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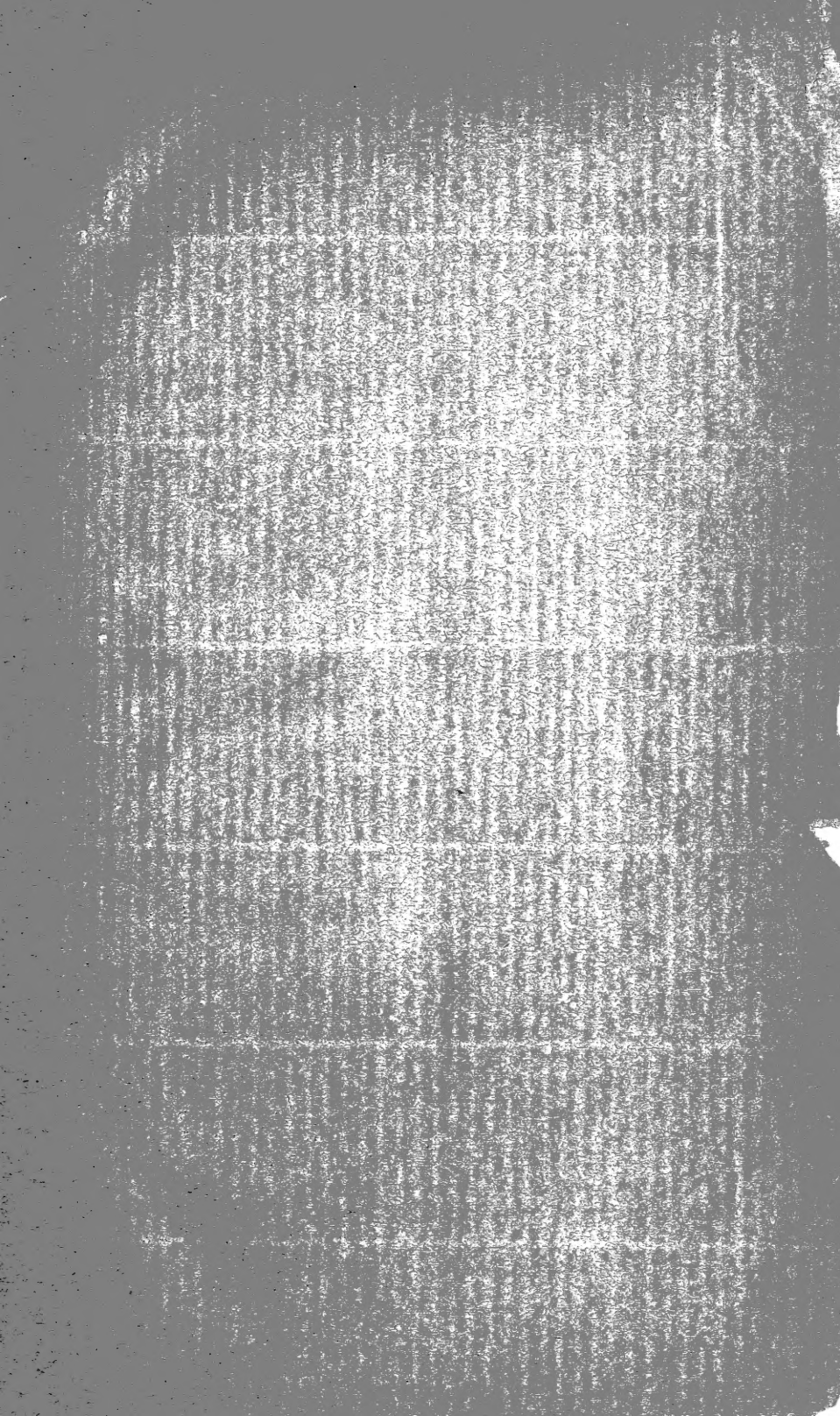
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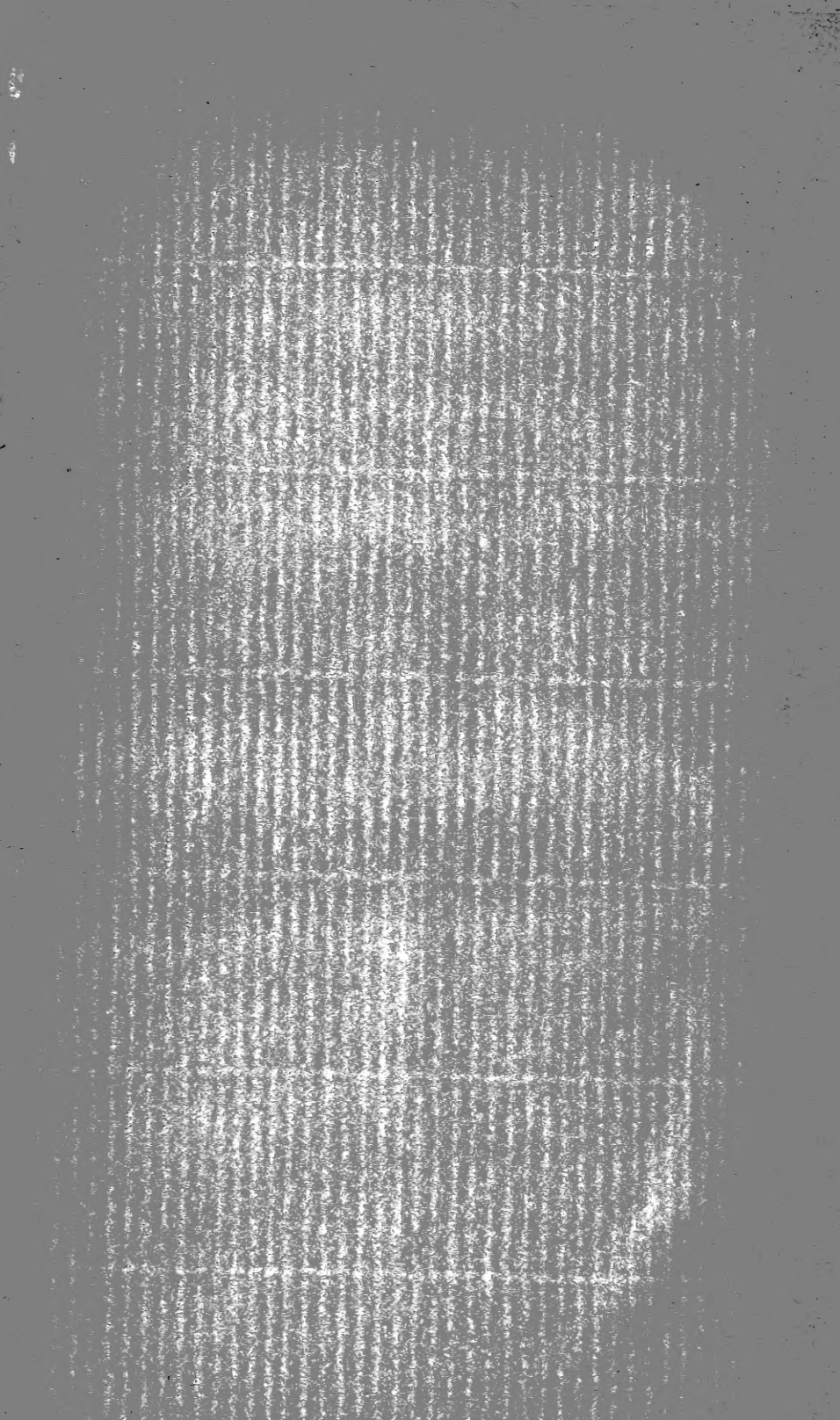
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THE
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A MONTHLY JOURNAL
DEVOTED TO THE INTERESTS OF
CONCHOLOGISTS.



VOL. VII.

MAY, 1893, to APRIL, 1894.



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THE NAUTILUS, VOL. VII.

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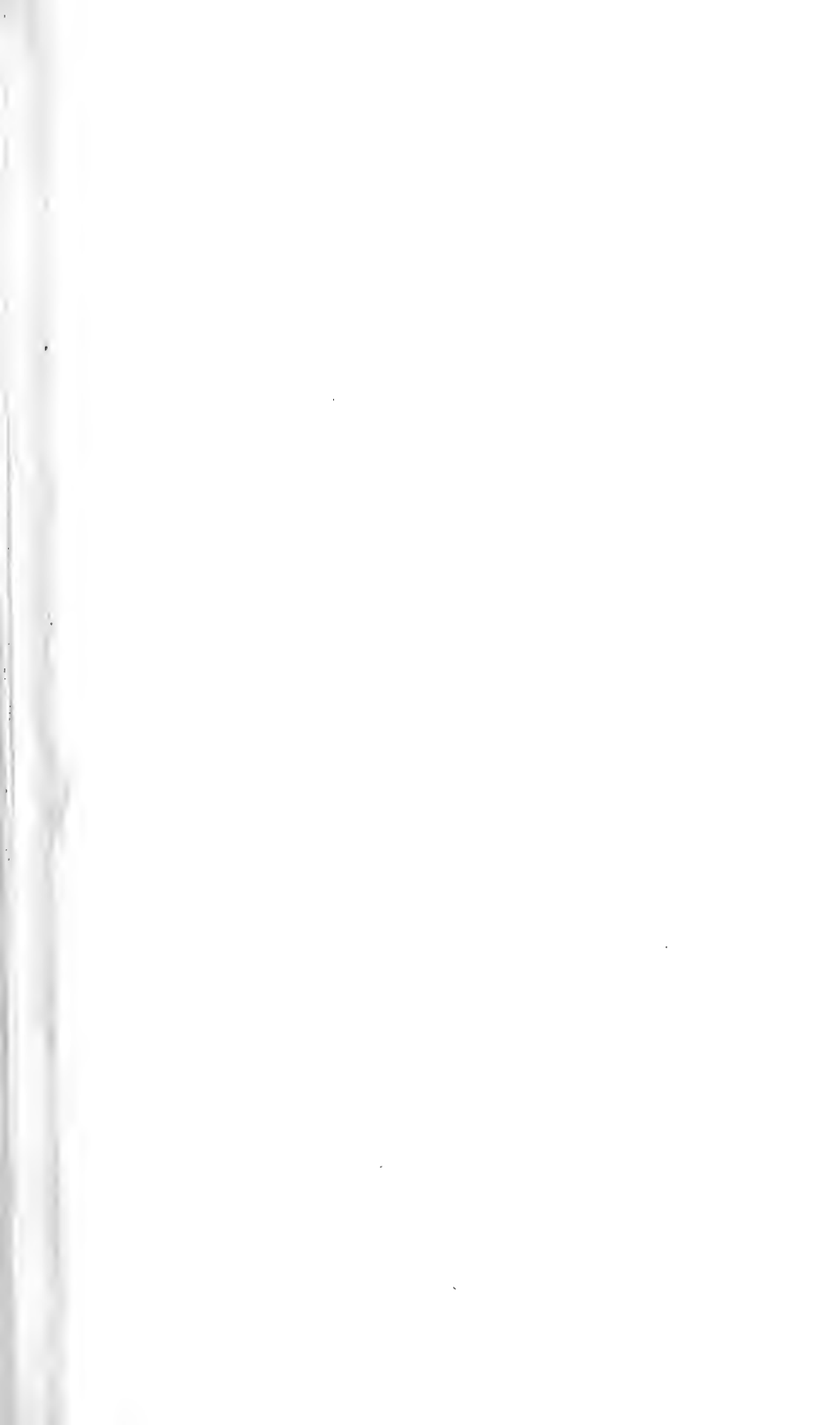
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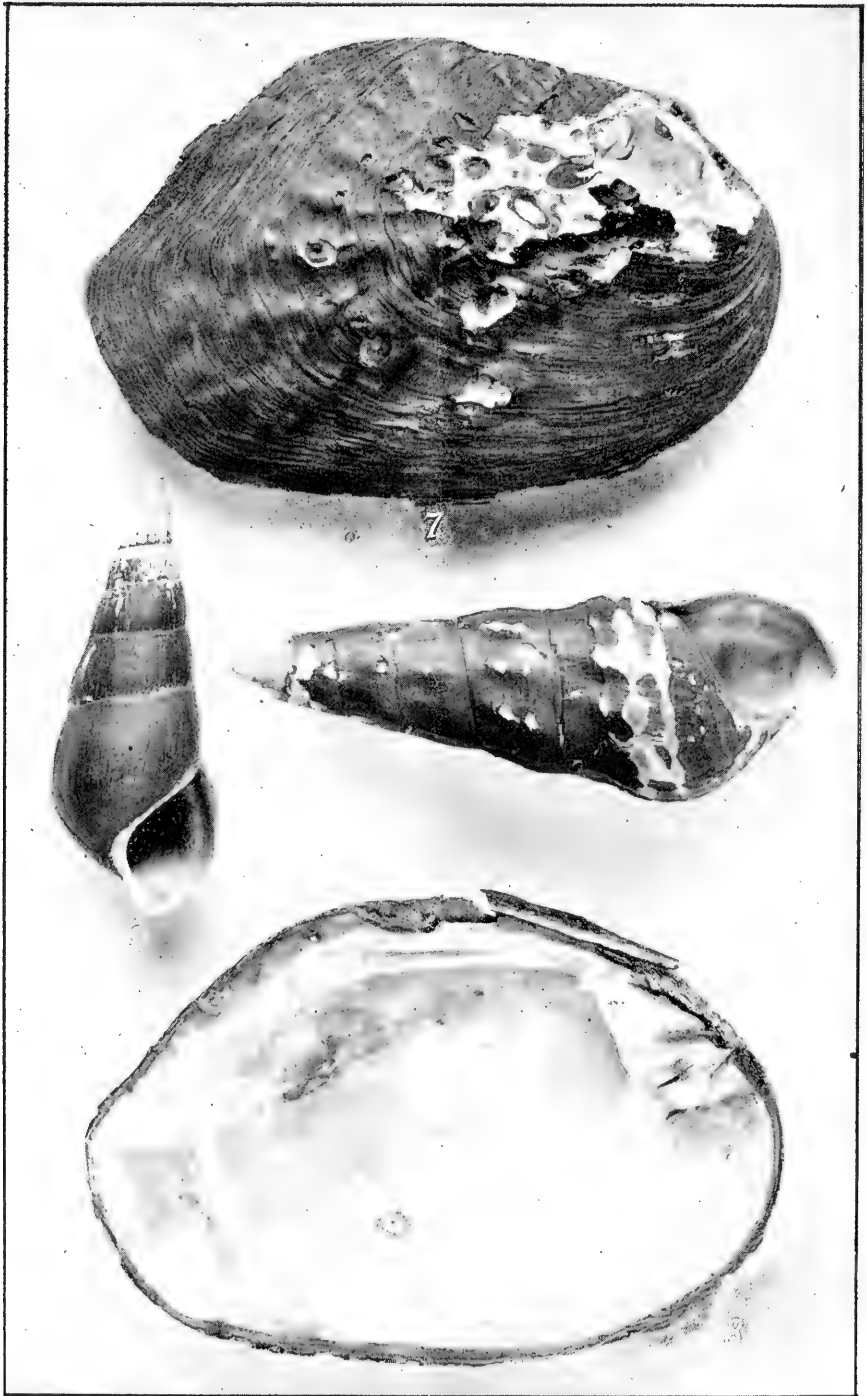
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OF CONCHOLOGISTS.

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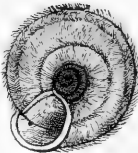
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THE NAUTILUS.

VOL. VII.

MAY, 1893.

No. 1

ILLUSTRATIONS OF NEW SHELLS.¹

Unio Pilsbryi Marsh, Plate I, figs. 7, 8.

This species is a member of the plicate group of Uniones. It is a decidedly compressed, oblong shell, black in color, having very distinctly marked lines of growth, which are spaced over the greater part of the disk, but become crowded on the lower margin. It has numerous oblique waves, which generally bifurcate indistinctly toward the posterior-lower end. The waves are more or less cut by short impressed furrows, as in *U. undulatus*, etc. The nacre is white and very thick anteriorly, but in the cavity of the valves and posteriorly it is thin and stained with blue and olive-green. The lateral teeth are also olive-green.

It was collected by Mr. Elwood Pleas in the Little Red River, Arkansas, and the original description, by Mr. Wm. A. Marsh, will be found in the NAUTILUS, V, p. 1.

Unio Pilsbryi is not closely allied to any other American species. It has a striking resemblance to *Unio Leai* Gray of China.

Specimens, including the individual figured, are in the special exhibit of United States shells, formed by the American Association of Conchologists, in the Museum of the Academy of Natural Sciences of Philadelphia.

¹The accompanying plate is reprinted by permission from the Proc. Acad. Nat. Sci. of Philadelphia.

The Melanian illustrated (figs. 9, 10) will be noticed in a later article.

SOUTH AMERICAN NOTES.¹

BY DR. WM. H. RUSH, U. S. N.

I have been adding lately to my collections many specimens, nearly all the work having been done near Maldonado, but few species being added, and they include the *Unios Rhuacoica* and *Charmana*, a fine, large *Anodonta*, *Azara labiata*, *Solecirtus Platensis*; and some fine, large, clean specimens of *Mytilus Platensis*, taken from the flukes and shank of an old anchor grappled here. This old anchor proved to be quite a blessing in disguise, for on it were some fine specimens of *Chiton Tehuelchus* and *C. Isabellei*, and a few large *Ostrea Puelchana*. In my dredgings since, I have found a few more *Chitons*, but always on rocky bottoms and attached to stones, so that while adding only a few of these, I have been adding nothing to my stock of the mud-lovers, such as *Corbula*, etc.

Mr. Burnett, the British Vice-Consul here, while visiting the ship, told me that he had occasionally found in his garden a large black slug. The day following proving pleasant found me on my way to hunt the monster, but anxious as I was for the little game of hide and seek, I found time on the way to loiter in a small patch of native trees to hunt for my old friends, the *Helix costellata* d'Orb., to add to the number of my accumulating exchanges. Finally I found Mr. Burnett and we started for the old ruins of a house. I did not anticipate much success when we entered the enclosure, for the ruins were in the center of the town of Maldonado, whose population is about twelve hundred, and the surroundings were extremely dry, there having been no rain for months. However, with willing hands we started in and after turning over many large masses of brick, my companion said, after the exertion of moving an extra heavy one allowed him to recover enough breath to speak, "There is one of those large mail-coated insects I was speaking of;" I promptly said, "Hold on!" and proceeded to turn out with my

¹The following extracts are from a letter received from our esteemed correspondent, Dr. Wm. H. Rush, dated U. S. S. Yantic, Maldonado Bay, Uruguay, March 7th, 1893.

forceps what seemed to be the veritable monster in all his glory of aestivation, the *Vaginulus solea* d'Orbigny, or more correctly according to Tryon, *Veronicella*. One more specimen was found with its egg-nest. Both specimens were curled, and the tentacles were not visible, in fact, it looked like a lifeless mass of very dark grayish-brown opaque glue, with lighter gray spots: about the size of that warred-upon Bland dollar, with a notch in one side and a crack extending nearly to the center. Turning it over it presented the well known under surface as shown in d'Orbigny's figure. Soon two tentacles came forth, which stuck up in the air, and each had a bright black eye visible in the exact center of its free end; then two more were observed, which projected downward and were broader and stouter than the others, and appeared bifurcated; these latter were constantly in motion, apparently acting as feelers, and later when the animal was moving along on a glass plate seemed to act as suckers. Finally he slowly straightened out until he was ten centimeters long and a little over two wide. I next took a look at the nest, of which I had found several in the woods, only never very large, usually containing about ten or fifteen eggs, but in this one I counted seventy-five, although, much to my discouragement as an amateur artist, in my sketch of it I can only account for forty-five—it was about the size of a silver half dollar and hemispherical, the eggs being regularly arranged around the circumference and held together by a heavy mucous-like rope. The eggs were oval in shape, some perfectly clear and transparent, others yellowish and more or less opaque, and all were covered by the stercoraceous deposit of some insect, I judged. Unfortunately, it broke to pieces before I reached the ship on account of the rough handling of curiosity. One specimen of the solea was much darker in color than the other, and the lighter seemed to fade before I had my water color sketch finished; subsequent finds may show considerable variation in coloration. I killed the first specimen in a solution of bichloride of mercury, 1 to 500, and then dropped it into glycerin hoping thus to preserve its colors, but it has contracted and become very dark: the second I killed in the same solution, in which it still remains. In dying it threw out much mucus, most rapidly and in greatest quantity from the extreme end so that I suspect there may be a mucous pore there; it also seemed to come from its whole surface enveloping it quickly in a cloud, completely hiding it, and in sufficient quantity to render the fluid as nearly opaque as milk.

The mantle retracted from the head, which thus exposed is one cm. long—the jaw was easily seen, by the unaided eye, as a brown crescentic band in the superior lip, and with an ordinary magnifying glass the ridges were easily seen. The whole animal is faded and contracted, but still pliable. The next I obtain will be killed in accordance with your directions in water, and will be kept for you.

Associated with the solea, and in damp places, I found some numbers of the slug which is given in d'Orbigny as *Limax unguis* Fer., but they are not as large as represented in the plate. I found this latter species very plentiful in the Prado at Montevideo and always several individuals together. This latter is in contrast with *Veronicella*, which were alone and widely separated.

I had a few Chitons of both species mentioned in the first part of this letter, alive in my aquarium bottle, for a few days in my room, with a long strip of glass upon which I coaxed them to crawl for the purpose of sketching for water-color work, and was surprised at the rapidity with which they travel, and it was rendered all the more decided when I compared it with the movements of the *Veronicella* which I had in another bottle alongside.

CONULUS FULVUS MULL.¹ VAR. DENTATUS, N. V.

BY DR. V. STERKI.

Among a number of *Con. fulvus* from Jackson Co., Alabama, kindly sent by Mr. H. E. Sargent, last year, there were a few specimens with distinct "teeth" in the base of the last whorl. Since then, Mr. Sargent has paid attention to the matter, and a few days ago sent me some more specimens in two lots, one from the valley and another from the hills. The latter were most small, young and half grown, and most of them showed 1-2-3 small, white, testaceous deposits in the base of the last whorl, at somewhat irregular intervals, roundish or elongate in a radial direction. They are not high, tooth-like, but quite distinct, whether seen through the shell, or if near enough, from the aperture inside, and recall the same feature

¹The species was first described by Müller, not by Draparnand. It may be said again, that *Conulus* is a genus founded on anatomic characters.

in the smaller *Gastrodonta*s, although I have never seen more than one tooth on the same radius. But, as said, in some they are in the form of radial bars, and when two or three are present they are always of the same character, either round or transverse. Two examples, mature or nearly so, but weathered and opaque, have at least one distinct round deposit each, about $\frac{1}{2}$ volution above the aperture. In the specimens from the valley, about a dozen in number, varying from young to large, and by the way a few of them with very high spire, there is not a trace of teeth to be seen.

This is certainly a very interesting fact, and the character described could mean a different species, and for the *Nouvelle Ecole* would be sufficient to establish a new genus. But as the shell is, in all other regards, formed like that of typical *C. fulvus*, we have to regard it as a variety of that species, the more so since in the lot there are a few examples without teeth and differing in no way from the type. This, and the variation in number, shape and size, show it to be a newly acquired character, which some time may be that of a distinct species.

It remains to know whether the form be found also in other places of our country—which is quite probable—and to ascertain also the nature of the localities where it lives. Another question is whether it also inhabits the Old Continent.

It may be mentioned here also that there are two different forms of the common *C. fulvus*, one more pale horn, the other deep wine or amber colored, and there are also differences in surface sculpture. It would be of interest to know how far these forms are constant and in correspondence with the nature of their habitats. I have seen them in both Europe and North America.

New Philadelphia, O., March 21, '93.

POLYGYRA SUBPALLIATA, N. SP.

BY H. A. PILSBRY.

Some time ago the writer received from Prof. A. G. Wetherby, a suite of the land snails found at his home, "Roandale Farm," Magnetic City, North Carolina; and with them a letter giving the collector's impressions and conclusions in regard to some, and queries

respecting other forms. A number of "Zonites" were included, among them specimens of *Z. carolinensis* Ckll., and of two new species, one of about the same size as *suppressus*, the other larger. Of these an account will be given later. Among the Helices, one of the most interesting forms was labelled "*H. wetherbyi* Bld. var. *Don't believe it!*" Upon glancing at the specimens I was compelled to join Wetherby in his scepticism, for the shells are certainly unlike *H. wetherbyi*, and belong to quite a different group of species. The first notice of these so-called *wetherbyi* appeared in a paper written by Mr. Wetherby on the shells of Roan Mountain, and published in the Journal of the Cincinnati Society of Natural History, vol. iv, as long ago as 1881. The paragraph is as follows:

"*Mesodon wetherbyi* Bland.—Shells which have been referred to this species occur somewhat sparingly at this locality. Like the specimens from the original station, the shells are covered with a thick coating of dirt, imbedded in the hirsute covering of the epidermis, which being carefully washed away leaves the shell of a pale greenish white color. These shells have a lamellar projection on the inferior surface of the peristome much like that of some varieties of *T. appressa*, and which is a character very distinct from that of the same region in the type. A very careful examination of the genitalia shows them to be much more like those of *Triodopsis*. Indeed, looking over the whole field, it seems not improbable that here we have another case of the union of characters of *Mesodon* with other groups, like that of *Stenotrema*, mentioned in my notes, No. 1. Mr. Binney says, *Terr. Moll.*, vol. v, p. 301, "*Triodopsis* does not differ from *Mesodon* or *Polygyra* in the character of its jaw." Again, p. 306, he says that the genitalia of *T. appressa*, resemble, in certain features, those of *Mesodon sayii*=*M. diodontia*. This shell certainly presents as many features that would ally it to *Triodopsis* through *appressa*, as to *Mesodon* through *dentifera*. In fact, I am inclined to the belief that the shell is not *Mesodon wetherbyi* at all, but a distinct species, probably a *Triodopsis*, and having the closest analogy to *M. dentifera* Binney, which certainly has some very strong claims to relationship to *Triodopsis* through *T. appressa*. The station of this species is always in the dirt under and beside rotting logs. It is very sluggish and timid, and very rare."

