus exilis*, a very common West Indian shell, but not previously reported from Jamaica, was found abundantly at Castleton not far from the botanical gardens. It was probably imported on plants.

On the hills at Mandeville, a dagger-leaved plant, which retained a considerable quantity of rain water in the axils of its large leaves, was much frequented by *Thelidomus aspera*. The mollusk was often found with its body touching the water.

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#### NEW FORMS OF AMERICAN ZONITIDÆ AND HELICIDÆ.

BY HENRY A. PILSBRY.

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##### *Omphalina Andrewsæ* n. sp.

Shell allied to *O. inornata* Say in general characters and size. Rich chestnut colored above, opaque buff below; the surface brilliant, polished. Whorls  $4\frac{1}{2}$ , slightly convex, slowly widening, separated by moderately impressed, margined suture; spire small, very low-convex, its width less than half that of the shell; last whorl very wide, depressed, rounded at periphery, evenly flattened-convex beneath; convex around the deeply indented umbilical perforation. Aperture slightly oblique, elliptical-lunate; interior lined with a heavy white callus which thins out and disappears a few millimetres from the lip-edge; the latter thin, sharp; columellar margin concave, expanded in a minute triangle slightly impinging on umbilicus. Alt. 8, greater diameter 16, lesser 13.2 mm.; width of spire 7 mm.

Under plants on the summit of Thunderhead Mountain. (Mrs. Geo. Andrews, June, 1894.)

With the general aspect of *O. inornata*, this species is even more polished, with somewhat rounder aperture and notably narrower spire. This last difference is very perceptible on comparing the upper surfaces of the two species. *O. andrewsæ* is also in the Academy collection from Macon Co., Georgia, collector unknown. The name must not be confused with *Zonites andrewsi*, which is a species of *Gastrodonta*, a genus belonging to quite a different division of the *Zonitidæ*. *O. rugeli* is a more capacious shell with wider spire than *andrewsæ*.

*O. Andrewsæ montivaga* n. v.

Like the type in the shining surface, etc., but with five whorls, chestnut above, slightly paler and subtranslucent below; last whorl more widened toward the aperture, more sloping. Aperture quite oblique, wider and shorter than in *andrewsæ*, the upper and basal margins sub-parallel; *baso-columellar lip very gently curved*, not deeply rounded as in *andrewsæ*. Interior without white lining, having only a narrow white rib within the lip. Alt. 8·7; diam., greater, 17; lesser, 13·5 mm.; width of spire 8·5 mm.

Same locality and collector. The very much straighter basal lip and lack of white lining differentiate this from preceding species.

*Gastrodonta (Pseudohyalina) patuloides* n. sp.

Shell about the size and form of *Pyramidula striatella* Anth.; light green, hardly transparent; irregularly but closely rib-striate above, below and in the umbilicus, the first  $1\frac{1}{2}$  whorls smooth. Whorls  $4\frac{1}{2}$ , slowly increasing, convex, with impressed sutures; last whorl rather tubular, rounded at periphery and below; aperture about the size of umbilicus, round-lunate, flattened above, lip simple, the *upper margin flattened down and arched forward*, as in *Selemites* or *Gastrodonta elliotti*; retracted at insertion. Umbilicus large, showing all the whorls very plainly. Alt. 2·5, diam. 5·1 mm.; aperture, alt. and width about 1·8 mm.

Thunderhead Mountain, under bark of a rotten log with *P. alternata* (ribbed), *P. perspectiva*, *Gastrodonta elliotti*, etc. (Mrs. George Andrews, June, 1894).

Two adult specimens collected. It is much smaller than *G. elliotti* Redf., with far larger, open umbilicus and heavier sculpture, recalling a *Pyramidula*.

*Polygyra* (*Stenotrema*) *stenotrema depilata* n. v.

Globose-conic, the spire much elevated; surface completely lacking hairs or their scars, showing sparse oblique short wrinkles above (hardly seen without a high power lens), the base with the luster of silk, or like the bloom on a grape, and showing indistinct spiral sculpture. Parietal tooth smaller than in the type, further from the basal lip, and not connected by a raised callus with the upper termination of the lip. Notch of basal lip rather shallow and wide. Alt. 8, diam. 10 mm.

Thunderhead Mountain (Mrs. Andrews), with typical *P. stenotrema* of the usual depressed-globose and hirsute form.

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#### A NEW VARIETY OF *OCINEBRA CIRCUMTEXTA* STEARNS.

BY R. E. C. STEARNS.

A very pretty variety of *Ocinebra circumtexta* has recently been detected on the coast of Los Angeles County, by some of the local collectors. It is of a pale orange color; the bands, which in the typical form are dark, sometimes almost black, in the variety herein described are of a deeper orange. I have named it var. *aurantia*.

It is noteworthy, the prevalence of the orange hue, pale or dark, in many of the species of *Ocinebra* of the west coast.

This color is frequently met with in various shades in *Purpura crispata* of the Puget Sound and Alaska region.

Los Angeles, Cal., May 10, 1895.

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#### NORTH AMERICAN SPECIES OF *VALLONIA*.<sup>1</sup>

BY DR. V. STERKI.

Private inquiries and publications appear to make it desirable to give a few notes on our *Vallonia*, in this place. As far as known, at present, there are the following species in North America:

Group of *V. pulchella*. Not ribbed; peristome with strong lip.

1. *V. pulchella* Mull. (= *V. minuta* Say), North America, east of the Rocky Mountains; west of them at least scarce. All Europe, and adjoining parts of Asia and Africa.

2. *V. excentrica* Sterki. Northeastern North America from Maine and Quebec to Washington, D. C. All Europe. It is constantly distinct from *V. pulchella*, and, when once known, can not

<sup>1</sup> Conf. Observations on *Vallonia*, in Proc. Ac. Nat. Sc., Phila., 1893, p. 234.



be mistaken. Generally smaller; somewhat elongate in outline, and so is the umbilicus; the spire is smaller, lower, and the suture less deep; the peristome is not everted, as in *pulchella*, but only slightly expanded.

Group of *V. costata*. Ribbed; peristome with strong lip.

3. *V. costata* Mull. Eastern North America to the Mississippi Valley, but less common than *pulchella*, though numerous in some localities.

4. *V. albula* Sterki. Quebec, Manitoba to British Columbia. Larger than *costata* (2.7–2.8 mill.), whitish, with fine, crowded, membranous ribs; quite unlike any *costata* from Europe or North America. Also jaw and radula show differences, and so it was to be regarded as distinct, the more so as it has been found in company with *costata* at Quebec.

5. *V. gracilicosta* Reinh. Utah to Dakota. Differs from *costata* by the stronger and more oblique ribs on the shell, and small or no membranous appendages on them; the last whorl and the aperture are more angular at the periphery, and more flattened above; the color is grayish, and the lip porcelain white, while in *costata* it is somewhat glassy transparent.

6. *V. parvula* Sterki. Illinois to Nebraska and Indian Territory. Smaller than *costata* (diam. 2 mill.), the spire flat, the last whorl not descending.

Group of *V. cyclophorella*. Peristome without a lip.

7. *V. cyclophorella* Ancey. Rocky Mountains. Ribs very fine and crowded; shell thin, grayish or whitish; last whorl ascending and descending; aperture transversely elongate; peristome thin, without a lip; diam. 2.7 mill.

8. *V. perspectiva* Sterki. Appalachian Mountains, in Tennessee and Alabama; also in Iowa. Membranous ribs rather fine and crowded; spire low; last whorl descending; peristome continuous without a lip; shell thin, pale horn to colorless; diam. 2.0 mill.

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ON THE GENERIC POSITION OF *PATULASTRA*? [PUNCTUM?] *PUGETENSIS* AND *PYRAMIDULA*? *RANDOLPHII*, WITH SUGGESTIONS FOR A CLASSIFICATION OF AMERICAN ZONITIDÆ.

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BY HENRY A. PILSBRY.<sup>1</sup>

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Specimens of the two species named above preserved in alcohol by Mr. Randolph, of Seattle, Washington, and kindly forwarded

<sup>1</sup> These species were described in *NAUTILUS* for March, 1895, p. 130.

to the writer by Dr. Wm. H. Dall, have furnished preparations of the teeth enabling us to fix the the generic positions of these interesting little species. *P. pugetensis* proves to be a Zonitid, with the dentition much like that of *Pseudohyalina minuscula* and *milium*, perfect laterals 4, as in *minuscula*, while *milium* has 2 or 3. The jaw, imperfect in my preparation, looks like that of *minuscula*.

*P. randolphii* has the characteristic dentition of *Punctum*, and with *pygmæum* (v. *minutissimum*) and *consectum* it makes three species of this genus for America. There are two in Europe, *pygmæum* Drap. and *massoti* Bgt., and one in Africa, *cryophilum* Martens. Some other minute Patuloids will doubtless prove to belong to *Punctum* when their dentition is examined. *P. randolphii* has a narrower umbilicus than our other species.

So ambiguous are the shell characters of these genera of small *Zonitidæ* and *Endodontidæ* that, as the event has proved, Dall was fully justified in the liberal use of question-marks in his provisional generic references. The moment their soft parts come under the microscope, broad distinctions between the groups appear, leaving no uncertainty as to the limits of the genera and families. The difficulty is to get the animals of these liliputian races alive or suitably preserved for dissection.

The classification of the numerous groups and genera of *Zonitidæ* is still in an embryo condition. The forms with well-developed spiral shell inhabiting North America fall into groups as follows:

- a. ♀ System bearing a long dart-sack surmounted by one or more coronal glands, and usually containing a slender, curved dart. Subfamily ARIOPHANTINÆ Pils.
- b. Caudal mucus pore present; shell without opaque color-markings, Genus GASTRODONTA.
- c. Shell with internal teeth or a layer of callus on the floor of last whorl, s.-g. *Gastrodonta*.
- cc. No internal teeth or callus.
  - d. Surface polished, s.-g. *Zonitoides*.
  - dd. Surface conspicuously striate or costulate, s.-g. *Pseudohyalina*.
- bb. No caudal pore; shell with streak, band or flame markings, Genus PÆCILOZONITES.
- aa. ♀ System lacking dart-sack, etc.

Subfamily ZONITINÆ Pils.

- b. No noticeable shell-lobes developed; mucus pore present.  
 c. Shell small, depressed and glassy; lower part of vas deferens not enlarged, Genus VITREA.  
 cc. Shell larger, smoky; lower part of vas deferens greatly enlarged, Genus OMPHALINA.  
 ccc. Shell smoky, *Vitrina*-like; vas deferens not enlarged, Genus VITRINIZONITES.
- bb. Right shell-lobe developed; no caudal pore, Genus VITRINA.

The positions of the genera *Pristiloma* and *Conulus* cannot be decided until their genitalia are investigated. The latter may prove to belong with *Microcystis* and *Guppya* in a sub-family *Microcystinae*, characterized by obsolescence of the sessile spermatheca. The *Ariophantinae* are well represented in the Orient by *Ariophanta*, *Xesta* and other genera. The *Zonitinae* by *Zonites* (restricted), *Rhysota*, *Trochomorpha*, etc. Although the grooves above the foot-edges are present in all *Zonitidae*, the tail pore is absent in various members of each prime division, such as the genera *Pacilozonites*, *Trochomorpha*, etc. The greatest defect in our knowledge of American forms is in respect to the *Zonitoides* and *Vitrea* groups, the shells of which offer no diagnostic genera features; and the nomenclature cannot be settled until the presence or absence of a dart-sack is ascertained in all the small species. The animals should be drowned, as ordinary alcoholic specimens of these minute forms are almost impossible to manipulate.

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#### ISAAC LEA DEPARTMENT.

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

The outlook for the Isaac Lea Chapter for this year is very encouraging; new members are coming in, and all our members are enthusiastic in regard to the possibilities of the Chapter. With THE NAUTILUS as our official organ, we hope for a brilliant future for the Chapter. This little corner of THE NAUTILUS will always contain articles from the pen of beginners, as well as from those of more advanced students of conchology.

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#### A DAY ON THE SPOON RIVER IN ILLINOIS.

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Report of Dr. W. S. Strode, Lewistown, Ill. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1894.

Owing to sciatic rheumatism, the writer, during the past summer and fall, has been unable to do much active work in the collecting

field. But one trip was made to the Illinois River, and, unfortunately, the stream was on a "high," and the conditions unfavorable for collecting. Excepting the dredging up of some fine *Pleurocera lewisii* Lea, nothing of interest was obtained.

However, a trip was made to Spoon River at Bernadotte, twelve miles from Lewistown, on October 20, which was more fortunate. The river was at a low stage, and everything favorable for collecting. My partner was Dr. J. M. Maguire, whose hobby was not shells, but birds. Yet, as is the case with all lovers of nature, when once within the pale of her magic influence, all her animate creatures met a responsive thrill in the kindly heart of the good doctor, and I found in him an enthusiastic and efficient helper in my search for molluscan treasures.

Procuring a boat we pulled up the river to Island No. 1, five miles from the village. There at the limit of back water from the mill-dam, we expected to find some shells; nor were we disappointed, for in the shallow water above and below this island, and on the banks under clumps of willows where they were carried by the minks and muskrats, we obtained quite a number of the following Unios: *capax* Green, *coccineus* Hild., *cornutus* Bar., *ebenus* Lea, *elegans* Lea, *lachrymosus* Lea, *luteolus* Lam., *levissimus* Lea, *occidens* Lea, *parvus* Bar., *pustulatus* Lea, *pustulosus* Lea, *rubiginosus* Lea, *trigonus* Lea, *Margaritana complanata* Barnes, *Anodonta inbecilis* Say, *decora* Lea, *edentula* Say.

Landing on this little island, which covers only about one acre of ground, we ate our lunch, and the doctor collected two or three each ruby-crowned and golden-crowned kinglets, that were busily seeking a dinner in the willows, and we then turned our boat's head down stream on our return voyage to the village. Every half mile or so we would come upon a flock of the beautiful moon ducks or dab-chicks, and, in the trees along the banks, were many red squirrels, and when one was particularly saucy, the crack of the doctor's gun would fetch him tumbling into the river. When the village was reached, we determined to try our luck in the shallow water along the rocky banks a half mile or so below the mill-dam.

The water-gates of the mills had just been shut down, and this would give us six inches less water to work in than when they were open. We soon descried an unexpected advantage from this fact. A half mile down the river, just above a place called the "deep hole," we found a large number of *Unio donaciformis* Lea and *Pleurocera elevatum* Say. In thirty minutes we picked up 200 of



the little *Unios*, and over a pint of the univalves. They were evidently making their way up stream, excited to do so by the strong millrace current. Many of them were busily working their shells out of sight in the coarse sand, and if we had been an hour or so later, perhaps none would have been visible.

Having collected all we desired of these two species, we went below the deep hole, and, in water from one to two feet deep, collected all we cared to haul home of the following species :

*Unio alatus* Say. A few.

*Unio anodontoides* Lea. Very plentiful and fine, ranging in size from full grown ones seven inches long to the very small young ones an inch in length ; and both varieties, the plain brown colored and the beautifully rayed ones.

*Unio occidens* Lea. Some very good ones.

*Unio gibbosus* Barnes. Only a few found, along with its cousin, the *anodontoides*, and *U. rectus* Lamareck, a half-dozen.

*U. gracilis* Barnes. Quite plentiful.

*U. lachrymosus* Lea. Some nicely marked ones.

*U. ligamentinus* Lam. More numerous than any other mussel in this locality. Specimens 5 to 7 inches long, were nicely rayed and but little eroded on the beaks.

*Unio multiplicatus* Lea. Four or five of the gigantic ones, 7 to 8½ inches long and a foot in circumference.

*U. plicatus* Lesueur. Plentiful, and all sizes.

*U. tuberculatus* Barnes. Plentiful, and all sizes, from 7 inches down.

*Margaritana rugosa* Barnes. A few adults found.

*M. complanata* Bar. Very plentiful and very fine, all sizes, from the beautifully-rayed young specimens, to the full sized adults peculiar to this river. One lying before me as I write, is 8½ inches long and thirteen inches in circumference.

This water was too swift and the bed of the river too rocky for the *Anodons*, and only a few *edentula* Say and *grandis* Say were found. Having loaded our boat with only the finest ones, and as many as we could get in our buggy, we pulled back up to the town, loaded up and departed for home, well satisfied with our day's outing.

A VISIT TO A VESSEL THAT WAS LOADED WITH SHELLS.—This winter I was much interested in a vessel which came into the port of Boston loaded with nothing but shells. I obtained a beautiful specimen of *Spondylus*, pink with white spines, and I can find noth-

ing like it in the museums here nor near Boston. Also a specimen of *Oliva*, beautifully marked. I visited the vessel three or four times, and was kindly allowed to visit the hold of the vessel, which had to be entered on hands and knees. *Tellinas*, *Conus*, *Myas* and other shells by heaps and bushels was a sight to behold and never forget.

I have taken great interest in the Isaac Lea Conchological Chapter, and have obtained much assistance in my work through it, and by coming in communication with the other members of it. —*Extract from the Transactions of the I. L. C. C., for 1894, by Mrs. T. E. Ruggles, Milton, Mass.*

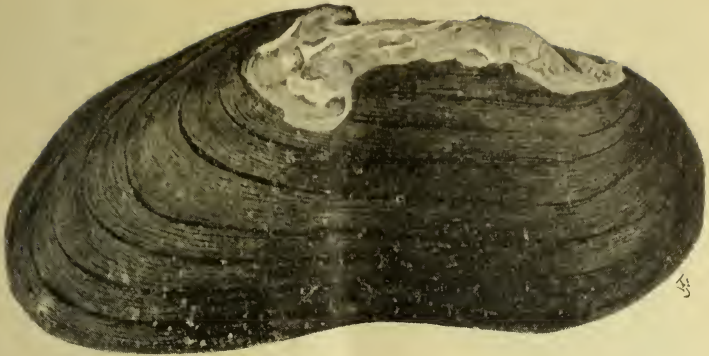
#### NEW PUBLICATIONS.

A MONOGRAPH OF THE LAND AND FRESHWATER MOLLUSCA OF THE BRITISH ISLES. By John W. Taylor, F. L. S.—We have indicated the scope of this long-expected work in a former issue (Dec, 1894, p. 96). The first part is now before us, and well sustains the expectations excited by the prospectus, the fact that Mr. Taylor has been devoting the study of years to the subject, and by the knowledge that a number of excellent observers were co-operating with the work, and most of the members of the Conchological Society of Great Britain have contributed data for its pages.



An Anisopleurous Pulmonate Gastropod, *Helix aspersa* v. *zonata* Moq.

The present fascicle of 64 pages treats of necessary elementary facts of the science of conchology; the broader principles of classification; primary divisions of *Mollusca*; of nomenclature, synonyms, etc. The *shell*, its composition, structure and forms are then considered, and here are defined the terms used in technical descriptions of mollusks, "turreted," "fusiform," "depressed," "turbinated" and so on, each explained briefly and illustrated by a figure in the text. This is an extremely valuable feature, for it makes perfectly clear to the beginner in conchology the whole jargon of descriptive terms, and, by a well-chosen illustration, fixes it in the mind.



A reniform Bivalve, *Unio margaritifer* v. *sinuata* Lam.

The parts of the shell and their names are similarly depicted.



Section through the shell of *Clausilia laminata* (Mont.)  $\times 2$ , showing the nearly straight columella.

Pyriform univalve, *Clausilia laminata* (Mont.).

The questions of *species* and varieties are then discussed at length. The definition of "species" is good; but that of "variety" seems to us to beg the question entirely. Thus, in one paragraph, a variety is said to be an incipient species; in another, "varieties may be individual, that is, occurring only in a more or less isolated and sporadic way, or they may be a sexual character," etc. American naturalists, at least, do not regard such deviations as this as "varieties," but use that term for what Mr. Taylor calls "a sub-species, geographic variety or race." We believe that sexual and "random" variations should have no place in specific nomenclature. It is also unfortunate that

Mr. Taylor (in common with Mme. Paulucci and others) uses the term "mutation" to express a slighter modification than "variety," as it has a very different significance in palæontology, expressing the successive stages of a specific form, or genetically related series of specific forms, in successive formations.

In treating of the causes of form-modification in shells, Mr. Taylor states that fluviatile species tend to develop a lengthened shell under the influence of a steady and rapid current, and short forms of otherwise elongated species in lakes and other large bodies of water.

Excellent illustrations are scattered freely throughout the text, illustrating at every point the statements made or the peculiarity mentioned; and this is a new departure in conchological treatises

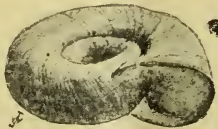


An Equivalve, Inequilateral Pelecypod *Unio pictorum* (L.). *a. s.* anal or excurrent siphon; *br. s.* branchial or incurrent siphon; *f.* foot.

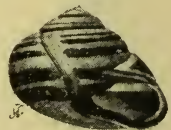
which can hardly be too warmly commended. The illustrations herewith shown are examples, and in beauty and fidelity to nature they speak for themselves. One would be critical indeed to ask for anything better than the figure of *Unio margaritifera* or *Planorbis corneus*. The species will be illustrated with colored plates, of which one accompanies this part. It is a really superb piece of color-printing.



*Vertigo antivertigo*  
(Drap.).



*Planorbis corneus* v. *albina*  
Moq.



*Helix nemoralis*  
L.

Malacologists will look with interest for the succeeding parts; for that before us leads us to hope that Mr. Taylor will break with the time-honored but woefully antiquated system of generic and family classification of former English manuals of land and fresh-water mollusks, and adopt a nomenclature and classification abreast of the science. The work will doubtless prove of great utility to those interested in British malacology, especially on account of the exhaustive treatment of variation and distribution contemplated; and the features noted above will, moreover, render it useful to conchologists generally.



# THE NAUTILUS.

VOL. IX.

JULY, 1895.

No. 3

## A REMARKABLE MONSTROSITY OF *FULGUR CANALICULATUM*.

*Fulgur canaliculatum* is one of the most conspicuous Gastropods of our coasts from Long Island to the Chesapeake. It occurs less abundantly as far south as Florida (east coast) and northward to Cape Cod.



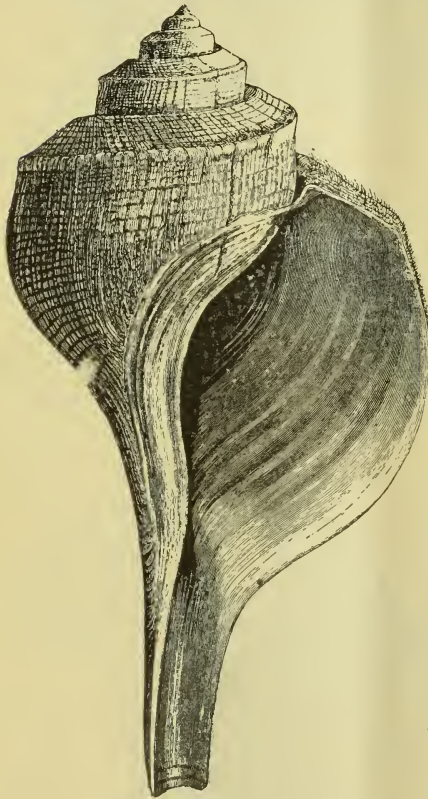
FIG. 1. *F. canaliculatum*, deformed.

In the Tertiary series, *F. canaliculatum* appears in the Pliocene of North and South Carolina (Wacamaw and Croatan beds); and pass-

ing downward, we find in *Fulgur coronatum* var. *rugosum* Conrad, from the Miocene of St. Mary's, Md., its probable ancestor.

*F. canaliculatum* exhibits but little variation in the recent fauna, except in point of size, southern specimens becoming much smaller. Thus, at St. Augustine, Florida, the largest shells found are not over half the dimensions of the largest from the New Jersey coast.

The typical form of this species is shown in fig. 2. Mr. James A.



Harkins, of Atlantic City, has called our attention to a remarkable deformed specimen, which he found at that locality, illustrated in fig. 1. It is an adult of average size, in which the basal canal is twisted to the left at a right angle to the axis of the shell. The growth-lines are everywhere unbroken, no evidence of an early fracture being visible, either outside or within the aperture. There is an abnormal lump or callus upon the upper part of the columella, probably deposited to fill some space left by the altered position of the soft parts in the cavity.

It is difficult to say how a monster of this sort was produced. The unbroken sweep of the growth-striae from body-whorl upon the canal indicates that the present canal was formed entirely after the abnormal condition set in, and is not a case of shell fracture and subsequent "patching" of the pieces, such as is often found. It is probable that the columellar side of the canal in the half-grown individual was injured, both soft and hard parts being affected; the mantle lining of the outer lip and base of canal being unhurt.

FIG. 2. *Fulgur canaliculatum* Say.

The specimen has been presented by Mr. Harkins to the collection of the American Association of Conchologists.

C. W. J. & H. A. P.

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DESCRIPTION OF A NEW VITREA FROM PUGET SOUND.

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BY W. H. DALL.

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*Vitrea Johnsoni* n. s.

Shell small, pale waxen-white or translucent, of three and a half whorls, rather rapidly enlarging, smooth except for delicate radial lines of growth which are occasionally visible; suture distinct, slightly impressed; spire hardly elevated but not flattened; periphery rounded, base convex, imperforate, the pillar lip strongly reflected close to the axis; aperture semilunar, sharp edged, the peristome hardly flexuous, the upper edge a little in advance of the lower; resting stages indicated internally by one or two narrow whitish streaks where the shell is slightly thickened, but which do not project internally. Height of shell 1, major diam. 2, minor diam. 1.5 mm.

This differs from *V. indentata* by the absence of the impressed radial grooves and by its much smaller size for the same number of whorls; from *V. subrupicola* Dall by its more rapidly enlarging last whorl and more ample aperture in specimens of the same size. The latter species has one whorl less in the same diameter, and attains, when fully developed, a much larger size, besides having a peculiarly flattened appearance both above and below.

*V. Johnsoni* was named in honor of Prof. O. B. Johnson who has done so much to promote interest in the mollusk fauna of the Puget Sound region. It was collected under chips with *Vitrea pugetensis* near Seattle by Mr. P. B. Randolph.

It may be mentioned that the original types of *V. subrupicola* were collected at Clinton's Cave, Utah, by Dr. Packard; while much larger specimens, though with the same number of whorls, were collected later at Cave City, Calaveras Co., California, by Hemphill. After careful study I have found no characters except size to separate these from the Utah specimens, but in view of this difference the former may take the varietal name of *spelæa*. Neither form can be confounded with *V. indentata* by any one who critically compares good specimens. A specimen of *V. subrupicola* with four

whorls has a major diameter of 2.7 mm.; one of the variety, with exactly the same number of whorls, measures 4.0 mm., and my largest specimen 5.5 mm.

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#### HELICES IN ILLINOIS.

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BY W. S. STRODE.

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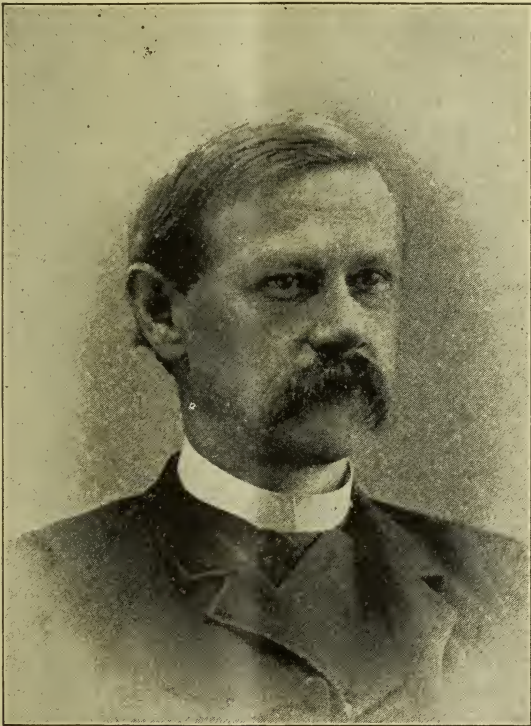
In the Spoon river region of central Illinois, *Polygyra multilineata* is probably the most numerous of all the Helices. In the heavily wooded districts bordering the banks of the stream, where rotten logs, decaying leaves and vegetation are in the greatest abundance, they attain the largest size. Further back near the bluffs they are much smaller, not being more than one-half the size of those found near the river's bank. This difference which is due probably to environment, has given rise to the so-called *multilineata major* and *minor*. Not long since while driving across the bottom a mile from the river, I noticed many snails in the wagon track and crawling across the road. Just on my left was a tract of swamp prairie land containing several acres. The previous season this had grown up with tall prairie grass two or three feet in height, but a day or two before it had burned over. Going over to it I found the ground thickly strewn with *multilineata* which the fire had killed. Wherever a bit of grass, log or rail had escaped the fire, live ones could be picked up by the handful. It was the most extensive snailery I had ever seen. Thousands of them dead and alive, but not an *albolabris* nor a *profunda* nor a *Helix* of any kind except the *multilineata*; and in coloration from those that were almost albinos to the *rubra* with scores of lines, and all were the *minor* variety. *Pyramidula alternata* is the next species in relative abundance. Taking both upland and lowland it probably will outrank the *multilineata*. Then comes the *appressa*, which in some localities is quite abundant. *P. hirsuta*, *profunda*, *mitchelliana* and *albolabris* will rank in the order in which I have placed them. On the overflow land of the Illinois River a snail is rarely to be found. Further back near the foot-hills and on the margins of creeks tributary to this stream, they are quite common and fine. In these localities are to be found a few *Polygyra elevata* Say, quite rare in the Spoon River region.



**DR. JOHN A. RYDER.**

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Dr. John Adam Ryder, Professor of Comparative Embryology at the University of Pennsylvania, and one of the most eminent embryologists and histologists in the world, died at his residence in Philadelphia, March 26, after a short illness, at the age of 43 years. The immediate cause of his demise was a complication of nervous troubles, which brought on gastric symptoms. Dr. Ryder was a very hard student, and his death was doubtless caused largely by over study.



JOHN A. RYDER, PH. D.

Dr. Ryder was born near Loudon, Franklin County, Pennsylvania, in 1852. He received a common school education and entered an academy, where his educational course was interrupted by financial reverses to his father. He then adopted his life work

teaching, and entered as a Jessup scholar, under an endowment held by the Academy of Natural Sciences of this city. He speedily showed great interest in scientific study and pursuit, and immediately began original research which has made him prominent in scientific circles. His mind was stored with a vast accumulation of facts which he so aptly used afterwards in illustrating his lectures. Early in life he began the publication of those original investigations that soon stamped him as one of America's foremost biologists. Later he was called, by the late Professor Spencer F. Baird, to the position of Embryologist to the United States Fish Commission.

The succeeding years, up till 1886, were spent in investigating the development, habits and breeding grounds of the oyster, sturgeon and other fishes, and in elaborate investigations bearing on these. His published papers on the oyster number about fifteen, and contain suggestions whose economic value is only now beginning to be recognized. His works and papers on the sturgeons and on propagation of the salmon are the most exhaustive upon these particular lines of study extant. These have been published in the bulletins of the United States Fish Commission, and have attracted the attention of American and European scientists. By means of Professor Ryder's method, the great fresh water lakes are now annually stocked with many thousand young sturgeon.

Dr. Ryder, four years ago, made an extended investigation of oyster culture at Sea Isle City, and the results of these studies are expected to revolutionize oyster culture.

He proved that oysters could be cultivated by artificial methods by starting with the egg, and, under conditions which can be controlled, and within a prescribed area and cost, that oysters could be raised by persons possessing the proper knowledge. He also wrote extensively upon the development of cetaceans and other mammals, and the thoughts and ideas advanced by him and the line of investigation opened up have been seized with avidity by scientists.

In 1886, he was invited to take the Professorship of Comparative Embryology at the University of Pennsylvania, and thereafter, although actively engaged in undergraduate and graduate teaching, he still was busy with his pen. The Proceedings of the Academy of Natural Sciences, of the American Philosophical Society, the *American Naturalist*, as well as the most prominent of European journals, were enriched by his contributions. Dr. Ryder was a strenuous opponent of the Weissmanian school of biological thought, believing,

as he did, that all phenomena of living organisms could be explained by the laws of mechanics. He was one of the foremost of mechanical evolutionists.

His chief writings and papers embrace "The Inheritance of Modifications Due to Disturbances of the Early Stages of Development, Especially to the Japanese Domesticated Races of Golden Carp;" "Dynamics in Evolution;" "The Mechanical Genesis of the Form of the Fowl's Egg;" "A Physiological Hypothesis of Heredity and Variation;" "The Origin of Sex Through Cumulative Integration, and the Relation of Sexuality to the Genesis of Species;" "On the Mechanical Genesis of the Scales of Fishes;" "The Sturgeons and Sturgeon Industries of the Eastern Coast of the United States, etc.;" "The Development of the Common Sturgeon;" "Evolution of the Specialized Vertebral Axes of the Higher Types;" "A Physiological Theory of the Calcification of the Skeleton," and "The Origin and Meaning of Sex."

Dr. McFarlane, speaking of Dr. Ryder, said: "He was, undoubtedly, one of the three greatest embryologists. His true worth was not known by the public, but the scientists with whom he was associated readily appreciated his great genius. His relations with his friends, colleagues and students were marked by a simplicity, earnestness and straightforwardness of purpose that endeared him to all. He enjoyed a profound reputation in Europe, and the news of his death will call forth the deepest sympathy from friends of science everywhere."

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**DR. W. S. W. RUSCHENBERGER.**

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Dr. William S. W. Ruschenberger, the eminent naval surgeon and scientist, died March 29, at his home, 1932 Chestnut Street, Philadelphia, in his 88th year.

Dr. Ruschenberger was one of the most widely known members of his profession in this country. He was born in Cumberland County, New Jersey, September 4, 1807. After receiving an academic education in Philadelphia and New York schools, he entered the medical service of the United States Navy as a surgeon's mate, August 10, 1826.

He was commissioned a surgeon in the navy April 4, 1831, and from 1835 to 1837 was Fleet Surgeon to the East India Squadron, with which he circumnavigated the globe. In 1840-42, Dr. Rusch-

enberger was attached to the naval rendezvous in Philadelphia. From 1843, he was Superintendent of the United States Naval Hospital at Brooklyn, and, during his term of service there, organized the Naval Laboratory, for supplying the service with pure drugs. He was again Fleet Surgeon of the East India Squadron from 1847 to 1850; Fleet Surgeon of the Pacific Squadron from 1854 to 1857, and of the Mediterranean Squadron from August, 1860, to July, 1861, having served in the intervals between cruises at Philadelphia.

In 1871, he was commissioned Medical Director on the retired list, with the relative rank of Commodore.

Dr. Ruschenberger has been best known in Philadelphia, perhaps, for his scientific labors, and particularly for his efforts in behalf of the Academy of Natural Sciences, which bestowed on him the highest honors within its gift.

He was elected Vice-President of the Academy in January, 1869, and President in December of the same year, serving in the latter office until 1881, when he was succeeded by Dr. Joseph Leidy. At the time of his death he was one of the curators, and Director of the Conchological Section.

Dr. Ruschenberger won considerable reputation by the results of his scientific observations during his various cruises, which he published at different times. Some of his works were: "Three Years in the Pacific," "A Voyage Round the World," "Elements of Natural History," "Lexicon of Terms Used in Natural History," "Notes and Commentaries During a Voyage to Brazil and China." Besides these, he wrote "A Notice of the Origin, Progress and Present Condition (1852) of the Academy of Natural Sciences of Philadelphia," and various other pamphlets.

Dr. Ruschenberger's works on Natural History were among the first American treatises on this subject, and were largely instrumental in creating an interest in zoology in this country. One of the most eminent entomologists in America, in speaking of Dr. Ruschenberger, said that he had first learned the orders of insects from Ruschenberger's Natural History.

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### THREE NEW SPECIES OF *MACOMA* FROM THE GULF OF MEXICO.

BY WILLIAM H. DALL.

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*Macoma limula*, n. s.

Shell small, long and narrow, moderately inflated, anterior end rounded, longer; the posterior end subrostrate, bent to the right;



the pallial sinus deep, reaching more than half way from the vertical of the beaks to the anterior adductor; one bifid cardinal tooth in the left and two in the right valve, without laterals; ligament short, strong; exterior with nearly smooth beaks and no radiating lines, but most of the valve covered with low elevated concentric irregularly broken lines, which are irregularly swollen or granulose minutely in a longitudinal sense; color of the shell pale lemon-yellow or white, without distinct epidermis. Alt. 6·0, lon. 13·0, posterior end 6·0, diam. 3·5 mm.

Gulf of Mexico west of Florida in 26 fathoms; off Cape Lookout, N. Carolina, in 22 fathoms; Barbados in 100 fathoms.

This curious shell is distinguishable from any other American species by its peculiar surface. It grows twice as large as the measurements given above.

**Macoma Mitchelli**, n. s.

Shell small, thin, polished, pinkish-white, moderately inflated; teeth as in *M. limula* but more feeble; valves closely resembling *Tellina versicolor* Cozzens, but without the lateral teeth, less solid, the pallial sinus more distant from the anterior adductor, the posterior dorsal slope less arched and not quite so long, the muscular impressions less impressed and the anterior end somewhat broader; in *M. mitchelli* the surface is mostly smooth, but near the ventral margin, especially in front, there are impressed, somewhat distant and inconstant, concentric lines in harmony with the lines of growth or nearly so. Alt. 8·25, long. 15·0, post. end 6·0, diam. 4·0 mm. Habitat, Matagorda Bay, Texas, (I. D. Mitchell).

**Macoma leptonoidea**, n. s.

Shell very thin, high, short, polished, smooth or with fine silky concentric striulæ under a thin iridescent epidermis; hinge very feeble, teeth as in *M. limula*; pallial sinus irregular, reaching about two-thirds the whole length, backward from the front edge of the valves; outline of valves leptonoid, the anterior slope longer and more rounded, the posterior shorter and more direct but not rostrate, though there are two obscure ridges radiant backward from the beaks but not modifying the posterior margin; the shell is somewhat compressed but not flattened. Alt. 13·0, lon. 16, lon. of post. end 6·0 diam. 6·0 mm. Matagorda Bay, Texas, (Lloyd.).

This little shell looks curiously like a *Lepton*. Its outline, though larger, differs little from that of *Lepton longipes* Stm. The types of

the above mentioned species are in the National Museum, being respectively Nos. 95,619, 124,686 and 125,532.

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ISAAC LEA DEPARTMENT.

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

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MARINE SHELLS ON THE COAST OF MAINE.

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Report of Mrs. E. P. Wentworth. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1893.

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During the past two years I have been much interested in conchology and have devoted my spare hours to collecting and studying mollusks.

I have collected marine shells from the Damariscotta River, Long Creek, near Portland, Peak's Island in Casco Bay, and Old Orchard and Higgin's Beaches, all these localities being in Maine. At Peak's Island the following shells were found in great abundance: *Mytilus edulis*, *Modiola modiolus*, *Macoma baltica*, *Mya arenaria*, *Saxicava arctica*, *Buccinum undatum*, *Nassa obsoleta*, *Nassa trivittata*, *Purpura lapillus*, *Littorina rudis*, *L. litorea*, *L. palliata*, *Lacuna vineta*, *Natica heros*, *Aemæa testudinalis*. Occasionally there would be found hidden in the crevices of the rocks or thrown upon the beaches, *Crepidula fornicata* and *Anomia aculeata*.

The Damariscotta River, some forty or fifty miles east of Portland, is somewhat sheltered; and it contains mollusks which might once have been plentiful all along the coast of Maine, but which are now not often found so far north. Among these shells are the *Odostomia bisuturalis* Say (if I have made no mistake in the identification), of which the extreme northern limit is Massachusetts Bay, according to Bulletin No. 37, U. S. National Museum. *Urosalpinx cinerea* is very common in Damariscotta River, and the following shells are also found there: *Rissoa minuta*, *Mya arenaria*, *Modiola plicatula*, *Crepidula convexa*, *Alexia myosotis*, *Purpura lapillus*, *Littorina palliata*, etc. There are many old shells of *Ostrea virginica* and *Venus mercenaria* buried along the banks of the river and some of the people who live near by say that within their remembrance there were many oysters and quahogs in the river and



that they have been killed out by the sawdust from the mills above. On this river are the celebrated Damariscotta shell heaps composed almost wholly of oyster shells, and varying in depth from a few feet to more than sixty feet. Some of the oyster shells from these heaps are more than a foot in length.

At Old Orchard and Higgin's Beaches the shells are very different from those found on Peak's Island or in the Damariscotta River. Here are found, on the sand, between high and low water mark, *Cyprina islandica*, *Tellina tenera*, *Ensis Americanus*, *Siliqua costata*, *Maetra solidissima*, *Nassa trivittata* (very fine specimens), *Lynonsia hyalina*, *Scala greenlandica*, *Bela harpularia*, *Periploma* (*Coehloidesma*) *leanum*, *Modiola modiolus*, *Mya arenaria*, etc. Clinging to the seaweeds thrown up by the surf, I found *Trachydermon ruber*, *Anomia glabra*, *Anomia aculeata*. Also found at Higgin's Beach, a very fine *Petricola pholadiformis*.

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#### GENERAL NOTES.

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THE collection of Dr. P. P. Carpenter, the well-known authority on West Coast shells, has been purchased by the Field Columbian Museum of Chicago.

DISPERSAL OF SHELLS.—In his book on the "Dispersal of Shells," Mr. Kew mentions floating pumice-stone as a possible means of dispersal as pointed out by Mr. Bates and Sir C. Lyell. As a slight contribution to dispersal, or possible dispersal, by this means, I may say that on November 18th last I picked up a piece of porous blast-furnace slag, about 8x6x2 inches, that contained 17 individuals of *Zonites nitidus* Müll., *radiatulus* Alder and *arboreus* Say, all hibernating. This slag was lying among drift on the bank of the Ohio River and the nearest point from which it could have come is at least 10 miles above the point where it was found. As the slag is very light and floats *high* in the water, it would probably travel a considerable distance before the shells were all drowned and thus a colony of *Z. nitidus*, a *northern* shell, might be started a considerable distance down the Ohio.—GEO. H. CLAPP, *Pittsburgh, Pa.*

PROF. H. E. SARGENT has left Woodville, Ala., to spend the summer in Clearwater, Minnesota.

PROFESSOR THOMAS H. HUXLEY, the most famous of English biologists, died at 3.35 P. M., June 29, at the age of seventy years.

DR. W. D. HARTMAN, of West Chester, is publishing an Illustrated Catalogue of the Mollusks of Chester Co., Pa., in *The Village Record*, West Chester.

PLANORBIS SAMPSONI *Ancey*, described from Sedalia, Mo., and hitherto recorded from no other locality, is in the collection of the Acad. Nat. Sci., Phila., from Athens, Illinois, collected by E. Hall.

PLANORBIS CENTERVILLENSIS *Tryon*.—This very distinct species seems to be quite widely diffused on the Pacific slope, but most western collectors call it *vermicularis* Gld., judging from the labels of numerous lots before us. It is a small, brown shell, with high whorls, flat top, concave in the middle, and narrow umbilicus, while the true *vermicularis* is a flat, corneous shell, very similar to *parvus* or small *deflectus*, and doubtfully distinct from eastern forms.

MR. S. N. RHOADS has returned from a collecting trip through Tennessee, from the Mississippi to Roan Mountain. Land shells, *Unionidæ* and *Pleuroceratidæ* were found abundant. *Io spinosa* was rather scarce in the Tennessee, Nolachucky and Holston Rivers under boulders in swift water. *Vitrinizonites* was taken at Roan Mountain, as well as *Polygyra andrewsæ* and *major*, with other fine and local species. *Helicina occulta* Say also turned up in east Tennessee. Mammals were scarce throughout the State, except at Roan Mountain.

MOLLUSKS AS PURIFIERS OF WATER.—Charles Hedley, in the *Journal of Malacology*, says: "A use, novel to me, of pond snails by the Chinese silk-growers, is described in an official work which caught my eye by chance. This waif of malacological information is so certain to escape recorders that I transcribe the passage: 'The water used for reeling silk is taken from mountain streams, as being the cleanest; the water from wells is never used, and if mountain water cannot be had, river water is taken, which is cleaned by putting a pint of live shell-fish to one jar of water. There is a special kind of shell-fish, called the pure-water shell-fish (probably *Vivipara chinensis* Gray), found everywhere in ponds, wells and creeks. They first of all sink to the bottom of the jar, and then by degrees make their way up its sides, consuming gradually all impurities in the water within half a day or so. After the clean water has been drawn from the jar, the shell-fish are cleansed and put to the same duty again.'"

# THE NAUTILUS.

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VOL. IX.

AUGUST, 1895.

No. 4

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## PLEUROCERA SUBULARE IN WATER-MAINS.

BY CHAS. T. SIMPSON.

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The U. S. National Museum has recently received from the Hannibal Water Co., of Hannibal, Mo. (through Mr. Chas. T. Lewis), a number of dead shells of *Pleurocera subulare* Lea, taken from the mains and pipes of the company in that city.

Mr. Lewis states that they accumulate at the cocks and faucets, and seriously retard the flow of the water, putting the company to considerable expense to remove them; also, that none have been found in their reservoirs or settling-wells, and they have never seen them in the Mississippi River.

The specimens taken in the company's pipes are always dead, and are only found in a space of perhaps 12 to 15 blocks, and not all the pipes in this area are infested.

This species has been found as far west as the White River, Carroll Co., Arkansas, and in the Mississippi River at Davenport, from which localities specimens were obtained that are now in the National Museum Collection, though the range of this form is mostly to the eastward of these localities. It is probable that the eggs or very young entered the mains through the strainers and took up their abode in certain favorable localities in the pipes, where food was brought to them by the currents, or existed in abundance, and that a more careful search would disclose them in a living state in the service pipes.

The existence of mollusks in water pipes is no new thing, though it is always interesting, and this is the first instance I have heard of in which any of the *Pleuroceridæ* have such a habitat. M. Locard found 44 species belonging to 13 genera in the water-mains of Paris,<sup>1</sup> and that they possessed certain peculiarities, no doubt the result of their environment. These were a diminution in size and decrease of coloration on account, perhaps, of the want of light; a more slender form, as this would make the least resistance to currents and enable the mollusks to cling more securely to the pipes. The specimens of *Pleurocera* sent by Mr. Lewis did not specially differ from those in the Museum Collection from Davenport, but, as the species had only been noticed at Hannibal a few years, it is probable that there has not sufficient time elapsed in its new environment to produce any important changes.

Many other cases of mollusks living in water pipes are known, notably that of *Dreissensia polymorpha*, introduced into England from the Aralo-Caspian region, and it has proven a serious nuisance in the mains of London, Birmingham and Manchester.

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#### MARINE SHELLS OF PUGET SOUND.

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By Mrs. Marie Drake. From the Transactions of Isaac Lea Conchological Chapter of the Agassiz Association for 1894.

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I have a *Glycimeris generosa* Gld. which I got from Dr. Pomeroy of Vashon Is. It weighed 7½ lbs. when alive, and was dug from a depth of three feet. Its length is 7½ inches, width 4¼ inches. Its longest circumference is 13¼ inches. It gapes widely at both ends; rarely meets when alive. Its edges are covered with a yellowish-brown epidermis. The pallial sinus, though not very deep, is from ¼ inch to ½ inch wide. Its distinct concentric grooves or lines are slightly irregular. The valves of this shell are strongly bulging. This shell is commonly called "Goe-duck," because it is so deep a burrower. The Indians esteem this shell-fish a great delicacy, and ornament their houses and yards with the shells. It is highly esteemed as an article of food, though quite difficult to obtain; one is said to furnish food for a whole family. Star-fish are also found by the hundreds at low tide on the mud flats, and of every hue—bright scarlet, peacock-blue, sea-green and paler tints.

<sup>1</sup> See NAUTILUS, Sept., 1894, p. 59.



I have found three species of *Purpura* here and many varieties, but the handsomest one is *Purpura crispata* Chemn. In my mind, the finest shell belonging to Puget Sound is this *Purpura* when banded orange and white. This shell usually does not see the light of day. Some persons prefer the deep orange variety. Both live under the water on the under side of stones or in rocky places, and are either obtained by dredging or at very low tide. *Purpura lactuca* Esch. is not found in so deep water, hence its white color; it is exposed to the rays of the sun sometimes. About September 1st, you can notice a great many purpuras closely packed together, clinging to rocks laying their eggs, which are in little capsules and resemble yellow oats stuck on end thickly over parts of the rock. Each capsule contains three or four dozen eggs, which require about four months to hatch, if they are not doomed before by some starfish hungry for an egg dinner. You can find a few egg cases almost any time of the year, but most of the eggs are laid during the months of August and September. *Purpura* lives on mussels, limpets and barnacles, or, if food gets scarce, it will eat dead fish. But the *Purpura* are not always victorious, for, when a crab wants a "purple tea," he shows no mercy to the destroyer of other homes, but inserts his strong claws under the operculum of the *Purpura* and digs him out and devours him.

One June morning, at Point Defiance, I saw three *Calliostoma costatum* eating a sea-weed breakfast. They looked so dainty and seemed to enjoy the bright sunshine so thoroughly, that it was with some regret that I placed them in my basket.

One of my friends dug up a fine *Priene orejonensis* Redf. It was five inches long and covered with a heavy dark brown epidermis. When the epidermis is removed, the shell is white. It has a strong epidermis. I have found a few specimens of *Bittium filosum* Gld., under stones at low tide, and several *Margarita pupilla*. *Crepidula dorsata* Brod. I have found by the hundreds growing on the shells, especially upon *Placunanomia macroschisma* Desh. The *Littorina* are very plentiful and are large. I have searched for *Chrysodomus dirus* Rve., but have seen no traces of it. Perhaps it is found only on the ocean beach, and does not care for the Sound.

*Modiola modiolus* L. (*Modiolus capax* Conr.?) grows to an enormous size in the vicinity of Puget Sound. My husband brought me several from Henderson Bay; the smallest measured 7 inches in length, the largest 9 inches, and was 4 inches in diameter. These

he found growing in the mud, standing perpendicular, only about an inch being visible at very low tide. They are heavily bearded near the edge, partially covered with a light brown epidermis (which is several shades lighter than the epidermis of this same species which grows in the south), and considerably eroded near the unbones. All the shells living in the mud here are somewhat eroded. These monsters have an uncanny look; they are hermits when they grow old, do not live in clumps or groups as they do when young, or as *Mytilus edulis* does. Often I have seen a solitary *M. modiolus* upon a pile or log, which was entirely covered with *M. edulis*. They grow from  $\frac{1}{16}$  inch to 8 inches in a single year. It takes muscle to remove one of the huge creatures from a rock or pile when it has fastened itself with brown byssal threads, which it spins with its huge tongue-like foot, from a sticky secretion formed at the base of the foot. They are said to live six hundred feet deep down in the ocean. Pupuras are death on mussels.

*Placunamomia macroschisma* Desh. is found here in great numbers. They live upon the under side of rocks which lie wholly in or part in water. A chisel is necessary to separate them from the rock, and even with this the pear-shaped byssal plug is rarely obtained entire. The interior of the upper valve is of a lovely sea-green and nacreous. The edges of the valves are thin and crumble at the least touch, which renders them difficult to clean and send away. If they grow upon other shells they are not so easily broken, but are much stronger. I have a fine specimen which I found growing in an old shell of *Cardium corbis* Mart. I obtained the byssal plug and both valves entire. The shells sometimes grow upon each other; when thus found, a perfect specimen is more readily obtained than from a rock. These shells are often mistaken for an oyster, especially by those unlearned in shell lore; they do resemble the variety known as *O. expansa*, though they are much larger and have the byssal opening and plug, which the oyster does not have. These bivalves are much handsomer than their southern cousins *Anomia lampe*. The animal is a bright orange, and is quite beautiful. To be prepared for the cabinet they are dipped in very hot water and the animal removed with a tiny steel chisel prepared for the purpose, then gently closed. This shell requires careful handling.

I saw a *Lunatia lewisii* Gld. eating a *Cardium corbis* very much larger than itself. I stopped this predatory proceeding, took both



home in my basket, and, after cremating the bodies, placed both shells in my cabinet. Both these shells are abundant on the Sound, and are easily obtained by digging in the sand and mud. The *Macoma* family thrives here. I have not found *M. secta*, but *M. nasuta* and *M. inquinata* are prized by the Indians as food, and *M. inconspicua* is found by the hundred, the exterior slightly eroded by the mud in which it dwells, but the inside of the shell is of a bright, rich, shiny pink; pale yellow and pure white are also found. The shell is about the size of a finger-nail.

I was surprised to find upon the rocky beach at Brown's Point a living specimen of *Lyonsia californica* Conr. It was moving about in a pool of water among pebbles and rocks. It seems marvelous that its thin, delicate little shell could remain uncrushed an instant; but it seemed to enjoy life as well here in the rugged, stormy north as it does in the warmer waters of the "land of sunshine and blue skies."

*Cardium corbis* is more hardy, though, unlike most of our northern shells, it is smaller than its southern cousins *C. quadragerium* and *Liocardium elatum*, but it is much more numerous than either of these species.<sup>2</sup>

*Pecten hastatus* Sby. is called by many our "prettiest shell," and with the thousands of little spears (*hastatus*), toothed edges and delicate coloring, it is indeed a lovely shell. I saw one for the first time (living) at Point Defiance during the month of April. It was caught on the top of a rock by becoming entangled by a piece of sea-weed; it opened and closed its shell rapidly, making a curious sound. The orange color of the animal shone and glittered in the sun. The circulation could be seen and the working of the heart and other organs. This *Pecten* is a deep-water species, swims about freely in the water and moves about at the same angle as a kite does in the air. It lives among sea-weeds and is found in great abundance at Fox Island in the spring of the year. The lower valve is bleached by the sand. It lives in the water and is never exposed to the rays of the sun, hence the delicacy of the color. This shell-fish has black eyes, and can tell when a hand or a bird comes to grasp it. I have seen *Amusium caurinum* in deep water, but have never succeeded in capturing one, as it is obtained only by dredging in very deep water. It is brown outside, white within, and has 20 ribs, and is not so handsome as *P. hastatus*.

<sup>2</sup> And is also a much heavier shell than the southern *Cardium*. M. B. W.

*Mya arenaria* L. is highly prized here as food, and grows six inches long. *Machœra patula* Dixon is sold in our markets. *Psammobia rubroradiata* Nutt. is more abundant and larger than in the south. It is found 5 inches long, here, partially covered with dark brown epidermis. Tapes and Saxidomus are well represented, and, though not so prettily marked, are very much larger and stronger (coarser) than those growing in the warmer waters of the south. They are almost always to be found in the markets.

*Zirphœa crispata* L. was recently described in one of our Tacoma daily papers by one of our Government surveyors as "a new clam."

"We have found a new shell unknown to science," etc. We were greatly amused, and sent an article to the paper the next day saying *Zirphœa crispata* ("a new clam") is found in abundance on both sides of the Atlantic, and was named by Linnæus long ago.

Limpets I have found in great abundance and of great size. I have several specimens of *Acmœa patina* Esch. found here in the "Narrows," measuring  $2\frac{1}{4}$  inches in length and  $1\frac{3}{4}$  inches across. Many of this species have bands of translucent tints on their interior, and are beautifully marked outside.

*A. pelta* is regularly marked with stripes from the apex, which is often corroded, in adult specimens, to the base. This is a most pleasing shell; is a sort of hermit, lives alone, often easily obtained; strong, not easily broken; often pure white inside, sometimes banded. I have one with a bright yellow band inside, embossed. Large specimens measure  $1\frac{1}{2}$  inches in length,  $1\frac{1}{4}$  inches wide,  $1\frac{1}{8}$  inches high. I have not found *A. spectrum* Nutt. nor *Lottia gigantea* Gray, here. Fine specimens and many variations of *A. scabra* Nutt. are abundant. I have found more of *A. persona* than of any other species. At Brown's point, we find at one spot a variety having a gray interior with beautiful translucent bands. This is a new variation to me. *A. asmi* Midd. is found here, and many I have not been able to classify.

I have one specimen of *Fissuridea aspera* Esch.  $2\frac{1}{4}$  inches long,  $1\frac{1}{2}$  inches wide and nearly  $1\frac{1}{4}$  inches high.

Limpets are sometimes used for picture frames by setting them deep in wood and fastening with glue. I saw one valued at fifty dollars here.

## INDEX TO CONCHOLOGISTS' EXCHANGE.

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## AN INDEX TO THE "CONCHOLOGISTS' EXCHANGE."

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The publication of this magazine was commenced by Mr. Wm. D. Averill, of Chestnut Hill, Philadelphia, in July, 1886. The first number was printed on a postal card. The August number (No. 2) consists of four pages, without pagination, size  $5\frac{1}{2} \times 6\frac{1}{2}$  inches. The September number contains six pages, without pagination. October number contains eight pages, which are numbered, the first being page 11; the last page (18) is blank. November number contains six pages. December number, eight pages and the last page is blank. January and February numbers (1887) each contain eight pages. March and April (Nos. 9 and 10) were printed together as a "double number," which consists of twelve pages. The May and June numbers each contain twelve pages and are a little larger,  $5\frac{1}{2} \times 7$  inches. Vol. I, complete, contains 84 pages.

Vol. II, Nos. 1 and 2 (July and August, 1887) each contain 16 pages. September number contains 12 pages, and with this number there was another increase in size to  $5\frac{3}{4} \times 7\frac{1}{2}$ . October and November numbers each contain 16 pages. December number, 12 pages. January (1888) number, 12 pages, *plus* a cover (pp. i-iv) of the same kind of paper. February number contains 8 pages and a cover (pp. i-iv). March and April were printed together, but as one number (No. 9); this contains 12 pages and a cover (pp. i-iv), and this was the last number published. Vol. II, complete, contains 120 pages, exclusive of cover pages. No index to either volume was issued. The "*Exchange*" contains many new generic or subgeneric names, with other important changes in nomenclature, and some new species. The Index herewith given has been arranged to aid conchologists who have not access to a complete copy of the original publication. It has been cut into short pages in order that those who have the *Conchologist's Exchange* may bind this Index with it.—H. A. P. & C. W. J.

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(To be concluded in September number.)

# THE NAUTILUS.

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SEPTEMBER, 1895.

No. 5

## A SORA CAUGHT BY A MUSSEL.<sup>1</sup>

When hunting in the marshes in this vicinity, September 3, 1894, Mr. Joseph D. Clark noticed a Sora (*Porzana carolina*) hopping along and trying hard to fly. His dog finally captured the bird. It had a "fresh-water clam" attached to one toe, being firmly caught by the bivalve. The poor bird, in its efforts to release itself, had



broken the bone of the toe and nearly severed it from the foot. Mr. Clark kindly presented me with his rare find, and a photograph, from which the accompanying cut was made, was taken at once. The mussel was 2.92 inches long and 1.61 wide.—JNO. H. SAGE, Portland, Conn., in *The Auk*, July, 1895.

<sup>1</sup>We are indebted to the editor of *The Auk* for the illustration of this article. This mussel is evidently *Unio complanatus* Sol.

SYNOPSIS OF THE SUBDIVISIONS OF HOLOSPIRA AND SOME RELATED  
 GENERA.

BY W. H. DALL.

Genus HOLOSPIRA Martens; type *H. pilocerei* Pfr.

Subgenus *Holospira* s. s.

Axis large, with an internal fold in the penultimate whorl and with a parietal, basal and peripheral lamina projecting into the lumen of that whorl. Besides the type, this includes *H. goldfussi* Menke and *H. goniostoma* Pfr.

Section *Bostrichocentrum* Strebel & Pfeffer, 1880.

Axis moderate, with a continuous plait, except in the last part of the last whorl; no laminae. Type *H. tryoni* Pfr. *H. veracruzianus* Dall belongs here.

Section *Haplostemma* Dall, 1895.

Axis moderate, with, in the penultimate whorl only, a short, stout axial lamina extending about half a gyration, but no other laminae. Type *H. mearnsii* Dall, New Mexico.

Section *Eudistemma* Dall, 1895.

Penultimate whorl with a parietal and a short axial lamina only, axis moderate. Type *H. arizonensis* Stearns.

Section *Distomospira* Dall, 1895.

Penultimate whorl with a basal and a short, strong axial lamina only, axis moderate. Type *H. bilamellata* Dall, New Mexico.

Subgenus *Metastoma* Strebel & Pfeffer, 1880.

Axis smooth, without plaits, penultimate whorl without internal laminae. Type *H. roemeri* Pfr. This includes also *H. pasonis* Dall, *H. coahuilensis* Binn., *H. semisculpta* Stearns, *H. pfeifferi* Menke, *H. remondii* Gabb., *H. crossei* Dall, *H. pilsbryi* Dall.

Subgenus *Cælostemma* Dall, 1895.

Axis vertically ribbed as in *Cælocentrum*, shell otherwise as in *Metastoma*. Type *H. elizabethæ* Pilsbry.

The internal characters of the following species are unknown: *H. gealei* A. Ads., *H. imbricata* Martens, *H. cretacea* Pfr., *H. microstoma* Pfr. and *H. teres* Menke.

Genus *Cœlocentrum* Crosse & Fischer, 1872.

Shell decollate, axis pervious.

Subgenus *Cœlocentrum* s. s.

Axis vertically ribbed internally. Type *C. turris* Pfr. This includes nearly all the known species.

Subgenus *Spartocentrum* Dall, 1895.

Axis as in *Bostrichocentrum*, not ribbed. Type *C. irregulare* Gabb., Lower California.

Genus *Eucalodium* Crosse & Fischer.

Shell resembling *Cœlocentrum*, but large, with a solid axis.

Section *Eucalodium* s. s. Type *E. ghiesbrechti* Pfr.

Axis sinuous and folded its whole length, except close to the aperture; transverse series of teeth on the radula long (65·1·65 in the type).

Section *Oligostylus* Pilsbry, 1895.

Axis straight and smooth; radula narrower (36·1·36 in the type). Type *E. blandianum* Crosse and Fischer.

*Columna ramentosa* J. G. Cooper, which might, from the shell, be assimilated either to *Berendtia*, *Rhodea*, or some of the above-mentioned groups, proves, from the anatomy, to be merely a section of *Bulimulus* closely related to *Leptobyrsus*. The genuine *Rhodea* very probably bears an analogous relation to *Otostomus*. It is viviparous, but the Lower Californian species is not. If the latter be deemed worthy of a sectional name, *Pseudorhodea* might be used for it. The new species of *Holospira* mentioned above are described in a report on the mollusks of the late Mexican Boundary Survey (1892-4), by the writer, which will appear, properly illustrated, in the report of the Commissioners of the Survey.

My special thanks are due Mr. H. A. Pilsbry for kind assistance rendered during the preparation of the report.

The anatomy of a curious cylindrical Austrian land snail, *Pupa obtusa* Drap., has recently been investigated by Mr. A. Protz and Professor von Martens. It proves to be no *Pupa*, but a member of the *Helicidæ*, closely allied to the chalky *Helices* of Europe known as *Helicella* or *Xerophila*.



## A NEW TEINOSTOMA.

BY HENRY A. PILSBRY.

*Teinostoma Hidalgoana* n. sp.

Shell orbicular, depressed, solid, bright, bluish-white. Spire very low, wide-conic, the apex acute. Whorls  $2\frac{1}{2}$ , hardly convex, the last large, rounded at periphery, depressed beneath; on its latter third the periphery descends toward the base, and immediately behind the lip is decidedly pinched into a short rounded keel. Surface closely engraved throughout with spiral lines of close, fine stippling or punctation. Aperture oblique, rounded, except for the straight parietal wall; peristome continuous, the outer lip thick, blunt, strengthened outside by a heavy rib or collar a short distance behind the edge; parietal wall bearing a low nodule or tooth near its upper termination. Parieto-umbilical callus heavy, deeply and coarsely pitted all over, forming a rounded lobe over the umbilical tract and a band in front of the parietal edge of peristome proper. Alt. 2, diam. 3.2 mm.

Singapore (Dr. S. Archer!). This exquisite species is respectfully dedicated to Dr. J. G. Hidalgo, of Madrid, author of numerous valuable contributions to malacological science.

One specimen of the type lot is much smaller than the others (diam. 2 mm.), but in all other respects exactly resembles them, and has the lip of a fully mature shell.

## NOTES ON THE SMALLER AMERICAN PLANORBES.

BY E. G. VANATTA.

Including the species put in the sub-genera *Menetus* and *Gyraulus* by Binney in "Land and Fresh-water Shells of the United States."

The smaller species of Planorbis are, as a general rule, found on leaves and sticks in small ponds and springs.

The Western Slope species are *centervillensis*, *opercularis*, *opercularis* var. *oregonensis* and *callioglyptus*.

*P. alabamensis* Pils. has so far been found only in Woodville, Alabama, and Grove, Cooper River, S. C.

*P. sampsoni* has been found hitherto only in Pettis and Henry Co., Mo., and Athens, Ill.

*P. umbilicatellus* occurs in Manitoba and Montana.

The other species mentioned below are more or less widely distributed over the United States, except *hirsutus*, which is restricted to the northern tier of States.

I think any normal specimen can be identified by the following key:

I. PERIPHERY ACUTELY KEELED.

- a.* Shell bi-convex.
  - b.* umbilicus broad, shallow, *deflectus* Say.
  - bb.* umbilicus small, deep.
    - c.* lip simple, aperture extremely oblique, *exacutus* Say.
    - cc.* lip thickened within, aperture less oblique, *alabamensis* Pils.
- aa.* Upper surface flat, lower convex.
  - b.* lip thickened within, spiral sculpture distinct, *oregonensis* n. v.
  - bb.* lip thin, spiral sculpture absent, or very indistinct.
    - c.* umbilicus broad, shallow, *exacutus* Say.
    - cc.* umbilicus small, deep.
      - d.* shell very small, radially ribbed below, *cristatus* Drap.
      - dd.* shell rather large, smoothish, *opercularis* Gld.

II. PERIPHERAL KEEL BLUNT OR ABSENT.

- a.* Radially ribbed below, *cristatus* Drap.
- aa.* spiral sculpture distinct.
  - b.* umbilicus broad, shallow; surface with spiral rows of hairs, *hirsutus* Gld.
  - bb.* umbilicus small and deep.
    - c.* shell rather large; aperture oblique, broader than high, keel indistinct, *callioglyptus*.
    - cc.* aperture small, nearly vertical, of equal width and height, periphery more angular, *sampsoni* Ancey.
- aaa.* Surface smooth or nearly so.
  - b.* umbilicus broad and shallow
    - c.* aperture oval, whorls rounded, *parvus* Say.
    - cc.* aperture broader than high, whorls angular, *deflectus* Say.

*bb.* umbilicus small, deep.

*c.* lip thickened within, *centervillensis* Tryon.

*cc.* lip simple, thin.

*d.* whorls angular above the middle, *dilatatus* Gld.

*dd.* whorls rounded or angular below the middle.

*e.* spire sunken in center, *deflectus* Say.

*ee.* spire level, apex not sunken.

*umbilicatellus* Ckll.

**Planorbis callioglyptus** n. sp.

Shell thin, yellowish corneous. Upper side flat, only a trifle concave in the middle; lower side convex; periphery very bluntly indistinctly angular, and midway between periphery and suture there is a slight angle; but both angles are obsolete at aperture; base often spirally malleated. Surface with a beautiful sculpture of fine spiral incised lines, crenulated by fine growth-lines. Whorls nearly 4. Umbilicus nearly a third the shell's diameter, deep and funnel-shaped, its edge bluntly angular. Aperture ovate truncate, moderately oblique. Lip not thickened inside. Alt. 3, diam. 8 mm.

Freeport, Washington, collected by H. Hemphill.

**Planorbis opercularis** var. *oregonensis* n. v.

Shell light yellowish, opaque. Upper surface flattened, slightly convex, the apex sunken; periphery keeled with a slight groove above the keel. Surface finely spirally striated. Umbilicus rather small and deep, its edge slightly angular. Aperture approaching vertical, *lip thickened within*. Alt. 2, diam. 6 mm.

Salem and Portland, Oregon. This looks very much like typical *opercularis*, but may be distinguished by the beautiful spiral sculpture and thickening within the lip. It differs from *callioglyptus* in having a decided keel around the nearly flat upper surface and a distinct thickening within the aperture. I have not seen any typical *P. opercularis* from Oregon. There are none in the collection of the Academy of Natural Sciences.

SYNONYMS.

*P. billingsii* Lea = *parvus* Say.

*P. brogniartiana* Lea = *exacutus* Say.

*P. buchanensis* Lea = *exacutus* Say (fide Simpson).

*P. circumstriatus* Tryon = *parvus* Say.

*P. concavus* Anth., M. S. = *parvus* Say.

*P. costatus* DeTarr & Beecher = *P. nautilus* var. *cristatus* Drap.

*P. dilatatus* Hald. = *dilatatus* Gld.

*P. elevatus* Adams = *dilatatus* Gld.

*Paludina hyalina* Lea = *exacutus* Say.

*P. lens* Lea = *exacutus* Say.

*P. lenticularis* Lea = *exacutus* Say.

*P. obliquus* DeKay = *deflectus* Say.

*P. planulatus* Cooper = *opercularis* Gld.

*P. umbilicatus* Taylor (not Müll.) = *umbilicatellus* Cockerell.

*P. vermicularis* Gld. = *parvus* Say.

*P. virens* Adams = *dilatatus* Gld.

*P. hirsutus* Gld. differs from the European *albus* Müll. in having the hairs longer and in fewer rows.

*P. costatus* DeTarr & Beecher, never having been reported from any locality but Michigan, is very likely introduced specimens of *P. nautilus* var. *cristatus* Drap., with which it seems identical.

*P. alabamensis* Pilsbry shows light spiral striations under a lens. In *P. sampsoni* Ancey, the spiral striation is quite distinct.

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#### GENERAL NOTES.

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WE have taken advantage of the mid-summer number when Conchologists, like everybody else, avoid all the desk-work they can, to insert an Index to the *Conchologist's Exchange*. This will afford malacologists an opportunity of ascertaining the contents of that periodical, now rare and out of print. We had hoped to reprint the *Exchange* in full, but a sufficient number of subscriptions has not been received to justify us in the outlay.

SEVERAL years ago I collected two young specimens of a delicate bivalve in a mud bank at Revere, Mass., and put them away labeled *Zirphæa crispata*. I lately discovered that they are *Pholas truncata*, which shell has not, to my knowledge, been previously reported from north of Cape Cod.—EDWARD W. ROPER.

MR. A. A. HINKLEY, who has been for some time in Rockford, Ill., has returned to DuBois, Ill.

THE Chicago Academy of Sciences has recently purchased of Mr. John Walton, of Rochester, his collection of *Cypræidæ*. It has also purchased one of the collections of California and Mazatlan shells, prepared by Dr. P. P. Carpenter, and numbering some 3000 species.

CURIOUS CHINESE USE OF SHELL-FISH.—The Chinese have been students of the habits of animals for many thousand of years, and the influences of this study have manifested themselves in their art and their architecture, so much so, that one can readily recognize the common form of their animal life through its resemblances to the objects and pictures with which we are familiar.

One of the most interesting is what is known as the "joss-shell." Every one has noticed the pearly luster of the bivalves of our rivers and ponds, fresh-water mussels, they are called. These mussels are lined throughout with the same kind of material as the pearl-oyster, and, indeed, pearls of value are often to be found in them. In China and Japan, these mussels grow to great size, in the latter country being oftentimes seven to ten inches in length, and in China, fully as large as a small saucer. The shrewd Chinese are aware that the pearly nacre is a protection of the animal, which has thus the smoothest of substances against its sensitive skin, and they know also that any grain of dirt or roughness will be quickly coated with pearl if it should lie under the mantle. They therefore catch the animal, and oblige it to make such designs as they desire. These are usually little josses, images of some one of the Chinese Gods, which are formed in clay and slipped between the mantle and the shell of the mollusk. The latter, as soon as it is put into the water again, begins to cover the model with a coat of pearl, and at some time, when the process has been carried far enough, the animal is killed and the shells preserved with their pearly josses and sold as curiosities. They are, however, very rare in this country, being on exhibition only in a few of the larger museums. It is said that upwards of one thousand of the Chinese made their living by this industry, and that they will, on order, insert in the shells models of the initials of any one's name, which, after a wait of a year and a half, will be ready for delivery.—*The Happy Thought*, July 15, 1895.

PROF. GILBERT D. HARRIS, of Cornell University, has returned from a geological trip through Mississippi and Alabama, and is now spending two weeks at the Academy of Natural Sciences, studying the "Lea Collection" of Eocene fossils.

POLYGYRA CEREOLUS SANCTIJOHANNIS n. var. Shell having the characters given in Man. Conch. IX, p. 73 for *P. cereolus septemvolva*, but periphery pinched out into an excessively acute keel. It is extremely abundant along the middle St. Johns River, Fla., from the Lake George region to L. Monroe at Sanford. I have seen nothing like it from other parts of the State. The shell is very thin, having very little lime in its composition, never enough to give a whitish color.—*Pilsbry*.



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# THE NAUTILUS.

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No. 6

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## ON THE AUSTRALASIAN GUNDLACHIA.<sup>1</sup>

BY C. HEDLEY, F.L.S.,

With note on American forms

BY H. A. PILSBRY.

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The eccentric shell of *Gundlachia*, one part shaped like a knife-sheath, or rather a spectacle-case, plastered askew upon another part like the shell of an ordinary fresh-water limpet, the creature's external likeness and internal unlikeness to *Ancylus*, and the remarkable, discontinuous, geographical distribution of the genus, combine to tempt a naturalist's curiosity. For a chance to satisfy such curiosity I am indebted to several friends who have liberally assisted me with all the material and information at their command, and without whose kindly aid I should have had to relinquish, unprofited, the study of the subject. Prof. Tate has kindly loaned me the actual types of *G. petterdi*, and given me examples of that species collected by himself at Mt. Lofty near Adelaide, S. Australia. Mr. W. F. Petterd has liberally communicated a large series of *Gundlachia*, including the actual type of his species *G. beddomei*. Mr. C. E. Beddome has supplied me with a collection of *Gundlachia* from various localities. Mr. H. Suter has convinced

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<sup>1</sup> From Vol. VIII (Series 2nd) of the "Proceedings of the Linnean Society of New South Wales" (November 29th, 1893). We have omitted Mr. Hedley's descriptions of the Australian species of *Gundlachia* and his plate illustrating them.—ED.



me of the method by which the primary shell is transformed into the adult by presenting me with a series showing the passage from stage to stage collected by him in New Zealand. To Mr. R. H. Pulleine, of the Adelaide University, who guided me to the spot and procured me several specimens, I am particularly obliged for the pleasure of viewing *Gundlachia* alive at Henley Beach near Adelaide.

The genus *Gundlachia* was instituted by Pfeiffer in the Zeits. Malak., vii, 1849, p. 98, for the reception of immature specimens of *G. ancyliiformis* Pfr., sent to him by his correspondent, Dr. J. Gundlach, from Cardenas in Cuba. Troschel supplemented his friend's description by an account of an animal which had dried in the shell. From the dentition he classed the puzzle, not, as Pfeiffer was inclined to do, with *Navicella* and *Neritina*, but with its real kin the Limnæidæ. Though not recognizing it as such, he distinguished the jaw as a brown, semitransparent arch, convex in front and extending from eye to eye. Further remittances from Gundlach enabled Pfeiffer to describe and figure (*op. cit.* 1852, p. 180, pl. I, ff. 1-16) the adult and immature shells and to add some information from the collector of its habits and appearance when alive. From this species Bourguignat carved (*Spicil. Malac.*, 1862, pp. 82-87) a new genus, *Poeyia*, type *P. gundlachoides*, and two other species, *G. adelosia* and *G. poeyi*; all of which, so Crosse tells us (*Journ. de Conch.*, xxx, 1890, p. 262), are but stages in the development of *G. ancyliiformis*.

In Trinidad the genus occurred to Guppy in the form described by him (*Proc. Sci. Assoc. Trinidad*, Dec., 1872) as *G. crepidulina*, and figured *Am. Journ. Conch.*, vi, 1870, pl. xvii, ff. 10 and 11.

From Mexico the genus is doubtfully indicated by Gibbons (*Journ. of Conch.*, iii, p. 267).

An undetermined species was recorded (*Am. Journ. Sci.* (3), xxiii, p. 248) by Cook from the State of New York.

On the banks of the Potomac River Stimpson discovered *G. meekiana*, which he figured and described (*Proc. Boston Soc. Nat. Hist.*, 1863, p. 249). This account, the best of the genus that has appeared, was transferred by W. G. Binney to the pages of "The Land and Freshwater Shells of North America," Pt. ii.

In California the genus is represented by *G. californica* Rowell, whose description is also reprinted, with additional figures, by Binney, from the *Proc. Cal. Acad. Nat. Sci.*, 1863, iii, p. 21.

As a fossil, *Gundlachia* occurs in S. Carolina in a quarternary marl containing mastodon bones (Cook, *l. c.*).

[In addition to the records of *Gundlachia* in North America, compiled by Mr. Hedley, we may instance the finding of numerous specimens in ponds near Greenport, Long Island, N. Y., by Mr. Sanderson Smith, recorded in the Annals of the Lyceum of Nat. Hist. of N. Y., ix, 1870, fig. 6. The specimens differ sufficiently from *G. meekiana* to be considered by Smith a distinct species, which he names *G. stimpsoniana*.

A *Gundlachia*, closely allied to, if not identical with, *G. meekiana*,



Fig. 1.

Fig. 2.

*Gundlachia* from Rock Island.

occurs abundantly in a lily-covered pond near Rock Island, Illinois. Specimens are drawn in the illustrations here given (figs. 1, 2), fig. 1 representing a shell with small accessory cap, the other figure showing one with it large. All intermediate sizes occur. With these, are found numerous specimens of like asymmetrical contour, but lacking the accessory shell! These are, as far as the shells are concerned, merely *Ancylus*. They live with the true *Gundlachias* on the lower surfaces of the lily-pads, grazing on their watery pasture like little sheep dotting a hillside. Professor B. Shimek has found something very similar to these near Lincoln, Nebraska (see NAUTILUS, August, 1890, p. 48).

Still another record of *Gundlachia* is given by Dr. Victor Sterki, who found it at New Philadelphia, Ohio (see NAUTILUS, Jan., 1895, p. 107).—*Pilsbry*].

Boettger has ventured to name an immature fossil from the Mayence Basin—*G. francofurtana* (Fischer's Manuel, p. 505).

A defective monograph of the genus, by Clessin, appeared in 1882 in the Conchylien Cabinet, Bd. i, Abth., 6, pp. 1-5.

The existence of this genus in Australasia was first announced by R. M. Johnston, who, in March, 1877, laid before the Royal Society of Tasmania an account of *G. petterdi*, from the vicinity of Launces-

ton in North Tasmania. In the first of two plates attached to "Critical Observations on Recent Contributions to our Knowledge of the Fresh-Water Shells of Tasmania," Pt. i, Proc. Roy. Soc. Tasmania, 1888, p. 84, but which Mr. Johnston, perhaps critically omitted to number or explain, are drawings 2a, 2b, 2c, presumably of this species. Appended to this paper is a table in which, under "General Remarks," a *Gundlachia beddomei* is mentioned as described "since 1881" by Petterd, which form is asserted to be "undistinguishable from *Gundlachia petterdi*." I believe that I am correct in stating that no species has ever been described under this title. The Quarterly Journal of Conchology contains, in Vol. iv, p. 150, a notice of a new and nameless mollusc by W. F. Petterd, dated Nov., 1883, and evidently relating to the form written of by Johnston.

Prof. Tate recorded (Proc. Roy. Soc. Tasmania, 1884, p. 216) *G. petterdi* from the hill streams of the Mount Lofty Ranges near Adelaide.

Finally, in a paper I have had the honor of communicating to you this evening, Suter declares the existence of an undetermined and probably new species from New Zealand.

The broken range of *Gundlachia* has attracted the attention of several conchologists: Petterd (Journ. of Conch., i, p. 399), Fischer (Manuel, p. 251), Tate (Rep. Austr. Assoc. Adv. Sci., 1887, p. 325), Spencer (*op. cit.* 1892, p. 96), and Suter (N. Z. Journ. Sci. iii, p. 252) have each commented thereon. The fluviatile mollusca of Southern Australia have, strange to say, a stronger likeness to those of New Zealand than to those of the northern part of this continent. *Amphipeplea*, *Potamopyrgus* and *Gundlachia* are confined to Tasmania and to the south-east fringe of Australia; they all reappear in New Zealand, but the *Vivipara* and *Melania* characteristic of tropical and subtropical Australia have failed to accompany them there. The extension of *Potamopyrgus*, *Gundlachia*, and, according to Tate, perhaps *Amnicola*, with another Australian genus, *Mycetopus*, to America is even more remarkable.

To explain similar instances, Mr. H. O. Forbes (to whose courtesy I am indebted for a copy of this very interesting paper) has lately revived the theory of an Antarctic continent, and supports it by several weighty arguments, notably the presence in the Patagonian Eocene of marsupial remains nearest allied to those now existing in Australia. A strip of land, with a mild climate, extending across the Pole from Tasmania to Tierra del Fuego, would have afforded a

possible route<sup>2</sup> for the migration from America to Australia of these Tertiary marsupials. But such a land could not have been connected with New Zealand, or the marsupials would have wandered there also. A great southward extension of Tertiary New Zealand, considered probable by Sir J. Hector,<sup>3</sup> would, however, have availed to people the latter with much of the fauna and flora of the suppositious Antarctic land, in the way that European plants are believed to have reached the Azores.

This theory of the origin of Australian marsupials would also account for the discontinuous distribution of *Gundlachia*.

The Australasian members of the genus known are *G. petterdi* Johnston, *G. beddomei* Petterd, MS., and *G.* sp. undetermined, and probably new, from New Zealand.

At present *G. petterdi* appears to be known, as adult, from only three localities: a small, shallow, stagnant pool near the First Basin, South Esk River, Launceston, Tasmania (Johnston and Petterd); a hill stream at Mt. Lofty, S. A. (Tate), and a chain of shallow, stagnant ponds behind the sandhills at Henley Beach, near Adelaide, S. A. (Adcock, Pulleine and Hedley). In this latter locality they were associated with *Planorbis*, *Bulinus* and *Ancylus*, the latter only determined by the shell. Their habit was to cling to drowned leaves and sticks, or to the submerged leaves and stems of water plants. So closely do they resemble *Ancylus* that a careful observer may, in the field, easily mistake one for another.

The precise mode of the growth of the shell does not seem to have been related by any writer. Johnston says (Proc. Roy. Soc. Tas-

<sup>2</sup> Had the alternative route advocated ("Island Life," 2nd ed. p. 497) by Wallace, "over what is now the Java Sea," been used by the marsupials, then Timor and the South-Eastern Austro-Malayan Islands should, as Forbes logically remarks, have preserved some remnants of the migrants amid surroundings so like Australia (Vol. iii, p. 22, Supplementary Papers, Royal Geographical Society, 1893). Spencer has demonstrated (Rep. Aust. Assoc. Adv. Sci., 1892, p. 118) "that the diprotodonts had their origin in the Euronotian region," which also seems to me, though not to him, to indicate the south rather than the north-west as the point of marsupial ingress into Australia. In his latest paper Prof. Zittel says (Geol. Mag., Nov., 1893, Vol. x, p. 512): "For its [*i. e.*, Australia's] connection at one time with South America, the abundant occurrence of fossil marsupials in the Santa-Cruz beds of Patagonia is valid evidence." See also Lydekker, "Nature," May 5, 1892, Vol. xlvi, pp. 11-12.

<sup>3</sup> Address to the Geological Section of the Aust. Assoc. Adv. Sci., Adelaide, 1893.



mania, 1878, p. 24): "In the young state the shell is simple and resembles the common *Ancylus* in the same neighborhood."

From the fact that *Ancylus woodsii* (*op. cit.* p. 23) is omitted by its author from his last catalogue (*op. cit.* 1890, p. 145) I infer that he now considers that name to be a synonym, and further that he considers it a synonym of *G. petterdi*. If so, it is a matter for regret that Mr. Johnston has withdrawn his species in a manner to confuse a student of his writings.

The published figures of the juvenile shell only represent the stage at which the septum is completed and the secondary growth is about to occur. Thanks to a series of specimens collected by Mr. Suter in New Zealand, which probably represent the fry of an undescribed species, I am enabled to detail the process. My friend supposes that in unfavorable circumstances a septum is never formed, a view which his American experience had already suggested to Gibbons. If this be the case, and *Gundlachia* sometimes continues to regularly enlarge the ancyliform shell, then only an anatomical examination could distinguish between the genera; and, although several supposed species have been named, and more or less adequately described as Australian, yet this hypothesis would require proof of the existence of *Ancylus* in Australia.

The first deviation shown by young *Gundlachia* from *Ancylus* consists of a fold appearing at the posterior end of the aperture. No increase occurs round the rim of the ancyliform shell until the fold is built into a septum flooring half or two-thirds of the original shell. This septum is flat and grows asymmetrically, the right margin advancing before the left. At this stage the shell has much resemblance to a spectacle-case, and has been well figured by Pfeiffer. Vigorous growth now occurs; in front, but in an altered plane, the margin of the ancyliform shell is continued outwards, behind, the shell is spread beneath the septum floor to form the roof of the secondary shell, then leaving the septum it is abruptly bent downwards. A slight inclination to spiral growth is shown by the increase on the right exceeding that on the left.

Stimpson suggests "that the *Gundlachia* commences its life as an *Ancylus*, . . . it passes the first summer and autumn of its existence in this smaller shell, and that the septum, which afterwards partially closes its aperture, is formed during the period of inaction which ensues during the winter. This septum would, in some degree, serve as a protection to the mollusc during this period, in the



same way as the epiphragm of the *Helices*. In the following spring—the period of greatest activity in growth with all the fresh-water Pulmonates—the animal throws forth its newer and larger shell, retaining the older one on its back for the protection of its more tender viscera.”

I regret that I can give but a meagre account of the soft parts. My only material was some specimens procured at Adelaide, which died on the voyage to Sydney, and were hastily and badly preserved on board the steamer. \* \* \* Part of the liver and the hermaphrodite gland are pinched off into a sort of tail, which occupies the primary shell. With this exception, as Gundlach and other observers have remarked, there is no difference from *Ancylus*. The form and disposal of the stomach and intestines seemed, as well as I could ascertain, to agree with those of *Ancylus* figured by Moquin-Tandon.

Jaw extremely minute and frail, about  $\frac{3}{4}$  the length of the radula, very narrow, composed of a great number of separate imbricating plates, which appear to be arranged two deep, in contact but unattached; each is oblong in shape and serrate at one end, resembling somewhat the scales on some butterflies' wings.

The difficulty of observing this tender and incoherent organ will account for the uncertainty that prevails regarding it. Troschel saw it, described it, and then unfortunately concluded that it was a piece of hardened skin. Stimpson failed to find it. Johnston noticed it in *G. petterdi*. In *Latia* Hutton asserts (Trans. N. Z. Inst., XIV, p. 156) that no jaw exists; it has more probably been overlooked.

Radula a narrow parallelogram, very small, measuring about  $3 \times 1$  hundredths of an inch. Formula, 70 rows of 8:12:1:12:8. Each half row straight, meeting at a low angle in the centre. Rachidian with a long, slender basal plate, rounded and slightly expanded posteriorly; reflection about a fifth of total length, bicuspid. Laterals with broad basal plates, emarginate at the proximal posterior corner, sloping away from the rachidian, reflection somewhat pyriform, the wide end proximal, set aslant on the basal plate and armed with a large proximal and two minor distal cups. Marginals more upright, with reflection of same pattern, but extending almost the length of the basal plate.

CONCLUSION.—The genus *Gundlachia* contains four American—*G. ancyliformis*, *meekiana*, *californica*, *crepidulina*—and two Aus-

tralian species—*G. petterdi* and *beddomei*. It is nearly allied to *Ancylus*, from which it differs anatomically by a distinct pattern of radula, and conchologically by its compound shell. The existence, variously affirmed and denied, of a jaw, is now demonstrated by figures. It has been suggested, but not proved, that in unfavorable circumstances the shell never attains its compound development, but remains simple. From an *Ancylus* of the same size the subcentral nucleus and regular elliptical outline distinguish young *Gundlachia*.

A fuller knowledge of the development and structure of the genus is very desirable.

The nearest, in phylogenetic array, to *Gundlachia* are probably the New Zealand *Latia* and the Tasmanian *Ancylastrum*. Should Hutton's *Latiidae* win acceptance, which seems doubtful, it might include these.

The distribution of *Gundlachia* agrees in part with that of the recent marsupials, and the theory of a Mesozoic or older Tertiary migration to or from Australia across the south pole, when a lost land with a mild climate united Tierra del Fuego to Tasmania, would explain its present position.

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#### A NEW MEXICAN BYTHINELLA.

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BY HENRY A. PILSBRY.

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##### *Bythinella palomasensis*.

Shell small, ovate, rapidly tapering above from the periphery of body-whorl to a blunt apex; composed of four very convex whorls, the last about five-sixths the entire length of the shell, well rounded out. Surface showing faint growth-wrinkles only. Aperture ovate, subangular above, its longest axis about half the length of the shell; peristome thin, continuous across the parietal wall and nearly straight there, although not appressed to the body-whorl. Umbilicus minutely perforated. Color whitish corneous and somewhat translucent.

Alt. 2.75, max. diam. 1.80 mm. Longer axis of aperture 1.36 mm.

Two specimens from Lake Palomas, northeastern Mexico, collected by Dr. E. A. Mearns, U. S. A., of the International Boundary Commission. One of the two specimens has the latter third of a

whorl free from the body, as in *Lyogyrus*, a somewhat common pathologic condition in species of this and allied genera; but in the other and evidently normal specimen the peristome is quite free from the adjacent body-whorl, not appressed thereto. Neither example retains the operculum or dried soft parts, and therefore the generic reference cannot be verified by examination of the dentition, but the figure of the shell is that of a *Bythinella* rather than of an *Amnicola*.

It is a stumplier species than *B. binneyi* Tryon, and has far less inflated whorls than *B. brevissima* Pils., but these two species are conchologically its nearest allies among United States species. Of the short-spined Mexican forms, *Amnicola orizabensis* C. & F. is totally diverse, although the figures in Crosse & Fischer's work (pl. 50, fig. 4, *a, b*) look somewhat like this species. *A. guatemalensis* C. & F. is larger, with relatively smaller aperture.

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#### ISAAC LEA DEPARTMENT.

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

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Every week the General Secretary receives letters from the members of the Chapter telling of the benefits of Chapter membership.

A good rule to follow in exchanging specimens is this: "Give a little more than you receive." The one who exchanges merely to add to the number of shells in his own cabinet, loses one of the great pleasures in life—the blessedness of giving pleasure to others.

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#### NOTES ON SHELLS.

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[Report of Mrs. E. C. Soper. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1894.]

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My enjoyment in studying shells is greatly lessened by the fact that to obtain good specimens I must collect those that are "alive," and then go through the intensely disagreeable operation of killing the helpless animals. Though, as we are told, they are not so sensitive to pain as the higher organisms, yet the poor, writhing, quivering creatures appeal to my pity in a very great degree.

However, men's cruelty, perhaps, does not surpass or equal that of the winds and the waves, and of the stronger animals that prey upon

the weaker ; but, until I overcome my repugnance to the killing and dissecting of molluscs, I shall take more enjoyment in studying their homes than in getting acquainted with the inmates themselves.

Being a new member of this Society, and also a novice in conchological lore, I can hardly hope to write anything of much interest to the older members, but, perhaps, the younger ones may care to hear about some of my most interesting (to me) "finds." \* \* \* \* I shall never forget an expedition, taken in the early part of this year ('94), to Long Beach, in company with a friend, when our enthusiasm for collecting had just begun. Leaving Long Beach a short time before noon, we started to walk to Alamitos Bay, neither of us knowing the distance. We picked up so many shells that, before we were half way there, we were very tired ; but determined to reach our destination, we pressed on, were caught in a shower, and finally reached the bay more dead than alive, judging from our feelings. We found nothing very valuable, but we fairly staggered under the load of shells we carried home, which place we did not reach until after dark. We were told the distance was five miles each way, and we believed it.

Last summer, during a trip taken with the Chatauqua Assembly School in Conchology, I picked up a shell near a fisherman's cottage on Tim Point, which proved to be a small specimen of *Siphonalia kellesti* Fbs. While cleaning it, I noticed, about two inches from the lip, on the inside, a rusty looking spot, through which the water trickled. After using quite a quantity of acid to take off the accumulation of foreign matter on the outside which nearly hid the form of the shell, I discovered opposite the rusty spot, and imbedded in the hard shell, a tiny mussel, half an inch long. I thought I had made a discovery ; but, alas ! on turning to "West Coast Shells," I found that these little mussels grow sometimes in large shells. I think it is *Adula styliana* Cpr., but so small and delicate ! How did it carve a home to fit it so perfectly ?

I have taken a good deal of pleasure in rude attempts to draw and paint some of the more simply formed shells, but I find it is difficult to reproduce them faithfully.

When in San Francisco, I had the privilege of a day in the Academy of Sciences, of looking at Tryon's magnificent work, which was beautifully illustrated in colors. I also had the pleasure of visiting Mill's College and the University at Berkeley, and of seeing the collections of shells at both these institutions, and I shall



always remember the courtesy shown to me, and the kindly interest taken in my growing desire to know something about conchology by those who have long made it a study.

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MRS. MARY P. DARLING has collected, at the various beaches in Los Angeles County, and reports "one hundred and eighty-three species; among them are a live *Calliostoma splendens* and a dead *Nassa insculpta*."

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#### WITH A DREDGE.

[Report of Miss Ida M. Shepard. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1894.]

I have added a number of specimens to my collection during the year, and had the pleasure of dredging in the bay, with very good results. It is with impatience we wait the dredge to fill, after dropping it over the stern of the boat; and when it comes up filled with mud how we watch and exclaim over some treasure we see as the mud is being washed out. But often we find nothing, and often many good and rare specimens. I will tell you of what a few dredges contained. After the dredge is pulled up and the mud washed out, the contents, if any, are dumped into the tub, and we look it over, and find nothing but a stone or two and a few *Olivella boetica*, *Tornatina culcitella*, and young *Rictaxis punctocaelatus*. After the dredge was dropped over again, I picked up a small stone and looked it over, and soon gave an exclamation of delight, for, on one side, snugly in its nest, was a fine, large *Lima orientalis* Ad. & Rve. It did not take long to cut the nest from the stone and put it into a jar of sea-water, and before we reached the shore the Lima came out of the nest and swam around the jar. I wish I could give a good description of what a beauty it was swimming. Will do the best I can. About  $\frac{2}{3}$  of the length of the shell the tentacles are of a bright rose color, the rest pure white, and, as it swam around, its beauty can be imagined. The tentacles are about  $\frac{1}{4}$  inch in length. It would put out its foot at times to help it along.

Another dredge brought up a fine, large *Clidiophora punctata* Cpr., and it gave an exhibition after being put into a cup of sea-water and sand. Other dredges gave live *Dentalium hexagonum* Sby., *Scala hindsii* Cpr., *Eulina micans* Cpr., *Mangilia variegata* Turbonilla tridentata, *Macoma yoldiformis*, and the pretty *Tellina variegata* Cpr.



Besides dredging comes the collecting of fine *Lunatia lewisii*, *Fissuridea aspersa*, *Acmæa pelta* var. *hybrida*, *Acmæa pelta* var. *nacl-loides*, *Diplodonta orbella* and nests; *Lacuna carinata* and two finds of over 150 *Terebratella transversa*. Then dead specimens, in good condition, of *Cadulus fusiformis*, *Parthenia armata*, *Rissoina infrequens*, *Felania sericata*, with quantities of rich drift, not yet sorted, which doubtless contains many rare specimens new to my cabinet.

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#### GENERAL NOTES.

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MR. CHARLES W. JOHNSTON left Philadelphia, September 24, for an extended geological trip in the Eocene regions of Louisiana and Texas.

DR. WM. H. DALL has published a resumé of the results of his systematic studies on *Mastridæ* and *Mesodesmatidæ* in the last number of the Proc. Malacological Society of London.

PROF. GILBERT D. HARRIS has been spending some time in Philadelphia studying and remounting Lea's type collection of Claiborne Eocene fossils.

ACANTHOCHITES MATTHEWSI *Bednall & Pilsbry*, described in THE NAUTILUS for February, 1894, from "South Australia," was found by me in St. Vincent's Gulf at Giles' Point, south Yorke's Peninsula, at an unusually low tide.—*E. H. Matthews*.

EPIPHRAGMOPHORA CALIFORNIENSIS VAR. CONTRACOSTÆ.—Smaller than var. *diabloensis*, but of the same depressed form; light yellowish straw-colored, with or without a dark band; surface rudely striate and cut by irregular spirals into small granules; not malleated or slightly so. Whorls  $5\frac{1}{2}$ ; outer lip *thickened*, hardly expanded, white, basal lip expanded and a trifle impinging on umbilicus, which is deep and rather widely open, somewhat as in *Polygyra kiawaensis*. Locality, Byron Hot Springs, Contra Costa Co., California.—*Pilsbry*.

EPIPHRAGMOPHORA REMONDI Tryon.—This species is, as Cooper and von Martens have lately recognized, quite distinct from *carpentari*. Ancy's *H. verrilli* (Conch. Exch.) is a synonym of Tryon's species, Ancy having been misled by the misidentification of *Rémondi*, which has prevailed since the publication by Gabb of his Lower California finds.—*Pilsbry*.

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## ON *DOLABELLA CALIFORNICA* STEARNS.

BY HENRY A. PILSBRY.

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The genus *Dolabella* has long been known as an inhabitant of the Indian Ocean and Polynesia, but it had not been reported from American waters until Sowerby described the shell of *D. guayaquilensis*, from Guayaquil, in 1868.

In 1879 Dr. R. E. C. STEARNS described a *D. californica* from Mulege Bay, Gulf of California, but unfortunately the shells only were available for his study. They were found by Mr. W. J. Fisher "in pools left by the tide" at the locality named.

Part of the specimens collected by Fisher were secured by Mr. W. N. Lockington, and presented to the Academy, in alcohol; so I am enabled to give below a description of the animal of this interesting addition to the West Coast fauna, which proves to be nearest allied to *A. tongana* and *ecaudata*, Polynesian species.

The dentition of *Dolabella* is excessively peculiar, and together with the unusual position of the genital orifice, necessitates the formation of a new subfamily, *Dolabellinae*, for this genus.

### *D. californica* Stearns.

Description of alcoholic specimens:—Length 12 to 14 cm. Oblong-ovate, broadly rounded behind, Aplysia-like in front. Buccal tentacles ear-like, short and folded about at the middle, not produced toward the mouth; tentacles conic and slit; the very minute

eyes in front of them and more separated. Mouth a vertical slit in a papillose disk. Swimming lobes arising at or behind the middle of the animal's length, contiguous. Posterior subcircular area defined by a groove with smooth, raised anterior edge, and enclosing a cord. Mantle having a large shell-foramen and a long posterior siphonal fold. Genital orifice under the back part of the gill.

Color (in alcohol) dark olive, or dull brown with more or less black maculation. In life it is said to be "a dark brown and the surface covered with warty papillæ."

Shell solid, with a brown cuticle. Apex with a roughened, reflexed callus, continuing along the dorsal margins as a reflexed border over the cuticle.

In external appearance, this species seems nearest to *D. ecaudata* and *tongana*, but the posterior area is defined by a far less conspicuous frill, which does not extend to the edges of the dorsal slit. *Dolabella guayaquilensis*, a species known by the shell only, is stated to have the margins "scarcely reflected, callus small, narrow, not continued upon the margins," while in the present species the margins are bounded by unusually broad reflexed callous bands. Traces of sparsely scattered wart-like papillæ are visible on some specimens, mainly posteriorly, but these are not very distinct in the alcoholic examples. Two of the original lot collected by Fisher are before me, the smaller one being drawn in my figure, and another specimen of a dark olive color collected by Dr. W. H. Jones on the "West coast of Mexico," has also been examined.

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#### DESCRIPTIONS OF NEW PISIDIA.

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BY DR. V. STERKI.

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In looking over more than 20,000 specimens of *Pisidium*, during the last twelve months, the writer came across numerous new forms, and many of them will prove to be new species. But, as some of those already published are not fixed beyond a doubt, owing to insufficient descriptions and figures, and lack of reliable originals, and as new forms are constantly coming in, it will be advisable not to hurry with publications. Yet a few of these new species were seen from so many different places, and come to hand again and again that it is too unsatisfactory to return them without or only with MS.

names. Besides, they are not doubtful species, being well defined and distributed over wide areas. Mr. E. W. Roper having examined specimens wished the writer to publish these species.

The descriptions will not be exhaustive, especially as to the hinges, leaving that, as well as figures, for a monograph, but they will be sufficient for recognition of the species.

*P. WALKERI* n. sp. Mussel of medium size, elongated, rather inflated, resembling *P. abditum*, but is smaller than good sized examples of that species; it is also more elongated, and the smaller and moderately prominent beaks are more posterior; thus the anterior part is comparatively very long, with the end rounded, the posterior quite short, truncated at the end; scutum and scutellum well marked. The shell is very thin, translucent, the surface very finely, and sharply striated, often somewhat scaly, dullish, or with a silky gloss; color grayish, along the margin more or less yellowish horn. Hinge moderately strong, of the same type as in *Pis. abditum*; cardinal tooth of the right valve moderately curved, its posterior part thickened and with a deep furrow; below this tooth, there is a deep groove formed by the inferior edge of the hinge list raised; and the same formation is in the left valve below the deep groove between the two cardinal teeth; ligament comparatively strong.

Long. 4.5, alt. 3.7, diam. 2.8 mill.

In outline, our species has some resemblance with *P. virginicum*, by its elongate shape, the beaks situated posteriorly, the long and below somewhat sacciform anterior part. But it is much smaller, its shell quite thin, the hinge finer, the striation finer and the beaks are much smaller.

*P. walkeri* is quite a characteristic and beautiful species which cannot be mistaken for any other. It has a wide geographical distribution but seems to live not in great numbers together, as e. g. *P. abditum*, *compressum* and others do. For the first time I found it in a lot of *Pisidia* from Kent County, Michigan, in the collection of Mr. Byrant Walker—in whose honor it has been named—and in another from Utica, Mich. Later it was seen from Grand Rapids, Mich. (L. H. Streng), Columbia, Pa. (Bryant Walker), Mohawk, N. Y. (in E. W. Roper's collection, from E. R. Mayo); Clearwater and Mississippi rivers, Minn. (H. E. Sargent).

*P. POLITUM* n. sp. Mussel of medium size, well inflated, rather high, beaks slightly posterior, rather high and prominent, not full but well rounded; scutum and scutellum slightly marked. Supe-



rior margin rather short, rather strongly curved; inferior well curved, more so in front than behind; posterior margin distinctly truncated, with a well marked angle where joining the superior, and a less marked, rounded angle where joining the inferior margin; anterior end forming a slight but distinct angle situated rather high up. Surface very finely, irregularly striated, polished; whitish or straw colored, often leaden-grayish on the beaks, or even all over. Shell moderately thick, nacre whitish; muscular insertions not very distinct; hinge of essentially the same type as that in *Pis. abditum*.

Long. 4·0, alt. 3·4, diam. 2·4 mill.; 4·7 : 4·0 : 2·9 mill. from another place.

*Pis. politum* is rather variable in size, and more so in color as noted above, but so markedly constant in its several habitats that a number of different local forms, or varieties could be described. It has some resemblance with *Pis. abditum* Hald. and *Pis. variabile* Pr.; from the former it is different by its being somewhat smaller, comparatively shorter and higher, the beaks being less full, the surface finer striated and more polished; from the latter it is distinguished by its smaller size, the beaks being less full, the antero-superior margin less straight, and the angle at the anterior end being situated higher up; the shell is thinner and the hinge less strong, the coloration different. With all these differences appearing only gradual, our *Pisidium* is a good species beyond a doubt and will always be recognized.

It was found, in May a. c., in the outlet of a small peaty swamp near New Philadelphia, Ohio, about 200 specimens, in company with *Pis. abditum*, *varibile* and *compressum*, all, when fresh, being of a remarkably uniform color and appearance; Philadelphia, Pa. (Morris Schick); Grand Rapids, Mich. (L. H. Streng); Joliet, Ill. (Jas. H. Ferriss); Clearwater River, and Dallas Lake, Minn. (H. E. Sargent).

*P. MILIUM* Held. This is not a new species, but new to our country. A number of specimens from East Twin Lake, at Charlevoix, Michigan, dead shells but in perfect condition, in the collection of Mr. Bryant Walker, were, after careful comparison, found to be congruent, in shape and appearance, as well as in the hinge characters, with one of the larger forms of *Pis. milium* from England, so that there can be no doubt in their identity.

New Philadelphia, Ohio, Oct., 1895.



## EDITORIAL CORRESPONDENCE.

Natchitoches, Louisiana.

October 6, 1895.

My first work was two miles below Mabelvale (12 miles southwest of Little Rock, Arkansas) along Fourche creek; an outcrop of Eocene limestone of the Midway or Clayton stage occurs here, containing *Enclimatoceras ulrichi*, *Ostrea pulaskensis*, *Cucullea microdonta*, *Cytherea sp.*, *Venericardia planicosta*, etc., etc. Most of the fossils consist of casts only, and are difficult to obtain from the hard limestone. The situation was very favorable for land shells, however, and the heavy rain of the day before had caused the snails to start from their hiding places and I found them very abundant, crawling over the rocks and leaves. *Helicina orbiculata*, *Polygyra thyroides* var. *bucculenta*, *Polygyra inflecta* and large fine specimens of *Zonites friabilis* were particularly common, while a search brought to light *Polygyra stenotrema*, *Polygyra divesta*, *Selenites concava*, and *Pyramidula alternata* var. *mordax*. The whole bluff was strewn with dead shells, and in turning over a log one of the enemies of the Helices was found, a large beetle of the genus *Cychrus*.

At White Bluff on the Arkansas River, in Jefferson Co., Arkansas, is a bed of Upper Claiborne. The principal fossils collected were *Venericardia planicosta*, *Nucula ovula*, *Cytherea discoidalis*, *Corbula nasuta*, *C. oniscus*, *Turritella arenicola* var. *branneri*, *Turritella clevelandia*, *Pseudoliva vetusta*, *Lævifusus branneri*, *Volutilithes petrosus*, *Solarium bellastriatum*, a fine series of *Mazzalina inaurata*, and many others, altogether probably 25 or 30 species.

At Vince Bluff on the Saline River in Cleveland Co., Arkansas, is a small exposure of the Jackson bed from which about thirty species were obtained. The river was very low and in many places paved with Unios. As it was getting late, and a drive of eleven miles was before me I had very little time to collect; but upon cleaning the "catch" next morning, found I had the following species: *Unio pyramidatus*, *U. crassidens* (?), *U. trigonus*, *U. camelus*, *U. turgidus*, *U. pustulosus*, *U. near castaneus*, *U. plicatus*, *U. cornutus*, *U. metanever*, *U. trapezoides*, *U. securis*, *U. hydeanus*, *U. aberti*, *U. tuberculatus*, *U. near satur*, *U. gracilis*, *U. purpuratus*. The first five species were abundant and many of the others would prove equally so with more thorough collecting. It is an ideal spot for a "Uniologist." *Campeloma subsolidum* Anth. and *Fleurocera elevatum* were also abundant, and among the former I find one specimen of *Vivipara subpurpurea* Say.

My next collecting was done at Mt. Lebanon, Bienville Parish, Louisiana. This is the locality discovered by Mr. T. Wayland Vaughan, and through his kindness in giving me the exact position of the bed, I was able to find it, after considerable digging, as the banks had caved down. I succeeded in getting a very interesting lot of fossils, including fine specimens of *Anomia ephippoides*.

While waiting for a train as Shreveport I took a stroll along the Red River and a small tributary ("Lake") to the north of the city. Nothing was to be found along the river except quantities of dead Helices, etc. among the flood-debris, but which have practically no value, as their habitat may have been Arkansas, Texas, or Indian Territory. Along the shores of the "Lake" I found some beautiful specimens of *Unio alatus* and *U. anodontoides*; and *Campeloma sub-solidum* and *Vivipara subpurpurea* were quite plentiful. Although the Red River was extremely low, the ever-changing bars and the freshet-swept shores are unfavorable situations for mollusca; while in the smaller rivers and tributaries they are abundant.

CHARLES W. JOHNSON.

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NOTE ON THE GENUS JOANNISIA.

BY W. H. DALL.

In the Transactions of the Wagner Free Institute of Science vol. III, p. 545, April, 1895, I proposed the name of *Joannisia* for *Cyrenella oblonga* Sowerby and another Philippine island species which had been referred to *Cyrenella* (or *Cyrenoida* Joannis) as the hinge of these species is quite different from that of the original type of *Cyrenella* (or *Cyrenoida*). The Marquis de Monterosato kindly calls my attention to the fact that in 1888 he had used the name *Joanisia* for a genus typified by *Tylodina citrina* Joannis (Nom. Gen. Con. Medit., p. 149).

I would therefore modify the name as applied to the Philippine bivalve to *Joannisiella*.

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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.]

Before the November issue of THE NAUTILUS each member of Chapter will have received a copy of our new printed list of members. A number of new names appear upon the list.

Please bear in mind that our Chapter reports are due next month (December). It is expected that our volume of Transactions will be very large this year. Write only on one side of paper eight by ten inches in size. Leave a margin of one and one-half inches at the left. Every member is expected to send in a report. A short one will be better than none.

The election of officers for the Chapter also occurs in December. The President and General Secretary, who also acts as Treasurer, are the officers to be elected. Those who have not paid dues in advance will please bear them in mind.

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#### RAISING BABY SNAILS.

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[From the Transactions of the Isaac Lea Conchological Chapter.]

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Prof. Keep once inquired, in the *Popular Science News*, "Did any one ever raise baby snails?" I copy from an old note book:

"May 24, 1886, *Mesodon thyroides* deposited forty-three eggs. All hatched between 4 P. M., June 8 and noon June 9. June 23 found fifty-seven eggs." They were in two nests, and I probably removed the mother before her day's work was done, as I found fourteen more immediately after, making seventy-one. "July 11, sixty-nine. July 20, forty-seven." Whole number deposited in four days less than two months by one snail, 230.

Those hatched June 8 show, on July 1, small umbilicus, 2½ whorls, and on July 8, three full whorls. July 23, four whorls, umbilicus partly covered. Shell so thin it is almost impossible to handle.

The following January, nearly five whorls, lip thickening and slightly everted. Callous on the body-whorl, but no tooth.

If any one interested in the study of mollusca could raise young, from any or all species in their vicinity, it would not only be instructive, but would save time and patience, when an undeveloped shell is found, in trying to find out what it is. The tiny youngsters have sometimes very little resemblance to an old one. I am rarely without one or two colonies.

## MY FIRST YEAR COLLECTING AND STUDYING SHELLS.

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[Report of H. Lowe. From the Transactions of the Isaac Lea Conchological Chapter of the Agassiz Association for 1894 ]

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My knowledge of collecting shells is quite limited as I have only studied conchology for about a year. I have collected chiefly at Long Beach and San Pedro, but prefer the latter place for collecting as it offers a great variety of beach, rocks, sand and mud flats. At Dead Man's Id. are to be found rock shells in abundance, the *Chlorostoma*, *Monoceros*, and *Littorina* clinging in dark patches on the rocks of the breakwater, while among them are bright red starfish and Chitons.

The *Pomaulax undosus* are also plentiful, for at one time I picked up thirty-five living specimens in one place. On the great pieces of kelp which are seen floating in the tide pools, are often found colonies of the beautiful *Norrisia norrisii* with their strawberry colored bodies extended from the shell.

I have found beautiful live specimens of *Semele decisa* in sand between the rocks on the Bay side of Dead Man's Id. and good specimens of the *Cordium quadrigenarium* in the mud flats. *Olivella biplicata* may be found at low tide between Rattlesnake Id. and Terminal Id.

Most of the shells of Alamitos Bay are bivalve, while those of San Pedro and Dead Man's Id. are mostly Gastropods.

This Summer *Neverita reclusiana* has been quite plentiful for I found one hundred and twenty-five in one morning at the Donax beds at Long Beach, and I found it quite true as Prof. Keep says, that the Natica eat clams for I caught them while boring into Donaces. \* \* \* \* \* Among other interesting relics which I found this Summer was the house which the *Oedalina subdiaphana* Desh., builds. It is made of sand and some substance which holds the sand together and covers the shell completely except for two tiny holes left for the siphons. It is about an inch long, and may sometimes be seen lying on the mud flats at Alamitos Bay, and resembles lumps of sand. The shell of the little mollusk which lives inside is pure white and very delicate, the lines of growth are distinct and the ligament is internal.

You may have wondered in walking along the beach, what the curious formation of sand, looking like a horse's hoof was. By some



people they are called "sand dollars." I was greatly puzzled over them till this summer when I learned, at the Conchology Class of the Chautanqua Assembly what they were. They are the egg cases of the *Natica* and are full of microscopic eggs mixed with the sand. Sometimes on top of the egg cases are found the eggs of the *Nassa* lying in long rows.

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NOTICES OF NEW PUBLICATIONS.

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ON THE STRUCTURE AND AFFINITIES OF SOME NEW SPECIES OF MOLLUSCS FROM BORNEO.—By W. E. Collinge and H. H. Godwin-Austen, P. Z. S., 1895.—This interesting paper gives descriptions and many figures of three new slugs collected by Mr. Everett in Borneo. The fact is brought out, that the slugs of Borneo resemble in their anatomy some of the shell-bearing forms of that island, rather than the Indian slugs to which they show more outward similarity. The first species is placed in *Damayantia* Issel, for all that it has a shell. The suggestion that Issel was mistaken in supposing that his genus was shell-less is probably correct; the present writer had in *Ann. Mag. N. H.*, Jan., 1891, p. 100, suggested a doubt as to the validity of this character by quoting it within inverted commas. Some remarks are given as to *Tennentia*, which is said to be "probably synonymous with Issel's genus," but immediately below is correctly shown to be equivalent to *Mariaella*. It is probable that the authors meant to say that the so-called *Tennentia philippinensis* is a *Damayantia*, but not that *Tennentia*=*Mariaella* is *Damayantia*! If the latter synonymy held, *Mariaella* would of course be the name of the genus, having long priority. The statement that *Dekhania* G.-A. is the same as *Mariaella* and "must be suppressed" comes rather late in the day, since the present writer had suppressed it, with all due pomp and solemnity, in 1891 (t. c., p. 103-104), and again in the check-list of 1893. The other two species are placed in *Microparmarion*, a genus or subgenus lately instituted by Simroth for a species from Java. Curiously, in making comparisons, *Africarion pallens* is said to be from South India, whereas it was really from Abyssinia, vide Godwin-Austen, *Moll. of India*, 1883.

Simroth's division of the Javan slugs into *Parmarion* and *Microparmarion* may be justified, but a new name is apparently required



for what he calls *Parmarion*. If we admit that the Javan slugs are not *Girasia* nor *Ibycus*, then they are assuredly not *Parmarion*; for that genus was founded by Fischer on four slugs, one of which is a *Mariella* one a *Girasia* (Indian), one an *Ibycus* (Indian), and the other a *Hyalimax*!

In conclusion, we may cordially echo the author's wish that further Bornean material may be obtained by them, for they have certainly only obtained a glimpse of the undoubtedly rich slug-fauna of that region.—T. D. A. COCKERELL.

REVIEW OF OUR PRESENT KNOWLEDGE OF THE MOLLUSCAN FAUNA OF MICHIGAN, by Bryant Walker (address delivered before the Michigan Acad. Science, Dec. 27, 1894). Michigan has a long Malacological history, for a Western State, beginning with Dr. SAGER, in 1839, who had worthy followers in MILES, CURRIER and DECAMP, successive historiographers of the rich mollusk-fauna of that great State. Other Michigan naturalists—MCNEIL, STRENG, LATHROP *et al.*—have made large additions to our knowledge of the mollusca, not to mention the Eastern authors Conrad, Anthony, Lea, Tryon and others, who described material collected by the ardent and enthusiastic band of Michigan naturalists. All of this is most interestingly related by Mr. WALKER, in this survey of the history of Michigan Malacology. In the notes accompanying his tabular enumeration of all species reported from the State, from all sources, (284 entries), much valuable information is given, but so condensed that no useful abstract is possible. A full bibliography of Michigan conchology concludes the paper.—H. A. P.

A CATALOGUE OF THE MARINE MOLLUSKS OF JAPAN has been issued by Messrs. Frederick Stearns and Henry A. Pilsbry. It is a handsome volume of 204 pp., and 11 plates. Suitable notice of the contents will be given next month.

MOLLUSQUES DE LA BASSE CALIFORNIE, recueillis par M. Diguët-déterminés par M. Jules Mabille (Bull. Soc. Philomathique de Paris, (8) vii, pp. 54-76, 1895). This annotated list comprises both marine and inland mollusks, and many supposed new species. In most cases exact localities are not given. The forms described or mentioned as new are: *Octopus digueti* Perrier & Rochebr.; *Fissurella* (*Cremides*) *pluridentata* and *digueti*, *Patella ænigmatica*, *Crepidula nebulata* Mabille; *Pleurobranchus digueti* and *Doris umbrella* Rochebr.; *Planorbis mysarus*, *Helix indigena*, *steganella*, *invecta*, *digueti*; *H. (Polygyra) solidens*, *triangularis*; *Bulimulus (Lepto-*

*byrsus*) *lapidivagus*, *dentifer*, *subspirifer*, *dismenicus*; *B. (Scutalus)* *acholus*, *cosmicus*, *cacotyces*; *B. (Thaumastus)* *digueti*; *B. (Globulus)* *recognitus*; *Berendtia digueti*, *minorina*; *Barbatia nova*, *digueti*; *Perna recognita*; *Anomya* [sic] *simplex* Mabile; *Plicatula spondylopsis*, *ostreivaga*, *Chama parasitica*, *digueti* Rochebrune. The diagnoses are not accompanied by comparisons with known species, nor are figures given; and the work as a whole, instead of adding to our knowledge of Lower Californian conchology, quite appreciably darkens the subject. There are unquestionably some misidentifications, or possibly mixture of specimens from other localities, among the marine shells; and numerous typographical errors mar the paper. There should be a petition in the litany of all good conchologists against this sort of dilettante trash.

DE L'EXISTENCE DU GENRE BERTHELINIA CROSSE A L'EPOQUE ACTUELLE, par Ph. Dautzenberg (Bull. Soc. Zool. France 1895). In 1875 a peculiar, very small, *Capulus*-like shell was discovered in the Paris Basin Eocene, and named by Crosse *Berthelinia elegans*. It was supposed to be a univalve; but later another was found, and proved to be a *left valve* of the species, which was then transferred to the bivalve family *Aviculidæ*. The genus has also been surmised to be an embryonic bivalve, analogous to *Sinusigera* in Gastropoda. Now a living representative of *Berthelinia* has been found, and named by M. Dautzenberg *B. Schlumbergeri*, in honor of the discoverer. It is less than a millimeter long, white, with spiral beaks like *Isocardia cor*; the interior is not pearly, but mat, so that Cossman is probably right in referring *Berthelinia* to *Prasinidæ* rather than to the pearl oyster group. It was dredged in sand at the island Nossibé, near Madagascar.—*H. A. P.*

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#### NOTES AND NEWS.

DR. WM. H. DALL, Honorary Curator of the Department of Mollusks, U. S. Nat. Mus., has returned from a prolonged sojourn in Alaska, where he has been engaged in an examination of the coal resources of the country.

MUSSELS IN A CITY RESERVIOR.—During the cleaning of the East Park Reservoir, 33d St. and Columbia Avenue, Philadelphia, Mr. J. E. Ives observed numerous *Unio complanatus* in the muddy sediment in course of removal. Specimens presented to the Academy of Natural Sciences by him are well-grown and normal. The water

supply of this reservoir is pumped from the Schuylkill, where this species is abundant; and it was doubtless introduced in the state of free-swimming embryos, which found in the muddy bottom of the reservoir, a suitable station.—*H. A. P.*

PYRAMIDULA ALTERNATA AND GASTRODONTA LIGERA, REVERSED.—In the collection of the late ROBERT WALTON, of Roxborough, Philadelphia, which was presented by his father to the Academy of Natural Sciences, a reversed specimen of each of these species occurs, both taken in the vicinity of Philadelphia. In a former issue we have announced a reversed *Z. cellarius* found by the same ardent conchologist.

Another sinistral specimen of *P. alternata* has been presented to the Academy, a finely developed shell of the size of ordinary adults in this locality. It was found by Mr. JOHN FORD in the West Park (Fairmount) some years ago, in a locality now destroyed so far as snails are concerned.

It would seem that sinistral individuals occur more frequently in *Pyramidula (Patula)* than in our other groups of American Helices. Binney records a reversed *alternata* (Man. Amer. L. Sh. p. 257) in the Museum of Comparative Zoology. I have seen a fine reversed specimen of *P. strigosa*, in the collection of the late Dr. FR. STEIN, of Indianapolis, Ind. I believe that no sinistral specimens of American species of this genus other than those mentioned above, have been put on record, but it is not unlikely that others exist in collections, unrecorded. If so, we would be pleased to hear from their possessors, and to record the occurrence of such sinistral Helices as may come to our knowledge.—EDS.

THE EDITOR has had the pleasure of very pleasant calls from Dr. THEODORE GILL and PROF. A. E. VERRILL, whose attendance at the meeting of the National Academy of Sciences, of which they are distinguished members, brings them to this City of Brotherly Love.

CONCHOLOGISTS who do not already possess a copy of Tryon's "STRUCTURAL AND SYSTEMATIC CONCHOLOGY" should procure it now. This work is indispensable to the collector who wishes to gain an intelligent idea of the affinities or structure of shells, or to classify a collection. The plates illustrate thousands of species representing all of the genera and subgenera, and the text contains interesting chapters on geographical and geological distribution, structure, classification, etc. It is the most complete text book on the subject in the English language.

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## NOTES OF A CONCHOLOGIST IN JAPAN.

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BY JOHN B. HENDERSON, WASHINGTON, D. C.

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It was my good fortune to accompany the Hon. John W. Foster on his diplomatic mission to Japan and China last winter. Official duties and the disabilities placed upon me by a suspicious military guard prevented me from doing very much collecting, although I eagerly seized such few opportunities that came my way to gather in the tempting array of mollusks that generally seemed near at hand.

There can be no more delightful country in the world to collect in than Japan. The natives are always pleasant and courteous and often show a disposition to assist. Even my solemn escort at times so far forgot pride and dignity as to remove their swords and wade in the muddy rice fields to capture the "dobukai." Land and fresh-water shells are abundant almost anywhere. The mountain sides are especially rich in that variable Helicid group of *Eulota* (*Euhadra*) *luhuana*, its many forms and varieties. *Clausilias* cluster together in old stumps, and the rice fields fairly swarm with *Corbicula*, *Vivipara* and *Melania*. One rainy day at Nikko, a coolie brought me a branch of mulberry, upon which seventeen fine specimens of *Euhadra brandti* were crawling.

The only marine collecting I could do was at Shimonoseki, and in the neighborhood of Nagasaki. Both these localities are delight-



fully rich in marine forms, especially the latter point, where a larger number of the true Indo-Pacific species occurs. At Nagasaki crowds of fisherwives and their children go out every day at low tide and gather *Tapes philippinarum* Rv. for the markets. These are found in great abundance on the pebbly beaches of the bay, an inch or so under the surface. At a little fishing village called Mogi, on the Gulf of Simibara, where a small stream meets the sea, I spent two days in a conchological paradise. I shall not soon forget the thrill at my first sight of those splendid Indo-Pacific species alive and moving along, that I had only seen before in collections and figured in books. Here at low tide an exposed stretch of rocky reef was covered with *Monodonta labio* L., *Purpura tumulosa*, *Chlorostoma lischkei* Pils., *Chl. turbinatum* Ad., *Chl. rustica* Gmel., *Turbo coronatus* Gmel., and an occasional *Turbo cornutus japonica* Rve. In the crevices of the larger boulders, hidden from the light, *Euthria ferrea* Reeve clings to the rough surfaces of the granite, and *Litorina sitchana* Phil. must be sacrificed at every step. In the little pools of clear water left by the receding tide, myriads of *Umbonium* glisten in the sunlight like gems, along with the more dingy *Potamides*. Under the stones are hidden all manner of nice things—the usual *Tapes* and a quantity of small species; occasionally a pretty *Calliostoma consors* Lisch., and now and then a fine, large, spiny *Murex* (*M. axicornis*!)

A sand- and mud-bank at the mouth of the little river is most interesting. Among a wealth of species and a profusion of specimens I stood dazed and excited. *Fusus* (two large species), with their brilliant scarlet-red bodies made furrows in the soft sand, and *Siphonalia kelletii* seemed quite as abundant. The large, fine *Polinices ampla* and *Eburna japonica* Sowb. thrive in the half mud half sand. Scattered along the shore and washed in from the deeper waters of the bay I found good specimens of *Hemifusus*, *Rapana bezoar*, *Ranella lampas*, *Triton tritonis*, *Fascolaria trapezium*, *Siphonalia cissidariaeformis* and *longirostris*, *Cassis pyrum* Lam., and *Astraliu modestum* Rve.

Among a number of bivalves I remember, in particular, *Soletellina boeddinghausi* Lisch., *Tellina praetexta* Marts., *Arca suberenata* Lisch., *Cytherea lusoria*, *Caecella chinensis* Desh., *Dosinea japonica*, *Mactra veneriformis* *Pecten japonicus* and *laqueatus*.

While collecting at this charming spot, I was assisted by a swarm of naked children, who vied with each other in finding specimens,



and whose little, black, oblique eyes could almost see around corners.

The market places usually offer a number of the more common species, among which one can often pick out rarer and more desirable forms. *Eburna japonica* and a large *Cardium* seemed the most favored as articles of diet.

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ANNOTATED LIST OF THE MOLLUSCA FOUND IN THE VICINITY OF  
CLEARWATER, WRIGHT CO., MINNESOTA.

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BY H. E. SARGENT, WOODVILLE, ALA.

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PART FIRST—LAND SHELLS.

Having the past summer at our disposal, and needing rest, our plans were laid gastronomically to enjoy the fruits of the old homestead garden, the pride of our octogenarian parent; socially, to renew the acquaintance of relatives and friends of former years, and, scientifically, for our own gratification and perhaps that of our fellow conchologists, to work up as fully as possible the molluscan fauna of the immediate vicinity of our sojourn. The two first desideratæ of the vacation were a pre-eminent success, and our friends may be our judges as to the latter.

Clearwater, Wright Co., Minnesota, is situated on the Clearwater River, at its junction with the Mississippi, some 60 miles above the famous Falls of St. Anthony.

The Mississippi, at this point is, at times, deep, rapid and filled with loose logs for the Minneapolis saw-mills. At the time of our investigations it was shallow, quiet and free from logs, thus greatly aiding in our search. Its bed being in the glacial drift, contains but little, if any, lime-rock.

Fine granite is quarried from the outcropping of the Archæan rocks at St. Cloud, only 15 miles above.

The several islands which occur at this point are low and densely overgrown with willows, elms, vines and rank weeds.

Being protected from fires, the undergrowth is a perfect tangle of dead limbs and living weeds. The portions which are overflowed in high water are cleared and more open.

The Clearwater River, a small stream easily crossed dry shod in summer, is from 8-10 miles long, and the outlet of Clearwater Lake. Except in the most rapid portions, it is muddy under its banks, with an occasional muddy slough connected.

Clearwater Lake is a beautiful sheet of water. It is 10 or 12 miles long, from a few rods to 3 or 4 miles wide, and very irregular in outline. Over most of its bed it is pebbly or rocky and quite shallow, many acres in its centre being less than two feet deep. The surrounding timber is quite heavy, and furnishes good retreats for land mollusks, while the maples, elms and oaks, by their abundant shade, keep the soil somewhat moist.

Belle and Heath Lakes, situated two miles west from Clearwater, are small, deep, weedy and muddy, and are typical of several other lakes visited, of which no further mention will be made.

Their floors, at margin, are covered with fine, marly mud deposit, and are heavily overgrown with rushes and white lillies. Beyond the water's edge, the shores are boggy and overgrown with rank grass. The surrounding country is rolling and sandy; timber, scrub-oak, poplar, birch, and other small shrubby trees—and to still further render it unfit for molluscan habitation, it is frequently overrun by forest fires. No shells were found away from the immediate vicinity of the lakes.

Land species were collected at the following stations:

Station B. Belle Lake. Among grass roots on crowns of bogs, unless otherwise designated.

Station C. Clearwater Lake. Sifted from leaf-mould taken from banks of small spring rill.

Station I. Islands in Mississippi River at Clearwater.

Station R. Rockford, Minn., 20 miles south of Clearwater.

Station D. Drift in Mississippi River at Bellevue, Ia.

Station E. Vicinity of Bellevue, Ia.

Valuable assistance has been rendered in verifying and identifying by Dr. Sterki.

1. *Selenites concava* Say. D.
2. *Pseudohyalina milium* Morse. C.
3. *Pseudohyalina minuscula* Binn. R, under chips at water's edge of Crow Creek. B, D.
4. *Zonitoides nitida* Mull. C, under boards among the reeds at lake margin. I, very abundant under fine bark chips at water's edge. E, crawling among weeds near creek.
5. *Vitrea radiatula* Ald. Common at B and C.
6. *Vitrea radiatula* Ald. (albino), very closely resembling *H. binneyana*. A beautiful variety found at both B and C, together with the typical specimens.

7. *Vitrea arborea* Say. C, B, I, R.
8. *Conulus fulvus* Drap. Very plentiful at B and C under decaying logs. I, R.
9. *Strobilops virgo* Pils. C, specimens perfectly colorless. D, R.
10. *Strobilops virgo* Pils. (dark brown variety). At C, in company with, and at B, without typical specimens.
11. *Punctum pygmaeum* Drap. C, B.
12. *Pyramidula striatella* Anth. B, C, I, R.
- 12a. *Pyramidula striatella catskillensis* Pils. Clearwater Lake.
13. *Pyramidula alternata* Say. Under decaying logs at C, I, D.
14. *Helicodiscus lineatus* Say. Very numerous and rather undersized at C, D.
15. *Polygyra (Tridopsis) multilineata* Say. I, E, island in Mississippi River near Bellevue, Ia. At both stations mature shells were very thin and delicate.
16. *Polygyra (Tridopsis) clausa* Say. D.
17. *Polygyra (Stenotrema) hirsuta* Say. D.
18. *Polygyra (Stenotrema) leai* Ward. I, under drift ; E, bogs on banks of creek ; B.
19. *Vallonia perspectiva* Sterki. I and R.
20. *Ferussacia subcylindrica* L. C, B, I, R.
21. *Pupa pentodon* Say. B, D.
22. *Pupa edentula* Drap. C.
23. *Pupa contracta* Say. B, C, D.
24. *Pupa holzingeri* Sterki. C, D, I.
25. *Pupa curvidens* Gld. C, D.
26. *Pupa corticaria* Say. C, under bark of decaying log.
27. *Pupa armifera* Say. B, on sandy hillside ; D.
28. *Pupa procera* Gld. D.
29. *Vertigo ovata* Say. B, C.
30. *Vertigo ventricosa* Morse var. *elatio*r Sterki. B.
31. *Vertigo tridentata* Wolf (1 *example*, 4-*dentate*) D.
32. *Vertigo milium* Gld. D.
33. *Succinea ovalis* Gld. C, B, R. Crawling on slough grass.
34. *Succinea obliqua* Say. I, very fine specimens among underbrush and weeds ; C, E, on island in Mississippi River.
35. *Succinea avara* Say. I, very abundant under pine bark chips at water's edge.
36. *Carychium exiguum* Say. C, B.
37. *Carychium exiguum* Say. var. R, C.

38. *Carychium exile* H. C. Lea. D, C.

The aquatic species will be enumerated in a second paper.

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DESCRIPTION OF A NEW AUSTRALIAN CHITON.

BY H. A. PILSBRY.

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*Chiton Bednalli* n. sp.

Oblong, *strongly elevated*, with *acute dorsal keel and straight side-slopes*. Cream-white, with a small flesh-pink spot at each beak, and a sparse mottling of same on lateral areas, the central areas clouded with green. Girdle flesh-tinted with green bars.

Median valves acutely beaked, the beaks hardly projecting on the straight or concave posterior margins of valves, which, at the sides, are *regularly serrated*. Central areas with a narrow, smooth band along the ridge (wider and triangular in valve ii), the pleura with 12 narrow, strong, rounded, longitudinal ribs on each side, separated by flat grooves wider than the ribs; *inner one or two ribs not reaching to anterior margin of valve*. Lateral areas well raised, divided by a median groove (doubled on some valves), *which widens at intervals, forming a series of triangular pits*; traces of somewhat similar pits appear along the diagonal slope, and the posterior border has a series of transverse undulations corresponding to the denticles of the sutural margin. Valve i with about 20 radial narrow grooves, also pitted; and, like the grooves of lateral areas, these do not extend to the beak, which is surrounded by a smooth area. Valve viii with central projecting mucro, the slope behind it very concave; anterior area ribbed, posterior area with pitted radial grooves.

Interior white, blue on the valve-callus. Girdle clothed with convex imbricating scales, rounded in contour, and measuring about two-fifths of a millimeter in width, faintly striated toward inner edge of girdle, blunter and smoother toward outer edge.