It will be seen that Wetherby recognized the Triodopsoid affinities of the snail; but in the writer's opinion it is more nearly allied

to the *palliata* than the *appressa*. The species may be diagnosed as follows:

Polygyra (Triodopsis) subpalliata n. sp. Shell depressed, thin, pale green or buff-green, somewhat translucent. Surface shining, minutely roughened by narrow granules elongated in the direction of growth-lines. Spire convex, composed of slightly over 5 convex whorls, the last rounded at the periphery, deflexed in front, and very deeply constricted behind the lip. Aperture oblique; outer lip flatly reflexed, white, wide, the arcuate basal lip bearing a long plate-like callus, as in *H. palliata*; parietal wall bearing a large, high, curved tooth, like that of *H. palliata*. Alt. $9\frac{1}{2}$, diam. 15 mill. (largest specimen). Alt. 7, diam. 13 mill. (smallest specimen).

DALL'S TERTIARY MOLLUSKS OF FLORIDA.¹

This second volume of Dr. W. H. Dall's great work upon the Tertiary Mollusks of Florida is much wider in scope than the previous part, including much matter upon other East American faunas of the same epoch, notably the Pliocene of the Carolinas. The introductory chapter graphically describes the series of changes of shore line and elevation of our southeast coast, from the close of the Eocene to the present time; and this has been noticed and quoted from in a previous number of the NAUTILUS.

The systematic enumeration and description of species occupies the greater portion of the work, the subject being completed down to the Pelecypods, which will form the third part of the work.

The new genera and subgenera proposed are as follows: *Glyptostyla* (type *G. panamensis* Dall), a peculiar form like *Pyrula* outside but ponderous and with the plaits of *Latirus*. *Trachyodon*, new subgenus of *Chiton* for *C. eocenensis* Conr.

The generic synonymy of *Vivipara* is worked out in full, the author concluding that *Vivipara* (Martini) Lamarek, has priority over the very bad masculine form, *Viviparus* Montf., which has lately been adopted by English authorities. Incidentally the history of the name *Bulinus* is discussed, and shown to be totally inapplicable to the genus of land snails generally known by that name. *Clava*, of Martyn, is used as a generic name to supercede

¹Transactions of the Wagner Free Institute of Science of Philadelphia, vol. 3, pt. ii. Issued January, 1893.

Vertagus. The genus *Natica* as used by most writers is definitely divided into two genera, *Natica*, in which the operculum is shelly, and *Polynices* Montfort (1810), in which the operculum is thin, flexible, corneous. The last group contains, of course, the familiar *duplicata* and *heros* of our east coast, and the similar western species. This is a division heartily to be commended, and it is surprising that it has not been placed upon a firm basis long ago.

A very large number of new species are described. The illustrations are excellent, having the merit of great clearness of detail. The appearance of the volume is highly creditable to the Wagner Institute, the officers of which have, with an enlightened appreciation of the importance of the work, spared no pains or expense in its production. Especially are the thanks of both Palæontologist and Conchologist due to Messrs Joseph Willcox and Charles W. Johnson, who collected much of the material, as well as to Dr. Dall who has so ably worked it up.

CESARE MARIA TAPPARONE CANEFRI.

On the 6th of August, 1891, CESARE TAPPARONE CANEFRI expired after a long illness. Professor CESARE TAPPARONE CANEFRI was born at Alexandria on the 5th of February, 1838, being descended from a noble Piedmontese family. His father was for many years Mayor, and destined his son for an official career. Tapparone, therefore, at the age of 20, entered the University of Turin as a law student; but he had already become interested in the natural sciences, especially botany. At Turin he formed a friendship with LUIGI BELLARDI and VITTORE GHILIANI; and in the elevating atmosphere of that fellowship he developed the enthusiasm and love for science which pervaded his whole after life.

A few years after his graduation, Tapparone was employed in the civil service of Spezzia; and there he was attracted by the rich shell fauna of the Gulf, which had already been studied by JEFFREYS and CAPELLINI. Many species not known to these students were found by the young enthusiast, who, in 1865, embodied the results of his research in a "Catalogue of the Mollusca of Spezzia," his first conchological paper. Henceforth, the greater part of his time was given to the study of mollusks. He shortly became an assistant to Professor LESSONA, in the Chair of Zoology and Com-

parative Anatomy, in the Royal University of Turin; while here he worked up the mollusks collected by DE FILIPPE during the circumnavigation of the Royal Frigate, 'Magenta.' In 1873, Tapparone began the series of articles upon Oriental land mollusks collected by O. BECCARI and L. M. D'ALBERTIS in New Guinea and adjacent regions; and it is to this series of papers that his reputation is chiefly due.

After a residence of eight years in Turin, Prof. Tapparone went abroad for the purpose of studying the mollusks of foreign museums. He visited the British Museum, the Zoological Museum of Berlin, etc., and finally spent some time in study under SEMPER at Würzburg. Returning to Italy, he went to Genoa, where he devoted himself to the mollusk collection of the Civic Museum. Shortly after, a disease of the circulation and nerves manifested itself, and despite the tenderest care of wife and friends, it proved fatal.

His collection and library have been given to the Civic Museum of Genoa, by his wife.

All students of land shells will regret the death of so conscientious and able a malacologist; and particularly will his loss be felt by those who have profited by his "*Fauna Malacologica della Nuova Guinea*," and the other essays upon allied faunas.

A bibliography and full biographical sketch by ISSEL, with portrait will be found in the *Annali del Museo Civico di Storia Naturale di Genova*, 1892.

THE UNIO MUDDLE.

BY PROF. CHAS. LE ROY WHEELER.

Under the above heading appears an article in the February NAUTILUS from the pen of Mr. Berlin H. Wright. In a recent number, also, appeared an article from Mr. John H. Campbell suggesting that the Uniologists connected with the American Association of Conchologists meet at Chicago this summer and settle disputed points as to priority of description, nomenclature, and synonymy. Certainly it would be "just too nice for anything" if the aforesaid Uniologists could have a little pic-nic at Chicago, pass a few resolutions forever settling all disputed points, pat each other

on the back, shake hands, adjourn, go home, and sleep more soundly than ever before; but, unfortunately, the ghosts of Dr. Lea, Mr. Conrad, Mr. Say, and others might appear upon the scene, and Mr. Ego might appear in the flesh, armed with carpet-bag, microscope, and manuscript; in which case the big show would not last half long enough to enable the quarrelsome scientists to finish throwing mussel shells at one another.

Seriously, however, this "muddle" ought to be unmuddled; but how is it to be done? Who is there upon whom all concerned will be willing to rest the responsibility of deciding contested points? Can three or five men be found upon whose judgment all will consent to rest? If so, who shall they be?

By the time the "Unio Muddle" shall have been fairly settled the indications are that there will be three or four other first class muddles ripe. Would it not be well for the American Association of Conchologists to do in regard to American mollusks as the American Ornithological Union has done in regard to the American Birds, and settle not only the "Unio Muddle," but all contested points in American Conchology?

Why is it that the reputation of a conchologist should rest upon the naming of new species rather than upon a knowledge of Conchology? and, honestly, may not the making of new species sometimes be attributed more to conceited self-assertion than to a desire to help the science? Suppose we have a committee of the American Association whose duty it shall be to decide upon the merits of so-called new species, and that a name be regarded as only provisional until it be accepted or rejected by such committee. So mote it be.

DESCRIPTION OF A NEW SPECIES OF NASSA FROM THE GULF OF CALIFORNIA.

BY ROBT. E. C. STEARNS, U. S. NATIONAL MUSEUM.

Shell small, elongated, ovate, of seven to eight whorls, with an acutely elevated spire, ornamented with generally three spiral series of granules; occasionally four series are exhibited on the penultimate whorl, and six to seven on the basal. These granules also correspond to a longitudinal arrangement. In some examples the sutural series is a little more prominent and followed by a slight

parallel sulcation. Otherwise sculptured with revolving liræ on the lower half of the basal whorl. Suture more or less distinct, aperture small, ovate, about one-third the length of the shell. Outer lip externally rimmed and internally thickened, crenulated and denticulate on the inner side; pillar and face of basal whorl heavily callosed, with a single plication or fold on the base and four or five obtuse wrinkles above. Aperture notched above with the usual attendant callosity; pillar roundly arcuated, and the whole surface of the parietal region and edge of the lip showing a warm shining brown glaze, light in some examples and quite dark in others; some specimens are much more robust than others and vary also in the elevation of the spire.

Dimensions of largest, altitude 16 mm., breadth 9 mm.

An intermediate example measures, altitude 15 mm., breadth 8 mm.

The majority of the specimens are much smaller than the least of the above.

The nearest ally of *N. brunneostoma* is *Nassa complanata* Powis, and these two species, together with *N. tegula* of Reeve, form a little group possessing similar general characters.

N. brunneostoma is readily separated from its congeners by the highly glazed and solid brown callus that surrounds the aperture.

Habitat.—Gulf of California, near the mouth of the Colorado River; also at Guaymas, on the easterly shore, where numerous examples were collected by Dr. Edward Palmer (Mus. Nos. 23721, 37239, 55951).

Washington, D. C., May 2, 1893.

NOTES AND NEWS.

THE MALACOLOGICAL SOCIETY OF LONDON.—At a meeting held on the 27th February, at 67 Chancery Lane, London, England, W. H. Hudleston, F. R. S., in the chair, the following resolutions were passed:

1. That a Society be formed in London for the purpose of furthering the study of the Mollusca and Brachiopoda in all their branches.

2. That the Society be called the "MALACOLOGICAL SOCIETY OF LONDON," and that the Annual Subscription be 10s. 6d.

3. That those who have signified to Mr. Sykes their willingness to join the Society shall constitute the original members: to wit (list of 70 names).

4. That the original Members, and those who join the Society during the year 1893, be exempt from entrance fee.

5. That the election of Members, subsequent to this the inaugural meeting, be by ballot, under regulations to be drawn up by the Council.

6. That there be an Entrance Fee, and that it be 10s. 6d.

7. That the following constitute the first Council:

President: Dr. H. Woodward, F. R. S.

Vice-Presidents: Lt.-Col. H. H. Godwin-Austen, F. R. S., etc.; W. H. Hudleston, F. R. S., etc.; J. Cosmo Melvill, F. L. S.; E. A. Smith, F. Z. S.

Treasurer: G. F. Harris, F. G. S.

Secretary: E. R. Sykes, F. Z. S.

Other Members of Council: H. W. Burrows; G. C. Crick, F. G. S.; W. Crouch, F. Z. S.; Rev. Canon Norman, D. C. L., F. R. S.; J. H. Ponsonby, F. Z. S.; G. B. Sowerby, F. L. S.; B. B. Woodward, F. G. S.

8. That the Council be instructed to draw up the rules, and submit them at the next Meeting of the Society.

9. That the Meetings be held on the second Friday in each month, commencing in April, 1893.

10. That the Resolutions passed at this Meeting be printed and circulated amongst the Members.

Votes of thanks were passed to the Chairman for presiding, and to Mr. G. F. Harris for the use of the room.

The next meeting will therefore take place on Friday, April 14th, at 8.00 p. m., and succeeding Meetings on the second Fridays in May and June, after which there will be no Meeting till November. Until further notice, the Meetings will be held, by the kind permission of Mr. Harris, at 67 Chancery Lane (second floor).

MR. CHARLES W. JOHNSON is spending a few weeks in Washington, D. C.

The death of the veteran botanist, ALPHONSE DE CANDOLLE, April 9, 1893, is announced.

MR. JOHN RITCHIE, JR., of Boston, paid a flying visit to his Philadelphia and Washington friends recently, being in the latter city attending the meeting of the National Academy of Sciences.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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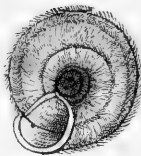
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THE NAUTILUS.

VOL. VII.

JUNE, 1893.

No. 2

SOME NOTES ON ZONITIDAE.

BY DR. V. STERKI.

1. The generic name *Zonites* Montf., has, by European malacologists, long ago been restricted to a group of circum-Mediterranean forms, such as *algirus*, *verticillus*, *gemonensis*, etc., none of them being represented in the recent North American fauna; and as it seems to be a well-defined genus, we will do well to recognize this restriction of the group. The old genus *Zonites*, or *Hyalinia*, is being disintegrated, just as the old genus *Helix* has been. For *nitidus* Müller, the genus *Zonitoides* has been established on characters chiefly anatomic, the presence of a dart sac and dart, and, as it seems, peculiarities of the radula. As the same dart sac and dart is present in a number of North American species, such as *elliotti*, *ligerius*, *demissus*, *intertextus*, *gularis*, *suppressus*, *internus*, etc., and, as has been supposed, and I can positively confirm, *arboreus*—they would range under *Zonitoides*, especially if their anatomy prove to agree with *nitida*, also otherwise. Dr. v. Ihering makes the proposition to unite all Vitrino-zonitidae having a dart¹ in a family, as xiphogone forms—"Zon." (or Hyal.) *fulvus* Müll., *gundlachi* Pfr., *sterkii* Dall., belong to the genus *Conulus* Fitz., well characterized anatomically. *Hy. crystallina* Müll., *diaphana* Studer., etc., of the old continent, have their peculiar anatomy also, and range under

¹ Which, however, is not homologous with the dart of the Helicidae, and therefore named *pugio*, by v. Ihering.

the genus *Vitrea* Fitz. On the other hand, as well known, our *Mesomphix* (s. str.) are hardly to be separated generically from *Hyalinia* (*Euhyalinia*), as *glabra*, *draparnaldi*, *cellaria*, etc., and forms like our *wheatleyi*, *petrophila* from *pura*, etc., not to speak of *radiatula* which is equally distributed on the old and new continents. We may, for all these, use the generic name *Hyalinia*, the more since such authorities as W. G. Binney, Tryon and others have done so before, and no embarrassing of the synonymy will result. Yet all these forms still need careful examination as to their anatomy.

2. Some *Zon. suppressus* Say, show not a trace of internal teeth or rather lamellæ, when adult; W. G. Binney (l. c. p. 226) also says that the tooth is sometimes "so little prominent as to be hardly visible." I have in possession specimens from Ohio and Virginia (Petersburgh, collected by myself) of 7-8 mill. diam. and 7-7½ whorls, with the last whorl and aperture well-rounded, without any "teeth," and only a thin callus inside. As to size and shape, they differ essentially from W. G. Binney's description and figure.² With these, there were examples of all ages and sizes, inseparately connected with the former, having two strong lamellæ upon a heavy callus. Also in *gularis* and other forms of the group, the lamellæ considerably decrease in size and number with advancing age, and at maturity sometimes are quite short and thin.

3. Mrs. Geo. Andrews, to whom we owe so many valuable finds among land mollusca, sent me, in 1891, a number of "*Zonites gularis* small var." Then I was satisfied that they were not *gularis*; and now, after repeated comparison and examination also of the soft parts on specimens recently obtained, this is beyond a doubt, and as well, that it is a distinct species, not yet described. Here only so much of the description will be given as to serve our purpose. The shell is of the general appearance of a small *Z. ligerus*, of only 9 mill. greater diameter, finely perforated, with a high spire, well-rounded at the apex. Inside there is a rather long fold corresponding to the same (outer) in *Z. gularis*, etc., and a lower one near the columella. In a part of the specimens there is another (outer) long fold, about ½-¾ volution above the aperture, sometimes connected by a fine marking with the one in front; evidently this is the one previously formed and not resorbed, the same thing as in *Z. internus*, etc.

4. A few examples of *Zonites*, I think a form of *demissus*, from

² Manual, p. 225; fig. 241, looks like drawn from an immature specimen.

Nashville, Tennessee, and Jackson Co., Alabama, the latter collected by Mr. Sargent, have a strong, thick, white, testaceous deposit inside the base of the last whorl, with some nodules, apparently irregular, but equal in the specimens from either locality, which correspond to teeth or folds. These testaceous deposits in different species are often smaller and thinner in mature shells than in adolescent, and sometimes entirely resorbed; they evidently are the same morphological element as the deposits and folds in *Gastrodonta*.

5. I believe the fact must impress itself upon anyone that *Zon. suppressus*, especially the form noted above; *gularis*, also more in some forms, much resemble *Z. ligerus*, *demissus*, etc., and are nearly related to them, much more so than the latter are to the *Mesomphix* between which they are inserted in systematic works. This feeling found its expression also in W. G. Binney's "L. & F. W. Shells," where *ligerus*, *demissus*, *intertexta* are ranged under the genus *Hyalinia*, the *Mesomphix* under *Zonites*. To this now comes the species announced under 3 above, resembling *ligerus* as to the general configuration of the shell, and "*Gastrodonta*" in the lamellæ, which are of a somewhat peculiar type at that, approaching it to *significans* Bld. Some light on the significance of presence or absence of internal teeth is given also by *Conulus fulvus*, in which, as we have seen, such may be found or wanting in the same form from the same locality. And a character common to the two groups, valuable even of higher order, seems to be the presence of a dart, in the genital organs, which would range them together in the genus *Zonitoides*. It may be communicated here, previously, that I have found, in the upper part of the penis in *Z. ligerus*, *suppressus*, the forms mentioned under 3 above, and in *arboreus* a peculiar papilla (*Reizkörper* of German authors) in which a part is hard, sharp, projecting and (in the 3 former species) impregnated with carbonate of lime.

6. Quite lately, Mrs. Andrews has sent me specimens of a *Zonites*, collected at Cranberry, Mitchell Co., North Carolina. They can be referred to none of the described species, and may prove to be a new one.³ The shell, of about 7 m. in diam., has two very small lamellæ or teeth near the aperture, corresponding to the same *Z.*

³ The n. sp., however, may be "hanged in the smoke till cured," or left in suspense till fully confirmed; it is, *as such*, of little consequence, but of great importance as a form.

gularis, and thus proves to be a Gastrodonta. The shell is thin, transparent, somewhat greenish deep horn colored, of the same appearance as *Z. nitidus* Müll., which species it surprisingly resembles below, while above it appears different by the greater number of whorls. It seems that here we have a "missing" or connecting link between the so-called type of *Zonitoides*, and its more characteristic North American members.

7. Mrs. Andrews has, of late, again sent me numerous small *Zonitidae*, collected in the mountains of Tennessee and North Carolina. From these I learned, beside other things, that *Zon. andrewsi* W. G. B., when adult, has very often (or always?) no internal teeth at all. Moreover, the shell attains quite a different configuration: the last whorl is placed considerably deeper on the penultimate, or gradually descends, thus causing the spire to be much more elevated; it becomes also deeper and at last somewhat truncate in the periphery (perpendicular section) and subangular below, comparatively large, just as we find it in some *ligerus*, *gularis*, *suppressus*. At the same time, the base is no more equally rounded, but becomes sloping inward, somewhat infundibuliform, the umbilicus is rather large, and the striation becomes more crowded and coarse, even so that the striæ appear to be raised (*i. e.* the intervals) in place of impressed, as they are on the inner whorls. The whole shell then has quite a different appearance from that commonly known as *Z. andrewsi*, much resembling the description and figure of *Zon. placentulus* Shuttl. (in W. G. Binney's Manual, p. 222). The whorls are fully 9 or more, the diameter 7-7.5 mill. It was somewhat difficult to state these relations, as I had, though, a good number of specimens, no complete series from one locality at disposition. There is no doubt, to say no more, that many such examples have been taken for *Zon. placentulus*. And, as a striking proof of this, I have in my collection four specimens from the mountains of North Carolina received as *Zon. placentulus*, years ago, from a conchologist who studied those land shells; they show more or less the characteristic features noted above, and one of them has a distinct row of denticles denoting it unmistakably as *Zon. andrewsi*.

8. As with the preceding, it is with *Zon. significans* Bld. Only the younger examples, *i. e.*, those commonly found in collections under this name, have the teeth, two series of two, as a rule. In older specimens, of 5-6 mill. diam., they are no more formed, or only occasionally one or another, and then the shells have the characters

of *capsella* Gld., and doubtless have been and will be taken for such. A lot of fine examples, received from the same author, collected in eastern Tennessee, and named *capsella*, are, to all probability, nothing else but adult significans, in which the last whorl becomes comparatively more voluminous and commonly more descending. The spire is variable from almost flat to rather elevated, and also the umbilicus shows some differences. Among lots, which to all appearance, were *Zon. capsellus*, there were examples with a single, sometimes barely perceptible, tooth.

9. With all this, I do not feel positive, at present, that *Zon. andrewsi* W. G. B., and *significans* Bld., are only the juvenile forms of *Zon. placentulus* Shuttl. and *capsellus* Gld. But so much is sure, that they must be desperately similar, respectively, and that they need careful revision, also as to anatomy. The words of W. G. Binney that the latter form "a puzzling group," become of an increased meaning now.

10. For faunistics, it may be of interest that there were a few specimens of *Hyal. ferrea* Mse., from eastern North Carolina, among the materials sent by Mrs. Andrews. In my collection there is one from Randolph Co., West Virginia. Also from different places in eastern Ohio it is known.

New Philadelphia, Ohio, May, 1893.

A REVIEW OF VON IHERING'S CLASSIFICATION OF THE UNIONIDÆ
AND MUTELIDÆ.

BY CHAS. T. SIMPSON.

Since the theory of evolution has been generally accepted, a complete revolution has taken place in the methods of study and classification among biologists. All artificial systems, or those based upon a single character, have either been relegated to the past or are hopelessly doomed. Students who are progressive and keep abreast of the times, realize that in the study of organic life it is necessary to seize on to every fact which can possibly aid them in classifying: embryology, anatomy, the study of its development in the past as taught by palaeontology, geographical distribution and habits.

Dr. H. von Ihering, of Rio Grande do Sul, Brazil, has recently

published in Archiv für Naturgeschichte,¹ a lengthy article on the *Najidae* of San Paulo, Brazil, and a proposed system of classification in which some startling discoveries are brought to light, and which ranks as one of the ablest papers ever written on the subject. This classification, while working a complete revolution in our pre-conceived ideas of the relationships of the different members of this group, is so clear and philosophical, it so thoroughly takes cognizance of all the known facts, that it is certainly worthy of the most thoughtful consideration. In a brief review like this I can only allude to the more prominent points, and those who are interested should read the paper itself.

H. and A. Adams, in the Genera of Recent Mollusca, divide the Naiades into two families, *Unionidae* and *Mutelidae*,² separated by certain minor characters of the shells and animals. Ihering uses the same family names in a somewhat different sense from the Messrs Adams, and unites the whole into a larger group or super-family, which he calls the *Najidae*. He finds in all the genera which he places in the *Unionidae*, the larval state is a *glochidium*, that is, a stage or condition in which the animal is completely enclosed in a porous bivalve shell.

On the other hand, the species which he places in *Mutelidae*, pass through a state after hatching which he calls a *lasidium*, in which the animal is divided into three parts, of which only the middle bears the small, single shell. He finds, on examination, that those South American forms that have hitherto been placed with *Anodon*, pass through the *lasidium* stage, hence they must be separated from that genus whose larval state is a *glochidium*, and he retains for this group the name suggested by Gray—*Glabaris*. He believes that *Aplodon*, having a few South American species, hitherto placed in *Monocondylæa*, and the so-called African *Anodons* belong to the same family, and that the latter should be placed in *Glabaris*.

D'Orbigny established the genus *Monocondylæa* for certain species of South American *Naiadae* whose shells possess a single cardinal, and no lateral teeth. Several of these will fall into other natural groups. Ihering does not mention the Asiatic species which Lea

¹ Najaden von S. Paulo und die geographische Verbreitung der Süßwasser Faunen von Südamerika, von H. von Jhering. Jahrg 59, 1 Bd., 1 Heft.

² Fischer, Manuel de Conchyliologie, p. 997, divides *Unionidae* into two sub-families; *Unioninæ* including *Unio*, *Monocondylæa*, *Pseudodon*, *Anodonta*, *Solenata* and *Mycetopus*; 2d *Mutelinæ*, with *Mutela*, *Hyria*, *Castalia* and *Leila*.

and others have placed in this genus, but I believe they have no close relationship to these South American forms, and that they are merely depauperate *Unios*, which have a close affinity to species of that genus found with them.

The *Unionidæ* of Europe, North and Central America, and probably of the whole Northern Hemisphere, develop eggs in the outer gills alone as far as is known, with the exception of *Unio multiplicatus* and one or two others, which contain embryos in all four leaves of the branchiæ. Ihering states that in all the *Najidae* hitherto examined from South America, the eggs are borne in the inner gills. I may remark in passing that the shells of the Australian, New Zealand, and many South African *Unios* bear an astonishing resemblance to those of South America in form, texture, smooth epidermis and concentric, sometimes slightly granulated sculpture, and especially in the peculiarly compressed, parallel cardinal teeth, and Suter states³ that the embryos of *N. menziesi* are borne in the inner gills. Ihering calls attention to the fact that all South American *Unionidæ* have a radial beak sculpture, and suggests that probably the same character may be found in the New Zealand species.

I have carefully examined extensive series of *Unio menziesi* and *lutulentus*, and on the latter find that the umbos are radiately ribbed where the shells are not too badly eroded, and there are traces of such ridges on the former and on some Australian species. He believes that we shall find the beak sculpture one of the best characters for determining the minor divisions of the *Unionidæ*. Notwithstanding the opinion of this eminent conchologist, and the fact that Mr. Wm. A. Marshall, of the New York State Museum, who has also given this subject some very careful study, believes that the beak sculpture is quite constant and may be used in determining species, my own experience in handling great quantities of material from all over the world leads me to consider this a somewhat variable character, and although it will no doubt prove very useful in studying species and the smaller groups, yet I am sure it cannot by any means be always relied on.

It is only in Europe that the post-embryonic larvæ of the *Unionidæ* have been observed actually attached to fishes, though the North American species are known to possess hooks and bristles during this stage, and they no doubt make use of the same means to assist in their distribution, as do their Old World relations.

³ N. Z. Jl. of Science, No. 6, Vol. I (new issue), p. 250.

Ihering fails to find them on any of the South American *Unionidæ* he has examined, but he has probably overlooked the statement of Lea¹ that the glochidium of *Unio firmus* of Brazil is provided with both of these appendages.

Castalia was placed in the *Mutelidæ* by the Messrs Adams, but Ihering shows that it is very closely and curiously related to *Unio*. In the latter the short branchial siphon is open; in the former it is closed; in *Unio* the lateral teeth are either smooth or obliquely striated;² in *Castalia* they are vertically ridged. He has applied the name *Castalina* to a few species which stand between the two genera, and has given it generic rank. But he shows that there is a complete intergradation and connection from one end of the chain to the other. In certain *Castalias* there is a typical animal, in others it is that of *Unio*, and in *Castalina* there is an almost complete blending and crossing of characters. I have noticed on examining large series of these shells that in some *Castalias* the peculiar tooth sculpture is nearly wanting.