Length 25, breadth 11 mm.; angle of divergence 98°.

Yorke's Peninsula (W. T. Bednall).

This species resembles *C. Covi* somewhat, but differs in the peculiar pit sculpture of the lateral areas. Its nearest ally is a still undescribed South Australian species collected by Mr. Bednall. The coloration described will probably be found subject to variation, as usual.



## SOME NOTES ON THE GENITAL ORGANS OF UNIONIDÆ, WITH REFERENCE TO SYSTEMATICS.

BY DR. V. STERKI.

It is generally known that in a group of Uniones comprising a great part of our species, such as *ligamentinus* Lam., *rectus* Lam., *subovatus* Lea, *parvus* Barnes, *nasutus* Say, *rangianus* Lea, *alatus* Say, etc., the females have the posterior part of their *outer branchiæ* peculiarly transformed into "branchial uteri," and also that in consequence of this, in almost all instances the shells of the female specimens are distinctly and decidedly dilated downward at the posterior end, so as to be distinguished from the males at first glance. The degree of difference between the sexes is, however, very different among the several species, but it is constant. For convenient reference in the following, this group is designated as A. There is another group, say B, in which *all four branchiæ* are charged in their totality with embryones, as already shown by Lea for some species,<sup>1</sup> but do not show such marked transformation and change in colors as those of the former group, and cause also no such striking differences in the shape of the mussel, according to the sexes. Examples of this group are: *U. subrotundus* Lea, *pustulosus* Lea, *aesopus* Green, *undulatus* Barnes.

There are some facts of peculiar interest in connection with this grouping. The first is that the animals are propagating at certain seasons quite different for the two groups, as the writer has ascertained by examining thousands of specimens during the last four or five years. In group A the branchial uteri are charged with embryones from late summer to the beginning of winter, and probably in most through the winter, while in early summer they are empty, the embryones having been discharged. At that time the ovaries of the females are charged with ova, and the testes of the males with spermatozoa, while the latter are missing, or quite scarce, in the time from late summer to winter, in which time the embryones attain their maturity in the branchiæ.

In group B, just the reverse is true. During the fall, *i. e.*, about from August, and probably winter, the branchiæ are empty, containing no embryones, while the ovaries are filled with ova, and the

<sup>1</sup> Yet Huxley, in his valuable "Man. Anat. of Inv. An.," says: "In Unio and Anodonta the young are hatched in the outer gill pouches of the parent



testes with the white, creamy sperma (rarely of a different color.) During early summer, the branchiæ will be found filled first with developing ova and then with embryones, which are discharged about in July; at that season the ovaries and testes are sterile. There are slight variations as to the time, but the general rule is as stated.

This radical difference in the season of producing ova and sperma, and maturing the embryones, coincident with the differences of the location and formation of the uterus sacs is highly interesting, the more so as they are in harmony with the differences in the shells, and thus seem to furnish systematic characters of a high order. In group A the mussels are generally more or less elongated, or at least longitudinal, that means with a small angle of torsion of the axis,<sup>2</sup> the hinge-teeth are moderately strong, and the epiconch is of a vivid color, as a rule, with numerous rays. In B, the mussels are, as a rule, shorter, the axis-torsion is more considerable, the hinge and hinge-teeth are stronger and of a different shape, and the epiconch is generally of a more uniform, dusky color.

Yet there seem to be some real or apparent exceptions, and dissident members of both groups. In *U. lens* Lea and *ellipsis* Lea the propagating organs are of exactly the same type as in group A, and also bound to the same season. In the former, which has often been mistaken for *U. circulus* Lea, the male and female mussels are very different, the latter being strongly dilated downward posteriorly—Lea's figure represents a female specimen well; the shell is also not heavy. In *U. ellipsis* the female mussel is also dilated and more full posteriorly, though not so marked, yet, as a rule, recognizable; the lighter color and green rays of the younger approaches it to group A, and more so, in the writer's opinion, the formation of the posterior mantle edge, which is of the same appearance as in the other species ranging under A.

On the other hand, two species, with an elongated mussel, *U. cuneatus* Barn. (*niger* Rat., *crassidens* v. C. Lam.) and *gibbosus* Barn. range with group B, as to their generative organs, and also in the season, while they at least show no downward dilatation of the female shell (in *cuneatus* it seems to be decidedly higher in general) and their shells are comparatively heavy, the epiconch is of a uniform deep brown or black, though having some green rays when young, as do also *U. subrotundus*, *coccineus* etc.; the shell is very

<sup>2</sup> More about this feature will be said in another place.

heavy in *crassidens*, and the teeth very strong and of the same type with the other species of group B, while the decided downward curvature at the posterior end in old specimens approaches both species to the same, and removes them decidedly from A.

In *U. multiplicatus* the female was found November 1, with evidently mature embryos filling the uterus sacs, which are of rather the same appearance as those of *U. alatus*, and occupying the most posterior part of the outer branchiæ. Also, otherwise this species is quite different from *U. undulatus* Barn., in spite of the similar appearance of the old mussels, as already pointed out by Say.

A few words about *U. alatus* Say, *laevissimus* Lea and *gracilis* Barn. may be added. Of all three the branchial uteri were found filled late in October, in the former evidently discharging the embryos, and of a rather different formation from that in the two others, while the young mussels of the two former species are very much alike. It is known that in *U. alatus* the female mussel is markedly produced downward, and more so in *gracilis*, while in *laevissimus* it is scarcely distinct from the male.

Besides these two main, and, as it seems, most numerous groups, there are some species of quite different types. In order not to let this article become too lengthy, they, together with *Margaritana* and *Anodonta* will be considered later.

It is probably known to most conchologists that during the first two or three years of life, the genital glands are not developed at all. Yet the specimens are still rather small and young when they begin producing ova and sperma, and the assertion that the presence of embryos is a criterion of maturity of the parent is as far from truth here as it is for the *Cycladidæ*. In group A the filled uterus- or embryo-sacs increase in numbers as well as in size with advancing age of the mother animal. In *U. subovatus* Lea, *e. g.*, 18, 25, 28, 40 have been counted on a side, in specimens of different sizes, and these are probably not the lowest and highest numbers to be found, and correspondingly so in other species. For every one of them there is, however, an average number the rule for an adult, and these numbers are very different for the different species.

The embryos, or glochidia, of many species have been examined and figured long ago, especially by Lea, and they prove to be of rather different forms. Very probably they would be found more or less uniform in the several groups, and with the latter show differences which may also be of value for systematics. Although

having examined some of them, and their development, the writer is not prepared, as yet, to speak in a general way about them.

New Philadelphia, Ohio, Nov., 1895.

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NOTES AND NEWS.

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NEW RECORDS OF REVERSED AMERICAN HELICES.—I have myself found three reversed Helices. First, reversed *thyroides*. This specimen I sent to the late John G. Anthony for the Cambridge Collection. Second, reversed *multilineata*. This also I sent to Anthony. I now have another reversed *thyroides* in my collection. I also know of a third one, collected near Cincinnati, by the late Mr. Stannage, and also of a reversed *mitchelliana* collected by Prof. F. W. Bryant near Cincinnati.

This makes a list of six reversed specimens of *Mesodon*, which I have seen. Dr. Lewis had a reversed *albolabris* in his collection. This does not indicate that *Patula* has much the start.

—A. G. WETHERBY, *Magnetic City, N. C.*

VITRINA LIMPIDA IN WESTERN PENNSYLVANIA.—The last time I saw you I promised to send you some living *Vitrina limpida* Gld. if my "colony" had not died out, so I send you a dozen and trust they will reach you in good shape.

Last year I only found 12 alive, so feared the "colony" had died out, and, up to to-day, had not found a single specimen this year. It has been exceedingly dry this season, the deficit in rain-fall being nearly 11 inches up to November 1, but yesterday we had a steady, soaking rain; so to-day I started out for *Vitrina* and collected 95 in two hours, so you see, the "colony" is still flourishing in spite of the drought, and burning off the "drift" under which they lived. I think I told you that this "colony" came down the river in the flood of February, 1891, as that was the time the drift lodged in the hollow where they are found, and the Signal Service records show that the '91 flood came from the headwaters of the Allegheny. This is a good example of "dispersal by water," and one that has practically been proved.

To-day was cold and raw, with slight snow-spits (Signal Service record for November 10 show maximum temperature 39° F., minimum 36° F.), so *V. limpida* has the same habits as its European

cousin *pellucida*, i. e., out in cold weather. I noticed one or two eggs among the rotten leaves.

As to the habits of *Vitrina limpida*, they were very hard to find yesterday [Nov. 17], as it was much dryer than a week ago, and most of the shells had crawled into the curled-up leaves. One specimen was busily engaged in making a meal off of the shell of a deceased brother or sister, eating right through the shell as is the habit of the *Zonites*.—GEO. H. CLAPP, *Pittsburg, Pa., in letters.*

THE STEARNS LOAN COLLECTION IN THE DETROIT MUSEUM OF ART.—The citizens of Detroit, Michigan, are to be congratulated upon the addition to their facilities for scientific and æsthetic education, of the great collection of archæological and ethnological material of MR. FREDERICK STEARNS. We quote the following from the *Detroit Evening News*, of November 1 :

“The occasion which last night emphasized the significance of the gathering at the Detroit Museum of Art is one which the whole Detroit public ought to recognize. It was the formal dedication to the public use of the additional gifts lately made to the museum by Frederick Stearns. The archæological and ethnological collection which Mr. Stearns placed in the museum last night is in itself valuable enough to entitle the donor to public gratitude, but when it is considered that the presentation of last night’s collection was but an incident in Mr. Stearns’ past relations to the institution, the event places Mr. Stearns among the foremost of Detroit’s public benefactors. The very presence in a community of a goodly number of persons of Mr. Stearns’ tastes and artistic discrimination is a refining influence, but when such a man is willing to contribute not only his technical acquirements and skill, but his pecuniary substance for the common good, the fact goes a long way to negative the current notions about the crime of being rich and refined in taste. The reception of last evening was a recognition in part of the public’s appreciation of its indebtedness to Mr. Stearns’ munificence, but the best and real recognition will be given from day to day by the individuals who are edified and profited by their visits to the museum. The *News* tenders its acknowledgements to Mr. Stearns of all the benefits which he has conferred upon Detroit through his generosity to the Museum.”

We understand that Mr. Stearns is preparing a series of Mollusca for exhibition in a special hall of the Museum of Art.



## NOTICES OF NEW PUBLICATIONS.

DESCRIPTION D'UNE NOUV. ESPECE DE MODIOLA (Feuille des Jeunes Naturalistes, May-June, 1895), *M. gallica*, Dautzenberg, from the ocean coast of France.

ON THE VALIDITY OF THE GENUS MARGARITANA. By Charles T. Simpson (Amer. Nat., April, 1895). The author maintains that *Margaritana* is not a natural genus, but is of polyphyletic origin, the species having arisen from various diverse groups of Uniones.

SCIENTIFIC RESULTS OF EXPLORATIONS BY THE U. S. FISH COMMISSION STEAMER ALBATROSS. *Report on Mollusca and Brachiopoda dredged in deep water chiefly near the Hawaiian Islands, with illustrations of hitherto unfigured species from Northwest America.* By William Healey Dall. Eight hauls of the dredge were made by the *Albatross* in between 300 and 400 fms., on approaching Honolulu, securing a number of very interesting new forms of the genera *Scaphander*, *Pleurotoma*, *Mangilia*, *Spergo* (a new group) *Polinices*, *Solariella*, *Emarginula*, *Dentalium*, *Euciroa*, *Lyonsiella* and *Pectunculus*. The anatomy of *Euciroa*, *Halicardia* and a new *Lyonsiella* is discussed by Dall at some length, and the important point that the foliobranch type of gill exists in certain members of groups in which most genera have the reticulate type, is brought forward and amply fortified by figures. Moreover, the branchial septum is shown to be of diverse origin in some allied genera, being made up in part of a reflected nephridial lamina in *Halicardia* and *Lyonsiella*. The facts developed tend strongly to break down the primary division of Lamellibranchiata based upon the modifications of the gill, as in the classification of Pelseneer. *Euciroa* is shown to be different from *Verticordia*, of which it had formerly been considered a subgenus, and a new family, *Euciroidæ*, is formed for it. In gill structure it seems to be intermediate between the foliobranchiate and the reticulate types. "The discovery of this type may be said to practically complete the series uniting the foliobranch with the reticulate gill, and give the quietus to the classification based solely on the divergencies of the ctenidia."

The examination of the soft parts of *Mytilimeria flexuosa* shows that form to constitute a new genus now described as *Halicardia*.

The second part of the paper gives additional information on Northwest American species of *Buccinum*, *Chrysodomus*, *Trophon*, etc., described in Proc. U. S. Nat. Mus., 1891, with good figures of many interesting forms. A valuable essay on the north Pacific Brachiopods concludes the article.



# THE NAUTILUS.

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## TO CONCHOLOGISTS.

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We regret the necessity which compels us to start the new year with an editorial of this nature; but it is nothing new to hear that the NAUTILUS must struggle for existence. This struggle has continued since the Jura, until now we have but a few species, three or four in the Indo-Pacific and one in the United States. Do you intend that the only recent NAUTILUS in North America shall become extinct? We are willing to supply the care, but not the entire environment. It needs feeding once a month in order to add another septum. You are asked to assist in this important function once a year; and when you see a slip of paper which reads, "Inclosed please find \$1.00," it means that it has come your turn to "chip in." We hope that you will no longer neglect these little reminders. They mean that *your* subscription is due. We cannot wait until the end of the year—we *must have it in advance.*

Wishing you all a Happy New Year.

H. A. P. & C. W. J.

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## NOTES ON THE WASHINGTON SPHERIA AND PISIDIA, WITH DESCRIPTIONS OF NEW SPECIES.

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BY EDWARD W. ROPER.

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The great State of Washington has been lightly touched by collectors of freshwater shells, but enough is known to indicate that when its hundreds of lakes and rivers are scientifically explored, large and interesting collections will be made. The researches of

Mr. P. B. Randolph at Seattle, and Mr. Henry Hemphill in several localities, have brought to light a goodly array of *Sphæria* and *Pisidia*, and regarding these the following notes may be of interest.

*Sphærium primeanum* Clessin. This shell, described in the Monograph of the Cyclades, is so little known to collectors that a brief description will be useful. Shell large, equilateral, dark brown or black with lighter beaks, shining. Outline rhomboidal, a little more elongated and the ends more rounded than *Sph. rhomboideum* Say, but the dorsal aspect very much like that of the species. The full, rounded beaks make the vertical section broadly cordate. One specimen, chestnut colored and with yellow border, is so close to *Sph. rhomboideum* as to be held in doubt. That species has been found in northern Idaho, and may naturally be expected from Washington. *S. primeanum* was found in Lake Washington, Seattle.

*S. dentatum* Hald. Handsome, bright green shells, differing only in color from brownish Oregon specimens, are doubtfully referred to this species. Collected at Spokane Falls by Mrs. Mary P. Olney.

*Sph. nobile* Gould. Identified by Dr. J. G. Cooper. It is a large, shining, dark brown shell, resembling *Sph. dentatum* Hald., but less inflated. The young shells are thin and smooth, while in *S. dentatum* they are more heavily striated than the adult. Abundant in small streams, Seattle.

*Sph. occidentale* Prime. Found at Spokane Falls by Hemphill.

*Sph. raymondi* J. G. Cooper. Small specimens abundant in streams at Seattle. Larger ones in Lake Washington. Beautiful specimens from Spokane Falls and Chehalis River (Hemphill). Also found in Idaho and Vancouver's Island. The species was found originally by Mr. Wm. J. Raymond in Tuolumne Co., Cal., at an altitude of 8700 feet, in 1889.

*Pisidium idahoense* Roper. First found by Mr. Henry Hemphill at Old Mission, Idaho, in 1890. Found abundantly in streams at Seattle by Mr. Randolph, and much larger than the types. One fine specimen has the following dimensions: Long. 0.45 inch; lat. 0.39 inch; diam. 0.30 inch. This is certainly the largest known species of *Pisidium*.

*P. variabile* Prime. Streams at Seattle. Unusually large.

*P. compressum* Prime. Green Lake, Seattle.

*P. abditum* Hald. Common in water courses at Seattle.

*P. ultramontanum* Prime. Unusually robust specimens from Seattle. As nearly every *Pisidium* found on the Pacific Slope has been

sent out under this name, it may be well to say that this shell is somewhat triangular with rounded margins, nearly as large and solid as the average *P. variable*, horn colored shading to yellow at the borders, some specimens with dark blotches or stripes near the basal margin. The California types were described as having "valves shallow in the cavity," but the northern shells are more full and rounded.

*P. randolphii* n. sp. Shell rounded oval, moderately inflated; anterior end elongated and perfectly rounded, no angle indicating the junction of the anterior and basal margins; posterior margin sloping abruptly from the very short hinge margin; beaks decidedly posterior, fairly prominent; surface very finely and evenly striated, polished, of a most peculiar greenish-yellow color, different from other *Pisidia*, but much like some *Corbiculas*. This of itself makes it easy to separate from *P. abditum* and *P. variable*, associated species. Long. 0.18 inch; lat. 0.14 inch; diam. 0.10 inch. Found at Seattle. Dr. J. G. Cooper says the shell most nearly resembling this is *P. harfordianum* Pr., a species practically unknown to collectors, and of which he has only a young specimen.

*P.* ———? n. sp. A rotund, orbiculate, dull yellow *Pisidium*, with prominent beaks and projecting scutellum, was collected by Mr. Hemphill in Patten Lake, Whatcom County. Dr. Sterki considers it identical with a species apparently common in the region of the Great Lakes, to which he has applied the name *P. scutellatum* (in letters). A deep water form is supposed to be *P. abyssorum* Stimp., but as Dr. Stimpson's manuscript was destroyed by fire, and his types mixed, this can never be certainly known. Figures and more minute descriptions of this and *P. randolphii* may be expected in Dr. Sterki's coming monograph. Additional specimens are urgently desired of this and other species of the Pacific Slope, which are, at present, deplorably scarce.

I believe it is safe to say that *P. insigne* Gabb., *P. harfordianum* Prime and *P. angelicum* Rowell are unknown, except from the original lots. *P. occidentale* Newcomb seems to be only a form of *P. abditum* Hald. Additional specimens may confirm that view or prove the contrary. The most experienced collectors disagree regarding the identity of the *Sphæria*. This tangle need not long remain if sufficient material can pass under the eye of a competent conchologist. Pacific coast collectors have generally given their attention to marine and land shells, and it would seem that a field for discovery is open among the freshwater species.

## NOTES ON COLLECTING SHELLS IN CHINA.

BY JOHN B. HENDERSON.

When I saw Mr. Schmacker's splendid collection of Chinese mollusks in Shanghai, and looked over Père Heude's Unios at Sicaway, I was laying the foundation for a bitter disappointment when I took to the field myself. The great alluvial plains extending from Peking and the Gulf of Pechelli on the north to Shanghai and the lower Yangtze on the south, are not particularly rich in species. My good friend, Mr. Schmacker assured me that "the hills" fairly trembled with molluscan life; but the hills were far away, the season unfavorable, so I continued my search along the muddy banks of the rivers and the slimy waters of the canals near Shanghai, with from fair to poor success, it being then too cold (January) for land shells.

The bulk of Chinese Unios that so closely resemble our Mississippi forms, live almost entirely in the upper waters of the great rivers and their tributaries that flow through the high lands of the interior provinces. In the neighborhood of Shanghai, *Unio murchisonianus* and *Anodonta woodiana* were the only naiads I met with, but these were generally abundant. Corbiculas and the two Viviparas, *chinensis* Bens. and *quadrata* Bens. are plentiful in the canals. I secured the services of one, Ah Sin, a bland and suave celestial, to collect for me. Ah Sin brought me, day by day, numbers of *Cyclina sinensis* wrapped in endless papers, that he assured me were rare and highly desirable Unios from the inaccessible Thibetan frontier. So Ah Sin proved a failure.

Upon a three days' journey in a house-boat from Tientsin to Tungchow (on the Pei-Ho River), I did not observe a single shell of any kind. From Tungchow to Peking, about 15 miles, I gathered quantities of *Vivipara*, *Unio* and *Corbicula* in the canal, and in the dried pools by the roadside many *Limnæa*. The walls of Peking swarm with *Cathaica pyrrhozona*; I even gathered a number of them in my bed-room, where they clung to the ceiling. This species has a wide distribution throughout China, as well as *Bithinia striatula* Bens. which I gathered in the canals about Tientsin.

Unfortunately, I had no opportunity to try the good marine collecting of the southern China coast, my only attempts for marines being in the immediate vicinity of Shanghai and at Che Foo and Taku on the Gulf of Pechelli in the north. The fauna of this region is not particularly interesting, consisting only of a limited



number of boreal forms, some of which can be traced along the Aleutians to Alaska and down as far as Vancouver.

These northern waters of the Yellow Sea on the Chinese side and the Gulf of Pechelli are not conducive to molluscan life on account of the immense quantities of mud poured in by the Yangtze and the Hwang Ho Rivers. The amount of this deposit is almost incredible. The shore line from the mouth of the Yangtze, several hundred miles north, is a great mud bank that is rapidly extending out and filling up the shallow sea. The few Pelecypods that rejoice in such surroundings must keep awake to avoid being "snowed under." They are exceedingly difficult to obtain, and especially when the icy winter winds blow as they do in that inhospitable region. From such stations I secured an *Arca*, a *Solecurtus*, *Cyclina sinensis* and a *Solen*.

At Che Foo, where the shore is more bold and rocky, a few *Monodonta labio* and *Littorina sitchana* rewarded a diligent search at low tide.

I made a desperate attempt to take advantage of the excellent collecting in the island of Formosa, but the circumstances of my visit to that most beautiful spot was such that I found it dangerous to venture out. Some natives, however, brought me quantities of beach worn shells, out of the lot of which I selected a few fairly good specimens of *Chlorostoma argyrostomum*, *Patella testudinaria*, two *Haliotis*, and *Cypræa isabella*.

The collector in China must be of a patient and amiable disposition to endure the throng of gaping fools that follow and ply him with a thousand questions. The quick tempered man is sure to get into trouble and get no shells.

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#### SHELLS OF SEATTLE, KING CO., WASHINGTON.

BY P. B. RANDOLPH.

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The following species I have collected within the city limits during the past year:

Selenites vancouverensis Lea.	Zonites arboreus Say.
Selenites sportella Gld.	Zonites pugetensis Dall.
Selenites sportella hybrida Anc.	Zonites johnsonii Dall.
Zonites lucidus Drap. (introduced).	Conulus fulvus Drap.
	Pristiloma lansingi Bld.



- Pristiloma stearnsi* Bld.  
*Punctum conspectum* Bld.  
*Punctum randolphi* Dall.  
*Epiphragmophora fidelis* Gray.  
*Epiphragmophora fidelis minor*.  
*Epiphragmophora fidelis albino*.  
*Polygyra* (*Mesodon*) *townsendiana* Lea.  
*Polygyra* (*Mesodon*) *columbiana* Lea.  
*Polygyra* (*Mesodon*) *devia* Gld.  
*Polygyra* (*Stenotrema*) *germana* Gld.  
*Vertigo simplex* Gld.  
*Vertigo binneyana* Sterki.  
*Succinea oregonensis* Lea.  
*Succinea nuttalliana* Lea.  
*Carychium occidentalis* Pilsbry.  
*Anodonta californiensis* Lea.  
*Anodonta oregonensis* Lea.
- Margaritana margaritifera* Linné  
*Sphaerium nobile* Gld.  
*Sphaerium raymondi* J. G. C.  
*Sphaerium primeanum* Cless.  
*Pisidium compressum* Prime.  
*Pisidium idahoense* Roper.  
*Pisidium ultramontanum* Prime.  
*Pisidium variabile* Prime.  
*Pisidium abditium* Hald.  
*Pisidium randolphii* Roper.  
*Physa gabbi* Tryon.  
*Limnæa tryoni* Lea.  
*Limnæa palustris* Linn.  
*Limnæa humilis* (introduced) Say.  
*Planorbis trivolvus binneyi* Try.  
*Planorbis callioglyptus* Vanatta.  
*Planorbis vermicularis* Gld.  
*Ancylus fragilis* Tryon.  
*Valvata sincera* Say.

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#### 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.]

Next month we will be able to announce the result of the annual election of officers for the Chapter.

This has been a year of activity along conchological lines in our chapter, and plenty of good reports are sure to follow enthusiastic work.

The fraternal spirit expressed by the members of our Chapter reveals the goodwill of each member, and is a pleasant feature in work of the Association.

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#### COLLECTING IN SOUTHERN CALIFORNIA.

[Report of Mrs. G. W. White. From the Transactions of Isaac Lea Conchological Chapter of the Agassiz Association for 1894.]

My interest in the science of conchology dates from the summer of 1893, when Prof. Josiah Keep, of Mills College, taught this sub-

ject during the Chautauqua Assembly at Long Beach, Cal. Though unfortunately, not a member of his class, some of my friends were enthusiastic students under him, and through them, the enthusiasm or "craze," as we sometimes call it, was communicated to me, and I very shortly became as eager a student and collector as my circumstances would allow. Happily for me, my husband shared my interest, and most of our collecting has been done together, and many of my choicest treasures were found by him in places I could not venture—in places where the waves dashed too high for my courage, or under rocks too heavy for my strength to lift. So this report must be understood as a record of our joint work.

In the winter of '93 and '94, we made a number of visits to Long Beach and San Pedro, going as far as Alamitos Bay in one direction and nearly to the old wharf beyond Times' Point at San Pedro. We collected quantities of shells, but as it would be impossible and unprofitable to mention them all, I will speak only of the rarer ones.

Under the rocks at Dead Man's Island, we found, on our first trip, a number of specimens of each of the following varieties: *Volvarina varia*, *Terebratella transversa*, and *Lazararia subquadrata*.

We also dug a number of fine fossil pectens out of the bank. One of the choicest shells found by us that day has never been fully identified by me. By some it is called *Cerostoma foliatum*, by others *Murex trialatus*.<sup>1</sup> At any rate it is a rare and interesting shell, and I have never seen another like it. On another trip up the beach above San Pedro we found, by digging in the sand with a trowel, some fine specimens of *Stenoradsia magdalenensis*, the largest Chiton on this part of the coast.

We also found several *Hinnites giganteus* Gray, *Cumingia californica* Conr., *Lucapina crenulata* Sby., and a fine old *Mitra maura* Swains., two inches in length, of which we are justly proud. In the spring of '94 we were on a visit in Ventura County, and when our friends proposed a trip to the beach, we interposed no objections. They drove to Punta Gorda, meaning Point of Rocks, most appropriately named, for I have seldom seen such a bed of rocks jutting out so boldly into the sea. They were literally covered with the largest species of mussels, many of them being nearly, if not, six inches in length. In the sheltered places in these rocks we found quantities of *Purpura saxicola* Val. and *Monoceros lapilloides* Conr. Our patient search in the rock pools was rewarded by our finding *Opalia crenatoides* Cpr.

<sup>1</sup> The shell proved to be *Pterorhytis trialatus* Sby.

In the summer of '94, while attending the class in conchology at Long Beach, our teacher, Mrs. M. Burton Williamson, kindly planned an excursion to Dead Man's Island, and took eighteen members of her class to San Pedro the evening before we were to do our collecting. We spent the night at an old seaman's hotel on Timm's Point, and at 3 o'clock A. M., rose to take advantage of the first beams of the sun and the tide, which was to be at the lowest point at about 4.30 A. M. There happened to be a dense fog, and as our ghostly boatman took one boat load after another of our companions away from us across the bay, we were strongly reminded of that other boatman, the Charon of our early studies and the River Styx.

However, by the time we were safely landed on our hunting grounds, the mist had risen and we could see to begin work. The most that we found of value was on the mud flats uncovered by the low tide. There we found, under the grass which lay flat on the mud, thus concealing thousand of mollusks which lay below, *Haminea virescens* Sby., and *Haminea vesicula* Gld. We also found, partly covered with mud, *Cardium quadrigenarium* Conr., and altogether covered with mud except some tiny points of a *Chorus belcheri* Hds. What a shout went around when some one called out, "Mrs. White has found a *Chorus*," and how eagerly the mud in that vicinity was scanned to see if another could not be discovered. But no, I bore off my trophy in triumph alone, for not another one was found.

On our way home, while walking along the beach, some one, I think Mrs. Williamson, called our attention to some narrow slits in the sand, where, upon digging carefully, we found a dozen *Lingula albida* Hds.

Later, on a walk to Alamitos Bay, I found *Periploma argenteria* Conr., *Petricola carditoides* Conr., *Labiosa undulata* Gld., *Yoldia cooperi* and *Clidiophora punctata* (?) Cpr. \* \* \* \* And now this account brings us up to the year of our Lord, 1895, and finds us still enthusiasts in conchology, only waiting for a favorable tide to go again in search of treasures of the sea. We are of those who believe that nature has secrets which she reveals only to those who love her, and we feel that in this kind of communion with her she has fully rewarded us.

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## NOTICES OF NEW PUBLICATIONS.

CONTRIBUTIONS TO THE TERTIARY FAUNA OF FLORIDA. TRANSACTIONS OF THE WAGNER FREE INSTITUTE OF SCIENCE.—Vol. III, part 3. By Wm. H. Dall, A. M. This forms an introductory chapter to Prof. Dall's work on the Tertiary Pelecypoda of Florida, and contains a new classification of the Pelecypoda, with an enumeration of the differential characters of the Orders, Suborders, Superfamilies and Families, a statement of their range in geological time, and an enumeration under each family of the chief generic groups believed to be referable to it. The paper is prefaced by a brief discussion of the features of the Pelecypod organization chiefly available as diagnostic characters. Continued study of this group has confirmed the author in the opinion that in its general features the classification which he proposed in 1889 (founded largely on the characters of the hinge, see Amer. Jour. Sci., XXXVIII, 445), and has now revised, comes nearer to meeting the requirements of the case than any other which has fallen under his notice. In describing the ligamental characters the term "resilium" is proposed for the so-called "cartilage" or "internal ligament." The Steinmann Formula, based on the teeth, sockets and resilium, is thoroughly explained. The Pelecypoda are divided into three orders—*Prionodesmacea*, *Anomalodesmacea* and *Teleodesmacea*. The first order contains thirty-four families, leading factors being *Solemyidæ*, *Nuculidæ*, *Arcidæ*, *Pteriidæ*, *Ostreidæ*, *Unionidæ*, *Trigonidæ*, *Pectenidæ*, *Anomiidæ* and *Mytilidæ*. Each of the above and of the following families being the typical representatives of a Superfamily. The second Order contains fifteen families, typical ones being *Anatinidæ*, *Clavagellidæ*, *Poromyidæ*. The third contains forty-seven families, such as *Pleurophoridæ*?, *Astartidæ*, *Cyrenidæ*, *Carditidæ*, *Chamidæ*, *Hippuritidæ*, *Lucinidæ*, *Leptonidæ*, *Cardiidæ*, *Tridacnidæ*, *Isocardiidæ*, *Veneridæ*, *Tellinidæ*, *Solenidæ*, *Mactridæ*, *Myacidæ* and *Pholodidæ*. The paper is concluded with some timely notes on nomenclature.—C. W. J.

CATALOGUE OF THE MARINE MOLLUSKS OF JAPAN, COLLECTED BY FREDERICK STEARNS. By H. A. Pilsbry. Detroit: F. Stearns, 1895. 8 vo, 214pp. and 11 plates.

Every one interested in geographical distribution, or in the fauna of eastern Asia, will be grateful for the liberality of Mr. Stearns, who obtained, and the care of Mr. Pilsbry, who has enumerated and identified, the large collection here treated of.



Not content with the labor of naming and cataloging Mr. Stearns' shells, Mr. Pilsbry has searched the literature and made a catalogue, not only of the shells collected by Mr. Stearns, but of all the species described from or assigned to Japan by earlier authors, thereby producing a most handy list which no student of mollusks can afford to be without. Notwithstanding the care with which the Monographs of Dunker and Lischke were made, the present catalogue enumerates about 20 per cent. more species than the latest of them. In addition to the list of marine mollusks and brachiopods, the land and fresh-water shells collected by Mr. Stearns are catalogued, and also a supplementary series of Loo Choo Island species, obtained by a native collector in Mr. Stearns employ. The plates and presswork are excellent, and the work, as a whole, is creditable to all concerned in its production, and cannot fail to be useful to students.

—W. H. D.

PRELIMINARY CATALOGUE OF THE MARINE MOLLUSKS OF THE PACIFIC COAST OF CANADA, with notes on their distribution. By Rev. Geo. W. Taylor, Transactions of the Royal Society of Canada, Vol. 1 (2d series), pages 17 to 100. This catalogue is very complete and full of interesting notes on distribution, etc. The number of species recorded is 284, to which is added a list of 67 land and fresh-water species, making the total number of British Columbian Mollusca at present known, 351.

BULLETINS OF AMERICAN PALEONTOLOGY, Vol. I, No. 3. NEOCENE MOLLUSCA OF TEXAS, OR FOSSILS FROM THE DEEP WELL AT GALVESTON. By G. D. Harris. In this Bulletin, 19 new species and 5 new varieties are described and figured, together with notes and figures of other species. Most of the specimens were obtained from a depth ranging from 2100 to 2920 feet. Up to this date no other marine Neocene fossils are known from the Gulf slope west of the Mississippi. The Bulletin contains 32 pages and 4 well executed plates.

MOLLUSQUES RECUEILLIS SUR LES COTES DE LA TUNESIE ET DE L'ALGERIE, par Ph. Dautzenberg (Mém. Soc. Zool. de France, 1895, p. 363). List, with descriptions of some new varieties of Mediterranean shells, and full information on the occurrence of *Meleagrina* in the Mediterranean Sea.

ON SOME PLIOCENE FRESH-WATER FOSSILS OF CALIFORNIA.

ON LAND AND FRESH-WATER SHELLS OF LOWER CALIFORNIA,  
No. 5.



## ON WEST MEXICAN LAND AND FRESH-WATER MOLLUSCA.

CATALOGUE OF MARINE SHELLS \* \* \* LOWER CALIFORNIA. By J. G. Cooper (Proc. Cal. Acad. Sci., IV, V).

In the first of these papers, *Margaritana subangulata* is described and figured as new, and the following species are figured: *Anodonta decurtata* Conr., *Ano. nuttalliana* var. *lignitica* Coop., *Limnæa contractostæ* Coop., *Planorbis pabloanus* Coop. and *Amnicola yatesiana* Coop.

In the second, land shells collected about 25 miles north of Cape St. Lucas are considered. *Bulimulus decipiens* being described as new. The generic name *Plicolumna* is proposed for *Rhodea* var. *ramentosa* Coop.; it is therefore equivalent to Dall's *Pseudorhordea* (Nautilus, Sept., 1895). The *Melaniella eiseniana* J. G. Coop. is referred to Strebel's genus *Pseudosubulina*, a group of *Glandinidæ*, on evidence of the dentition, which has been worked out by Dall.

In his paper on West Mexican Land Shells, Cooper announces the presence of the northern forms *Conulus fulvus*, *Hyalinia indentata*, *Limnæa columella*, *Sphærium partumeium* var. *truncatum*, from Tepec, south of Mazatlan, as well as other species belonging to the Mexican fauna.

The last paper enumerates marine shells collected mainly by Mr. W. E. Bryant, including some interesting forms, but no new species.

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 NOTES AND NEWS.
 

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PLOVER CAUGHT BY A PINNA—The article in the September number, "A Sora Caught by a Mussel," recalls a similar incident which I observed at New Pass, Sarasota Key, Fla. It was after a heavy storm, and there was a large number of *Pinna muricata* washed ashore. On my return to the boat after collecting some shells, I observed a Killdeer Plover that seemed very tame, but on a closer examination I found that it was caught by a *Pinna*. In this case it was caught by the bill. Its tongue was bleeding and the bill was indented by the sharp edges of the shell. It was with some difficulty that I removed the shell and let the Plover go rejoicing on its way.—*E. J. Post*.

MR. CHAS. LEROY WHEELER has been appointed Curator of the Lackawanna Institute of History and Science, Scranton, Pa. They desire to obtain more material in all branches of natural history,

and any assistance from older institutions or their members will be sincerely appreciated.

LEPIDOPLEURUS IN NEW ZEALAND.—Some months ago we received numerous specimens of a *Lepidopleurus* from Mr. H Suter, collected by him in Auckland Harbor. The species seemed to us to be a new one; but on requesting Mr. E. R. Sykes of London to compare with the types of certain forms in the British Museum, he found it to be identical with Reeve's *Chiton inquinatus*—a result wholly unexpected. The species was described from Tasmania, but South Australian specimens we have seen (collected by Mr. Bednall) agree in all respects with those found by Mr. Suter in New Zealand.—*H. A. P.*

THE EARLIEST PUBLICATION OF *Dorcasia* GRAY.—In examining the appendix of James Edward Alexander's Expedition of Discovery into the Interior of Africa (London, 1838), I find on p. 268 of volume II, a description by Gray of the genus *Dorcasia* and the species *D. alexandri*. This group has hitherto been dated from its publication in the Zeitschrift für Malakozologie, 1845. *Helicodonta sculpturata* Gray (= *Sculptaria sculpturata*) is also described, with (on p. 269) two alleged Bulimi, *B. hottentota* and *B. eulimoide*. All were collected by the expedition about the Great Fish River in Great Namaqualand. *B. eulimoide* apparently belongs to the *Stenogyra* group. This publication seems to have been unknown to Pfeiffer and other writers on African land snails.—*Pilsbry*.

ON THE NAMES OF CERTAIN SUBGENERA OF *Helicostyla*.—For some inscrutable reason, the writer, when considering these groups in the Manual of Conchology, neglected to ascertain the fact that the names *Prochilus* and *Eudoxus* of Albers have long been preoccupied. They may stand in future as follows :

*Dolichostyla* n. n. (= *Prochilus* Alb., 1860, not of Illiger, 1811, Mammalia, nor of Brullé, 1835, Orthoptera, nor of Cuvier, 1817, Pisces).

*Opalliostylia* n. n. (= *Eudoxus* Alb., 1850, not of Kirby, 1837, Coleoptera). The types and limits of the groups remain as stated in Man. Conch. (2), ix, pp. 229, 231.—*Pilsbry*.

SINISTRAL PATULA STRIGOSA.—My brother, L. M. Cockerell, took a sinistral *P. strigosa* at Norwood, Colorado. It was in my possession for a long while, but is now in the British Museum.

—*T. D. A. Cockerell*.

# THE NAUTILUS.

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## THE AULACOPODA: A PRIMARY DIVISION OF THE MONOTREIMATE LAND PULMONATA.

BY HENRY A. PILSBRY.

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If the foot of a living or properly preserved *Helix* or *Polygyra* be compared with that of a *Zonites*, *Pyramidula* (*Patula*) or *Ariolimax*, a conspicuous point of difference becomes apparent. In the latter three genera a groove or furrow may be seen running the whole length of the foot, a short distance above and parallel to its edges; while no such structure is present in the first named genera.

These furrows are the *pedal grooves*. They rise slightly at the tail, and meet above it; and at this point there is often a local deepening of the groove, and a greater development of the mucus-secreting cells lining it. This is the "caudal mucus pore," conspicuous in *Zonites*, *Ariolimax*, etc. There is vast variation in the degree of development of this pore,—from a barely visible widening of the united pedal grooves, to a deep slit or a triangular pit surmounted by a fleshy horn; and in some forms it is extremely difficult to say whether a pore exists or not, so nicely graduated are the stages of its development. Consequently, we find genera very closely allied in other characters, differing in this one. Such are *Pacilozonites*, without pore, *Gastrodonta* with it; *Ariolimax* with pore, *Prophysaon* without it; and many similar cases.<sup>1</sup> In spite of all the instances of this kind, the tail pore has been a great bugaboo to the systematists, while the *pedal grooves*, of which this pore is merely an

<sup>1</sup> Compare also, in this connection, Cockerell's remarks in *Journal of Malacology* (*The Conchologist*), Vol. ii, p. 118.

occasional extra development, have been very generally ignored.<sup>2</sup> Even "families" have been based on the presence or absence of the caudal pore; but it need hardly be said that such groups are violently unnatural.

It is now proposed to unite all of the groups having the pedal grooves developed, into a superfamily to be called AULACOPODA, equivalent in value to the AGNATHA (so-called, including *Selenitidæ*), or to the group composed of *Helicidæ*, *Bulimulidæ*, *Cylindrellidæ*, *Pupidæ* and *Achatinidæ*, which may be called HOLOPODA.

The American *Aulacopoda* may be tabulated as follows:

- I. Marginal teeth with narrow, lengthened basal-plates, either unicuspid and thorn-like, or bicuspid by elevation of outer on middle cusp.
  - a. Foot-margin wide; shell more or less spiral; ovotestis imbedded in liver, ZONITIDÆ.
  - aa. Foot-margin narrow; shell a flat internal plate, not spiral; ovotestis free from liver; slugs, LIMACIDÆ.
- II. Marginal teeth with short, wide and squarish basal-plates with one or several cusps, the outer cusp never elevated on middle cusp.
  - a. Shell spiral, usually wholly external, ENDODONTIDÆ
  - aa. Shell non-spiral, internal, more or less obsolete or wanting; slugs.
    - b. A vestigial shell present; mantle small, anterior, ARIONIDÆ.
    - bb. No shell; mantle covering the whole upper surface, PHILOMYCIDÆ.

Most of these families contain genera with, and genera without a caudal mucus pore. The *Limacidæ* and *Arionidæ* are degenerate so far as the shell is concerned, and have doubtless descended from the ancestral *Zonitidæ* and *Endodontidæ* respectively.

#### North American Genera.

ZONITIDÆ comprises *Omphalina*, *Vitrinizonites*, *Vitreæ*, *Gastrodonta*, *Pæcilozonites*, *Guppya*, *Conulus*, *Pristiloma* and *Vitrina*. See NAUTILUS, June, 1895, p. 18.

<sup>2</sup> Exceptions need not be noted here; but I cannot refrain from mentioning that the importance of the pedal grooves has been fully recognized by a brilliant Australian malacologist in dealing with the *Charopa* group.

LIMACIDÆ, *Limax* only.

ENDODONTIDÆ, *Pyramidula* (*alternata*, *perspectiva*, etc.), *Punctum*.

ARIONIDÆ, *Arion* (imported), *Ariolimax*, *Prophysaon*, *Hemphilia* and their immediate allies.

PHILOMYCIDÆ, *Philomyces* (*Tebennophorus*), *Pallifera*.

The systematic position of the *Selenitidæ*, with a revised catalogue of the species and varieties, will be considered in a future article.

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#### ON SOME NEW SPECIES OF SCALA.

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BY W. H. DALL.

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*Scala* (*Sthenorhytis*) *Mazyckii* Dall.

Shell solid, stout, rapidly enlarging, with (on the last whorl six) stout rather carinate varices which increase in size successively, the last being very heavy, its anterior face sloping backward from the nearly circular aperture; outer margin of the varix even, rounded, slightly winged on the axial side; whorls smooth except for a single faint revolving rib encircling the base at about the level of the top of the aperture of the succeeding whorl; specimen decollate, probably with four or five whorls when complete, the spire probably short and acute. Height 31.5, diameter 28 mm. in the decollate shell.

Miocene, Cainhoy, South Carolina, W. G. Mazyck.

This fine species differs from *S. pernobilis*, *S. Stearnsii* and others of the group by its small number of distant rapidly enlarging varices. The type is in the collection of Mr. W. G. Mazyck, of Charleston, who collected it, and to whom it is respectfully dedicated.

*Scala ranellina* Dall.

Shell of five or more whorls, rather rapidly increasing, spirally ribbed with ten or twelve rather feeble flattish ridges which are obsolete or absent above the shoulder; basal area projecting, strongly marked, overrun by the varices which are angulated and prominent over the keel; varices of two sorts, one set large, thin, wide set at the half whorl, continuous up the spire on each side like the varices of *Ranella pulchra*, their profiles rounded, the aperture circular,



the axial edge narrower, not perceptibly angular; the other varices are much smaller and less prominent, about seven to twelve on each half whorl between the larger series, sharp edged and subequal. Height of (decollate) shell 33, max. diameter 23 mm.

Zeuglodon bed of the Jacksonian, near Cocoa P. O., Alabama, Burns and Schuchert.

This fine species is related to *S. octolineata* Conrad, which is found in the same horizon, but has the large varices less conspicuous and irregularly distributed. *S. octolineata* is also a smaller, more cylindrical shell. The present species is readily recognized by its peculiar flattened aspect recalling *Ranella*.

*Scala Mitchelli* Dall.

Shell rather large for the genus, thin, with rounded rather compact whorls, well marked suture and elongated spire; the color is yellowish white, the basal area and a band somewhat above the periphery dark reddish brown; surface with numerous low spiral ridges with wider interspaces covering the whorl, crossed by about 18 distant rather irregular low varical threads, slightly angulated just in front of the suture; the young whorls show a tendency to peripheral angulation; basal area well marked, bordered by a low keel, its spiral sculpture feeble but the varical ridges unchanged; axis imperforate; aperture higher than wide, the peristome interrupted over the body, the pillar lip strongly reflected, the outer lip narrow, inconspicuously reflexed; shell decollate but showing eight whorls, and originally supplied with three or four more at least; height of (decollate) shell 36, max. diameter 14, apical diameter at the decollation 1.5 mm.

Found on the beach of Matagorda Island on the Texas coast by Hon. J. G. Mitchell, to whom it is respectfully dedicated; the type is in his collection. This is the finest recent species from shallow water yet reported from the Gulf coast, and needs no comparison with any other, as no American or exotic species has been figured which is at all closely related to it. In a general way it is somewhat like *S. acuminata* Sby. from Japan.

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**SCULPTURE OF THE APICAL WHORLS, A NEW CHARACTER FOR DISTINGUISHING GROUPS OF BULIMULI.**

BY HENRY A. PILSBRY.

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The classification of the American Bulimoid snails has been an extremely intricate problem, but much has been done by Binney,

Strebel and Pfeffer, von Martens and Crosse and Fischer, toward a better understanding of it.

With all of this good work, there has remained a vast amount of confusion. Thus authors almost universally separate *Orthalicus* as a family distinct from *Bulimulidæ*; but, in reality, it constitutes merely a generic group of that family. No anatomical or shell character can be shown, of greater than generic value, between *Orthalicus* and *Drymæus*.

Again, the genus "*Bulimus*" of all authors contains forms belonging to two families—*Helicidæ* and *Bulimulidæ*.

The forms generally grouped under the name *Bulimulus* have been shown by von Martens to fall into two groups, based on the character of the jaw: *Bulimulus* and *Otostomus*. Crosse and Fischer have made the same division, calling the two groups *Orthotomium* and *Goniognathmus*. These correspond to the two Martensian groups, the first having a vertically plaited jaw, the second has the plates angularly converging toward the middle.

Binney has shown that there exist two styles of teeth, and these correspond to the two forms of jaw, and constitute a far more useful character, as the jaw forms intergrade pretty completely.

It has not hitherto been noticed that there are certain characters in the shells, and especially in the sculpture of the apices, by which the two groups, or genera, may be distinguished.<sup>1</sup>

In the following synopsis, the leading sections are enumerated, arranged as they fall into groups according to the sculpture of the apices. Of course it is not proposed to base a classification on this single character.

Certain rectifications and substitutions demanded by the law of priority, and by the proper restriction of the subgenera to species allied to their *types*, have been made.

#### Genus *Bulimulus* Leach, 1814.

The species of *Bulimulus* are *terrestrial* snails, æstivating or hibernating in the ground, crawling on the ground or on plants in damp weather. There are three distinct types of apical sculpture, as follows:

<sup>1</sup>The only especial notices of the apical sculpture of Bulimuli which I have noticed are by the writer, *Nautilus*, viii, 1894, p. 35, and by Dall, *Proc. U. S. Nat. Mus.*, xvi, 1893. Martens also figures a few apices on the last plates of the "*Biologia*."

A.—Apex irregularly wrinkled or wrinkles dislocated, broken into granules. Subgenus *BULIMULUS s. str.*

All the species are South American and West Indian.

*Bulimulus s. str.*, type *B. exilis* = *guadeloupensis*.

*Leptomerus* Alb., type *B. limnæoides*.

*Rhinus* Alb., type *B. heterotrichus*.

*Plectostylus* Beck, type *B. peruvianus*.

*Scutalus* Beck, type *B. proteus*.

*Nesiotes* Alb., type *B. nux*.

B.—Apex with vertical regular riblets. Subgenus *ORTHOTOMIUM*.  
Species of Lower California and Northern Mexico, extending into U. S.

*Sonorina* Pils., type *B. spirifer* (*Leptobyrsus* C. & F., 1875, not *Leptobyrsa* Stal., 1873).

*Orthotomium* C. & F., type *B. sufflatus* (*Rabdota* part, Alb., not *Rabdota* Dej., 1833; *Globulinus* C. & F., 1875, not *Globulina* Orb., 1826. *Thaumastus* Auct. not Alb.)

*Plicolumna* Coop., type *B. ramentosa*.

C.—Apex smooth, rather mamillar. Subgenus *BOSTRYX*.

Species South American, mainly of Ecuador, Peru and Chili.

*Lissoacme* Pils., type *B. erythrostomus*.

*Ataxus* Alb., type *B. umbilicaris*.

*Bostryx* Trosch., type *B. solutus*.

*Peronæus* Alb., type *B. pupiformis*.

*Geopyrgus* Pils., type *B. turritus* (*Pyrgus* Alb. not Hübner).

The only group of *Bulimulus* extending into the United States is *Orthotomium*. This includes *schiedeanus*, *dealbatus*, *baileyi*, *montezuma*, *sufflatus*, *pilula*, *alternatus* and their allies. It is very characteristic of the Sonoran life-area, as originally limited by Merriam.

It is somewhat remarkable that in each of the three subgenera of *Bulimulus*, narrow, pupiform species have been independently developed.

Genus *Drymæus* Alb., 1850.

(= *Goniognathmus* Cr. & Fisch.; *Otostomus* Martens).

Arboreal snails, never found on the ground when living. Apical sculpture an extremely fine grating formed of vertical and spiral striæ intersecting at right angles. Radula peculiar.

A.—Lip expanded or flaring.

*Zaplagius* Pils., type *D. navicula* (= *Otostomus* Martens not Beck & Gray; *Navicula* Spix not Blainv.).

*Semiclausaria* Pfr., type *D. semiclausus*.

*Drymæus* s. str., types *D. xanthostoma* and *hygrohylæus* Orb.

*Neopetræus* Mts., type *D. altoperuvianus*.

B.—Lip simple, arcuate.

*Mesembrinus* Alb., type *D. virgulatus* Fér.

*Eudiptus* Alb., type *D. pseudosuccineus*.

C.—Apical sculpture not distinctly grated.

*Leiostracus* Alb., type *D. vittatus* (not *Liostraca* Burm.).

The genus *Drymæus* is represented within our limits by *D. serperastrus* in Texas, belonging to the restricted section *Drymæus*, and in Florida *D. dormani* and *marielinus* represent a section perhaps requiring a new name. *D. multilineatus* belongs to *Mesembrinus*.

A certain number of Brazilian and Venezuelan forms, of which *D. vittatus*, the type of Albers' group *Leiostracus*, is an example, have superficial vermiculate wrinkles on the upper portion, excessively fine, often indistinct, spirals on the lower portion of the second apical whorl. This is quite different from the usual evenly grated sculpture. It is often very indistinct.

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#### THE SIZE OF MUSSELS.

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BY W. S. STRODE, M. D., LEWISTOWN, ILL.

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Some time since, in conversation with an aged naturalist, I informed him that I had found a valve of *Unio alatus* Say, in Spoon River, Ill., that was nine inches long. He expressed surprise and said that he never saw a mussel of any kind over six inches in length, and, old as he was, he would walk five miles and go into water up to his neck to get a specimen above that size. Feeling a little taken back by his assertion, I determined to go home and make some measurements of my largest species of Spoon River Uniones. I was certain that I had several varieties that were above six inches in length. The following is the result of my measurements:

*U. anodontoides* Lea, length 7 in., circumference 9 in.

*U. ligamentinus* Lam., length 7 in., circumference 10½ in.

- U. multiplicatus* Lea, length  $8\frac{1}{2}$  in., circumference  $12\frac{1}{2}$  in.  
*U. rectus* Lam., length 7 in., circumference 8 in.  
*U. tuberculatus* Barnes, length  $7\frac{1}{2}$  in., circumference  $9\frac{3}{4}$  in.  
*U. plicatus* Les., length  $6\frac{3}{4}$  in., circumference  $9\frac{1}{2}$  in.  
*U. gracilis* Bar., length 7 in., circumference 11 in.  
*Ano. grandis* Say, length 8 in., circumference 12 in.  
*Marg. rugosa* Bar., length 7 in., circumference 8 in.  
*Marg. complanata* Bar., length  $8\frac{1}{2}$  in., circumference 13 in.  
 These were all from Spoon River, Ill.  
*Ano. stewartiana* Lea, Ripley's Lake, Tex.,  $7\frac{1}{4}$  x 9.  
*U. rotundatus* Lam., Ask Bayou, Tex.,  $5\frac{1}{4}$  x  $8\frac{1}{2}$ .

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SMALL LAND MOLLUSCA FROM NEW MEXICO.

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BY DR. V. STERKI.

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A few days ago, Mr. Theo. D. A. Cockerell kindly forwarded me some small and minute shells of Mollusca collected in drift on the Rio Grande, at S. Marcial, N. M., with the request to publish a list of them with notes. The species were the following:

*Hyalinia minuscula* Binn.

*Helicodiscus lineatus* Say. One example.

*Vallonia costata* Mull. One example; this find is of peculiar interest.

*Vallonia cyclophorella* Anc. Rather small form; a few examples.

*Pupa fallax* Say.

*Pupa arizonensis* (Gabb.) W. G. Binney.

*Pupa hordeacea* Gabb. Rather small; variable in size and color.

*Pupa procera* Gould. One example, light colored.

*Pupa hordeacella* Pilsb. Light colored to glassy transparent.

*Pupa pilsbryana* Sterki. One example; slightly more striated than those previously seen.

*Pupa blandi* Morse. A few; light color to colorless.

*Vertigo ovata* Say. Two specimens, rather typical.

Besides these, there were a few examples of *Limmæa* and *Planorbis*.

New Philadelphia, Ohio, December, 1895.



## THE GEOGRAPHIC DISTRIBUTION OF PLANORBIS UMBILICATELLUS.

BY E. G. VANATTA.

This species was first described by Mr. J. W. Taylor in the Journal of Conchology, 1883-85, Vol. IV, p. 351, under the name *P. umbilicatus*; but since Müller had previously described a *P. umbilicatus* in 1774, Cockerell renamed Taylor's shell *P. umbilicatellus* in the Conchologist's Exchange, November, 1887, p. 68.

It is now known from the following localities:

Manitoba:	Brandon and Birtle,	R. M. Christy! Original locality.
Minnesota:	Dallas Lake, Wright Co.	H. E. Sargent! Coll. A. N. S. P.
	St. Michael's,	H. E. Sargent! Coll. A. N. S. P.
Iowa:	Near Davenport,	H. A. Pilsbry! Coll. A. N. S. P.
Montana:	Mingusville,	H. Squyer! Naut. VIII, p. 65.
Colorado:	Davidson's Ranch, Boulder Co.,	J. D. Putnam! Coll. A. N. S. P.

From these localities it seems to have a wide range through the northwestern States, the extreme points being Birtle, Manitoba; Mingusville, Montana; Davenport, Iowa, and Boulder Co., Colorado.

The shell is grayish-white, with a flat spire and a deep umbilicus. It may be easily distinguished from *P. parvus* Say by its deeper and narrower umbilicus and fewer whorls, and from *P. deflectus* Say by the flat spire, lack of blunt keel at periphery and the heart-shape of the aperture; *deflectus* having a rounded aperture.

No doubt this species will be found well represented in the collections of many western conchologists, unidentified or under the name "*deflectus*."

## TRANSACTIONS OF THE ISAAC LEA CHAPTER.

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

The annual election for officers occurs on the last Wednesday in December, and as Christmas for 1895 occurred on the same day, our election was postponed for one day. All the members of our Chapter residing in California were invited to be present at the home of the General Secretary on Thursday, December 26, to elect officers, as provided for in Article V of our Constitution. As our President, Professor Keep, lives five hundred miles from Los Angeles, he was

not able to be present, much to the regret of those present on that day. The Honorable Delos Arnold presided. A letter from the President was read, also one from Dr. M. L. Leach, one of the founders of our Chapter. It was hoped that Dr. R. E. C. Stearns, of the National Museum who is at present in Los Angeles, could meet with us, but his health would not permit him to be present. Mr. Arnold exhibited a fine *Pecten (Janira) floridus* Hinds from Santa Catalina Island, also, *Zonites milium* Morse from his own garden. They are the first reported from Los Angeles County.

The Secretary canvassed the votes sent in by mail, as well as those cast by the attending members. The result was as follows:

For President, Professor Josiah Keep, Mills College, California.

For General Secretary, Mrs. M. Burton Williamson, University, Los Angeles Co., California.

Before this number of THE NAUTILUS shall have been received, the volume of Transactions will be on its annual round to the members of our Chapter. Excerpts will, however, be published monthly in THE NAUTILUS, our Chapter organ.

Rules for the identification of shells were published in THE NAUTILUS some years ago, but many of the members of our Chapter may not have seen them. The following are the rules in substance: 1st. The number of species in one sending is limited to 12. 2d. The sender is to pay all expenses of transportation, and the specimens are to become the property of the Academy of Natural Sciences of Philadelphia. 3d. Each species must be numbered, so that identification may be given by number.

These same rules apply when identification is made elsewhere than at the Academy, only in this case they become the property of the one who names them. In sending shells for identification to the Secretaries of the various Sections, please bear these rules in mind. Label two sets of shells with the same numbers, retaining the duplicate set for reference when those sent for determination are reported to you.

We hope to have the best volume of transactions this year that the Chapter has compiled. A number of fine manuscripts are promised. The Chapter is in excellent condition as a working Chapter. This is the case because each member is in earnest, and because each one feels an interest in the welfare of the Chapter.

## DREDGING IN LONG ISLAND SOUND.

[Report of Mr. A. H. Gardner. From the Transactions of Isaac Lea Conchological Chapter of the Agassiz Association for 1893.]

Of the species of bivalve mollusca given as dredged in Long Island Sound, all are common to the waters of New York Bay with the exception of *Pecten irradians* and *Modiola modiolus*. *Nucula proxima* has so far only been found by the writer in the curve of Sandy Hook Bay, the remaining species are more abundant in the bay than in the sound.

It must be remembered that the portion of the sound dredged in only constitutes a small section of it contiguous to New York City.

The *Odostomia* given as *bisuturalis* and *trifida* are probably one and the same thing; the distinguishing character being insignificant. The specimens dredged in Lloyd's Harbor are rather smaller than others, and apparently have a few more revolving lines. The calmer waters of the sound seem to favor the growth of many small species of univalve shells, uncommon in New York Bay, where their place is probably supplied by the larger species of *Natica* and *Fulgur*, which species are taken in almost every haul of the dredge in the bay, and are not found commonly in the sound.

List of localities and Mollusca dredged in Long Island Sound, July 15 to 22.

Hempstead Harbor, 2 to 4 fathoms, mud:

*Eupleura caudata* Say, 3; *Pandora trilineata* Say, 2; *Mulinia lateralis* Say, 9; *Arca transversa* Say, 1; *Nucula proxima* Say, 12; *Yoldia limatula* Say 5.

Matinicock Point, 3 fathoms, mud:

*Astyris lunata* Say, 3; *Tritia trivittata* Say, 1; *Pandora trilineata*, 3; *Nucula proxima*, 34.

Plum Point, Oyster Bay Harbor, 3 to 4 fathoms; oyster beds:

*Tornatina canaliculata* Say 2; *Astyris lunata*, 8; *Urosalpinx cinereus* Say, 4; *Fulgur canaliculatum* Say (young), *Eupleura caudata* 7; *Solen americana* Gould (young), *Pandora trilineata*, 4; *Arca transversa*, 7; *Nucula proxima* 21; *Pecten irradians*, 1.

Lloyd's Harbor, 2 fathoms; mud and eel grass:

*Tornatina canaliculata*, 35; *Bittium nigrum*, 29; *Odostomia trifida*, 36; *Turbonilla elegans*, 1; *Anachis avara* Say, 7; *Astyris lunata*, abundant; *Nassa obsoleta*, abundant; *N. vibex*, 2; *Urosalpinx cinereus* 1; *Eupleura caudata*, 15; *Pandora trilineata*, 1; *Mulinia lateralis*, 12; *Lyonsia hyalinia* Say, 2; *Tellina tenera*, 1; *Arca transversa*, 3; *Nucula proxima*, 34; *Yoldia limatula*, 1; *Pecten irradians*, 2.

Huntington Harbor ; shore :

*Littorinella minuta*, 2; *Litorina rudis*, abundant; *Odostomia bisuturalis*, 46.

Lloyd's Point, 5 fathoms, sand :

*Lunatia triseriata*, 1; *Tritia trivittata*, 2 (young); *Pandora trilineata*, 8; *Mulinia lateralis*, 4; *Arca transversa* (young), *Nucula proxima*, 56; *Yoldia limatula*, 5.

Portchester Harbor, shore :

*Arca pexata*, 1; *Modiolus modiolus*, 1; *Crepidula convexa*, 2; *Littorinella minuta*, 1; *Odostomia bisuturalis*, abundant; *Urosalpinx cinereus*, abundant.

#### NOTES AND NEWS.

TROCHOMORPHA FUSCATA Pease. This species was listed in Man. Conch. (2), IX, but, so far as I know, no description has appeared. It is allied to *nigritella* and *contigua*, but the umbilicus is smaller than either (one-eleventh to one-twelfth diam. of base); spire slightly-convex conic, the apex much more pointed than in *contigua*; base flattened as in *contigua*. Alt.  $8\frac{1}{2}$ , diam.  $11\frac{1}{2}$  mm. Color uniform blackish-brown, or clear honey-yellow. It is from Ponape, or Ascension Island, near the Caroline group.

CALIFORNIA SLUGS.—Mr. Edw. M. Ehrhorn has lately sent me some slugs from California, which may as well be put on record. A box from Mountain View contained a number of *Amalia gagates* (syn. *hewstoni*) and one *Agriolimax campestris*, both, in my opinion, native species. A lot from San Jose, Sta. Clara Co., consisted wholly of introduced species, namely, *Agriolimax agrestis*, heavily mottled forms, and *Limax maximus*, young and old. The three adult *L. maximus* in the box were all different, one being of the form *marmoratus* Ckll., one *moquini* Ckll., and the other an ill-defined form nearest to *czernaevii* Kal. These forms are like those which occur commonly in the southeast of England.

—T. D. A. COCKERELL.

SHELLS OF THUNDERHEAD MT., N. C.—I went to Thunderhead again last June, and I found two more specimens of *Gastrodonta patuloides* Pils., and more of the other new forms I had taken the year before [see NAUTILUS, p. 14]. I found, this time, what I think is a banded form of *Mesodon andrewsi* W. G. B. I have never seen this variety before. A few of the long-looked for *Mes. christyi* were found also, but they are very rare.

—MRS. GEO. ANDREWS, *in letter*.



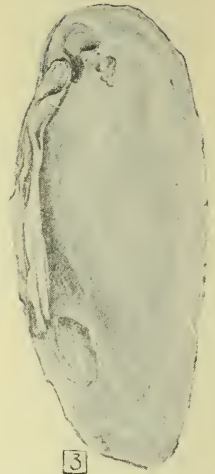




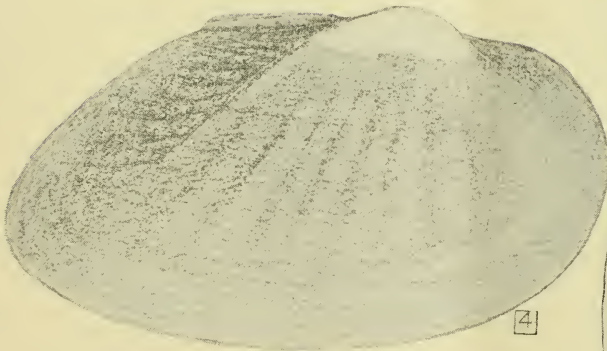
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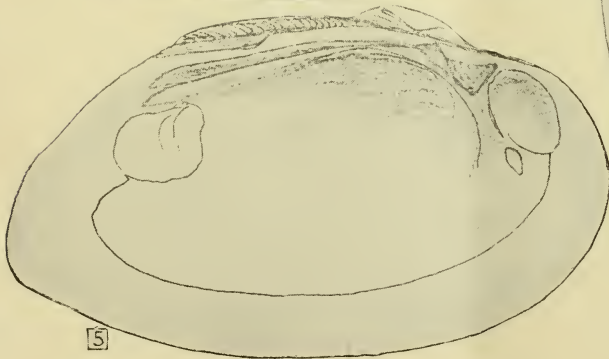
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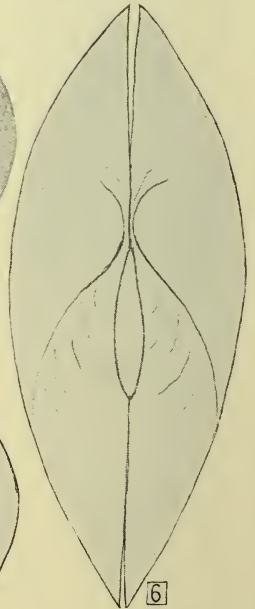
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# THE NAUTILUS.

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## NEW FLORIDA UNIOS.

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BY BERLIN H. WRIGHT, PENN YAN, N. Y.

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*Unio Hartwrightii* *sp. nov.* Pl. II, figs. 4, 5, 6.

Shell smooth, elliptical, inflated, pointed or subbiangulated posteriorly, well rounded anteriorly, inequilateral; rather thin and hard, slightly thicker in front; beaks very prominent, with two or three obscure wide undulations in one series; epidermis dark chestnut-brown with faint green rays, more or less disposed in fascicles over the entire disk; growth lines barely distinct; umbonial slope raised into an abrupt high ridge on the upper half, and rounded and flattened below; dorsal area wide, carinate, nearly cordate and usually with numerous heavy wrinkles or sharp folds; cardinal teeth double in the left and simple in the right valve, divergent, crested, rather short and subcompressed; lateral teeth long, striate and thin; nacre pinkish-purple and in concentric zones towards the margins, highly iridescent, and especially so on the posterior half; cavity of the umbones rather deep; posterior cicatrices confluent, anterior ones distinct, and the dorsal ones few and in a short line under the hinge plate.

Hab., Lake Beresford, Florida.