Von Ihering finds that *Unio multistriatus* of Brazil is very closely related to *N. senegalensis* of Africa, and to certain Indian forms. He has, in his collection, a specimen of *Unio radula* of India that is identical with *N. coriaceus* from Rio Janeiro, and believes this fact to be a proof of the long duration of the species of this family and probably evidence in favor of the existence of the lost Atlantis.

His arrangement of the families and genera stands as follows:

<p><i>Mutelidæ</i> v. Ih. (nec Adams).</p> <p><i>Leila</i> Gray.</p> <p><i>Glabaris</i> (Gray) v. Ihering.</p> <p><i>Aplodon</i> Spix.</p> <p><i>Plagiodon</i> Lea.</p> <p><i>Fossula</i> Lea.</p> <p><i>Mycetopus</i> Orb.</p> <p><i>Solenaia</i> Con.</p> <p><i>Mutela</i> Scop.</p> <p><i>Iridina</i> Lam.</p> <p><i>Pleiodon</i> Con.</p> <p><i>Spatha</i> Lea.</p>	<p><i>Unionidæ</i> v. Ih. (nec Ad.).</p> <p><i>Hyria</i> Lam.</p> <p><i>Castalia</i> Lam.</p> <p><i>Castalina</i> v. Ih.</p> <p><i>Unio</i> Retz.</p> <p><i>Margaritana</i> Schum.</p> <p><i>Cristaria</i> Gld.</p> <p><i>Anodonta</i> Lam.</p>
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¹ Observations on the Genus *Unio*.

² In *Unio tortuosus* Lea, a remarkable inequivalve species from China, the laterals have perpendicular striæ, and Lea remarks that if this is found in all the individuals of the species, it would have to be placed in *Castalia*. It has much the appearance of *Unio ellipsis* Lea.

This classification is, to a certain extent, provisional; and may have to be somewhat modified when we have a fuller knowledge of the anatomy. Whatever else may be said of it, the principle adopted is the right one, and the only one which modern science can recognize. The arrangement of the Adams brothers is largely artificial, both as to genera and subgenera, as well as the system adopted by Lea, as they bring together side by side, species and groups from every country which have no close relationship whatever, and by such methods anatomical and conchological characters, the facts of geographical distribution, habits and palæontology, are ignored.

THE SMALL GREY SLUG IN JAMAICA.

BY T. D. A. COCKERELL.

Some days ago Mr. W. Harris sent me from Cinchona some strawberry plants, together with a beetle larva which was injuring them. Of this larva there will be more to say hereafter, but the object of the present note is to record that among the plants I found three specimens of the small, grey slug of Europe, *Agriolimax agrestis*. This slug, well-known as a garden pest in England, has never before been noticed in the West Indies, and there can be no doubt that it has been introduced with plants. It is, I suppose, almost impossible to import living plants without sooner or later introducing foreign slugs. They and their eggs come in the earth about the roots, and, in many cases, it must be practically impossible to detect them on arrival. It might be advisable in some cases to isolate newly-arrived plants by water, and search for slugs on them at intervals; or we might import the carnivorous slug, *Testacella*; or introduce some of our native carnivorous snails, *Oleacina*, into the locality where the plants were being propagated. It has been recorded that in twenty-four hours, 25 specimens of *Testacella* devoured 25 earth-worms and 25 *Agriolimax agrestis*.

The small, grey slug, although now first detected here, has spread to many distant localities by human means. I have seen specimens from various parts of the United States, west to the Pacific coast and east to New Jersey, from St. Helena, the Canary Islands, Tristan d'Acunha, New Zealand, etc., and no doubt in time it will inhabit every part of the earth in which the climate is suit-

able to it. In Jamaica it will probably remain confined to the higher altitudes.

Institute of Jamaica, April 13, 1893.

A REPLY TO PROFESSOR WHEELER.

I think that quite enough has been said on the subject of the *Unio muddle* in the columns of the *NAUTILUS*, and I do not want to revive the subject. But there are one or two suggestive points in Professor Wheeler's note in the May number that I want to call attention to.

While a Congress of American conchologists might be able to settle certain contested points in nomenclature, if their work did not come into too glaring opposition to certain established laws recognized by scientific societies in general, yet I believe it is impossible for any such body to straighten out the muddle of specific limits, or perhaps, in all cases, the relations of one species to another. I believe that an expert, a specialist who has devoted years to the loving study of a family or genus, is better qualified to judge on these points than any body of students, no matter how capable they may be otherwise, but who probably have only a mere smattering of the matter in question.

C. B. Adams and Dr. Gould ranked easily among the ablest conchologists in the world, but who can doubt that Mr. Lea, or James Lewis were better qualified to judge on the nice distinctions of the Unionidae, or that Dr. Newcomb was more competent to arrange the Achatinellas, or that Dr. Dall has a better knowledge of deep sea Mollusks than did either of these? Because these men have made life studies of these subjects, while the others were not specially interested in them.

A specialist who works on a difficult or puzzling group, goes over his work again and again, putting it aside when he tires of it, and taking it up when the mind is rested. He patiently and lovingly labors over the most minute and obscure points that to most students would be of little or no interest, because his heart is in the work and he is thoroughly determined to master the whole subject. As a rule, his collecting is largely done in the direction of his hobby, and he therefore has more material to work on than one slightly interested. He eagerly reads all literature relating to his work, and in time, if his judgment is well balanced, he becomes an authority.

Now I do not pretend to say that any such person can ever arrive at a point where he never makes mistakes, or where his authority should be taken as absolute, but I do say that he knows at sight and has constantly on his tongue's end much that the ordinary student cannot possibly know or have.

And even when such a specialist publishes the results of his studies they must stand the test of criticism, merciless and searching; they must be subject to all the modifications that will be caused by future discoveries and enlarged knowledge, for it is the naked truth alone that will stand, and not the assertions of any specialist or body of scientists. But I believe that the man who spends years of loving, conscientious labor and study on a subject is better qualified to act as an authority than any body of outsiders.

CHAS. T. SIMPSON.

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

Since the article in the October NAUTILUS, the following have been admitted as members of the Association:

T. S. Oldroyd, 142 N. Los Angeles St., Los Angeles, Cal. Subject—(not chosen yet).

Wm. H. Myles, 53 Arkledun Ave., Hamilton, Ontario, Canada. Subject—Helicidae and Pupidae of Ontario.

A. H. Gardner, P. O. Box 84, Fort Hamilton, Long Island, N. Y. Subject—Land Shells and Fresh-water Univalves of the United States.

Miss S. P. Monks, 305 Bunkerhill Ave., Los Angeles, Cal. Subject—(not chosen yet).

A. G. Wetherby, Magnetic City, Mitchell Co., N. C. Subject—(not chosen yet).

Chas. S. Hodgson, Albion, Ill. Subject—Helicidae.

W. H. Conrad, 11 Bank St., Philadelphia, Pa. Subject—Tertiary Shells.

M. J. Elrod, Wesleyan University, Bloomington, Ill. Subject—(not chosen yet).

Geo. H. Clapp, 116 Water St., Pittsburgh, Pa. Subject—Helicidae.

Members will please note the following changes of addresses since the publication of the list of members:

- John Ford, Holmes Station (B. & O. R. R.), Delaware Co., Pa.
 Mrs. E. P. Gaylord, 167 E. Congress St., Detroit, Mich.
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 A. Schlehenried, 16 N. William St., New York City.
 John H. Campbell, 1009 Walnut St., Phila., Pa.
 Robt. T. Jackson, 33 Gloucester St., Boston, Mass.

NOTES AND NEWS.

MR. HUGH FULTON, of London, passed through Philadelphia, recently, en route for Chicago. His stay, though short, was most enjoyable.

NOTE.—Owing to the expected absence from Philadelphia of the Editors and Manager, the July issue of the NAUTILUS will probably be delayed beyond the usual time.

Last week a coyote was found at Punta Banda, San Diego county, trapped by an abalone shell [*Haliotis cracherodii*]. The coyote had evidently been hunting for a fish breakfast, and finding the abalone only partially clinging to the rock had inserted his muzzle underneath to detach him, but the abalone closed down on him and kept him a prisoner.—*Weekly Bulletin*, San Francisco, May 17.

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DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

Vol. VII.

JULY, 1893.

No. 3.

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THE NAUTILUS.

VOL. VII.

JULY, 1893.

No. 3

TO CONCHOLOGISTS.

The Editors of the NAUTILUS would like to impress upon American Conchologists that they are not conducting this paper for their personal aggrandizement, as some persons seem to believe. The work done has been purely a labor of love, for the promotion of interest in conchology; and the Editors have not only put much work into the enterprise, but, from first to last, a considerable number of large and shining Dollars, and this without expectation of pecuniary return.

We have looked forward to the unanimous support and encouragement of American Conchologists, for it is only by such support that a paper of this character can be sustained. We know that there are enough persons in the States interested in Conchology to give this support, and to enable us to increase the size, the number of illustrations and the interest of the articles as well.

We depend upon YOU to aid us in bearing the expenses of publication. We depend upon YOU to send us notes and matter to increase the interest and usefulness of the numbers from month to month. The time we put on this work is time stolen from scientific work of vastly greater magnitude, and it is only by the liberality of the Academy of Natural Sciences and the Wagner Institute that we are enabled to give the attention necessary to conduct a monthly journal.

We write thus because we know that we are not having the sup-

port we deserve from American Conchologists. Scores of subscriptions remain unpaid, and requests by letter to "square up" are calmly ignored.

We would ask our subscribers in all seriousness, Do you need this paper? If so, why not support it. We depend upon the Conchologists of America to help and encourage us in making our NAUTILUS a journal worthy of American Science.

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

BULIMULUS PROTEUS Broderip AND ITS DISTRIBUTION.

BY W. H. DALL.

Bulimus proteus was described by Broderip from Peru in 1832. It was referred by Deshayes to *B. sordidus* of Lesson, an opinion not generally adopted, and which he afterward relinquished. In 1860, Mr. J. Xantus, collecting for the Smithsonian Institution at Cape St. Lucas, obtained one adult and two young specimens of a large *Bulimulus*, which were referred to Broderip's species by Binney; an opinion which was justified by the close resemblance and small amount of material for comparison. The singularity of distribution has been commented on by every one from Binney to Crosse and Fischer in their magnificent work on the Mexican land shells, and Dr. Cooper in recent papers on Lower Californian land shells. By a recent expedition of the California Academy of Sciences to Lower California, nearly 100 specimens of the shell in question were obtained, which I examined while in California in 1892, and which are described by Dr. Cooper (Proc. Cal. Acad., 2d Ser. III, p. 211, 1892), thus for the first time giving an opportunity for careful comparison of our Californian species with that from Peru. A series kindly sent by Dr. Cooper on behalf of the Academy, together with the original specimens of Xantus and a series of fourteen specimens of the Peruvian *B. proteus*, have been critically compared, leaving no doubt, in spite of the close similarity, that the Mexican shell is distinct and must receive a name, as the synonyms are all strictly referable to the Peruvian form.

Bulimulus (Scutalus) montezuma Dall.

B. (S.) proteus Binney, L. & F. W. Shells N. Am., 1, p. 207, fig. 358, 1869; not of Broderip, P. Z. S., 1832, p. 107.

Habitat, Lower California, mostly from the mountainous region (3500 ft. alt.), Eisen, Belding and Xantus.

As Dr. Cooper observed, this species is not as "protean" as some others. It exhibits no such variations in form or color as *B. proteus*; the latter assumes almost every mutation of form, but taken on the average is less acute and has the last whorl less patulously drawn out, axially, than the *B. montezuma*. The color of *B. proteus* is variably distributed, but tends in the most strongly colored examples to be laid on in 4-6 broad, spiral bands of brown, with indistinct boundaries, separated by paler zones. In *B. montezuma* the color is seldom present, but, when it is, it is laid on in narrow, obscure zones, parallel with the incremental lines and never spirally disposed. The granulation in the Californian shell is less coarse and intense than in the Peruvian species when most developed, and the umbilicus averages much smaller in the former. All these characters are of degree rather than kind, but two features may be mentioned which appear constant and specific. In the Mexican shell the angle which the outer lip makes with the body whorl, or axial perpendicular, at its junction is invariably more acute than in *B. proteus*, which latter has the lip bent suddenly down at this point. Secondly, the larval shell or nucleus of *B. proteus* is beautifully shagreened with minute punctations or short, almost vermicular, indentations, visible plainly under a glass, and only absent when worn off by abrasion. Traces of this sculpture may always be found. In *B. montezuma* the nucleus is delicately ribbed in harmony with the incremental lines, and does not show the peculiar shagreening alluded to, a character which alone is sufficient to establish its distinctness, but the constancy of which could not be predicated from the three specimens examined by Mr. Binney.

The distribution of the species now determined by Messrs Eisen and Belding is sufficient to disprove the hypothesis of introduction by artificial means, and it is satisfactory to have our largest North American species placed upon a permanent footing.

EDIBLE MOLLUSKS OF SOUTHERN CALIFORNIA.

BY MRS. M. BURTON WILLIAMSON, UNIVERSITY, LOS ANGELES CO.,
CAL.

In an interesting article upon the "Edible Mollusks of Rhode Island," by Mr. Horace F. Carpenter, published in the NAUTILUS some time ago, he compares the number of marine edible mollusks of Rhode Island with those reported from San Francisco by Professor Keep.

Without wishing to leave the impression that California can compete with Rhode Island in the number of species found in the "fish markets," yet the number recently reported from this State can be greatly increased. The number of shells offered for sale here is always limited, and the famous "clam-bake" of the eastern shore is never duplicated. In the Los Angeles fish markets, *Donax* and *Chione* are the most abundant.

Donax californicus Conr. is the favorite clam for soup. This tiny bivalve might seem to an observer "all shell," yet it proves a very good substitute for the oyster in soup. The shells are carefully washed, allowed to remain in fresh water some hours, boiled, then drained. The liquid drained off is, with plenty of milk added, converted into a very palatable soup, especially when one is on the beach, and has just returned to the tent after a good bath in the ocean.

Chione simillima Sby. is often offered for sale at five cents a pound. *Chione fluctifraga* Sby. and *Chione succincta* Val. are occasionally found with the former, as they are collected from the same mud flats. Soup made from this shell-fish is not finely flavored and the meat is tough.

Tivela crassatelloides Conr., large shells are sometimes sold in the markets, usually at five cents each. *Tapes staminea* Com., *Ostrea lurida* Cpr., *Ostrea virginica* Gmel. (the latter brought here from San Francisco), *Mytilus californianus* Conr., *Mytilus edulis* Linn., and *Pecten aequisulcatus* Cpr., are also occasionally offered for sale, but in limited quantities. *Haliotis cracherodii* Leach may sometimes be seen in the market, although I have not seen one this winter. Occasionally a small *Haliotis fulgens* Phil. has been seen with the former species. The Mexicans seem to be fond of this shell-fish, as I have seen three and four dozen Halioti dried and strung on a cord, the same as they string red-peppers. When dried, the Abalones, as they are named by the Mexicans, look like oblong pieces of very thick leather, more than anything else that I can describe.

The number of species found in Los Angeles city markets, and not reported from San Francisco, would, I believe, add six more to the Californian region. Professor Keep says the *Mytilus californianus* is found outside of San Francisco Bay, but does not mention it as sold in the city. *Amiantis callosa* Conr. is occasionally eaten when collected in San Pedro Bay, although I have been told it was "not a very tempting dish." As it does not live near the shore,

collectors do not often find more than single valves on the beach.

In the "Catalogue of Economic Mollusks," written by Lieutenant Francis Winslow, upon the exhibition of the U. S. Nat. Museum, at the "International Fisheries Exhibition," at London, in 1883, he says of *Macoma nasuta* Conr., "It is abundant in San Francisco Bay, and it was evidently eaten largely by aborigines, as the shell-mounds in the vicinity of the bay are largely composed of shells of this species." I have not heard of this shell-fish being eaten here, nor the much larger *Macoma secta* Conr., but Lieutenant Winslow says the former is "eaten on the Pacific coast by all classes." The same writer mentions *Platydon cancellatus* Conr. as existing in "great abundance in Bolinas Bay and Santa Barbara. Its habits are essentially those of the 'soft clam,' and it forms one of the staple food shell-fish of the Pacific coast," although Mr. C. R. Orcutt, in his "Notes on the Mollusks of San Diego," says this shell has been collected for food at La Playa, "but the animal is bitter." I fear I am digressing, as Professor Keep's article was intended by him as the first of a series of articles reporting "food mollusks which may be bought in the markets of our country," each writer "reporting for his (or her?) own locality."

Notwithstanding the number of species we can report from California, I am compelled to admit that, in quality and number of individuals, California cannot boast of her edible mollusks.

ON A NEW SPECIES OF YOLDIA FROM CALIFORNIA.

BY W. H. DALL.

Yoldia montereyensis n. s.

Shell large, stout, inflated, with a polished, dark greenish olive epidermis; beaks eroded in all the specimens, situated in the anterior part of the middle third of the shell, not prominent; valves full and rounded, anterior end evenly rounded into the upper and basal margins; posterior end narrower, rounded, the extreme end nearer the cardinal margin with which it almost forms an angle, below sloping obliquely toward the basal margin, with a very obscure broad ray impressed in a radiating manner from the beaks toward the oblique slope, the profile of which it does not perceptibly indent; surface sculptured only by feeble incremental lines; epidermis polished with one or two darker concentric color zones and a microscopic, irregular, radially disposed wrinkling, most con-

spicuous at the margins of the impressed ray; posterior cardinal margin nearly straight, anterior ditto evenly rounded; interior porcellanous white, the pallial sinus not reaching the middle vertical line of the shell, broad and rather rounded; ligamental fosset large, cuplike; anterior teeth V-shaped, about 22 in number, strong and prominent; posterior teeth similar, and forming an equally long line but only 18 in number, the posterior cardinal margin showing a long narrow impressed area very feebly marked; length of shell 32; beak from anterior end 12; vertical from beak to base 17; max. diameter 13 mm.

Habitat U. S. Fish Com. Station, 3202, in 382 fathoms green mud, Monterey Bay, California, bottom temperature, 41° Fahrenheit.

This fine shell recalls *Y. thraciaformis*, but is smaller, without the angularity of that species and proportionately more solid. It was dredged by the U. S. Steamer Albatross, several years ago. It is probably a deep water species exclusively at least in the latitude of California. The types are in the U. S. Nat. Museum, 106,972.

NOTES ON THE GENERA OF UNIONIDÆ AND MUTELIDÆ.

BY H. A. PILSBRY.

In the June number, p. 20, a list of the genera of *Unionidæ* and *Mutelidæ* recognized by Dr. v. Ihering is given. It should be noted that by inadvertence *Pleiodon* Conr. is given as a genus, but Ihering considers it a synonym of *Iridina*. The genus *Pseudodon* Gld. was omitted after *Cristaria* Schum.¹

Attention should also be directed to the fact that the name *Castalia* Lam., 1819, is preoccupied in Vermes by Savigny, 1817 (*Système des Annelides*). Probably TETRAPLONDON Spix, 1827 can be used in this case as a substitute.

For *Aplodon* Spix (preoc. by Rafinesque in Pulmonata), may be substituted SPIXOCONCHA.

Lea's name *Plagiodon* (1856) seems also to be preoccupied (by Dumeril in Reptilia, 1853), and the group may therefore be called IHERINGELLA, Lea's species *isocardioides* being the type.

¹ The Editor fears that these errors may have been due to his own hasty proof-reading, rather than to defects in the original MS.

NOTES ON THE ACANTHOCHITIDÆ WITH DESCRIPTIONS OF NEW
AMERICAN SPECIES.

BY HENRY A. PILSBRY.

The family Acanthochitidæ includes Chitons having the exposed surface of the valves, when present, divided into a narrow dorsal smooth or striated band, sometimes obsolete, with a granular area on each side, formed by the union of the lateral areas and the plural tracts of the central areas. The *Cryptoplacidæ* also share this peculiar plan of valve-sculpture, but they are vermiform in shape and not nearly covered above by the valves, whilst the *Acanthochitidæ* have well-developed valves covering the upper surface, even in those genera like *Amicula* and *Cryptochiton* which have the girdle-skin extending over the larger part or the whole of the dorsal armor. There are many other differences, but still the *Cryptoplacidæ* give unmistakable evidence of their descent from *Acanthochitidæ*. On the other hand, all other Chitons differ in having the valves divided into triangular lateral, and wide central areas, and in other equally important if less obvious features.

The following genera belong to Acanthochitidæ: *Spongiochiton*, *Leptoplar*, *Acanthochites*, *Katharina*, *Amicula*, *Cryptochiton*. All but the first two are found upon the United States coasts. It will be noticed that the association of *Acanthochites* with *Mopalia*, instituted by Dr. Philip Carpenter, is not retained.

Some naturalists may find it difficult to believe that complex structures so very similar to each other as are the posterior valves in *Mopalia* and *Acanthochites* could have arisen independently; but that this is the fact I feel entirely assured. In the two cases, this peculiar form of two-slit and sinused posterior insertion-plate, arose from a perfectly regular, even, and many-slit plate; the two phyla travelling along parallel roads. The Mopaloids reach their culmination in *Plaxiphora*, which has lost its two posterior slits, and is in this respect quite analogous to an old individual of *Cryptochiton stelleri*.

The genus *Acanthochites*, which has given its name to the family, is readily recognized by the series of tufts of fine bristles, like spunglass, along each side. These tufts may be accounted for by the theory that they are the result of over-nutrition caused by the frequent flexure of the girdle at the sutures; this flexure naturally bringing a greater share of nutriment to the stimulated point than

to the comparatively motionless portion at the sides of each valve, resulting in a more exuberant growth of girdle spicules there.

Within the *Acanthochites* stock the progressive diminution of the tegmentum or outer layer of shell, has proceeded along two lines: in one series of forms the girdle has encroached at the sutures, producing a heart-shaped exposed area, seen in such species as the *Notoplax*, and this system has also produced the Amiculas. In the others, the tendency has been to encroach along the sides of the valves, leaving a narrow or linear tract, resulting in forms like *Acanthochites exquisitus*, and culminating in *Cryptoconchus* (*C. monticularis* Q., and *floridanus* Dall.)

Acanthochites is divisible into four sections: *Acanthochites* typical, having a wide caudal sinus and two slits in the tail valve, and well-developed sutural tufts; *Notoplax*, having several slits in the tail-valve behind, and the girdle encroaching at the sutures; *Cryptoconchus*, having a similar tail-valve, but the girdle encroaches at the sides, leaving only a linear dorsal area exposed; and finally, *Loboplax* (sect. nov.), with a many-slit tail-valve, the head valve strongly 5-lobed and ribbed, girdle nearly naked—type *A. violaceus* Quoy. The following two species belong to the typical section:

A. exquisitus n. sp. Visible portions of the valves extremely narrow, generally less than one-fourth the entire width of the dried animal. Valves dark olive, interior blue; the girdle light green, tufts very large, either green, pink or bronze; fleshy covered with a green pubescence. Length 30, breadth 18 mill. La Paz (Lockington).

The valves are more covered than in any other form, the tegmentum being far less in area than one of the sutural laminae.

A. rhodeus n. sp. Exposed portion of valves subtriangular, about one-third the entire width, the valves depressed, obtusely carinated, brown, almost separated by the encroachment of the girdle at the sutures. Median area smooth, not striated. Interior deep rose colored. Length 28, breadth 15 mill. Panama (MacNeil).

A. (Notoplax) hemphilli n. sp. Valves heart-shaped, about one-third the total width; red, more or less maculated with white; girdle rust-brown; dorsal area having some longitudinal striae. Interior light green at the sides, deep rose-red in the middle. Girdle wide, sparsely clothed with microscopic hyaline spicules, having a marginal row of longer spicules and 18 small white tufts. Length 24, breadth 11 mill. Key West, Florida (Hemphill).

MOLLUSCA OF ARKANSAS.

BY F. A. SAMPSON, SEDALIA, MO.

A report on the shells of Arkansas, made to the State Geologist of that State, will soon be published, and in this paper I will give the list of species, not including the Unionidæ. I have collected in twenty-five counties, but not equally in all—in some having made search in many different places and at different times, and in others in only one place or at one time.

The type specimens of those species marked * were from Arkansas.

<i>Selenites concava</i> Say.	<i>M. divestus</i> Gld.
<i>Limax campestris</i> Binn.	<i>M. elevatus</i> Say.
<i>Zonites friabilis</i> W. G. B.	<i>M. exoletus</i> Binn.
<i>Z. lævigatus</i> Pfeif. (Binney's Manual).	<i>M. exoletus minor</i> .
<i>Z. demissus</i> Binn.	<i>M. thyroides</i> Say.
<i>Z. brittsi</i> Pils.*	<i>M. thyroides bucculentus</i> Gld.
<i>Z. ligerus</i> Say.	<i>M. clausus</i> Say.
<i>Z. arboreus</i> Say.	<i>M. kiowaensis arkansensis</i> Pils.*
<i>Z. viridulus</i> Mke.	<i>Dorcasia berlandieriana</i> Mor.
<i>Z. indentatus</i> Say.	(Binney's Manual).
<i>Z. minusculus</i> Binn.	<i>Bulimulus dealbatus</i> Say.
<i>Z. placentulus</i> Shuttl. (Binney's Manual).	<i>Pupa fallax</i> Say.
<i>Z. fulvus</i> Drap.	<i>P. armifera</i> Say.
<i>Z. undetermined.</i>	<i>P. contracta</i> Say.
<i>Z. undetermined.</i>	<i>P. procera</i> Gld.
<i>Z. gularis</i> Say.	<i>Succinea ovalis</i> Gld.
<i>Tebennophorus carolinensis</i> Bosc.	<i>S. ovata</i> Say.
<i>Patula solitaria</i> Say.	<i>S. obliqua</i> Say (Binney's Manual).
<i>P. alternata</i> Say.	<i>Helicina orbiculata</i> Say.
<i>P. perspectiva</i> Say.	<i>Limnæa humilis</i> Say.
<i>Helicodiscus lineatus</i> Say.	<i>L. columella</i> Say.
<i>Strobila labyrinthica</i> Say.	<i>L. catascopium</i> Say.
<i>Polygyra texasiana</i> Mor.	<i>Physa gyrina</i> Say.
<i>P. triodontoides</i> Bland.	<i>P. heterostrophe</i> Say.
<i>P. jacksoni</i> Bland.	<i>Planorbis trivolvis</i> Say.
<i>P. dorfeuilliana</i> Lea.	<i>P. bicarinatus</i> Say.
<i>P. dorfeuilliana sampsoni</i> Weth.*	<i>Ancylus tardus</i> Say.
	<i>Vivipara contectoides</i> W. G. B.

<i>P. leporina</i> Gld.	<i>V. subpurpurea</i> Say.
<i>Stenotrema labrosum</i> Bland.	<i>Campeloma subsolidum</i> Anth.
<i>S. edgarianum</i> Lea (Binney's Manual.)	<i>C. ponderosum</i> Say.
<i>S. stenotremum</i> Fer.	<i>Pomatiopsis lapidaria</i> Say.
<i>S. monodon fraterna</i> Say.	<i>Pleurocera subulare</i> Lea.
<i>S. leaii</i> Ward.	<i>P. canaliculatum</i> Say.
<i>Triodopsis obstricta</i> Say.	<i>Goniobasis lawrencei</i> Lea.*
<i>T. appressa</i> Say.	<i>G. plebeius</i> Anth.
<i>T. inflecta</i> Say.	<i>G. cubicoides</i> Anth.
<i>T. edentata</i> Sampson.*	<i>G. crandalli</i> Pils.
<i>T. fallax minor</i> Weth.*	<i>Sphærium sulcatum</i> Lam.
<i>T. vultuosa</i> Gld.	<i>S. striatinum</i> Lam.
<i>Mesodon albolabris</i> Say.	<i>S. stamineum</i> Conr. (Prime).
<i>M. albolabris minor</i> .	<i>S. transversum</i> Say (Prime).
<i>M. albolabris alleni</i> Weth.*	<i>Pisidium abditum</i> Hald.
	<i>P. virginicum</i> Bourg.

One unnamed *Zonites* bears considerable resemblance to *Z. limatulus*, but is of only three mm. diameter, more depressed, sutures less impressed and outer whorl more rounded, and having four whorls.

The other unnamed one has the general size and appearance of *Z. arboreus*, but has six whorls. These were both found on the Boston Mountains. *Zonites brittsi* was described in the NAUTILUS of last January. The type specimens were collected by Mr. R. A. Blair, of Sedalia, in Garland County near Hot Springs. They are very close to *Z. demissus*.

Patulu solitaria has not before been recorded from as far south. Very few specimens of *Polygyra texasiana* were found in the State, but they were very abundant in the Indian Territory across the river from Fort Smith. In no county except Garland were both *dorfeuilliana* and its variety *sampsoni* found. The latter was most abundant in Carroll County, fifteen or twenty being frequently under one stone. *P. jacksoni* was much larger than typical size on the bluffs at Van Buren. But one *T. obstricta* was found, and that a dead one, near Batesville. *T. edentata* were collected on the Boston Mountains in Franklin County. They are larger than *inflecta* and almost or entirely without teeth on the peristome. *T. fallax*, from the northwest corner of the State, were quite small, and many of them albinos.

The *Mesodon albolabris*, from Eureka Springs, are pronounced by Wetherby to be a very distinct variety. He has also described the two other varieties from the same place, and the *exoletus minor* from there are said by Mr. Binney to be "very curious."

The *kiowaensis* variety, *arkansensis*, lately described in the NAUTILUS, were collected by Mr. R. A. Blair, near Hot Springs.

The *Goniobases* were generally very plenty where found at all, and in other streams near by there were none. I have them from many streams. The *G. crandalli* was collected at Mammoth Spring, and described in the Proceedings of the Philadelphia Academy of Sciences.

NOTE ON ENDODONTA (*Flammulina*) INFUNDIBULUM Hombr. & Jacq.

BY CHARLES HEDLEY, AUSTRALIAN MUSEUM, SIDNEY, N. S. WALES.

In the "Reference List of the Land and Fresh-water Mollusca of New Zealand" by Mr. H. Suter and myself, the species named above was placed under *Flammulina crebriflamnis* Pfr. as a synonym. Tryon and Pfeiffer, whom we followed in this course, were certainly wrong in connecting *infundibulum* with *crebriflamnis* (Mon. Hel. Viv. iii, p. 148, etc.). *H. infundibulum* was described from Vavas, Tonga Is., and appears to be a small variety of *Gradata* Gould. It was omitted from Mousson's Tongan list.

NOTES AND NEWS.

REV. DR. A. DEAN has removed from Muncy, Pa., to Fort Lee, N. J., on the Hudson, above New York City. The best wishes of many brother Conchologists go with him to his new home on the Palisades.

AN interesting paper on the shells collected by the Death Valley Expedition, by Dr. R. E. C. Stearns, has appeared in the "North American Fauna" series, published by the U. S. Dept. of Agriculture. Some pages are given to the discussion of the Tryonias, which were collected alive by Dr. Merriam in a hot spring in Pahrana-gat Valley, Nevada. The "*Tryonia*" *protea* is shown to intergrade perfectly with the smooth form which Frauenfeld called *Hydrobia seemani*. It is a species of *Bythinella*. Stearns retains *Tryonia clathrata* distinct, as he has seen no examples connecting with *protea*. Several species of Amnicolidæ are described and figured, and valu-

able data on the south-eastward distribution of *Arionta* are presented.

DR. H. VON IHERING has been appointed Director of the Zoological Department of the Museum at San Paulo, Brazil.

IN electing officers of the American Association of Conchologists for the ensuing year, John H. Campbell was elected President; John Ford, Vice-President; Chas. W. Johnson, Secretary.

THE death of the well-known Zoologist, CARL SEMPER, of Würzburg, Germany, on the 29th of May, has been announced.

WILLARD M. WOOD, of San Francisco, intends very soon to make an eastern trip, visiting Chicago, New York, Philadelphia and Washington.

Mr. H. E. SARGENT, formerly of Woodville, Alabama, is in Philadelphia, where he proposes to spend some time in biological work.

A "REFERENCE LIST of the Land and Fresh Water Mollusca of New Zealand" has been published by Messrs Chas. Hedley of Sydney, N. S. Wales, and H. Suter of Christchurch, New Zealand. It forms an extremely useful index to that fauna, and is indispensable to those who desire to understand the peculiar genera of Australasia.

EXCHANGES.

WANTED, about 25 specimens of any one species of *Dentalium*; also live specimen of *Zonites elliotti*, *demissus*, *intertextus*, *gularis*, *internus* and *nitidus*. Offered, British L. and Fr. W. and North American L. and Fr. W. shells, also part of *Zonites ligerus* Say.—Robert Walton, Houghton street, Lower Roxborough, Philadelphia, Pa.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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THE NAUTILUS.

VOL. VII.

AUGUST, 1893.

No. 4

NOTICE OF NEW CRETACEOUS FOSSILS FROM THE LOWER GREEN MARLS OF NEW JERSEY.¹

BY R. P. WHITFIELD, AMERICAN MUSEUM OF NATURAL
HISTORY, NEW YORK CITY.

Mr. Pilsbry recently sent me a few New Jersey fossils for identification; among them were the following new species which he wished me to describe for the NAUTILUS.

Volutoderma Woolmani n. sp.

Shell, as shown by the internal cast, somewhat more than an inch in length, and having a diameter of the body volution of seven-sixteenth of an inch in the cast, being more slender than any species yet described. Volutions largest just below the suture and attenuate below, forming a moderately long beak; marked in the upper part by eight comparatively strong vertical plications, which are obsolete below. Columella marked by three very distinct folds or ridges, the lowest of which is the strongest. These are well marked on the inside of the upper volutions.

This species like most of those from the New Jersey Green Marls is known only from an internal cast. It retains only two volutions and is imperfect at the base of the beak. It is very distinct, how-

¹ Illustrations of the following species will be given next month.

ever from any species previously noticed, being much smaller and of more slender habit. The external markings are unknown. The specimen is from the Lower Green Marls at Lenola Station on the Long Branch Division, Pennsylvania Railroad in Burlington Co., New Jersey. The type is in the collection of the Academy of Natural Sciences of Philadelphia. Collected by Mr. Lewis Woolman of Philadelphia for whom it is named.

Cerithium Pilsbryi n. sp.

Shell elongated and slender; volutions numerous, number not determined, very gradually expanding with additional growth; apex and aperture unknown. Volutions slightly convex between sutures, and ornamented by a band of small oblique nodes immediately below the suture; also by a series of larger vertical folds which extend across the exposed part of the volution, below the upper band of nodes, and numbering something more than one half as many to the volution as the nodes above. There are also very fine spiral striae almost too fine to be seen without magnifying. The lines of growth are fine but distinct, and take a broad sweeping backward curve between sutures. Apical angle fifteen to eighteen degrees.

This species is a new type for the New Jersey cretaceous, and I know of none of the same type in the rocks of this age in North America; while in the Cretaceous of Palestine there are several species already described. The one most nearly like this being that described in the Bulletin Am. Mus. Nat. Hist. for December, 1891, figured on Pl. IX of Vol. III, figs. 11 and 12, under the name *Cerithium Conradi*; the point of difference between them being the exact reversal of the lines of nodes, the upper one here being small while on that one it is the largest. These specimens consist of concretionary matrices, in what appear to have been Coprolitic bodies, in one of which there are fragments of several species of molluscs represented. They are also from the Lower Green Marls at Lenola, N. J. Collected by Mr. Lewis Woolman, and are deposited in the collection of the Academy of Natural Sciences, Philadelphia.

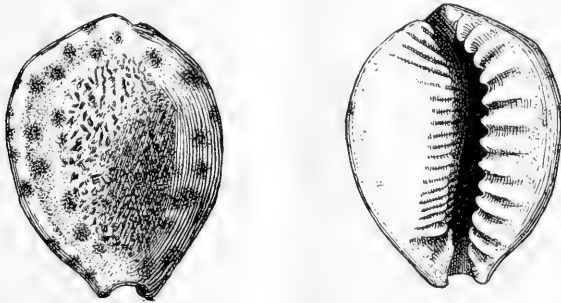
Another *Cerithium*-like shell occurs with the above, but is too imperfect for specific description. It presents characters which would most likely ally it to *Cerithiopsis*. There are imprints of portions of six volutions remaining in the matrix showing three lines of nodes on each volution, increasing in size from above downward. This also is an undescribed species. There is also an internal cast of a species of *Anchura* or *Rostellaria*, which differs from any

described form, but too imperfect for characterization. Mr. Woolman writes me that the locality from which these specimens were obtained has yielded upward of sixty species of Molluscan remains, which is rather more than that obtained from any one locality within the State, from this bed, so far as I know.

DESCRIPTION OF A NEW SPECIES OF CYPRÆA.

BY JOHN FORD.

In the description of *Cypræa cruenta* Gmel. var. *Greegori* Ford, published in the NAUTILUS for Feb., 1893, it was suggested that most conchological students would probably have made *Greegori* a species instead of a variety. It may at once be said that the writer of that description is now fully convinced of the specific distinction of the latter, and has therefore decided to alter the name from *C. cruenta Greegori* Ford to *C. Greegori* Ford. Under the circumstances such a



change will doubtless meet with some opposition. Nevertheless, I have no hesitation in making it, inasmuch as my conclusions are chiefly based upon the careful study of some fifty specimens secured by me since the description referred to was written.

These are of various sizes and stages of growth, yet all of them can be readily separated from any other species belonging to the genus, though in exceptional instances the heavy callus on the sides and ends is creamy white and the typical blotches scarcely discernible. The larger portion of my former description may be profitably retained, but as it is desirable to make a few additions it is reproduced here with these included.

Cypræa Gregori Ford, n. sp.

Shell depressed, orbicular oval in form, callus on the sides and ends remarkably thickened. That on the sides light salmon in color, with irregular purple-brown spots, having a blotchy appearance. Dorsal surface similar to that of *cruenta*, but lacking the whitish spots typically present in that species. Base semi-translucent, spotless, dark buff or salmon colored, darkest in the interstices. Teeth on outer lip very strong, long and whitish; on inner lip finer, with exception of the anterior fold and one or two adjacent teeth, the first of these latter being very prominent and notably transverse. Space between the anterior fold and the following tooth wide and brightened; posterior teeth of inner lip prolonged outward upon the base. Dimensions of average specimen: length $1\frac{1}{4}$, breadth $\frac{7}{8}$ inch.

That *C. Gregori* is more nearly related to *C. cruenta* than to any other species, I have no doubt. But it is equally true that the former possesses several characters altogether distinct from those belonging to the latter. For instance, *C. gregori* is more translucent, more rugged, much smaller and rounder in form, different in general color, and in the peculiar variations of the teeth, also in the remarkable thickness and brilliancy of the callus with which it is rimmed.

With the probable exception of one poor specimen, this shell was unknown to the late Mr. Tryon, and for the same reason, perhaps, it was not noticed in Mr. Robert's catalogue of the species. Nevertheless, an excellent figure of it was published by Kiener¹ who merely referred to it as a variety of *C. cruenta* (*variolaria*). A figure, possibly intended for the same shell, was also published by Sowerby² who seems to have considered it a variety of *C. caurica*. More recently, Sowerby's figures were alluded to by Mr. J. C. Melvill³, as the var. *coloba*. but whether this variety was referable to *C. cruenta* or *C. caurica*, seems to have been a question that he was either unable or unwilling to decide. At least, in one sentence he apparently makes *C. cruenta* responsible for its parentage, while in another sentence the same honor is given to *C. caurica*. Verily it seems that even the babes in "Pinafore" could not have been more hopelessly mixed than were these poor little waifs.

¹ Iconographie Coquilles Vivantes, Page 57, pl. 27, fig. 3.

² Thesaurus Conchyliorum. Plate 23, fig. 190.

³ 1st Vol. 4th series of Memoirs and Proc. of the Manchester, (Engd.) Lit. and Phil. Society, 1887-8.

So far as I am aware, no description of the shell, previous to my own, has been published; and unless proof of such publication is shown I shall claim priority both for the name and description. This claim has especial reference to a criticism of the name applied to the shell in my former article.

It might be well to add that the incipient tooth in the interstice next to the anterior fold, as shown in the figure published in THE NAUTILUS for April, 1893—is not typical, since it is discernable in less than five per cent of the specimens, and very slightly in them. In a hurried selection of the specimen for drawing purposes, this very minute protuberance was unobserved by me. Otherwise it would not have been drawn. This error has been corrected in the figure accompanying this article.

BEACH SHELL COLLECTING IN CONNECTION WITH A STUDY OF
OCEANIC PHENOMENA.

BY MRS. M. BURTON WILLIAMSON.

It has often occurred to me that a shell collector who is something of a physicist, having a love for historical facts, could furnish interesting data in regard to shore collecting under certain physical conditions of the ocean. Few amateur collectors note the historical, or rather chronological appearance of genera and species collected by them, they are usually satisfied with obtaining a "good find," but time and seasons are hardly observed, certainly not studied as furnishing data for future reference. A storm is hailed as a precursor of "rare finds," but a study of the storm with notes in regard to it, accompanied with a list of shells found after such a storm are too frequently neglected by collectors. Mollusks are collected too often as a miser collects his money, *as a mania*, not as a medium for an intelligent study of Nature. It seems to me, that a study of mollusks thrown upon the shore from other areas, in connection with a study of the physical condition of the ocean at such times, would be very helpful to the collector, although of no value to science. It may be urged that shells cast up by the sea are merely "happen-

ings" and no data can be gathered in reference to what seems a work of chance. When a heavy gale ploughs up the home of mollusks and huge breakers land them, by the incoming tide, on the shore, no collector can fore-tell when such a phenomenon may occur, nor what conchological rarities may follow in the wake of such a storm. Rare shells are sometimes washed ashore, then years may elapse before they again make their appearance. Sometimes shells considered as belonging to the fauna of a different latitude are found among the drift in such small numbers as to raise a question as to their introduction by artificial means. During a violent storm mollusks travel great distances before they are cast upon the shore. This is especially noticeable in pelagic organisms which are often cast upon the beach when some ocean current buoys them inward toward the shore. All these facts combine to make it impossible to collect *working* data, but one cannot doubt that a study of collections as the result of unusual conditions of Neptune might be conducted with some satisfactory results. A diary of the atmosphere, tides, daily physical conditions of the ocean with lists of shells found during the same period, if followed any length of time, might be resultant in adding a few facts that would be interesting, even though not very valuable. High and low tides would influence "finds" at any time, but some "low tides" are much richer in molluscan forms than others.

As a rule each region has its own fauna; when this fauna is disturbed and carried outside the range of its own normal environment it must be due to unusual conditions in the surrounding water; shells from the laminarian and inner corallines zones found strewn upon the beach are the *effect* of some *cause*. To a physicist, a study of the storm that stranded rare forms upon the beach, would surely be as interesting and important as the shells found in the drift! The study of oceanic phenomena in connection with conchological acquisitions might be valuable to the collector in many ways; although of no value to the scientific world in these days of applied science, with hydrographers collecting data, and with all the modern appliances furnished to ships sent out on scientific explorations.

We narrow our horizon by failing to observe and study that which is near at hand. There are environments that afford more than ordinary facilities for study, but only a few are so favored, and only a small proportion of these utilize their opportunities.

NOTES ON THE NORTH AMERICAN SPECIES OF SUCCINEA.

BY T. D. A. COCKERELL.

[Concluded from Vol. VI, p. 31.]

(18.) *S. luteola* Gould. Mr. Singley sent me this from Manatee Co., Florida, and at the same time specimens marked *texasiana* Pfr., from Derby, Frio Co., Texas. I made notes on these shells as follows:

- (a.) *S. texasiana*. Belongs perhaps to *putris* group, but very different from it, and forming a new subsection. Shell shaped, but for mouth, like some varieties of *Limnæa palustris*. Length $16\frac{1}{2}$ mill. Transversely irregularly striate-ribbed. Young example semitransparent pale horn, adults opaque yellowish-white.
- (b.) *S. luteola*. No doubt the same species as *texasiana*, but the specimens are horn-color and smaller; some little ones are more like *putris*— $7\frac{1}{2}$ mill. long, shiny, striate, horn-color, more globose, spire short.

Sect. III. *Lucena*.=*Lucena* Oken.

(19.) *S. avara* Say. This species varies in color a good deal, and also in shape. The following are the varieties described or known to me.

- (a.) forma *alba* nov. Shell greenish-white. Horseshoe Bend Gulch, Custer Co., Colorado, at about 10,000 ft. alt. Mr. H. Prime has an albino of *S. avara* from Arizona, and there is a specimen in the Binney and Bland collection from New York State (Dr. Lewis.)
- (b.) forma *wardiana* Lea. Shell yellow.
- (c.) var. *vermeta* Say. Yellowish, thin, suture deep. I have seen a clear red-brown form of this from Toronto, Canada (D. B. Cockerell). An amber-colored form was sent to me by Mr. Binney, collected by Mr. W. S. Teator at Barrytown, Dutchess Co., N. Y.—this may also fall under *vermeta*.

- (d.) var. *compacta* Ckll. J. of Conch., 1892, p. 39. Colorado.
- (e.) forma *major* W. G. Binney, Ac. Nat. Sci. Phila., Nov., 1858, sine descr. A large variety, about $13\frac{1}{2}$ mill. long, in the Binney and Bland collection, is from Utica, N. Y. It is marked var. *major*, apparently in Mr. Binney's handwriting.
- (20.) *S. aurea* Lea. I formerly supposed this might be closely allied to *pfeifferi*; having received a close relative or variety of that species from St. Thomas, Ontario, Canada (D. B. Cockerell), which seemed to agree with *aurea*. This view, however, was probably erroneous, as a specimen marked *aurea* in the Binney and Bland collection seems to belong to the *avara* section.
- (21.) *S. mooresiana* Lea. I have found shells in a dry locality on Round Mountain, Custer Co., Colo., which, although no doubt referable to a variety of *avara*, appear to be Lea's *mooresiana*. A specimen of *mooresiana* in the Binney and Bland collection, from the Platte River, also seems to belong to *S. avara*.
- (22.) *S. oregonensis* Lea. Mr. Singley sent me this from Dalles, Oregon, (E. H. White). I noted that they were of the *avara* group, but in shape approaching the *pfeifferi* group, pale reddish-horn, striate, dull. One in the Binney and Bland collection looks like a member of the *pfeifferi* group, but another, marked with a query, is larger and seems to belong to the *avara* section.
- (23.) *S. rusticana* Gould. Mr. Singley sent me some shells labelled *oregonensis* from Plumas Co., California (G. W. Michael), of which I noted: *avara* group, larger than *oregonensis* from The Dalles, greenish-horn, more shiny, whorls more convex. These specimens seemed to agree better with *rusticana* than *oregonensis*. Later, Mr. Binney has sent me a shell, apparently *rusticana*, found by Mr. Hemphill at Julian City, San Diego Co., California. This shell is $10\frac{3}{4}$ mill. long, form of *rusticana*, but aperture more oblique, color reddish-horn, rather shiny; soft parts (in alcohol) black. It is impossible to tell whether

these shells should be separated from *rusticana* without examining a larger series showing the variation.

- (24.) *S. verrilli* Bld. Apparently belongs to sect. *Lucenæ*, but I have not seen specimens.
- (25.) *S. grænlandica* Beck. Specimens in the Binney and Bland collection from Kuksuk, Greenland, almost certainly belong to this group; although the species seems to have leaning toward the *Campestris*, with which it allies itself through *S. chrysis* and *S. annexa*.

Section IV. *Campestris*.

- (26.) *S. campestris* Say. Mr. Singley sent me specimens of this from Long Key, Florida; they seemed to me nearly identical with *S. lineata* from Kremmling, Colo. A variety of *campestris* was named *inflata* by Lea.
- (27.) *S. lineata* W. G. Binney. Found in rejectamenta at Kremmling, Colo., together with a form *elongata*, Ckll., J. of Conch., 1892, p. 39.
- (28.) *S. greerii* Tryon. This is considered a synonym of *S. obliqua*, but a dead shell in the Binney and Bland collection from Vicksburg, Miss. (Tryon), appeared to resemble *campestris*.
- (29.) *S. chrysis* Westerl.
- (30.) *S. annexa* Westerl. This and the last appear to belong here, but are probably related somewhat to *grænlandica*. The presence of whitish streaks on the arctic species is noteworthy. Dr. von Martens (Conch. Mittheilungen, 1885) has described a var. *aurelia* of *S. chrysis* from Alaska.
- (31.) *S. unicolor* Tryon. A specimen so named is in the Binney and Bland collection from New Orleans, La. It is a peculiar shell, apparently of sect. *Campestris*, very globose, spire short and blunt.
- (32.) *S. turgida* Westerl. This species is unknown to me; it is recorded in Land- och Sötv. Moll. Vega-Exped. 1885.
- (33.) *S. decampii* Tyron. Belongs to *Amphibinæ*, and was accidentally omitted in the proper place. It is considered a form of *ovalis*, but a specimen from Michigan (Tryon), in the

Binney and Bland collection seemed hardly quite like *ovalis*; small, shiny, thin, rather greenish.

Of these 33 nominal species of *Succinea*, possibly not more than about half will prove valid, but it is impossible to arrive at any exact results without further research into the variation, anatomy and distribution of the several forms.

The distribution, so far as known, present some features of interest. The species of the eastern and northern states are more like those of Europe than the southern or western. The southern and northwestern distribution of the *campestris* is noteworthy. It appears that in glacial times, owing to a warm current, the coast of Alaska was free from ice, while that of British Columbia was glaciated down to the sea¹; hence a contingent of the *campestris* may have survived to the north, while their representatives in some of the middle regions were exterminated.

While on the subject of *Succinea*, it may be worth while to call attention to fig. 13 of pl. II, Bull. U. S. Geol. Survey, No. 34, (1886). The fossil there figured is referred by Dr. C. A. White with doubt to *Limnœa*, but is it not a *Succinea* of the section *Lucenœ*?

Regarding the Calif. *Succ. stretchiana* (Naut. VI, p. 72), I fear the specimens were in a box which unfortunately got lost in the post on its way back to Mr. Singley. They *seemed* to represent a distinct form, but it is possible that they were not true *stretchiana*. Bland's type was from Washoe Co., Nevada; and no doubt the specimen from that locality in the Binney and Bland collection belonged to the original lot, the actual type being in U. S. N. M. (see Man. Amer. Land Shells, p. 497). The Washoe Co. specimen examined by me was in some respects like *avara*, and by no means altogether like the Californian examples; but considering the variation seen in species of *Succinea*, I did not feel able to decide without better material, whether they should be held distinct, and so accepted the indication of the labels. There is a Colorado *Succinea* which was formerly thought to be *stretchiana*, but it is certainly either a var. of *avara* or a species very closely allied. Is anyone prepared to say exactly what distinguishes *stretchiana* from other species? If the San Francisco specimens were not *stretchiana*, I am rather puzzled to know what are the true characters of the species. Perhaps the anatomy would settle the question.

¹See Prestwich, Geology (1888) Vol. II, p. 464.

GENERAL NOTES.

VITRINA LIMPIDA IN PENNSYLVANIA.—In April of this year I found about a dozen dead shells of *Vitrina limpida* Gould on the bank of the Ohio River about 14 miles below Pittsburg, I have since visited the place and found about 20 additional shells all dead and most of them broken. There were many more too badly broken to be worth taking. A careful search both times failed to bring any live shells to light, and as many of the shells found were young I think the colony must have become extinct last year. They were found among "drift," so *may have come* from the head-waters of the Allegheny River in New York State.

I intend visiting the place again soon and will report results.—
Geo. H. Clapp, Pittsburg, Pa.

ARGONAUTA FOUND ALIVE.—A living specimen of the Paper Nautilus, *Argonauta argo*, was found at Palm Beach, Dade Co., Fla., in April by Mrs. C. Rowland of Philadelphia. This handsome shell is over six inches in diameter. It is rare that living examples of this are found on our coast.

The *West American Scientist* for July contains a biographical sketch of the late Henry Chandler Orcutt, of San Diego, Cal.

A RARE OLD BOOK.—An auction sale of old and rare books took place here a few days ago. This collection was consigned to a prominent auctioneer direct from Great Britain (around the Horn). I was lucky enough to have a catalogue sent me. In looking same over, I found only one book on Conchology. It was numbered 324 and described as "Collection de diferentes especies de Coquillage, par George Wolfgang Knorr. Both parts, plates giving hundreds of beautifully colored figures of rare shells, 4to"

I attended the sale and when no. 324 was put up the bid started at 50 cents; I went one better, 55, then two prominent bookdealers began bidding with me, until one of them struck the dollar limit and ceased. I went one better, bidding \$1.10; and as they saw that I was determined to get it, they stopped; and the book was knocked down to me for the above ridiculously small amount.

Upon reaching home I found it to be published in French, and during the *reign of King Louis XV—1765*, although George

Wolfgang Knorr, the author, states he wrote it during *Nov.* 1756 at Nuremberg. The print is in the old style; very large.