Types in the collection of the author, cabinet of Mrs. Geo. Andrews, Knoxville, Tenn. and Museum Acad. Nat. Sciences, Phila.

REMARKS.—Some fifteen specimens of this shell were taken in 1887, showing quite a disposition to variability, the sharp umbonial angle being more or less depressed, and the wrinkles less numerous and prominent. It does not group well with any species, but has some characters which, perhaps, suggest an affinity with *U. Anthonyi* Lea, under which name it has been sparingly distributed, but differs in being more rounded behind, rayed, in the color of epidermis, location of point of greatest diameter, prominence of umbones, elevation of umbonial ridge, and in the greater cavity of the shell and beak.

The specimen in the cabinet of Mrs. Geo. Andrews is a magnificent one, and was collected in Florida by the late Mr. F. Rugel. I dedicate this rare and beautiful species to my father, Dr. Samuel Hart Wright, A. M., Ph. D., who shared the delights of my Florida collecting tour, and whose counsel in the study of the Book of Nature, has always been an inspiration.

Another Florida *Unio* was given this name by the late Dr. Wesley Newcomb, but it was never published, its specific value being doubted.

*Unio Oscari* B. H. Wright. Pl. II, figs. 1, 2, 3.

The original description of this species may be found in NAUTILUS March, 1892, p. 124.

Habitat: A creek from Lake Osceola, at Winter Park, Florida.

Collections of G. W. and O. B. Webster, B. H. and Dr. S. H. Wright, Museum Academy Natural Sciences, Phila., and National Museum.

Over 100 specimens of all ages of this well marked and beautiful species were taken by the Messrs. Webster and submitted for examination. They are remarkably uniform in character and most nearly related to *U. aheneus* Lea, from which it differs in having a smoother and nearly *polished* epidermis, cavity of the shell very much deeper and the lateral teeth shorter, heavier and wider. This shell has been needlessly confounded with *U. Hazelhurstianus* Lea of the Satilla River, Ga., from which it differs in being more roughly furrowed (sides deeply grooved near the umbonial ridge with *concentric rounded furrows*) more inflated, thinner, more pointed behind and more sharply angled on the posterior umbonial angle and in having a reddish-brown epidermis instead of black, and the teeth are much slenderer.

This species is here figured for the first time.

## A NEW VARIETY OF LIMNÆA.

BY L. H. STRENG.

*abrusa**Limnæa desidiosa* var. *De Campi*.

Shell oblong, subconic, pale horn color, subdiaphanous, very finely striated. Whorls about 5, rapidly enlarging, very convex and flattened; suture very deeply impressed, forming a considerable shoulder. Aperture about equal in length to the spire, not dilated, elliptical; subumbilicate. Labium but a small portion appressed to the body whorl, and the callus very light; sinus of the fold not very prominent. Length 5 mm., breadth  $2\frac{1}{2}$  mm.

Inhabits Brook's Lake, Newaygo Co., Mich.



Remarks: The shell is rather slender in appearance, its main features being the rapid enlarging of the whorls and the shoulder. It is most closely allied to *L. desidiosa* Say, except in the prominent shoulder, and it is a great deal smaller shell. It was discovered by Dr. De Camp several years ago, and has lain in our collection ever since. I name it after my

friend Dr. De Camp, who has done so much for the furtherance of our knowledge of the Molluscan fauna of Michigan, especially the western part of the State.

Nov. 22, 1895.

## DESCRIPTION OF A NEW GASTRODONTA.

BY H. A. PILSBRY.

*Gastrodonta collisella* n. sp.

Shell rather solid, minutely perforate, above elevated and somewhat dome-shaped, below rather flattened, the periphery rounded. Surface glossy, especially beneath, the base being radially finely wrinkled, and with faint traces of spiral striation in the slightly excavated umbilical region; upper surface sculptured with irregular, arcuate wrinkle-riblets in the direction of growth-lines, and stronger toward the sutures. Whorls  $7\frac{1}{2}$ , slightly convex, separated by very shallow sutures, which, under the lens, seemed margined below by the partial transparency of the shell.

Aperture mainly basal, lunate, with a lining of white callus a short distance within, heavier and bearing a small tooth on the columellar slope, and a rather short white lamella toward the outer part of the base. Lip-edge thin and acute, suddenly expanded at the columellar insertion, half covering the umbilical perforation.

Alt. 7, diam.  $8\frac{1}{2}$  mm.

Alt.  $5\frac{2}{3}$ , diam.  $8\frac{1}{2}$  mm.

Described from thirty-four specimens, from Knoxville, Tenn.; Citico, Monroe Co., Tenn. (A. G. Wetherby); Knox Co., Tenn. (Mrs. Geo. Andrews), and Nashville, Tenn. (G. A. Lathrop).

Variation is observed in the height of spire and the degree of development and length of the basal lamella. It is most nearly allied to *G. ligera* and *G. cerinoidea*, being smaller than the former, with different aperture armature, and larger, duller and more elevated than the latter.

My attention was first called to this form by Mr. A. G. Wetherby, although specimens from Nashville had long been in the collection of the Academy of Natural Sciences. It seems to be a fairly common species, probably confined to the "Cumberland Subregion" of Binney.

In describing this form, it is a pleasure to add that so competent an observer as Mr. Wetherby agrees with me that it is a new species; for I suppose no living naturalist is more experienced than he in dealing with the shells of the beautiful mountain region it inhabits.

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#### NEW NORTH AMERICAN PISIDIA.

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BY DR. V. STERKI.

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*Pis. trapezoideum* n. sp.

Mussel of moderate size, rather much inflated, irregularly quadrangular in outline; beaks slightly posterior, rather large and prominent, more or less distinctly flattened on top; superior margin little curved, with the scutum and scutellum well developed and marked by distinct angles where joining the posterior and anterior margins; the former truncated perpendicularly, and with an obtuse, rounded angle where passing into the moderately curved and comparatively long inferior margin; antero-superior margin little curved or straight and meeting the inferior in a well marked somewhat



rounded angle situated rather inferior. Surface with irregular, rather fine striæ, slightly shining; color of epiconch pale or grayish horn; shell moderately thick; nacre whitish-glassy; hinge rather stout; cardinal teeth lamellar, the right moderately curved, not reaching the inferior edge of the hinge plate, with a rather deep groove below; the left anterior cardinal tooth moderately or rather strongly curved, the posterior oblique, moderately curved, with a deep groove between them; lateral teeth rather strong, finely crenulated or rugulose, those of the left valve strongly, those of the right valve slightly projecting over the valve edge, and the latter also into the cavity of the mussel; ligament strong.

Size: long. 4·2-4·7, alt. 2·5-3·0, diam. 2·5-3 mill.

Habitat. The species has a wide geographical distribution; Michigan, many places in the Upper and Lower Peninsula; southern Minnesota; Pedan River, Canada; Philadelphia, Pa.; Adamsville, N. J.; Comal Co., Texas.

It is surprising that such a well characterized *Pisidium* has not been noticed before this. Careful comparison with the earlier descriptions of *T. Prime* shows that it cannot be identical with any of those species.

*Pis. tropezoideum* is somewhat variable in size and shape; the angles at the scutum and scutellum are more rounded in some forms, and so the superior margin is more curved, the beaks are more or less flattened on top, sometimes almost imperceptibly.

New Philadelphia, Ohio, February, 1896.

(*To be Continued.*)

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ANNOTATED LIST OF THE MOLLUSCA FOUND IN THE VICINITY OF  
CLEARWATER, WRIGHT CO., MINNESOTA.

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BY H. E. SARGENT, WOODVILLE, ALA.

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*Part Second—Aquatic Species.*

In searching for aquatic specimens a ten quart tin pail and a wire gauze dip net were the implements made use of. Sediment and specimens were dipped into the pail and washed by repeated stirring and decantation. By this means the most minute specimens were retained for future sifting and sorting.

The stations searched have been fully described and located in the first part of this article. They will be hereafter referred to by letter as follows :

Station B. Belle Lake.

Station C. Clearwater Lake.

Station D. Mississippi River at Bellevue, Ia.

Station F. Clearwater River.

Station H. Heath Lake.

Station M. Mississippi River at Clearwater, Minn.

Station R. Crow River, Rockford, Minn.

Station S. A dry meadow at St. Michaels, Minn.

Station T. Among damp moss in tamarack swamp at Clearwater, Minn.

39. *Pleurocera subulare* Lea. M.

40. *Bythinella obtusa* Lea. M.

41. *Amnicola lustrica* Pils. B, C, H, in all cases feeding upon weeds.

42. *Amnicola limosa* Say. B, C, F, R, M, H.

43. *Amnicola limosa* Say var. *porata* Say. M.

44. *Amnicola cincinnatiensis* Anth. R.

45. *Valvata tricarinata* Say. B, F, M, H, R, T, C.

46. *Valvata tricarinata* Say var. *bicarinata* Lea. B, F, H, R, T, C.

47. *Valvata tricarinata* Say var. *simplex* Gld. C.

Notes.—Typical specimens occurred alone in the Mississippi River only. Of 132 specimens taken from there, none show any tendency toward the varieties. The carinæ are very prominent; specimens mostly large and dark colored. At all the other stations, specimens were much smaller, light in color and only in exceptional cases having three distinct carinæ. In most cases the middle one is entirely wanting. The few specimens taken at Clearwater Lake are about equally divided among the three forms.

48. *Lyogyrus brownei* H. F. Carpenter. B, F, in muddy bottom.

49. *Campeloma rufum* Hald. F, M. 3 sinistral specimens of this species were taken.

50. *Campeloma subsolidum* Anth. D. Adult specimens are curiously depressed, closely resembling *Vivipara subpurpurea* Say with which it is found.

51. *Vivipara subpurpurea* Say. D.

52. *Vivipara intertexta* Say. D.

53. *Limnæa megasoma* Say. The only station for this species in this vicinity, so far as known, is a small lily-pond in the bed of the Mississippi River just below St. Cloud. It was discovered here a few years ago by Prof. Hubbard of the St. Cloud State Normal School. The snails are to be seen floating on the surface or feeding upon the lily-leaves. They are shy, sinking almost instantly when alarmed.

54. *Limnæa stagnalis* L. C, H, B, feeding upon weeds. R, found putrifying at the roots of grass in slough near the river.

55. *Limnæa emarginata* Say. C. Two quite distinct varieties of texture were taken. One corneous, translucent and rather thin in both young and adult specimens; the other nearly white, opaque and heavier, with much thickened margin. Both forms were plentiful and near together. One was found on the pebbles, the other on the sandy bottom.

56. *Limnæa gracilis* Jay. After finding dead specimens of this beautiful species in Belle Lake, I was told by Prof. Hubbard that he took it alive in Heath Lake the previous fall upon the under side of lily-leaves. Later a thorough search was made for them in the same original locality, but only two dead specimens were found. Query—where do they keep themselves in summer?

57. *Limnæa reflexa* Say. C, B, S.

58. *Limnæa reflexa zebra* Tryon. B.

59. *Limnæa columella* Say. R.

60. *Limnæa catascopium* Say. M.

61. *Limnæa caperata* Say. S.

62. *Limnæa palustris* Mull. R, on slough grass; D.

63. *Limnæa humilis* Say. C, B, M, F.

64. *Limnæa desidiosa* Say. C, B, M, F.

65. *Aplexa hypnorum* L. R, T, S.

66. *Physa gyrina* Say. D, F, B, M.

67. *Physa integra* Hald. St. Cloud, Minn.; D.

68. *Physa oleacea* Tryon. D.

69. *Physa vinosa* Gld. F.

70. *Planorbis campanulatus* Say. Abundant everywhere.

71. *Planorbis bicarinatus* Say. Abundant everywhere.

72. *Planorbis trivolvis* Say. Abundant everywhere.

73. *Planorbis exacutus* Say. C, B, R, F, H.

74. *Planorbis hirsutus* Gld. C, B, T, F, H.

75. *Planorbis umbilicatellus* Ckll. B.

76. *Planorbis parvus* Say. B, T, F, D.  
 77. *Segmentina armigera* Say. Everywhere abundant.  
 78. *Ancylus* (sp.?). M, D.  
 79. *Sphaerium sulcatum* Lam. B, F, H. Mississippi River at St. Cloud. Specimens extra large and fine.  
 80. *Sphaerium striatinum* Lam. R, F, D, M.  
 81. *Sphaerium transversum* Say. D.  
 82. *Sphaerium truncatum* Linsley. R, F, S, B, F.  
 83. *Sphaerium rhomboideum* Say. B, H. Mississippi River at St. Cloud.  
 84. *Sphaerium solidulum* Prime. M, F.  
 85. *Sphaerium Jayanum* Prime. Marshes near Clearwater.  
 86. *Sphaerium securis* Prime. H.  
 87. *Pisidium virginicum* Gmel. F.  
 88. *Pisidium abditum* Hald. F, H, B, T, C. Spring at Bellevue, Iowa.  
 89. *Pisidium Walkeri* Sterki. F, M.  
 90. *Pisidium politum* Sterki. F, B.  
 91. *Pisidium variabile* Prime. F, C, H.  
 92. *Pisidium compressum* Prime. F, M, C.  
 93. *Pisidium ferrugineum* Prime. F, M, H.  
 94. *Pisidium rotundatum* Prime. B, T.  
 95. *Unio occidens* Lea. M.  
 96. *Unio rectus* Lam. C, M, F. Red River of the North, Fargo, N. D.  
 97. *Unio luteolus* Lam. C.  
 98. *Unio ligamentinus* Lam. M.  
 99. *Anodonta footiana* Lea.

The *Pisidia* enumerated above are certified to by Dr. Sterki; the *Sphaerium* by Mr. E. W. Roper; and such other species as there was any doubt concerning by Prof. H. A. Pilsbry.

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#### TRANSACTIONS OF THE ISAAC LEA CHAPTER.

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

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Owing to the delay of some of our reports the volume of Transactions was not started promptly on its annual round, but we hope our members will make allowance for the delay. The volume will

be found interesting and suggestive. Extracts from the Transactions will be found in this department of THE NAUTILUS each month.

A member who has joined our Chapter during the year, writes the following when forwarding her report for 1895; "I did it only because I understood that was the one thing that would insure me the privilege of reading the 'Transactions' for the year. I have read those of 1889 and 1891, and am willing to do anything in my power for the pleasure and profit of reading another volume." Please bear in mind that one week is the limit of time allowed for the retention of the volume of Transactions.

The Secretaries of Sections for our Chapter have been appointed, as provided for in Section 1, of our By-Laws, and are as follows:

Section A.—Marine shells of the West Coast, Prof. Keep, Mills College, Cal.

Section B.—Mrs. E. P. Wentworth, Portland, Maine.

Section C.—Land shells east of the Rocky Mts. (Secretary not yet chosen).

Section D.—Fresh water shells east of Rocky Mts., Dr. W. S. Strode, Lewistown, Ill.

Section E.—Land and fresh water shells west of Rocky Mts. (Secretary not yet chosen).

Section F.—Fossil shells, Hon. Delos Arnold, Pasadena, Cal.

Section G.—Juvenile Section, Mrs. Mary P. Olney, Spokane, Wash.

Section H.—Microscopic shells, Mrs. T. S. Oldroyd, Los Angeles, Cal.

Section I.—Marine shells of the S-Eastern Coast, Mr. J. J. White, Rockledge, Florida.

The Executive Committee consists of the "President, General Secretary and one other member" (Art. IV). The Honorable Delos Arnold has been appointed a member of the Executive Committee.

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#### WEST COAST SPECIES OF HALIOTIS.

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[Report of the President, Professor Josiah Keep. From the Transactions of Isaac Lea Chapter for 1895].

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The recent revision of the genus *Haliotis* and the changes of some specific names since the publication of my little book on West Coast



Shells, make it proper to place the matter anew before the members of our Chapter. Those who have the opportunity of consulting Vol. XII of the "Manual of Conchology," will find a full discussion of the subject; but as there are some who cannot consult that excellent authority, I propose to use some of the statements of Prof. Pilsbry in connection with this report.

There are six species of the genus in question to be found upon our Western Coast, only three of which, however, are sufficiently abundant to be called common. The first of these species, and probably the best represented in respect to the number of specimens, is *Haliotis Cracherodii* Leach. This is the common "black abalone," so called on account of the dark color of the outer layer of its shell. The "Manual" gives the limits of locality as "Fallarones Is. to San Diego." Probably the Farallones Is. off San Francisco are meant, a natural mistake having been made in the spelling, but I think the species reaches much farther to the northward than the latitude of these islands. I should like to have my suspicions confirmed or refuted by those who have made northern observations.

One morning during the last summer I took advantage of the low tide and explored the granite rocks that form the promontory beyond the Point Pinos lighthouse near Monterey. The waves have been breaking for ages over those venerable cliffs, and the results of their work are distinctly seen. Out in the water, quite far from land, you get glimpses of sunken rocks, the very bones of the ancient cape. Nearer are a series of small and precipitous islands, most of which you can reach at low tide. Strewn all over the bases of the cliffs are masses of granite, some of them loose boulders, while others are the seamed and weather-worn outcroppings of the underlying ledges. Many of the rocks are covered with a thick mat of seaweed, but others are gray and bare.

Venturing out as far as safety would allow, I was amazed to find the available roosting on some of the cliffs almost literally covered by young specimens of the species under consideration. The shells averaged, perhaps, three inches in length; a few were twice that size, but many were much smaller. Their keen instinct teaches these animals to seek the least exposed positions, a deep and narrow cleft in the rock being the favorite retreat, and there, away from danger, they congregate in great numbers. As the tide came in I was obliged to leave them, and so could not continue my observations, but I fancy that when they were well covered with water they loosened

their firm hold upon the surface of the rock and began to move around in search of food. It is evident that this species is very prolific, and though large specimens are not so common as formerly, there seems to be no danger that the species will soon become extinct.

The next species is the red abalone, *H. rufescens* Swainson. This animal has a much larger shell than the last, some of them reaching the length of nine or ten inches, possibly more. They were formerly very common about Pacific Grove, but they have been so persistently collected that adult specimens are rarely found. They live at a somewhat lower level than their black brothers, and are not often seen on the rocks above the water, even at low tide. The Chinese fishermen cruise around in their boats at such times armed with a hook on the arm of a long pole, with which they secure the coveted prize. The large shells are mostly collected from the more unsettled parts of the coast, and there is danger that the supply will soon become seriously diminished. Last summer I saw a two-horse wagon loaded with these shells, which had been drawn up to Pacific Grove from a point some thirty miles down the coast.

The third species, named from its beautiful internal color the "green abalone," has generally been known to scientific circles as *Haliotis splendens*. It was given that very appropriate name by Reeve in 1846, but it has been found that in 1845 it was named by Philippi *H. fulgens*, and so the latter name must stand. This beautiful shell abounds in southern waters, but as I have never had an opportunity to study its habitat, I cannot report upon its prospective decrease. The only live one I ever saw was an aged specimen which was found upon the rocks near Cypress Point. Monterey Bay seems to mark its extreme northern location, and even then I have never found a specimen in the Indian shell-heaps, though *rufescens* and *Cracherodii* are found by the thousands in all stages of decomposition.

*H. corrugata* Gray, does not come so far north as the last species. A fine specimen before me from San Pedro, Cal., measures  $6\frac{1}{2}$  in. in length,  $5\frac{1}{2}$  in breadth, and  $2\frac{1}{2}$  in convexity. The shell has strong ridges upon its back, and there are four large open holes. I have never seen a living specimen, and know very little concerning its habits.

*H. assimilis* Dall, is now considered to be a distinct species. The Manual reports it from "Monterey to San Diego in deep water." A

specimen before me from San Diego is 4 inches long and  $3\frac{1}{4}$  inches wide. It has seven open holes. The exterior of the shell is marked by many threads like Brussels carpeting, and the spire is short but distinct. The interior is smooth, silvery, and without visible muscle-scar. The shell is tolerably thick, and appears very compact and solid.

The last species to be noticed is *Haliotis gigantea* Chem. var. *Kamtschatkana* Jonas. The large typical form of this species belongs essentially to Japan, but the variety seems to have come around with the warm current past the Aleutian Is., and down the coast, at least as far as the middle of California. My best specimens I purchased in Victoria, B. C., where I was told that they were gathered on the west coast of Vancouver Island. My largest specimen is 5 inches long,  $3\frac{1}{2}$  inches wide, and  $1\frac{1}{2}$  inches high. In shape it appears long and narrow when compared with other species. The shell is thin, the edge sharp, the spire quite prominent, the surface uneven, and the open holes are four in number, large and surrounded by high walls. A deep channel runs under the line of holes. The interior is very iridescent, light color prevailing. The muscle-scar is not distinct.

Concerning at least half of our species there is need of further information respecting the habits of the living animals, as well as observations concerning localities where specimens are to be found. In the gathering of information of this kind, even about our more common species, I believe the members of our Chapter may be able to do much good work. While a few great men may do the important work of determining the correct names and classification of the species, each one of us in our more humble sphere may make observations and collect information which will help to swell the total amount of knowledge concerning the molluscan world. I shall personally be grateful for any further information concerning any of our species of the genus *Haliotis*.

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HOW TO PACK SPECIMENS FOR MAILING.—Three times within the last few days I have received small sendings in which the specimens were crushed to powder. It is too unsafe to send shells in a letter, simply packed up in paper or a paper tube, or weak quill. Strong turkey quills are better, especially when double, *i. e.* one tightly stuck into another, and fastened in the bottom of the envelope. Also a piece of thick pasteboard, or a slice of cork is suitable, with a hole in the middle, and paper pasted on both sides.—It is a pity how often valuable and even unique specimens are lost by carelessness in packing.—DR. V. STERKI.







*Unio bursapastoris* Wright.  
*Unio Friersoni*.      *Unio Friersoni* Wright.  
*Unio bursapastoris* Wright.



# THE NAUTILUS.

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No. 12

## NEW AMERICAN UNIONIDÆ.

BY BERLIN H. WRIGHT, PENN YAN, N. Y.

*Unio bursa-pastoris* sp. nov. Pl. III, figs. above and below.

Shell rough, disposed to be both nodulose and pitted, very inequilateral, rounded evenly in front, umbonial ridge nearly obsolete, dorsal margin arcuate, ligament long, thick and much elevated, epidermis reddish-black, rayless, except when very young; substance of shell thick; cavity of shell shallow and uneven, with a wide flattened area extending from beak cavities to the posterior angle; cavity of the beaks very deep, compressed and very wide; pallial impression very rough and deep; greatest diameter of shell over the anterior edge of the cardinals; cardinal teeth low, thick and rather smooth; lateral teeth short, thick and widely separated from the cardinals; dorsal plate long, wide and usually notched near the cardinals. Terminal cicatrices distinct; dorsal cicatrices numerous, shallow and under the posterior cardinal. Nacre white and usually much blotched with smoky spots; occasionally with a shade of pink in the center of the cavity.

Size, length 2.5 inches, width 3.6, diameter 1.25.

Hab. Powell River, Virginia.

My Cabinet, National Museum and Mus. Acad. Nat. Sci., Phila.

Remarks.—This species belongs to the group of which *U. argenteus* Lea is typical. It differs from that species in having a darker

epidermis, an obsolete umbonial ridge and deep, compressed beak-cavities. It differs in much the same manner from *U. Lesleyi*, which has greater shell cavity. Compared with *U. abacus* Hald., it is proportionally much wider, deeper and with more compressed beak-cavities, and has not the checker-board markings of that species. Old specimens resemble *U. Pilsbryi* Marsh, interiorly, but without alation or undulations. In old specimens the base becomes emarginate, and there is more or less biangulation behind, and the teeth become almost obsolete, and of a dull smoky tinge. Thirty specimens were received.

*Unio Friersoni* sp. nov. Pl. III, figs. right and left.

Shell smooth, triangular, inflated, nearly equilateral, obtusely pointed behind; sides swollen not constricted, rayless or obscurely radiate when very young; substance of the shell uniformly rather thick and solid. Beaks angular to the tips and with three or four close undulations which form parallel V-shaped ridges with the angle pointing down the umbonial angle, and the long straight arms of which extend diagonally across the beaks. Ligament very short, thin and of a lighter red than the epidermis, which is a dark-chestnut color, with minute striæ and with coarse growth-lines. Umbonial slope obtusely angular. Posterior slope rounded on the margin and with a raised ridge line from beak to posterior end, forming there, generally, a slight biangulation. Dorsal area wide, cordate. Cardinal teeth large, erect, with furrowed sides, the anterior branch in the left valve being very thin and broad and with a long striate edge. Lateral teeth short, slightly curved, the outer one being the thinner. Anterior cicatrices distinct with a secondary cicatrix above, and running under the cardinal tooth. Posterior cicatrices distinct. Dorsal cicatrices few and under the posterior cardinal. Cavity of the shell very deep, and quite uniformly hollowed out. Cavity of the beaks broad, roomy, the apex within being nearly a right angle. Nacre usually white, with a tint of blue, and iridescent at posterior end; sometimes the nacre is entirely pink.

Animal always white. Size, width 2 inches, length 1.75, diameter 1.38.

Habitat Bayou Pierre, an arm of the Red River in De Soto Parish, Louisiana.

My Cabinet, U. S. National Museum, Academy of Natural Sciences, Phila. and cabinet of L. S. Frierson.

Remarks.—This species belongs to the group of which *U. trigonus* Lea, may be considered the type, although differing much from that species in outline, beaks and in the uniform roundness of the sides. It also has certain characters indicating a relationship with *U. Ridellii* Lea, *U. Chunii* Lea and *U. cuneus* Con. It differs from the first in having the posterior apex lower and more or less biangulated; the posterior margin rounded, instead of straight; posterior margin without the hip peculiar to *U. Ridellii*; the cardinal teeth are heavier and not pyramidal; and differs most remarkably in the character of the beak undulations. From *U. Chunii* Lea, it differs in having a greater depth of cavity; more massive and higher umbones and swollen sides without depressions; much shorter posterior extension; base not emarginate; entire absence of rays and the same difference in beak undulations that distinguishes it from *U. Ridellii* Lea. It differs from *U. cuneus* Con. in being smoother; lighter colored epidermis; much larger opening to the umbonial cavity; cavity of the shell much deeper and more uniformly rounded; lateral teeth more slender and the species never attains the extreme size of *U. cuneus*, the declivity of the posterior slope is much steeper; the ligament shorter; without the anterior subtruncation, and it is never cuneiform.

The peculiar undulations of the beaks amply distinguish it from any other known species.

Some twenty-five specimens have been critically examined which maintain a remarkable constancy in all the characters.

It is named in honor of Mr. Lorraine S. Frierson of Frierson Mill, La. who is a zealous student and collector of Unionidæ.

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#### ON CERTAIN ABNORMAL SPHÆRIA.

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BY BRYANT WALKER, DETROIT, MICH.

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The peculiar characteristics of the hinge-teeth of the American species of *Sphærium* and *Pisidium* have been almost totally ignored by Prime and the earlier writers in their descriptions of the various species which they established. With the exception of some of the descriptions of the more recently described species, nothing but the most general remarks upon the subject are to be found in the American literature upon these genera. Among the European concholog-

ists, however, more attention has been given in this direction, and while perhaps some have gone to the other extreme and have accorded too great importance to the hinge characters, there can be no doubt, but that a careful and conservative study of our American species in this regard would be in many cases a valuable assistance to the determination of the relations and specific validity of many of the at present poorly defined and ill-understood forms.

In examining some specimens of the common *Sphærium striatinum* Lam. recently, I was struck in several instances with the occurrence of an abnormal arrangement of the hinge teeth, and was thereby induced to go further and ascertain if possible to what extent such irregularities were present.

My observations thus far have been confined to two species, *Sphærium striatinum* Lam., and *S. simile* Say. Of the former species one hundred specimens from twenty-four localities, were chosen at haphazard, the number from each locality varying from one to eleven. Of these, all the specimens from sixteen localities, forty-six in number, were normal. Of the remaining fifty-four specimens from eight localities, ten were abnormal. In only one instance, did more than a single abnormal individual occur in any one locality, and in that, three out of nine specimens were abnormal and all in the same particular.

Of *Sphærium simile* Say, sixty-four specimens from nineteen localities were examined, the number from each locality varying from one to six. Of these, ten individuals out of thirty from eight different localities were abnormal. While in those from eleven localities, represented by thirty-four specimens, no variation occurred. In both species the number of abnormal specimens seems surprisingly large, amounting to ten per cent in *S. striatinum* and to nearly sixteen per cent in *S. simile*. In no case was any attempt made to pick out unusual specimens and, indeed, no external variation in appearance was noticed as being coincident with the abnormal arrangement of the hinge.

The normal arrangement of the hinge-teeth of a *Sphærium* is as follows :

Right valve	Cardinal 1	Ant. laterals 2	Post. laterals 2.
Left valve	Cardinals 2	Ant. lateral 1	Post. lateral 1.

The variations noticed consisted in the reversing of the position of one or more pairs of these teeth.

Of the seven possible variations from the normal arrangement, but four were noticed. In no case were the cardinals alone reversed, but invariably a reversal of these teeth was accompanied by a reversal of either one or both pairs of laterals. Neither were the cardinals and posterior laterals alone, nor both pairs of laterals alone reversed in any case. The following table gives the details of the different variations observed and their relative frequency.

Normal *Sphaerium*—cardinals  $\frac{1}{2}$  Ant. Lat.  $\frac{2}{1}$  Post. Lat.  $\frac{2}{1}$ .

Abnormal *S. striatinum* Lam.

No. of specimens 22: Cardinals  $\frac{1}{2}$  Ant. Lat.  $\frac{1}{2}$  Post. Lat.  $\frac{2}{1}$ .

No. of specimens 32: Cardinals  $\frac{2}{1}$  Ant. Lat.  $\frac{1}{2}$  Post. Lat.  $\frac{2}{1}$ .

No. of specimens 22: Cardinals  $\frac{2}{1}$  Ant. Lat.  $\frac{1}{2}$  Post. Lat.  $\frac{1}{2}$ .

No. of specimens 32: Cardinals  $\frac{1}{2}$  Ant. Lat.  $\frac{2}{1}$  Post. Lat.  $\frac{1}{2}$ .

Abnormal *S. simile* Say.

No. of specimens 52: Cardinals  $\frac{2}{1}$  Ant. Lat.  $\frac{1}{2}$  Post. Lat.  $\frac{2}{1}$ .

No. of specimens 32: Cardinals  $\frac{2}{1}$  Ant. Lat.  $\frac{1}{2}$  Post. Lat.  $\frac{1}{2}$ .

No. of specimens 22: Cardinals  $\frac{1}{2}$  Ant. Lat.  $\frac{2}{1}$  Post. Lat.  $\frac{1}{2}$ .

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#### NEW AMERICAN ANCYLIDÆ.

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BY HENRY A. PILSBRY.

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Owing doubtless to the difficulty of distinguishing species in this group, but little work has been done upon the United States forms since the publication of Haldeman's monograph in 1842. Clessin, in the "Conchylien Cabinet," has added nothing of value to our knowledge of United States species, his *A. oregonensis* from Salem, Oregon, of which I have "topotypes," being doubtfully distinct from Tryon's *A. fragilis*. *A. caurinus* is also, as Tryon states, a synonym of *fragilis*.

In naming a series of Illinois mollusks for the Illinois State Laboratory of Natural History, my attention was directed to this genus.

The species of *Ancylus* fall into two groups, not, I suppose, of much importance systematically, but of considerable interest in a broad view of the conditions of mollusk life. One group, which may be termed the "petrophilous" Ancyli, live on rocks and shells in rivers, and usually have a rather highly conic shell. The other group, "phytophilous" Ancyli, live on water plants; some deeply submerged, as on the "leaves of grass" (to use a Walt. Whitmanism), streaming upward from the bottom; others inhabit the round



under-world of floating lily-pads; sometimes they are found on dead leaves in the water. The species of this group are mainly more fragile and depressed than those of the first group, and sometimes they are modified to correspond with their stations, as *A. parallelus*, living on narrow stems. It is evident that this difference of station means also more or less difference of food; and it will be interesting to find whether there exists any corresponding divergence in the dentition. The importance of full information on the *station* of every lot of *Ancylus* collected, will be evident from the foregoing.

Nearly all specimens when collected, are more or less coated with foreign matter, sometimes calcareous, but generally ferruginous. This must be removed before the color and finer sculpture can be observed. By floating the shell a short time on the surface of a weak solution of oxalic acid, rinsing it in water and then brushing, it may readily be cleansed. Nearly all North American species are then seen to be a clear corneous-white tint; most of them have growth-lines only, a few have radial striæ. Most of those species which have been described as dark colored, such as *A. obscurus* Hald., owe their color entirely to foreign matter, the shell itself being very pale.

Exhaustive comparisons with specimens of all North American species, and the types or author's examples of most of them, convince me of the novelty of the following species.

*Ancylus peninsulæ* Pilsbry & Johnson, *n. sp.*

Shell thin and fragile, with much depressed; broadly oval contour, the obtuse, rounded summit somewhat to the right of and behind the middle. Anterior, posterior and right slopes of the low cone nearly straight; left slope slightly convex. Color light horny brown, with a suggestion of olive when cleaned, usually with a very light brownish coating in a state of nature. Surface with slight, fine growth-lines and close, fine and conspicuous radial striæ.

Length 7, width 5, alt. 1.7 mill., often larger.

St. John's River and other localities in Florida, usually in creeks, living on the foliage of aquatic plants.

Somewhat like the northeastern *A. fuscus*, but readily known from all other species of the United States by its large size, broadly oval and depressed form, blunt apex, and the dense radial striation. Several Antillean and South American species are somewhat similar to this, but these large and depressed forms have the apex far more excentric.

This is by no means rare in collections of fresh-water shells from Florida, but is generally labelled "*A. filosus* Conrad," probably on account of the conspicuous radial sculpture. Conrad's *filosus*, however, is a stout, very steeply conical species with coarser radial riblets than any other known American form, and totally different from the low and delicate *A. peninsulae*. It is from the Alabama River, where it is found living on Melanians. This fact, together with the texture and form of the shell, indicate that *filosus* is a typical rock *Ancylus*, like *rivularis*; while the form from Florida is a true weed dweller.

The types of *A. peninsulae* were collected by the editors of this journal in Salt Creek, one of those sparkling streams of "sulphur water" so characteristic of Florida, arising from great brimming springs and feeding the St. John's and other rivers. Salt Creek is the northernmost stream flowing into Lake George on the west side. The *Ancylus* lives on long water-grass, and is abundant.

*Ancylus eugraptus* Pilsbry, *n. sp.*

Shell rather fragile, oval, the right side less arcuate than the left; rather elevated, the apex slightly behind and to the right of the middle, somewhat obtuse, with an indistinct apical depression or scar, posterior and right slopes straight, anterior and left feebly convex. Translucent horn colored and glossy when cleaned, with a blackish coating when collected. Surface with faint growth-lines and very fine, somewhat irregular radial striæ, more distinct toward the periphery. Length 6, breadth 4, alt. 1.8 mm.

Illinois River at Havana, Ill.

Types are no. 67791, coll. A. N. S., Phila., from lot no. 13542, coll. Ill. State Lab. Nat. Hist.

This species, while resembling *A. obscurus* and *A. fuscus* somewhat, differs from both in the sculpture. The apex is far more ex-centric than in *A. borealis* or *A. ovalis*, both of which are very small species. *A. filosus* is far rounder, more steeply conic, and has stronger radial riblets. In *A. rivularis* the apex is much more strongly recurved, and the slope behind it notably concave.

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#### ISAAC LEA DEPARTMENT.

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

One of our new members in a letter to the General Secretary writes as follows in reference to collecting Mollusks in Winter in

California: "I have discovered that the sunshine has much to do with finding shells, as they come up much more readily on a warm day than on a cold cloudy one. Even these little creatures appear to love the sunshine." Is this the experience of other collectors during the winter?

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#### ALONG THE DAMARISCOTTA.

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[Report of Mrs. E. P. Wentworth. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

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The banks of one of the loveliest rivers in Maine have been the principal scene of my "shelling trips" this year, and I shall make these trips the basis of my report. The first warm days in May found me taking advantage of the low tides. I was not sanguine enough to hope to find new species, and the object of my search was merely to lay in a store of *Natica heros* var. *triseriata*, *Nassa obsoleta* (large uneroded specimens) and to find, if possible, the *Skenea planorbis* which so far, has eluded my diligent search. Armed with a wooden tooth-pick, collecting bottle and tin dish, I advanced upon the unsuspecting mollusks. I found quantities of *Naticas* underneath the sea-weed, crawling on the surface of the mud which coated the rocks covered by the sea-weed, and thousands of *Nassas* crawling on the mud near the low water mark. The *Nassa* in the water were waving their siphons in the air as if signaling to one another, but I knew they were only feeding in their own peculiar fashion. On turning over some small flat stones near low water mark my cup of joy ran over, for there, clinging to the edges and under sides of the stones, were the long looked for *Skeneas* and associated with them many of the graceful little *Rissoa minuta*.

At this period of my search the wisdom of taking a wooden tooth-pick instead of a larger and more dangerous weapon was impressed upon me, for it was the most convenient instrument imaginable for transferring these tiny mollusks to the collecting bottle. Before the tide turned I had hundreds of specimens, but, better than the shells was the consciousness that now I knew where to find *Skeneas*. I also found an *Acmea testudinalis* Müll. clinging to an old bone, and although it was only moderate size and so fragile that I broke the edges in dislodging it, I carried it home in triumph, for it was the first one I had found in this river.

In July, my husband (who shares my studies with me) and I went up the river to a rocky point a short distance beyond the place where I found the Skeneas and here we tried our hand-net. Our efforts were rewarded by a live *Lyonsia hyalina* Conr. Our surprise and delight were unbounded. Never before had we even thought of *Lyonsia* as living so far from the sea (15 miles or more), and on a muddy bottom. This added another species to the many we had already found in this river. Repeated dredgings with the hand-net brought us no more *Lyonsias*, but on a careful examination of a small patch of mud at low water mark, covered with a hairy green sea-weed we discovered the hiding place of the fragile *Haminea solitaria* Say, and our diligent search resulted in our finding six of these transparent dainty shells. These the first we ever found alive, although in the bay at the headwaters of the river two miles away, I have found quantities of the dead shells. I am not aware that *Haminea solitaria* has ever before been found in Maine. It is a southern species and is not found in boreal waters. Its presence here along with several other distinctively southern species is regarded as evidence that the water bathing the coast of Maine was once much warmer than now, and these mollusks are the survivors of a fauna now nearly extinct in Maine.

On another trip, a short distance down the river, our net brought up a dead shell of *Nassa trivittata* Say.

As a result of this Summer's work along the salt water I have added four species to my list of Damariscotta River shells: *Lyonsia hyalina* Conr., *Acmæa testudinalis* Müll, *Skenea planorbis* Fabr. and *Nassa trivittata* Say.

But the river banks are not the only localities in this vicinity rich in molluscan treasures. On a trip to a brook in South Newcastle we found forty-one specimens of *Margaritana arcuata* Barnes. A second visit to the same locality gave more *Margaritanas*, *Sphærium partumeium* Say, *Ancylus rivularis* Say, and one *Limnæa* which I have not yet determined. While waiting for our train we found a number of fossil shells in clay which had been unearthed by men who had been getting gravel for the railroads. The shells found in this clay were all bivalves, and did not seem to be at all like the shells common to this period or locality. One shell somewhat resembled *Lyonsia hyalina* but it had numerous teeth in the hinge like the *Arca*.



Picture to yourselves a wide, shallow brook bordered on either side with tall, beautiful flowering grasses, the brilliant cardinal flower and delicate lavender flowered mints, and you will have some idea of the scene of loveliness which awaited us, after our nine mile drive to South Jefferson, one fine day in August. The brook, which is called Dyer's River, is rich in Molluscan life, and quantities of *Unio complanatus* were to be found there. The dead shells of *Margaritana arcuata* were strewn along the banks, where they had been left by the pearl hunters. After collecting all the *Unio complanatus* we desired we used our hand-net with good success and the following shells were the result of the dredging: *Campeloma decisum* Say, *Pisidium equilaterale* Pr., *P. rotundatum* Prime, var. *torquatum* Sterki, *P. abditum* Hald., *Annicola limosa* Say.

My best hunting ground for land shells this Summer has been the crevices of an old ledge, and an old cellar where trees grow out of the cellar floor. In the cellar and on and near the ledge I found Pupas, Vallonias, Succineas, Patulas and Zonites. Under some bricks near a building on my own place I have for several seasons found *Vertigo pygmæa* Drap. but the find in land shells which I value most is *Vallonia costata*, which I found under rocks near our old sea-wall. These I have found in quantities since the tenth of November, finding some as late as the 27th of December. I believe this is the first time *Vallonia costata* has been found in Maine.

The report of the year's effort and pleasure in the conchological line would not be complete if I did not mention our trip to Old Orchard Beach and Saco, Maine, one day last October. After reaching the beach it took us but a short time to realize that our find would be small that day, and, after three hours gleaning, we had a dozen or two *Siliqua costata*, one *Astarte castanea*, three *Periploma cochlodesma* and a few other common shells; so, after eating our lunch and giving a few parting glances to the beach, we decided to take the electric car for Saco, and call on the Rev. Henry W. Winkley, whose interesting articles we have read in THE NAUTILUS. We had never met the gentleman, but our faith in the kind-heartedness of all true lovers of Nature gave us confidence, and surely this confidence was not misplaced. Mr. Winkley welcomed us most cordially and inviting us into his library gave us the exquisite pleasure of closely examining the finest collecting of New England shells we had ever seen. Mr. Winkley has been dredging for several seasons and the many rare deep water shells in his



cabinet testify to his success. We gazed with admiration upon the many rare and beautiful shells we had many times read about, but never seen, and were allowed the pleasure—not granted except to members of the guild, I suspect,—of actually handling these specimens.

After carefully examining the New England marine shells we were shown a fine collection of land shells, gathered from every country and every clime, and their various colors, forms and markings were of the deepest interest to us. But all things come to an end all too soon, we had to bid our good friend adieu and hurry to the railroad station (we were to return home by the steam cars). As we reluctantly took our departure from Mr. Winkley's home, where the latch string always hangs out invitingly to every conchologist, we felt that better than the grand collection of shells we had just seen, was the simple, generous, kindly spirit which Nature inspires in all her true disciples.

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#### NOTES AND NEWS.

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A SECTION OF CONCHOLOGY has recently been formed in connection with the Michigan Academy of Science, the following gentlemen being members: W. H. Sherzer, Ypsilanti; A. H. Boies, Hudson; C. A. Whittemore, R. J. Kirkland, M. D., W. Miller, Charles Miller, Jr., and L. H. Streng, Grand Rapids; F. E. Wood, Bay City; L. T. Schurrer, M. D., Lakeport; C. D. McLouth, Muskegon; Chas. A. Davis, Alma; Jerome Trombly, Petersburg; John M. Miller, Escanaba; Bryant Walker, Detroit.

The formal organization will not take place until the next regular meeting of the Academy, but an interesting programme of work has been planned, which will doubtless lead to substantial additions to the knowledge of Michigan conchology.

PRESERVATION OF MARINE MOLLUSCA.—Those who were interested in Mr. Hornell's paper on formalin (*Nat. Sci.*, vol. VII, p. 416), may like to learn that this fluid has been tried for the preservation of *Aplysia* and *Pleurobranchus*. In both cases, however, a considerable amount of coloring matter was dissolved out of the integument. Dr. J. D. F. Gilchrist, who contributes this observation to Professor Herdman's report, also records a method of killing *Aplysia* in an expanded condition, which he says is the only one that can be

depended upon with certainty. "A few drops of a 5 per cent. solution of cocain were mixed with the water in which the *Aplysias* were. After a time they expanded fully. They were then left in the solution (twelve hours or more) till no contraction took place when removed and put into weak alcohol. If contraction took place, they would be put back into the cocain solution when they again expanded. This was repeated till no contraction took place, when they could, after a time, be put into stronger alcohol."—*Natural Science*, March, 1896.

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#### NEW PUBLICATIONS RECEIVED.

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A LIST OF THE SPECIES OF AMPHIDROMUS ALBERS, WITH CRITICAL NOTES AND DESCRIPTIONS OF SOME HITHERTO UNDESCRIBED SPECIES AND VARIETIES. By Hugh Fulton (*Ann. Mag. Nat. Hist.*, January, 1896). The species of this difficult genus of *Bulimi* are arranged according to their affinities in groups; the synonymy is thoroughly overhauled, and several new forms are described. Mr. Fulton has done good service in reducing to varietal rank a large number of nominal species, which have caused collectors endless pains and confusion; his treatment of the *perversus* group being especially commendable. Three excellent lithographic plates illustrate new or previously unfigured species and varieties.

RECOLTE DES MOLLUSQUES; CONSEILS AUX VOYAGEURS, par A. Bavay. Instructions for collecting mollusks, land, fresh-water and marine, with quite full information on where to find them.

CATALOGUE OF THE SPECIES OF CORBICULIDÆ IN THE COLLECTION OF TEMPLE PRIME NOW FORMING PART OF THE COLLECTION OF THE MUSEUM OF COMPARATIVE ZOOLOGY AT CAMBRIDGE, MASS.—By Temple Prime, 1895.—The species are arranged geographically and under each species are arranged by letters, the synonymy and the various localities represented. Of the genus *Corbicula* there are 58 species; *Batissa* 8; *Velorita* 3; *Cyrena* 42 recent, and 23 fossil; *Sphærium* 23 recent and 2 fossil; *Limosina* 10; *Pisidium* 31 recent and 2 fossil.

BULLETIN OF THE CHICAGO ACADEMY OF SCIENCES, Vol. II, No. 11, 1895.—Preliminary Outline of a New Classification of the Family Muricidæ, by F. C. Baker.

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CONCHOLOGISTS.



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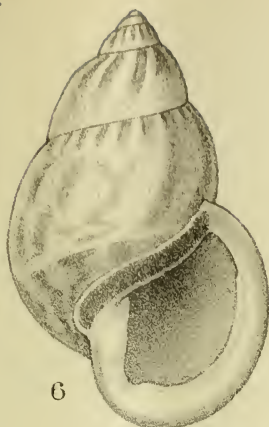
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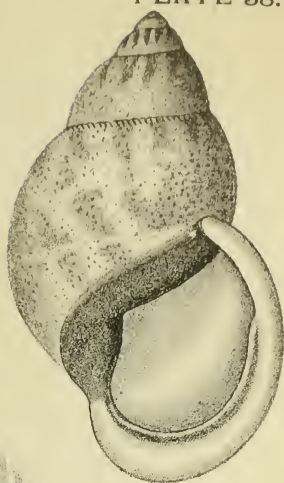




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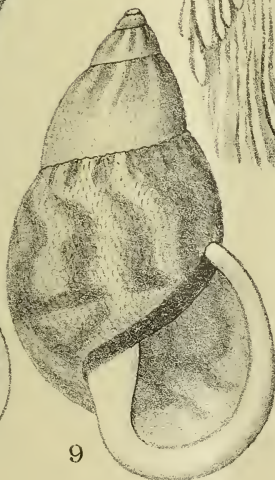
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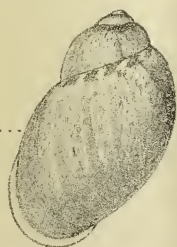
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# THE NAUTILUS.

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No. 1

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## NEW SPECIES OF LEDA FROM THE PACIFIC COAST.

BY WM. H. DALL.

The species of *Leda* from the littoral zone north from Panama are not numerous, though individuals are plenty in suitable localities. *Leda hamata* Cpr. is only known from the Sta. Barbara Islands. *Leda cœlata* Hinds ranges from Bodega Bay to Lower California in 6 to 60 fms. *Leda fossa* Baird is known from Bering Sea to Puget Sound. *Leda cuneata* Sby., from Panama to Monterey and also in the Atlantic. *Leda minuta* Fabr., a circumpolar species, reaches south as far as Puget Sound on the Pacific. Omitting some Arctic and abyssal species, the above-mentioned five species include all hitherto recognized from the western coast of the United States. I am now able to add three well defined species to the list.

### *Leda cellulita* n. s.

Shell solid, with a dull olive-gray epidermis, moderately convex, with subcentral, not prominent beaks, base profoundly arcuate, anterior dorsal slope rounded, posterior straight or slightly concave; posterior extreme bluntly pointed; escutcheon large, transversely striate; lunule not differentiated but similarly striate; sculpture of fine sharp, concentric grooves with wider interspaces, less arcuate than the incremental lines; chondrophore small, triangular, not projecting, with 22 anterior and 16 posterior hinge teeth on the cardinal border. Height 10.5; diameter 7.2; length 15.5 mm.

Puget Sound near Port Orchard, dredged by the Young Naturalists' Society of Seattle, Wash.

This species is less inflated, less polished, with finer grooving and less recurved rostrum than *L. calata*. It is heavier, more inflated, and with a coarser hinge plate and larger teeth than *L. confusa* Hanley (*L. pella* Sby. non Lin.) from Japan.

*Leda leonina* n. s.

Shell rather thin, compressed, with the low beaks at the anterior third; base slightly arcuate, anterior end rounded, posterior dorsal slope concave, lunule and escutcheon narrow, elongate, strongly impressed, smooth, with the valve margins elevated; rostrum broadly and a little obliquely truncate; sculpture of thin sharp concentric lamellæ strongest on the rostrum, epidermis dull olive-gray, dehiscent; hinge with 22 anterior and 28 posterior teeth, the chondrophore small, inconspicuous. Height 11; length 23.5; diameter 5.25 mm.

Off Sea Lion Rock, Coast of Washington in 477-559 fathoms, mud, U. S. Fish Commission.

This species bears a distant resemblance to *L. tenuisulcata* but cannot be confounded with it.

*Leda conceptionis* n. s.

Shell elongate, smooth, polished, compressed, with the beaks in the anterior third; base arcuate, prominent below the beaks; anterior dorsal slope slightly rounded, posterior slope straight, rostrum narrow, pointed, obliquely truncate, cardinal margin elevated between the halves of the narrow impressed, almost linear lunule and escutcheon; beaks very small, low, the prodissoconch conspicuous; hinge with 18 anterior and 33 posterior small and delicate teeth; the chondrophore narrow, produced posteriorly, interior of the rostrum without a longitudinal septum. Height 10.5; length 27.5; diameter 4.5 mm.

From Sannakh Islands, Alaska, to the Santa Barbara Channel in 200-500 fathoms, especially off Point Conception, Cala., in 278 fathoms, U. S. Fish Com.

This is nearest to *L. platessa* Dall, from off Rio Janeiro, but that species is smaller, with much fewer teeth and has a strong septal ridge dividing the interior of the rostrum.

*Leda pontonia* Dall, originally described from 812 fathoms off the Galapagos Islands, has since been dredged in 822 fathoms off San Diego, California, thus adding another to the rapidly increasing list of species which occur off the coast of West America in both hemispheres.

## SOME REFERENCES TO THE GENUS OLIVA.

BY JOHN FORD.

Of all the marine univalves the Olives are perhaps among the most difficult to define specifically. It is true that the most irregular forms can in some instances be readily determined and properly placed by expert conchologists, for however greatly they may differ from the accepted types, certain characters, proving a common origin, are always perceivable. This is especially the case with such species as *O. inflata* Lam., *O. maura* Lam., and *O. peruviana* Lam. (Fig. 1).

To other species, however, many shells have been assigned which are apparently devoid of characters necessary to sustain the relationship claimed for them. In this group may be included *O. araneosa* Lam., *O. irisans* Lam., *O. ispidula* Linn., and *O. reticularis* Lam. So variable both in form and color patterns are many of the shells assigned to these four species, it is not at all strange that they have been honored with scores of specific names. That a majority of these names are synonymous there is no reason to doubt, but it seems equally apparent that quite a number of the shells, the names of which have been thus subordinated, are really specifically distinct from the types with which they are associated.



FIG. 1.

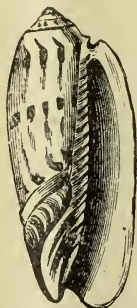
*O. peruviana* Lam.

FIG. 2.

*O. erythrostoma* Lam.

FIG. 3.

*O. porphyria* Lam.

Among these may be noted *O. ornata* Marratt and *O. julietta* Duclos, which some recent writers have determined to be varieties only, the former of *O. irisans*, the latter of *O. araneosa*. If there



is an affinity between these so-called varieties and the species mentioned, I have failed to discover it, though in possession, perhaps, of every form of the shells in question known to science.

Certain writers also claim that the difference between *O. irisans* and *O. textilina* Lam. is merely varietal. Possibly this may be true; still, the facts do not appear to favor any such conclusion. On the contrary, the characters exhibited by large numbers of each clearly show them to be specifically distinct.

It is just possible that intervening forms linking the two together are known, such for instance, as those uniting the typical *O. irisans* with its admitted varieties *O. zelanica* Lam., *O. tremulina*, Lam., and *O. erythrostroma* Lam. (Fig. 2), but if so they are certainly absent from the several large collections of Olives belonging to members of the American Association of Conchologists and the Philadelphia Academy of Natural Sciences. These are but a few samples of the difficulties at present barring the way to a thorough comprehension of the specific relationship of the various members of the genus. The presence of such obstacles, however, should be to the earnest student more of a pleasure than an annoyance, since any effort for their removal will surely give him ample opportunity to exercise both his judgment and powers of observation. Despite the individual vagaries referred to, the genus is a thoroughly attractive one, many of the species, indeed, being unsurpassed in

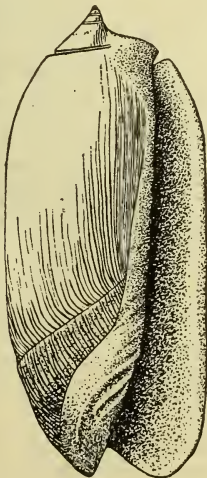


FIG. 4 *O. cryptospira* Ford.



FIG. 5.

richness of color and perfection of form by even the more pretentious members of the genus *Cypræa*.

Among the most charming of the 55 or 60 accepted species, *O. porphyria* Lam. (Fig. 3) may be safely reckoned. These are the "tent shells" of the amateur collector, being so-called from the peculiar patterns which often cover the surface in such profusion as to suggest a large military encampment, including the marquees supposed to be necessary for official comfort, etc.

The ground color, on which these tent-like figures appear, is of a deep chocolate hue and exceedingly brilliant. Add to this the graceful form of the shell and we may readily see that the combination presents a picture of the utmost beauty.

*O. cryptospira* Ford (Figs. 4, 5) is smaller and less charming in appearance than *O. porphyria*, but the callus-covered spire and enamelled body whorl make it a very interesting species. The type of this is in my own collection. There is, however, a fine suite of typical specimens in the Phila. Acad. Nat. Sciences, and, I think, a similar set in the U. S. National Museum at Washington.

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#### DESCENT AND DISTRIBUTION OF UNIONIDÆ.

BY BERLIN H. WRIGHT, PENN YAN, N. Y.

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It must be admitted that the Unionidæ are under the same natural laws, and occult forces, that have operated for vast ages on all animal and vegetal life. Fossilized Unios are found in several geological formations, and all living Unios are their descendants, or else they are new creations. But no evidence sustains the theory of successive creations. On the contrary, we behold everywhere successive new but related forms of descent on divergent lines. Nowhere is this astonishing fact better exemplified than in the numerous species of Unionidæ. But what causes the new forms? If not direct creations—a baseless theory—they are the outcome of changed conditions of life or varying environments.

Geographical distribution furnishes such environments. The young fry of the Naiads have a byssus which generally disappears early and with this appendage they can and do attach themselves to the legs of ducks, wading birds and floating objects. They are then easily transported by the semi-annual bird migration, from river to river, and from lake to lake, and eventually to very remote

regions. New habitats, with new climates, and with changed chemical qualities of new waters, and with new food materials, must disturb the usual and normal lines of descent. A change in the activity of functions of organs, affecting the physiology of the animal must result. Over stimulation of some functions, and depressed activity of others, must change the tenor of life, ultimately evolving new shell characters, and minimizing old ones, or even reducing them to a rudimentary state—all being effected by change of environment.

The dispersion of species is scarcely affected by mountain ranges, but oceans are potential barriers. Distribution eastward or westward is very slow, owing to the fact that the migrations of water fowls and birds, is mainly from north to south and *vice versa*. The spawn, fry or seeds being carried in these migrations, causes a great mixing of fauna and flora, on the lines of migration.

The paucity of Unionidæ west of the 100th meridian is probably due to the fact that since the laying of the cretaceous beds there and the destruction of the once numerous forms of Naiads that swarmed in that region, by the great upheavals of the country—there has not been sufficient time to repopulate. There are signs, however, of adventive Naiads, even from Europe, there. *Margaritana (Unio) margaritifera* L. and *Anodonta cygnea* L. from Europe, neither of them fully divorced from their Old World progenitors, seem to have somehow got a lodgement in California and Oregon, though Drs. Lea and Gould did not detect it. Mr. Simpson suggests that the Californian *A. cygnea* is the parent of the "tramp" *A. exilior* Lea, found from Southern California to Mexico and Central America, where it resents having relatives in Europe.

The most common Unios are those most subject to variation, as seen in *U. complanatus* Sol., whose progeny are clamoring for "sovereign rights" and recognition, which some Uniologists grant, and others deny. On the other hand Naiads vigorously resisting variation, such as *U. cylindricus* Say, and others, have no near relatives, and are generally rare and with very restricted distribution.

In living plants, secessions from a given and normal type are readily traceable, and in fossil types, floral and faunal, the gradations of differences are well marked. "Connecting links" may be absent, when we seek to trace and run down a species, through the long æons of geologic time. But if a long line of visible road be crossed by a chasm, we cannot resist the conviction that the road was once continuous.

There are no inherent tendencies in a species to depart from itself, but when estrangements do occur, they are effected by ulterior causes, natural or artificial. Where color markings are bleached out in mature shells in clear streams, they are retained in the same species in muddy waters. Shells thin and fragile in cold, limeless, pure water, become thicker and coarser in dirty streams. Spinose and verrucose shells are found in rapid waters, with a maximum development of spines and warts, while the same species in sluggish waters have these characters minimized or even absent. The thin edentate *Anodontas* of ponds or lakes, need no teeth to keep their valves in place, and hence have none. Nature's argument for an organ or an accessory is the need of it, which is furnished by a process of slow development the heavier species showing rudimentary teeth.

Mr. Darwin, in "The Origin of Species," shows that in a genus having many species, if it has not reached a maximum development, many other species are *still forming* in it. This is confirmed in *Unio* and *Anodonta*, and we may reasonably expect new species will be discovered in them.

Departures of a *Unio* from its parent stock, when seen as features of whole colonies, entitle it to *specific* distinction without hesitation, provided the habitats differ, and to *varietal* distinction where found in company with or near its next in affinity. On such a basis specific recognition is accorded in other branches of zoology, and also in botany. Plenty of land and marine shells, are specifically separated, only by the most minute or *microscopic* differences of the shells. We would not advocate such peering minuteness in the *Unionidæ* where the tendency to variation is much greater, and where expert comparative anatomists are unable to find distinguishing generic or specific differences in the soft parts.

In the *Unionidae*, the constants of nature are few and the differentials many. How then shall a rule be formulated by which we can confidently say a given *Unio* is distinct from another? The hiatus necessary for the founding of a new species must be such an aggregation of differences of character, such an estrangement from its next in affinity, that the gap will be large enough to justify a specific separation of the two. A substantial agreement in the *outline* of two *Unios* may be a fact, and yet other distinctive characters easily and unmistakably separate them. A process of differentiation must be applied in uniology but with extreme care. But just



here we are confronted with the fact that all differential observations are more or less affected with the variable "personal equation" among observers. The measure of conclusions is more or less in error, and the elimination of the variable is not a mathematical possibility. It follows, therefore, that a definition of the word SPECIES is almost an impossibility, the judgment of a naturalist being a controlling factor. This is a serious and unalterable fact. The most unselfish and conscientious naturalists will often radically disagree on the validity of a species. Others without a surplus of conscience, candor or brains, will go on making species *ad libitum*, to the end of time.

As a result of such diffusiveness, the birds, fishes, insects, shells, and plants, have generally been named three or four times over. This condition is discreditable to science, and Congresses of scientists are not able to remedy the evil. An epidemic of this sort is raging in Europe, and the "New School" mills are grinding out species by the hundreds.

The animus of species mongers is often visible, and not praiseworthy. Posing as scientists, they grasp nomenclature and bandy names about football fashion, with a nonchalance that takes away the breath of astonished beholders and raises the hair on end. The vocation of such gentry is that of the "Bulls and Bears," tearing down what others labored hard to build up, and raising standards which a later litter of "Bears" will demolish.

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#### A FEW NOTES ON PISIDIA.

BY DR. V. ŠTERKI.

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It is hoped that our fellow conchologists will not feel chilly when reading this title, but kindly excuse the writer for coming again with Pisidia. The *Cycladidae* are in order at present, and the season for collecting is at hand. Many conchologists in the East and West, North and South of our country are prepared to do vigorous collecting, and many others not yet enlisted will probably join them, so that, in all probability, more will be done in this line than at any previous time. And there is no doubt that the results will be highly satisfactory. Almost every sending coming in from the comparatively few places where collecting has been done so far, brought up some new form or forms which may prove to be new species, or varieties, by comparing them with more materials from other places.



By the perplexing variability of some members of this group, it is too unsafe to establish new species upon a few specimens coming from a single locality.

The headquarters of these smallest Bivalves, and so probably of *Sphærium*, are the region of our great lakes, which, in fact, seems to be the richest on the globe. And here, too, a serious difficulty is added to the one already lying in the embarrassing richness of forms itself. The deep water mussels are decidedly different from the shallow water and shore forms, reduced in size, and less characteristic in shape, striation, color, hinge formation, etc., hence the double difficulty in ascertaining their true relations with the shallow water, river, pond and shore forms on the one hand, and among themselves on the other. Such is the teaching of the materials brought up so far from some deeper places of the lakes, mainly by the efforts of the Michigan Fish Commission, as I understand, upon the encouragement of Mr. Bryant Walker. There also is a field for successful work; the use of the dredge.

Another point may as well be mentioned here. It is an open question how far *Cycladidæ* are able to exist in brackish water, of rivers and creeks emptying into the sea, and in salt marshes. Conchologists having chances to collect in such places are invited to pay the matter their attention. The researches may be extended to other fresh water mollusks at the same time.

A few hints must be added for those collecting and sending *Pisidia* (and *Sphæria*). 1. Not even the smallest specimens should be overlooked, as some forms are very minute, and the young of all are of interest and value. 2. It is not only annoying, but really perplexing and deceptive, to examine lots where a part of the specimens had been picked out previously. Thus the larger, mature and characteristic examples of one or several species may be wanting, while the younger and poorer are represented in the remnants. Whole suites only can afford a true conception of a species, variety or local form. Mixed lots, however, are the most desirable for examination, separated only for considerable differences in size of the specimens.

Several conchologists lately have sent living *Pisidia*, which arrived alive and could be kept alive for some time, observed and examined for the soft parts. I would solicit the sending of more such. They should be packed up with damp moss, or other similar material, in receptacles admitting air, not in tightly corked vials.

## 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.]

During the first quarter of the year the following new members have been added to the chapter: Mrs. H. A. Zeck, Los Angeles, Cal.; Mrs. E. H. King, Napa, Cal.; Mrs. E. A. Lawrence, 2024 E. Second St., Los Angeles, Cal.; and, in the Juvenile Section, Master James H. Porter, New Wilmington, Pa. The California members will belong to Sections A. and F., the first section "Marine Shells of the West Coast," is under Professor Keep's instruction, and, Section F, "Fossil Shells," is directed by the Hon. Delos Arnold.

## NOTES ON SOME ONTARIO SHELLS.

[Report of Mr. James H. Lemon. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

During last Summer I was able to do very little work in the conchological line, as my time was mostly occupied with botany. This report, therefore, will have to deal with work done in former years.

As far as I am aware about 147 species of land and fresh water shells have been found in the Province of Ontario, fifty-five species being land shells, and ninety-two fresh water; but as very few localities in the Province have been diligently searched it is very probable that in the future several more species will be added to the list. Of the 147 species, quite a number are extremely common all over the Province. Others, although widely distributed, are comparatively rare. Others, again, are rather plentiful in some parts, but entirely wanting in other parts. Of our rarer species mention might be made of the following:

*Selenites concava* Say. This shell has been found in several parts of the Province of Ontario, but nowhere abundantly. I, myself, have found it in Eastern Ontario, and it is reported from around Ottawa.

*Omphalina fuliginosa* Griff., has been found, as far as I am aware, only near the city of Hamilton, in S. Ontario, and even there is not a common shell.

*Omphalina inornata* Say, has been found around Ottawa, but I have not heard of its being taken elsewhere in the Province.

*Gastrodonta intertexta* Binn. This shell has not been found, to my knowledge in Eastern Ontario, but several specimens have been

collected around Hamilton. I also collected a few specimens near Brantford.

*Pyramidula perspectiva* Say, is another species which seems to be confined to the southern portion of the province. I have found it around Hamilton, and, also in Brant County, but it is not abundant in either place.

*Polygyra (Mesodon) Sayii* Binn. has been found in several parts of the Province, but is by no means a common species. I have never been fortunate enough to find any live specimens, but have found dead ones.

*Polygyra (Triodopsis) palliata* Say, and *T. tridentata* Say, are both comparatively common in parts of Southern Ontario, I have not heard of their being found in the Northern or Eastern parts.

*Pupa fallax* Say, has been found very abundantly around Hamilton, especially in sandy places, but I have not found it elsewhere.

It is chiefly among our Fresh Water species that additions to the list are to be expected. Ontario abounds in lakes and streams, which when diligently explored will no doubt yield a number of species new to the Province. Many additions may be expected among the Unionidæ and Cycladidæ (*Sphærum* and *Pisidium*), although over 30 of our 92 Fresh Water species belong to the Unionidæ.

During the coming summer I hope to have more time to devote to the study of Conchology, and will endeavor to get as complete a list, as possible, of those shells found around Toronto.

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#### CUTTLE FISHES WASHED ASHORE IN SAN PEDRO BAY.

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[Extract from the report of H. Lowe. From the Transactions of the Isaac Lea Conchological Chapter for 1895].

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In June, while I was out collecting one morning, I was surprised to find a number of cuttle fishes which had been washed ashore. They were all dead, excepting one, which I carried home and kept in water for a day or two. The length of the entire mollusk was about four feet, and, weight about twenty pounds. It was covered with a very thin paper-like skin, so thin that the bloodvessels could be seen beneath for it has, unlike most other mollusks, red blood. The head was surmounted by ten arms with powerful suckers, two of these arms were much longer than the rest, being about two feet long. Where the ten arms radiated was the mandible, shaped like,

and much resembling, the beak of a parrot. This mandible was partially enveloped in a tough white muscle and was connected with the digestive organs by a muscular gullet. On each side of the head was a large eye about two inches in a diameter. The crystalline lens, when dried, were clear and bright and closely resembled large solitaires (I have seen the lenses used for settings). The gladius, or internal shell was about eighteen inches long, composed of shining white cartilage, and shaped like a large quill-pen, with the pen point towards the tail. I found about fifteen of these mollusks, but have been unable to identify them and would be pleased if some one could give me the probable name.