The book contains 100 pages, has 47 plates containing 248 exquisitely water-colored (by hand) figures of shells.

Think of the time it must have taken to color these! How I would like to have a glimpse of the person who colored them, 129 years ago! Some of the tints, especially the pearly ones used in *Haliotis striata*, *Haliotis marmorata* and *Trochus niloticus*, are something wonderfully clever.

On the inside of the cover, was a piece of paper glued. On it was engraved a crest of some person, with the words "Navitir et Solerter," and underneath it was engraved the following:—"Daniel Cresswell, S. T. P. Coll: S. S. Trin: apud Cant: Soc." The crest was composed of a large ostrich with a nail in its mouth. Beneath this was a shield, within same were three squirrels sitting on their hind legs, eating acorns or something of that sort. Upon close investigation, I discovered this crest was pasted over another. With a great deal of trouble I succeeded in separating the two. The lower one was an egg-shaped circle, within was a shield with three holes in the upper portion. On top of the shield rested some kind of a royal head-gear. Upon this head-gear lay a mummy and upon the mummy an eagle had just alighted, and was in the act of tearing out the eyes of the mummy. Under the crest was the signature of "JOHN LATHAM, M. D., Winchester."

Who can tell me anything about the persons above named? Also if there are many of these books in existence. I should judge they were quite rare. How I do wish that many other British collections of old books might be brought here and sold at public auction. Many rare books published during 1567-1656-1780 and 1800 were sold at the above sale, all the way from 25 cents to \$5.00—*Williard M. Wood, San Francisco, Cal., March 15, 1893.*

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OF CONCHOLOGISTS.

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SEPTEMBER, 1893.

No. 5.

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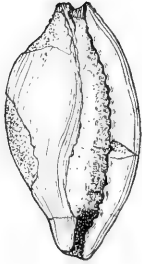
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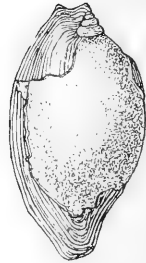
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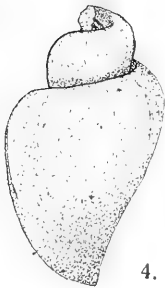
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THE NAUTILUS.

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ILLUSTRATIONS OF NEW CRETACEOUS SHELLS.

Volutoderma Woolmani Whitf. Plate II, figs. 4, 5.

Described in the *Nautilus* (August) Vol. VII, p. 37. Lenola, Burlington Co., N. J.

Cerithium Pilsbryi Whitf. Plate II, fig. 3.

Described in the *Nautilus* (August) Vol. VII, p. 38. Lenola, Burlington Co., N. J. Drawn from a guttapercha squeeze of the natural cast.

Since the publication of Mr. Woolman's article on the cretaceous fossils found at Lenola, near Moorestown, Burlington Co., N. J., in the *Proc. of the Acad. Nat. Sci. of Phila.*, 1893, page 219, the following additional species have been found by Messrs Morris Schick, Robt. Hancock, John G. Johnson and Chas. L. Thackeray.

LAMELLIBRANCHIATA.¹

Cyprimeria densata Conr. Vol. I, p. 157, pl. XXII, figs. 19-21.

Lucina Smockana Whitf. Vol. I, p. 130, pl. XVIII, figs. 21, 22.

Arca quindecimradiata Gabb. Vol. I, p. 208, pl. XXVII, figs. 10-13.

Crassatella conradi Whitf. Vol. I, p. 209, pl. XXVIII, figs. 1-5.

¹ The references after specific names are to Whitfield's *Paleontology of N. J.*

Modiola (Lithodomus?) inflata Whitf. Vol. I, p. 197, pl. XXVI, figs. 13, 14.

Inoceramus sagensis Owen. Vol. I, p. 76, pls. XIV, XV, figs. 15, 1, 2.

Inoceramus sagensis var. *quadrans* Whitf. Vol. I, p. 79, pl. XV, fig. 16.

Cardium sp.

DESCRIPTION OF A NEW FOSSIL CYPRÆA.

BY JOHN H. CAMPBELL.

Cypræa Squyeri n. s. Plate II, figs. 1, 2.

Shell ovate-oblong, attenuated at the extremities. Spire prominent, showing four whorls; outer lip thickened and having on the inner edge thirteen or fourteen teeth. Anterior half of the aperture wide, but contracted at the extremity, posterior end contracted and projecting slightly beyond the spire. Under the magnifying glass the shell shows strong revolving raised lines and striæ. Length 20 mm., width 11 mm., height 9 mm.

A notice of the finding of this shell by Mr. Homer Squyer of Mingusville, Mont., in the cretaceous formation (Fox Hills Group) of eastern Montana, and the above proposed name, were published in the NAUTILUS Vol. VI, p. 50. This shell resembles in outline the recent *Cypræa stolidus*, but its very prominent spire would separate it from this group. Shell structure is wanting on most of its dorsal surface and the inner lip obscured by the hard matrix, which it would be inadvisable to remove. In a recent letter from Mr. Squyer he says "This summer while looking for fossils I found the outer lip of the imperfect specimen, found at the time I obtained the type. This specimen I have sent to the U. S. National Museum." The type has been placed in the collection of the American Association of Conchologists.

PRELIMINARY NOTICE OF NEW SPECIES OF LAND-SHELLS FROM THE GALAPAGOS ISLANDS, COLLECTED BY DR. G. BAUR.

BY WM. H. DALL.

Bulimulus (Næsiotus) duncanus n. s.

Shell short, stout, inflated, thin, with wrinkled and slightly gran-

ulose surface and six and a half whorls; apex rather pointed, whorls rapidly enlarging, the suture behind the last whorl deeper than the rest, aperture relatively small, rather oblique; the lip simple, not reflected, a single tubercle on the body whorl well within the aperture and about equidistant from either lip; umbilicus perforate, narrow. Alt. of shell 18; of last whorl 12·5; diam. of shell 11 mm.

Duncan Island, Baur; no living ones seen.

Bulimulus (Næsiotus) amastroides Ancey var. **Anceyi** Dall.

Shell resembling *B. amastroides* Ancey but with more plicate surface, ruder aspect, smaller mouth and more angular periphery. Lon. 9, lat. 4·5 mm.

Chatham Island, 1600 feet; Baur.

This may prove merely a depauperate variety of *B. amastroides*, but at first sight it looks very different.

Bulimulus jacobi var. **vermiculatus** Dall.

Shell with five and a half sharply granulated, wrinkled whorls; suture deep, aperture small, simple, thin-edged; umbilicus perforate, rather large but not funicular. Lon. 8, lat 5·5, alt. of last whorl 6·0 mm.

James Island at James Bay, Baur.

Resembles a dwarf *B. jacobi* with very sharp, beaded, alternate granulations in spiral rows; transverse wrinkles small but distinct; the spire pointed but the apex rather blunt.

Bulimulus olla Dall. (**B. jacobi** Reeve, Ieon., not of Sby., Conch. Illustr.)

Duncan, Indefatigable, and Barrington Islands, Dr. Baur.

This shell is closely related to *B. jacobi* and was figured by Reeve under the name of *jacobi*. The original *jacobi* was sent by Cuming to Dr. Lea and subsequently a specimen of Reeve's form was added by Mr. Cuming. These are now in the Nat. Museum.

The true *jacobi* is smaller, and is sharply spirally sculptured with fine lines of beaded granules alternating in size, every fifth or sixth row being larger. It has six inflated whorls and a pale peripheral band. *B. olla* has a nearly smooth almost polished surface, only marked with incremental faint lines, seven whorls and a very bulbous pillar. It is a larger shell than the original *jacobi*. The latter comes from James, Albemarle, Charles and Chatham Islands, in the wooded zone, while *B. olla* inhabits the grassy upper zone.

Bulimulus (Næsiotus) tortuganus n. s.

Shell small, solid, moderately elongated with six and a half whorls; the earlier whorls subtranslucent madder brown with a pale peripheral stripe, more or less silky and sculptured with very fine spiral lines; sutures very distinct; later whorls malleated, wrinkled or pecked; rude, fleshy white, with a variably large perforate umbilicus; aperture small, with a lump on the pillar and another within the middle of the outer lip; lips thickened, white, slightly reflected, the throat brownish, body with a thin, transparent callus. Lon. of shell 12, of aperture 5.5; max. diam. of shell 7 mm.

La Tortuga, grassy zone, South Albermale, Baur.

This shell which is very characteristic seems to be abundant where found by Dr. Baur. It seems nearest to *B. simrothi* Reibisch. of the described species. It is remarkable for the illustrations it gives of the varied influence of the environment on different individuals. The sculpture of the last whorl recalls that of *B. rugiferus*. The young is hispid and colored like that of *unifasciatus*, but is narrower; the pale peripheral band is almost wholly obscured in the adult and the hairs are soon lost.

Bulimulus (Næsiotus) Bauri n. s.

Shell small, short, stout, with a dark rapidly attenuated spire, distinct suture, and opaque yellow-brown last whorl; whorls about seven, the earlier ones dark livid purple with straw colored streaks, paler at the suture, rude and malleated; last whorl inflated, more or less transversely wrinkled, somewhat polished; umbilicus closed or a mere chink; aperture subquadrate, angulated behind and at the base of the pillar; pillar short, oblique; lips simple, thick, especially across the body where the callus has a raised edge; throat white. Lon. of shell 10, of aperture 4.5; max. lat. of shell 6.5 mm.

Hibernating on the under side of leaves of plants at the Southwest end of Chatham Island, 1600 ft. above the sea, Dr. Baur.

This is one of the most distinctive species of the whole group.

Hyalinia chathamensis n. s.

Shell small, thin, straw colored, depressed, with four rounded polished whorls; suture distinct; sculpture of numerous radiating, slightly flexuous, indented lines; umbilicus deep, exhibiting all the volutions, but rather narrow. Max. diam. 3, min. diam. 2.25 mm.

Alt. of shell 1.30 mm.

Chatham Island, 1600 feet, 1 specimen, Dr. Baur.

This shell recalls *H. arborea* Say, but is much smaller and has a different umbilicus. In the characters of the aperture, etc., not mentioned above, it duplicates *arborea*.

Conulus galapaganus n. s.

Shell close to *C. fulvus*, but has five whorls to four in a specimen of *fulvus* of the same diameter; it has a very well marked suture and the whorls between the sutures are more rounded than in *fulvus*. The height of *C. galapaganus* is greater in proportion to the number of whorls. Alt. of shell 3.25; max. diam. of shell 2.5 mm.

Chatham Island, 1600 ft., Dr. Baur.

This shell appears to differ from all the forms like *fulvus*, *selenkai*, *cœcocides*, etc., by its smaller size, very brilliant surface, inflated whorls and number of turns. It wants entirely the spiral striation of *Zonites bauri* which is a much larger and more depressed shell. In fact it seems like an elevated, dwarfed and inflated *C. fulvus*.

There are probably other *Helices* on the islands which have not yet been collected.

Succinea corbis n. s.

Shell small, of two and a half whorls, to which a black mould adheres with tenacity. The first whorl and a half are salmon pink in the adult but the young of the same size are pale amber. In the adult the last whorl is of a pale straw color. The shell resembles *S. wolfi* in form but is smaller and has a more contracted aperture; it is instantly recognized, when examined with a good lens, by its surface which is minutely shagreened all over with an excessively fine network of closely reticulated incised lines. Alt. of shell 4., max. diam. 4; extreme length of aperture 4 mm.

S. Albemarle Island on dry bones of turtles, Dr. Baur.

The remarkable sculpture is not visible to the naked eye except as a sort of hoary bloom on the surface. Under a compound microscope it looks like closely woven basket work. I have examined a great many *Succineas* without finding any other species possessing this character. The sparse dichotomous impressed sculpture which appears on *Succineas* from Samoa and other oceanic islands and is occasionally visible on *S. bettii* is an entirely different thing.

I may add that the *S. bettii* var. *brevior* of Smith, is in my opinion distinct from *S. bettii* and should be raised as *S. brevoir* to specific rank. I have examined a large number of both forms. *S. bettii* is a species of the wooded zone, *S. breviar* of the dry zone. It is probable that *S. wolfi* Reibisch may be only a variety of *S. bettii*.

The final report on Dr. Baur's collections will not long be delayed. The species will be figured and their anatomical characters discussed. The most important fact thus far determined is the close alliance of all the *Nesiotes*, *Rhaphiellus* and *Pleuropyrgus* to the American *Bulimuli* of the type of *B. serperastrus*. The different forms of the shell are dynamic not genetic differences, and there is no doubt as to the exclusively American type of the whole fauna, when the groups represented are not of world wide distribution.

PRELIMINARY NOTE ON THE SPECIES OF STROBILOPS.¹

BY H. A. PILSBRY.

The United States species of this genus have generally been believed to be but two in number, the "*Helix*" *labyrinthica* of Say, and *Hubbardi* of A. D. Brown; the types of both being in the museum of the Academy of Natural Sciences of Philadelphia.

The writer some months ago, gave the varietal name *virgo* to specimens sent him for determination by Rev. H. W. Winkley,² and later the name *affinis*³ to another form.

Recently, with the assistance of Mr. H. E. Sargent, the various species and varieties have been re-examined and compared, with the result of finding that, in what has hitherto passed as "*H. labyrinthica*," there seem to be at least three well marked species. These species agree in general form and sculpturing, but differ in size, color, degree of depression, and especially in the *internal lamelle* of

¹*Strotilops* Pilsbry, Proc. Acad. Nat. Sci. Phila., 1892, p. 403, *Strobila* Morse 1866, not *Strobila* Sars, 1833, nor *Strotilus* Anton, 1839.

²Nautilus.

³Proc. Acad. N. S. Phila., 1892, p. 404, (no description).

basal and outer walls of the body whorl. In this they are comparable to the Clausilias, Endodontas, etc.

The species may be tabulated thus :

- a. Internal lamellæ on floor of body whorl 2 or 3, short ; color dark brown ; one parietal fold conspicuously emerging from aperture.
 - b. Form elevated conoidal . . . *S. labyrinthica* Say.
 - bb. Form much depressed . . . *S. labyrinthica strebeli* Pfr.
- aa. Internal lamellæ on floor and adjacent side wall of body whorl 6 or more.
 - b. 6 long lamellæ ; 2 parietal folds emerging ; color white or pale brownish ; form elevated, . . . *S. virgo* Pils.
 - bb. About 8 short lamellæ arranged in a curved radial series ; color dark brown ; form elevated *S. affinis* Pils.

The figures of Morse and Binney represent *S. labyrinthica* Say.

The *S. labyrinthica strebeli* Pfr. was described from Mirador, Mexico, the specimens before me being from that locality. It was well figured by Pfeiffer in the *Malakozoologischer Blätter* viii, pl. 1, figs. 5-8 ; but Crosse and Fischer's figures (*Moll. Mex.*) do not represent it. They were probably drawn from a specimen of *S. virgo*, but certainly not from *strebeli*. Mr. Sargent has found a form closely resembling the Mexican *strebeli*, at Woodville, Ala.

The original examples of *S. virgo* are greenish-white in color. They were collected by Rev. H. W. Winkley near Sebec Lake, Piscataquis Co., Maine. Mr. Sargent has found a form of the same species at Woodville, Ala., where they are of a light brownish tint.

S. affinis is a large form, very abundant at many localities in New York, Ohio, etc. Its prominent feature is the armature of numerous short lamellæ, extending in a forwardly curved series from the axis across the base and up the side wall.

The writer wishes to prepare an illustrated paper upon these forms, and will be glad to receive specimens from as many localities as possible, and especially western and southern localities. Anyone sending specimens will receive in return (if they wish it) a copy of the pamphlet "Preliminary Classification of the Helices," and, when it is issued, a copy of the projected paper on *Strobilops*.

CHARLES B. FULLER.

BY REV. HENRY W. WINKLEY.

The death of Mr. Charles B. Fuller, which occurred in April last, removes from our midst a man who had been a most enthusiastic worker in the Natural History of the State of Maine. Since 1858 he had been Curator of the museum of the Natural History Society of Portland, and the results of his labor have greatly enriched that museum. His interest in Conchology was great, and though he never published his results, the rooms of the society show what his labor was. I had several times suggested that he allow me to send his name for membership in the Association but his reply was "I am too old now and cannot help them." He has however helped many, and some of our younger members will recall him as ever ready to assist. Though quiet and retiring, he soon became a warm friend to one who loved Nature. His work and influence must live for a long time, though he is no longer present.

THE NEW POSTAL RULING.

It has always been recognized that scientific research is greatly furthered by the exchange of the various objects with which that research is concerned. For the transmission of objects of natural history from one country to another, the mails have offered a cheap and speedy means. Heretofore, through the laxity with which the regulations have been enforced, it has been possible to enter such objects in the mails of the Universal Postal Union as "samples of merchandise," and under the rates of postage therefor. From official information lately received from the United States Post Office Department, it appears that such a rating is entirely unauthorized by existing provisions, and that objects of natural history may only be mailed by the rates required for letters. The United States Post Office Department also stated that it had recently submitted a proposition to the countries comprised in the Postal Union,

to modify the regulations so that such specimens may be entered in the mails as "samples of merchandise;" but that a sufficient number of countries had voted against the proposition to defeat it. Those countries voting negatively were Austria, Bolivia, British India, Canada, Germany, Great Britain, Guatemala, Hungary, Japan, Norway, Portugal, Russia, Spain, Sweden, Tunis, Uruguay and Venezuela.

The Academy of Natural Sciences of Philadelphia has appointed, through its President, a Committee (Chairman, Mr. P. P. Calvert) to address the various scientific bodies with which it is in communication in those countries, and to request them to memorialize their respective Governments in favor of the proposed modification. The letter rate for postage in the Postal Union is ten times that required for samples of merchandise, so that the former is virtually prohibitive.

In view of the fact that the subject is one which concerns all Zoologists, the NAUTILUS would urge its readers to use such influence as they may be able in favor of the proposed change. Foreign Conchologists living in the countries named above, will, it is hoped, exert their influence toward the modification desired.

NOTES AND NEWS.

MR. E. W. ROPER of Revere, Mass., returning from Chicago, visited the Conchological fraternity of Washington and Philadelphia recently.

DR. B. SHARP of the Academy of Natural Sciences of Philadelphia has departed on a scientific mission to the Sandwich Islands. He expects to return in December.

A VALUABLE MONOGRAPH upon the "Pleistocene History of Northeastern Iowa," by W. J. M'Gee appears in the Eleventh Annual Report of the U. S. Geological Survey, just issued.

The senior Editor of the NAUTILUS is engaged upon a guide of the Heliciform land snails. All of the genera and subgenera will be thoroughly defined, both as to shells and anatomy; a number of species of every subdivision will be figured, the anatomy will be figured, and the species of each group will be enumerated. An

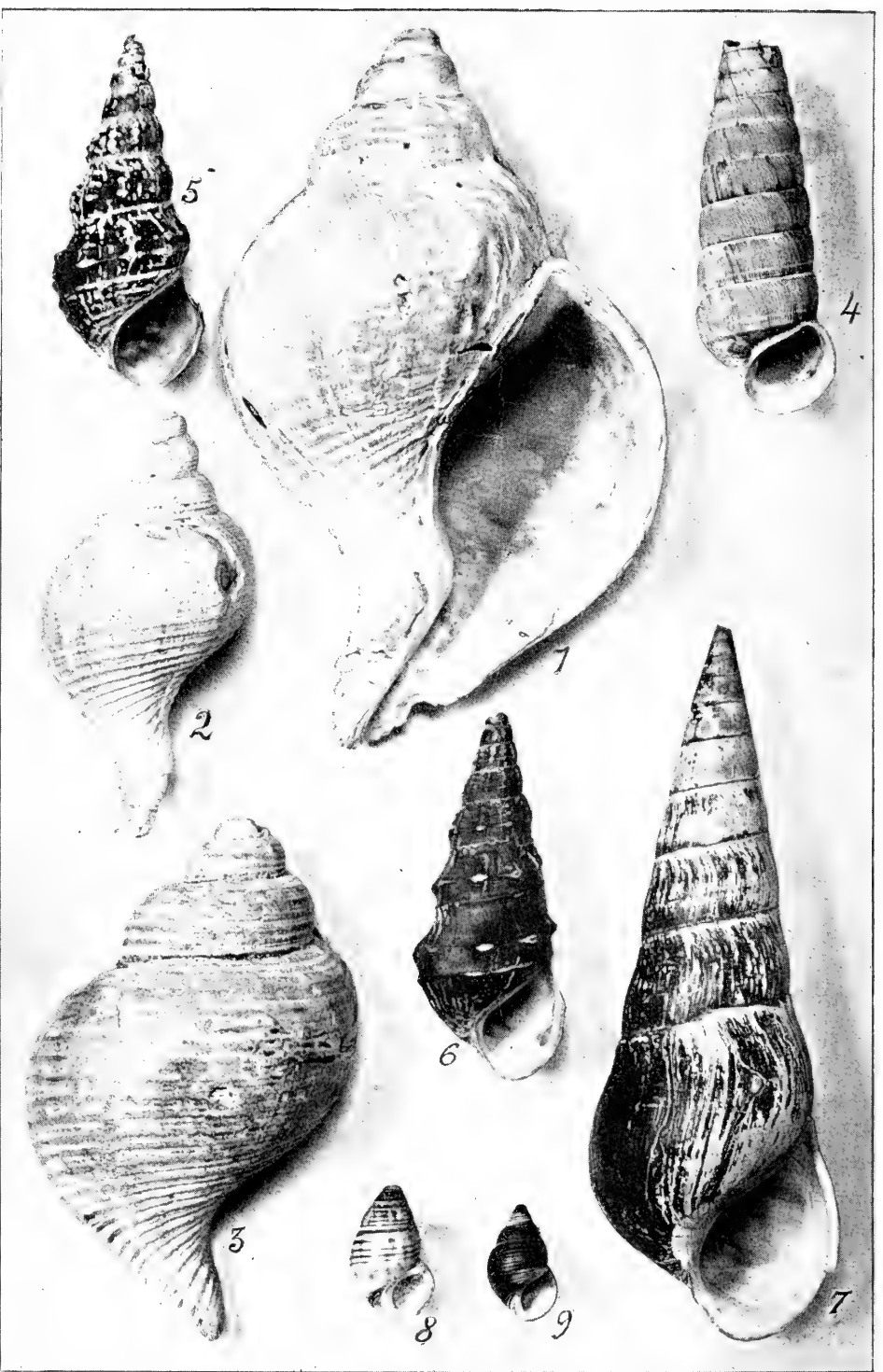
immense amount of new information, not to be found in any of the conchological manuals, will be offered. The work, it is believed, will form a complete text book of the subject, and will be indispensable to the student of land snails.

PROF. RALPH TATE describes a number of interesting new Australian gastropoda in the Tr. Roy. Soc. S. Austr. June, 1893. Among them are the following *Turbinidæ* and *Trochidæ*; *Astralium rutidoloma*, *Clanculus consobrinus*, *euchelioides*, *Thalotia neglecta*, *Calliostoma spinulosum*, *Euchelus fenestratus*, *pumilio*, *vixumbilicatus*, *annectans*, and *E. (Hybochelus) ampullus*. He states that *Euchelus tasmanicus* Tenison-Woods is the same as *E. scabriusculus* (Angas) Fischer, the type of Pilsbry's subgenus *Herpetopoma*. A supplemental list of S. Australian mollusca is also given.

OLFACTORY ORGANS OF HELIX. Dr. A. B. Griffiths (Proc. Roy. Soc. Edinb. 1892,) contends that Sochaczewer's experiments, by which he showed that the tentacula of *Helix pomatia* are not olfactory organs, were untrustworthy from his use of turpentine, which gives off a vapor that is irritating to the sensitive tissues generally. If snails are placed on flat slabs, the edges of which have been smeared with eau de cologne, methyl or ethyl acetate, liquids the vapors of which are not irritants, such as have the tentacula removed gradually approach the edges of the slabs, while those whose tentacles are uninjured turn away from the edges. He concludes, therefore, that the tentacles are the seat of the olfactory organs in *Helix*.

The Mid-August number of the *Zoologischer Anzeiger* contains an excellent portrait of J. Victor Carus, in commemoration of his seventieth birthday.

Mr. A. Belt, in writing of the mollusks of Dorset, (England) gives the following interesting notes. It is well known that thrushes in seasons of scarcity hunt for snails, and to extract the animal break the shell by beating it against a stone. Stones that have been used for this purpose, with the broken shells lying around them are frequently noticed but I had never before found them in such profusion as on the present occasion. A very large proportion of the 576 specimens of *Helix nemoralis* and *H. hortensis* found consist of these fragments. In fact, the birds had so thoroughly worked the district that until a heavy fall of rain induced the snails to come forth from inmost hiding-places, I did not find more than a dozen live shells of these species. On one occasion I found 42 *H. aspersa*, *H. hortensis* and *H. nemoralis* round one stone.



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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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OCTOBER, 1893.

No. 6.

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THE NAUTILUS.

VOL. VII.

OCTOBER, 1893.

No. 6

ILLUSTRATIONS OF MEXICAN MELANIANS.¹

BY H. A. PILSBRY.

The distribution of the Melanians and of land operculates in the Americas forms a most interesting chapter in zoogeography. As is well known, the family *Pleuroceridae* comprises all of the Melanians found living in North America above the Rio Grande; and moreover no members of this family or subfamily are known to exist outside of this area. South of the Texas boundary there are few melanians or none throughout northern Mexico; but as we approach the isthmus of Tehautepec the characteristic neotropical genera *Pachychilus* and *Hemisinus* appear, and are represented by a considerable number of species and innumerable local races. The richness of this fauna in varietal forms rivals the prolific streams of Tennessee and northern Alabama. Every spring and stream has its peculiar variations, often so distinct typically, that the naturalist is tempted into extravagance in naming them as species. The illustrations here with given represent some of the forms of *Pachychilus glaphyrus* from the State of Tabasco, sent to the Academy of Sciences by Professor ROVIROSA, a zealous and enlightened naturalist of that State.

¹ Reprinted by permission from the Proc. Acad. Nat. Sci., Phila.

***Pachychilus glaphyrus* Morelet.**

This species is an exceedingly variable one, more so perhaps than any other Mexican Melanian. The American student, however, will readily call to mind cases of equal variability among the species of our Southern States. The material sent by Prof. Roviroso comprises a number of varietal forms not before made known.