#### GENERAL NOTES.

NOTE ON CARYCHIUM EXILE (C. B. ADAMS).—This Jamaican species was originally described in Adams' Contributions to Conchology, III, p. 38 (Oct., 1849) as *Pupa exilis*; and Pfeiffer retains the species in *Pupa* in the Monographia Heliceorum III, p. 556. It is omitted from the Monographia Auriculaceorum. Bland in Journal de Conchyliologie, 1872, p. 46, first refers the species to *Carychium*. In this genus the name is preoccupied by H. C. Lea for a species of the United States described in 1841. The Jamaica form will, therefore, stand *C. exile* Lea, var. *jamaicensis* Pilsbry (see Nautilus VIII, p. 63, figs. 15, 16), although some would probably consider it distinct from the United States species. *P. exilis* Ad., *C. exile* Bland, becoming a synonym of the variety described by myself.—H. A. P.

#### NEW PUBLICATIONS RECEIVED.

I. THE UNIONIDÆ OF THE OHIO RIVER. II. THE STREPOMATIDÆ OF THE FALLS OF THE OHIO.—By R. Ellsworth Call, from Proceedings Indiana Academy of Science, No. IV, 1894. Published Nov., 1895. Brief comparative reviews. The writer states that "the literature of the subjects reveals some sixty species" of Unionidæ found in the Ohio River. "The Strepomatid molluscan fauna of the Falls of the Ohio is one that is very rich in numbers, but rather poor in species," the total number being but ten species.

ON THE OCCURRENCE OF ALECTRYONIA UNGULATA IN S. E. AFRICA WITH A NOTICE OF PREVIOUS RESEARCHES ON THE CRETACEOUS CONCHOLOGY OF SOUTH AFRICA.—By R. Bullen Newton (from the Journal of Conchology, VIII, 136-151, Jan., 1896).

BULLETIN OF THE U. S. GEOLOGICAL SURVEY, No. 133; CONTRIBUTIONS TO THE CRETACEOUS PALEONTOLOGY OF THE PACIFIC COAST; FAUNA OF THE KNOXVILLE BEDS. By T. W. Stanton. This Bulletin, which contains 132 pages and 22 plates, is a very valuable addition to our knowledge of the Cretaceous Mollusca. Preceding the descriptions of species, is a thorough discussion of the geological features of the region. There are enumerated 77 species of invertebrates, 50 of which are described as new; all but 7 of the species are mollusks.



# THE NAUTILUS.

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## NOTE ON *NERITINA SHOWALTERI* LEA.

BY WM. H. DALL.

In February, 1861, Dr. E. R. Showalter of Alabama sent four small shells without opercula or soft parts to Dr. Isaac Lea. They were obtained ten miles above Fort William, Shelby Co., Alabama, from the Coosa River. Three of these specimens are now in the National Museum, with the original labels of Showalter and Lea. The species was described under the name of *Neritina Showalteri* by Dr. Lea, who observed that it was the first instance of the discovery of true freshwater *Neritina*, like those of Europe, in our southern waters. The note in which the description is embodied was read Feb. 12, 1861 and published in the Proceedings of the Academy of Natural Sciences, vol. xiii, p. 56, March 19, 1861, and also separately.

Since that time for many years no notice of the species as collected has come to my knowledge and I began to suspect that Dr. Showalter had been imposed upon by some one who had given him, as obtained from the Coosa River, some specimens of *Neritina fluviatilis* of Europe, to which these shells bear a marked resemblance, except that they are smaller and without any dark markings upon the olivaceous surface. It seemed very curious that a species of the section *Theodoxus*, to which *Neritina fluviatilis* is now referred, and which is notably profuse in individuals when occurring at all, in Europe, should be found only in one small stream in our Southern States and very sparsely there. Of numerous collectors on the Coosa River since



1865, none seemed to have found it. Dr. Lewis in his Freshwater and Land shells of Alabama (Geol. Sur. Ala. Rep., p. 25, 1876) gives no further information but states that in the absence of the operculum it is uncertain whether it should be referred to *Neritella* (= *Neritina*). Binney was not able to add any further information in his Land and Freshwater shells of North America. I find in one of my books a manuscript note by a very competent conchologist which declares under date of 1884 that this shell is the young of *Anculosa ampla* Anth. Under *Neritidae* in the Manual of Conchology (vol. x, 1888) Mr. Tryon observes that it has not the characters of *Anculosa*, on the contrary it more nearly resembles *Neritina crepidularia*, though the coloring of the epidermis is more like that of *Anculosa* than in the other fluviatile species of *Neritina*.

For some years I have used every opportunity to seek further information about this species but without success, until lately Mr. Bryant Walker of Detroit informed me that he had found, among shells collected on the Cahawba River in Alabama, by Prof. R. E. Call, a single specimen which he had referred to Lea's species. This he was kind enough to send me for examination and on comparison with the types it proved identical, thus establishing the correctness of the American habitat of the shell which had been so long in doubt. The specimen had also the operculum, which was not that of a *Neritina*, but the soft parts had been removed.

A comparison was then made with the young of all the species of *Anculosa* in the National collection, which resulted in confirming Mr. Tryon's opinion that it could not be referred to that genus. During this search, under the head of "*Anculosa ampla*, very young" were found three additional specimens of the so-called *Neritina*, received under that name from Dr. Lewis, who in turn had received them from Mr. T. H. Aldrich who had collected them from the Cahawba River, Alabama, thus fixing a second locality for the species. The smallest of Dr. Lewis's specimens fortunately contained the operculum and dried remains of the soft parts which were put in soak and boiled in potash finally revealing an extremely minute rhipidoglossate radula, in general not unlike that of *Neritina* but not like that of any species of *Neritina* yet figured. The differences are such as would ordinarily be regarded as generic and, taken into consideration with the operculum, it becomes evident that, while the species is related to *Neritina* (and not to *Anculosa*), a new genus must be instituted to receive it.

Genus *LEPYRIUM* Dall.

Shell neritiniiform, small, thin, unicolorate; with a broad smooth-edged pillar lip; the operculum shaped like that of *Neritina* but without any calcareous layer or projecting processes; the dentition comprising a very wide rhachidian tooth with a short finely denticulate cusp, the median denticle hardly larger than the others and on each side of it a small obliquely set lateral, a broad major lateral with finely denticulate short cusp, and a short series of spatulate uncini much longer than the median teeth. Formula x.2.1.2.x.

Type *Lepyrium Showalteri* (Lea, as *Neritina*), from rivers of the Appalachian drainage in Northeastern Alabama. Types, numbers 29,016 and 102,851, U. S. Nat. Museum.

The specimen from which the radula was obtained was very small and the radula so minute, and its long uncini so tangled, that it was impossible to make a complete description or enumeration of them. The rhipidoglossate character, however, was evident, and the form of the cusps of the middle part of the radula could be clearly seen. They differ from those of *Neritina* by having a very wide and short, finely denticulate rhachidian tooth, instead of a small quadrate one with simple edges; one instead of two oblique minor laterals; in the broad and simple quadrate form of the major lateral, and the relatively smaller number and larger size of the uncini. *Anculosa* has a tænioglossate radula with the formula 3.1.3, so it is evident that this form is not in any way related to *Anculosa*.

The Oligocene of the Southern United States contains several species of *Neritina*, but none, so far as known, having a close resemblance to *Lepyrium*; which is, however, probably an offshoot from *Neritina*. The fluviatile fauna of the Coosa region contains several unique or isolated types of mollusks and the present species adds another to the list.

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**THE GOOSE FAIR BROOK.**

BY REV. HENRY W. WINKLEY.

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A curious brook, with an odd name, the origin of which I do not know. For some years this stream has formed the boundary between the city of Saco and the town of Old Orchard. The portion of it known to the writer is the last five or six miles of its course.

It flows for a distance through meadow land in a valley ; here mollusca are seldom found. The next portion continues through a valley thickly wooded, with alders overhanging the water and covering the narrow belt of marsh ; beyond these the steep banks and upper land are covered with pine growth. Land shells occur rarely along this area : *Succinea ovalis*, *Patula striatella*, *Strobilops labyrinthica*, *Zonites exiguus* etc., have been found here. The brook has a fine lot of *Margaritana margaritifera* of large size and fine specimens. *Pisidium variabile*, *abditum* and *adamsii* occur in the mud, the last of these in an area of a few feet, but having some fine examples. *Planorbis* and *Physa* also occur sparingly. The third area is a mile or two of tide marsh ; here one may study the problem of salt and freshwater distribution. The writer gave an afternoon to this work a few days ago with the following result : In the upper quarter of the marsh *Pisidium* occurs more or less abundantly, and *Amnicola* is to be found in great profusion ; following the windings careful siftings were made. *Pisidium* disappeared after the first quarter of the distance to the sea ; I am quite sure that salt water has little or no influence here. *Amnicola* was met with where *Pisidium* had disappeared, but only for a short distance. The portion following this in the second quarter was entirely wanting in shells, but gradually salt water forms showed themselves, i. e., *Macoma* and *Litorina*. The marsh itself now gives an interesting field of study. Plant life is very rich, but that is not our subject. Pot holes now reveal the presence of multitudes of *Litorinella minuta* living on the thread-like marine plants. The Goose Fair Brook enters the sea in the middle of a long beach, generally known as Old Orchard beach. Its marine shells are chiefly *Litorina littoria* and *Macoma*, the latter often badly eroded. I have seen living specimens with the animal exposed in places where erosion had destroyed the shell. Not far from the shore there must be beds containing *Tellina tenera*, *Ceronia arctata* and others, as specimens are washed up by storms. I trust that these few observations may help to settle the question of the distribution of marine and freshwater forms. At any rate this is one point in the evidence.

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**SOME NEW OR RARE SPECIES OF MARINE MOLLUSCA RECENTLY  
FOUND IN BRITISH COLUMBIA.**

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The following note may be of interest to collectors of West Coast Mollusca. It adds sixteen species to our fauna not hitherto reported

from British Columbia (though some have been found in neighbouring seas), and four species are new to science. My best thanks are due to Dr. Dall for kindly determining new and doubtful material, and species so identified are marked in the accompanying list by an asterisk.

It will be noticed that the range of several Californian species receives a considerable extension, as in the case of *Diala marmorea* Cpr., *Eulima falcata* Cpr., *Ischnochiton radians* Cpr., *Lepidopleurus rugatus* Cpr., *Chrysallida cincta* Cpr., *Phasianella pulloides* Cpr., *Tornatina harpa* Dall, and *Turbonilla styliina* Cpr., etc.

Of northern species the southward range is extended of *Buccinum plectrum* Stimps. (now first established as living in our waters) of *Trichotropis borealis* Br. & Sby., and of *Sipho verkrüzeni* Kobelt. The two last mentioned species occur at Alert Bay in company with an unusual abundance of boreal and circumpolar species such as *Buccinum cyaneum* Brug., *Bela violacea* M. & A., *Margarita helicina* O. Fab., *Cryptobranchia concentrica* Midd., *Lepidopleurus cancellatus* Sby., *Crenella decussata* Mont., etc.

Of the four new species, three belong to genera new to our waters; viz. *Rissoina*, *Mölleria* and *Phasaniella*. The fourth species belongs to a subgenus (*Mumiola*) of *Odostomia* especially Japanese in its recorded species.

Most of the following additions are of small shells, of which, however, we are still far from having on record a normal proportion.

The stations quoted in the following lists are arranged in their order passing from the south towards the north.

*Station 1.* Near Victoria, Vancouver Island, in 60 fathoms, fine clean sand. Collected by the Natural History Society of B. C. March 14, 1896.

*Station 2.* Near Alert Bay, Queen Charlotte Sound, northeast of Vancouver Island, 20 fathoms, small gravel. Collector, C. F. N. July, 1895.

*Station 3.* North side of the entrance to Cumshewa Inlet, Queen Charlotte Islands, 10–20 fathoms, small broken shells and sand. Collector, C. F. N. Sept., 1895.

*Station 4.* East end of Skidegate Inlet, Queen Charlotte Islands, sand and mud. Collector, C. F. N. August, 1895.

*Station 5.* Dawson Harbour, west end of Skidegate Inlet, Queen Charlotte Islands, 20 fathoms, broken shells. Collector, C. F. N. Sept., 1895.



*List of Species.*

\* *Admete Couthouyi* Jay. Cumshewa Inlet, living.

*Angulus variegatus* Cp. Victoria, Station 1.

\* *Bela fidicula* Gld. "variety approximating *B. scalaris* Möller." Alert Bay, Station 2.

\* *Bela tabulata* Cpr. A remarkably slender variety occurred at Station 2 with the last.

\* *Bela violacea* Migh. & Ads. Not uncommon at Alert Bay, Station 2.

\* *Bittium quadrifilatum* Cpr. At all stations in the Queen Charlotte Islands. A Californian shell new to B. C.

\* *Buccinum cyaneum* Brug., var. *Mörchianum* Fischer. Very fine and plentiful, living at low water near Station 2, Alert Bay. Not reported from any other locality.

\* *Buccinum plectrum* Stimpson. Two dead and a few living specimens at Station 1, Victoria. Dead specimens have before been recorded since 1878 as *B. polare* var. *compactum* Dall, and as *B. percrassum* Dall. It has also been found at Rivers Inlet, B. C. (C. F. N.) and in Queen Charlotte Sound by Dr. G. M. Dawson.

*Cadulus aberrans* Whiteaves. Several specimens at Station 1, Victoria. Only once taken before in B. C.

\* *Cæcum crebricinctum* Cpr. Living in great abundance at Station 3, Queen Charlotte Islands. Only a single dead specimen before noted.

\* *Cancellaria modesta* Cpr. One dead specimen dredged in 15 fathoms, near Victoria in 1894, the first reported in B. C. It measures 33 mm. in length and is the largest species of its genus here.

\* *Cancellaria unalaskensis* Dall. A few found at Stations 3 and 5 in the Queen Charlotte Islands.

*Chrysodomus rectirostris* Cpr. Three living specimens of this rare shell at Station 1, Victoria.

*Chrysodomus (Sipho) Verkrüzeni* Kobelt. Three young living specimens dredged near Alert Bay by Mr. W. Harvey in 1894.

\* *Crenella decussata* Mont. Abundant at Station 2 near Alert Bay.

*Dentalium pretiosum* Nuttall. A single living specimen at Station 5, Dawson Harbour, Q. C. I.

*Dentalium rectius* Cpr. A few living at Station 1, Victoria. Only noted here once before.

\* *Diala marmorea* Cpr. At Station 5, Dawson Harbour, Q. C. I. New to these waters.



*Doridium Adellæ* Dall. Clayoquot Sound, B. C., and near Victoria. Taken in 1893, by C. F. N. Not hitherto recorded from B. C.

\* *Eulima falcata* Cpr. At Station 2, near Alert Bay. Also taken at low water. A rare Californian shell not on our lists, but probably identical with the form recorded as *E. distorta* and *E. incurva*.

\* *Halistylus pupoideus* Dall. Very abundant, living at Station 3, Cumshewa Inlet.

*Ichnochiton interstinctus* Gld. On rocks at low water near Station 4. A Californian species new to our Province. Sixteen specimens of various markings.

*Lazaria subquadrata* Cpr. Dead shells and single valves at Stations 3 and 5 in the Queen Charlotte Islands, the northern limit of this species so far as known.

\* *Leda acuta* Conr. A few living and many dead specimens at Stations 3, 4 and 5, Q. C. I.

\* *Leda fossa* Baird. A few specimens at Station on 3, Cumshewa Inlet. In 1894 I dredged three living specimens near Victoria.

\* *Lepidopleurus rugatus* Cpr. Under rocks at low water near Victoria, April, 1894, C. F. N.

\* *Macoma yoldiformis* Cpr. Stations 3 and 4 in the Queen Charlotte Islands.

*Mactra falcata*. Station 3, Cumshewa Inlet.

\* *Mölleria Quadræ* Dall, sp. nov. A few living and dead specimens at Station 3, Cumshewa Inlet.

\* *Mumiola tenuis* Dall, sp. nov. Station 3, with the last.

\* *Odostomia (Chrysallida) cincta* Cpr. In 30 fathoms near Victoria, March, 1896. New to B. C.

\* *Phasianella (Eucosmia) lurida* Dall, sp. nov. Station 5, Skidegate Channel. Encrusted with a polyzoan.

\* *Phasianella pulloides* Cpr. Station 5, Dawson Harbour. Skidegate with the last, and in shell sand from Nootka Sound.

\* *Rissoina Newcombei* Dall sp. nov. Station 3, Cumshewa Inlet, Queen Charlotte Islands.

\* *Tellina inflatula* Dall. Stations 3 and 4 in the Queen Charlotte Islands. The northern limit so far as known.

\* *Tonicella submarmorea* Midd. Not rare at low water at Station 2, Alert Bay, and quite plentiful at Station 4, Skidegate Inlet.

\* *Tornatina harpa* Dall. Not rare at Stations 3, 4 and 5, Queen Charlotte Islands. The northern known limit.

*Trachydermon (Cyanoplax) Raymondi* Pilsbry. Not rare at Stations 2 and 4, Alert Bay and Skidegate, Q. C. I.

\* *Trichotropis borealis* Br. & Sby. Station 2, Alert Bay. New to this Province.

*Turbonilla chocolata* Cpr. Both at Stations 2 and 4.

\* *Turbonilla stylina* Cpr. Cumshewa Inlet, Q. C. I., at Station 3. A Californian shell, new to B. C.

\* *Turbonilla torquata* Gld. With the last.

\* *Turbonilla tridentata* Cpr. At Station 3, Cumshewa Inlet. Though found in Puget Sound many years ago, it has not before been reported from British Columbia.

\* *Venericardia borealis* Conr. At stations 2 (Alert Bay) and 4, Skidegate Inlet.

C. F. NEWCOMBE.

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#### DESCRIPTIONS OF NEW PISIDIA.

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BY DR. V. STERKI.

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*Pis. fallax* n. sp.

Mussel rather small; it is of the same type with *Pis. compressum* Pr. but smaller, more rounded in outline, the upper margin is less strongly curved, not angular, the ridges on the beaks are comparatively larger and situated less high up; the striation is finer, crowded, somewhat irregular and sharp; the color commonly greenish or yellowish-horn in the younger, more yellow in older specimens; the hinge is strong, more regularly curved than in *compressum*, the hinge plate broad, the cardinal tooth of the right valve more oblique, the lateral teeth strongly projecting inward; nacre more glassy-whitish; ligament strong.

Size: long 3.2, alt. 2.9-3, diam. 2.1.

Habitat: Tuscarawas River and Sugar Creek, Ohio.

It was first noticed in October and November, 1891, when hundreds of specimens were collected, and so every year since, in company with *Pis. compressum*, *cruciatum* and *punctatum*. Also found in the stomach of the "Buffalo Sucker" (fish) with *Pis. cruciatum* and other molluscan shells. It is decidedly and constantly distinct, not a variety or depauperate form of *Pis. compressum*. The latter has been collected in this vicinity in many places and in very different forms. Old specimens of *Pis. fallax* are almost always badly eroded, and covered with a thick, blackish coat, while *Pis. compressum* from the same places, were intact and clean.

*Pis. vesiculare* n. sp.

Mussel small, ovoid, very inequipartite, somewhat oblique, strongly inflated; beaks very posterior, moderately prominent; margins all well rounded, or the scutum forming a very slight angular projection; color yellowish to brownish-horn; surface slightly striated, polished, often with a few coarser lines of growth; shell thin, translucent; nacre rather glassy, colorless; hinge rather small, markedly short; cardinal teeth lamellar, the right moderately curved with its anterior end thicker; anterior left distinctly directed upward, curved, often angular, posterior oblique, moderately curved; groove between them narrow and deep; lateral teeth situated very close to the cardinals, short, especially those in the left valve abrupt, high; ligament short.

Size: long 2·3, alt. 1·9, diam. 1·7 mill.

Habitat. Michigan.

More than fifteen hundred specimens were seen during the last year, collected at Grand Rapids, Michigan, by Mr. L. H. Streng about ten years ago, and all were remarkably uniform in shape and appearance. Yet I hesitated to announce the form as a new species, thinking it might be a variety of *P. ventricosum* Prime. But later it has been seen from various other places, as Lake Michigan, Hess Lake, "Michigan," in one instance named "*P. rotundatum*," from which it is very different by its beaks situated posteriorly, while in *rotundatum* they are almost in the middle.

*P. vesiculare* can be mistaken only for *P. ventricosum* Pr., from which it differs by the following characters: it is longer, less oblique, more regular in form, being more regularly though less inflated, the beaks are much less prominent; the surface shows less coarse and irregular lines of growth. It is somewhat variable in size, measuring 2·1–2·7 millimetres in length, and in being slightly more or less inflated.

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A NEW VARIETY OF PUNCTUM.

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BY H. A. PILSBRY.

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*Punctum conspectum* var. *pasadenæ* n. var.

Shell resembling *P. conspectum* Bld., but *more widely and openly umbilicated, and without spaced riblets, or with them very slightly indicated.*

Light chestnut colored, rather opaque. Contour about that of *P. conspectum*, the spire very low-conic, apex obtuse. Whorls  $3\frac{3}{4}$  to 4, convex, separated by impressed sutures, the last more or less descending in front. Umbilicus open, easily showing all the whorls, its width contained  $3\frac{3}{4}$  to  $3\frac{1}{4}$  in diameter of shell. Surface with close, fine, irregular growth-striae, sometimes showing slight traces of wide-spaced stronger striae, and very densely, minutely spirally striated. Aperture rounded-oval, quite oblique, the lip thin; columellar margin brought far forward and expanded. Alt. 1.15, diam. 2 mm.

Numerous specimens of this small species were found by Hon. Delos Arnold crawling upon a cement walk in front of his residence in Pasadena, California, and were communicated to the writer by Mrs. Julia E. Campbell.

In typical *P. conspectum* the umbilicus is smaller, contained  $4\frac{1}{4}$  to  $4\frac{3}{4}$  times in diameter of base, and the riblets are prominent, although subject to considerable variation. The dentition of the Pasadena shells is similar to that of *conspectum*. The other species of *Punctum* now known from America are *P. pygmaeum* var. *minutissimum* Lea, and *P. Randolphii* Dall.

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#### GENERAL NOTES.

PROPOSED BIOLOGICAL STATION.—Professor T. D. A. Cockerell, of Las Cruces, New Mexico, has it in view to found in New Mexico a Biological Station, and health and holiday resort for scientific persons, teachers and kindred spirits.

Three years experience in this country gives the writer the highest opinion of the value of the climate for persons in the earlier stages of phthisis; while the abundance of new and interesting forms of life, especially among the insects, is remarkable. Many interesting general problems, such as those of the life-zones, can also be studied in New Mexico to great advantage.

A beginning will be made this summer if students can be found. Prof. Cockerell will be glad to hear from any who are interested in the matter, and especially from those who might be inclined to work with him for longer or shorter periods during the present summer.

PROFESSOR H. E. SARGENT is now in Detroit, Michigan (Detroit Museum of Art), engaged in preparing for public exhibition the Stearns collection of Mollusca.



*ASPERGILLUM GIGANTEUM* Sowb.—This species, the largest of the genus, was figured in Stearns' and Pilsbry's Catalogue of Japanese Marine Mollusks, pl. iii, fig. 1. We have lately noticed that it was renamed (in 1889, *Le Naturaliste*, p. 121) by M. Ménégauz, who curiously enough proposes anew the specific name given by Sowerby in 1888. The specimen is said to be from "les mers de la Chine."

*PALUDINA HETEROSTROPHA* KIRTLAND.—I consider this shell only as an abnormal production of *Campeloma decisum* Say. Comparatively few are found here. About ten years ago, I gathered quite a lot of them, and among the young of them which were not delivered yet, I found this abnormal form, and as near as I could guess, I found about one of this form in two or three hundred; and so came to the conclusion above stated.—L. H. STRENG.

SHELLS OF MARYLAND.—In a recent sending of land shells from Cumberland, Maryland, from Mr. Howard Shriver of that place, we find four species not before recorded from the State: *Omphalina fuliginosa* Griff., *O. inornata* Say, *Gastrodonta intertexta* Binn., and *Polygyra profunda* Say. The latter two are western species, probably at or near their (in this latitude) eastern limit. None of these were recorded in Pilsbry's Mollusks of the Potomac Valley, Proc. Acad. Nat. Sci. Phila., 1894, p. 11. *Polygyra fraudulenta* Pils. is a particularly abundant species at Cumberland, and the specimens of *Pyramidula alternata* are decidedly keeled.

#### NEW PUBLICATIONS RECEIVED.

ON THE MISSISSIPPI VALLEY UNIONIDÆ FOUND IN THE ST. LAWRENCE AND ATLANTIC DRAINAGE AREAS (AMER. NAT., 1896, p. 379). 2. DESCRIPTIONS OF FOUR NEW TRIASSIC UNIOS FROM THE STAKED PLAINS OF TEXAS. 3. THE CLASSIFICATION AND GEOGRAPHICAL DISTRIBUTION OF THE PEARLY FRESHWATER MUSSELS (Proc. U. S. Nat. Mus., XVIII, 1896), by Charles T. Simpson. The first of the above papers considers the origin of such Lake and Atlantic drainage forms as *Unio liebi*, *canadensis*, *borealis*, *hippopæus*, *Anodonta footiana*, *subangulata*, *benedictii*, *undulata*, etc., all of which are claimed to be altered Mississippi drainage types, which found their way into the Lake drainage during the period when the lakes drained into the Mississippi, and subsequently travelled eastward when the St. Lawrence outlet became established. Their advent is thus about coeval with the Glacial period. *Unio radiatus*, *ochraceus*, *heterodon*, *tappanianus* and *Marg. undulata* are believed to be older inhabitants of the eastern country.



The third paper mentioned above is already so condensed that any abstract is difficult to make. It deals with the questions of classifications, mutual relationships of the genera, and geographic distribution. *Margaritana* is merged in *Unio*, as the species are believed to have lost the lateral teeth by degeneration or disease. It is an error, however, to give *U. margaritifer* (not "margaritiferus") as type of *Unio*; and it should be noted that in having a series of small muscle-scars in the middle of the disk, *M. margaritifera*, *monodonta*, etc., differ from any *Unios* as well as from the *M. undulata*, *rugosa* group, which is more properly called *Alasmodonta*. These groups seem to be as valid genera as *Castalina*, which Simpson retains. Simpson, in common with other recent authors, recognizes two families, *Unionidæ* and *Mutelidæ*. The former containing genera *Unio*, *Anodonta*, *Prisodon*, *Tetraplodon*, *Castalina*, *Burtonia*, *Arconaia*, *Cristaria*, *Lepidodesma*, (new genus for *U. languilati* of China), *Pseudodon*, *Leguminaia*, *Solenaia*. *Mutelidæ* contains *Mutela*, *Chelidonopsis*, *Spatha*, *Pleiodon*, *Brazzæa*, *Glabaris*, *Iheringella*, *Monocondylæa*, *Fossula*, *Mycetopoda*. Each genus is discussed in a separate paragraph, and a careful reading inclines us to place great reliance upon Mr. Simpson's conclusions. A full synonymy of each genus would have been a useful addition, for there are some generic names not mentioned in the text, probably because they prove to be mere synonyms.

The geographic provinces indicated by *Unionidæ* and *Mutelidæ* are: *Palaearctic*, including all Europe, Africa north of Sahara (except the Nile), all northern Asia, and the Pacific drainage of North America. *Ethiopian*. *Oriental*, including southern Asia to Japan, Philippines, Malay Archipelago and to the Solomon Is. *Australian*, Australia, Tasmania and New Zealand. *Mississippian*, the Gulf drainage, spreading to N. C. and Central America. This region is the richest in species in the world. *Atlantic*, Atlantic drainage from Florida to Labrador. *Neotropical*, the whole of South America. *Central American*, Panama to Mexico and Cuba. A map presents the areas of distribution graphically. In conclusion Mr. Simpson discusses the geological history of the groups. Students of the *Uniones* will find this paper crowded with important facts and careful reasoning from them, in the main very reliable. Our experience with other groups leads us to believe, however, that more important points will follow an anatomical study of the *Uniones* than have yet been developed.

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## ON THE AMERICAN SPECIES OF ERVILIA.

BY WM. H. DALL.

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Very little attention seems to have been given to the genus *Ervilia*, which is composed of small, rather solid shells which are, in the recent species, frequently brightly colored, concentrically or radially striated or smooth. The soft parts are still unknown though the typical species appears to be common in the West Indies, and the largest known species is found in British and Mediterranean waters. In the forms which are normally concentrically striate or grooved it often happens that some of the specimens have the umbonal portion nearly smooth, the normal sculpture appearing only when the shell is half grown; there are also light modifications of the outline, coming within the range of individual variation. In examining the recent forms of North America and the West Indies for comparison with the fossils, the following were recognized, though the small size of the shells and their general similarity of form renders it necessary to study them under a magnifier with the greatest care and attention in order to grasp the distinctive features.

*Ervilia nitens* (Mont.) Turton.

This species has the valves somewhat compressed, coarsely, evenly, concentrically grooved, with faint, radial striations on the dorso-posterior surface, both ends somewhat attenuated, the posterior longer and more attenuated, the base evenly arched, the anterior end shorter, higher, with a steeper dorsal slope; the shell rather solid with a robust hinge; the pallial sinus narrow, angular in

front, and reaching beyond the vertical of the beaks, anteriorly. In general the shell is yellowish or bright pink, with occasional brownish rays. It seems to be confined to the Antilles and the southern Florida Keys.

*Ervilia subcancellata* Smith.

Valves much compressed, both ends somewhat attenuated, the base arcuate and prominent in the middle; the surface concentrically striated and covered with fine, distinct, radial striæ; the pallial sinus reaching to the vertical of the beaks, rather wide, anteriorly rounded; shell solid, hinge moderately strong; lon. 8; alt. 5.5; diam. 3 mm.

This species is differently shaped, rather more compressed and with a different hinge and pallial sinus from the *E. nitens*. The specimens I have seen are white or brownish and were obtained at Bermuda by Dr. Goode.

*Ervilia concentrica* Gould.

Shell solid, plump, with a robust hinge; the surface with strong, even, concentric riblets and narrower, even grooves between them; there are few very faint or no radial striæ; the posterior end is slightly the longer and more attenuated, the anterior shorter and higher; pallial sinus narrow, almost angular in front, just reaching the vertical of the beaks; the color is generally white, rarely pinkish or yellowish.

This species is common in moderate depths from Cape Hatteras to Key West and Pensacola, Florida. It is smaller and more lozenge shaped than *E. nitens*. Several specimens from the Mediterranean are in the Jeffreys collection under the name of the young of *E. castanea* or *E. nitens*. It is represented in the Postpliocene of North Creek, Little Sarasota Bay, Florida, by a variety less strongly striated and which seems to form the transition to the Pliocene species.

*Ervilia maculosa* Dall, n. s.

Shell almost perfectly oval, very thin, compressed, and almost translucent; closely, sharply, finely, concentrically striated without radial striæ; posterior end higher, rounded, longer than the anterior; beaks low and calyculate; hinge very feeble; pallial sinus wide and rounded, falling short of the vertical of the beaks anteriorly; surface mottled with brown streaks and patches on a translucent ground. Lon. 4.5 alt. 2.7 mm.

This quite distinct form was obtained off Cape Lookout, N. Carolina in 22 fathoms by the U. S. Fish Commission. It is recognizable

at once by its very oval, compressed and translucent shell with very fine and sharp concentric groovings. So far I have not found it in the fossil state.

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#### NOTES ON MOLLUSKS OF FLORIDA.

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BY JOSEPH WILLCOX.

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In THE NAUTILUS for November, 1894, the writer referred to the habits of many species of mollusks which he observed on the west coast of Florida. The present paper has been written in continuation of the same subject.

It is an interesting matter, for personal observation, to witness the persistent and relentless warfare of the molluscan forms upon others of the same family in their quest for food.

In the case of the oyster their enemies are not confined to members of the mollusca. In Florida waters they are preyed upon by numerous enemies which ply their predaceous vocation during the twelve months of the year.

Among the fishes the drum and the sheephead are the chief consumers of the oyster; the former devouring those of moderate size, while the latter confine their attention to the destruction of young oysters.

In the vicinity of the oyster beds nearly all the sheephead fish are found with ragged and freshly-cut lips caused by the sharp edges of the young oysters which they break loose from the clusters. So persistent are the sheephead, in the destruction of the young oysters, that single individuals of the latter are comparatively rare; and the survival of the species, in some localities, is, in a great measure, due to their protective habit of living in clusters.

Coextensive with the destruction of the oyster by the fishes, referred to above, their consumption appears to be as great by their molluscan enemy the *Melongena corona*.

Every oyster bed, on the west coast of Florida, from Cedar Keys to Cape Sable, is infested by these ostraëphagi, which persistently prey upon the oysters as the chief article of their diet.

Their method of attack and subsequent destruction, from which there is no escape for the victim, is exceedingly ingenious, and is probably not unaccompanied by some measure of discomfort and even pain on the part of the aggressor.



The first effort in the assault, on the part of the *Melongena*, is the insertion of its beak or rostrum between the open valves of the oyster, when the latter is feeding. The valves, of course, are immediately closed upon the beak of the assailant, which is round and tough, resembling in form and color a leather shoe-string.

At this particular juncture the oyster appears to have the best position in the struggle for life; and if it could maintain its existence, without relaxing its muscles, the *Melongena* would, in time, starve to death while held in its grasp.

The position of affairs just described is probably continued for a long time, until the oyster, exhausted with the strain in the contraction of its muscles, is obliged to open its shells.

This is the opportunity which the *Melongena* has been patiently, or impatiently, awaiting; and its beak is immediately thrust further between the oyster shells.

It is only a question of time when the beak of the *Melongena* reaches the muscular portion of the oyster; and then the process of devouring it begins.

Early in the progress of this struggle for life other *Melongenas* assemble at the prospective feast, and insert their beaks between the shells of the oyster, and then await their opportunity for engorgement.

The writer has picked up an oyster in Little Sarasota Bay, in Florida, from which 14 *Melongenas* were dangling, suspended by their long beaks, which were held in the closed shells of their victim. A cluster of oysters was found, at the same place, between the shells of which were inserted the beaks of 22 *Melongenas*.

The *Sigaretus* is enabled to destroy the oyster by enveloping it in its folds, and in that manner smothering it. In the same manner the *Fulgur perversum* kills the oyster by enveloping it in its foot.

The *Melongenas* successfully attack and destroy large specimens of *Fulgur perversum*. They crowd on and around the operculum of the latter, and when it is opened for the admission of water for respiration, the beaks of the *Melongenas* are ruthlessly inserted between it and the shell; and the same method of attack is pursued as in the case of the oyster.

It is surprising to see how skillfully the *Melongenas* can arrange themselves, in order that the greatest number may occupy the space at their disposal at the feast.

The writer has seen a *Melongena corona* devouring a shrimp, and also a *Solen americanus*.



The only mollusk, seen to destroy the Melongena, was a *Fasciolaria gigantea* which enclosed it in its folds.

On one occasion a dead king-crab was found, lying on its back, on which many *Fasciolaria tulipa* were crowded and eating it.

An abundant food for the *Fasciolaria distans* is the *Vermetus*, (*Petalococonchus*) *nigricans*, into the tubes of which the former inserts its beak.

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#### A WORD ABOUT SPHÆRIA.

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BY EDWARD W. ROPER.

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Among thousands of Sphæria examined during the past year several unique forms have been found. For example, a robust, rounded shell less than one-fourth inch long, with prominent beaks, from near Tallahassee, Florida. This is quite distinct from any species yet seen from the Gulf states. Again a very dark brown shell from southern Ohio, of the group of *S. occidentale*, but thicker and with more prominent beaks. From an unknown locality came a single specimen resembling a small *S. transversum* but with a less angular outline. Lastly from Minnesota and other neighboring states, may be mentioned a thin, orbicular, gray or light olive shell with calyculate beaks, often regarded as *S. truncatum*, but probably different from the New England shell described by Linsley. These forms have mostly come from single localities in very small numbers, and in view of the great variation among species in this genus, it would be unsafe to consider them new on such slight evidence. The writer would like correspondence with collectors having unique and doubtful Sphæria in their possession.

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#### THE MUSSELS SCARS OF UNIOS.

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BY CHAS. T. SIMPSON.

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In some comments on my recent paper on the classification and distribution of the *Naiades* in THE NAUTILUS for June, 1896, I notice the statement that in having a series of muscle scars in the middle of the disk *Margaritana margaritifera*, *monodonta*, etc. differ

from any Unios; and this seems to be the character on which the writer would separate *Margaritana* generically from *Unio*.

In the former species these little muscle scars or points of attachment of the mantle are sometimes a set of round, deep punctures in the nacre, but more often they consist of slightly indented dashes, which radiate from the umbonal cavity. They vary in number from a very few to 50 or more, *and are often entirely wanting*. In some examples these scars are more or less aggregated into a sort of longitudinal row along the middle of the disk, looking like a strongly developed pallial line.

In *Margaritana monodonta* they appear usually as deep punctures, and vary from many to none and the same thing is true of *Unio hembeli*. I have not found them in *U. decumbens* or *U. laosensis*.

In 1830 Isaac Lea described *Unio trapezoides* in the Transactions of the American Philosophical Society, Volume IV, page 69, and called attention to the fact that this species possessed a strongly developed muscle scar near the center of the disk, which he then named the ventral cicatrix. It is present (sometimes double) and well developed in most specimens, feeble in others, or it may be found in one valve and wanting in the other, or absent altogether. The same is true of most of the species of the plicate group of Unios, which are all nearly related; *N. multiplicatus*, *undulatus*, *perplicatus*, etc., but I have never found these scars in the nearly allied *U. sloatianus* Lea, of Georgia, which is so close to *U. trapezoides* that Call has placed it in the synonymy of that species.<sup>1</sup> In *U. trapezoides* there may be one or two anterior pedal scars and they are often widely separated.

A wonderful degree of variation is also found in the number and position of the dorsal scars of many species of Unios, and in the degree of development of the scars in the pallial line. In Mr. B. H. Wright's new *Unio*,—*U. bursa pastoris*, from Tennessee, the pallial line is generally composed of deep, strongly marked scars, to which the mantle is attached; in *Unio ventricosus* it is often so faint as to be scarcely discernable. I know of no character more variable and wholly unreliable as a means of classification in the *Unionidæ* than that of the muscle scars and my studies lead me to believe that it is seldom a mark of even specific value.

<sup>1</sup>Tr. Acad. Sci. St. Louis, VII, No. 1, p. 54.

DESCRIPTION OF TWO NEW SPECIES OF ACHATINELLIDÆ  
FROM THE HAWAIIAN ISLANDS.

BY D. D. BALDWIN.

*Partulina Hayseldeni* n. sp.

Shell sinistral, minutely perforated, rather solid, ovately conical, apex subacute; surface shining, marked with delicate incremental striæ, and under a lens exhibiting very close, minute, decussating spiral lines; embryonic whorls faintly cross-lined. Color generally of a uniform reddish-brown; sometimes the coloring of the middle portion of the whorl shades into white on the apical whorls, and in some examples a white line revolves below the suture. Whorls  $5\frac{1}{2}$ , slightly convex, narrowly margined above, the last carinated or angulated at the periphery, the angle becoming almost obsolete towards the aperture; suture distinctly impressed and often margined above by the continuation of the peripheral keel. Aperture oblique, subovate, white within with a pinkish tinge; peristome white, rather obtuse, thickened within, the basal and columellar margins slightly reflexed; columella terminating in a strong, flexuous, white fold.

Length  $17\frac{1}{2}$ ; diam. 10 mm.

Habitat, Island of Lanai.

Animal when extended in motion longer than the shell. Mantle slate color with a brown band encircling the outer edge. Foot above and below almost white with a yellowish tinge. Tentacles white tinged with slate.

This species is allied to *P. semicarinata* Newc. which is found in another district of the same island. The latter is a light straw-colored, more conical, and invariably dextral shell. The animals of the two species are somewhat similar, but sufficiently different to warrant the separation.

We take pleasure in dedicating this handsome shell to Mr. Walter H. Hayselden, the young naturalist who discovered both it and the following species.

*Amastra aurostoma* n. sp.

Shell dextral, imperforate, solid, elongately ovate, spire conical, apex subacute; surface lusterless, striated with somewhat irregular, coarse growth striæ; the embryonic whorls finely, radiately sulcated. Color light brown, apex dark chestnut; the lower whorls covered with a black, fugacious epidermis which is generally dense on the last whorl and more sparsely distributed on the other whorls.

Whorls  $6\frac{1}{2}$ , somewhat convex; suture well impressed. Aperture ovate, a little oblique, of an orange yellow color within; peristome simple, acute, not thickened within, extremities united by a thick, orange tinted, parietal callosity; columella orange-yellow, flexuous, abruptly terminating in a thin, slightly curved lamellar plait.

Length, 25; diam. 12 mm.

Habitat, Island of Lanai.

Animal when extended in motion as long as the shell. Mantle dark slate, margined on the outer edge with reddish-brown. Foot above and below very dark-brown, the sides studded with large patches of darker hue, the posterior portion tinged with red. The head above and tentacles covered with almost black granulations.

The prominent features of this shell are its elongate form and orange colored aperture.

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#### ISAAC LEA DEPARTMENT.

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

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The first week in May, the vol. of Transactions crossed the Rocky Mountains on its way east. Our members in the Eastern States have been very patient in awaiting its arrival. The address of Mr. James H. Lemon has been changed from 134 Grange Ave., to 270 Markham St., Toronto, Canada.

In the January number of THE NAUTILUS the Editors noted the publication of the Reverend George W. Taylor's, "Preliminary Catalogue of the Marine Mollusks of the Pacific Coast of Canada, with notes on their Distribution." This Catalogue will not only be found helpful to members of our chapter residing on the Pacific Coast, but useful to all members interested in the Molluscan fauna of the coast. The bulletin shows great care in bringing the nomenclature up to date. The classification adopted by Dr. W. H. Dall in his "Marine Mollusks of the S. E. Coast of the United States," has been followed by Mr. Taylor. The Catalogue is for sale by John Durie & Son, Ottawa, and The Copp Clark Co., Toronto, Canada.

Another new name is added to our membership roll, Mr. Leon Walker, Chelsea, Mass. Members will please notice that additions



to our membership are now published in *THE NAUTILUS*. Our Chapter is so large that the small amount charged for dues, for one member, is consumed by the time the new one has been introduced by postal card to all the members of the chapter. *THE NAUTILUS* is our chapter organ and no member can afford to be without it.

The Juvenile Section is reported in *The Observer*, Portland, Conn., May number page 265, under the title "Notes from Young Conchologists."

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#### AN INTERROGATION REGARDING THE FOSSIL SHELLS OF SAN PEDRO BAY.

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[An Extract from the Report of the Hon. Delos Arnold. From the Transactions of the Isaac Lea Conchological Chapter for 1895].

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It is probable there are many species of shells undiscovered in the hidden recesses of our extended shores, that will be revealed from time to time as our facilities for systematic collecting are increased. This feature of the question cannot but inspire the devotees of conchology—both old and young—with a keen interest. The possibility, not to say strong probability, of being instrumental in adding new forms to the accumulating list is an ever present incentive to earnest, careful and intelligent observation. To lend color to the idea of the existence of undiscovered species in this region, is the fact that among three hundred or more species and varieties of Quaternary and Tertiary marine fossils that have been discovered in the rocks and raised beaches in the vicinity of San Pedro Bay there are many that are supposed to be extinct in this locality, and yet, the same or nearly allied species are known to be living along the shores of Alaska and Washington, and some even as far south as the northern shores of California. Among there are; *Machæra patula* Dixon, *Priene Oregonensis* Redf., *Pecten hastatus* Sby., *Nassa Californica* Conr. and others.

There are several species, also, that are occasionally found alive at Santa Cataline Id. and possibly in the water in San Pedro Bay, whose scarcity excites the suspicion that they are "in the course of ultimate extinction," or at least, in the line of departure. Among these are:

*Chrysodomus tabulatus* Baird.

*Fusus Barbarensis* Trask.



- Surcula Carpenteriana* Gabb.  
*Surcula Tryoniana* Gabb.  
*Venus (Chione) gnidia* Brod. & Sby.  
*Pecten (Janira) floridus* Hinds.  
*Lucina acutilineata* Conr.  
*Nassa insculpta* Cpr.  
*Hemicardium biangulata*.

It would hardly be safe with our limited knowledge of the mollusca of this region, at this time, to assert with positiveness that any of the supposed extinct species, are really extinct species, and yet, the fact is apparent that even those species that are occasionally found living here bear a very small relation, so far as numbers are concerned, to those that existed in the past. The fact is further apparent that along the northern shores of the Continent these same species are found in great abundance; this might suggest a probable migration.

Still the uncertainty of the matter, and the possibility of disproving the theory of extinction by an actual discovery of the living individuals here add interest and a stimulus to collectors and scientists.

If, after an exhaustive search for these missing species, it shall appear that they have really disappeared, then the interesting question arises as to the reason of their departure.

What were the conditions surrounding this locality in the Quaternary and Pliocene periods that made it possible for these forms to exist then, that are now so changed as to render it impossible for them to exist at present, and why are they still living along more northern shores?

The study of these questions may lead us somewhat out of the line of conchology and into other branches of scientific investigation, but as knowledge is what we should all covet, it might not be time mispent to look into the subject.

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#### NOTES AND NEWS.

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AMERICAN PALEONTOLOGY.—For some time past we have been considering plans to increase the scope of our present publication, "Bulletins of American Paleontology," in several ways, the details

of which it is not necessary here to enumerate. In order, however, to ascertain what material suitable for a purely paleontological publication may be available, we have concluded to offer a prize \$50.00 for the best American (North, Central or South) paleontological article presented for publication, as a separate Bulletin, before May 1, 1897. The article must be a well written original monograph or report upon some special problem studied in the field or laboratory or both, *i. e.*, not a mere compilation from books. This report may contain from 50 to 200 pages and from 5 to 10 full page plates of the size of our Bulletins. It may be written in any language using Roman characters. The judges named below shall have the power to divide the prize in two equal parts in case of doubt between the merits of two excellent articles, or to withhold the prize in case no suitable articles appear.

JUDGES: H. S. Williams, Yale University, New Haven, Conn.; T. W. Stanton, U. S. Geol. Surv., Washington, D. C.; G. D. Harris, Cornell University, Ithaca, N. Y.

Address all communications to G. D. Harris, Department of Paleontology, Cornell University, Ithaca, N. Y.

AGRIOLIMAX CAMPESTRIS IN THE PECOS VALLEY, N. M.—When recently at Roswell, N. M., I found a few specimens of *Ag. campestris*. This is only the second locality for the species known in New Mexico, and is the first record of any slug from the drainage-area of the Pecos River.—T. D. A. COCKERELL, *Mesilla, N. M.*

THE EDITOR acknowledges receipt of living West Coast Helices from Mrs. E. P. Gaylord and Mr. Fred L. Button. They are enjoying life in the vivarium of the Academy of Natural Sciences.

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#### NOTICES OF PUBLICATIONS RECEIVED.

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A STUDY OF THE UNIONIDÆ OF ARKANSAS, WITH INCIDENTAL REFERENCE TO THEIR DISTRIBUTION IN THE MISSISSIPPI VALLEY. By R. Ellsworth Call.—(Tr. Acad. Science of St. Louis, VII, 1895). Under the above title the author has published a catalogue of the *Unionidæ* of the state of Arkansas, with partial bibliographic references and copious notes. The species are arranged in alphabetical

order, for convenience of reference, no doubt, for Mr. Call has elsewhere acknowledged and used the natural system of placing allied forms in groups. A number of the species, especially those of Lamarck, are illustrated by carefully drawn wood cuts, the original and additional descriptions are given.

Lamarck's types were only briefly described by him in the Animaux sans Vertèbres, and were not figured, and as he had but a limited amount of material on which to base these descriptions, and many of his localities were erroneous much of his work naturally rests under a cloud. Lea examined most of what were believed to be his types of Naiades, and it is on his testimony that our identifications of the species of the great French Naturalist, for the most part, rest. The determinations of the Lamarckian species given in this paper agree with those of Lea.

Mr. Call has long been known as an extensive collector and a careful student of the North American *Unionidæ*, and is deservedly considered a high authority on the subject. The only criticism on his paper that occurs to the writer of this review is that one or two errors are made in identification, and that he has placed rather too many species in the synonymy. *Unio brevidens* is not the male of what Lea afterwards described as *U. arcaiformis*, for although closely allied it is perfectly distinct. The former in its younger stages is more compressed, and the remarkable swelling in the posterior region of the female is always full and distinct, projecting below the base of the shell. *N. arcaiformis* is always greatly inflated, is more strongly angled posteriorly, and the swelling of the female shell is not so distinct, nor does it usually project below the ventral line. It is not colored like *U. brevidens*.

*Unio venustus* Lea is a solid shell, with broad, distinct, green rays, and is probably only a heavy form of *U. spatulatus*, while *U. pleasi* Marsh, is more delicate, and has indistinct, wavy hair-line radiations of dull green, and a general reddish tint throughout the shell.

In general the synonymy is quite correct, and Mr. Call has made a good move in the direction of checking the enormous multiplication of specific names that are founded on mere variations or insufficient material. The paper is a valuable and welcome addition to the literature of the North American *Unionidæ*.—C. T. SIMPSON.

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At a special meeting of the trustees of the Detroit Museum of Art, held June 25th, a bronze medal was presented to Mr. Frederick Stearns, in recognition of his valuable gifts and untiring efforts on behalf of the Museum during the past twelve years.

# THE NAUTILUS.

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## A NEW SPECIES OF POMATIOPSIS.

BY HENRY A. PILSBRY.

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The genus *Pomatiopsis* is peculiar to North America. All of the species occur in the temperate portion of the continent, and the whole United States, excepting perhaps parts of the Rocky Mountain region, still but imperfectly explored for small shells, is occupied by the various forms. The best-known species *P. lapidaria* Say, is as much a terrestrial mollusk as most of the Succineas. They cannot live for any length of time immersed in water, and I have drowned specimens, just as land snails may be drowned, by confining them in a vessel full of water. Information upon the other species is less definite, but *P. cincinnatiensis* at least seems to be of aquatic habits.

The genus is much more distinct than most genera of *Amnicolidæ*, the dentition being, as William Stimpson first pointed out, strikingly characteristic of the group. The shells vary from the high, turrated *Bythinella* form, to nearly as short as some *Amnicolas*.

The species described below is the third from the Eastern States, and the fourth species of the genus, the others being *P. lapidaria* Say, *P. cincinnatiensis* Lea and *P. intermedia* Tryon.

***Pomatiopsis Hinkleyi* n. sp.**

Shell perforate, turrated, decidedly stouter in figure than *P. lapidaria*, but less compact and widely conic than *P. cincinnatiensis*. Olive-brown. Surface with growth-lines about as in *P. lapidaria*. Whorls 6, very convex, separated by a deep suture. Aperture

slightly exceeding one-third the length of shell, ovate, the outer lip strongly arcuate above, columellar margin flattened above; peristome continuous, the adnate parietal portion longer than in *P. lapidaria*. Alt. 6, diam.  $3\frac{1}{2}$  mm.

*Black Falls, above Florence, Alabama* (A. A. Hinkley, 1894).

The species is somewhat intermediate between *P. lapidaria* and *P. cincinnatiensis*, but more like the former, from which, however, it is very easily distinguished on comparison. The form is stouter, the aperture larger, the outer lip more strongly curved above, and the color duskier. The apex is somewhat eroded in all of the well grown specimens. The dentition is similar in general characters to that of *P. lapidaria*.

I am indebted to Mr. Bryant Walker for the specimens, which were collected by Mr. Hinkley. Upon inquiry, my correspondent quotes as follows from Mr. Hinkley's letter: "Most of the distance from Florence to the last lock of the canal there is a steep rocky bank; a few rods from the water of the river over this bank and out of it are several small streams and springs of clear water. The species under consideration was seen at most of these small streams but was not numerous except at the two falls from which they were taken. Three forms of *Goniobasis* were taken from the same streams. Now, while the *Goniobasis* were in the water, the others were not. They were taken from moss and decaying vegetation but were kept damp by the spray of the falls or by the dripping water under the rock back of the falls and the saturated moss. As I made a hurried trip the day I collected these shells, they were not examined closely, but I took it for granted they were feeding in the decaying vegetation. None of them were found beyond the reach of the spray but still they might have been hidden under the rubbish."

From this the new species appears, as Mr. Walker remarks, to be clearly Pomatiopsine in habits. In choosing a specific term for the form, I have acted upon the suggestion of Mr. Walker that the name of one of our best collectors be associated with this interesting species.

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#### THE WEIGHT AND SIZE OF SHELLS.

BY REV. HENRY W. WINKLEY.

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With the assistance of Mr. D. E. Owen, teacher of Physics in Thornton Academy, the writer has weighed a few species of minute shells. The results are given as follows:



Twelve specimens of *Astyris lunata* from Wood Hole, Mass. weighed 0.095 gms. This would make one specimen weigh about 0.008 gm. Reducing this to avoirdupois weight we have one shell weighing 0.000282 oz.

The next example is *Cerithiopsis Greenii*—being the first of the species found in Canadian waters, i. e. from Prince Edwards Island. Ten specimens weighed 0.023 gm. or in ounces one specimen would weigh 0.000081 oz.

Two sets of *Odostomia seminuda* were compared. The one being, like the above, the first found at Prince Edwards Island. The others came from near Woods Hole, Mass. It was found that the Canadians weighed each 0.000048 oz. while those from Mass. weighed each 0.000105 oz. The difference in size is noticeable without weighing. This proves that Mass. is a better place to live than Prince Edwards Island. The most interesting of all is New England's conchological elephant, *Skenea planorbis*. The set weighed was found near Saco, Me. The average weight of a specimen is 0.000018 oz. At this rate it would require 56,700 to make an ounce, 907,200 to the pound, and a ton would require 18,144,000,000. At the rate of five cents each, a pound would be worth \$45,360.00. I am sorry to say I cannot supply them by the ton, or pound.

After weighing, the writer became interested in size comparisons, and two species from the same region, i. e. Saco, were compared. The largest shell in my New England cabinet is *Mactra solidissima*, and the smallest *Skenea planorbis*. The *Mactra* weighs  $17\frac{1}{4}$  oz. It would require 1,004,250 of *Skenea* to balance the one *Mactra*. The surface of the *Mactra* was reduced to a flat as near as possible, divided into small squares, and the *Skenea* was placed on the small square to estimate the comparative size. Dividing an inch into sixteen squares, *Skenea* would find room enough for 25 on each square, or 405 to the square inch. On the total surface of the *Mactra* (including both sides) there would be space enough for 30,000 individuals of *Skenea* to rest comfortably. The above species are all marines and hence the comparisons are more interesting since conditions of life are similar. Much larger forms occur in other waters but the specimens selected represent the extremes of the New England area. I need hardly say that in commercial life these extremes are avoided and the medium sizes are of more economic value and popularity.

## SOME NOTES ON FLORIDA MOLLUSCA.

BY FRANK A. WHITE.

Just before the middle of March I went on a trip to the headwaters of the Halifax river, which is one of the coast-wise waters of Florida. On that trip I had the pleasure of picking up two shells of *Argonanta argo* var. *americana*. I found them on the Atlantic Beach about thirty miles north from Mosquito Inlet.

During the past winter and spring there have been over a hundred of these shells picked up in this vicinity. I never heard of but seven having been found on this beach previous to this season.

I also found *Cyrenoides floridana* Dall. These animals were alive and in apparent health, about one hundred feet from the creek and from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch below the surface of the soil. The land was low and at the time of finding was wet from a copious rain. I also came across a locality where *Physa pomilia* Conr. are found, in abundance in running water.

In January, 1895, I spent some time at Crescent Beach about twelve miles south of Cape Canaveral. One day I walked south about two or two and a half miles to "the rocks" and found a large live *Cypræa exanthema* although it differs very much in contour and spots from the "*C. exanthema*" in my collection. Thinking perhaps some of the measurements might interest the readers of the NAUTILUS I submit the following :

Length 113, width  $60\frac{1}{2}$  mm.; height when lying with aperture down, 46 mm.; aperture at the widest place 19 mm.; spire not covered, and shows five volutions, dental plications on lip 40; plications on columella 34; lip only slightly inflexed having the inner side of lip all visible.

When found the entire shell was a rich dark brown externally; purple inside where visible. The outside showed no trace of band, spot, or growth-lines but it has faded much although kept in the dark most of the time, and now shows growth-lines more than half way round, across the back it shows three light bands and near both lips light spots. In the summer of 1881 I found one somewhat smaller of the same rich brown color and in just about the same place. I have never known of any of this species being found alive any farther north than "the rocks."

## A NEW SPECIES OF BULIMUS.

BY H. A. PILSBRY.

*Anctus* (?) *Stearnsianus* n. sp.

Shell narrowly umbilicate, subulate, tapering, rather solid but not thick; covered with an opaque dark olivaceous-brown cuticle, indistinctly and irregularly streaked obliquely, and wanting on the fleshy-whitish earlier whorls. Surface shining, with close, fine growth-wrinkles and very minute, close and superficial spiral striæ. Spire tapering regularly from the last whorl to the obtuse apex, which is smooth (but somewhat worn) in the specimens. Whorls 7, hardly convex, with linear sutures, the last not deflexed.

Aperture contained about  $2\frac{1}{2}$  times in alt. of shell, long-ovate, dull purplish within, somewhat oblique; peristome white, obtuse, a trifle expanded at the edge, the margins in a plane and brought forward to the level of the front of the body-whorl; columellar margin expanded; parietal callus rather heavy.

Alt. 19, diam. 7; alt. of aperture 8 mill.

Alt.  $19\frac{1}{2}$ , diam.  $7\frac{2}{3}$ ; alt. of aperture  $8\frac{1}{2}$  mill.

*Sierra de la Ventana, Argentina* (U. S. F. C.).

A peculiar species, not agreeing well with others of this group, but so far as I can see not referable to any section of *Bulimulus*. In my opinion, *Anctus* is to be grouped with *Odontostomus*, *Tomigerus* and *Anostoma*, not with the true *Bulimuli*.

The first whorl in this species is truncated pyramidal, with the earlier third depressed, rapidly ascending; a comma-shaped apical pit passed into the suture. The whorl just back of the upper angle of the aperture, is somewhat flattened, recalling the condition so conspicuous in *Plekocheilus Taylorianus* Rve. It is named in honor of my friend R. E. C. Stearns, who some years ago transmitted to me for identification specimens collected by the "Albatross."

LAND MOLLUSCA FROM THE REJECTAMENTA OF THE RIO GRANDE,  
NEW MEXICO.

BY T. D. A. COCKERELL.

A few weeks ago I collected a quantity of small land shells in the rejectamenta of the Rio Grande at Mesilla, and sent them all to Dr. Sterki, who has kindly identified them as follows:

- (1.) *Hyalinia minuscula* Binn., Nineteen examples.
- (2.) *H. leviuscula* Sterki. Thirteen.
- (3.) *Zonitoides arboreus* Say. One, immature, weathered.
- (4.) *Helicodiscus lineatus* Say. Five.
- (5.) *Vallonia perspectiva* Sterki. One; small, whorls scarcely over three.
- (6.) *V. gracilicosta* Reinh. (probably). Three.
- (7.) *V. cyclophorella* Ancey. One.
- (8.) *Buliminus* ("Pupa") *fallax* Say. Fifteen.
- (9.) *Pupa blandi* Morse. Eleven. "Very variable in altitude; a few smaller specimens are scarcely or not distinguishable from *P. triplicata* Studer, from the eastern continent, except in color, which, in *P. blandi* and other species of the group, is very variable." (Sterki.)
- (10.) *P. arizonensis* (Gabb) W. G. B. Three. With distinct ribs.
- (11.) *P. hordeacea* Gabb. Eighty-four. "Rather variable in size; one specimen is of considerably smaller diameter than the average." (Sterki.)
- (12.) *P. hordeacella* Pilsbry. Thirteen.
- (13.) *Vertigo ovata* Say. Twelve. Two are lower than the rest, with the base somewhat truncate.
- (14.) *Cionella lubrica* Müll. One.
- (15.) *Carychium exiguum* Say. One.

Mesilla is much lower down the river than San Marcial, whence a rejectamenta-collection was formerly recorded. Yet the types found are largely boreal. I was particularly surprised to come across the *Cionella*, which must surely have floated a long way. There was no vestige of any *Holospira*. *Limnæa*, *Planorbis* (*parvus* Say, and two others) and *Physa* occurred with the above land-shells, but there were not any traces of *Sphærium* or *Pisidium*, nor of any operculates.

*Further Records of Land Shells from New Mexico.*

I am now able to offer two more lists of New Mexico shells, all identified, as before, by Dr. V. Sterki, who has been most kind in attending to them.

- (1.) Shells from the rejectamenta of the Rio Grande at Rincon, N. M. This is between Mesilla and San Marcial. They were with much juniper debris.
- 14 *Hyalinia minuscula* Binn. 3 *Vertigo ovata* Say. "One albino?"



- 10 *Hyalinia laeviuscula* Sterki. 2 *Succinea avara* Say.  
 2 *Helicodiscus lineatus* Say.  
 1 *Vallonia costata* Müll.  
 17 *Buliminus fallax* Say. Some apparently albino.  
 12 *Pupa hordeacea* Gabb.  
 1 *Pupa procera* Gld. "Light colored or possibly albino."  
 18 *Pupa hordeacella* Pilsb. "Very variable in altitude, as usual."  
 3 *Pupa blandi* Mse. "One quite small, and like *triplicata* Stud."  
 There were also 9 *Planorbis parvus* Say, and 2 *Planorbis* sp. Dr. Sterki had not before seen *Pupa procera* from so far west.

(2.) Shells from debris at Lone Mountain near Silver City, N. M., about 6000 ft. alt. They may have been washed two or three miles, but no great distance, certainly.

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|--|----------------------------------|
| 6 <i>Hyalinia minuscula</i> Binn.      | 37 <i>Pupa hordeacea</i> Gabb.   |
| 22 <i>Hyalinia laeviuscula</i> Sterki. | 1 <i>Pupa hordeacella</i> Pilsb. |
| 1 <i>Vallonia perspectiva</i> Sterki.  | 6 <i>Pupa pentodon</i> Say.      |
|  | 1 <i>Vertigo ovata</i> Say.      |

The range of *V. perspectiva* is extended.

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#### ISAAC LEA DEPARTMENT.

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

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Members of our Chapter who have not received the Transactions will be glad to learn that before many weeks the volume will have gone the rounds of the chapter. With two or three exceptions, members have promptly forwarded the volume after retaining it but one week, and the General Secretary desires to thank members for their promptness in notifying her when forwarding the reports.

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#### A CHAPTER ON METHODS.

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[From the report of Mr. A. H. Gardner. From the Transactions of the Isaac Lea Chapter for 1895.]

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Not the smallest object to the collector and conchologist is symmetry in the arrangement of the cabinet. Nothing can appear worse than an untidy heterogenous array of specimens, which too frequently reflects the spirit of its author.



Efforts in this line do not necessarily entail expense, but, they do call for more care and work than some people like to give. Perhaps the first thing the collector thinks about after he has his specimens and has determined them, is of some arrangement whereby he can secure the safety and identity of the separate species, and on this account he casts his eyes around for trays or the bottom parts of boxes. Now there is abundance of boxes to be found but a scarcity of those that will suit his purpose, and so he frequently takes the best he can find and proceeds to form his collection with the original lot as a basis of supplies.

This was at least, my experience. I tried druggists sundries houses and dealers in these supplies but I could never get the size, shape or color I desired, until I made up my mind to make them myself and in this way satisfy my requirements, to my own satisfaction. As several people have frequently commented on their neat appearance, and as the process is comparatively easy, I conceived the idea that it might be of use to others, in our chapter, I herewith give the *modus operandi*.

My trays are all one half inch in depth, in width multiple of one half inch, viz. ; 1½, 3, 6 inches, which I have found the largest size required ; in length, they run as follows 1, 1½, 2, 2½, 3, 4 and 6 inches. They are made from what are called 8-ply blanks,—a fine white smooth card board which I purchased cut to the various sizes from the Hasting Card Company, Beekman St., New York, at very nominal prices. The first operation is the gouging of the corners thus : (In this report, Mr. Gardner has three simple cards glued on his Ms., they are all 2¾ by 2 inches, and, are numbered 1, 2 and 3. One half inch from the edge of the card numbered “ 1,” there are four corners marked in ink, making four right angles, these indicate the four lines to be scored with the knife, M. B. W.). Then with a sharp knife I score the lines from edge to edge half through, (No. 2) then cut out the corners and turn up the sides, the long ones first, (No. 3). The short sides are scored a trifle irregularly that they may lie evenly in the finished box and maintain the required size. (On each of the short sides allowance is made in order that they may stand up *within* the longer sides and make a perfect tray the same size top and bottom. The difference is about equal to the thickness of the card-board).

I then rule a sheet of white paper with lines ½ inch apart in width, and 1 inch in length, fasten it with four pins to a board, and cover

its ruled surface with gum arabic laid on smoothly with a brush. When dry it is cut into gummed tags  $\frac{1}{2}$  inch wide and 1 inch long with which the sides of the trays are fastened together on the outside. Of course this is a little tedious and I found it best to set myself the task of making one dozen a day, and very soon accumulated several gross of assorted sizes, and it is an easy thing now when I am short of any particular size, to replenish the stock.

The cards to make the size of boxes given in this report should be cut to the following sizes  $2\frac{3}{4} \times 2$ ,  $4 \times 2\frac{1}{2}$ ,  $4 \times 3$ ,  $4 \times 3\frac{1}{2}$ ,  $4 \times 4$ ,  $4 \times 7$ , and  $7 \times 7$ . They will give an appearance of uniformity to the drawers and save a great deal of space. I usually place a card  $\frac{1}{2}$  inch in width to just fit the inside of each tray, ruled on the top and bottom red lines, this is for the name, authority, and locality of specimens, and other data. All shells whose size will admit of it I enclose in glass vials, square at the bottom and with no neck, they are about  $2\frac{1}{2}$  inches long so that the cork takes up the balance of the space in the tray, and of a width to enable them to hold such specimens as *Helix tridentata*. For the smallest boxes the vials are  $1\frac{1}{4}$  inches long and about  $\frac{1}{4}$  inch in thickness. Here, in New York, they can be bought for about 50 to 70 cents a gross.

For the reception of the smallest species, *Vertigo Pupa*, etc., and in order to bring the characteristics of these minute shells prominently before the observer, I adopted the following plan: Equidistant from the sides of a  $3 \times 1$  inch slip of card board I punched a hole with a die, made for the purpose; and then gummed this slip to another of equal size on which the surface beneath the whole was covered with black paper. The specimens were then mounted with gum in this depression and the whole covered with one of the ordinary  $3 \times 1$  inch glass slips used by microscopists, those with rough edges preferred. The whole thing was then bound around its edges with slips of gummed paper 8 inches long by about  $\frac{1}{4}$  wide and the edges trimmed with scissors when dry. This plan also protected the shells from dust and worked capitally when examining their apertures under a low microscopic power, a very necessary proceeding when determining or explaining to others the difference in the various species.

The gum I found best adapted for mounting the shells was picked gum arabic—a saturated solution in water mixed with an equal quantity of glycerine, then filtered and a few drops of acetic acid added, this never cracks, nor shows any objectionable gloss. Want of space has compelled my relinquishing this plan, for the smallest size trays and vials, which, however, I have never found as convenient.

## NOTE ON BULIMUS HANLEYI AND B. CORONATUS.

BY H. A. PILSBRY.

The two Brazilian species mentioned above are thin, unicolored, glossy shells, with the spire long, suture crenulated, columella simple and foldless, and the outer lip thin and acute. *B. Hanleyi* Pfr. was (with *B. recluzianus* Pfr.) placed in a new subgenus, *Oxycheilus*,<sup>1</sup> by Albers in 1850; but von Martens in 1860 referred it to *Orphnus*. *B. coronatus* Pfr. was placed by Albers in *Leptomerus*, but von Martens transferred the species to *Peronæus*, where it has been retained by subsequent authors.

The characters of the apical whorls show at once that the reference of the species to *Leptomerus* (a section of *Bulimulus*) is erroneous; while the structure of the columella and the texture of the shell equally remove the species from *Peronæus*.

The texture of the shell is that of such South American Stenogyroid species as *B. calcareus* Born and *B. cuneus* Pfr., etc. which have been called *Obeliscus*, but for which the name *NEOBELISCUS*<sup>2</sup> is now proposed. These, however, have a bulbous, more or less costulate apex, without apical dimple.

For *B. Hanleyi* and *B. coronatus*, we suggest the name *SYNAPTERPES*, the former species being the type. The conchological features of the new group are: an oblong-turritid, thin, glossy, more or less vitreous shell with crenulated sutures, rather obtuse (but not bulbous) nuclear whorl with comma-shaped apical dimple, the aperture long-ovate with thin, sharp outer lip and simple columella, not truncate below, its edge narrowly reflexed above.

I do not know that any species except the two mentioned belong to this group. Its systematic position, if we judged by shell characters, would seem to be in the *Achatinidæ* near *Neobeliscus*; but if Binney's identification<sup>3</sup> is correct, the jaw and dentition are considerably like those of some forms of the genus *Strophocheilus*, and, therefore, as far as their testimony goes, indicate a position for the group in the *Helicidæ*.

<sup>1</sup> Not *Oxychilus* Fitz., 1833, nor *Oxycheila* Dej., 1825.

<sup>2</sup> *Obeliscus* was restricted by Gray in 1847 (P. Z. S., p. 176) to *B. obtusatus* Gmel., a Madagascar species for which the name *Clavator* was proposed in 1860. Humphreys had previously used *Obeliscus* in another sense.

<sup>3</sup> See under *Orphnus Hanleyi* Pfr., in Annals of the N. Y. Acad. Sci., III, p. 115, pl. xi, fig. D (jaw and dentition).

## NOTES AND NEWS.

MESSRS. S. H. STUPAKOFF AND GEO. H. CLAPP gave a lecture on shells at the regular monthly meeting of the Academy of Science and Art of Pittsburgh, held in the lecture room of the Carnegie Library, Pittsburgh, on Friday Evening, June 5th. It was illustrated by specimens from the collections in the Museum, and wall charts. After the lecture an adjournment was taken to the Museum. The lecture is the first of a series arranged with the idea of popularizing the Museum, which occupies spacious rooms in the Carnegie Library.

NOTE ON LIA, ALBERS.—The names *Lia* and *Leia* being pre-occupied, Schaufuss proposed the term INLIACULUS for this Jamaican group of *Cylindrellidae*, in the first edition of Pætel's Catalogue (Molluscorum Systema et Catalogus. System und Aufzählung sämtlicher Conchylien der Sammlung von Fr. Paetel, 1869, p. 15). This will take precedence over *Vendryesia* Simpson (Proc. U. S. Nat. Mus., xvii, 1894, p. 430). FAUXULUS Schauf. is proposed for *Faula* H. Ad., a South African group of *Pupidae*, and new names are also brought forward for *Parthenia*, *Cantharidus*, *Orphnus*, *Acicula*, *Rupicola* and some other groups. Most of these changes are unnecessary, but they seem to have escaped general notice.

NOTE ON MACTRA.—In the Saco market, a few days ago, a specimen of *Mactra solidissima* was opened, and found to have another of the same species in the gill cavity; the sizes in inches were:

$$1. 3\frac{3}{4} \times 2\frac{3}{4} \times 1\frac{9}{16}.$$

$$2. 1\frac{5}{8} \times 1\frac{1}{4} \times \frac{3}{4}.$$

The size of the smaller leads me to suspect that it had been some time in the larger, not as a parasite, but as partner.—HENRY W. WINKLEY, *Saco, Me.*

MR. CHARLES W. JOHNSON, junior editor of the NAUTILUS, sailed on the 13th of July for Liverpool. He will spend the summer in studying the Museums of England, France and Germany, returning in September.

MR. FREDERICK STEARNS, of Detroit, Mich., has departed upon an extended tour in South America.

## NOTICES OF PUBLICATIONS RECEIVED.

DIAGNOSES OF NEW SPECIES OF MOLLUSKS FROM THE WEST COAST OF AMERICA, by W. H. Dall (From Proceedings of the U. S. National Museum xviii, 1895, pp. 7-20).



*Calliostoma iridium*, West Mexico.

*Calliostoma turbinum*, Santa Barbara Is., 100 fms.

*Anaplocamus* (new genus) *borealis*, S. of Unimak Isld., 61 fms.

"This very remarkable shell recalls a fresh-water genus at once and would easily be overlooked amid a quantity of *Anculosa dilatata*. \* \* \* It is probably referable to the family *Trichotropidæ*."

*Solariella nuda*, off Lower California, 298-455 fms.

*Solariella ceratophora*, off La Paz.

*Rimula* (?) *expansa*, Gulf of Panama.

*Emarginula flabellum*, Lower California.

*Cloristes carpenteri*, Gulf of Panama.

*Benthodolium pacificum*, Gulf of Panama.

*Phos cocosensis*, Gulf of Panama.

*Cominella brunneocincta*, Gulf of Panama.

*Fusus* (?) *rufocaudatus*, Gulf of Panama.

*Tractolira sparta*, Gulf of Panama to Acapulco.

This new genus seems to be a degenerate form of *Volutidæ*.

*Scaphella benthalis*, Gulf of Panama.

*Cancellaria centrota*, Gulf of Panama.

*Cancellaria io*, Gulf of Panama.

*Pleurotoma aulaca*, off Acapulco.

*Pleurotomella castanea*, E. from Galapagos Is.

*Fucula iphigenia*, Gulf of Panama.

*Limopsis compressus*, Gulf of Panama.

*Philobrya atlantica*, Off Argentina.

*Callocardia stearnsii*, Off Washington, near Tillamook.

*Callocardia lepta* and *gigas*, Gulf of California.

*Callocardia ovalis*, Gulf of Panama.

*Callogonia angulata*, Gulf of Panama.

*Periploma stearnsii*, Gulf of California.

*Periploma carpenteri*, Gulf of California.

All the species are from considerable depths; and many of them being of considerable interest, figures will be very acceptable. The *Philobrya* is the first marine form in which a glochidium stage, comparable to that of the *Unionidæ*, has been recognized. We have in a former issue referred to the important light on the morphology of the gill supplied by the *Callocardia stearnsii*.



# THE NAUTILUS.

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## NOTES ON SOME WEST AMERICAN CHITONS.

BY H. A. PILSBRY.

### I.

Among some interesting small Chitons from San Pedro, California, collected by Mr. T. S. Oldroyd, which I have lately examined (through the kindness of Dr. Dall), the following call for especial notice, as they offer differences from the types figured in the Manual of Conchology.

#### *Mopalia imporcata* Cpr.

The single specimen measures 9 by 18½ mm., and is somewhat more elevated than the type of the species; color pale olivaceous, white towards the girdle, speckled on the ribs of lateral areas with brown, and with a brown patch on each pleural tract. The teeth are very distinctly thickened along the outer edges of the slits, as in the typical *Callistochitons*. Sculpture typical.

The color is different from that of the type, and the specimen is larger.

#### *Ischnochiton scabricostatus* Cpr.

Lateral areas with four (on one side of valve ii, five; on one side of valves iv and v, three) radial riblets, which are *very weakly*, hardly perceptibly, granose. Sutures very feebly crenate. Anterior and posterior valves with 9 slits each. Color reddish (but not at all of an orange cast), with a few inconspicuous white spots on some of the lateral areas.

The typical specimen of *I. scabricostatus* was orange with some dark sutural dots, and the lateral areas are three ribbed, some low pustules on the ribs. It was described from Catalina Island.

Both this species and the last are excessively rare in collections.

## II.

A series of Chitons received from Miss Ida M. Shepard, of Long Beach, Cal., contained specimens of a *Callistochiton*, which, while allied to *C. decoratus* Cpr. of Lower California, yet differs in important respects.

*Callistochiton decoratus* var. *punctocostatus* n. v.

Similar to *C. decoratus* in sculpture of end valves and lateral areas; but the central areas have no wide, smooth triangle at the ridge, such as types of *decoratus* have (Man. of Conch., xiv, pl. 58, fig. 18); being somewhat irregularly pitted toward the beaks, and with rows of pits on each side of a small oblong smooth tract at the ridge; most valves pitted also on the ridge anteriorly.

## III.

Finally, with numerous other interesting species collected by Dr. Benj. Sharp in Alaskan waters during the summer of 1895, there were two specimens of a new and unusually distinct form, which we dedicate to that accomplished zoologist.

*Trachydermon Sharpii* n. sp.

Shell oblong, elevated, carinated, the side slopes somewhat convex. Surface to the naked eye smooth; lustreless; slightly soiled white, with some faint and ill-defined brownish spots on the lateral areas, the girdle gray.

Anterior valve smooth, with some indistinct concentric grooves; the anterior slope shorter than the posterior edges; hind margin emarginate. Intermediate valves wide and short, with slightly arcuate margins at junction with girdle, hind margins emarginate. Central areas very minutely roughened by diverging wrinkles; lateral areas slightly raised, with a few arcuate faint grooves in the direction of growth-lines. Posterior valve highest at its anterior margin, the subcentral mucro but slightly projecting, the slope behind it about straight.

Interior white; valve callus strong; sinus concave and shallow, not defined at the edges; sutural laminae but little projecting, broadly rounded, invading the sinus. Insertion plates hardly longer than

the narrowly channelled and solid eaves, sharp and smooth. Slits in valve i, 16; valves ii to vii, 1-1 or 2-1 or 2-2, the larger number prevailing on the more anterior valves; in valve viii, 13. Posterior tooth in the median valves square and well developed.

Girdle rather unevenly covered, with convex, pebbly, coarse scales, those toward the outer margin elongated, and there is a copious marginal fringe of stout hyaline spinules.

Gill-row three-fourths the length of foot, with 21 plumes on each side.

Length about 14, breadth 8 mm.

Unalaska (Dr. Benj. Sharp!).

The number of slits is unusually great, and they are doubled in some valves; the girdle scales are coarse, the marginal fringe conspicuous. These characters, together with the general smoothness of the valves externally, and the undefined, concave sinus, will readily distinguish the species. In view of its numerous slits, solid leaves and coarse girdle-scales, it is aberrant for a *Trachydermon*; but the girdle is not that of *Trachyradsia* nor *Ischnochiton*, and the gill-row is short, extending forward only three-fourths the length of the foot, as in the true *Trachydermons*. It has not the spongy eaves and sinus of *Spongioradsia*.

The slitting of the intermediate valves is variable, but mainly Radsiod. In valve ii there are 2-2 slits; valves iii, iv, v, 2-1; valves vi, vii, 1-1 slits, in the type specimen.

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#### ON THE AMERICAN SPECIES OF CYRENOIDEA.

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BY W. H. DALL.

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The genus *Cyrenoidea* was published in June, 1835, by de Joannis, in the *Magazin de Zoologie*; by a typographical error, apparently, the Latin form, which was used only once in the article, was printed *Cyrenoida*. A little later in the same year, Deshayes reclaimed the genus for his manuscript name of *Cyrenella*, which had been read to the *Société Philomathique* in December, 1834. The first published name, corrected as above, has been adopted, in spite of the objection to its formation as a Latin name with a Greek suffix.

The original type, *C. Duponti* Joannis, is from the Senegal River, West Africa, and it seems that his specimen was defective, since in

Senegambian specimens I find the hinge quite different from Joannis' figure, and essentially similar to that of American species.

The first of the latter was described by Morelet in 1851, from Porto Rico, under the name of *C. americana*. It differs from the African species by its smaller and more delicate shell, its more quadrate form and proportionately shorter ligament. Some species reported from the Philippines by Sowerby I have shown to have a different hinge and separated under the name of *Joannisiella*.

The first continental American species was obtained by Hemphill in the marshes of southwest Florida (Marco, Boca Ceiga Key, and the Everglades) where it affects brackish, or even tolerably salt water, indifferently. This I named in manuscript *C. floridana* (cf. Bull. 37, U. S. Nat. Mus., 1889, No. 217, p. 50). Lastly a fine Pliocene species was obtained by Mr. Willcox and myself from the marls of the Caloosahatchie River in south Florida.

Diagnoses of the two latter follow.

*Cyrenoidea floridana* (Dall, MS., 1889) n. s.

Shell rounded, small, thin, very delicate, whitish or translucent with a pale, silky, yellowish, dehiscient epidermis; surface smooth, or sculptured only by incremental lines; interior margin smooth, polished; the visceral area with a dull, more or less punctate surface; pallial line indistinct, often broken, not sinuous; ligament short, brownish, external; hinge as in *C. duponti* but more delicate. Largest specimen, lon. 13·5, alt. 12·5, diameter 8·0.

The range of the species, as far as known, is from Brunswick, Georgia, south to the Everglades on the east, and, on the west, north to Charlotte Harbor and vicinity.

The animal is distinctly Lucinoid, the foot is long, slender, filiform and with an ovate, swollen distal termination.

*Cyrenoidea caloosaënsis* n. s.

Shell large, thin, resembling *C. floridana*, but coarser, with ruder concentric sculpture, sometimes approaching undulations; more inequilateral, the anterior part relatively smaller and shorter, the anterior left bifid cardinal tooth proportionately much shorter than in either of the other species of the genus. Lon. of shell 30·9, alt. 27·0, diameter 17·5 mm.

The shell is known, so far, only from the Pliocene marls of south Florida.

All the species are very similar to one another, and differ only in minor details of form and hinge. They would, as a rule, be taken for *Diplodontas* except for the differences of the hinge.

## EDITORIAL CORRESPONDENCE.

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LONDON, August 11, 1896.

The providential occurrence of a rainy day gives me the opportunity to make good my promise to write something about the museums and collections of England before my departure next Saturday for Paris.

The main collection of shells in the British Museum (Natural History) occupy a room (or gallery, as it is called) about 140 feet in length and 40 feet wide. The shells are arrayed in 52 beautiful mahogany cases, about 8 feet long and 4½ feet in breadth. They extend longitudinally in pairs, making four rows. The cases are of the horizontal type, with inclosed drawers below. The specimens are mounted on wooden tablets, which are covered with blue-gray paper, the smaller and fragile species being in glass-covered boxes which are also placed on tablets. On each side of the room are four smaller cases, which contain special collections, viz., some of the economic uses of shells, the pearl-bearing mollusks, eggs and egg-capsules of various species, Brachiopoda, some groups of the Cephalopoda, etc. At the entrance of the gallery there are two table cases, the one on the left containing pathologic monstrosities produced by disease and the reparation of injuries, the other sections of shells showing the internal structure and mode of growth, also specimens of rock and coral illustrating the boring power of mollusks and several kinds of wood perforated by various species of boring mollusks. Near the latter, against the wall, are four upright cases, two on each side; these contain the specimens too large for the cases containing the general collection. In one of these, protected by a glass cover, you see the great *Pleurotomaria adansoniana*, from Tobago. This shell a friend of mine saw in an office in Tobago, being used as a paper-weight! but, when we wrote for it, "the bird had flown." They are evidently not made for paper-weights. Two large valves of *Tridacna gigas*, 36 inches in length and weighing 310 pounds, also greet you on entering this magnificent room, and, if it was near dinner-time, they would probably increase your appetite (since they have become the trade-mark of one of our leading restaurants); but you would soon forget the "inner man" when you got among some of the conchological gems. I have spent many hours going over the great collection, and hunting up some of those old rarities we have read about since boyhood: *Cypraea princeps*



(=*C. valentia* Perry), *C. leucodon* Brod., *C. broderipi* Gray, *C. marginata*, *Conus gloria-maris* and many of the beautiful Volutes ; and looking at those strange forms obtained by the "Challenger" expedition : *Guivillea alabastrina* (Southern Ocean, 1600 fathoms), *Provocator pulcher* (105 fathoms off Kerguelen), *Volutolithes abyssicola* (150 fathoms off S. Africa, a genus so common in the Eocene), *Columbarium pagodoides* (410 fathoms off Sydney, Australia), *Lyrta lutea* (275 fathoms off western New Zealand), *Oocorys sulcata*, and others. A shell that interested me very much was *Fulgur coarctatum* Sowb., two specimens from the Gulf of Mexico. It is undoubtedly a dextral *Fulgur perversum*. It reminds one of *F. rapum* from the pliocene of Florida, except that it has a prominent row of small, spine-like tubercles at the periphery. Like the few specimens of *T. carica* that are sinistral, we may only see such forms once in a lifetime. To describe the beauty and extent of the collection of land shells space would not permit, even if I could. The groups from the Philippines seem to be perfect, while the collection of *Amphidromus* recently monographed by Mr. Hugh Fulton, and which now contains his types, is a grand sight ; one can hardly imagine the exquisite coloring of some of the species. Equally fine are the groups representing the African, South American and West Indian faunas. The *Nudibranchiata* are shown by an elegant series of glass models, while throughout the entire collection are wax, glass or alcoholic representatives of the soft parts of many of the principal genera.

But this is not the only collection of shells. "The alcoves round the central hall, five on each side, are devoted to the Introductory or Elementary Morphological Collection, designed to teach the most important points in the structure of the principal types of animal and plant life, and the terms used in describing them, all of which should be known before the systematic portion of the collection can be studied to advantage. This has been called the 'Index Museum.' " The Mollusca are in alcove No. VII ; here is arranged an elegant series of anatomical preparations, a large series illustrating the forms of shells, and other series showing ornamentation, specific variation, muscular impressions, the hinge-teeth, opercula, etc.

The north end of the central hall is known as the Gallery of British Zoology. Here is a large collection of the Mollusca of the British Isles, occupying five of the horizontal and one upright case, the latter containing the large specimens.

I cannot close this brief description of the collection of Mollusca in this great Museum without giving you some idea of the vast col-

lection of fossil mollusks. The *Cephalopoda* occupy a room one-half the size of the shell gallery and containing 16 horizontal cases arranged transversely, while around the entire room are large wall cases. The *Gastropoda* and *Pelecypoda* occupy one-half of a room the same size as the shell gallery, including large wall cases along the side (the other half of the gallery being given to the fossil *Arthropoda*, *Echinodermata*, etc.). Then there is another gallery the size of this devoted to the *Cephalopoda*, that contains special collections of historical interest, or collections including a large number of types described and figured in standard monographs. The principal ones are the collection formed by William Smith, the pioneer of geology in England, the Searles Wood collection of Crag Mollusca, the Edwards collection of Eocene Mollusca, the Davidson collection of Brachiopoda, the types of Sowerby's "Mineral Conchology," and specimens belonging to the collection of Sir Hans Sloane, which was the nucleus of this great Museum.

There is also a very large collection of fossil Mollusca at the Museum of Practical Geology, which contains the material obtained by the Geological Survey of the United Kingdom, and here I wish to express my sincere thanks to Messrs E. A. Smith, B. B. Woodward and the officials of the British Museum generally, as well as to Messrs G. F. Harris, E. R. Sykes and others, who did so much to make my visit to London both pleasant and instructive.

I spent a few very pleasant hours in Cambridge with Rev. Prof. H. M. Gwatkin, who took great pleasure in showing some of his rare forms of radulæ. I cannot describe this collection, and one can only wonder at the time and careful work involved in making so many beautiful slides. It is undoubtedly the largest and finest collection of radulæ in the world. While at Cambridge, I also had the good fortune to meet Mr. A. H. Cook, of Kings College, who kindly showed me the "MacAndrews Collection." This is a collection that one could spend hours over, instead of the few minutes hastily spent in glancing at some of the important groups. The large suites showing the shell in all stages of development is a very noticeable feature, and shows what a good selection was made of the large amount of material evidently obtained by MacAndrew in his extensive dredgings. Another collection which the museum at Cambridge has recently obtained is the "Saul Collection," made by Miss Saul, of London. The collection is noted for its beautiful Cypræas. Here we see all of those mentioned as being in the British Museum,

except *Cypræa leucodon*; while it contains such rarities as *Cypræa barclayi*, *C. saulæ*, two specimens of *C. guttata*, large suites of *C. scottii*, *C. thersites*, *C. umbilicata* and very large and handsome series of the more common species. Both collections are still in cabinets of drawers and not publicly exhibited.

The collection of shells on exhibition in the Liverpool, or Derby Museum, as it is called, although not large, is exceptionally fine, and represents a great deal of care in its selection. A few species or genera of fossil forms closely allied to living mollusks are incorporated with the latter. Very interesting features of the museum are its aquaria, where both fresh water and marine mollusks may be seen alive. Through the kindness of Mr. Joseph A. Clubb, Assistant Curator, I spent several very pleasant hours in going over these collections.

CHAS. W. JOHNSON.

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#### ISAAC LEA DEPARTMENT.

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

The summer vacation is finding a number of our members engaged in collecting and taking notes. We anticipate some fine reports next December.

The residence of Mrs. Laura N. Trowbridge has been changed from Whittier, California, to National City, San Diego County, Cal.

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#### MARINE SHELLS ON THE SOUTHERN CALIFORNIA COAST.

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[Extract from the report of Mrs. E. D. G. Campbell. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

My collecting has been done in San Pedro Bay and vicinity. Mr. Campbell hunting where I had not strength to go.

During January and February at Dead Man's Island have found a few fine specimens of *Astraliium (Pomaulax) undosus* Wood and *Pteronotus festivus* Hds.

Upon the breakwater connecting Dead Man's Island with Terminal Island, *Acmaea scabra* Nutt., *A. spectrum* Nutt., *Littorina planaxis* Nutt. and *L. scutulata* Gld. were very plentiful. At extreme low tide in the drift, on the sandy beach along the northern part of the

breakwater, I found numerous bright, perfect (dead) specimens of *Calliostoma gemmulatum* Cpr., *Modiola recta* Conr., *Scala hindsii* Cpr., *Siliqua patula* Dixon (small specimens), *Solen rosaceus* Cpr. and *Fissurella volcano* Rve., while the occasional finding of a pretty *Calliostoma gloriosum* Dall, *Erato vitellina* Hds., *Mitromorpha filosa* Cpr. or *Acteon (Rictaxis) punctocalatus* has marked the day.

During the low tides of the last month (November), alive upon the rocks at White's Point we found a few fine specimens of *Mitra maura* Swains., and *Gadinia reticulata* Sby. The under side of some of the large stones there were covered with *Astyris gausapata* Gld. var. *carinata*, which little animals would move off at such rapid pace that it required lively movements to capture them. With the *Astyris* were a few *Scala Hindsii*.

In the vicinity of Laguna near Three Arches, among *Mytilus californicus* Conr., *Purpura lima* Mart. var. *emarginata* Desh. were very plentiful, some of them larger than I had seen before. There was also one nice living *Cypræa spadicea* Gray. Upon the beach sand were several bright, large specimens of *Trivia solandri* Gray. These were dead, as were all but one of *Muricidea incisa* Brod., which were quite plentiful. *Macron lividus* A. Ad. was there, too, living upon the under side of large stones.

At Catalina on the Main, upon the beach, were several specimens of *Chrysodomus (Kelleitia) Kelleiti* Fbs., which had been brought in by fishermen. But the "find" which I appreciated most was that of a "baker's dozen" of living *Semele rupium* Sby., upon the rocks above extreme low tide, at a place about one mile and a half west of Laguna.

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#### NOTES ON THE PARVUS GROUP OF UNIONIDÆ AND ITS ALLIES.

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BY CHAS. T. SIMPSON.

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Mr. R. Ellsworth Call, so well known as an able student of the American *Unionidæ*, has recently published a revision and synonymy of the *Parvus* group of *Unionidæ*,<sup>1</sup> and I wish to call attention to certain points in the paper.

The *Parvus* group is, in general, well characterized, consisting of small Unios, with brownish to blackish epidermis, rayless or feebly-

<sup>1</sup> Proc. Indiana Acad. Science for 1895, pp. 109-119, plates I-VI.



rayed posteriorly, usually somewhat pointed behind, the females distinguished from the males by a well-developed basal swelling, and the beak sculpture consisting of parallel, curved ridges, which are drawn in towards the hinge-line posteriorly, and are more open anteriorly. The cardinals are usually compressed, often torn and reflected upwards, and the nacre is generally brilliant bluish-silvery, becoming richly iridescent behind, but it is sometimes purple. The peculiar beak sculpture, much like that of the *Tetralasmus* group, is one of the best characters when not eroded away.

Mr. Call is right in his criticism on my paper on the *Unionidæ* of Florida, in which I placed *Unio trossulus* Lea and *U. lepidus* Gould in the *Parvus* group. At the time of writing that paper I had carefully examined all of Lea's material, all the general collection of the National Museum, much of B. H. Wright's, Mrs. George Andrews', Wm. A. Marsh's, Rev. A. Dean's and my own collection of Florida and Georgia Unios of this general type, but had not found a specimen old or young that showed the beak sculpture. Recently, in examining some specimens of *U. amygdalum* in Mr. A. G. Wetherby's collection, from Clear Lake, Florida, I noticed that the beak sculpture was perfect, and consisted of a *double loop*, hence they cannot be placed in the *Parvus* group. I may remark, in passing, that having seen Gould's type of *U. lepidus*, I should unhesitatingly pronounce it the same as Lea's *amygdalum*.

Unfortunately, Mr. Barnes' description of *Unio parvus*<sup>2</sup> is very brief and imperfect, and the only figure he gave of it is an outline. Much confusion exists concerning this species, and it is often confounded with *Unio texasensis*; in fact, Mr. Lea himself has placed a lot of specimens of the latter species from northern localities among the *parvus* in his own collection. *Unio texasensis* certainly extends into southern Indiana and Illinois, and well north into Missouri and Kansas. In general, *U. parvus* is smaller than *U. texasensis*, is more inflated and cylindrical, rather more elongated, and has a much more evenly rounded posterior region. The latter is almost always distinctly pointed behind.

I cannot agree with all of Mr. Call's synonymy. I have all of Lea's types of this and related groups before me. *U. marginus* Lea, and *U. cromwelli* Lea, are probably the same, and are, no doubt, members of the *Parvus* group, but are widely different from *U. parvus*, in which he places the former, as they are shorter, less inflated,

<sup>2</sup> Am. Jl. Science and Arts, VI, 1823, p. 174, pl. XIII, fig. 18.



and have a copper-tinted nacre. *U. paulus* Lea and *N. corvinus* Lea are very likely the same species, but I should not place them in the synonymy of *U. parvus* as Mr. Call does.

*U. vesicularis* Lea, of which I have before me the two original specimens on which the species was founded, is certainly not *U. parvus*. Both these specimens are dead shells, very badly eroded and in poor condition, but they are nearer to *U. amygdalum* than any of the *Parvus* group, and probably are merely a somewhat heavy, light-brown variety of that species. *Unio singleyanus* is a smooth, shining, yellowish or waxy-brown shell, sometimes tinted and rayed with green, and very different from *U. parvus*. And *U. minor* seems to me to be more nearly related to *U. vesicularis* than to *U. parvus*, under which Mr. Call places it.

*Unio haleianus* Lea is not noticed in this revision of the *Parvus* group, although it should undoubtedly be placed with that assemblage. It is the largest of the species, one of Lea's specimens before me being  $2\frac{3}{4}$  inches long by  $1\frac{1}{2}$  high, and is nearest to *U. texensis*, but is a less heavy species.

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#### NOTES AND NEWS.

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MEXICAN LAND SHELLS.—Professor T. D. A. Cockerell has sent to me a few land shells collected at San Rafael, Jicaltepec, Vera Cruz, by Professor C. H. T. Townsend. The species are:

*Helicina flavida* Mke. Wonderfully variable in color. Some are uniform yellow with red apex; others uniform reddish; others whitish with the spire red, or whitish below, red above, while some specimens are girt with a reddish band above the periphery, on a whitish ground. The size also varies considerably.

*Glandina*? A species of the *decussatus* group, not adult.

*Volutaxis similis* Strebel. Somewhat larger than the type, alt. 7 mm.

*Praticolella griseola* Pfr.

*Praticolella ampla* Pfr. This *Helix* looks a good deal like *similis* Fér.

*Bulimulus sulphureus* Pfr. Besides the ordinary unicolorous form, there is one example with five reddish bands, the umbilical and basal continuous, those above interrupted into squarish spots at irregular intervals. This color-form has not before been noticed.—H. A. P.

MARYLAND SHELLS.—In the NAUTILUS, Vol. X, p. 23, you mention some shells not before recorded from Maryland, *inter alia*, *H. intertexta* Binn. I find, however, this is recorded from that State by Binney in his Terr. Moll. U. S., II, p. 207.—*G. K. Gude*.

MESSRS SIMPSON AND WALKER have been making a vacation journey in North Carolina and Georgia. They report the rivers too high for successful clamming.

MR. E. G. VANATTA is spending the summer at Chestertown, Md.

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#### NEW PUBLICATIONS RECEIVED.

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MR. G. K. GUDE describes a new *Corasia* from Luzon, *C. lauræ*, in *Science Gossip* for August. It is a pale-blue shell, another of the beautiful *H. reginæ* group. The following Philippine and Marianne Island Helices are figured: *Ganesella catocyrtæ*, *G. apex* with var. *apiculata*, *Endodonta quadrasi*, *Charopa fusca* and *Trochomorpha boettgeri* Mlldff. & Quadras; also *Pyramidula omalisma* "Bgt." Fagot, from near Barcelona, Spain. These species have not hitherto been figured.

I. A REVISION AND SYNONYMY OF THE PARVUS GROUP OF UNIONIDÆ. II. SECOND CONTRIBUTION TO A KNOWLEDGE OF INDIANA MOLLUSCA. III. INDIANA UNIV. BIOL. STA. REPORT ON MOLLUSCA (From Proc. Indiana Acad. Science for 1895). By R. Ellsworth Call. In the *Unio parvus* group, Professor Call recognizes four species: *U. parvus*, *U. texasensis*, *U. glans*, *U. amygdalum*. Alleged synonyms of *U. parvus* are: *U. paulus*, *minor*, *marginis*, *corvinus*, *vesicularis* of Lea and *U. singleyanus* Marsh. From this extraordinary synonymy it will be seen that our author belongs to the extreme "lumper" class. Some other points in the paper are equally ill-taken, but it is not worth while to criticise in detail where nearly everything is wrong. Six plates of characteristic, though rather crude figures, illustrate the forms.

The second and third papers continue Prof. Call's very praiseworthy efforts to record the distribution and variations of Indiana Mollusks, and do not admit of abstract here; but those interested in the detailed mapping of the areas of our species will be grateful for Call's good work in this field, as well as for the similar service he did in cataloguing Kansas shells.

# THE NAUTILUS.

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## SOME NOTES ON THE COLLECTION OF SHELLS IN THE MUSEUMS OF PARIS, BERLIN AND AMSTERDAM.

BY C. W. JOHNSON.

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The collection of shells in the Museum of Zoology, Jardin des Plantes, Paris, is one often referred to as being the only collection in which you can see the recent and fossil species side by side. One, therefore, naturally imagines what such a collection *should be*, and, as usual under such circumstances, one is somewhat disappointed. The collection is distributed as follows: Around the entire outer portion or railing of the first gallery, in a case about two feet in width, are arranged the Pelecypoda, while on the second gallery around the entire wall, in a wide, slanting case or shelf (with corals above and a series of eight drawers beneath) are arranged the Gastropoda. This necessarily scatters the collection to a great extent, and makes it very inconvenient. A collection of the recent and fossil species arranged together is very interesting and instructive, but it should be a special collection of such forms as can be readily traced back through geological time, and which anyone would consider to be the prototypes of the recent species; in other words, the primary object of such a collection should be to show the evolution of species and genera. The study of recent and fossil mollusca is now divided into well-defined specialties; no one person can cover with success more than a few closely related groups, faunæ or formations; so it seems to us that a large collection should be arranged accordingly. The paleontologist must be a geologist, also;

he cannot ignore stratigraphy; therefore, the collection most convenient to him is one arranged geologically; again, he is making a special study of the tertiary mollusca, and has, for instance, a collection of Paris Basin fossils, he would not want to travel two or three hundred linear feet, on two or three different galleries to determine his material. Neither would the collector of recent shells want to delve among the overwhelming mass of fossils to name his collection. I think that we can therefore lay aside this plan (which is advocated by many) as being entirely inconsistent with our present system of investigation. The specimens in the Museum are mounted on tablets, the recent on white and the fossil on yellow, the label being pasted on the lower edge of the tablet.

The collection of mollusca in the Museum of Natural History of Berlin, presents many features of interest. It occupies one-half of a large room, that is divided into small alcoves by tall, upright cases. All of the alcoves open into a passage-way along the side of the room, leaving three sides for the display of specimens. Each alcove is about 20 x 30 feet, and in the center of each is a long horizontal case, with drawers beneath, containing an exhibit of the land and fresh water shells of Germany, and the mollusca of the North and Mediterranean Seas. The latter are arranged longitudinally in a series, the one above the other. The conditions of the two seas being so different, the two collections form a very interesting comparison. The general collection is arranged in the upright cases in cardboard trays, above which the printed label is held by a small card holder. In the upper part of the cases are a series of enlarged drawings of the animals, radulæ, jaws, darts, etc. On top of the cases is a light iron framework, on which are hung excellent charts of the "Weichthiere," showing the anatomical features of the leading groups. Throughout the entire museum great emphasis is placed on geographical distribution. At the entrance to the rooms is a large chart of the world, each faunal region having a different color. Under each chart is a series of the labels used in the museum, the labels having a wide colored border to indicate the different faunæ. Small charts are also placed among the specimens, the areas inhabited by certain species being colored.

In the Zoological Garden at Amsterdam, are two museums of natural history. The one devoted to the fauna of the Netherlands contains a very good collection of the shells of Holland. The other occupies the second floor of a long building, extending each side



from a central hall. Around the walls of these two rooms are arranged the birds and mammals, while in the center in two longitudinal rows of table cases is a splendid collection of shells, a collection that any museum should be proud of. One can get an idea of the space occupied by the following figures: Each case was about  $2\frac{1}{2} \times 4$  feet, and of these there were 144. In hastily going over this collection, certain families and genera were represented by magnificent specimens, and seemed almost complete, the most noticeable being the Pectinidæ, Veneridæ, Cardiidæ, Crassatellidæ, etc. Among the Volutidæ and Conidæ were many of the rarer species, while the Cypraea were graced by the presence of *C. princeps* and *C. guttata*. Very interesting in showing color variation was the very large suite of *Nanina citrina*. But my time was too limited to do justice to these grand collections, and, at the time of my visit, the curators were either on vacation or absent for the day. Our readers will therefore please pardon the incompleteness of these brief descriptions.

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INFLUENCE OF ENVIRONMENT UPON THE FORM AND COLOR OF  
*HELIX ALTERNATA*.

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BY C. C. ORMSBEE, MONTPELIER, VT.

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The *Helix alternata* is one of the most abundant of the larger forms of New England land shells, and, in its distribution, it extends over nearly the whole of the United States. Yet, owing to its habits, it is not as familiar as many of the more rare species. It is seldom, if ever, seen crawling upon the ground, after the fashion of other so-called snails, but nearly, or quite, always found snugly hidden in some old log or stump, or piece of rotten wood, which, by the way, forms its food.

It is extremely nocturnal in its habits, feeding during the night and never stirring during the day time, unless disturbed, in which case it will crawl to the nearest place of concealment and resume its slumbers. It never ventures from its home except during the breeding season, and hence, when one is found, others may generally be found near by. In color the *H. alternata* is one of the most beautiful shells, being striped by alternate bands of light and dark of different shades, from which fact the common name of "tiger-snail" has been given to it.



Its favorite location is between the bark and wood of a decaying log or stump, and it always selects a cool, shady and rather moist spot. It prefers maple, elm or ash. I have never found it in connection with any of the resinous varieties of wood.

Now, different kinds of wood in decaying, form products of varying shades of color. Thus decayed maple is almost black; elm is dark brown; ash is light brown; beech is still lighter, and birch has a reddish tinge. It is no less true that the shells of the *H. alternata* differ in shade and resemble that of the wood in which they are found, and which forms a part of their food. Thus those found in maple are almost black; those in elm are dark brown; those in ash are light brown; those in beech are still lighter, and those in birch have a reddish tinge. I have shells in my collection extending through almost every gradation of color, from black to ashy-white. In some the black stripes predominate and almost obliterate the white ones. In others the black stripes are almost wholly wanting, and in a few they are replaced by reddish colored stripes, indicating in every case the nature of the hiding-place of each individual.

Again, the bark of decaying trees clings much more tightly under some conditions than under others, and this has a marked effect upon the upper surface of the shell. I have one shell which is almost as convex as the *H. albolabris*. I recollect that it was found in a cavity where its upper surface could never be touched. Another was found in a narrow crevice, where it had barely room to squeeze itself, and its upper surface is perfectly flat, and it might well be taken for a subspecies. Between these extremes every variation of angle may be found, all seeming to result from a greater or less degree of pressure. Or, rather, having been governed by the height of the crevice in which they developed.

Theoretically, the supposition may have one or two slight objections which it is not necessary to mention, but it is based upon several hundred observations, and I believe it to be correct.

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## TWO NEW PISIDIA.

BY DR. V. STERKI.

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*Pisidium pauperculum* n. sp.

Mussel of moderate size, rather oblique, moderately to rather strongly inflated; beaks slightly posterior, moderately large and prominent, rounded; scutum and scutellum slightly marked; edges

acute or acutish, not pinched; superior and inferior margins moderately curved, posterior well rounded or slightly truncated, joining the inferior without any marked angle; antero-superior margin sloping, oblique, slightly curved, meeting the inferior at an angle situated rather inferior, more distant in the adult than in younger examples; surface very finely striated, polished; color pale or yellowish to greenish-horn, sometimes whitish or straw in old specimens; shell thin, translucent; hinge moderately strong; cardinal teeth of the right valve moderately curved, its posterior end thickened, those of the left valve lamellar, almost equal, the superior rather short, slightly oblique and little curved; lateral teeth rather strong; ligament short, thin.

Long. 3·2, alt. 2·7; diam. 1·9 mill., in the average.

It has a wide geographical distribution, and is one of the most common *Pisidia*, having been seen from Massachusetts: Winchester (E. W. Roper); New York: Mohawk, Herkimer County, Erie Canal (E. W. Roper, A. Bailey, Dr. Jas. Lewis); Hudson River (R. E. C. Stearns); Pennsylvania: Philadelphia, in different waters (M. Schick); New Jersey: White Pond, dredged (Pilsbry and Rhoads); Michigan: Ann Arbor, High Island Harbor in Lake Michigan; East Saginaw, Pine Lake, dredged (Br. Walker); Grand Rapids (L. H. Streng); Wisconsin: Fox River (Geo. T. Marston); Minnesota: Clearwater and Mississippi Rivers, Heath Lake (H. E. Sargent); fossil, at White Pond, N. J. (Pilsbry and Rhoads).

Our species is one of modest appearance, and yet somewhat unique. Being so common, it has evidently been overlooked, or taken for younger specimens of some others, owing to its want of striking features; hence the name given to it. Almost always the mussel is more or less coated with a blackish or rusty substance in a rather characteristic way, especially over the beaks and upper part, even when found in company with other *Pisidia* not thus coated, so that this is a feature of the species, usually independent of the habitat. Yet sometimes all specimens in a place are found clean, e. g., those (dredged) from White Pond, New Jersey. Dead shells are of a rather characteristic plumbeous-gray color.

The species is variable, though being more constant in each place. There are marked differences in size and shape, prominence of the beaks and color. Especially notable is a form from Michigan, with less curved superior and inferior margins, the posterior end more abrupt, obliquely, so that the outline of the mussel resembles an ob-

lique parallelogram; others, from Michigan and Minnesota, are very high, the altitude equalling or even exceeding the length. Some of these local forms may prove to be true varieties.

This *Pisidium* has caused considerable trouble, correspondence and controversy for a long time. Almost two years ago it was recognized as a well-defined species, and given its present name. Then Mr. E. W. Roper obtained a type specimen of *Pis. ferrugineum* Prime, from the Museum of the Boston Society of Natural History, which he kindly sent me for comparison, and we were both satisfied at once that it was identical with the present species. Several examples, of T. Prime's own hand, also named *P. ferrugineum*, from "New York," in my collection, probably none of them mature, are of the same species. After this, the present name was suppressed, although it was evident that all these *Pisidia* were very far from being congruent, as to size and shape, with the author's description and figures of *Pis. ferrugineum*, in *Mon. Pis.* and *Mon. Corbiculadae*. Among the thousands of specimens seen from New England and New York, none could be referred to these descriptions, and so necessarily the question arose: What, and where, is the true *P. ferrugineum* of Prime? Last winter, Mr. Roper received several lots of *Pisidia* from Cambridge and Waltham, Mass., and from Maine, and obliged me by forwarding them for examination. Among them there was undoubtedly the long sought for *Pis. ferrugineum*, in every particular conforming with the author's description as well as the figures in *Mon. Pis.* (Pl. XII, figs. 8, 9, 10). Now we knew also that *Pis. pauperculum* was distinct and deserving a name of its own. The mixing up of the two species by Prime, is explained by the fact that both of them are usually covered with a dark or blackish "ferruginous" substance, in the same way, giving them the same outward appearance, the more so as in some forms or specimens of *Pis. pauperculum* the beaks are rather high and prominent, though rounded, and not "tubercular," without ridges (Conf. the figures cited above). Under the impression that they were identical, the author could say that *P. ferrugineum* was one of our most common species, while properly restricted, it seems to be rather rare.

*Pisidium scutellatum* n. sp.

Mussel of medium size, rather high, oblique, markedly protracted downward in its anterior part, well rounded, rather strongly in-

<sup>1</sup> The author himself could not be consulted, since he had given up, long ago, the study of these mussels.

flated; beaks much posterior, rather large, prominent rounded; superior margin short, little curved, or almost straight, scutum and scutellum well marked, forming projecting angles; the other margins well curved, or the posterior very slightly truncated, anterior end well rounded, or with a slight indication of an angle; surface polished, with irregular striae and some coarse lines of growth; shell thin, transparent, of a yellowish-horn to amber color, often grayish or brownish-horn in old specimens, and whitish on the beaks; nacre glassy, inner surface microscopically rugulose; hinge fine, short, cardinal teeth lamellar, the one in the right valve moderately curved, its posterior end thicker; the inferior in the left valve curved, the superior little so or almost straight; lateral teeth very short, very abrupt, pointed, thin, little projecting into the cavity of the mussel; ligament small.

Long. 4.0, alt. 3.6, diam. 2.8 mill.

Long. 3.3, alt. 2.8, diam. 2.4 mill. or less (deep water form).

The center of its distribution is in the region of the Great Lakes, where it seems to be common, especially northward, in the great and small lakes and rivers. It has been dredged from deep water in different places: Pine Lake, 5-11 meters; Lake Michigan, off New York Point, 24 meters; also taken from the stomachs of white fish of Lake Michigan. These deep water forms, almost all dead shells, were first seen among materials sent by Mr. Bryant Walker, in 1894. Later, fresh specimens in lots from different places in Michigan were sent by Mr. Bryant Walker, L. H. Streng and Geo. T. Marston; from different waters of the Mississippi drainage, in Minnesota, by Mr. H. E. Sargent. A few specimens, in two identical lots, in Br. Walker's and Roper's collections, from Shendon, Montana, at an elevation of 9000 feet, have much resemblance with our species, yet differ in some points, and it will take more materials to ascertain whether they are identical or not.

This is one of our most characteristic *Pisidia*, distinguished, beside its surface features, color and the configuration of the hinge, by its oblique shape and the much larger anterior part. This character it has in common with *Pis. virginicum* Gmel. and *walkeri*; the former of these is out of the question; the latter species is much more elongated, its beaks are much smaller, the outline is more angular, and the surface dull, from microscopic lamellae, but even.

*Pis. scutellatum* is somewhat variable: the largest specimens seen, from Orchard Lake, Mich., are 4.5 mill. long. Those from deep



water are the smallest and most inflated, and their beaks are commonly more prominent; some of them have crowded striae of growth.

New Philadelphia, O., Sept., 1896.

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ISAAC LEA DEPARTMENT.

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

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NOTES ON SOME SHELLS OF PUGET SOUND.

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[Extract from the report of Mrs. M. Drake. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

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In January, I went out to Gig Harbor, but the tides were not good and I got few shells. About seventy *Pterorhytis foliatus* were found at Point Richmond, some of them quite large with rich brown bands. We find this shell at quite low tide, clinging to the rocks in much the same way as *Purpura crispata*, and its operculum is very much like that of the *Purpura*, only it is of a deeper brown and stronger. A horn is on each one of its three wing-like varices. As it grows in strong currents, its shell is heavy and not easily broken.

I also collected (dredged) some young *Pecten hastatus* which are plain in color, and without the lovely spines of the adult. We found them attached to kelp. The young are attached to kelp by their byssus, while the larger ones are free swimming, and can move quite rapidly through the water. We take most of them in several feet of water, with a dip-net, at low tide.

We find four species of *Saxidomus*, they are *Saxidomus nuttalli*, *S. squalidus*, *S. aratus* and *S. brevisiphonaria*. As the last name indicates, that species has short siphons, and it is more rounded, shorter and has a stronger shell. I found two species of *Cardium* at Brown's Point, one being in somewhat deeper water than the other, with a rougher, heavier and plainer shell. The animal is also different. By the way, how can conchologists be sure of the differences and resemblances of closely allied shells without studying the living animals?<sup>1</sup> I am sure I could not have seen so much beauty

<sup>1</sup> Here is where we amateurs may add to the general knowledge by studying the animal in its habitat while it is yet alive.—M. B. W.



in shells had I not studied the animals in them and learned of their friends and their enemies, their food and manner of reproduction. I have also learned that when we find certain species we may expect to find there certain other species, either because both like the same conditions of life, or one may prey upon another.

*Lepeta concentrica* was one of my new finds in April. It was dredged from 100 feet of water and was clinging to stones, to which *Waldheimia pulvinata* and the eggs and young of *Placunanomia macroschisma* were also attached. *Placunanomia macroschisma* grows to a large size here, four inches across, and of a lovely green tint inside. The animal is a bright orange in color, and is good eating.

During March and April we collected several thousand of the finest *Purpura crispata* I have ever seen—pure white, orange, brown, striped and banded, smooth and foliated, huge and infantile, one can hardly tell how variously beautiful they are. I have given two entire drawers in my cabinet to them. I have one in color exactly like a violet snail.

During May we found several live *Acmæa mitra*, whose "white caps" had a most decided green color. They are larger than the southern ones. I got five shells, which were new to me, from Lemon's Beach, on the Narrows—*Eulima rutila*, a shell of rare beauty both in form and color, being pure white at the apex and bright rosy pink at the base; *Eulima falcata*, pure white and larger than *E. rutila*; *Axinea intermedia*, larger than described in west coast shells; one *Lucina*, unknown at Washington, and some fine *Semele rubroradiata* which live in the little sandy pit-holes of a hard cement reef which is bare at low tide. Here, too, we found many live *Psammobia rubroradiata*. Both kinds of these red-rayed clams, especially the latter, told us where they lived by spouting up small streams of water at intervals.

In company with a friend I went to Fort Defiance where we found *Acmæa digitalis* living in the crack of a granite rock. We found *Cryptochiton stelleri* and an unknown *Chiton*, whose shell is salmon-colored on the inside. *Cryptochiton* is very abundant here at certain times, when they come ashore to breed. We have collected several hundred of them at a place, and a month later not one was to be seen. Our largest was thirteen inches long. Most of them are brown, but some are almost white. We found them on rocks and flat on the pebbly beach at extreme low tide. We found them

quite hard to clean properly. The Indians are fond of the sole-like strip which protects the insides, and are fond of the eggs which are very numerous. These animals look so much like the rocks on which they cling, that few of the frequenters of the beach knew the animal when we showed it to them.

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NOTES AND NEWS.

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GREEN-HOUSE SHELLS.—This spring I found some *Zonites glaber* Stud. in one of the green-houses of this city. It was identified for me by Dr. W. H. Dall. *Arion hortensis* Fér. was found at the same place and identified by Mr. H. A. Pilsbry. *Zonites lucidus* Drap is found in all the green-houses of the city.

P. B. RANDOLPH, *Seattle, Washington.*

NOTE ON LEDA CAELATA HINDS.—This species was described by Hinds in the *Geology of the Voyage of the Sulphur*, p. 64, pl. 18, fig. 13, 1844, and *Proc. Zool. Soc. London* for 1843, p. 99. But Conrad had already described a fine species of *Leda* from the Claiborne sands under this specific name, in the *Am. Jour. Sci.*, Vol. XXIII, p. 343, Jan., 1833. This, in December of the same year, was renamed *brogniarti* by Lea, *Contr. to Geology*, p. 82, pl. 3, fig. 61. Consequently the species of Hinds requires a new specific name. As there is already a *L. hindsii* of Hanley, I propose to substitute for *caelata* the specific name of *taphria*, while *Leda brogniarti* Lea must retain the prior name of Conrad.—W. H. DALL.

CALLISTA VARIANS HANLEY, IN EASTERN FLORIDA.—Mr. J. J. White, of Rockledge, Fla., reports the finding of numerous specimens of this species in Lake Worth, on mud flats near the Inlet. This seems to be the first finding of this West Indian species in Florida.

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NEW PUBLICATIONS RECEIVED.

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DIAGNOSES OF NEW MOLLUSKS FROM THE SURVEY OF THE MEXICAN BOUNDARY, by W. H. Dall (*Proc. U. S. N. Mus.*, xviii, pp. 1-6). *Patula strigosa* var. *concentrata*, New Mexico; a small race, further southward than any other reported.

*Epiphragmophora arizonensis*, near Tucson, Arizona.

*Epiphragmophora hatchitana*, Hachita Grande Mt.

*Epiphragmophora arnheimi*, California.

*Polygyra chiricahuana*, Arizona.

*Polygyra mearnsii*, New Mexico.

*Holospira crossi*, *pilsbryi*, *bilamellata*, *mearnsii*, *veracruziana*, all from New Mexico and Mexico.

*Unio mitchelli* Simpson, a Texan species collected by Hon. J. D. Mitchell.

*Cerion pineria*, Isle of Pines (S. of Cuba).

LIST OF DUPLICATES OF JAPANESE SHELLS COLLECTED BY FREDERICK STEARNS (Detroit, 1896). A list for purposes of exchange, which may be obtained on application by those having shells, echinoderms, corals, etc., to offer for Japanese shells.

DIAGNOSES OF NEW TERTIARY FOSSILS FROM THE SOUTHERN UNITED STATES. By W. H. Dall (Proc. U. S. Nat. Mus., XVIII, pp. 21-46, 1895). This paper deals mainly with new or misunderstood species of Bulloid Tectibranchs, of *Terebra* and of *Conus*. A new section of *Bullina*, *Abderospira*, is proposed for a new Chipola species; and *Wakullina* is a new subgenus of Cantraine's genus *Carolia*. A general discussion of the Terebridæ of our tertiaries precedes the descriptions of new forms. The preliminary remarks under *Conus* have a vastly wider application than to the particular genus under discussion, and cut at the root of a false method in much paleontologic work of both hemispheres. We refer more especially to this paragraph. The italics are our own: "*The general rule that local faunæ are derived from pre-existing faunæ of the same general region is a good guide, and a careful comparison of the fossils with the recent types will often assist materially in determining the relations of fossil forms. The identifications which travel to distant faunæ for representatives—as, for instance, the Indo-Pacific fauna for Haitian fossils—are usually wrong,*" and all Gabb's identifications of this sort will be modified by further and more careful study. *Analogous characteristics are often purely dynamic in forms of different lineage, subjected to similar conditions, in widely separated localities. Where modern faunæ differ in the races of any genus which they contain, the antecedent fossils in the same regions are not likely to be much more nearly related.*" We have, for some years, been endeavoring to persuade our German friends of the truth of this general doctrine as applied to their tertiary land snails, but without much success thus far; so that it is peculiarly refreshing to find an acknowledged master stating the result of his broad experience in other groups, in diction so unequivocal as the above extract.

OBITUARY—B. SCHMACKER.<sup>1</sup>

A letter just received from Shanghai, China, announces the death of B. SCHMACKER, Esq., of that city, in Yokohama.

Mr. Schmacker was a most enthusiastic conchologist. It was his aim and purpose to close up all his business affairs next winter and devote the balance of his life to his shells. During his long residence in the far East he had collected extensively in China, Japan, and the islands of the coast, and had, at the time of his death, probably the finest private collection of oriental land and fresh-water shells in the world.

From time to time, as his business engagements permitted, he published papers upon various conchological topics. I can now only recall certain pamphlets upon Formosa shells, Chinese Clausiliae, Chinese Helices, and, I believe, a paper upon the Molluscan fauna of the island Hainan.

Much of his literary work was done in connection with Boettger and von Mollendorff. He told me a year ago that it was his purpose to write a comprehensive work upon Chinese land and fresh-water shells, and that it was to that end that he had made such extensive collections in China and the neighboring islands. I doubt if anyone could have been better qualified for this undertaking.

Personally, Mr. Schmacker was a most charming man. He was kindness itself, and his greatest happiness seemed to be to give others pleasure. He had a keen sense of humor, and was a most agreeable conversationalist. Unfortunately, he was somewhat deaf; but I believe it was only the disagreeable things he could not hear.

He was manager of the great German trading firm of Carlowitz & Co., of Shanghai, and was a man of some wealth.

His death will be mourned by a host of friends in Asia and Europe, and his loss will be felt by the brotherhood of conchologists all over the world.

JOHN B. HENDERSON, JR.

Bar Harbor, Me., Sept. 17, 1896.

<sup>1</sup> We take the liberty of publishing the above letter from Mr. John B. Henderson, Jr., bringing us the sad news of the death of one of the most capable of Oriental conchologists. During a short visit to Philadelphia some years ago, Mr. Schmacker became known to us; but it is not alone as an excellent conchologist, but as a man of rare and attractive personal qualities that we have valued his friendship and regret his untimely death.



# THE NAUTILUS.

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## CASCO BAY.

BY REV. HENRY W. WINKLEY.

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The two most famous collecting grounds on the coast of Maine are Eastport and Casco Bay. The writer having spent several summers at Eastport, devoted his energies this year to Casco Bay. From the city of Portland to Cape Small the distance is perhaps thirteen miles. From the mainland to the outer islands is some six miles. This area is said to contain 365 islands. A fortunate location was secured on one of the outer islands, in a central position as regards the longer axis of the Bay. The naturalists of the expedition were the writer and his two enthusiastic and constant companions Frank H. and Robert L. Winkley aged 10 and 7½ respectively. The shores are for the most part rocky, affording occasional tide pools rich in animal life. The bottom is of every variety, giving opportunity for any taste the mollusca may display. Land shells abound on the outer islands. Singularly they find a favorite home here while on the main land they are exceedingly scarce. We visited, for land shells, Eagle, Brown Cow, Jewells, inner and outer Green and Cliff Islands; on all but outer Green we obtained good results. The most curious of this group is the famous Brown Cow. In the midst of rough ledges,—an out post fronting the open sea,—this mere spot, rises with perpendicular cliffs to a height of at least fifteen feet. The approach must be made in calm weather, and at low tide. We had a half hour's visit and such a harvest! The top of the island is one half covered with grass, the other half is a clump of bushes. *Helix hor-*



*tensis* covered the leaves and branches of these bushes, the varieties being the yellow and five banded. On the ground *Pyramidula alternata*, *Polygyra albolabris* and *Succinea obliqua* were abundant. We obtained the famous wine colored variety of *P. albolabris*, and among the specimens discovered a set banded with fine lines, like *P. multilineata*. Time was precious and we collected expeditiously as the tide was coming in. We escaped from the island with a slight ducking from the surf, but happy are the results. On Green island a few specimens of *H. hortensis* were found, among them two full grown forms, which had for some reason started to grow again; extending from the finished lip was a continuation of the outer whorl, but of a dirty cream color and rough with ridges. On one of the islands Frank discovered the home of the albino *P. alternata*, a valuable prize. Shore collecting gave us a beautiful series of the various varieties of *Purpura lapillus*, and some of the specimens were the largest we have seen. We also found *Buccinum*, *Skenea planorbis*, *Turtonia minuta*, *Rissoa aculeus*, *Lacuna vineta*, and the common shore varieties. Considerable time was given to dredging in depths from seven to twenty-five fathoms. One summer is far too short to exhaust this region, but many localities were dredged with good results. A dozen to fifteen new forms were added to the cabinet, and at least fifty duplicate sets, to represent the Bay, found places in the collection. Five species of chitons were found, including *Amicula Emersonii*; a few fine specimens of *Pecten magellanicus* were dredged, among them one that had received an injury and in repairing had turned the edges of both valves upward so that they grew at right angles to the natural plane. The interesting genus *Bela* revealed a half dozen or more species, *harpularia* being the most abundant. Brachiopods were found occasionally, and sponges, shrimp, echinoderms and other invertebrates were abundant, but with much regret at not having the means to care for them they were returned to the sea. A list of results would contain all of the common forms. The more rare species included the genera *Thracia*, *Astarte*, *Nucula*, *Modiolaria*, *Crenella*, *Cylichna*, *Margarita*, *Odostomia*, *Lunatia*, *Velutina*, *Astyris* and others.

Since the above article was written I have read with much interest the article on "*Helix alternata*" by Mr. Ormsby. I do not wish to take anything from his statements, but to add one or two concerning that species. The islands of Casco Bay are good to stand a man on his head, figuratively if not literally, for he meets with circumstances

which upset his former ideas. Land shells are very scarce in the state of Maine, at least in the parts I have visited. As a rule two or three specimens of the larger species, would be all one would find after a careful search, not so, however, on the small islands. *Pyramidula alternata* occurs in great profusion. *Polygyra albolabris* and *Helix hortensis* are also abundant. *P. alternata* occurs on one island, some distance from any trees, just above high water mark, its only shelter being rocks and small raspberry bushes. In this location some two hundred, including the albino, were found. On another island it occurs in the woods but crawling on the ground, so numerous is it, that one can hardly step without crushing the shells. Furthermore it was found feeding on animal matter, dead crabs and shells left by the crows were covered with hungry individuals.

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THE SYSTEMATIC POSITION OF SPHYRADIUM ("PUPA")  
EDENTULUM Drap.

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BY DR. V. STERKI.

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For some time, it has been my opinion that this species (= *Vertigo simplex* Gld.) has not its proper place under Pupa. The shell, though Pupa-like in its general aspect, shows two marked differences from all groups of that genus as well as all Pupidæ. In the first place, its aperture is radial, while in the Pupidæ it is lateral, or tangential, from the columellar wall being prolonged to the periphery of the penultimate whorl, or even beyond it. In the second place, the peristome in Pupidæ is more or less everted, generally with a more or less distinct lip, or at least the margin is "finished up," in mature specimens, while in *edentulum* the peristome is straight and simple, and the margin always thin and sharp, as it is in *Patula*, etc., and in the *Zonitidæ*.

This view is now confirmed by the examination of the radula. The teeth are small, comparatively, and the cusps of all are very short and small. There are  $r+21$  (20) in a transverse row, and 116-127 such rows were counted. The centrals are tricuspid, the laterals all bicuspid, except the last which is a minute nodule; in the others there is no difference of laterals and marginals but that the plates of attachment become shorter towards the margins, and

evanescent in the outer teeth. The radula is 0.55 mill. long, 0.14 wide, and so one tooth measures about  $0.0045 \times 0.0035$  mill.

This is so radical a difference from the Pupidæ that our species can no longer be placed under that family. It comes nearest *Punctum pygmæum* Drap.,<sup>1</sup> the radula being of the same type, and also the jaw is of the same formation, being quite low and composed of distinct plates.

As to the generic name, *Sphyradium* Charp. 1837(=*Columella* West., *Edentulina* Cless., both 1876, teste Westerlund) must be used.

An interesting analogue is "Pupa" *neozelanica* Pfr., with much the same form of shell, which Mr. H. Suter, a few years ago, has shown to be no Pupa, but a Charopa.

It may be added that the American form is absolutely identical with the palæarctic, even showing the same wide range of variation. There is no need, then, to name it Sph. "edentulum simplex." Just so, to mention it by the way, *Punctum pygmæum* Drap. is identical on both continents, and so it is equally useless to name it *P. pygmæum minutissimum*.

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LIST, WITH NOTES, OF LAND AND FRESH WATER SHELLS COLLECTED  
BY DR. WM. H. RUSH IN URUGUAY AND ARGENTINA.

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BY HENRY A. PILSBRY AND WILLIAM H. RUSH.

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In presenting this list of land and fresh water shells from Uruguay and Argentina, perhaps it will be well to state precisely the localities at which collections were made, especially so from the Uruguay River, which region seems to have been omitted from the report of D'Orbigny. The U. S. S. Yantic, to which the writer was attached, arrived at Montevideo, Uruguay, in January, 1892. The public park, El Prado, of the city proved to be the richest region near by; the suburbs of the town were rich in *Helix lactea*, as, indeed, were many places in Uruguay and Argentina; several large tracts are preserved for the cultivation of them for the supply of the Italian markets. The Cerro, which is quite a prominent hill on a

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<sup>1</sup> In the radula of one specimen of *P. pygmæum* r+17 teeth were counted in a transverse row, r+16 in another, and 80 (78) rows were found. The laterals, except the last one or few, were bicuspid. (Conf. E. S. Morse, *Pulmonifera* of Maine, p. 27, pl. 8, fig. 71.).

small peninsula opposite the main city, and from which Montevideo, "The mount, I see," derives its name, contained nothing special, but the plain back of it yielded several land species, and the small runs and creeks many fresh water forms, in some of which, when dry, the whole bottom was found to be covered with dead *Planorbis*. Maldonado Bay is about 20 miles nearer the sea, in Uruguay, and was the only place in which the dredge was used with good results as showing the extreme southern limit of several West Indian species. Gorriti Island, in that bay, was a treasure for *H. lactea*, and was abundantly supplied with *Strophochilus lutescens* King and *Bulimulus gorritiensis* Pils. Near the small town of Maldonado, was found *Amphidoxa costellata* D'Orb. in a small grove of native trees, about the only one met with. Most of the trees of any size in the immediate neighborhood of Montevideo and Buenos Ayres, are the introduced eucalyptus. Upon the visit to Buenos Ayres, Ensenada, etc., the only thing noticeable was the extreme abundance of *Ampullaria canaliculata* Lam. and its varieties, in all stages of growth from the egg upward. The Rio Parana, upon which the ship went as far as Rosario in Santa Fé province, did not yield much, principally for the reason that the ship was there during a revolution, when excursions always have an element of danger, as all the hoodlums of the town are turned loose with Winfield rifles. It was only when the ship went up the Uruguay River as far as Paysandu that things began to be interesting, but the time was too limited. This region proved to be extremely rich in undescribed *Potamolithus*. The collecting was easy, as all that was required was to pick up any stone at extremel low water and scrape the specimens off with the right fore-finger into the collecting basket. The first visit to the water's edge at Paysandu, resulted in finding *P. Rushii* Pils., which was found to be unfigured in D'Orbigny, and so few in number that one or two trips more were taken especially to find them, but only with limited results, so it can be considered scarce. Nearly all the other forms were abundant. The means of living there are so easy that it was found a hard matter even to hire the amphibian small boy to collect *Unionidæ*. A trip, by a well-organized party, up the river to its source, would yield valuable results. Only three specimens of *Vaginulus* were found, and these among the ruins of an old hide building in Maldonado. The plain back of Buenos Ayres did not yield such an abundant supply as one would expect from D'Orbigny's remarks, but possibly that was owing to the extreme dryness of the season while we were there.



## HELICIDÆ.

*Helix aspersa* Müll. British cemetery at Buenos Ayres, Argentine Republic.

*Helix lactea* Müll. Gorriti Island, Maldonado Bay. Cultivated for food. This species was already abundant in Uruguay when d'Orbigny was there in 1826, and the date of its introduction could not then be ascertained.

*Strophocheilus oblongus* Brug. var. Fray Bentos. The apex is blunter than in typical *oblongus*, more as in *S. capillaceus* Pfr.

*Strophocheilus lutescens* King. Gorriti Island, Maldonado Bay. Originally described from Maldonado. The eggs vary in size, especially in length, measuring from 6.5 x 9.2 to 6.2 x 7.6 mm.

## BULIMULIDÆ.

*Bulimulus gorritiensis* Pils., n. sp.<sup>1</sup> Gorriti Island, Maldonado Bay, under stones.

*Bulimulus Rushii* Pils., n. sp. Montevideo, plain back of Cerro, on thistles.

## PUPIDÆ.

*Odontostomus dentatus* Wood. Montevideo, Uruguay, on thistles and close to ground, on plain back of the Cerro.

## ENDODONTIDÆ.

*Amphidoxa (Stephanoda) costellata* d'Orb. A small grove of native trees near Maldonado, Uruguay. Abundant.

## SUCCINEIDÆ.

*Omalonyx unguis* d'Orb. Locality not noted.

*Omalonyx convexa* Mart. Creek in Prado, Montevideo.

## VAGINULIDÆ.

*Vaginulus solea* d'Orb. Near Maldonado, Uruguay.

## PHYSIDÆ.

*Physa Sowerbyana* d'Orb. Creek in Prado, Montevideo.