***P. glaphyrus* Rovirosai Pils. (Pl. I, figs. 9, 10.)**

Shell large and heavy, elevated conical, the lateral outlines straight above, modified by the slight convexity of the whorls below. Spire more or less truncated at tip, half-grown specimens, (Pl. I, fig. 9,) possessing 8 remaining whorls; adults, (Pl. I, fig. 10,) having one or two whorls less.

Surface most minutely spirally striated the striæ visible only under a lens. Young and half-grown specimens are otherwise smooth, except for very slight spiral liræ toward the base. When a little more than half-grown, there appear coarse, oblique, curved wave-like folds on the body-whorl, extending to the periphery but not below it. Simultaneously with these undulations, begin spiral spaced liræ crossing them, which are slightly more prominent on the crests of the waves. This sculpture continues upon all subsequent volutions. The last volution of an adult specimen is slightly compressed below the suture, then quite convex. It has ten waves, and about nine spiral liræ, but the number of these last is quite variable on different specimens.

The color is olive in young, blackish in old examples: interior of the mouth white, maculated with brown at the position of the periphery and folds. This marking is also seen on the eroded spire in some specimens.

Aperture ovate, acute above, slightly exceeding one-third the total length of the shell. Columella white, regularly arcuate, spreading in a brown-tinted callus.

Dimensions. An adult specimen measures: Alt. 78, diam. 28 mm. Aperture, alt. 25, width 18 mm. A younger specimen measures: Alt. 56, diam. 20 mm. Aperture, alt. 20, diam. 12½ mm.

Collected from a spring which gushes from the western brow of the little ridge of the Limon, State of Tabasco, Mexico.

This form is allied to *P. glaphyrus* typical, and to the var. *scam-nata*, but it is distinct from both. The form is notable for its stout, straight-sided spire, non-impressed sutures, and the unsculptured young.

P. glaphyrus var. between *polygonatus* and *immanis*. (Pl. III, figs. 5, 6.)

The two specimens figured are of the same size but differ in sculpture. One (fig. 6) is smooth above and below, having a strong sub-spinous keel at the periphery, and a smooth, acute keel below it. Upon the earlier whorls of the spire there are longitudinal waves, and two spiral cords above the peripheral keel, which diminishes in size. The base has no spirals. The other specimen has the entire body-whorl spirally lirated (liræ on body-whorl 9, on penultimate whorl 3) and strongly plicate.

P. glaphyrus potamarchus. (Pl. III, fig. 7.)

This is one of the largest forms of *Pachychilus* known, and it is the most aberrant of the *glaphyrus* stock. The shell is rather slender and acutely conical, the outline of the spire being straight. The aperture is ovate, narrowed above, and one-third the length of the shell. Whorls 10-11 remaining, several of the earlier being lost by erosion. The microscopic sculpture is the same as in var. *Rovirosai*. There are no traces whatever of the waves or folds so prominently shown by the other varieties of *glaphyrus*, and the spiral cords are also completely obsolete, or indicated by the faintest traces on the base. The color is olive-green or olive-brown.

Alt. 99, diam. 33 mill.

Alt. 87, diam. 29 mill.

Tabasco, Mexico.

This variety differs from the *pyramidalis* of Morelet in being larger and smoother, lacking altogether the chestnut colored spirals of that form.

Potamanax subgen. nov.

Shell solid, oval with short conic spire, spirally sculptured or banded. Aperture ovate, acute above, broadly rounded below; outer lip not sinuous; inner lip more or less heavily calloused, not notched at the base. Operculum few-whorled, with basal nucleus. Type *P. Rovirosai* Pils.

This group has the sculpture of *Hemisinus* but differs from that genus in the entire, un-notched basal lip. The columella callus is much like some species of *Pachychilus* but the operculum is very different from that genus. From both of these groups it differs in the short, ovate contour of the shell. The description of the operculum is taken from *Melania brevis* d'Orbigny of Cuba, which I consider congeneric.

The relationship of *Potamanax* to *Hemisinus* in sculpture and operculum is obvious, and has caused me to regard it as a subgenus

rather than a distinct genus; but the total lack of a basal notch or truncation is a character usually considered of generic importance.

P. Rovirosai n. sp. (Pl. III, figs. 8, 9.)

Shell oblong-conic, very solid, whitish, encircled by numerous narrow smooth spiral liræ of a dark brown color, and somewhat alternating in size. Spire conical, apical whorl eroded; whorls 5 remaining, slightly convex, the last whorl large, regularly convex. Aperture a little less than half the length of the shell, ovate, angular above; outer lip regularly acute; inner lip strongly calloused.

Alt. 20, diam. 12 mill. (old specimen.)

Alt. $16\frac{1}{2}$, diam. $9\frac{3}{4}$ mill. (young specimen.)

Two specimens are before me, collected by Prof. Rovirosa at the mountains of Poana, State of Tabasco. The older individual (Pl. III, fig. 8) is considerably worn; the other is perfect but not wholly adult, and neither contains the operculum. The species is allied, apparently, to the Cuban *Melania brevis* Orb., but is decidedly longer, and the liræ are much stronger.

EXPLANATION OF PLATE III.

Figs. 1, 2, 3, *Chrysodomus (Sipho) Stonei* Pils.

Fig. 4, *Eucalodium compactum* Pils.

Fig. 5, 6, *Pachychilus glaphyrus* var.

Fig. 7, *P. glaphyrus* var. *potamarchus* Pils.

Figs. 8, 9, *Potamanax Rovirosai* Pils.

NOTE ON CYPRÆA GREGORI FORD.

BY EDGAR A. SMITH.

I sincerely trust that Mr. Ford¹ wrongly estimates the critical acumen of modern conchological students. He says that most of them would probably have made *C. Gregori* a species instead of a variety.

There is no doubt that the new French School of Conchologists would agree with Mr. Ford in considering the shell in question specifically distinct from *C. cruenta*, but I am glad to say that in England (and I hope in America also) the ideas are not so advanced (?). Although examples of this shell have been in the National collection for more than 50 years, no British author has ever suggested that they belonged to a distinct species.

¹ NAUTILUS, Vol. vi, p. 112, Vol. vii, p. 39.

I fully admit that the differences pointed out by the author are fairly constant, and that examples are pretty easily separable from the typical form of *eruenta*. But admitting this does not prove that they ought to be held specifically distinct, and I venture to suggest that they only constitute a recognisable race or variety of an already known species.

The chief object of this note, however, is to make complaint respecting the name which Mr. Ford has imposed upon his so-called species.

When he published *Gregori* as a varietal name, it was already five years previously preceded by Mr. Melvill's varietal name *coloba*,¹ and therefore there is no question I think, which name should be employed if this variety be regarded as a distinct species. Right and justice (*and even courtesy*) at once direct us in the present case.

Mr. Ford is under the impression that Mr. Melvill was in a state of uncertainty whether the form in question was a variety of *eruenta* or *caurica*. I find no such impression conveyed by Mr. Melvill's sentences which are criticised by Mr. Ford. Moreover, in the catalogue of species (l. c., p. 243), Mr. Melvill ranges the var. *coloba* under *eruenta* and in addition gives a representation of the ventral side of the shell (Pl. I, fig. 7).

LAND MOLLUSCA OBSERVED IN THE GASPE REGION.

A. W. HANHAM, QUEBEC.

About the middle of May last I left Quebec for Gaspé Basin, by the way of Port Dalhousie, N. B. and the steamer "Admiral." It was my intention to spend a week or more in this district collecting shells and insects.

Unfortunately I found the season very backward up there, the weather too was wet or cold during my stay; owing to this but little collecting could be done, and I was more than disgusted having journeyed so far for so little purpose.

The following specimens were taken or seen at Barachois, near Mal Baie; this village is at the inner end of a deep bay, and is distant from Gaspé Basin some 25 miles, and from Percé about 10 miles.

With a few exceptions the land shells collected were found living in the grass on a sandy hillside close to the beach. The open coun-

¹ Mem. and Proc. Manchester Lit. and Philos. Soc., 1887-8. Ser. 4. Vol. I, pp. 218 and 243.

try was too wet and the woods were too full of snow to be worked at all, in fact it was only in places on the hill side that the snow had melted.

A broad sandy bar, some 5 or 6 miles long, cuts off the ends of the bay at Barachois, leaving a narrow channel at one end: on this bar I was surprised to find *Pupa muscorum* and *Vallonia costata* in the sand under pieces of wood. *Z. radiatulus*, *P. striatella*, *A. harpa* and *F. subcylindrica* occurred here rarely, as well as a *Vertigo*, of which two specimens only were taken.

Helix hortensis was very common on the hillside, generally buried in the sand; several varieties were taken; the plain form seemed to be the least abundant. At the entrance to some burrows I found quite an accumulation of empty shells, and nearly all being entire, many were in very fair condition.

A little collecting under more favorable circumstances would no doubt materially increase this list, from which several of the Northern or universally distributed species are absent.

At Gaspé Basin, *Limnea palustris*, *catascopium*, *desidiosa*, and one *Physa*, most likely *heterostropha*, were found in drift. Some marine species were also taken, but are not yet identified.

Limax campestris Binn. A few.

Vitrina limpida Gld. Frequent. All dead.

Zonites arboreus Say. A few.

“ *radiatulus* Alder. Common.

“ *fulvus* Drap. Two specimens.

Patula alternata Say. Frequent.

“ *striatella* Anth. Common.

Helicodiscus lineatus Say. Rare.

Acanthinula harpa Say. Common.

Tachea hortensis Müll. Abundant.

Vallonia costata Müll. ? A few. Mostly dead.

Pupa muscorum Linn. Frequent.

Vertigo. Two specimens (perhaps two species).

Ferussacia subcylindrica Linn. Common.

Succinea obliqua Say. “

“ *avara* Say. A few.

Carychium exiguum Say. Rare.

¹ Reprinted by permission from the Proceedings of the Academy of Natural Sciences of Philadelphia, 1892, p. 328.

A NEW GASTROPOD FROM NEW JERSEY.¹

BY H. A. PILSBRY.

At the regular weekly meeting of the Academy of Natural Sciences of Philadelphia, October 18, 1892, Mr. H. A. Pilsbry exhibited a series of specimens of a large species of *Chrysodomus*, belonging to the subgenus *Sipho*, which he had received from Messrs Witmer Stone, Chas. LeRoy Wheeler and John Ford. He stated that the specimens were cast upon the shore during severe gales from the south east, and were evidently derived from a submarine stratum which was disturbed and broken up at those times. Associated with the *Chrysodomus* were examples of *Buccinum undatum*, *Urosalpinx cinereus* of extraordinary dimensions, and *Chrysodomus (Sipho) Stimpsonii*, the latter being well developed and typical in sculpture. The age of the deposit cannot be definitely settled at present, but the evidence at hand indicates that it is post-pliocene.

The following description of the new species was offered :

CHRYSODOMUS (SIPHO) STONEI (Pl. III, figs. 1, 2, 3,). Shell obese-fusiform, rather thick and solid, with strongly convex whorls separated by deep sutures. Sculpture consisting of strong spiral cords, equal on young specimens and on the spires of adults, but which alternate with smaller intermediate cords on the body-whorl in full grown specimens. A young shell therefore has about 20, an adult 40 spirals upon the body-whorl. The aperture is oval: the canal is strongly curved to the left and backward.

Length 72, greatest diam. 45 mm.; length of aperture and canal 51 mm. The largest individual measures, length 100, breadth 64, length of aperture 73 mm. Both of these, as well as all specimens seen, have lost several of the earlier whorls; so the length of a perfect individual would be proportionately greater.

The more prominent features of this species are the swollen form, deep sutures, the strong spiral sculpture, and the strongly recurved canal.

The localities whence specimens have been obtained are as follows: Point Pleasant, N. J. (Witmer Stone); Sea Isle City, N. J. (John Ford, Oct., 1892); Cape May, N. J. (C. LeRoy Wheeler, 1891.)

Prof. A. E. Verrill of Yale College very kindly compared specimens of this species with the collection under his charge (a collection vastly richer than any other in mollusks of the north-west Atlantic.) He writes as follows:

"I have made a careful comparison of the *Sipho* sent by you with our series.

"It differs notably from any thing we have, and is probably, as you suppose, an undescribed species, unless described as a fossil. We have specimens of the ventricose varieties of *S. Stimpsoni*, which equal this in stoutness, and nearly equal it in curvature of the columella, but the whorls are less ventricose, the shoulder less swollen, the sutural region less deep, and the sculpture is very much finer."

Comparisons have also been made by myself with the Atlantic Siphos in the U. S. National Museum, and of course with the recent and fossil series in the collection of the Academy.

SHELLS OF HENRY CO., INDIANA.

BY E. PLEAS.

To judge from such works on the Mollusca as I have had access to, Indiana has not been regarded as having a Molluscan fauna worthy of the attention of the Conchologist. It is not often mentioned in giving localities. W. G. Binney in his very valuable Manual of Am. Land Shells, prints a list of his large collection as presented to the Smithsonian Institute; some 312 species and varieties, only mentions a beggarly 4: *Zonites fuliginosus*, *Patula solitaria*, *Triodopsis appressa* and *T. inflecta* as hailing from the Hoosier State.

I have been a student and collector of Mollusca for several years and have made it a point to secure our home shells first, and am able to present the following list collected within 5 miles of my residence near Dunreith, Indiana.

Mesodon albolabris Say.	striatella Anth.
elevatus Say.	Polygyra leporina, Gould.
thyroides Say.	Stenotrema stenotremum Fer.
" var bucculenta.	monodon Rack.
Mesodon exoletus Binn.	" var. leaii.
profundus Say.	" var. fraternum.
multilineatus Say.	hirsutum Say.
Sayii Binn.	maxillata? Gould.
clausus Say.	Triodopsis fallax Say.
pennsylvanicus Green.	tridentata "
Patula alternata Say.	palliata "
" var. carinata.	inflecta "
perspectiva Say.	appressa "
solitaria "	Zonites ligerus Say.

- fuliginosus Griff.
 intertextus Binn.
 exiguus Stimp.
 arboreus Say.
 indentatus Say.
 limatulus Ward.
 nitidus Müll.
 viridulus Say.
 fulvus Drap.
 minusculus Binn.
 petrophilus Bland?
 Strobila labyrinthica Say.
 Helicodiscus lineatus "
 Vallonia pulchella Müll.
 Punctum pygmaeum Drap.
 Pupa contracta Say.
 pentodon " "
 corticaria " "
 fallax " "
 armifera " "
 curvidens Gld.
 Vertigo ovata Say.
 miliun Gld.
 tridentata Wolf.
 bollesiana Morse.
 gouldii Binn.
 Carychium exiguum Say.
 Valvata sincera Say.
 tricarinata " "
 Amnicola porata Say.
 cincinnatiensis Anth.
 Sayana " "
 Pomatiopsis lapidaria Say.
 Bythinella attenuata Hald.
 Melanthis integra Say.
 Bulimus dealbatus Say.
 Ancyclus rivularis Say.
 Limnaea reflexa Say.
 palustris Mull.
 desidiosa Say.
 humilis " "
 catascopium Say.
 caperata " "
 Physa gyrina Say.
 heterostropha Say.
 Bulinus hypnorum L.
 Planorbis trivolvis Say.
 " var. fallax.
 bicarinatus Say.
 companulatus Say.
 parvus " "
 Segmentina armigera Say.
 Succinea obliqua Say.
 ovalis Gould.
 avara Say.
 " var. vermeta.
 Sphaerium sulcatum Lam.
 solidulum Prime.
 occidentale " "
 striatinum Lam.
 truncatum Lins.
 Pisidium abditum Hald.
 Unio rubiginosus Lea.
 occidens " "
 luteolus Lam.
 sub-ovatus Lea.
 gibbosus Bar.
 pressus Lea.
 gracillis Barr.
 phaseolus Hild.
 glans Lea.
 radiatus Lam.
 cocineus Hild.
 spatulatus Lea.
 nigerimus " "
 ligamentinus Lam.
 plicatus Les.
 undulatus Bar.
 nov-eboraci Lea.
 Margaritana marginata Say.
 calceola Lea.
 deltoidea " "

<i>M. rugosa</i> Bar.	<i>shaefferiana</i> ? Lea.
<i>Anodonta grandis</i> Say.	<i>salmonea</i> “
<i>plana</i> Lea.	<i>ferusacciana</i> “
<i>decora</i> “	<i>ferruginea</i> Lea.
<i>imbecillis</i> Say.	<i>stewartiana</i> Lea.
<i>ovata</i> Lea.	<i>subcylindrica</i> Lea.
<i>edentula</i> Say.	

ON A COLLECTING TRIP TO MONTEREY BAY.

BY WILLIARD M. WOOD.

The editors of the NAUTILUS have asked me to write a short article for the NAUTILUS, while I am here, on my trip to this once famous collecting ground.

Now that I am about to leave for San Francisco, I feel sorry to think that I have not devoted more time to the collection of specimens. Of course, there have been many long drives to be taken, a dip in the surf once in a day, huckle-berry expeditions with friends, and a thousand and one things to be done, while stopping at a summer watering place.

Between these “sports,” if I may be permitted to call them such, I have managed to find time to do some collecting.

The hotel at which I am stopping is situated within five hundred yards of the beach. To the north, runs a very smooth beach, devoid of rocks of any character for some fourteen miles. To the south, and extending for many miles, is a very rocky stretch. To this rocky portion, almost all of my collecting trips were confined.

Monterey is no longer the famous collecting ground it used to be. The increasing population at and around Pacific Grove is driving away all the land shells. The deadly sewerage flowing from the various towns into Monterey Bay is killing the marine shells. However, new and very interesting species are occasionally brought up from deep water by the dredge.

Early in the morning, on the 28th of June, I started by steamer from San Francisco with my shell collecting outfit, consisting of glass pill bottles for small shells, paper boxes, cigar boxes, cloth bags, long, thin pieces of wood with rubber bands attached for the Chitons, alcohol stove and pan for the killing of bodies of the shells,

cotton batting, long rubber boots, an immense sun hat, a chisel to detach *Haliotis* shells from the rocks, etc.

I arrived here at seven in the evening and although the trip down was rough, and our little "tub" rocked dreadfully, causing me to be sea-sick, it nevertheless did not prevent me from starting right in and collecting as soon as my feet rested on terra firma. On that evening, I began collecting at seven o'clock and as it was very light at that hour, I continued to collect along the beach until eight. I am very glad I did so, as it netted me some beach-washed species which I have not come across since.

I selected a week when the early morning small low tides occurred. Thus, one morning I devoted to the collection of *Haliotis cracherodii*, another morning I went in search of *Littorina planaxis*, another for *Chlorostoma costatum*, *Acmaea scabra*, *Nassa mendica*, etc.

During this second week, when no morning low tides have occurred, I have gone among the rocks, gathering any and every species which was so unfortunate, nay, I should say, fortunate, as to be placed within my reach.

Priene Oregonensis Redf. will be noted as having been collected here. I do not as yet understand how this large and beautiful northern shell should be found so far south. It could not have drifted into the bay, as it was a fresh, perfect-lipped specimen.

I may also mention that in a letter recently received from Mrs. M. Burton Williamson, of University P. O., Cal., that lady informed me that *Psammobia rubro-radiata* Nutt., is not found north of San Pedro Bay. As will be noted, I found one specimen, alive and perfect. It is truly a beautiful shell. The inside of both valves resembling delicate porcelain.

I am exceedingly sorry to think that I have no dredge here with me, as I feel positive I could gather at least five times as many specimens as I have already collected.

In the following list, the number of specimens taken is given after each name, and will serve to show the relative abundance of the species.

Arionta californiensis Lea, 51; *dupetithouarsi*, Desh., 4; *nickliniana*, Lea, 1. *Acmaea asmi* Midd., 33; *mitra* Esch., 11; *patina* Esch., 5; *pelta* Esch., 2; *persona* Esch., 2; *scabra* Nutt., 2; *spectrum* Nutt., 6. *Amphissa corrugata* Rve., 64. *Astyris gausipata* Gld., 12. *Bittium filosum* Gld., 24; *filosum* Gld. var. *esuriens*

Cpr., 2. *Calliostoma annulatum* Mart., 17; *canaliculatum* Mart., 32; *costatum* Mart., 80. *Chlorostoma brunneum* Phil., 23; *pulligo* Mart., 3; *funebre* A. Ad., 2. *Cerostoma foliatum* Gmel., 1. *Crucibulum spinosum* Sby., 9. *Crepidula edunca* Sby., 21; *rugosa* Nutt., 2; *navicelloides* Nutt., 12. *Conus californicus* Hds., 4. *Cryptomya californica* Conr., 1. *Chaetopleura hartwegii* Cpr., 11. *Chama spinosum* Sby. (?), valves only, 4. *Columbella carinata* Hds., 24. *Drillia torosa* Cpr., 5. *Erato columbella* Mke., 6; *vitellina* Hds., 6. *Fusus luteopictus* Dall, 1. *Fissurella volcano* Rve., 47. *Gadinia reticulata* Sby., 8. *Glyphis aspera* Esch., 3. *Haliotis cracherodii* Leach, 72; *fulgens* Phil., 1; *rufescens* Swains., 2. *Hipponyx tumens* Cpr., 57. *Lyonsia californica* Conr., valves only, 1. *Lottia gigantea* Gray, 44. *Lucina californica* Conr., valves only, 11. *Lucapina crenulata* Sby., 4. *Lunatia lewisii* Gld., 2. *Lamellaria stearnsiana* Dall, 1. *Leptothyra carpenteri* Pilsbry, 28. *Litorina planaxis* Gray, 83; *scutulata* Gld., 2. *Lazaria subquadrata* Cpr., 5. *Mitromorpha aspera* Cpr., 2. *Modiola fornicata* Cpr., 2. *Mangilia variegata* Cpr., 3. *Mitra maura* Swains., 1. *Marginella jewettii* Cpr., 25. *Monoceros engonatum* Conr., 2; *lapilloides* Conr., 75. *Mopalia lignosa* Gld., 3; *ciliata* Sby., 2. *Macoma inquinata* Desh., 1; *secta* Conr., valves, 2. *Mytilus californicus* Conr., 2. *Nassa californiana* Conr., 1; *fossata* Gld., 13; *mendica* Gld., 58. *Nacella incesso* Hds., 19; sp. undet., 2. *Nuttallina scabra* Rve., 29. *Olivella biplicata* Sby., 14. *Ocenebra circumtexta* Stearns, 7; *interfossa* Cpr., 7. *Priene oregonensis* Redf., 1. *Psammobia rubra-radiata* Nutt., 1. *Pedicularia californica* Newc., 12. *Purpura saxicola* Val., very large, 16; *saxicola* Val., var. *emarginata* Desh., 80. *Pachypoma inæqualis* Chem., 1. *Phasiarella compta* Gld., 9. *Pecten hastatus* Sby., valves only, 4. *Pholadidea penita* Conr., 1. *Placunanomia macrochisma*, Desh. (valves), 2. *Petricola carditoides* Conr., 2. *Rupellaria lamellifera* Conr., 3. *Saxicava arctica* Linn. (valve only), 1. *Scala indianorum* Cpr., var. *tincta* Cpr., 10. *Surcula carpenteriana* Gabb., 3. *Septifer bifurcatus* Rve., 11. *Standella falcata* Gmel. (?) (valves only), 2. *Schizothærus nuttallii* Conr. (valves), 2. *Tapes staminea* Conr. (?), 3. *Trivia californica* Gray, 20. *Tellina bodegensis* Hds. (valves only), 2.

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OF CONCHOLOGISTS.

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THE NAUTILUS.

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NOTES ON PAPUINA.

BY CHARLES HEDLEY, AUSTRALIAN MUSEUM, SYDNEY, N. S. W.

All *Papuina*¹ are arboreal; this habit is as "good" a generic character as any anatomical feature could be. Parenthetically, I may remark, that my friend Mr. Brazier, who has probably gathered more living *Papuina* than any other naturalist, agrees with me that the account (Ann. Mag. N. H., (4) xx, p. 242) of a *Papuina* clinging half way up a reed in a brackish swamp is quite incredible. The usual position of *Papuina* is upon the trunks or limbs of trees where an unpracticed eye might take it for a rough bit of bark. In southern Europe the *Macularia* perch just so on precipitous rocks; indeed, I recollect there capturing an *H. niciensis* on an olive tree in exactly the manner affected by the *Papuina* in New Guinea.

A small group of Queensland snails, viz, *conscendens* Cox, *fucata* Pfeiffer, and *bidwilli* Cox, seem to differ from the main body of the genus in their habits. Not the stem or branches, but the leaves of trees are chosen by these for their favorite abode. To suit the situation the shell has been modified until the contour would suggest *Partula* rather than *Papuina*. The more conical shape has proba-

¹This name is now generally used for the conical *Helices* characteristic of the Papuan and Solomon Island faunas, formerly called *Geotrochus*.

bly been adopted for greater safety in the exposed tree tops; to the same end every superfluous atom of weight has been abandoned, the shell reduced to the thinnest, and the reflected lip dispensed with. Under the lens the apex is seen to be of one and a half whorls, black or darker than the adult shell, smooth and subglobose. Oblique growth lines are the predominant features of the adult sculpture; by flashing the shell in the sunshine under a lens, an extremely minutely shagreen surface is perceptible in the gleam, and here and there broken lengths are decipherable of engraved spiral lines. Viewing the shells of these three species by transmitted light the color markings are seen as translucent spaces in the opaque shell. I should interpret these signs as indicating a descent from an ancestor like *naso* and *macgillivrayi* through a form very close to *bidwilli* Pfeiffer.

The minute almost imperceptible shagreen surface may represent the coarse sculpture of *naso*; the evanescent spiral lines are traceable from the clear cut lines of *macgillivrayi* through the fainter sculpture of *bidwilli* Pfr., to their vanishing representative in *bidwilli* Cox. But the minute subglobose apex and especially the translucent spiral color bands ally this group unmistakably with *Papuina*. Admitting this, in default of anatomical examination, it will be necessary to rename the shell hitherto known as *Bulimus bidwilli* Cox, lest it should clash with that other *Papuina* described by Pfeiffer as *Helix bidwilli*. I therefore propose that in allusion to its peculiar habits, it be henceforth called *Papuina folicola*.

Between these leaf-dwelling *Papuina* of Queensland and *Bulimus mageni* Gassies, of New Caledonia, I note a strong resemblance in color, form and sculpture, but especially in their translucent color bands. Until further research settles authoritively the position of this species I would provisionally class it with the foregoing.

SAN PEDRO AS A COLLECTING GROUND.

San Pedro, California, is remarkable for the number and variety of recent and fossil mollusks.