## CHILINIDÆ.

*Chilina fluminea* Maton. San Gabriel's Island, in the Rio de la Plata, opposite Colonia, Uruguay.

*Chilina Rushii* Pilsbry, n. sp. Uruguay River, at Fray Bentos, Uruguay. Distinguished by its angular shoulder.

<sup>1</sup>See Man. Conch. (2), XI for description and figure of this and the next species. The other new forms will be described in Proc. Acad. Nat. Sci. Phila. and the next number of NAUTILUS, space being lacking in this number.



## LIMNÆIDÆ.

*Limnæa viator* d'Orb. Montevideo: creek in the Prado.

*Planorbis heloicus* d'Orb. Montevideo, back of Cerro. The typical and a large less shining form, diam. 10 mm.

*Planorbis peregrinus* d'Orb. Montevideo, back of Cerro.

*Planorbis paropseides* d'Orb. (?). Creek in Prado, Montevideo. Agrees well with d'Orbigny's description and figures, but on account of the locality may be a different species.

*Planorbis castaneonitens* Pils. & Van., n. sp. Near Maldonado.

## ANCYLIDÆ.

*Ancylus obliquus* Brod. & Sowb. San Gabriel's Island, on stones in Rio de la Plata.

The specimens vary considerable in degree of curvature of the apex, but are apparently all referable to this species, which was originally described from Chili.

## AMPULLARIIDÆ.

*Ampullaria neritoides* d'Orb. La Plata River, San Gabriel's Island, Uruguay; Uruguay River at Paysandu. Specimens with the interior pure white as well as the usual purple form.

*Ampullaria canaliculata* Lam. Rio de la Plata at Buenos Ayres, Palenno and Ensenada; Parana near Rosario and at Paraiso. The specimens vary from true *canaliculata* to the varieties *insularum* and *australis*.

*Ampullaria* sp. A small form, not determined, occurred in the creek in the Prado, Montevideo.

*Ampullaria Roissyi* d'Orb. Parana River near Rosario, Santa Fé province, Argentina.

*Ampullaria Spixii* d'Orb. Parana River near Dos Hermanos ("Two brothers") Island.

## AMNICOLIDÆ.

*Littoridina australis* d'Orb. Creek in the Prado, and in a small spring back of the Cerro, Montevideo. We follow the usual identification in this case, although not at all sure of its correctness. The larger specimens measure as much as  $8\frac{1}{2}$  mm. alt.

*Littoridina charruana* d'Orb. (?). San Gabriel's Island.

*Littoridina Isabellei* d'Orb. (?). San Gabriel's Island, with the preceding.

*Potamolithus Rushii* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus Iheringi* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus microthauma* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus Hidalgoi* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus dinochilus* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus Buschii* 'Dkr.' Ffld. Uruguay River at Paysandu, Uruguay; Rio de la Plata at San Gabriel's Island.

*Potamolithus tricostatus* Brot. Uruguay River at Paysandu, Uruguay.

*Potamolithus conicus* Brot. Uruguay River at Paysandu, Uruguay.

*Potamolithus Orbignyi* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus lapidum* d'Orb. Fray Bentos.

*Potamolithus lapidum* v. *supersulcatus* Pilsbry. Rio de la Plata at San Gabriel's Island.

*Potamolithus Sykesii* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus bisinuatus* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus bisinuatus* v. *obsoletus* Pils.

*Potamolithus gracilis* Pilsbry, n. sp. Uruguay River at Paysandu, Uruguay.

*Potamolithus gracilis* v. *viridis* Pils. Uruguay River at Fray Bentos.

#### CYRENIDÆ.

*Corbicula limosa* Maton. San Gabriel's Island.

*Corbicula coloniensis* Pilsbry, n. sp. Rio de la Plata above Colonia, Uruguay. A larger, more trigonal form than the preceding species.

*Sphærium* sp. undet. Creek in the Prado, Montevideo.

*Pisidium* sp. undet. " " " "

*Pisidium* sp. undet. " " " "

#### UNIONIDÆ.

*Unio parallelopipedon* Lea. Rio de la Plata at Colonia, Uruguay.

*Unio charruana* d'Orb. Lake Potrero, near Maldonado, Uruguay.

*Unio variabilis* Maton. Uruguay River at Fray Bentos.

*Unio peræformis* Lea. Rio de la Plata at Colonia. The rugæ on the posterior slope mentioned by Lea as perhaps inconstant, are present in the specimens collected.

## MUTELIDÆ.

*Monocondylæa Pazii* Lea. Colonia, Uruguay.

*Monocondylæa lentiformis* Lea. Colonia, Uruguay.

*Glabaris siriones* d'Orb. Rio San Carlos, Uruguay.

*Glabaris latomarginatus* Lea var. *felix* Pils. Colonia, Uruguay.

*Glabaris rubicunda* Lea. La Plata River at Colonia, Uruguay ; Uruguay River, Paysandu.

*Glabaris lucidus* d'Orb. La Plata River at Colonia, Uruguay.

*Glabaris trapesialis* var. *cygneiformis* Pils. Pond and a small creek near Maldonado.

*Glabaris trapesialis* var. *exoticus* Lam.

*Anodonta exotica* Lam. An. s. Vert., vi, 1819, p. 87 ; Delessert, Rec. de Coq., pl. 13, f. 1 (figure of type).

*Anodon scriptus* "Fer." Sowb., Conch. Icon., pl. 4, f. 9 (1867).

It is narrower than *G. trapesialis*, long, the anterior end very narrow, angled at end of hinge-line ; posterior muscle-scar quite near the sinus at edge of hinge ligament, connected therewith by a short impression.

Rio San Carlos, Uruguay. Rather small specimens, but agreeing with the figure of type in Delessert's Recueil.

*Glabaris Forbesianus* Lea. Rio de la Plata, Colonia, Uruguay. Lea's figure was from a deformed shell, and the specimens would hardly have been recognized as *Forbesianus* had it not been for the kindness of Mr. Simpson, who compared with the types.

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 ISAAC LEA DEPARTMENT.
 

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

Members of our Chapter will please bear in mind the fact that the annual reports are due in December. We anticipate some fine papers this year as our members have been enthusiastic in their study of shells.

Yearly dues are payable in December, and promptness in this respect will be appreciated by the officers of the Chapter.

The annual election of officers occurs on the last Wednesday in December. Officers to be elected are the President and General Secretary. Write the names of your choice for these two officers, and send them to the General Secretary. The present incumbent for the last named office declines re-election, and would suggest that the office be filled by a member east of the Rocky Mountains.

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**EXTRACT FROM A NOTE BOOK.**

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[Extract from the report of Mrs. M. F. Bradshaw. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

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A pleasant ride through beds of wild flowers, sweeping miles of barley, or golden avenues of mustard, brought us to the seashore at Newport, Orange County, California. Here begins a peninsula of several miles in length, and in width but a narrow strip of sand, formed by the bay, into which empties the Santa Ana River. Our destination was down this strip some three miles from the little town.

The road was on the bay side, and low sand dunes, covered with wild flowers we had never seen before, lay on one side, on the other the muddy shores of the bay, literally covered with *Cerithidea californica*.

In the afternoon we drove down the hard beach on the ocean side of this narrow peninsula for a mile or more, then crossed over the low dunes to a little "lake" made by the receding tide leaving the sand, or rather mud, dry all around this little depression. Here was our hunting ground. We proceeded to dig in the mud for live shells and, to my surprise, brought out not only clams and scallops but Naticas and Muricidæ. And here I found my first *Nassa tegula*. While *Cerethidea* laid high and dry and apparently dead, acres and miles of them, the Nassas kept under the edge of the water, walked about quite lively, and when disturbed went quickly down into the soft mud and out of sight.

*Chorus belcheri* had been taken out of that pond in numbers, but M. S. had exhausted the supply before we came. There were a

dozen or more *Pteronotus festivus*, about three inches long, and they were in the bottom of the pond, under two or three feet of water.

*Monoceros engonatum* and *Conus californicus* were raked out of the mud near the edge, though not in great numbers.

I had always thought Muricidæ were rock shells, and I wonder what they were doing here in this vile mud. *Conus* I have found in pools among the rocks, but only one in a place and never but four.

Which is their home, the muddy bottom of a bay, or the clear pure pools among the rocks? I confess to being disappointed in the creatures I found living in such a degraded way. Yet they had beauty of color and of form; perhaps are more pleasing than the same number of the prettiest shells I could select from those I got among the rocks.

*Crepidula rugosa* was there in great numbers, built into towers and knots upon some old valve of a *Pecten*, or even upon an old shell of their own kind. They are not a very dignified mollusk, but I had never found any alive before, so was glad to find them and learn their mode of co-operative house-keeping, of which I was in ignorance. Doubtless every shell friend I have knew this habit of the *Crepidula*, knew it so well as never to think of mentioning it, though freely giving me the shells.

\* \* \* A friend has awakened my interest in "strays," so I will mention two which came under my observation on this trip. One was a *Fusus*, three or more inches long, which Mr. S. picked up on the ocean beach near the wharf. It was yellow but had been white, I think.

The other was a large *Arca*, which a lady who lives where we were stopping picked up on the bay shore. It was dead, but the two valves lay close together; was quite perfect but the epidermis was all worn away. It measured  $8\frac{1}{2}$  inches in circumference one way, and nine inches the other way, and the straight hinge line was 2 inches. I have nothing like it, so do not know its name. This lady had lived there for years but had never found any other like it. She was quite ignorant of habitat, so had no idea she had found anything of peculiar interest.

At Arch Beach I have found two or three small *Arca* valves among the drift, and this past summer found one valve about an inch long, which is similar to an *Arca fasciata* from Australia.



*Pecten hastatus* is now occasionally found at Newport, on the ocean beach. All I have seen are far more brilliant in color than those from Puget Sound. They are the richest shades of rose pink and crimson, both valves alike or nearly so.

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### SOME LAND SHELLS OF MICHIGAN.

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[Extract from the Report of Mr. H. Smith. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

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I live on the bank of the St. Joseph River, about 25 miles from Lake Michigan. I find here *Helix thyroides* Say, *Helix elevata* Say, *H. multilineata* Say, *H. leai* Ward, *H. hirsuta* Say, *Patula solitaria* Say, *P. alternata* Say, *Pupa armifera* Say, *Planorbis trivolvis* Say, *P. bicarinatus* Say, *P. exacutus* Say, *Succinea ovalis* Gould, *Selenites concavus* Say, *Campeloma integra* Say, *Hyalina electrina* Gould, *Pomatiopsis cincinnatiensis* Lea. I am indebted to Prof. Pilsbry for aid and encouragement. He identified a good many of my shells for me, and advised me where to get literature on the subject. Prof. Keep also helped me and sent me some specimens.

I found what might be called a "colony" of *Patula alternata* on a big stone pile, they seemed very plentiful at that place, and I did not see them anywhere else. The stone pile is gone now, and I shall have to look elsewhere for the pretty shells. The *Helix elevata* I found in a colony on the steep river bank, under the bushes among the leaves.

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### ODOR OF SNAILS.

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It may not be known to every conchologist, that some of the Helices have odors peculiar to them.

We find here, *Mesodon ptychophorus*, *Patula strigosa*, *P. solitaria*, *Triodopsis mullanii* var. *olneyæ* in the same locality. The *Patula solitaria* has so strong an odor, like *Mephitis mephitis*, that I supposed at first they fed on *Ictodes (Symplocarpus) fetidus*. Always the same odor and at all seasons.—MARY P. OLNEY.

# THE NAUTILUS.

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## PURPURA LAPILLUS, VAR. IMBRICATA.

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BY R. E. C. STEARNS.

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Nearly sixty years ago I detected in the interstices between the granite blocks that formed the seawall on the outside of Harrison Avenue in Boston, where said highway touches the waters of the South Cove in the immediate vicinity of the South Boston bridge (as it then existed), numerous specimens of *Purpura lapillus*; the entire surface of all the specimens was evenly and beautifully imbricated, and the specimens were of a dingy white color.

Here was a colony quite distinct in sculpture from the usual examples, as seen at numerous places along the coast in the neighborhood of Boston. I compared them at the time with the series of this species, as exhibited in the table cases of the Boston Society of Natural History; at that date the museum of said society contained no examples with the above sculpture characteristics, nor have I seen any since among the hundreds of specimens I have collected and handled. I made pen and ink drawings at the time, but both shells and drawings have long since passed from view and went, perhaps, to what Mr. Mantalini called the "demnition bow-wows." It is not at all uncommon to find *P. lapillus*, its varieties and allied forms, imbricated, more or less, but the specimens referred to and contained in my museum when I was a boy, were closely and evenly imbricated throughout, over the entire surface.

NOTES ON NEW SPECIES OF AMNICOLIDÆ COLLECTED BY DR. RUSH  
IN URUGUAY.

BY H. A. PILSBRY.

Full descriptions of the new forms collected by Dr. Rush will appear as soon as illustrations can be prepared. Meantime, the following notes on the Amnicoline species may be of service.

The South American fresh water Hydrobioids fall into three or four genera: POTAMOPYRGUS Stimpson, apparently confined to the extreme northern border of the continent, and perhaps to be regarded as a straggler from the Antillean and Middle American fauna. LITTORIDINA Eydoux & Souleyet, a characteristic South American genus of slender, acute shells, usually called "*Paludetrina*," "*Hydrobia*" or *Heleobia* Stimp. LYRODES Doering, possibly a group subordinate to *Potamopyrgus*. LITHOGLYPHUS of authors, stout of figure, thick and strong, the American forms with the lip expanded or having an external varix, or contracted by a callous deposit within the posterior angle in fully adult examples. These seem to me to differ conchologically from the European types sufficiently to call for generic distinction, and the new term

POTAMOLITHUS

may be applied to them. Type *P. Rushii*.

The genus *Cochliopa* Stimpson, with two Central American species, *C. Rowelli* Tryon and *C. Tryoniana* Pils., is like *Potamolithus* in the solidity of the shell, but it is heliciform and umbilicated. *Lacunopsis* and *Jullienia*, two Cambodian genera, are evidently near akin to the South American *Potamolithus* (see Journ. de Conchyl. 1881, p. 1).

The peculiarly striking modifications of the species of this genus are scarcely paralleled in recent fresh water prosobranchs outside of Lakes Tanganyika or Baikal. They cannot well be appreciated without the aid of figures, which the writer intends publishing as soon as practicable. Until then, the species may be discriminated by the following diagnoses, which for more ready reference have been cast into the form of a key. The characters of previously known species are much abridged.

- I. Columella with a longitudinal groove or pit; outer lip with a strong varix.

a. Depressed ; periphery with a strong, cord-like keel ; back of body whorl gibbous below suture ; umbilical area moderate or large, bounded by a keel. Alt. 5.2, diam. 6 mm.

P. RUSHII n. sp.

aa. Globose, without keels ; periphery rounded ; no ridge or hump on the back ; umbilical area small, with angular edge ; yellowish or olivaceous-brown, unicolorated or with subsutural and superperipheral green bands. Alt. 5, diam. 5.4 mm.

P. HIERINGI n. sp.

## II. No groove on face of the columella.

a. With 5 or 6 spiral keels, all, or the upper two with acute tubercles ; operculum with several whorls. Alt. 8-9, diam. 10 mm.

P. MULTICARINATUS Mill.

aa. Shell carinated or angulate, without tubercles.

b. Peripheral keel visible on the penultimate as well as the last whorl ; lip expanded or varixed.

c. Trochoidal, with acutely, straightly conic spire, compressed median peripheral keel, a small subsutural carina, and a basal keel defining a very large umbilical tract. Aperture much contracted, the lip varix very high, recurved above periphery, the highest point of recurved lobe connected with lip-edge by a short oblique rib. Alt. 5.2, diam. 6 mm.

P. MICROTHAUMA n. sp.

cc. Trochoidal, with high conic spire and flattened base and acute peripheral keel ; surface smooth above and below the keel, whorls flat above, the base slightly convex ; umbilical area very narrow, inconspicuous ; lip varix narrow, near the lip edge. Alt. 5, diam. 5 mm.

P. HIDALGOI n. sp.

ccc. Elevated turbinate, with an acute peripheral keel, convex above and below it ; lip expanded. Alt. 5, diam. 5 mm.

P. PERISTOMATUS Orb.

bb. Peripheral keel or angle concealed on the penultimate whorl.

c. Lip varix very strong, recurved above ; periphery hardly angular, base convex, back of body whorl with a spiral rib below the suture ; aperture much contracted ; no columellar area defined. Alt. 5, diam. 5½ mm.

P. DINOCHILUS n. sp.

- cc.* Varix, expansion or contraction of the lip rather weak or inconspicuous.
- d.* Keeled or angular at the basal periphery, rounded or flattened above the keel.
- e.* Columella wide and heavy; alt. 4·6, diam. 4·4 mm. *P. BUSCHII* 'Dkr.' Ffld.
- ee.* Columella narrow; alt. 4·3, diam. 3·2 mm. *P. CONICUS* Brot.
- dd.* Body whorl squarish, the angles rounded; columella rather wide; umbilical crescent defined by a carina; lip with a narrow varix. Alt. 5, diam. 4½ mm.
- P. ORBIGNYI* n. sp.
- ddd.* A carina at the basal periphery, and two approximate keels on the back above.
- P. TRICOSTATUS* Brot.
- dddd.* Periphery and base well rounded; a wide shallow sulcus or two low carinæ on the back above. Alt. 5·5, diam. 4·8 mm.
- P. LAPIDUM SUPERSULCATUS* n. v.
- aaa.* Whorls rounded, without spiral keels, angles or sulci.
- b.* Globose or globose-conic; peristome not nicked or sinuous.
- c.* Not banded; last whorl rounded; aperture slightly contracted *P. LAPIDUM* Orb.
- cc.* 3-banded: lip and columella thin.
- P. PETITIANUS* Orb.
- bb.* Ovate, the outer or basal lip sinuous or nicked.
- c.* Outer lip expanded or flaring, its face thickened, with two or three nicks or sinuses. Alt. 5, diam. 4·3 mm. *P. SYKESII* n. sp.
- cc.* Outer lip thin, unexpanded.
- d.* Outer lip produced in a broad tongue or lobe, a deep rounded sinus above and below. Alt 5, diam. 4 mm.
- P. BISINUATUS* n. sp.
- dd.* Similar, but the upper sinus obsolete.
- P. BISINUATUS OBSOLETUS* n. v.
- ddd.* Much more slender; outer lip retracted at insertion above, sinused at base. Alt. 4·6, diam. 3·1 mm, *P. GRACILIS* n. sp.



dddd. Similar, but with a rounded sinus in the outer lip above; green.

*P. GRACILIS VIRIDIS* n. v.

The operculum of *P. multicarinatus* Miller has more whorls than those of the other species, and may eventually be placed in a new genus.

*P. bisinuatus* might be regarded as an immature stage of *P. Sykesii* were it not that until the lip expansion of the latter is fully developed no trace of sinuation occurs, the sinuses being developed in the thickened margin beyond the expansion.

The variety of *P. lapidum* described and figured by Strobel (Mater. Malac. Argent.) from a single shell, does not seem to have sufficiently tangible characters for recognition as distinct from typical *lapidum*.

*P. dinochilus* closely resembles *P. microthauma* in characters of the lip varix and aperture, and it may possibly prove to be a form of that species when extensive series of each are collected; but the other features of the shells are so strikingly different and so constant in the series before me, that their union would not be justified with present knowledge.

Certain forms of *P. Bushii* have two weak keels on the back and offer an approach to *P. tricostatus*, and the two may prove to be specifically the same, although proof is lacking that this is the case. In *P. Bushii* the keels or sulcus on the back are weaker when present, the umbilical crescent is larger and angular, and the form less elevated.<sup>1</sup>

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<sup>1</sup>Since the above table has been in type, I have received Mr. E. R. Sykes' notes on certain species which he was so kind as to compare at my request, with d'Orbigny's types in the B. M. "*Potamolithus lapidum*. Compared with the typical series your shells differ a bit in the aperture being somewhat pyriform, while those of the museum series are more rounded. Still they are, I think, the same species. There is only one tablet, and this contains one of your variety [*supersulcatus*] mingled with the rest, as also one specimen which is not the same species but may be *Petitiana*."

"*P. Sykesii*. I think that this is only a form of *Petitiana*; there are however only two specimens, both immature, of this last species in the museum." [I had supposed d'Orbigny's shells were mature, and therefore separated *Sykesii* on the ground of its peculiar peristome. It remains to be seen whether adult *Petitiana* will prove to have the same characters, but I agree with Mr. Sykes that it is likely].

*P. gracilis*. This is distinct from *picium*, which is a thinner and slighter-built species, [and does not show the same apertural characters.]

DESCRIPTIONS OF SOME NEW SHELLS FROM THE NEW HEBRIDES  
 ARCHIPELAGO.

BY C. F. ANCEY.

*Endodonta* (?) *tenuiscripta* Anc.

Shell much depressed, lenticular, very sharply keeled at the periphery, thin, not much shining, of a somewhat silky appearance, openly but very widely umbilicated. Spire convex, apex obtuse, with 5 regularly and slowly increasing whorls, barely convex and furnished with a linear and appressed suture, the last one slightly impressed above and below the very acute keel, slightly convex above, more so beneath. Umbilicus circular, exhibiting all the volution ( $1\frac{1}{2}$  mill. wide), surrounded by a very obtuse angle. Aperture rather oblique, securiform, somewhat sinuous, very much angular at the end of the carina, not deflexed in front. Margins distant scarcely connected by a very thin shining deposit. Sculpture very fine, consisting of oblique and very fine crowded lines of growth. Color fulvous, with numerous fine and irregular stripes of a brown tint, larger on the last whorl.

Greater diam.  $6\frac{1}{2}$ , less. 6, height 3 mill.

Island of Mallicolo, New Hebrides (E. L. Layard).

This shell is evidently related to my *Patula Glissoni*, described several years ago from the same group of islands. According to Mr. Pilsbry's new arrangement, this should perhaps be rightly located in *Endodonta* with the species now considered, unless it may eventually prove to belong to *Flammulina*. *E. tenuiscripta* is a very beautiful little shell, recalling the Hawaiian *E. lamellosa* which is very much like it, but wanting internal laminae. It looks like a small *Trochomorpha* and especially *Pararhytida* on a very small scale, but is perhaps nearer to Crosse's *Helix trichocoma*, from New Caledonia.

From its ally, *Patula Glissoni*, found in the island of Vate, New Hebrides, it may be easily distinguished from its larger size, much more acute keel, different style of color, planulate whorls and other differences.

*Melania vatensis* Anc.

Shell imperforate, turritid, somewhat shining, rather solid, fulvous with irregular and more or less interrupted longitudinal brown stripes and dots and lighter suture on the two last whorls. Ground color frequently more obscure at the base. Spire long, pointed,

entire, conic, with very regular outlines. Whorls 12-13, convex, regularly increasing, furnished with small warts, becoming obsolete at the base of each whorl and disappearing on the two last ones and sculptured with fine incised spiral sulci more crowded towards the base of the shell. Suture impressed, canaliculate on the last volutions. Body whorl broadly oval, rounded, often more convex below its middle. Aperture oval, angular above, not much effuse nor oblique, scarcely sinuous, livid within. Columellar edge thick, regularly arched. Operculum as usual in the genus.

Long. 30, breadth 10, height of aperture 9 mill.

Island of Vate, New Hebrides (E. L. Layard).

This has been submitted for identification to Dr. A. Brot, the regretted author of many papers on *Melanians* and he wrote me that he received the same shell from Dr. W. D. Hartman under the erroneous name of *Melania mariei* Gass. He was unacquainted with the shell from Vate and thought it may prove to be an undescribed species, so that I venture to give a name to it, under Dr. Brot's undisputed authority.

*Neritina coccinea* Anc.

Shell solid, oblong, not shining, reddish-yellow, without markings, tinged with orange near the aperture, finely striated, not spirally sculptured, convex but not globose. Spire distinct, obtuse, lateral, entire, consisting of two whorls only, very rapidly increasing, the last one very large, transversely oval. Suture linear. Aperture oblique, with the superior edge long and elliptical connected with the basal by a large flat and thick callosity of a dull whitish or livid color. Margins not remote. Outer margin acute. Septal area without teeth. Operculum red, thin.

Diam.  $6\frac{1}{2}$ , height 5, do. of aperture  $4\frac{1}{2}$  mill.

Island of Vate, New Hebrides (E. L. Layard).

This very pretty little species is quite different from any one I know of. It may perhaps be allied to Pease's *rubida*, from Tahiti, but is very much larger.

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#### NEW AMERICAN UNIO.

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BY WM. A. MARSH, ALEDO, MERCER CO., ILLINOIS.

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*Unio Askewi*, new species.

Shell smooth, subrotund, somewhat inflated, inequilateral; sides slightly constricted, rounded before, subtruncate posteriorly, with

or without rays, rays obscured. Substance of the shell thick and solid; beaks small, with a few rather coarse, concentric undulations; ligament rather long and dark brown; epidermis reddish-brown; growth lines rather coarse and slightly raised; umbonial slope obtusely angular; posterior slope angular, with a raised ridge from beaks to posterior end, slightly biangulated; cardinal teeth large, erect, compressed and corrugate; lateral teeth short and slightly curved; anterior cicatrices distinct and deep; posterior cicatrices distinct; cavity of the shell deep; cavity of the beaks moderately deep; nacre white or rose-color; soft parts unknown.

Habitat: Village Creek, Hardin Co., Texas; Sabine River, Texas.

This shell seems to be between *U. beadleianus* Lea and *U. chickasawhensis* Lea, and bears some resemblance to *U. chunii* Lea. It is more triangular than *U. beadleianus*, and more solid, with a different epidermis and teeth; it is much more inflated and more angular posteriorly than *chickasawhensis*, and it differs in being less heavy in the beaks and in the outline of the shell.

One specimen was received many years ago from Mr. A. G. Wetherby, from Village Creek, Hardin Co., Texas, and many specimens, lately, from Mr. H. G. Askew, of Austin, Texas, who is an earnest worker in this family of shells, and in whose honor I name this shell.

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#### ISAAC LEA DEPARTMENT.

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

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Kindly bear in mind the fact that this is the month when our reports are due, also annual dues and election of officers, as noted in the November issue of THE NAUTILUS. The tardiness of some of our members in reporting last year delayed the issue of our volume of Transactions. Some of our members are always prompt in reporting, and the General Secretary appreciates their readiness to conform with the rules of the Chapter.

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[From the report of Miss Nelson. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

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My interest in shells dates as far back as I can remember, when my brother and I played on the banks of the stream at our old



home, and gathered a good many varieties of fresh-water and land shells which I have always kept.

Ill-health has prevented my doing much collecting the past year, and my attempted exchanges have been unfortunate in almost every case. However, I do not consider a "collection" the most important part of *any* study, though I must confess it adds pleasure to it. Last July I very much enjoyed the class in conchology taught by Mrs. Shepard, and found profit also.

I spent one afternoon capturing what mollusks I could besiege in their homes in the sand and mud at the mouth of the river above Alamitos, stopping long enough at "Devil's Gate" to waylay with a hatchet a few of the inhabitants of the soft rock, such as *Pholadidea penita* Conr., and *Platyodon cancellatus* Conr. *Nassa tegula* Rve., *Cerithidea sacrata* Gld. were enjoying a promenade on the mud, and it seemed a pity to end their happiness, unless I accept the belief of Agassiz, Cuvier and others in the immortality of animals.

I noticed a good many small holes in the sand, some with little mounds around them, like those made in the earth by some of the insect world, and, I found, on excavating them, that some of my little molluscan friends were at the bottom of the contrivance for breathing. I brought to light *Donax flexuosus* Gld., *Liocardium substriatum*, *Lyonsia californica* Conr. and *Heterodonax bimaculatus* D'Orb.

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#### HENRY D. VAN NOSTRAND.

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It is with regret that we record the death of Mr. Henry D. Van Nostrand, which occurred at his residence in Glen Ridge, N. J., on the morning of the 8th of October.

Mr. Van Nostrand was born in New York City about 73 years ago, and was long actively engaged there in mercantile business as a member of the firm of J. & H. Van Nostrand, wholesale grocers, which was founded near the beginning of the present century by his father.

Early in life he became interested in the study of conchology, and began a collection of shells which will rank with some of the best private collections in the country. The nucleus of it was that of the late John A. Redfield, which he purchased from Mr. Redfield about 40 years ago.



Until within a few years, Mr. Van Nostrand resided at Greenville, near Jersey City, N. J., where he was a prominent and highly esteemed citizen. There, in his beautiful and hospitable home on the shore of New York Bay, he entertained many noted conchologists, including the great collector, Hugh Cuming.

He was one of the earliest members of the New York Lyceum of Natural History, and among his intimate associates were Messrs. Redfield, W. G. Binney, Robt. Swift, Wheatley and Haines, but his closest friend was the late Thomas Bland, for whom he had a most affectionate regard which was reciprocated by that distinguished naturalist. After the death of Mr. Bland, Mr. Van Nostrand raised a fund to provide for the monument which now marks his grave in Greenwood Cemetery, Brooklyn, near that of Mr. Redfield. He frequently expressed to the writer his affection for the memory of his deceased friend, and only a short while before his death planned a visit to Mr. Bland's grave, which he was not able to carry out.

Mr. Van Nostrand's cabinet is rich in many families, both marine and terrestrial, particularly so in cones, olives, volutes, cypræas and mitras. It also contains the larger and better portion of the Bland collection of West Indian land shells, the labels of which are in the hand-writing of Mr. Bland. It also contains many choice specimens obtained from the Perry Expedition. It is to be regretted that Mr. Van Nostrand made no provision for the disposition of this truly valuable collection which should adorn some one of our great public institutions. Several species of shells have been named in his honor, among them *Helix Van Nostrandi* Bland, of our southern States.

A gentleman of the old school, a kind and generous friend, he will be missed and his memory cherished by those whose good fortune it was to know him.—S. RAYMOND ROBERTS.

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[COMMUNICATED.]

**THE AMERICAN ASSOCIATION OF CONCHOLOGISTS.**

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A number of representative members of the American Association of Conchologists in various parts of the country, having expressed their desire to renew the activity of the Association, the initiative was taken by a gentleman of Philadelphia, not a former officer,

who invited several of his brother conchologists to meet at his board to discuss the outlook.

As some readers are not aware of the circumstances, it may be well to state that the Association was originated in 1890, for the purpose of encouraging and advancing conchological study in America by concerted effort and mutual assistance. It rapidly attained a much larger membership than its originators had anticipated; and the correspondence of the President and other officers became so large as to be a serious burden. Moreover, the original articles or "constitution" stated that there were to be no membership dues, so that the expense to the officers named for postage, etc., was not inconsiderable.

Although the pages of the NAUTILUS were freely used for Association communications, it was found necessary to print lists of the members, their addresses and specialties, for general use. This expense was met by the officers on the first occasion, and the second list was printed by generous subscriptions from various members throughout the country.

These conditions, together with business engagements and ill health which prevented the first President of the Association from continuing to give his time in the generous measure required, led to the present inactive condition of the Association.

So much for the past. With these conditions in view, it was the unanimous judgment of the assembled conchologists that "Rule 3" of the former by-laws should be stricken out; and an annual membership fee of (say) \$1.00 be fixed, to defray expenses of the Association, such as postage, printing of Reports, to contain lists of members, Treasurers' statements, and information useful to the membership at large.

Should this meet with the approval of the members, it will be necessary to elect a Treasurer, not originally provided for by the rules. It is believed that these modifications, by providing ample means for communication between members, will lead to a renewed and healthy growth of the Association.

All members of the Association are requested to consider the conditions above set forth, and freely submit their views thereon to the Secretary, (Charles W. Johnson, Wagner Free Institute of Science, Philadelphia), who will report the same at a meeting of the Association to be held at the call of the officers, date to be announced hereafter, to pass upon these amendments to the Rules. It is desired

that such communications be sent before the 20th of the present month.

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NOTES AND NEWS.

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CHOANOPOMA (CTENOPOMA) BAHAMENSE SHUTT. AT KEY WEST.—When at Key West, some years ago, Dr. Wm. H. Rush, U. S. N., collected specimens of a small land operculate which he found living with *Chondropoma dentatum*. The species proves to be *C. bahamense*, described from the island of New Providence. Compared with specimens from that locality, the Key West shells are smaller—alt. 8–9, diameter  $4\frac{1}{2}$ –5 mm.—but identical in sculpture and form. It is a light, fleshy-yellowish shell, with quite indistinct narrow interrupted bands of well-separated brownish dots, closely longitudinally ribbed, but not latticed, having no fine spiral sculpture, only coarse, very low revolving sculpture, hardly visible on most specimens except around the umbilicus. The lip is flat and there is a little reflexed “hood” above the upper angle of aperture in fully mature shells. Operculum calcareous, with tangential lamellæ. It is easily separated from *C. dentatum* by the lack of decussated sculpture. This is a species new to the United States fauna.

—H. A. P.

LIMNÆA BULIMOIDES LEA RESISTING DROUGHT.—Specimens of a very short-spined form of this species were lately received from Mr. Geo. H. Clapp, with the following note: “They were collected by my cousin, Geo. H. Pepper, from a water-hole that appeared to be dry most of the year, near Farmington, New Mexico, on September 20, 1896, and reached me, packed in cotton, on October 5. On the 4th of this month (November) I dropped them into warm water to soak them loose from the cotton, and about two dozen out of 50 or more came to life. They had been *out of water 45 days!* The shells spend nearly as much time out of the water as in it, frequently crawling to the top of the glass in which I keep them.” Out of 4 specimens sent alive, packed in dry cotton, one revived at once upon being placed in water, after an additional journey, dry, from the 6th to the 9th of November. The survivor has a translucent or almost water-colored body, closely peppered with opaque white; eyes black; tentacles opaque white; a dark stripe on back starting between tentacles. With the Limnæas were some of the little bi-valve Phyllopod crustacean, *Estheria mexicana* Claus.—H. A. P.

# THE NAUTILUS.

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## TO CONCHOLOGISTS.

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“The night is starry and cold, my friend,  
And the New Year bright and bold, my friend,  
Comes up to take his own.”

NINETY-SIX has rolled by, and with it THE NAUTILUS almost completes another volume. We had hoped to tell you at this festal season that conditions were becoming more favorable for the development of the NAUTILUS in northern latitudes. The NAUTILUS is all right in deep water, but the cold winter winds of adversity seem to be too much for it, and by April it is usually ashore and pretty well broken up. The editors come to its rescue, and with paper sails, on which there is a little printing, writing and a few figures, start it again on its yearly voyage. But the editors are getting tired of furnishing sails. We don't mind putting them on—in fact, we'll do all the work cheerfully, only give us the material.

We are not asking for a gift, but merely suggesting to you that to pay the price of a year's subscription, now due, is not only a reasonable action on your part, but a positively meritorious one as well.

Our editorial of last January seems to have been taken as a joke, judging by the results in hard cash. We do assure you, friends, “this is no joke.” THE NAUTILUS *is ashore now*. Are you going to help it out of the breakers? Is the tenth voyage to be the last? It depends upon you.

We wish you all a Happy New Year.

H. A. P. & C. W. J.

## NOTES ON THE LAND SHELLS OF QUEBEC CITY AND DISTRICT.

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 BY A. W. HANHAM.
 

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In this district the Isle d'Orleans may be considered the only rich collecting ground in species; all the following, with one or two exceptions, having been taken there, while many of the small species have not been observed elsewhere. The other good localities in the district are: St. Joseph's (deLevis) for *Vitrina*, *Vallonia*, and *Vertigo*; St. Romauld's for *Polygyra* and *Vertigo*; the Plains of Abraham for the introduced *Helices*, ribbed *Vallonia*, and *Pupa armifera* Say, and a ravine off the River St. Charles, near the city, for *Vitrina*, some of the *Zonites* and *Succinea*.

It may be stated here that the Isle d'Orleans lies in the St. Lawrence, about five miles below the city. The island is twenty-one miles long by one or two broad, and during the summer months there is a regular ferry service; only a few miles of the end nearest the landing have been worked.

On May 25, 1893, the day after my return from Barachois, Gaspé, I distributed nearly fifty young *H. hortensis* L. (from a quarter- to a half-grown) along the top of the cliff bordering the Plains of Abraham; this is where both *H. cantiana* Mont. and *H. rufescens* Penn. seem to thrive. On July 29 I noticed two full-grown specimens, both the plain yellow form, and, on September 15, another, this one banded. I see no reason why this locality and climate should not suit *H. hortensis* L., as it has, without doubt, the other introduced species. I have a record of this *Helix* being taken as far as far up the St. Lawrence as Little Métis.

*Selenites concava* Say. Local, throughout the district.

*Limax agrestis* Müll. Common.

*Limax campestris* Binn. Rather local.

*Limax* sp. Rare; in two or three places only (Lake Beauport and Isle d'Orleans).

*Vitrina limpida* Gould. Taken in three localities only: abundant under cliff close to the St. Lawrence River at St. Joseph's; a small colony near St. Romauld's, and some fine ones from the banks of creek running into the river at St. Charles.

*Zonites cellarius* Müll. In drift on Isle d'Orleans, and a few up the St. Charles River. None living, but many shells containing the animal.



*Zonites nitidus* Müll. Quite rare, a few from banks of creek, St. Charles River.

*Zonites arboreus* Say. Plentiful, but not often in good condition.

*Zonites radiatulus* Alder. Plentiful.

*Zonites binneyanus* Morse. Well-distributed, but never abundant.

*Zonites ferreus* Morse. Both rare and local.

*Zonites exiguus* Stimpson. Woods, Isle d'Orleans, very abundant.

*Zonites fulvus* Drap. Fairly abundant.

*Zonites multidentatus* Binn. Isle d'Orleans only; rare.

*Tebennophorus caroliniensis* Bosc. Occasional.

*Pyramidula alternata* Say. Widely distributed, but only common on side of cliff, Isle d'Orleans.

*Pyramidula striatella* Anth. Common everywhere.

*Pyramidula asteriscus* Morse. Plentiful in a piece of swampy wood, Isle d'Orleans, area of distribution very limited, and no trace elsewhere in district. I got a good supply of these shells by taking home a quantity of dead leaves and débris, and sifting them during the winter evenings.

*Helicodiscus lineatus* Say. Rather abundant under accumulations of dead leaves in damp woods.

*Acanthinula harpa* Say. Exceedingly common in a small, rather dry clearing (covered with a little low bush and bracken) between woods, Isle d'Orleans. Early one morning, after a very damp night, Mr. Latchford took a number off the trunks of the small trees in this clearing. On mainland, traces found in two widely separated localities.

*Punctum pygmæum* Drap. Fairly common.

*Helix rufescens* Penn. Very abundant throughout the city, especially on the cliffs and city walls. Extends along the cliff some distance up the St. Lawrence; a large colony noticed at St. Sauveur; a few up River St. Charles, and a small colony on the Isle d'Orleans, close to the ferry landing. Recorded from Levis by the Abbé Begin. This species appears to be spreading rapidly.

*Helix cantiana* Mont. Common on cliff bordering Plains of Abraham and extending to the citadel. Not noticed in the city.

*Polygyra albolabris* Say. Well distributed, but not common.

*Polygyra albolabris* var. *maritima* Pils. Some half-dozen examples, apparently this variety, taken here.

*Helix dentifera* Binn. Local, but where found at all, more plentiful than *albolabris* or *sayii*. At St. Romauld's a small colony was

discovered on the cliff side on May 9, 1893, all still in hibernation. In the more elevated parts of a small piece of rather swampy woods off the St. Foye road, not far from the city limits, this shell was rather common. Living shells all presented a more or less worn appearance, the tooth was often lacking in seemingly full-grown individuals, and they seldom approached in size, and were generally more fragile, than those occurring on the Isle d'Orleans. From this I should judge that their surroundings were not exactly healthy or suitable ones, and they no doubt owe their existence here to the fact of the wood being a private preserve, comparatively undisturbed by man or beast. No other Mesodon was seen here.

This good species was first taken in the vicinity of Quebec City by Mr. Latchford, of Ottawa, Ont., the occasion being a visit to the Isle d'Orleans on August 16, 1891. Since that date a good number have been taken there, all, without exception, on the cliffs on both sides of the islands; at some places within a few yards of high water mark of the St. Lawrence River. On the cliff side having a northern exposure, the vegetation is decidedly rank, and where there is a good deal of moist, shaly rock mixed with dead leaves, etc., live specimens are sure to be plentiful and in fine condition.

On May 27, 1893, chiefly from an old unused path on the cliff side, I made the following capture: *Selenites concava* Say, 66; *Pyramidula alternata* Say, 59; *Polygyra albolabris* Say, 1; *Polygyra dentifera* Binn., 71; *Polygyra sayii* Binn., 29; *Polygyra monodon* Rack., 15; *Succinea obliqua* Say, 9—all good and mostly living shells.

*Polygyra sayii* Binn. This species is more widely distributed than *P. dentifera* Binn. along the cliff side on the mainland (northern exposure only). On the island it occurs with *M. dentifera*, but never in abundance (except on the above-mentioned occasion). It has also been taken rarely in the woods which cover a good part of the island. This species appears to be more hardy than the other *Polygyra*; it does not go into hibernation nearly so early in the fall. Unfortunately, eaten shells are rather too conspicuous.

It took me a whole season to get used to the habits of these species, so as to know just where to look for them, often going home nearly empty-handed when I had really been in the midst of them. When hibernating, they are most easily seen, the beautiful white (sometimes pinkish) lip of *P. dentifera* Binn. catching the eye when exposed to view. Early in the spring, when just out, they are more

difficult to find, as they adhere to the dead leaves, and, unless felt, may then easily be turned over and lost.

*Polygyra monodon* Rack. This species is well-distributed and very common in places on the cliff side at the Island. I have a record of 140 specimens taken November 12, 1892, and have found 20 or more all together—in fact, on the cliff side, either in the fall or spring, it is usual to find these large families buried together in the loose, shaly rock. At other places where I have collected, it has been unusual to find more than a pair together. A few of my Isle d'Orleans specimens are very fine, and have the umbilicus unusually large.

*Polygyra monodon* Rack, var. *fraterna* Say. A few approaching this variety were taken in the neighborhood of the Gomin swamp on the mainland.

*Vallonia pulchella* Müll. Common on the mainland at foot of cliffs, and on the Plains of Abraham, also observed on the Island.

*Vallonia costata* Müll. Occurs with *pulchella* on both sides of the St. Lawrence River, but is not so plentiful.

*Vallonia excentrica* Sterki. Local, at foot of cliff at St. Joseph's with *pulchella*, not observed elsewhere.

*Vallonia labyrinthica* Say. Chiefly from the Island, and generally from the dryer parts of the woods.

*Pupa armifera* Say. Recorded by the late Abbé Provancher as being common on the Plains of Abraham; it may be taken there in some abundance with *Vallonia* from under pieces of rock. I have taken single examples on the Island and at Levis.

*Sphyradium simplex* Gould. Rare, Island d'Orleans.

*Vertigo milium* Gould. A few on the mainland, more common on the Isle d'Orleans.

*Vertigo ovata* Say. Fairly plentiful in some localities.

*Vertigo gouldii* Binn. Rare, Isle d'Orleans.

*Vertigo ventricosa* Morse. Rare, Isle d'Orleans.

*Vertigo pentodon* Say. Isle d'Orleans, local. This shell has a habit of coating itself with dirt, like *Succinea avara* Say, and consequently it is difficult to find.

*Vertigo bollesiana* Morse. Common on mossy rocks under cliffs at St. Joseph's and St. Romauld's. A form taken with this, Dr. Sterki calls the New England variety.

*Vertigo curvidens* Gould. Isle d'Orleans, rare.

*Ferussacia subcylindrica* L. Two easily separated forms of this species are found in the district; one occurs everywhere and is abundant, the other has only been taken in damp woods on the Isle d'Orleans, and is a larger shell.

*Succinea avara* Say. Local.

*Succinea ovalis* Gould. Not at all common. Both these species are smaller in size as compared with specimens from western Ontario.

*Succinea obliqua* Say. The ravine running into the St. Charles River is a splendid place for this shell. During hibernation I have, on several occasions, taken 200 fine specimens in a short time, and some are the largest I have ever seen or captured. I am inclined to think that some of them would pass for *Succinea totteniana* Lea; there certainly appear to be two forms. In cleaning some of these shells taken on November 8, 1891, a few of the finest living specimens contained the peculiar parasite, reference to which is made by Dr. Dall, in his useful pamphlet, "Instructions for Collecting Mollusks, etc." (*Leucochloridium*).

*Carychium exiguum* Say. Very common in decaying vegetation in woods and all damp places.

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#### NEW LOWER CALIFORNIAN BULIMULI.

BY H. A. PILSBRY.

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*Bulimulus hypodon* n. sp.

With the general form of *B. spirifer* Gabb, this smaller species differs in the more convex lateral outlines of the spire and the much shorter body-whorl, which in a dorsal view is not produced and oblong, but short and transverse, and with the suture ascending somewhat toward its termination. Whorls  $7\frac{1}{2}$ , surface with an oily polish, only slight growth-lines, but under the lens showing close, *fine incised spiral striae, without trace of granulation*. Aperture slightly over half the total alt.; *peristome very broadly and flatly reflexed*, recurved at the edge, the margins joined by a rather heavy callus, but without defined edge. Columella distinctly truncate at base; internal lamina well-developed, thin, *triangular*. Color almost white, the cuticle with an extremely faint buff tint. Alt. 25, diam. 12.5 mm.; alt. of aperture (including peristome) 13, width 10.2 mm.; width of reflexed outer lip 2.3 mm.

Lower California, exact locality unknown.



*Bulimulus lamellifer* n. sp.

General form of *A. spirifer*; waxen white or light brownish; the surface more or less granulose, as in examples of *B. spirifer*. Whorls about  $6\frac{1}{2}$ . Aperture over half the altitude usually, but sometimes less than half; the lip-ends conspicuously approaching, joined by a short callus; peristome broadly expanded and reflexed, much as in *spirifer*. Columella showing from the aperture a sharp, oblique lamina; this lamina becoming very high internally, projecting in a square or bisinuate plate. The type measures, alt. 32, diam. 15 mm.; but they are very variable in size, the smallest seen being  $23\frac{1}{2}$  mm. long. The square or emarginate internal plate differs conspicuously from the corkscrew twisted fold of *B. spirifer*, and is apparently a constant character. Seventeen specimens examined.

Lower California (W. M. Gabb).

These forms are evidently different from *B. spirifer* Gabb, *B. bryanti* Cooper and *B. veseyanus* Dall, the species of this group described by American naturalists. A careful comparison with the descriptions of *B. lapidivagus*, *dentifer*, *subspirifer* and *dismenicus* of Mabile, causes me to consider these also as specifically distinct from the forms described above. Illustrations will appear in the next number of the *Manual of Conchology*, in which the other North American Bulimuli will also be figured.

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 NEW AMERICAN UNIONIDÆ.
 

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BY WM. A. MARSH, ALEDO, MERCER CO., ILL.

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*Unio superiorensis* n. sp.

Shell smooth, obovate, slightly inflated, inequilateral, rounded before, oblique, obtusely angular behind, with or without rays, rays when present interrupted by lines of growth. Substance of shell thick, beaks small, with a few rather coarse undulations; umbonial slope flattened, ligament long, dark brown; epidermis dark olive; growth lines very close, quite prominent, cardinal teeth large and solid, compressed and nearly smooth, double in left valve and widely separated; lateral teeth long, thick and nearly straight, anterior cicatrices deep and rounded, posterior cicatrices confluent and well impressed. Cavity of shell deep; cavity of beaks deep and rounded; nacre white, sometimes shining.

Habitat: Michipicoton River, upper shore of Lake Superior, Canada.



This shell is more closely related to *U. borealis* A. F. Gray than any other I know of; it is not so much inflated as that species, it is more transverse on both dorsal and ventral portions; when the rays are present they differ entirely; the posterior portion of the shell is flatter, it is more oblique in outline, the cardinal teeth are much smoother and more compressed, the cicatrices are deeper and more rounded, shell cavity shallower, the lines of growth are very much more numerous and closer.

It bears some resemblance to some varieties of *U. luteolus* Lam., but differs entirely in the teeth, growth lines, epidermis, outline of shell, and cavity of beaks and shell, from any variety of *luteolus* I ever saw.

Several years ago, Mr. James H. Ferris, of Joliet, collected a number of these shells at the locality given, and I was never satisfied that they could be placed, even as a marked variety, with any described species.

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#### ON SOME SINISTRAL LAND SHELLS.

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BY C. F. ANCEY.

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The following are several sinistral specimens of normally dextral species, nearly all included in my own collection. Some of these monstrosities are still, I think, unrecorded. In addition to these, I must say that I have collected, in 1884, in the mountains near Héas, Pyrenees, a *dextral* example of the usually sinistral *Buliminus quadridens* Müller. This is also in my collection. From the list given below, it appears that sinistral monstrosities are much more scarce in operculate land shells than in *Helicidæ*, and, besides the well-known reversed *Campeloma decisum* Say (=var. *heterostropha*), still rarer in fluatile shells.

*Helix (Xerophila) trepidula* Servain (Dept. du Bouches-du-Rhône, S. France).

*Helix (Xerophila) oreta* Bourg. Oued-el-Hakoum, south of Berrouaghia (Algeria).

*Helix (Euparypha) pisana* Müll. South France.

*Helix (Tachea) nemoralis* L. Bundoran, Ireland (from Mr. Brockton Tomlin).

*Helix (Macularia) vermiculata* Müll. Marseilles, France (in Mr. M. Sollier's collection).

- Helix (Pomatia) pomatia* L. West France.  
*Helix (Pomatia) aspersa* L. Marseilles.  
*Helix (Mesodon) thyroides* Say. Connecticut.  
*Leucochroa candidissima* L. var. *major* Brg. Near Boghari,  
 (Algeria).  
*Leucochroa candidissima* L. (typical). Marseilles ; Algeria.  
*Zonites algirus* L. Montpellier, south France.  
*Rumina decollata* L. var. *major*. Near Berrouaghia, Algeria.  
*Pupa (Torquilla) bigorrensis* Charp. Cazaril, Hautes-Pyrénées.  
*Pomatia crassilabrum* Dup. Cauterets (Hautes-Pyrénées), Assat  
 (Basses-Pyrénées).  
*Ditropis planorbis* Blanford. Tinnevely.  
*Achatina panthera* Fér. Mauritius.  
*Gibbus lyonnetianus* Pallas. Mauritius.  
*Nanina (Dyakia) javanica* Fér. Java.  
*Nanina (Dyakia) duplocincta* Bttg. Java.  
*Limnæa peregra* Drap. England.  
*Campeloma decisum* Say. New York.

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COCHLICELLA VENTRICOSA Drap., NEAR CHARLESTON, S. C.

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BY WM. G. MAZYCK.

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On the afternoon of October 27, last, I found a small colony of this species living under a fallen fence post on a lot in the rear of the United States Life Saving Station, in the town of Moultrieville, on Sullivan's Island, at the entrance to Charleston Harbor, S. C.

The discovery is one of peculiar interest, presenting a problem of somewhat difficult solution. The island is quite small, being only about four miles long, with an average width of some 300 yards and an average height above mean high water of only about six feet. The only natural growth of shrubbery is on the end, where there is a dense growth of stunted myrtles. Moultrieville covers about one-half of the Island. The lot upon which the specimens were found is destitute of any vegetation, except a stunted growth of a coarse low grass, somewhat similar in appearance to the ordinary lawn grass; there is no garden nearer than half a mile, and that contains no plants of foreign importation. There is absolutely nothing in the environment to suggest congeniality, and the spot is

apparently most unfavorable to the propagation of the species, which is entirely isolated as far as yet observed. The entire island was submerged for about ten hours to an average depth of about two feet during the hurricane of August 27, 1893, and almost all vegetation was killed at that time, a circumstance which leads to the opinion that the species is of very recent introduction. The terrestrial species of mollusca so far observed on the island are :

<i>Polygyra espiloca</i> Rav.	<i>Pupa fallax</i> Say.
<i>Triodopsis hopetonensis</i> Shutt.	<i>Pupa pentodon</i> Say.
<i>Cochlicella ventricosa</i> Drap.	<i>Succinea campestris</i> Say.
<i>Vertigo rugosula</i> Sterki.	<i>Succinea inflata</i> Lea ?

I have a single dead specimen of *Mesodon thyroides* Say, most likely washed from the neighboring mainland, and a few specimens of *Stenogyra decollata* L., certainly brought from Charleston, where it is abundant.

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#### ISAAC LEA DEPARTMENT.

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

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#### UNIOS.

[Excerpts from the Report of Dr. W. S. Strode. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

\* \* \* \* To the Spoon River, only three miles away, two or three hurried visits have been made. With one exception only the usual shells of this stream were found. I was fortunate in striking a new bed of Unios. It was in a little bayou six feet wide and about three deep by twenty long, just above a rough ledge of lime and sand rock. The environment was suitable to many species, and the mud and sand at the bottom of this little cove was literally packed with them. In half an hour I had thrown out on the clean, white sand several bushels of various species, as *Unio tuberculatus*, *anodontoides*, *plicatus*, *rectus*, *ligamentinus*, *luteolus*, *occidens*, *gibbosus*, *lacrymosus*, *pustulosus*, *trigonus*, *alatus*, *gracilis*, *ebenus*, *lavissimus*, *complanatus*, *rugosa*, *donaciformis*, and several of the gigantic *multiplicatus* peculiar to this stream. Some of these species had been so long in this still water, and were so hoary with age that they were moss grown. When I had thrown out about all the little bayou contained, I selected the finer specimens of such species as I

cared for, and then returned the rest to the water for future use. From one of the *U. occidentis* I took one of the finest pearls that I had ever seen. It was a perfect oval, very lustrous, and about the size of a small buckshot. The exceptional shell found in the bayou was *Margaritana confragosa* Say, not heretofore reported in this stream, though they are not uncommon at Liverpool on the Illinois River. Two or three young shells were found, which is a good indication that the parents were somewhere about. In a pool in the shade of a long bridge at Bernadotte, I found a large number of *Pleurocera elevatum* Say and a few *Somatogyrus subglobosus* Say.

\* \* \* \* A collector in Texas has also sent me some fine specimens, a list of which may prove of interest to the members of the Isaac Lea Chapter of the Agassiz Association: *Unio nodiferus*, *U. manubrius*, *U. rotundatus*, very large and fine; *U. purpuratus*, *U. aureus*, also a variation of the same; *U. Mitchelli*, said to be found only in Guadalupe River; *U. tampicoensis*, *U. hydianus*, *U. berlandierii*, *U. perplicatus*, *U. speciosus*, *U. tuberculatus*, *Anodonta leonensis*, *A. stewartiana*. The *U. manubrius* is the long-lived mussel, burying itself and living for months in the banks and beds of streams after they have dried up. The *U. tuberculatus* is the purple nacre variety. These are all from Jackson and Victoria Counties, and from Guadalupe and Brazos Rivers, Skull, Colleto, Spring and Garcitas Creeks, and Ripley, Bluett's and Manchoula Lakes.

Of the smaller species I also received the following: *Sphærium elevatum*, *Polygyra texasiana*, *Praticolella berlandieriana*, *P. griseola*, *Polygyra auriformis*, *Physa mexicana*, *Vitrea electrina*, *Bulimus schiedianus*.

While at Niagara Falls in August I found Goat Island rich in Helices. The *Polygyra albolabris*, large form, was particularly noticeable. Early in the morning great fine ones were to be seen crawling about over the leaves and in the crevices of the rocks in the almost impenetrable shade of the thick forest that covered the island. \* \* \* \*

I append the list or the Unionidæ of the State (Illinois). Later I will issue a printed list with localities. I am indebted for much valuable information and assistance to Messers. Hinkley, Ferris, Marsh and Wolf, of Illinois; to Dr. Leach, of Michigan, and the late Dr. Stein, of Indiana. Some of the species in the list are doubtless synonyms, as *Unio zigzag* and *U. donaciformis*, *U. occidentis*

and *U. ventricosus* and some others. But as the authorities have not agreed on this matter, I have included them as separate species. (As Dr. Strode will issue a complete printed list of the Unionidæ in some other form, the list as added to his report is not reproduced here.—M. B. W.)

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#### NOTES AND NEWS.

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A LARGE DECAPOD.—I have been greatly interested in an immense Cephalopod which came ashore about five miles south of Jack Mound, Anastatia Island. Only the stumps of the tentacles were left, as it had been dead for, perhaps, days. The body proper measured 18 feet in length, 11 feet in breadth and  $3\frac{1}{2}$  feet thick above the sand as it lay soft and flattened on the beach. Of course there is no way of knowing how long the tentacles were, but, judging from the size of the body, the arms must have been of enormous length.—DEWITT WEBB, M. D., St. Augustine, Fla.

ARMATURE OF HELICOID LAND SHELLS.—Under this title Mr. G. K. Gude, of London, is contributing a series of important articles to *Science Gossip*. The Indian genera *Corilla* and *Plectopylis* have thus far been discussed, their peculiar internal barriers figured, and the specific characters more fully worked out than in any former publication. In the first paper (September, 1896) a new species of *Corilla*, *C. Fryæ* Gude is described, and the armature of *C. humberti* Brot for the first time figured. A key to the species of *Corilla* is given in the second paper; and in the third, which has just appeared (November, 1896), the discussion of *Plectopylis* is commenced. The work promises to be very valuable to Helicologists, and we hope that Mr. Gude will succeed in procuring a sufficient number of specimens to make it complete.

SAD DEATH OF AN ORIENTAL BY HALIOTICIDE.—In the November *Popular Science Monthly*, Margaret Wentworth Leighton relates that while she was living in San Francisco, "A Chinamen went out on the rocks at low tide to gather some [Haliotis]. As he attempted to wrench one from its home his hand was caught between shell and rock, and so firmly held by the animal that he could not escape the rising tide and was drowned." West coast collectors should take warning. Don't fool with *Haliotis cracherodii* without having by you a crowbar or at least an ax, lest you should perish miserably like this child-like and bland Celestial.



# THE NAUTILUS.

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## ON THE GENERIC POSITION OF *BULIMUS GALERICULUM* MOUSS.

BY H. A. PILSBRY.

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This species was described by Mousson in his *Land- und Süßwasser-Mollusken von Java*, 1849, p. 34, from near Pardana, Java, from a single specimen collected by Zollinger. In von Martens' edition of *Die Heliceen* the species is placed in *Geotrochus*, with the Cingalese forms later referred to *Beddomea*. Pfeiffer in his arrangement of the land snails in *Malak. Blätter* for 1855, p. 162, makes *galericulum* the sole species of a new section of *Bulimi*, *Pseudopartula*. The name he later corrects to *Pseudopartula*. In the *Nomenclator Hel. Viv.* he includes with *galericulum* in *Pseudopartula* (which is here made a subsection of *Geotrochus*), the New Caledonian species grouping around *B. sinistrorsus* Desh.

It is evident from this that *B. galericulum* is the type of *Pseudopartula*. On comparison with *Ariophanta dohertyi* Aldr., I find that that species also belongs to the same group; and here likewise must be placed *Helix nasuta* Metc., which has the same conchological features. As to the systematic place of *Pseudopartula*, I am in doubt. In the absence of information upon the soft anatomy, the group might be placed either next to *Papuina* in *Helicidæ*, or in the *Bulimulidæ* or the *Zonitidæ*, although it is evident that it has no affinity with the typical *Ariophantas*. Conchologically, it is well-characterized by the trochiform, sinistral, obliquely perforate shell; thin in texture, milky subtranslucent, the surface with fine spiral incised striæ, apex smooth and blunt, aperture extremely oblique and with well-reflexed peristome. The species are:

1. PSEUDOPARTULA GALERICULUM (Mouss.). Moll. Java, p. 34, pl. 3 fig. 5.

1a. PSEUDOPARTULA GALERICULUM var. GEDEANA (Bttg. MS.). More elongate with the peripheral angle subobsolete. Alt.  $19\frac{1}{2}$ , diam. 12 mm.

2. PSEUDOPARTULA DOHERTYI (Aldrich). Nautilus, VI, p. 90, pl. 2, f. 1, 2. Sumatra.

3. PSEUDOPARTULA NASUTA (Metc.). Man. Conch. (2), II, p. 21, pl. 3, f. 42. Borneo.

For the group of *B. singularis*, *sinistrorsus*, *turgidulus*, etc., Montrouzier's name DRAPARNAUDIA may be used.

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TIMOTHY ABBOTT CONRAD.

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Born in Trenton, N. J., June 21st, 1803, died in the same city, August 9th, 1877.

To most conchological students, and especially to those interested in Cretaceous and Tertiary shells, the name of Timothy Abbott Conrad must be more or less familiar; and yet few, perhaps, are aware of the labor performed by him in searching the tombs of long vanished species, and presenting to the world in a series of papers the story of their origin, development and final extinction.

In this work he was one of the foremost America pioneers, and doubtless, the very first to note, from careful observation of their molluscan forms, the absolute relationship of the several outcropping Cretaceous beds ranging from northern New Jersey to southern Alabama. Nor was he less successful regarding recent species, since very many of these, native to the East and West coasts of America, were first studied, figured, and described by him, his skill in drawing being no less remarkable than his talent for investigation.

Personally he was a man of plain appearance, exceeding shy and sensitive, but withal a "good hater" and a true friend. Much of his time was devoted to literary pursuits other than scientific, and there are still extant a few copies of his poems, many of which show superior merit both in construction and sentiment.

Owing to failing health for several years preceding his death, he was often subjected to attacks of mental and physical depression, and it was in relation to this fact that the subjoined verses were

written and addressed to him. The present time, when renewed interest in Conrad and his labors has led to the republication of his chief works, seems an appropriate occasion for their presentation.

**TO TIMOTHY ABBOTT CONRAD,**

*Poet and Scientist.*

Of as the sons of Greece and Rome  
Returned victorious from afar,  
Their tyrants shouted "Welcome home!"  
The while they shared the spoils of war.

It mattered not that other lands  
To yield them wealth must lie in chains;  
And naught, forsooth, were crimsoned hands,  
So other's hearts impressed the stains.

But where are now those soldiers brave,  
Both they who lost and they who won?  
They sleep forgotten in the grave,  
Their names and nations dead and gone.

Not so have slept the gems of thought  
Born unto men far down the years;  
These live—while deeds of valor wrought  
In battle have dissolved in tears.

The world indeed has wiser grown  
Since Error's clouds such shadows cast;  
And few now dare to build a throne  
Upon the ruins of the past.

"Grim visaged war," rapine and strife,  
May clutch awhile their less'ning lease;  
But knowledge is the soul of life,  
And knowledge hails the reign of Peace.

To force of brutes, whose right is might,  
Eternal thought has ceased to yield;  
The Day has dawned that rules the Night;  
Fair Science now commands the field.

With valiant hearts, and lips comprest,  
Her sons are wheeling into line,  
And woe betide the sable crest  
Of Error when their strokes combine.

No nobler chief their legions know  
Than thou, whose victories I sing;  
No prouder wreath can men bestow  
Than round thy memory will cling.

As bard or sage thou art the peer  
Of men embalmed in storied song,  
Who, holding truth and virtue dear,  
Both lived the right and scorned the wrong.

Upon the fairest diadems  
Of Poesy thy name is cast;  
And, graven on Creation's gems,  
Thy fame will live while ages last.

Will live in myriad laurels won  
 From sands, and marls, and strata old,  
 And shine as brightly as the sun  
 In medals wrought from mental gold.

Long o'er thy path may honors shed  
 Their cheering rays, and may the years,  
 As on they come with gladsome tread,  
 Bring smiles to thee in lieu of tears.

And when at last thy life shall glide  
 Beyond the outer rim of Time,  
 May heaven's gates swing open wide  
 In welcome to its joys sublime.

JOHN FORD.

*Philadelphia, January, 1873.*


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### ISAAC LEA DEPARTMENT.

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

In conformity with Art. V of the Constitution of our Chapter the election of President and General Secretary occurred on the last Wednesday in December at the home of the latter. All members residing in Southern California were invited to be present. The Hon. Delos Arnold presided in the necessary absence of the president. The votes were canvassed, and the following were declared elected.

President, Professor Josiah Keep, Mills College, California.

General Secretary, Mrs. M. Burton Williamson, University, Los Angeles Co., California.

The Executive Committee consists of the President, General Secretary and one other member (Art. IV). The Hon. Delos Arnold has been appointed a member of the Committee.

The following have been appointed Secretaries of the various Sections:

Section A.—Marine Shells of the West Coast, Prof. Keep, Mills College, Cal.

Section B.—Marine Shells of the East Coast, Mrs. E. P. Wentworth, Portland, Maine.

Section C.—Land Shells east of the Rocky Mts., Mr. James Lemon, Ontario, Canada.

Section D.—Fresh Water Shells east of the Rocky Mts., Dr. Wm. S. Strode, Lewistown, Ill.

Section E.—Land and Fresh-Water Shells west of the Rocky Mts. (Secretary not yet chosen).

Section F.—Fossil Shells, Hon. Delos Arnold, Pasadena, California.

Section G.—Juvenile Section, Mrs. M. P. Olney, Spokane, Wash.

Section H.—Microscopic Shells, Mrs. T. S. Oldroyd, Los Angeles, Cal.

Section I.—Marine Shells of the Southeastern Coast, Mr. J. J. White, Rockledge, Fla.

Mr. J. J. White, the popular proprietor of White's Cottage, Rockledge, Fla., makes the following generous offer to our chapter members. He will send *Strombus pugilis* or *Cardium isocardia*, or both if desired, to any member of the Chapter who will send stamps for their postage. This offer holds good until his stock of them is exhausted.

The name and address of a new member, Miss Lena L. Perrine, B. A., Valley City, N. D., was unavoidably crowded out of the January issue of THE NAUTILUS.

#### MY SNAILERY.

[Report of Miss C. Soper. From the Transactions of the Isaac Lea Conchological Chapter for 1895.]

Partly from choice, partly from necessity, I have followed the suggestion given by one of the members in last year's "Transactions," and have studied the shell life found in my "ain countree," and I want to tell some of the members who live far from the sea-shore, what delightful possibilities there are collecting and studying shells at home.

With the exception of a couple of weeks spent at Santa Barbara last summer, I have had no opportunity for collecting ocean shells, and as my "finds," at that place were very meagre, being confined to some live *Chama exogyra*, and a queer little slipper shell, I should have no report to give were it not for my family of snails, which I have had for nearly a year.

Last February, I found in an old cactus stump near Gabriel about 120 dead specimens of *Helix tudiculata*—7 or 8 large ones, the remainder being above a half of an inch in diameter. One or two small live ones were found, and they were treasured carefully in an old flower pot which was kept in a saucer of water. A little later the sexton of the cemetery, whose interest I had enlisted, found for me a fine large specimen of *H. tudiculata* near one of the hydrants. This was a large addition to my small family, which had already become the object of a great deal of attention from myself and others. \* \* \* In March, in company with a friend, I went to the Arroyo Seco, near Pasadena, in search of helices. My friend had found their home one day when she was digging ferns, and learning of my desire to find some live snails, kindly piloted me to the place.



We found 20 or more, nearly all full grown of *H. tudiculata* and *H. Traskii*. Right here let me say that I think snails display exquisite taste in their choice of a home, at least some varieties do.

I am as much or more interested in photography than I am in conchology and I have found that the haunts of these humble creatures are nearly always in spots that delight the heart of a photographer. Pretty shady nooks, old gnarled trees and stumps, fern lined—which by the way, might contain water snails—broken down fences, and, overgrown hedges, are places equally attractive to the conchologist and the “disciple of the tripod.” I cannot think of two studies that can be pursued more harmoniously than conchology and photography.

I have yet to experience the pleasure of a trip to the seaside with my camera and shell basket.

But, to return to the snails. The flower pot besides being too small was not a very satisfactory place for them. In some way, they would manage to span the distance between the pot and the edge of the dish which was kept full of water, as a means of keeping them at home, and, some of them were constantly escaping. I procured a large cheese box, filled it with leaf-mold, planted several varieties of ferns in it, transferred my snails to their new home.

In order to keep them there, I put around the box which I had first placed on another box to make it higher, a fence of wire netting about three feet high, and, far enough from the box, so that Mr. Snail could not get out without crawling down to the floor and then up the screen—a feat which only a very few have accomplished. Before I got this safeguard I had many long searches for miscreant members, under the bed, and similar places.

But, in spite of their roving disposition, they seemed fairly comfortable and happy, sleeping mostly during the day-time, and foraging at night. They ate a great deal of bread and lettuce, and the ferns shared with them the frequent showers of water which they received.

As has already been hinted, this snailery of mine is kept in my bedroom and I have spent many hours late at night and early in the morning, as well as during the day, watching its interesting inhabitants.

They are very particular about their personal appearance when they are not hibernating, keeping themselves, or rather their shells, bright and clean by “mouthing” them all over, I believe I have sometimes seen them performing that office for one another.

Early in May they began to lay eggs—depositing them mostly in a little hole and covering them with earth, although some were apparently indifferent about the matter. The eggs of *H. Traskii* were somewhat smaller than those of *H. tudiculata*, and resembled very much, in size, shape and color, homeopathic pills. They hatched in about 3 weeks, the baby snails seeming to know their way out of the case or shell. Is it not probable this forms the first meal?

The tiny things did not live very long, and I could not notice any perceptible growth. The conditions were not favorable, I suppose.

Early in the Summer the old snails began to go into Summer quarters, and they were soon all asleep except my dear, little glossy-brown *Glyptostoma*. I had found him in Santa Anita cañon. He kept watch all summer over the other sleepers. He would sometimes disappear for a week at a time—buried in the ground, but I have never seen him attach himself by an epiphram to the sides of the box as the others do.

All Summer they remained impervious to the frequent sprinklings which they received, but when the first rain came one night in early November, four or five of them woke up and began to investigate matters. They seemed to appreciate some bread and lettuce, but went to sleep again during the dry weather which followed.

Each rain brought some of them to life, and during a long and recent rain, nearly every one of them "came to."

A few of them have died since awakening out of their sleep, but I think their time had come, for they were regular old patriarchs. I have not noticed any addition to the growth of the larger ones, but the smaller ones especially little "Glyp," have made quite an addition to their houses. The newly formed shell looks soft and is almost transparent.

Perhaps I will tire those who know all about raising snails, by my long description, but, I hope there will be some to whom my report will be of interest, and who will find as much pleasure and profit in a Snailery as I have found.

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#### COMMUNICATION.

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To all readers of THE NAUTILUS, the editorial note on the first page of the January number suggests the possibility that the pleasant monthly visits of this modest but valuable little journal may stop with the current volume. Are we as conchologists going to allow

this to happen? We have the cheerful assurance of the editors that they are willing to do their part, but it remains for us to do ours. No steam engine can be run without steam, no matter how faithfully the engineer may polish the metal work and oil the bearings. And let me add that no journal can maintain its existence without the expenditure of hard cash, as well as careful thought and labor on the part of the editors. To be sure, in the present instance the cash is the smaller part of the outlay, but some one must furnish it.

THE NAUTILUS is the only journal in the country devoted wholly to the interests of conchologists, and whose columns are open to our notes and exchanges. It rests with us, the conchologists of the country, to help the NAUTILUS into deep water. The subscription price is a trifling amount and surely we receive far more in return. I for one shall miss the NAUTILUS if it is discontinued and I know that others will. Let us *pay up* if we have not already done so and get our friends to subscribe as well.

W. J. R.

*Oakland, Cal., Jan. 6, 1897.*

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IN MEMORIAM—JOHN H. CAMPBELL.

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It is with feelings of regret and sorrow that we record the death of our late fellow conchologist Mr. John H. Campbell, which occurred on January 15th. As is known to most of our readers, Mr. Campbell was the first President of the American Association of Conchologists, and it was mainly owing to his energetic nature that the Association, during the time of his activity, exercised a wide influence and stimulated many naturalists to more earnest study of conchological subjects.

For several years Mr. Campbell made a special study of the *Cypræidæ*, and his collection of these ocean gems is doubtless the largest and finest in America.

Mr. Campbell was born in Philadelphia, March 31st, 1847, graduated from the Central High School in Feb., 1864, and admitted to the Philadelphia Bar, April 4th, 1868. He was elected a delegate at large to the Pennsylvania Constitutional Convention and served throughout the sessions of that body in 1872-3. In 1873 he became identified with the Catholic Total Abstinence Union, and for eleven years was the honored President of the Philadelphia branch of that organization. When the magnificent fountain erected by the society, largely through his efforts, was unveiled in Fairmount Park, July 4th, 1877, it was he who made the presentation address.

Mr. Campbell was also a member of several other prominent associations, among which may be mentioned the Academy of Natural Sciences, Philadelphia Atheneum, and Pennsylvania Historical Society. He was the author of several valuable papers, but perhaps the chief literary work of his life is the History of the Hibernian Society, a noble volume published about four years ago.

To his bereaved family we present an assurance of our deepest sympathy, trusting that He who tempers the winds to the shorn lamb will comfort and cheer their sorrowing hearts.

J. F.

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#### NOTES AND NEWS.

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PLANORBIS NAUTILIUS L. IN AMERICA.—The occurrence of this well-known European species in the United States has hitherto rested upon its discovery at Ann Arbor, Michigan, by De Tarr and Beecher, who described it as new under the name of *Planorbis costatus*.

Several years ago, among some *Vallonia pulchella* Müll., purporting to come from Eaton, N. Y., a single specimen of this *Planorbis* was found. The collector of these specimens was unknown, so that no further information was obtainable, and, in view of the possibility of some accidental mixture of specimens, I have refrained from making a record based on a single example, which might be erroneous. Recently, however, I have received specimens of this species about which there can be no doubt, and which, taken in connection with the Michigan locality, render the New York citation fairly probable. Mr. O. A. Nylander, of Caribou, Me., is the fortunate discoverer of the new locality for this beautiful little species. He writes that he found it in Barren Brook, Aroostook County, Maine, in three or four inches of water under logs and bark associated with *Planorbis parvus*, *bicarinatus* and *trivolvus*. It hardly seems possible that in this locality, so remote from foreign commerce, the species could have been introduced by human agency. And in this connection it is a fact of some significance, that in the same brook is found a small *Pisidium*, which Dr. Sterki says is apparently identical with the European *P. milium* Held., and that the only other known American locality for that species is northern Michigan.

It is possible that the small size of the shell and its superficial resemblance to a very young *Planorbis exacutus* Say, has caused it to be overlooked by collectors, and that it will be found to have substantially the same range over the northern part of this continent as other circumpolar species.—BRYANT WALKER, Detroit, Mich.



A NEW VARIETY OF *HELICINA Plicatula* PFR.—*H. plicatula* v. *christophori*. Like *plicatula* in sculpture, but the umbilical region is decidedly concave, excavated around the smaller callus, which does not fill it as it does in *plicatula*. Color uniform dark reddish (like *H. occulta* Say). This very pretty *Helicina* was collected by Dr. Wm. H. Rush, U. S. N., at the island of St. Kitts. A large number of specimens were taken. It differs constantly from *H. plicatula* of Guadelupe in the particulars mentioned.

*H. A. Pilsbry.*

SOUTH AMERICAN VOLUTIDÆ.—Dr. H. v. Ihering gives a valuable review of the Volutes of this region in the July–August number of the *Nachrbl. D. M. Gesellschaft*. Critical notes on the classification may be summed up with the conclusion that the group is a very natural one, with transition-forms between the extremes. v. Ihering believes *V. ferussaci* to be a variety of *V. brasiliiana*. The tertiary species of Chili are believed to be *Cymbiola* (*Scaphella*) forms, and two new species are described from the Eocene St. Cruz formation, of which one, *V. ameghinoi*, is stated to be certainly the ancestor of the recent *V. brasiliiana*. It should be mentioned here that the Eocene age of the Santa Cruz beds is doubtful. They are more likely Miocene. The *Cymbiolas* are stated to have arisen from Alcithoë-like progenitors, but whether these belong to the Volutoid or the Scaphelloid series as defined in Dall's pioneer study, remains undecided.

CAMPELOMA DECISUM SAY, REVERSED.—A series of this species, collected by Mr. W. W. Jefferis, of Philadelphia, at Fort Edward on the Hudson River, N. Y., has been carefully examined for me by Miss Jennie E. Letson for sinistral specimens, with the following results: Out of 681 specimens, mainly adult, but including those from one-fourth grown, up, none were sinistral. Out of the 410 shells of the uterine young 3 were sinistral, slightly over 0.73 per cent. Probably all who have collected *Campelomas* have noticed the greater proportion of sinistral examples among the young shells. This doubtless indicates that the reversed condition is an unfavorable one for maturation. The proportion of sinistral adult shells in this locality must be very much smaller, judging by the negative result obtained; but, of course, data are lacking for its determination.—*H. A. P.*

HAWAIIAN LAND MOLLUSKS.—Mr. E. R. Sykes has given descriptions of new species of *Macrochlamys*, *Endodonta* and *Achatinellidæ* in *Proc. Malac. Soc.*, II, pt. 3. The status of the name *Microcystis*



Beck is elucidated; the conclusion is reached that *ornatella* Beck should be considered type of *Microcystis*. The small one-colored Polynesian Zonitoid forms, generally placed in *Microcystis*, are referred to the genus *Macrochlamys*, Bens.

YOUNG PYRAMIDULA STRIGOSA.—During the past August I cleaned 50 *P. strigosa* and found in each of them from 6 to 15 young shells. Have cleaned hundreds before and never found but one.—*Mary P. Olney, Spokane, Wash.*

NOTE ON THE GENERA OF S. AMERICAN AMNICOLIDÆ.—In writing upon this subject in the November NAUTILUS, the papers by Dr. H. von Ihering on *Die Gattung Paludestrina* (Nachrbl. D. Mal. Gesellschaft, VII, 1895, p. 122), and *Zur Kenntniss der Gattung Lithoglyphus* (Malak. Bl. VII, 1885, p. 96) should have been mentioned, as they are the most important contributions to our knowledge of the anatomy of these forms yet made. In regard to the nomenclature adopted by von Ihering, one criticism may be made: he states that *peristomata* Orb. is type of *Paludestrina*, "weil d'Orbigny nicht nur in seiner Voyage Am. Mér., sondern auch 1835 im Mag. de Zool. den Namen Paludestrina verwandt und dabei als erste Art *P. peristomata* beschreiben hat." This is not the case, for in *Magazin de Zoologie* d'Orbigny describes the South American forms under the generic name *Paludina*, and does not mention *Paludestrina*, which was first brought forward in the Voyage. As there stated, the type must be "*Paludina*" *acuta*, of France. Von Ihering follows Fischer in the wrong spelling "*Littorinida*" (as though derived from *Littorina*) of Eydoux and Souleyet's *Littoridina*; a name evidently intended as a hybrid of *Littorina* and *Paludina*.—*H. A. P.*

ANATOMY OF SULCOBASIS.—Messrs. William Moss and Wilfred Mark Webb have examined the genitalia and dentition of two species of this subgenus, *Chloritis (Sulcobasis) stiophora* and *C. (S.) rehsei*, recording their results in *The Journal of Malacology* V, no. 3. They found both to possess a short spur, in addition to the flagellum, at the point of junction of vas deferens with epiphallus, and there was no penis-papilla, but the walls of its lumen are wrinkled. The top of the tail in *stiophora* has a median row of large tubercles, only part of which are cleft, instead of a continuous impressed line as in *Chloritis* species previously described. The spiral sulci, which gave name to the section, do not occur on the base of the shell in *C. stiophora*, and are, therefore, not characteristic of the group.

## PUBLICATIONS RECEIVED.

A BIOLOGICAL EXAMINATION OF LAKE MICHIGAN, etc. (Bull. Mich. Fish Comm., No. 6). A brief resumé of the malacological results in the vicinity of Charlevoix, Mich., by Mr. Bryant Walker, is given on pp. 96-99.

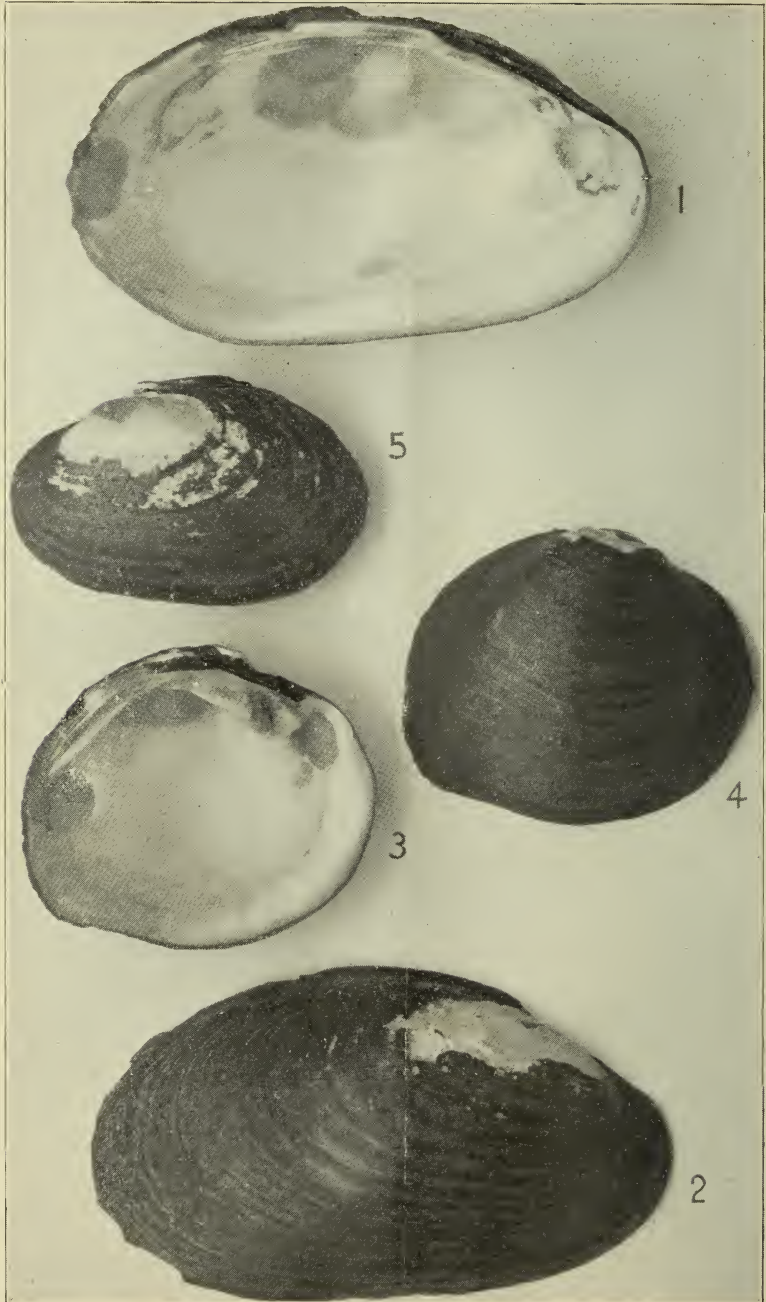
THE MOLLUSKS AND BRACHIOPODS OF THE BAHAMA EXPEDITION OF THE STATE UNIVERSITY OF IOWA (Nat. Hist. Bull. S. U. I., IV, No. 1). By W. H. Dall. New forms are *Murex nuttingi*, *Cerion niteloides*, *Liotia centrifuga*, *Carditella smithii*, the latter from Bermuda. *Cerion mumiola* Pfr. is recorded from Tortugas, "probably the result of transportation by sea drift. If living at Tortugas it would add a new species to the fauna of the U. S." The new species are figured.

ON THE CORRECT POSITION OF THE APERTURE IN PLANORBIS, by F. C. Baker (Cincinnati Soc. N. H., XIX, p. 45). By the examination of young specimens and broken adults, Baker concludes that all the larger species examined are sinistral, the small ones dextral; these terms being used in their old senses. The late work of Fischer and others on cognate inquiries is not referred to.

THE ANATOMY OF SPHÆRIUM SULCATUM LAM., by Gilman A. Drew (Proc. Iowa Acad. Sci., 1895). A thorough and useful paper, illustrated by plates of details and a reconstructed figure from sections. No useful abstract can be made; it may be mentioned, however, that a vestige of the byssal gland persists in the adult. The typhlosole is not strongly developed. Sphærium is hermaphroditic, but the ova and sperm are produced by distinct follicles, the ova-bearing being fewer and among the most posterior. A useful but not exhaustive bibliography is given.

CONTRIBUTIONS TOWARD A LIST OF PAPERS RELATING TO THE NON-MARINE MOLLUSCA OF THE HAWAIIAN ISLANDS, by E. R. Sykes (privately printed). Includes scattered papers, other than general or monographic works, and within this scope seems to be a nearly or quite complete bibliography. In a footnote on p. 5 Mr. Sykes calls attention to an error in a date given in the Proceedings of the Academy of Natural Sciences of Philadelphia, but in so doing commits an equal error himself, misquoting the date actually given in the Proceedings.—H. A. P.





1, 2, 5, *Unio Superiorensis* Marsh.  
3, 4, " *Askewi* Marsh.

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## ILLUSTRATIONS OF NEW UNIONIDÆ.

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Plate I, figs. 1, 2, 5, *Unio superiorensis* Marsh. For description see NAUTILUS for January, 1897, p. 103.

Figs. 3, 4, *Unio Askewi* Marsh. Description in NAUTILUS for December 1896, p. 91.

Figures are natural size. The specimens illustrated have been placed by Mr. Marsh in the Museum of the Academy of Natural Sciences of Philadelphia.

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## LIST OF SPECIES COLLECTED AT BAHIA, BRAZIL, BY DR. H. VON IHERING.

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IDENTIFIED BY W. H. DALL.

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The following species of shells were collected under the direction of Dr. H. von Ihering at Bahia, except when otherwise stated, and were forwarded to the National Museum for identification. This list includes only the doubtful species which could not be named with the literature available at the San Paulo Museum. Dr. von Ihering will eventually publish a complete list of the Brazilian coast fauna; meanwhile these identifications may be useful for reference. The remarkable thing about the collection, made 500 miles south of Cape San Roque and 2,200 miles beyond the mouth of the Amazon, is its typically Antillean character, resembling the fauna of the Bahamas. This indicates (if there be no uncertainty as to the



provenance of the specimens) that the present distribution of the coast fauna antedates the present volume of the Amazonian discharge, since it would seem incredible that so many thoroughly littoral species should be able to cross the present area of some hundreds of miles of fresh water in either direction. A few species marked with an asterisk are inserted on Dr. v. Ihering's authority.

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|---|---|
| Melampus flavus Gmel.                               | Janthina communis Lam.                                |
| Bulla striata Brug.                                 | Janthina exigua, Bahia.                               |
| Terebra cinerea Born, San Paulo.                    | Tritonium tritonis var. nobile                        |
| Conus verrucosus Hwass.                             | Conr.   |
| Conus mus Hwass.                                    | Tritonium femorale L.                                 |
| Conus daucus Hwass.                                 | Tritonium chlorostomum Lam.                           |
| Drillia albinodata Reeve.                           | Lambidium oniscus L.                                  |
| Drillia albocincta C. B. Ads.                       | Ranella ponderosa Reeve.                              |
| Mangilia limonitella Dall.                          | Cassis tuberosa.*                                     |
| Olivella jaspidea Gmel.                             | Dolium perdix* L., replacing D.                       |
| Olivella nivea Gmel.                                | galea of San Paulo.                                   |
| Marginella bullata.*                                | Trivia suffusa Gray.                                  |
| Marginella largillierti.*                           | Cypræa cinerea Gmel.                                  |
| Volvarina fusca Sby.                                | Strombus pugilis L., Bahia and                        |
| Mitra nodulosa Gmel.                                | southward.  |
| Turbinella ovoidea Kien.*                           | Strombus costatus Gmel. (not                          |
| Fasciolaria aurantiaca Lam.*                        | south of Bahia, v. Ihr.).                             |
| Leucozonia cingulifera Lam.                         | Strombus gallus L. (not south of                      |
| Pisania pusio var. janeirensis                      | Bahia, v. Ihr.).                                      |
| Orb.  | Cerithium literatum Born.                             |
| Tritonidea tineta Conr. (!)                         | Cerithium algicola C. B. Ads. ?                       |
| Nassa vibex Say, Rio.                               | Cerithium atratum var. varia-                         |
| Nassa ambigua Mtg.                                  | bile? Ads.  |
| Anachis albella C. B. Ads.                          | Modulus modulus L.                                    |
| Anachis catenata Sby.                               | Siphonium nebulosum Dillw.                            |
| Nitidella nitidula Sby.                             | Vermicularia spirata Phil.                            |
| Columbella mercatoria L.                            | Petalocochus irregularis Orb.                         |
| Murex pomum Gmel.*                                  | Crepidula plana Say.                                  |
| Coralliophila galea Ch.                             | Amalthea antiquata L.                                 |
| Sistrum nodulosum C. B. Ads.                        | Capulus incurvatus Gmel.                              |
| Purpura hæmastoma Lam., typical, Rio Grande do Sul. | Polynices porcellana Orb.                             |
| Purpura hæmastoma var. trinitatensis Guppy.         | Polynices lactea Gmel.                                |
|   | Polynices caudidissima Recl.,*<br>replacing the next. |

- Polynices brunnea* Link., San Paulo.  
*Polynices rufilabris* Rvc.\*  
*Natica caurena* Lam.  
*Natica pusilla* Say (!).  
*Natica sulcata* Lam.  
*Acmæa onychina* Gld.  
*Phasianella minuta* Anton.  
*Uvanilla americana* Gmel.  
*Astraliuim tuber* L.  
*Omphalius hottessierianus* Orb.  
*Calliostoma jucundum* Gld.  
*Calliostoma jujubinum* Gmel.  
*Submarginula octoradiata* Gmel.  
*Fissurella rosea* Gmel.  
*Fissuridea alternata* Say.  
*Plicatula ramosa* Lam.  
*Spondylus spathuliferus* var. *intermis*.  
*Pecten ornatus* Lam.  
*Mytilus exustus* Lam.  
*Botulina opifex* Say.  
*Arca jamaicensis* Gmel.  
*Arca imbricata*.\*

- Arca auriculata*.\*  
*Arca candida* Ch., San Paulo.  
*Lucina costata* Conr.  
*Chama congregata* Conr.  
*Cardium lævigatum* L.  
*Venus pectorina* Lam. (also S. Paulo).  
*Venus cribraria* Conr.  
*Venus circinata* Born.  
*Venus subrostrata* Lam. (beaui Recl.).  
*Cytherea varians* Wood.  
*Dosinia concentrica* Born, S. Paulo.  
*Lucinopsis tenuis* Recl., S. Paulo.  
*Tagelus mollis* Gould, Rio Grande do Sul.  
*Tagelus gibbus* Spengl. (+ *plattensis* Orb.).  
*Macoma constricta* Brug.  
*Mactrella Iheringi* Dall, n. sp., San Paulo.  
*Semele reticulata* Gmel.  
*Bouchardia rosea* Mawe (Rio ?).

***Mactrella Iheringi* n. sp.**

Shell thin, white, inflated, with small and prominent beaks, externally with fine concentric, and a few irregular, radial lines, and a silky-yellowish epidermis, the beaks median, smooth, with an obsolete posterior keel, the lunular region widely and deeply impressed; hinge of the subgenus, the pallial sinus angular, reaching to the vertical of the beaks. Lon. 65.0; alt. 52.0; diam. 32.0 mm.

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**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.]

Volume 8 of the Transactions has begun its annual round of the Chapter members. It will be some time before every member has

received the book, but extracts from it will be found in this department of THE NAUTILUS from month to month. Our Chapter cannot afford to do without THE NAUTILUS.

On page 112, February number, under "Section C" the name of the city (Toronto) was omitted in Mr. Lemon's address.

Members of our Chapter interested in West Coast mollusks, will find Dr. Wm. H. Dall's bulletin on "Diagnosis of New Species of Mollusks from the West Coast of America" valuable. It contains 27 new species and 2 new genera. The shells were collected by the *Albatross* from points as far north as Tillamook, Washington, to the Gulf of Panama, excepting one species dredged off the Argentine coast. In this species *Philobrya*, instead of the more familiar *Bryophila* is used for the genus, the reason for this is given. A *Nucula* is described as being "one of the largest known." Two orbicular species of *Periploma* are described. Mention of this bulletin will be found in the August number of THE NAUTILUS.

Another publication of the National Museum is Charles T. Simpson's comprehensive work upon the Naiades, entitled "The Classification and Geographical Distribution of the Pearly Freshwater Mussels." The title will convey to our members some idea of its scope. The genus *Margaritana* is placed with the genus *Unio*. A comparison of *Unio pressus* and *Margaritana rugosa* is presented. The various areas of the Naiades are given, Europe, Asia, Africa, America and the islands of the seas, also a map showing distribution. The Geological age of *Unios* is noticed, and the bulletin contains many references to the books and pamphlets written on the pearly freshwater mussels. It is a valuable contribution to molluscan literature.

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#### A TRAY OF SHELLS FROM DENMARK.

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(Extract from the report of the President, Prof. Josiah Keep. From the Transactions of the Isaac Lea Chapter for 1896.

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(In the report of the President, Professor Keep, he has given minute instructions in reference to an exchange of United States shells for European forms by an illustration. He tells the members of our Chapter how he sent some West Coast Mollusks to a gentleman in Copenhagen, the return of his box filled with foreign shells

from the North Sea, the value of Latin and Latinized terms in nomenclature the world over, and of the difference of geographical names written in Danish. This article is also illustrated with pen and ink drawings of the shells mentioned in his report. These are all omitted from the following paper. M. B. W.).

Now as to the shells themselves. There were no large specimens, the largest bivalve being a fat horse mussel *Modiola modiolus* var. *umbilicata*, about four inches long. The shell is white and thin, the epidermis brown and glossy, with a tendency to become hairy near the front of the shells. It greatly resembles the *Modiolas* of our coast. *Cyprina islandica*, three inches long, is a nearly circular bivalve, with strong hinge teeth and external ligament, and in shape it greatly resembles an ordinary quahog. The whole exterior, however, is covered with a black epidermis which makes it look like a monster *Cyclas* from our brooks.

Of gasteropod shells the largest is the historic *Fusus antiquus*, the "waring buckie" that Woodward speaks of, which used to be employed as a lamp, the slender canal being just fitted for a little wick. This *Fusus* is an elegant shell, tapering equally at both ends, the whorls well rounded, and the surface divided into minute cheeks. It seems like an old friend from beyond the sea, and tells the story of children at play in the little Shetland cottages, listening to the mysterious roar of the sea in the shell, while the strange lamp sheds a faint ray over the humble scene. Happy shall we be if we make our specimens tell us stories of the land across the seas from which they come!

Of Pectens there were five species. *P. opercularis* a round regular shell, white within, marked by about twenty ribs, and the surface cut into myriads of little projections, like the teeth on a cross cut file. *P. varius* is more one sided, like our *P. hastatus*. Within the shell is of a magnificent royal purple, while the outside of its thirty ribs is dark and dingy. Both of these species have shells about two inches across. A smaller kind, *Pecten pes-lutræ*, the "otter's foot," has only five ribs, and they are more like waves than typical ribs. The shells are shining white within, while the outside is red on one valve and gray on the other.

Of Cockles there is the pretty little *Cardium edule*, strong and smooth, and the spiny *C. echinatum*, about the size of a hen's egg, and whose ribs are set with a multitude of little sharp saw teeth. *Mya arenaria* is present also, having a shell rather more dense and



firm than those of its brothers which flourish so finely in San Francisco Bay. A slender curved specimen of *Solen ensis*, the length of one's finger, is present from its home in the sands of the "Skagen," while its little cousin *S. pellucidus*, is almost as thin and transparent as tissue paper. Quite the opposite from this are the heavy black shells of *Astarte compressa* from Greenland. This northerner seems heavily clad to resist the waves of his native region.

The principal limpet is *Patella vulgata*, a large, heavy, conical shell, with a sharp apex and rather distinct ribs. There is also an oblong sea weed limpet, *Helcion pellucidum*. Naturally you will find *Nassa reticulata* present, a plump, checked shell about an inch in length; also that sharp corkscrew *Turritella terebra*.

*Macoma baltica* is a thick shelled, short and stout little Dutchman, whose interior is as rosy as the coming of dawn, and whose very redness shines clear through its white exterior. There are other tellens, small, flat and thin, also some small top-shells of which *Trochus cinerarius* is chief. It is interesting to note that almost all the shells were named by the great Linné, and we are carried back to the cheery northland, where he explored and studied and wrote not for his time alone, but for future generations as well.

Of freshwater shells there is the great *Planorbis corneus*, an inch and a quarter across, the little button-like *P. umbilicatus*, the thin-shelled, inflated *Limnæa ovata* and that odd little three-cornered mussel *Dreissena polymorpha*. This shell is shaped like a large beechnut, and from one side comes out a byssus of fine black silk. Note what Woodward says of this little creature that has strayed from its home in southern Russia, and has even entered the iron water pipes of London.

*Helix pomatia*, the great edible snail, adds two large shells to the collection. I have just obtained some live specimens of this species which were imported by San Francisco grocers, and intend to try to domesticate them. My Danish collection contains several other species of *Helix*, e. g., the well known garden snails, *H. nemoralis* and *H. hortensis*, so common in England. There are also several small forms, like *Helix hispida* and minute kinds like *Zua lubrica*. Finally there are specimens of the singular genus *Clausilia*, with their long slender, many whorled little shells, whose apertures are set with teeth, as if to keep the poor little creature inside his prison house, or more probably to keep his enemies out.



In all, my collection contains 62 species, and as I examine them from time to time, I not only see many interesting shells, whose names are all as common to the conchologist as household words, but I am also transported in imagination back to those northern regions whence came the early ancestors of our Anglo-Saxon forefathers.

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#### POSTAGE ON SPECIMENS OF NATURAL HISTORY.

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In *THE NAUTILUS*, Vol. VII, p. 58, September, 1893, we have had something to say on the subject of postage on specimens of natural history to foreign countries. We have there detailed the efforts made by the Academy of Natural Sciences of Philadelphia to obtain lower rates, explaining that the present regulations of the Universal Postal Union permit such specimens to be mailed only at letter rates. It is indeed true that many countries have Parcel Posts, the charges for which are lower than those for letters. The aim of the Academy has been to secure the adoption by the Postal Union of a proposition offered by the U. S. Post Office Department that specimens of natural history be admitted to the international mails at the rates for, and under the conditions applicable to, samples of merchandise. This proposition was, however, rejected at the last International Postal Congress of Vienna.

At the International Congress of Zoology, held at Leyden, Holland, in September, 1895, Dr. Chas. Wardell Stiles, official delegate to the U. S. Government, offered resolutions, which were subsequently adopted, that the Swiss Government be requested, through its delegate to the Congress of Zoology, to propose to the next International Postal Congress an amendment to the regulations thereof whereby specimens of Natural History shall be carried in the mails of the Universal Postal Union at the rates for samples of merchandise; that an appeal should be addressed to all the delegates and members of the Congress of Zoology to bring this amendment to the notice of their respective governments, so that those governments should instruct their delegates to the Postal Congress to act favorably upon the same; that copies of these resolutions be sent by the Secretary of the Congress of Zoology to all governments forming part of the Universal Postal Union and which were not represented at the Congress of Zoology.

In accordance with these resolutions, Dr. Stiles suggested to the committee of the Academy in charge of this matter of postage that, although it is probable that the U. S. Government will vote in favor of this proposed amendment, seeing that it is the same proposition which the United States had presented at Vienna, the cause would be helped by the Academy adopting resolutions in favor of this proposed amendment and requesting the Postmaster-General at Washington to instruct our American delegates to vote in favor of it.

This the Academy has done ; but other American scientific bodies should join in the work, adopt similar resolutions and send them to our Postmaster-General that he may know that the students of natural history in the United States eagerly desire such a reduction in postage rates. The next International Postal Congress meets at Washington on the fifth of May next. The purpose of this article is to urge all those who read it to use such means and influence as may be at their command to help in the accomplishment of this end.

For the guidance of those who will aid in the manner suggested, a translation of the original French text of the amendment referred to is as follows :

“Amendment to Article XIX (samples) 4, of the Regulations of Details and Order.

5. Objects of natural history, dried or preserved animals and plants, geological specimens, etc., of which the transmission has no commercial interest, and the packing of which conforms to the general conditions concerning packages of samples of merchandise.”

If this amendment be adopted by the Postal Congress, specimens of Natural History can be sent to countries of the Universal Postal Union at the rate of one cent for every two ounces.

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#### IN MEMORIAM—HENRY MOORES.

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It was not until recently that we learned of the death of our old friend, Mr. Henry Moores, of Columbus, Ohio, which occurred on October 1, 1896, in his 85th year. A correspondent of Say, Amos Binney, Conrad, Lea, Haldeman and others, we might well say that he is the last of the “old school.”

Born in Hudson, N. Y., June 13, 1812, he went to Columbus, Ohio, in the fall of 1843. Remaining there until the following spring, he moved to Albany, N. Y. Here he remained until September, 1845, when he married and returned to Columbus, residing there continuously until his death, with the exception of a trip to California and a year's residence in Dayton, Ohio.

He was an earnest and enthusiastic naturalist, being interested in both the recent and fossil forms. Mr. Moores discovered and named the following new species of *Unionidæ*: *Anodonta hoekingensis*; *A. sommersi*; *A. hydei*; *A. freidi*. Dr. Lea named, in his honor, *Succinea mooresi*. A fossil crinoid, *Zeoocrinus mooresi* Whitfield, and a fossil bivalve from Carbon Hill, *Schizodus mooresi* Miller were respectively dedicated to him.

There was also one snail discovered by him in Texas, and named, by Mr. Binney, *Helix mooreana*. Some of the shells in his collection were collected over a hundred years ago by early scientists; one bears the date 1778, and many are wrapped in pieces of newspapers dating as far back as 1850 and earlier. Like many others, Mr. Moores caught the gold fever in 1849, and some of the specimens in the Ohio State University Museum were collected by him then.

His own private catalogue of species is a work of scientific value for its accurate arrangement and modern classification.

As a reward of his industry his cabinet contained over thirty-three hundred species of land, fresh water and marine shells, about one thousand species of fossils and about two hundred and fifty varieties of minerals.

But the industry of one man may be better understood when it is said that it took three days' solid work for a drayman with horse and wagon to move the collection from Mr. Moores' former home on W. Rich street to the University, after he had spent nearly five weeks in packing them in boxes and preparing them for the transfer. The real scientific ability of the collector is shown in the fact that every specimen that could be labelled bore its card, giving all data necessary for any person to take it up and study it understandingly. This one feature adds more to the value of the collection than anything else possibly can, except first-class specimens, and those of this collection are of the best. If it were necessary to choose between poor specimens with full and accurate data and good ones with no labels, it is often that the scientific student would choose

the former. But there is no need of such a choice here, for both quality and accurate data abound, as well as quantity, giving all that the most thorough student might require.

The purchase was made by the Ohio State University, principally for the shells, to place them in the room for the department of zoology, and the fossils were a secondary consideration, but when Dr. Orton saw the fine number of specimens that were to be added to the university collection as new species, as well as the great number of desirable duplicates, enabling numerous exchanges, he was forced to remark, "Oh this makes us rich. This is material that we had not counted upon." The assistant geologist has been busy until the present time on the Lower Silurian specimens alone, or only those found in the vicinity of Cincinnati, and in working over them and cataloguing them for the museum he has entered over one hundred species from that locality alone that had not formerly appeared in the University collection. Of the Devonian fossils, found near Columbus, there is an immense number; especially are the fossil corals very fine and nicely cleaned, but it yet remains for work in the near future to tell how many specimens may be found among them that are new to the museum collection.

There is the most complete set of carboniferous specimens, from Carbon Hill, Hocking County, O., that the world knows. It was in this locality that Mr. Moores did most of his field work in palæontology and made some of his most valuable discoveries.

But the part of the collection with which Mr. Moores has more recently done his entire scientific work is to be found now in the department of zoology. All possible varieties of shells from all over the world have been collected, labelled and arranged by this indefatigable naturalist. These specimens vary from the beautiful pink and green radiating "sun shell" of the Atlantic coast to the plain and lowly house of our ordinary, slowly plodding snail, or from the thick, glossy and bright colored shell of the tropical region to that of the more sombre hue of the arctics.

We are indebted to the kindness of his daughter, Mrs. A. S. Humphreys, for greater part of the above information.—C. W. J.

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#### NOTES AND NEWS.

PLANORBIS NAUTILEUS L.—Referring to Mr. Walker's interesting notes on this species in the February number of THE NAUTILUS, I may say that a few were taken at Hamilton, Ontario, in 1889. In



the report of the Conchological Division of the Biological Section of the Hamilton Association contained in the Journal and Proceedings of the Association for the Session 1889-90, the following note on *Planorbis nautilus* appears:—

Occurs in a small piece of marsh at the junction of Hamilton Bay (Lake Ontario) and the Desjardines Canal. A very tiny shell, the smallest water shell known to me; is hairy. The Rev. G. W. Taylor in naming it states that this is identical with the English *P. nautilus*. From its small size is difficult to find; if an introduced shell it would be interesting to know by what agency it reached its present habitat. Do not know that it has been taken anywhere else in North America. I found the shell among layers of dead leaves and on the stems of reeds in a few inches of water; not many were met with, but as it required considerable patience, especially in such moist surroundings, special search for them was only made on one or two occasions. The Dundes marsh is of large area, and I dare say the species occurs throughout it.—A. W. HANHAM, Winnipeg, Man.

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#### PUBLICATIONS RECEIVED.

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DRAGAGES EFFECTUES PAR L'HIRONDELLE ET PAR LA PRINCESSE-ALICE, 1888-1895, par Ph. Dautzenberg et H. Fischer (Mém. Soc. Zool. France, 1886, pp. 104, pl. 7). An important paper on the deep sea Gastropod fauna of the Eastern Atlantic, supplementing the extensive works of Jeffreys and Watson. Most of the dredging was done around the Azores Islands, where besides numerous new species of many genera, a considerable number of forms first described from the western Atlantic and Gulf of Mexico occurred, such as *Pleurotoma sigsbeeii*, *centimata*, *serga*, *comatropis* Dall, *chariessa* Watson, *Sipho profundicola* Verrill and Smith, *Coralliophila lactuca* Dall, etc. Among the more interesting new species described are two Mitromorphas, *Kryptos elegans* Jeffr. mss., *Iphitus cancellatus* and *tenerrimus*, *Danilia affinis*, some fine species of *Solariella* and *Calliostoma*, a *Turricula*, two Fissuriseptas, two species of *Propilidum* and an *Acmæa* (Azores, 1,385 meters!); the latter probably not really belonging to this genus.

The figures are for the most part very good examples of heliotype work, but in some cases lack clearness of detail. Messrs. Dautzen-



berg and Fischer have left little to criticise in the text, although we could wish that they had assorted the new *Pleurotomidæ* into sub-generic groups.—H. A. P.

DESCRIPTIONS OF TERTIARY FOSSILS FROM THE ANTILLEAN REGION, by R. J. Lechmere Guppy and Wm. H. Dall (Proc. U. S. Nat. Museum, XIX, pages 303–331, Plates XXVII–XXX, 1896). In the preliminary remarks Dr. Dall gives stratigraphically the source of the various fossils described. The Pliocene material was obtained from Moen, Costa Rica. The Caroni beds of Trinidad, the deposits at Bowden, Jamaica, and in Haiti, and the Chipola beds of Florida which have long been referred to the Miocene, are here placed in the Upper Oligocene, no strictly Miocene strata being recognized in the Antillean region. The Gatun beds of Conrad and Hill on the Panama Isthmus are Eocene, and contain a fair proportion of the species common to the Claibornian of Ala. and the Upper Tejon of Cal. “The list of Tertiary fossils of the West Indian region, prepared by Mr. Guppy in 1874, comprised some 250 species of fossil mollusks, but the fauna is much richer than this, since in one day at the Bowden beds, Messrs. Henderson and Simpson procured over 400 species. A significant proportion of these appear to have survived little changed, or to be represented by closely analogous species in the recent fauna of the West Indies.” In this paper 43 new species are described by Mr. Guppy and 19 by Dr. Dall, besides notes on a number of well known and doubtful species.—C. W. J.

ON THE GENUS REMONDIA GABB, A GROUP OF CRETACEOUS BIVALVE MOLLUSKS, by Timothy W. Stanton (Proc. U. S. Nat. Mus., XIX, pages 299–301, pl. XXVI). The type of this genus is *Remondia furcata* Gabb. “The genus has been recognized in the Manuals of Conchology and Paleontology, and placed in the Trigonidiæ by Tryon, Zittel and Fischer, though the latter remarks that it would perhaps be better placed near *Astarte*.” Mr. Stanton places it in family Crassitellidæ or Craesitellidæ, as the family is now called.

NEW AND INTERESTING EOCENE MOLLUSCA FROM THE GULF STATES, by Gilbert D. Harris (Proc. Acad. Nat. Sci., 1896, pages 470–482, pls. XVIII–XXIII). This paper relates to new and interesting forms in the “Lea Collection of Eocene Mollusca” in the Academy of Natural Sciences of Philadelphia. Seventeen new species are described and a number of specimens that are much finer than the types, have also been figured.

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## THE IANTHINAS.

BY CHARLES T. SIMPSON.

The Ianthinas, or violet snails, live gregarious in the open seas of the tropics, and float by means of a raft composed of vesicles filled with air, which cannot be withdrawn into the shell. Sometimes they are carried by winds and currents into the seas of temperate regions, and their shells have been found along the shores of our own country as far north as New England. I had collected for many years and in many countries, but had never found, perhaps, more than a dozen dead, broken shells. In January, 1883, I was on a large schooner bound for Spanish Honduras, and we stopped at Key West, where I spent one of the most delightful weeks of my life gathering *Cylindrellas*, *Chondropomas*, *Cerions*, *Helicina orbiculata*, and the beautiful *Orthalicus*, *Liguus*, and *Bulimulus multilineatus* in the thick, thorny, tropical scrub, or Strombs and bright *Tellinas* and blending *Neritas* and a hundred other interesting forms along the south shore. We were to sail about noon on Sunday, but I could not resist the temptation to take one last look at the places where I had spent so many happy hours, so after breakfast I wandered through the city and out to the beach.

Before I reached it I noticed that as far as the eye could see, it was a mass of the most intense, glowing violet color, and on coming up to it was astonished to find that this color came from untold millions of *Ianthina*, which had been washed up in the night, for when I had left the beach the evening before at dusk, not one was to be seen. To say that they lined the shore gives no idea of the real truth. Everywhere, from below low water to highest tide mark they were piled up, in most places, over shoe-top deep, and in the hollows of rocks one could have waded in among them up to his knees—shell, animal and float all of a vivid purple, the richness of

which soon fades, to a great extent, in dead shells or preserved specimens. They were all dead—a kind of slimy mass—and they somehow looked pitiful.

There had been no storm, nothing but an ordinary breeze blowing up from the south, and it is probable that an immense school had been drifted along, and where they struck the island, some five miles in length, every one within that distance was stranded.

I had brought no basket or sack or anything to collect in, but I could not bear to go away and leave that vast bed of treasures without taking at least a few with me. I searched in vain for a box or tin can or a piece of canvas, but could find absolutely nothing, not even a scrap of paper. I took out my handkerchief, knotted the corners, and tried to pull out the animals from the shells, but the whole mass was so slippery and the shells were so frail that the latter invariably broke, so I filled it with shells, animals and all, as many as it would hold. Then I took off my straw hat and filled it; and that would not satisfy me, for as I wandered along I found so many fine specimens that I began to put them into my pockets, and I did not leave the shore until every pocket was bursting full. I had on a linen coat and white duck pants; the day was hot and it seemed to me that those Ianthinas melted. In a little while streaks of glowing violet began to show down my clothes; I felt a clammy, wet, uncomfortable, feeling clear through to my skin, and my shoes were filled with purple liquid. By the time I reached the city I looked like an Indian in war paint, and I have no doubt that the people of Key West, who were just going to church, thought I was a lunatic, and perhaps they were not far from right. At last I reached the schooner, took off and threw away my suit, which was utterly ruined, and got my precious mollusks into sea water to soak, although at least half of them were broken, yet, when I cleaned them out, I had the satisfaction of counting up over 2,000 good shells.

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#### VERTIGO COLORADENSIS AND ITS ALLIES.

BY T. D. A. COCKERELL.

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Dr. Dall, in his interesting paper in Proc. U. S. Nat. Mus., XIX, has, on p. 367, *Vertigo decora* Gould, Colorado to Alaska (+ *P. ingersolli* Ancey + *P. coloradensis* Ckll.); *Vertigo decora* var. *concinna* Ckll., Colorado.

It is a long time since I paid particular attention to these small snails, but I do not think the above can be correct.

The genuine *V. coloradensis* is a very small form, with only a single lamella on the parietal wall; its length is  $1\frac{1}{2}$  mm. The form which I named *concinnulla* I found at higher elevations; it is larger, 2 mm. long, cylindrical, dull brown with whitish striæ, whorls  $4\frac{1}{2}$ , striate, suture not very deep, mouth pyriform, usually elbowed externally above, lamellæ 4 or 5; one, double, on parietal wall; one on columella, about its middle, and two on outer wall; peristome distinct. This differs from *decora* in color and the shape of the aperture.

I did not publish a description of my *concinnulla*, because I believed (and still believe) it to be identical with Ancey's *ingersolli*, which, also unpublished, had priority in MS. But, in view of Mr. Dall's publication, it becomes necessary to refer to it and explain what it really is.

Now as to *ingersolli*, it was based on Ingersoll's supposed *californica*. Mr. J. H. Thomson sent me some of the "*californica*" collected by Ingersoll, and I transcribe my notes upon them:—

No. 6. "Animas Valley, Colo." and "Timber Line, N. E. Antelope Pk., *V. californica* Rowell." (Perhaps only the latter label really belongs to the shells.) Certainly not *californica*, but apparently *concinnulla*.

No. 7. "*Vertigo californica* Rowell, Rio La Plata, Colo." Rather highly colored, but evidently *concinnulla*.

No. 8. "*V. californica*, Cunningham Gulch." Shinier than usual, perhaps, or thinner, but *concinnulla*.

There was also a single specimen of the same species from North Park, collected by E. A. Barber, Aug. 12, 1874.

Typical *V. decora* is  $2\frac{1}{2}$  mm. long, therefore much larger than *coloradensis*. It is to me evident that there are three quite distinct forms: (1) True *decora* of the north; (2) *ingersolli* or *concinnulla* of high elevations in Colorado; (3) *coloradensis* of the Colorado mid-alpine. Whether these are called species or subspecies is, perhaps, of small importance, and Dr. Sterki may be allowed to decide.

I may later refer to some other matters in Dr. Dall's excellent paper. He keeps "*Limax montanus*" as a species, which it certainly is not. The *Patula strigosa* v. *concentrata* Dall, seems to be a form similar to my var. *minor* (J. of Conch., 1890, p. 175), which forms a distinct race near Egeria, Colorado.

## CONTRIBUTION TO A KNOWLEDGE OF UNITED STATES UNIONIDÆ.

BY S. HART WRIGHT.

*Unio Pinkstonii* sp. nov.

Shell flask-shaped or triangular, clavate, inflated below the beaks, rounded anteriorly and very bluntly pointed behind. Epidermis olive with transmitted light, with numerous close lines of growth; rayless. Beaks elevated, blunt and nearly on a line with the anterior margin in old specimens, but the shell very inequilateral in the young. Sides very convex and descending in front very abruptly. Basal margin very convex. Umbonal ridge very blunt, and only slightly raised. Posterior slope narrower, its margin not keeled. Cavity of shell deep, cavity under the beaks slight, bluntly rounded. Cardinal teeth erect, striate; the anterior cardinal truncate. Cardinal in right valve single. Cavity between cardinals with a deep conical pit. Lateral teeth straight and short. Dorsal cicatrices over the beak-cavity. Nacre white, without iridescence, except at the posterior end, where the nacre is thin, it being thick elsewhere. Cicatrices all distinct and well-impressed. Width  $1\frac{7}{8}$  inches, length  $1\frac{1}{8}$ , diameter 1.

Habitat: Tuscaloosa River, Macon Co., Ala.

Remarks: Affinity, *U. castaneus* Lea, from which it differs in having a tray-shaped cavity, instead of bowl-shaped, as in the former. Its rings of growth are low and fine, not ridgy and coarse as in old *U. castaneus*. The *U. nux* group probably includes this and *U. castaneus*, *U. concolor*, *U. brunbyanus* and *U. perovatus*, species more or less related to our shell, in which the nacre is laid unevenly in plates and ridges, which form two or more pits where they meet. The species is dedicated to Miss M. S. Pinkston, who assiduously collects Unionidæ, and found this among her collections.

*Unio Kirklandianus* sp. nov.

Shell ovate, brilliantly polished, rather thin and somewhat inflated. Sides dilated in the middle and attenuated at each end. Base very convex; anterior end rounded and the other bluntly pointed. Epidermis yellowish horn-color, with broad green rays on all the surface, which are interrupted near the base with narrow yellow bands. Lines of growth only two or three and ferruginous. Beaks blunt and broad, slightly raised; umbonal ridge raised and abruptly rounded. Posterior area abrupt, narrow and slightly



keeled, and cordate at the beaks. Cavity of the shell rather deep and uniform; cavity of the beaks well under the dorsum, blunt within. Cardinal teeth, low, compressed and double in both valves and nearly tubercular. Nacre white within the pallial line, and darker and iridescent exterior to it. Lateral teeth small, short, remote from the cardinals, and straight in the groove, but making a slight angle from the dorsal plate at the anterior end of the ligament, which is  $\frac{3}{8}$  of an inch long. Width  $1\frac{1}{2}$  inches, length  $1\frac{1}{8}$ , diameter  $\frac{3}{4}$  of an inch.

Habitat: Ocklocknee River, Leon Co., Fla.

Remarks: Affinity, *U. subangulatus* Lea. Our shell differs from this in being more polished, thinner, rays broader, those of the anterior end sweeping around in curves. The shell cavity is much deeper and broader. The beak cavities are much larger, and the shell substance white instead of incarnate. We take pleasure in naming this species, which is probably not exceeded in pictorial beauty by any known *Unio* in North America, in honor of Dr. Reynold J. Kirkland, of Grand Rapids, Michigan, who is a vigorous investigator in conchology.

*Unio Burtchianus* sp. nov.

Shell uniformly solid, though not thick, oblong-elliptical, flattish, inequilateral, smooth and polished, with a slight constriction near the middle. Sides rounded, anterior end rounded, pointed behind with a very short truncation. Dorsal and basal margins uniformly curved. Epidermis reddish, nearly occulted with dark green rays running over all the surface, which are grouped in irregular fascicles, darker and densely striate on the posterior slope. Growth lines almost invisible. Beaks small and low, slightly rounded. Umbonal slope subangular, with a fainter ridge back of it, making a biangulation behind. Beak cavities very slight, confluent with a cavity under the lateral teeth. Shell cavity moderate and oblong. Cardinal teeth erect, light, crenulate, with an oblong groove in the cardinal of the right valve. The inner lateral tooth thickened and upturned at the end. Posterior cicatrices confluent, anterior distinct, all well impressed. Pallial impression distinct and crenulate. Nacre salmon within the pallial line and purplish exterior to it. Width  $2\frac{1}{4}$  inches, length  $1\frac{1}{4}$ , diameter  $\frac{5}{8}$ .

Habitat: St. Mary's River, Nassau Co., Florida.

Remarks: Affinity, *U. lehmannii*, herein described, in which the distinction is made between these species. It is named in honor of

Mr. Verdi Burtch, of Penn Yan, N. Y., who is a working student in Unionidæ and ornithology.

**Unio Lehmanii** sp. nov.

Shell ovate, uniformly thick, evenly rounded before and broadly pointed behind; and slightly biangulate. Dorsal and basal curves equally convex. Epidermis reddish-brown, smoothish, numerous and faintly rayed. Lines of growth obscure and slightly raised. Umbonal slope broadly rounded, making in old shells a slight uncination at the posterior end. Beaks broad and short, not raised. Posterior margin not keeled. Cardinal teeth broad, rather compressed and much lacinated, the anterior cardinal elevated, crested, ending in a long, thin, sharp edge, nearly truncated, which points forward and downward. Lateral teeth heavy and nearly straight, with a curve in the dorsal plate. Cicatrices distinct. Cavity of shell very broad and quite uniformly excavated. Beak cavities not deep, but broad and obtuse. Nacre purplish, lighter and sometimes salmon, within the pallial line. Width 3 inches, length  $1\frac{3}{4}$ , diameter  $1\frac{1}{4}$  inches.

Habitat: St. Mary's River, Florida.

Remarks: Affinity, *U. burtchianus*, which, with our shell, seems to form a distinct group confined to St. Mary's River, stationed between the *Buckleyi* and *Forbesianus* groups. It differs from *U. burtchianus* in having greater inflation, less pointed behind, rays less distinct, greater dorsal curvature, higher sides and rougher. It is named for Mr. W. V. Lehman, a specialist in fossil insects, and an energetic student of Unionidæ.

**Unio Brimleyi** sp. nov.

Shell quadrate, bluntly pointed behind, slightly inequilateral. Sides gracefully rounded, submarginate below and slightly arched above. Epidermis olive, with transmitted light, rayless and with very numerous finely striated raised crinkled lines. Shell thick on the anterior half and much thinner behind. Lines of growth three or four and faint. Ligament dark red and prominent. Greatest diameter in the shell center. Posterior slope with two impressed divergent broad and shallow grooves, from beaks to posterior margin. Beaks broad and rounded, slightly raised. Umbonal slope broad and keeled. Beak cavity moderately deep. Cardinal teeth double in both valves, erect and serrated. Laterals thin and straight, and in the left valve continuous with the cardinals. Cicatrices distinct. Dorsal cicatrices concealed from view. Pallial

impression seen only in anterior half, and there it is very faint. Nacre dead-white in front half and iridescent and darker in the other half, the two shades meeting in nearly a straight line. Width 2 inches, length  $1\frac{1}{2}$ , diameter  $\frac{3}{4}$ .

Habitat: Neuse River, Raleigh, N. C.

Remarks: Affinity, *U. negatus* Lea, from which our shell differs in having rounded sides, olive epidermis, thinner and more direct teeth. The peculiar structure of the epidermis reminds one of *U. estabrookianus* Lea. Named for Mr. C. S. Brimley, of Raleigh, N. C., who is collecting histological material.

(To be Continued.)

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#### PLANORBIS NAUTILEUS L. IN AMERICA.

BY GEO. W. TAYLOR.

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In a note with the above heading in the February number of THE NAUTILUS, Mr. Bryant Walker makes the following statement:

“The occurrence of this well-known European species in the United States has hitherto rested upon its discovery at Ann Arbor, Michigan, by DeTarr and Beecher, who described it as new under the name of *P. costatus*.”

This is true, no doubt, as far as the United States is concerned, but it is not correct as to *America*, for *P. nautilus* has been already recorded from three *Canadian* localities, and has, apparently, a wide distribution in the northern part of the Continent.

About eight years ago I received two specimens of *P. nautilus* from Mr. A. W. Hanham, who had taken them near Hamilton, Ontario. Five years later, in the autumn of 1893, I found the shell myself in some abundance in the ponds near to the St. Louis Dam, Ottawa. This find I recorded in a note in the *Ottawa Naturalist* for December, 1893, mentioning, I think, in the same note, Mr. Hanham's previous discovery. Again, in 1894, I received numerous specimens of the same shell from Mr. A. O. Wheelen, who collected them in southern Alberta. These were also recorded by me in the *Ottawa Naturalist* in a paper entitled “The Land and Freshwater Shells of Alberta.”

I was inclined, in the first instance, to think that this little shell might have been introduced by the agency of man, but its occur-

rence in Alberta, at a considerable distance from the line of railway, leads me to suppose that it is truly indigenous, and in this opinion I am confirmed by Mr. Walker's observations.

While on the subject of *Planorbis* I should like to call attention to the occurrence of another shell in southern Alberta (recorded in the paper referred to above), namely, *Planorbis umbilicatellus*. This record seems to have been overlooked by Mr. Vanatta when writing on the distribution of *P. umbilicatellus* in the last volume of THE NAUTILUS.

By the way: The *Ottawa Naturalist* is one of our best Canadian natural history magazines, and a good many papers on Canadian Conchology have been published therein during the last few years.

Nanaimo, B. C.

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#### ISAAC LEA DEPARTMENT.

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

At this writing the volume of Transactions is still in California. Promptness in forwarding the book will be appreciated by the General Secretary, as well as by our members whose homes are in the eastern States.

The name of Mrs. V. R. Hayward, Spokane, Wash., is added to our Chapter Roll.

Mr. J. J. White's gift of shells to our members, mentioned in THE NAUTILUS, is greatly appreciated.

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#### FOSSILS OF DEAD MAN'S ISLAND.

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[From the report of Hon. Delos Arnold. From the Transactions of the Isaac Lea Conchological Chapter for 1896.]

In submitting my annual report as Secretary of the Fossil Section of the Chapter, I have to regret that so little progress has been made during the past year along the lines of this Section of the Chapter.

While the work during the past year, so far as the main conchological work is concerned, is very gratifying, showing, as they do, an increasing interest in the study of the science and a commendable activity in the collecting of specimens, the Fossil Section has



not been actuated by the same spirit of inquiry. With the exception of some twenty species of fossils from the Tertiary beds of New Mexico, sent here for identification, and a few inquiries relative to exchanges, there is nothing outside of my own personal observations to report. It may be proper to state that the New Mexico specimens were collected and sent by a gentlemen not a member of our Association.

The Chapter was instituted primarily to encourage the study of conchology, and commemorates the achievements of the honored individual whose name it bears.

My visits to the beach during the past year have been few, and the visits I made were for the purpose of delving into the raised beaches at San Pedro, or of excavating the rocks at Dead Man's Island in search of buried treasures. Since my visits to these localities, a few months ago, and especially since the heavy rains of the past few weeks, I found that the alluvial of the bluffs that overlie the reefs of shells has been loosened and have fallen in large masses, almost, and, in some localities quite, obscuring the collecting grounds, so that collecting is very much obstructed or entirely destroyed. I succeeded, however, in unearthing a few very fine specimens, mostly of recent species; one specimen of *Lunatia lewisii* Conrad being five inches in diameter and as symmetrical and perfect as a living form.

But it was at Dead Man's Island, an older and more interesting formation, that I devoted most of my time and efforts. To one who has spent as many pleasant and profitable hours in this lonely spot, it cannot but cause an abiding sorrow to witness the devastation that is constantly and rapidly going on by the relentless waves. Within the recollection of the persons now living, the island has diminished one-half or more, and there are now living those who will see the tides sweeping over the spot where the receding island now stands, unless some steps are taken to protect it.

I have found nothing new or especially rare at this island during the past year, but the specimens are so perfect and life-like that it is always a pleasure to see them, and a desire to possess them is usually so strong that they are secured and added to one's collection. The specimens which, to me, are the most interesting, are those found imbedded in the sand rocks that have fallen from a ledge near the top of the island. They are referred to the Pliocene period, and so perfectly are they preserved that when eroded from their matrix and mingled with the dead shells of the same species that are scat-



tered on the beach, only a close scrutiny can distinguish a difference. Among the species that were revealed in this almost perfect state were: *Fusus kobelti* Dall, *Fusus barbarentis* Trask, *Lucina acutilineata* Conrad, *L. californica* Conrad, *L. nuttalli* Conrad, *Lawnatia lewisii* Gld., *Olivella buplicata* Sby., *Cardium centiflosum* Cpr., and a very unique and interesting specimen of *Serpulorbis squamigerus* Cpr., together with a large number of common species of shells.

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#### NOTES ON VITREA CELLARIA MÜLL.

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

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There is, perhaps, no more interesting land shells in New England than *Vitrea cellaria* Müll., on account of its peculiar habits. It was first noticed in cities along the Atlantic Coast about fifty years ago, and was undoubtedly introduced through commerce on wine casks or hothouse plants. For some physical cause this shell has not yet been found at any distance from the ocean, and is still confined to a few cities on the coast. Living chiefly in cellars, as its specific name implies, and not exposed to the weather, it does not hibernate, but is active the year around. It is sometimes a great pest to the housewife, annoying her greatly by crawling into milk-pans or eating vegetables that are placed on the cellar bottoms. The depredations of the animal are confined to the night; in the daytime it lies hidden under some board or in some crack or crevice in the wall. The animal has a very acute sense of smell, and can be readily collected by placing fruit or vegetables within its reach. *Vitrea cellaria* is not the only cellar mollusk, as there are a few slugs that lurk in similar situations, but it alone has an external shell.

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#### NOTES AND NEWS.

THE COLONY OF *HELIX NEMORALIS* AT LEXINGTON, VA.—The colony of *Helix nemoralis* is thriving; one yard is full of them, but I do not see that they do any injury to vegetation. They appear to grow larger here than the specimens I have seen of the same species from Europe. Another feature I have also observed: When they were first introduced we could find solid brown ones

rarely; now they are never to be seen. They look like tortoise-shell or have very wide bands, but no more *solid brown* appear, although I keep a sharp lookout.—MRS. JOHN M. BROOKE.

A NEW FORM OF PUPA.—I find, occasionally, in the rejectamenta of the Rio Grande at Mesilla, N. M., a *Pupa* which has been considered to be *P. gabbii* Dall (i. e., *arizonensis* W. G. Binn., not Gabb.). On examining it more carefully than heretofore, it seems to me at least a distinct variety, and it may be called *P. gabbii* var. *mexicanorum*. It is  $3\frac{1}{2}$  mm. long, diam.  $1\frac{1}{2}$  mm., white, delicately but distinctly ribbed, the ribs filiform, four of them entering the parietal wall of the aperture. The aperture is rather narrow, with the outer margin somewhat flattened, and inclined to be elbowed above. The peristome is quite thick. Besides having the well-marked ribs, this is smaller and narrower than the typical *gabbii*. I found, however, an equally small form of *gabbii* in Colorado, on Round Mountain near Silver Cliff.

To Dr. Dall's recent list of Central Region Pupidæ may be added *Vertigo gouldi* Binney, which I found in a post-Tertiary deposit at West Cliff, Colorado, along with a variety of *V. ovata*. It has not yet been found alive in that neighborhood.—T. D. A. COCKERELL.

VALLONIA PULCHELLA IN PITTSBURGH.—A couple of months ago a friend sent me a lot of *Vallonia pulchella* that he had collected on his front walk in the East End, Pittsburgh. He says that he first noticed them late last spring or early summer, but is not sure of the date now. He says that they suddenly appeared after a rain literally in *millions*, and about three weeks later they again appeared, but in smaller numbers. The first time they appeared he says he gathered up a half tumbler of the shells for me but lost them. On their second appearance he got about a thousand which he turned over to me, and I send you a few under separate cover to let you see that they show the effect of Pittsburgh smoke.

My friend is going to watch for them this spring and summer, and if they appear will make a note of the date and how long they stay. There is a stone wall around the place and he thinks they come from this wall.—GEO. H. CLAPP.

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#### PUBLICATIONS RECEIVED.

LIST OF THE CLAUSILIE OF SOUTH AMERICA, WITH THE DESCRIPTION OF A NEW SPECIES, by E. R. Sykes (Jour. Malac., V,

pages 57-59, pl. IV). In this list 37 species are recorded. From United States of Columbia 11; Venezuela 1; Ecuador 6; Peru 16; Bolivia 2; and Porto Rico 1. *C. perplexa* Sykes is made a synonym of *C. dohrni* Pfr.—C. W. J.

REPORT ON THE MOLLUSKS COLLECTED BY THE INTERNATIONAL BOUNDARY COMMISSION OF THE UNITED STATES AND MEXICO 1892-94, by Wm. H. Dall (Proc. U. S. Nat. Mus., XIX, pages 333-379, pls. XXXI-XXXIII). In this report the fauna of the region adjacent to the international boundary line that extends from the Rio Grande River near El Paso, Texas, to the Colorado River near Yuma, Arizona, is fully treated. Two new species of *Polygyra* (*P. ashmuni* and *P. pseudodonta*) are described from New Mexico. Two new *Coelocentrum*, a new *Anisospira* and a new *Streptostyla* are described from Mexico.—C. W. J.

REVISION OF THE GENERA OF LEDIDÆ AND NUCULIDÆ OF THE ATLANTIC COAST OF THE UNITED STATES, by A. E. Verrill and Katharine J. Bush (Amer. Jour. Sci., III, 1897, pages 51-63). This interesting paper, the authors state, is but a preliminary account of the classification adopted in a somewhat extended study of the series of deep sea forms belonging to these families. "These families are often united by modern malacologists under a single family (Nuculidæ), while others regard them as distinct. The family Nuculidæ differs from Ledidæ mainly in having no siphon tubes, the mantle edges being completely disunited." A new subfamily (Glominæ) of Nuculidæ, and a new subfamily (Tindarinæ) of Ledidæ are used, while in the Ledidæ four new genera and one subgenus is adopted. The article is illustrated by 22 cuts, and closes with an analytical table of the recent subfamilies, genera and subgenera.—C. W. J.

THE EOCENE DEPOSITS OF THE MIDDLE ATLANTIC SLOPE IN DELAWARE, MARYLAND AND VIRGINIA, by Wm. B. Clark (Bull. U. S. Geol. Sur., No. 141). The introduction contains a complete bibliography and an exhaustive account of its stratigraphical and paleontological characteristics, followed by descriptions of species. About 60 species of Mollusca are described and illustrated. The entire work contains 93 pages and 40 plates.













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