New forms and an unusual abundance of known species are constantly being found.

This is due in a great measure to the extension of the Government breakwater, which has made changes in the sea currents near the

shore, and caused the tide water of the harbor to scour out the channel and drift large quantities of sand over the shallows.

By this means new homes are made for wanderers, and old inhabitants are washed from their moorings and swept by the tide within reach of eager Conchologists.

It is surprising, however, how seldom the year's abundance of any species repeat themselves.

At one time *Nassa fossata* Gld., at another *Periploma discus* Stearns; at another *Lima orientalis* Cpr.; or *Scalatella striata* Cpr., are found by the dozen, or score, or hundred in San Pedro Bay or vicinity, and then for years after only a few are found at a time.

The sea conditions are unsettled. This keeps local collectors alert.

Within a few months I have found a specimen of *Tritonium gibbosum* which is new to California, and one of *Cylichna cylindracea* var. *attonsa* Cpr., which is new to San Pedro. Both shells are beach worn.

This summer I spent July at San Pedro and added a number of new specimens to my collection besides learning many interesting facts about habits and habitat of molluscs.

A student only gets a half knowledge who cannot collect specimens and study the living animals in their native haunts.

July seems to be a favorite month for many species to lay their eggs.

Mitra maura (Idæ), fastens her capsules to the underside of stones; the Naticidæ place their "sand collars" in the damp sand; *Bulla nebulosa* Gld. coils up her yellow strings on the grassy flats, and *Haminea virescens* Sby. chooses the same place and time, but has a different shade of yellow for her egg-strings.

I was much interested in the eggs of *Actæon* (*Rictaxis*) *punctocelatus* Cpr.

This mollusk has been rare, and I am inclined to think it only comes inshore in numbers during the breeding season and after that burrows in sand in deeper water for the rest of the year. In July we found them by the hundred.

The eggs are laid in a white string three or four inches long that coils so as to form a loose spiral.

The spirals are anchored, by some means, so firmly that the washing of rough surf does not sweep them away.

They so closely resemble the spiral pattern on the adult shell that the collector, looking down through the water, not unfrequently stoops to pick up what he thinks is one of these little gasteropods and finds a string of eggs in his fingers.

I visited Portuguese Bend and learned that *Purpura emarginata* Desh., which I found in quantity more than a year ago, is a resident or a comer and a goer, for more than a dozen were collected this summer. Its habitat is limited to a small mussel bed.

Other localities so much like this mussel bed, that one would consider them suitable dwelling places do not boast of a single *Purpura*; so that something besides collectors must disturb this usually common species.

I collected at San Pedro an abundance of *Acmæa paleacea* Gld. on the eel grass.

These close clingers love the grass on the outside of the island that is swept by heavy swells and where the water scarcely leaves them even in very low tides.

Their more peaceful cousins *Acmæa depicta* Gld. will probably be found swaying with the grass in the stiller waters of the bay, for dead shells have been frequently found in the drift.

In the quiet bay quantities of drift material are washed up with algæ and eel grass during medium tides.

This is rich in minute forms. It consists largely of broken shells of molluscs and crustaceans, but there is a sufficient quantity of *Pedipes*, *Siphodontalium*, *Tornatina*, *Cæcum*, *Truncatella*, *Mitromorpha*, *Turbonilla*, *Cerithiopsis*, *Triforis*, *Diala*, *Mumiola* and other wee bodies to amply repay any one for carrying away a few pounds of the drift to be dried and sorted at home.

The sifting and the sorting with a microscope takes so much time and patience, that the new and rare species hidden in my bags of drift must wait a more convenient season.

The yearly extension of sand flats at San Pedro, must make happy all sand loving species such as *Bulla*, *Sigarcetus*, *Natica*, *Olivella* and scores of bivalves.

Besides these sandy stretches there are mud flats, rocky points, brackish water, fresh water, smooth or rocky beaches enough to make San Pedro an ideal collecting ground.

Although nearly all the localities are easy of access for the Conchologist, or the collector who "makes shell flowers," there are changes enough taking place to insure a good supply of shells.

A storm that stirs up the depths makes a grand holiday, but nearly every visit, in storm or calm, repays the student by some glimpse of the life history of some soft—hard dweller of the sea.

Sarah P. Monks.

PRELIMINARY NOTES ON TASMANIAN LAND SHELLS.

BY HENRY SUTER.

Since I became acquainted with the New Zealand and Tasmanian land and fresh water molluscan fauna, some four to five years ago. I came to the conclusion that both are very nearly related, though this opinion is not shared by Conchologists generally. On several occasions I expressed my views, especially when describing *Charopa subantialla* and *Ch. mutabilis*. It is well known that no attempt has been made to classify the Tasmanian land shells; all the Helicidæ have been simply placed in that "olla potida" genus *Helix*, Mr. Charles Hedley of Sydney, was first to publish structural details of the animals of some Tasmanian land shells (Proc. Linn. Soc., N. S. W. (2) VI, p. 19). Descriptions and very good figures of the animals and the dentition were there given of *Bulimus dufresni*, *B. tasmanicus*, *Anoglypta launcestonensis*, *Rhytida lampra*, *Helicarion verreauxi* and *Cystopelta petterdi*.

I have not been successful in procuring land shells with their animals from Tasmania, and I therefore decided to sacrifice part of my collection. There were some specimens with the animal dried in them and these I used for preparing the jaws and radulæ. I have just finished the microscopic slides and have not yet had time to study them carefully. However, I ascertained a few facts, which, I feel sure, may prove of great interest to Conchologists, though my communication is only provisional.

Conchologists of course know that the genera *Endodonta*, *Charopa* and *Rhytida* are common to New Zealand and Tasmania. The new facts I ascertained of genera or sections of genera found in New Zealand as well as in Tasmania, and part of Australia in some cases, are the following:

Genus *Gerontia*.

Section *Flammulina*, thought to be confined to New Zealand only. I think that *H. Jungermannia* Petterd, belongs to this section, though I am not yet quite positive.

Section *Thalassohelix*, hitherto not recorded from beyond New Zealand. There is no doubt that *H. fordei* Brazier, (= *petterdi* Cox = *positura* Cox) must be classed under this section, and very likely also *H. austrinus* Cox, *H. allporti* Cox, *H. helice* Cox, *H. medianus* Cox, *H. mixta* Cox, *H. tabescens* Cox, *H. tranquilla* Cox, *H. trajectura* Cox, which are said to be varieties of *H. fordei*. This species is found also in Australia.

Genus *Laoma*.

Section *Phriægnathus*, a genus which was thought to be peculiar to New Zealand "par excellence." Now I am quite sure that the following Tasmanian mollusks belong to this section :

H. cæsus Cox (and var. *occultus* Cox?) *H. henryana* Petterd, and *H. pictilis* Tate; the latter being found also in Australia.

Genus *Rhenea*.¹

This genus of which two species are known from New Zealand, is in Tasmania represented by *Hyalina nelsonensis* Brazier (= *fulgetrum* Cox, and very likely *H. dyeri* Petterd, though the dentition of the latter is unknown to me).

I am confident that on examining my slides there will be some other sections of *Gerontia* to be placed on record in my next communication on Tasmanian snails.

In future we may no doubt be able to distinguish in New Zealand and Tasmania two different immigrations of land mollusca, one having spread from north southward, and another, the *antarctic*, migrating from south to north.

Springfield Road, Christ Church, New Zealand, Sept. 6, 1893.

SOME (RESPONSIVE) REMARKS RELATIVE TO *CYPRÆA GREGGRI*
FORD.

BY JOHN FORD.

In the note on *Cypræa Greggri* Ford, published in the October number of the NAUTILUS, the writer, Mr. Edgar A. Smith, of London, rather forcibly remarks that "the new French School of Conchologists would probably agree with Mr. Ford in considering the shell in question specifically distinct from *C. cruenta*," but, "he

¹A genus of carnivorous, jawless snails allied to *Rhytida* and *Paryphanta*, formerly called *Elæa* Hutt. (preoc.)—Ed.

was glad to say that in England (and, he hoped, in America also), the ideas were not so far advanced (?).” In support of the last proposition, he says: “Although examples of this shell have been in the National (British) collection for more than fifty years, no British author has ever suggested that they belonged to a distinct species.” This statement is apparently correct, but he might have added quite as truly, that nearly all of these years were required for “British authors” to find them worthy even of varietal distinction.

In view of this “state of things,” it is not at all surprising that Mr. Smith should consider it a “bit of presumption” for an American student, having less than one year’s knowledge of the shells, to attempt to lift them above the plane of varietal controversy.

It matters not that this student has examined hundreds of specimens, all showing the same distinctive specific characters. His “ideas” do not agree with English formulas, therefore they must necessarily be too far advanced.

Nevertheless, the new species, *C. Gregori*, has doubtless come to stay, since it has been endorsed already by quite a number of eminent (American) Conchologists, whose opinions, were it necessary to mention names, would at once be accepted as weighty. In regard to Mr. Smith’s admission, “that *examples* are pretty easily separated from the *typical* form of *cruenta*,” it may be said that I have seen no specimens whatever that could not be separated on sight from *any* form of *C. cruenta*. Just here, it may also be said, that I do not hesitate to claim (as in my former article) priority both for the name and description of the shell; and this claim is made in face of the fact that British authors, as a rule, command my highest respect and esteem. But while according this, I do not expect them to throttle, without ample reason, even the humblest seeker after knowledge.

It is only just to myself to say that not until my first description was in type, did I learn that Mr. Melvill had ever referred to the shells, nor, so far as I could ascertain, was this reference known to any of my Conchological friends. Indeed, the gentleman who finally gave me the information has, from the first, regarded them as *C. caurica* var. As Mr. Smith suggests, I was then, and still am, under the impression that Mr. Melvill’s sentences left the reader in a state of uncertainty as to whether he considered the shells a

variety of *cruenta* or of *caurica*. That his purpose is more plainly shown in the list of figures given is apparent, but as the volume examined by me was an uncut one, this list was not at the time discovered.

Since many readers of the NAUTILUS may lack the opportunity of seeing Mr. Melvill's statement, and judging for themselves as to its clearness, it is given here *verbatim*, as follows: "*C. cruenta* (Gmel.) is very nearly allied to the preceding," [i. e. *caurica*] "and the variety *coloba* (fig. 7), so-called from the stunted appearance, is also figured in Sowb. Thes. f. 190, as *caurica* var.; it would appear nearer this species: the base is always brighter coloured, and teeth interstices bright red. I possess stunted *caurica* with which this var. cannot be mistaken."

Now if any reader of the NAUTILUS can show by these sentences to which of the two species Mr. Melvill assigned the variety, it will be a pleasure for me to acknowledge my error in questioning his meaning. But whether the language refers to one variety or another is really of very little moment at this time, since it can in no way affect the present status of the shells. Be it agreeable to Mr. Smith or not, the fact remains that Mr. Melvill's so-called description is simply meaningless and void, embracing as it does, just three words, viz, "base brighter colored," meaning, of course, brighter colored than the type shells he had in mind.

But how brighter or how colored? They are certainly *not brighter* than both *cruenta* and *caurica* usually are; and there is not a hint as to whether the *color* is green, blue, yellow or any one of a dozen hues, yet with such a description at hand, the student was expected to distinguish the shells from all others. It is true that there are other words besides the three quoted, viz, "teeth interstices bright red." Unfortunately, however, the same sentence is used in the description of the type *C. cruenta*, (to which species Mr. Smith assures us the variety *coloba* relates) and is therefore entirely worthless as a distinctive *varietal* character.

For these reasons, I claim that the name *coloba* is absolutely devoid of collateral support, since nothing can be plainer than the fact that without an accompanying description intelligible enough for comprehension, the suggested name or title of a shell is of no scientific value whatever.

But then, as Mr. Smith intimates, there is the figure! and surely that counts for *something*.

Perhaps it does. But not for anything of special importance in this connection, for Kiener, many years before, gave us a *pair* of figures quite as good; not to mention that made by Sowerby some years later.

It should be understood that these references are not made in defence of the present specific standing of the shells, but mainly in deference to those readers who may have missed seeing my former articles relating to them. The species, i. e., *C. Gregori*, is doubtless already sufficiently fortified to prevent successful assaults from any quarter.

In conclusion, it might be well to add, that Mr. Smith's rather emphatic "reminder" of my lack of courtesy, is wholly gratuitous, and therefore does not call for comment.

In the interest of peace, however, it is accepted "with thanks," and filed for future courteous consideration.

Philadelphia, October, 1893.

THE SHEEPSCOTE RIVER.

BY REV. HENRY W. WINKLEY.

The fauna of the eastern coast of New England, aside from the species which characterize it as a whole, has a number of small areas where the oyster, quahog and other southern forms exist. The most conspicuous of these areas is Northumberland Straits, where the oyster is abundant enough to be of commercial value. Other points, where the Virginian fauna occurs, are a few sheltered spots on the east coast of Nova Scotia, in Minas Basin, Casco Bay and Massachusetts Bay, with a few outliers of less importance.

These spots on the coast are widely separated from each other, and have in the near neighborhood animals which are adapted to the colder waters. Some few years ago the present writer published a list of thirty species found in Northumberland Straits.¹ The present summer was spent in Wiscasset, Maine; this and a visit to that place three years ago enabled me to dredge in many places in the Sheepscote River.

Wiscasset is ten or twelve miles from the sea and the river is practically a salt water bay or fjord. Its depth is ten fathoms in

¹ Bulletin VII—Nat. Hist. Soc. of New Brunswick.

places, and at no point is it shallow. The width, on the other hand, is but a few hundred yards except at Wiscasset, where it is three quarters of a mile wide. The river is famous for its scallops, *Pecten magellanicus* Gmelin, these occur for the most part in the lower part of the river.

It was frequently reported to me that oysters were to be found "up river" four or five miles. I am sorry to say I had but one day "up river;" that trip, however, revealed the fact that a very narrow spot known as the Falls, separated an upper basin from the main part of the river. Here in the warmer waters oysters do occur, but very few and far between. With the oysters I found a few of the old companions noticed in Northumberland Straits, and abounding south of Cape Cod.

As a whole this river is rich in specimens, and the cold and warm water species are by no means distant neighbors. Some forms are dwarfed, some like *Bullinella alba*, are colored probably by iron to a darker shade than the normal. I believe that more species may be added to the list by a more careful search above the place dredged. I give the list of those found by me in the area extending four or five miles each way from Wiscasset.

<i>Mya arenaria</i> Linn.	<i>Pecten magellanicus</i> Gmelin.
<i>Pandora gouldiana</i> Dall.	<i>Ostrea virginiana</i> Gmel.
<i>Lyonsia hyalina</i> Conrad.	<i>Anomia simplex</i> Orbigny?
<i>Saxicava rugosa</i> Lam.	" <i>aculeata</i> Gmel.
<i>Macoma baltica</i> var. <i>fusca</i> Say.	<i>Diaphana debilis</i> Gld.
<i>Cryptodon gouldii</i> Stimp.	<i>Utriculus gouldii</i> Stimp.
<i>Astarte undata</i> Gld.	<i>Bullinella alba</i> Brown.
<i>Gemma gemma</i> var. <i>totteni</i>	<i>Chiton marmoreus</i> O. Fab.
Stm.	<i>Chiton albus</i> Mont.
<i>Cardium pinnulatum</i> Conrad.	<i>Acmæa testudinalis</i> Mull.
<i>Venericardia borealis</i> Conrad.	<i>Puncturella noachina</i> Linn.
<i>Nucula proxima</i> Say.	<i>Skenea planorbis</i> Fabr.
<i>Nucula dolphinodonta</i> Migh.	<i>Cingula minuta</i> Totten.
<i>Yoldia sapotilla</i> Gld.	<i>Onoba aculeus</i> Gld.
<i>Mytilus edulis</i> Linn.	<i>Lacuna vineta</i> Mont.
<i>Modiola modiolus</i> Linn.	<i>Litorina tenebrosa</i> Mont.
<i>Modiola plicatula</i> Lam.	" <i>litorea</i> Linn.
<i>Modiolaria nigra</i> Gray.	" <i>palliata</i> Say.
" <i>discors</i> Linn.	<i>Odontostomia bisuturalis</i> Say.
<i>Crenella glandula</i> Stimp.	<i>Odontostomia trifida</i> Totten.

Velutina halioidea Stimp.	Purpura lapillus Linn.
“ zonata Gld.	Ilyanassa obsoleta Say.
Polynices heros Say.	Nassa trivittata Say.
“ triseriata Say.	Buccinum undatum Linn.
Bela incisula Verr.	Chrysodomus stimpsoni Mörch.
“ harpularia Couth.	Chrysodomus pygmaeus Gld.
“ cancellata Migh. & Ad.	Trichotropis borealis Sby.
“ decussata Couth.	

[COMMUNICATED.]

AMERICAN ASSOCIATION OF CONCHOLOGISTS.

The President of the Association regrets that he has been compelled through stress of business engagements and other matters, to temporarily suspend his correspondence upon Conchological matters, but would be glad now to hear from any of the members, especially those whose letters have not been attended to promptly.

The Association has recently not been so active as formerly, but everything looks fair for a go-ahead, prosperous season. Nearly 200 members are enrolled in the Association, and any proposals of new members will be acted upon promptly by the officers. Such proposals should be made to the Secretary, Mr. Chas. W. Johnson, Wagner Institute, Philadelphia.

Members desiring to forward fine specimens of shells to the “American Collection,” will kindly communicate with the President, Mr. John H. Campbell, 1009 Walnut Street, Philadelphia, sending him lists of such species as they wish to forward. Due acknowledgment of shells received will be made in the pages of the “NAUTILUS.”

The most recent addition to the collection has been a fine series of fossil species from the Miocene and Pliocene of Maryland, Virginia, North Carolina and Florida by Mr. Joseph Willcox of Philadelphia. The collection, already, is one of the finest “special collections” in America, and bids fair to surpass all others. Each species is carefully examined, named, mounted and placed in the cases set apart by the Academy of Natural Sciences and the collection as a whole, is kept separate from the general collection of that

institution. The *name* and *address* of each donor with date of reception, are neatly written on the cards, upon which the shells are mounted and the officers of the Association give the collection their personal supervision.

Changes of address of members should be promptly noted to the Secretary.

NOTES AND NOTICES.

Mr. F. H. Lattin, whose Natural History establishment at Albion, N. Y., has long been well known to many of us, has recently founded a "branch" in Chicago, where we lately had the pleasure of looking through his large mass of material. Mr. Lattin has now a considerable stock of shells in addition to his departments of ornithology and oology, and it is with pleasure that we announce this first commercial enterprise in the Conchological line in the West. F. H. Lattin & Co. now occupy a handsome and well filled building at 3571 Cottage Grove Avenue.

A VIGOROUS EDITORIAL from the pen of Mr. J. Ritchie, Jr., dealing with the recent postal ruling against natural history specimens, appeared in the *Commonwealth* (Boston), Saturday, September 23.

VARIATIONS OF *STROBILOPS HUBBARDI*.—In looking over our collection of this species I find that over half of them have three teeth, but about a third have four, and I found one with five. We have collected them from several different localities, but all in Florida, and nearly all in this county, some near the coast and some 16 to 18 miles inland.—*G. W. Webster, Lake Helen, Florida.*

A SYNONYM OF *LEPTOTHYRA*.—It seems to have escaped notice hitherto that Gabb's genus *Petropoma* (Journ. Acad. Nat. Sci., Phila. viii, p. 281) is founded upon a species exhibiting all the essential features of *Leptothyra*. The operculum and shell are very like in structure to the granulose species of the central Pacific. Gabb, in his description, mistakes the inside for the outside of the operculum. Being later in date than *Leptothyra*, the name *Petropoma* becomes a synonym.—*H. A. P.*

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A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR :

H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR :

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

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DECEMBER, 1893.

No. 8.

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THE NAUTILUS.

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LAND AND FRESH WATER SHELLS IN THE ROCKY MOUNTAINS.

BY GEO. W. TAYLOR, VICTORIA, B. C.

In the October NAUTILUS there is a short paper by my friend Mr. Hanham upon the shells found by himself during a trip in that rather out of the way Canadian locality, the Gaspé region.

It may be interesting to have a record of a small collection made by me a few weeks ago in another little-known locality at the opposite end of the Dominion viz.: Laggan near the summit of the Rocky Mountains.

I had received earlier in the year from Mr. T. R. Bean of Laggan, a nice little collection of shells which included specimens of what Dr. Sterki considers to be the true *Pupa hoppii* of Möller, and this tempted me to stay over for a couple of days when passing through Laggan last September on my way to Toronto.

Dr. Bean most kindly showed me all the best localities known to him, and our united exertions were rewarded by the discovery of several species that he had not previously recognized, including one which I believe had not before been found in Canada.

In the rivers, the Bow and the Pipestone, we could not find any shells at all, the waters being cold and the stream rapid in each case, but in all the little creeks and swamps *Limnaea palustris* abounded and *Planorbis parvus* occurred in less numbers. In a small lake not more than a mile from Laggan we found, in addition to the

species above named, 3 others—*Planorbis trivolvis* Say, common, *Pisidium abditum* Hald., rare, and a *Valvata*, which I suppose to be *virens* Tryon, 6 specimens only.

No *Physa* of any kind were observed, nor has Dr. Bean as yet found any species of *Unio*, *Anodonta*, or *Spharium*.

The land shells enumerated below were all found under logs or under pieces of board in the neighborhood of the settlement and along the banks of the rivers. *Vitrina limpida* Gould, *Hyalina arborea* Say, *Hyalina radiatula* Alder, *Conulus fulvus* Drap., *Patula striatella* Anth., *Vallonia costata* Müll. (form *gracilicosta* Reinh., teste Sterki), *Ferussacia subcylindrica* Linn., *Succinea avara* Say, and a species of *Vertigo* closely resembling *gouldii*, were all common.

Pupa hoppii Möller, was not very common in the spots I searched and I only secured 8 specimens. Still less frequent was *Pupa alticola* Ingersoll, which I had here the pleasure of finding for the first time.

Dr. Bean has in his collection, besides the above, specimens of *Pupa pentodon* Say, which he took a few miles to the west of Laggan; and a second species of *Succinea* perhaps *S. ovalis* Gould. Lastly some slugs which were probably *Limax hyperboreus* West., were observed by us but not collected.

The altitude of Laggan is about 5,200 feet above sea level and the locality is interesting, as being nearly at the summit of the Rocky Mountain range, which seems to form, in Canada, a hard and fast line of demarcation between the eastern and western species of Mollusca.

HÆCKEL'S PLANKTONIC STUDIES.

All interested in the life of the open and deep sea, the so-called pelagic or Plankton fauna, will be interested to read the translation of Prof. E. Hæckel's paper of 1890, which is printed in the Report of the U. S. Fish Commission for 1889-91, pp. 565-641.

Some of the German polemics are omitted, though a sufficient amount remains to spice the article in a lively manner. There is much reason to believe that Hæckel, who has had no experience in deep sea work, has overestimated the evidence in favor of zonary distribution of life in the deep sea. Certainly the observations of

Agassiz and Tanner are superior by reason of their better apparatus to any heretofore made, and they seem to show that with the exception of a superficial zone of a few hundred fathoms and a thin zone immediately over the bottom, the animal kingdom is represented in the intervening region by the dead bodies of sinking animals only, and has no peculiar fauna of its own and but little life. There is no obvious reason why this must be so, but the most carefully checked observations yet made indicate that it is so. Apart from this one point, the paper of Hæckel gives a most interesting, accurate and vivid idea of the pelagic life of the sea, and one which every one may read with profit. The vast experience in surface and coast collecting which the Jena Professor has had, enables him to speak from experience in this direction, and the material obtained by others, on the Challenger and elsewhere, which he has worked up, has given him great familiarity with the Plankton fauna.

W. H. D.

CONTRIBUTIONS TOWARD A REVISION OF THE TASMANIAN LAND
MOLLUSCA.

BY H. SUTER.

Since I wrote the "Preliminary Notes on Tasmanian Land Shells," I have sacrificed many more specimens of my collection for the study of the dentition, and, as I have just finished the work, I wish to give here the result of my investigations.

Before giving the results of my study, it will be necessary to say a few words on the classification of the New Zealand Helicidæ. Mr. H. A. Pilsbry proposed (NAUTILUS, VI, 1892, No. 5, pp. 54-57) a new classification of N. Z. Helicidæ, the main feature of it being the forming of one genus, *Gerontia*, of these former genera constituting my family *Phenacohelicidæ*. Later on he published (Proc. Acad. Nat. Sci. Philada., 1892, pp. 387, etc.) a "Preliminary Outline of a New Classification of the Helices," in which he included under the one genus *Endodonta*, the following groups: *Endodonta* s. str., *Ptychodon* (= *Maoriana*), *Charopa*, and his genus *Gerontia*. I can not agree with this latter classification, as the author was under the impression that *Endodonta*, *Charopa*, etc., possess a muc-

ous tail gland, which is not the case. Moreover, the jaw in *Endodonta* and *Charopa* is only striated, whilst stegognath in *Gerontia*, and the radula in the latter is more or less distinctly pseudozonitoid. I am of opinion that the separation of *Gerontia* from *Endodonta* is fully justified; the patuloid shells being included in *Endodonta*, whilst the more zonitoid forms are embraced in *Gerontia*.

Mr. Charles Hedley and the writer substituted von Martens' *Flammulina* for *Amphidoxa* of N. Z. authors, and as the genus of von Martens dates from 1873, it must be used as the generic name instead of *Gerontia* (1883).

The classification of the New Zealand Helicidæ I propose, following chiefly Mr. H. A. Pilsbry, is the following:

Group HAPLOGONA Pilsbry.

1. Genus *Flammulina* (von Martens) Suter.

Sections: (1) *Flammulina* v. Mart. s. str.; (2) *Gerontia* Hutt.; (3) *Phacussa* Hutt.; (4) *Therasia* Hutt.; (5) *Pyrrha* Hutt.; (6) *Phenacohelix* Sut.; (7) *Allodiscus* Pils.; (8) *Suteria* Pils.; (9) *Thalassohelix* Pils.

2. Genus *Endodonta* (Albers) Pilsbry.

Sections: (1) *Endodonta* Albers, s. str.; subsect. *Ptychodon* Ancy; (2) *Charopa* Albers; subsections, a. *Tesseraria* Bottger; b. *Aeschrodomus* Pils.

Group POLYPLACOGNATHA Pilsbry.

Genus *Laoma* (Gray) Pilsbry.

Sections: (1) *Laoma* Gray, s. str.; (2) *Phrixognathus* Hutton.

Giving now the classification of the Tasmanian land shells examined, I wish to point out that it is based on the dentition as well as on the shell characters; their number is thirty-two.

Genus *Flammulina* (von Mart.) Suter.

Sect. *Flammulina* von Martens, s. str.

- (1) *F. jungermanniae* Petterd. (3) *F. luckmani* Brazier.
(2) *F. sitiens* Cox.

Sect. *Gerontia* Hutton.

- | | |
|-------------------------------------|------------------------------------|
| (1) <i>G. albanensis</i> Cox. | (7) <i>G. tasmaniae</i> Cox. |
| (2) <i>G. stanleyensis</i> Petterd. | (8) <i>G. subrugosa</i> Brazier. |
| (3) <i>G. legrandi</i> Cox. | (9) <i>G. mathiunæ</i> Petterd. |
| (4) <i>G. marchiannæ</i> Cox. | (10) <i>G. macdonaldi</i> Cox. |
| (5) <i>G. diemenensis</i> Cox. | (11) <i>G. bassi</i> Brazier. |
| (6) <i>G. gadensis</i> Cox. | (12) <i>G. tamarensis</i> Petterd. |

Sect. *Phacussa* Hutton.

- | | |
|--------------------------------|-------------------------------|
| (1) <i>Ph. saveni</i> Petterd. | (3) <i>Ph. Hamiltoni</i> Cox. |
| (2) <i>Ph. stephensi</i> Cox. | |

Sect. *Allodiscus* Pilsbry.

- (1) *A. limula* Cox.

Sect. *Thalassohelix* Pilsbry.

- (1) *Th. fordei* Brazier.

Genus *Endodonta* (Albers) Pilsbry.Sect. *Charopa* Albers.

- (1) *Ch. antialba* Beddome.

Genus *Laoma* (Gray) Pilsbry.Sect. *Phrixgnathus* Hutton.

- | | |
|---------------------------------------|----------------------------------|
| (1) <i>Ph. weldii</i> Tenison-Wood. | (5) <i>Ph. pictilis</i> Tate. |
| (2) <i>Ph. caesus</i> Cox. | (6) <i>Ph. pipænsis</i> Petterd. |
| (3) <i>Ph. henryana</i> Petterd. | (7) <i>Ph. halli</i> Cox. |
| (4) <i>Ph. furneauxensis</i> Petterd. | (8) <i>Ph. hobarti</i> Cox. |

Genus *Rhytida* Albers.

- | | |
|-----------------------------------|-------------------------|
| (1) <i>R. sinclairi</i> Pfeiffer. | (2) <i>R. ruga</i> Cox. |
|-----------------------------------|-------------------------|

Genus *Rhenea* Hutton.

- (1) *R. nelsonensis* Brazier.

It is a most astonishing fact how close the relation between the Tasmanian and New Zealand molluscan fauna really is, more so than I ever expected it to be. Of nine sections of the genus Flam-

mulina occurring in New Zealand, five are represented in Tasmania. Most remarkable is the preponderance of *Gerontia*, a section represented in New Zealand by two species only, and of *Phrixgnathus*, which is also well represented in New Zealand. A very striking feature is the almost total absence of *Endodonta*, there being one species of *Endodonta* s. str. (*E. dispar* Braz.) and one of *Charopa* known from Tasmania. *Rhytida* is more abundant in Tasmania, whilst *Rhenea* is represented by two species in each country.

There can be no doubt about the great antiquity of these forms, as they must date at least from the Cretaceous period.

New Zealand, Christchurch, October 4, 1893.

IN MEMORIAM—ROBERT WALTON.

■

It is with sad hearts that we record the death of our young friend Robert Walton. While out collecting on Saturday, November 11, along the steep bank at West Conshohocken, he slipped and fell as a freight train was passing below, receiving a terrible gash on the head and having one of his legs crushed beneath the wheels, from which he died at 8 P. M., the accident occurring about noon. He was born in Halifax, England, July 17, 1875, and came to this country in the summer of 1889. He was a collector from boyhood, studying nature with that enthusiasm which only a born naturalist can. He was not content with a collection of shells alone; his was a collection of the mollusca. He studied their anatomy, working out their jaws and dentition, the darts from the *Zonites*, and the testaceous shell-plates, from the *Limaces*. He was a close observer, and by his zealous collecting he found many forms not before recorded from this section. Among his rarities were reversed specimens of *Zonites cellarius* and *Zonites ligerus*, and I remember his saying, when we met only a few days before his sad accident, that he found the reversed *Zonites cellarius* at West Conshohocken. He was to be appointed as a Jessup student at the Academy of Natural Sciences, and was looking forward, as only a young heart can, to the day when he would be studying and working there among the objects he so dearly loved. Mr. Pilsbry was looking forward with a great deal of pleasure to the time when he would have such a valuable

assistant. We shall miss him with his bright and happy face and his pocket full of shells, and all tender our heartfelt sympathy to his parents and brothers.

The appended lines are by his friend, Mr. John Ford.

C. W. J.

Toll, toll the bell! his young heart beats no more;
 His eyes are dimmed, his life's short cycle run.
 No more may Science yield him, as before,
 The charming favors he so fairly won.

Alas, that in the East his sun should set,
 And 'neath the shadows hide the hopes he knew!
 Bright hopes, recalled to mind with keen regret
 By all who felt his power to will and do.

Though now in sorrow we must say "Farewell!"
 Sweet memories of him our hearts will hold;
 While through the years that Time for us may tell
 His friendship shall be cherished as of old.

A NEW HAND-BOOK OF THE HELICES.¹

This new work, of which the first one of the four parts has now appeared, aims to present a complete introduction, key and index to the genera, subgenera and species, of the Helices of the world. Each group, whether generic, subgeneric or sectional, is defined, and its species enumerated; the type and usually a number of prominent species of each is figured, and the anatomy is described and figured.

The first genus included in the "part" just issued, is *Trochomorpha*, an important Asiatic and Polynesian group, many specimens of which are in most collections. Although it has generally been associated with the Helicidæ, *Trochomorpha* really belongs to the Zonitidæ; and it is admitted to this work only because the species have been generally known as "*Helix*."

¹ By H. A. Pilsbry; being Vol. IX of the Manual of Conchology. Published by the Conchological Section of the Academy of Natural Sciences of Philadelphia. 8 vo. Issued in parts, price \$3.00 per part, plain edition; or \$5.00 per part colored edition. Any volume complete in itself, and sold separately.

The following genera belong to the Helicoid group *Haplogona*.² They have a shell with simple, non-reflexed lip, more or less similar to our "*Patula*" *alternata*, etc. The genital system lacks all appendages. *The foot has on each side a border above the margin bounded by a groove (easily seen in alternata, solitaria, etc.).* This last character is shared with the family *Zonitidae*. The jaw exhibits considerable variety in the several genera. It is either (1) composed of separate squarish plates, overlapping or imbricating, and only connected by a common membrane (*Punctum, Laoma*), or (2) the plates are soldered together, the outer edge of each being free (*Flammulina, Charopa*), or (3) the plates are completely soldered together, their edges appearing only as vertical striæ (*Pyramidula*—" *Patula* "). The first type has been called *Goniognathous*, but falsely, as it has no near relationship to the jaw of *Orthalicus*, etc.; the second type has been called *Stegognathous* or "plaited"; and the third *Aulacognathous* or "striated." The three are really only stages of development, and between the last two all intermediate forms occur.

The principal peculiarity of the generative system, besides its simplicity, is the very low insertion of the spermatheca duct. The teeth show no very characteristic features, except that in many cases the inner cusp is retained on the laterals, as in the *Pupidae*.

The genera of *Haplogona* may be briefly tabulated thus:

- | | |
|---|------------------------|
| a. Jaw composed of separate plates, | <i>Punctum, Laoma.</i> |
| aa. Plates of jaw more or less soldered together, | |
| b. Tail having a mucous pore, | <i>Flammulina.</i> |
| bb. No mucous pore | |
| c. Australo-Polynesian forms, | <i>Endodonta.</i> |
| cc. S. American forms, | <i>Amphidoxa.</i> |
| ccc. S. African forms, | <i>Phasis.</i> |
| cccc. North temperate forms, | <i>Pyramidula.</i> |

The five last named genera include a great number of subgenera and "sections," all of which are defined and fully illustrated both as to shells and anatomy, with lists of the species of each.

The group *Haplogona* as a whole may be regarded as an ancient and unspecialized type, formerly world wide in distribution. At present a vast majority of the species retain their footing only on the southern extremes of the three great land masses of the globe, and

²The genus *Polygyra*, formerly included in the *Haplogona*, does not belong there. It has a solid, ribbed jaw and no grooves above the foot margin.

on the Pacific Islands, where they are free from the competition of highly organized types of *Helix*, which have driven them from the Tropics and North Temperate regions. In the north the species are comparatively few in numbers, and live mainly in the colder latitudes, where more recent types of *Helix* do not flourish, or in some cases they have become reduced in size as in the sections *Helicodiscus*, *Pyramidula s. str.*, *Planogyra*, *Patulastra*, etc., acquiring the habits of the *Pupæ* with which they compete, and in many cases the *Pupæ* type of dentition also.

The name *Pyramidula* Fitz. 1833, has been preferred to that of *Patula* Held. 1837, for the Eur-American group to which *H. rotundata* and *alternata* belong, on the ground of prior publication, and because two other names for the group were proposed in 1837, either of which has as much claim to be accepted as *Patula*. There are moreover, still two more names antedating *Patula*, besides the earliest name, *Pyramidula*. This change is therefore inevitable.

The figures were mostly drawn by the author. They illustrate prominent typical species of all the subgenera and sections; so that it is comparatively easy for a person unacquainted with the intricacies of *Helix* classification to refer any specimen to its appropriate group, whether it be a living or fossil form.

NOTES AND NEWS.

IN a recent letter from Miss Ida M. Shepard, she says: "We have formed what we call the LOS ANGELES CONCHOLOGICAL CLUB, for the study of our local shells, and hope to take up the west coast species generally later. We have eleven members, and meet once or twice a month." We heartily endorse this new organization for the study of the mollusca, and wish the club a successful future.—C. W. J.

SPECIES DETERMINED.—From M. M. Schepman, Rhon near Rotterdam, Holland, 1. *Sistrum nodulosum* C. B. Ads.; 2. *Bittium* sp.; 3. *Carditamera gracilis* Shuttl.; 4, 5. *Acmæa cubensis* Reeve; 6. *Acmæa leucopleura* Gmel.; 7. *Donax fossor* Say; 8. *Heterodonax bimaculatus*, L.; 9. *Litiopa bombyx* Kien.; 10, 11. *Mytilus exustus* Linn.—C. W. J.

VALLONIA AMERICANA Ancey *ms.*—The description of this has been published by Dr. Sterki in Proc. Acad. Nat. Sci. Phila., 1893, p. 266. The locality of Ancey's types, however, is not stated, so it seems desirable to record that they were from Davenport, Iowa, collected by Professor D. S. Sheldon. *V. parvula*, it will be noticed, is recorded by Sterki from the same locality. It may be added that I saw Ancey's MS. description in May, 1890.—*T. D. A. Cockerell.*

STROBILA HUBBARDI.—Noting your comments on *S. labyrinthica* and vars., suggested to me the idea of comparing them with *S. hubbardi*.

There is evidently a close affinity between the two species, and the same tendency to variation in the number of teeth. I find in the *Hubbardi* three constant teeth, but in nearly one-half of our collection of several hundred there is an extra tooth between the second and third tooth counting from the umbilicus, and in some cases a fifth tooth beyond the third. The variety *S. strebeli* found here in our locality is also an approach to *S. hubbardi* in its depressed spire and dark color. They are also found in similar stations often together under the bark of old logs or on palmetto trees, hidden in dirt or old rubbish. *Hubbardi* is a very shy snail, and I have spent many days looking for them. At first I thought three or four a good day's find.—*G. W. Webster.*

VITRINA LIMPIDA IN PENNSYLVANIA.—In my note on *Vitrina limpida* Gld. in Pennsylvania which you published in the August NAUTILUS, I promised to report the results of future visits to the place where the shells were found. I went down yesterday afternoon and found 24 *living shells*, and as I could only go over a very small portion of the hollow, owing to a *very heavy* growth of nettles, brambles and other noxious weeds, I think the shells must be very plenty—in fact, I do not think I “worked” over two or three square yards at the most. * * * *

In continuation of my letter of October 2: On the 8th inst. I again visited the place where I found the *Vitrina limpida* Gld., and got 38 living specimens in about one and one-half hours, and went over exactly the *same ground* as in my former visit, though this time the space worked over was less than on October 1. The colony appears to be in a very flourishing condition, although dead shells are very plenty. * * * *

Since writing you last, I have collected 208 living *Vitrina lim-pida* Gld. The last time I was out, a friend and myself collected 70 *in an hour*, and only took the *largest* specimens.

—Geo. H. Clapp, Pittsburg, Pa.

ON LAND AND FRESH WATER MOLLUSCA OF LOWER CALIFORNIA, by Dr. J. G. Cooper (Calif'a Acad. Sci. III). In this paper several very interesting species are described and figured. Among them are two species referred to *Columna*, a *Melaniella*, two *Planorbis* allied to *P. cultratus* Orb., and a sub-species of *Helicodiscus lineatus*.

THE ISAAC LEA CHAPTER of the Agassiz Association is becoming an important factor in the revival of interest in American conchology. The President is now Prof. Josiah Keep; the General Secretary Mrs. M. Burton Williamson (University, Los Angeles Co., Cal.). Interesting reports of their work are published by the Secretary in *Popular Science News* from month to month.

A valuable paper on the anatomy of *Bulimus acutus*, by Messrs. W. Moss and F. Paulden, appears in the *Trans. Manchester Micros. Soc.* for 1892.

THE FIRST MEETING of the Winter Session of the Perthshire (Scotland) Society of Natural Science was held at Perth, Nov. 9, Mr. Henry Coates, President, in the chair. In his opening address the President gave his impressions of the principal Scientific Museums of America, which he had visited during the Summer. The criticisms seem for the most part appreciative and just, and are of interest to us as showing how our work appears in the eyes of a cultured observer familiar with English museum methods.

Dr. WM. H. DALL has left Washington to investigate geological problems in South Georgia and Florida.

MESSRS. HENDERSON AND SIMPSON, of Washington, have departed on a winter tour in the West Indies, especially Jamaica. They will no doubt return with a rich store of conchological plunder from this paradise of mollusks.

ACANTHOCHITES EXQUISITUS Pilsbry.—The locality given in a former number of the NAUTILUS for this species is incorrect. I am informed by Dr. R. E. C. Stearns that Mr. Lockington procured his

specimens of this and other Lower California mollusks from Dr. W. J. Fisher, who fitted out a vessel at his own expense. He collected this species at Los Animas Bay.—*H. A. P.*

NEW PUBLICATIONS.

NATURAL HISTORY NOTES FROM NORTH CAROLINA, by A. G. Wetherby. From the Jour. Cincinnati Soc. Nat. Hist. An interesting article strongly criticizing the present mania for species-making with notes on the *Mesodon* of Roan Mountain and vicinity.

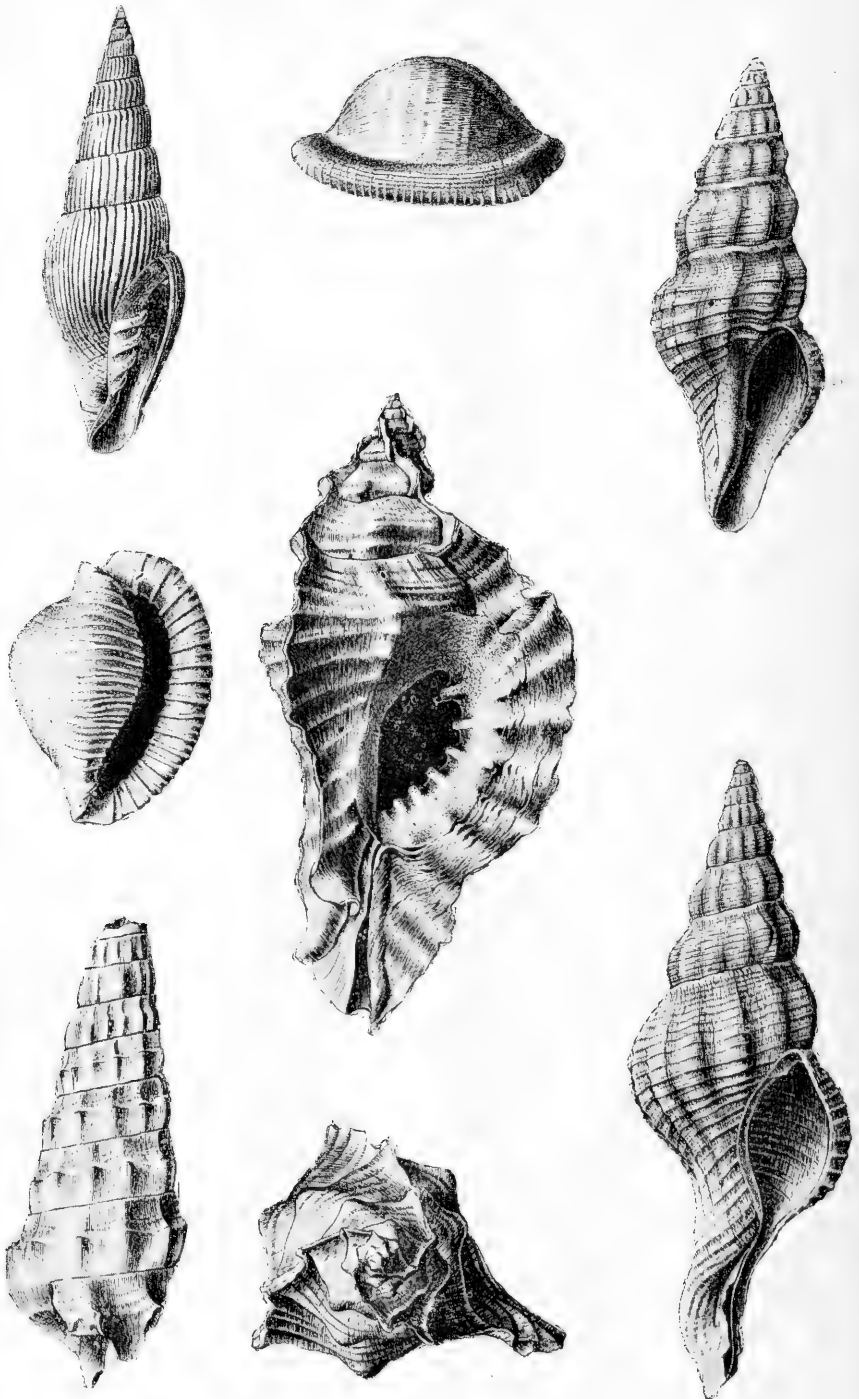
—*C. W. J.*

REPORT ON THE MOLLUSK-FAUNA OF THE GALAPAGOS ISLANDS, by R. E. C. Stearns, Ph. D., from the Proc. U. S. Nat. Mus., Vol. XVI. The geographical and physical characteristics of the Islands are thoroughly discussed, and with the amount of material at his command, Dr. Stearns finds that the many so-called species of *Bulimulus* are only forms of *B. nux* "for this is one of those protean forms, like, for instance, *Patula strigosa*, *cooperi*, etc., that can not be properly exemplified or understood by a few examples, nor even by a hundred specimens."—*C. W. J.*

An able article by Mr. Chas. T. Simpson, ON SOME FOSSIL UNIOS AND OTHER FRESHWATER SHELLS from the drift at Toronto, Canada, with a review of the distribution of the *Unionidae* of north-eastern North America, appears in the Proc. U. S. Nat. Mus., Vol. XVI.—*C. W. J.*

OBSERVATIONS ON VALLONIA, by Dr. V. Sterki from the Proc. Acad. Nat. Sci., Phila., 1893. In this article Dr. Sterki has, with his accustomed acumen, revised the species and varieties of this genus of minute Helices, illustrating the shells, dentition and jaws of the species. The group has been much neglected heretofore; and while some Conchologists may not be prepared to accept so many species as Dr. Sterki distinguishes, it must be everywhere admitted that in pointing out the distinctive features of the forms, a very valuable service has been rendered, and a substantial addition made to conchological literature.—*H. P.*





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OF CONCHOLOGISTS.

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THE NAUTILUS.

VOL. VII.

JANUARY, 1894.

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NEW TERTIARY FOSSILS FROM RED BLUFF, MISSISSIPPI.

BY T. H. ALDRICH.

The fossil-bearing stratum designated by Dr. E. W. Hilgard as the "Red Bluff group," occurs in Wayne County, Mississippi, near Red Bluff station, and is exposed on the banks of the Chickasawharg River. The fossiliferous stratum is four feet thick and contains beautifully preserved specimens imbedded in a greenish clay. Through the kindness of Prof. W. H. Dall I have had an opportunity to examine the collections of the National Museum, which were obtained here by Mr. F. Burns and others and with a series in my own cabinet have been enabled to list 135 species from this bed. Of these 26 are peculiar; 25 are found also in the beds at Jackson, Miss.; 54 occur also at Vicksburg, and 30 are also common to Jackson and Vicksburg. This bed, therefore, should be classed with the Vicksburg series. The following are described as new:

Mitra lintoidea n. sp. Pl. 4, fig. 1.

Shell fusiform, whorls nine, somewhat turrated, densely but coarsely longitudinally ribbed, a transverse impressed line behind the suture gives the upper whorls the appearance of being beaded; aperture narrow, elongate; outer lip sharp, slightly incurved, striated within, labium four plaited; canal open, rather short, curved, a number of impressed lines showing upon the lower part of body whorl. Alt. 27 mm.; diam. 8 mm.

This species differs from *Fusimitra cellulifera* Con. by its lack of

impressed revolving punctures and by being broader and much heavier.

The ribs are almost obsolete in young specimens. Type is in my collection. Examples in National Museum.

Cypræa Dalli n. sp. Pl. 4, fig. 2, 2 a.

Shell ovate, moderately elevated, surface highly polished, crossed above by a number of lines not closely set, dividing the surface into a series of facets, base ventricose; labrum very much thickened, profoundly striated but the striations do not extend up over the whole surface. Teeth on outer lip alternate. The smaller ones half the length of the others; aperture narrowed in some specimens in the centre, in others regular and strongly denticulated. Length 15 mm.; width 12 mm.; alt. 9 mm.

This shell is also found at Jackson, Miss. It resembles *C. linteæ* Con., and has been considered as that species. It is however larger, with a more thickened labrum on which the striations do not reach the body of the shell as in Conrad's species, but stop half way; the surface of this shell is very different. In *C. linteæ* the surface is completely covered with close-set, very fine lines, while this species has but few, and they are not impressed, some specimens being smooth. The type retains some color, showing the shell to be chocolate brown above with the lip white; *C. linteæ* Con. is figured in my *Preliminary Report*, Pl. V, fig. 2, p. 32, 1886.

Conrad's original description contains a misprint which seems to have been perpetuated in later publications. It should read "with *fine* approximate equal impressed lines," instead of "*four* . . lines." Type in National Museum; examples in my collection.

Pleurotoma Clarkeana n. sp. Pl. 4, fig. 3.

Shell rather solid, fusiform, whorls about nine, spire smooth (?), whorls with about eleven strongly raised and rounded ribs crossed by coarse revolving lines; somewhat alternate. The finer lines between often being double, especially upon the body whorl. Suture appressed, bordered by a corded thread, and this in turn by a concave space. Aperture oblong-oval. Canal short. Sinus semi-circular, and well up in the aperture. Length 31 mm.; breadth 11 mm.

Murex (Pteronotus) Burnsii n. sp. Pl. 4, fig. 4, 4a.

Shell large, with three foliated varices, whorls nine. Nucleus pointed, smooth; whorls convex, appressed at suture, whorls fol-

lowing the nucleus have two ribs on centre, each rib bearing a node which is equidistant from the foliations; three continuous fin-like varices continued from apex, which revolve in descending, edges of varices dentate. Body whorl with about thirteen distant spiral raised ribs, the two on the periphery bearing a node each between the foliations. Aperture elongate-oval. Outer lip having internally seven plications, inner lip smooth; canal rather long, almost closed posteriorly, widening anteriorly, and bent upwards. Canal of preceding aperture persistent. Alt. 65 mm.; diam. 33 mm.

This elegant *Pteronotus* is described from the unique example belonging to the National Museum. Named in honor of its discoverer, Mr. F. Burns, of the U. S. National Museum.

Cerithium serratoides n. sp. Pl. 4, fig. 5.

Shell elongate; suture linear; whorls ornamented with transverse ribs, which are moderate near the suture, but suddenly become enlarged and spinous at the intersection of a spiral near the middle of each whorl; a couple of fine spiral lines occur between the spines and preceding whorl; also a single spiral line just below the suture. Whorls slightly shouldered.

Specimen figured has lost its apex and aperture, but is so evidently a serrate *Cerithium* that I have concluded to describe it.

Length of part figured is 36 mm.

Type in National Museum. Example in my cabinet.

Latirus indistinctus n. sp. Pl. 4, fig. 6.

Shell fusiform, whorls nine, rounded; apical whorl smooth, the remaining ones transversely ribbed, crossed by raised lines that on the body whorl are alternately coarse and fine; suture distinct, whorls appressed to it anteriorly. Canal long, twisted strongly to the right and then to the left. Striations continue to the end of canal. Aperture oblong-oval, toothed posteriorly and shouldered anteriorly. Outer lip striated internally; inner lip covered with a thin callus, definitely delineated and running to end of canal. No teeth on the inner lip, but some of the striations show through the callus. Alt. 42 mm.; diam. 14 mm.

This handsome species is strongly *Fusoid* in appearance, and does not possess plications on the inner lip like most of the genus, but it evidently belongs there from its other characters.

Type in the National Museum. One example in my collection.

NOTES OF A COLLECTING TRIP TO DEPARTURE BAY, VANCOUVER
ISLAND.

BY GEORGE W. TAYLOR.

The account given by Mr. Wood in the October number of THE NAUTILUS of his collecting trip to Monterey Bay tempts me to put on record an experience of my own which goes to prove that our Northern waters are quite as rich in molluscan life as those of the sunnier South.

Departure Bay is a small bay on the east coast of Vancouver Island, about 75 miles north of Victoria. It is shut in by its own shores on the north, west, and south, and is protected from the open sea on the east by a series of small islands. Consequently, the water, at most seasons of the year, is smooth, and as the depth ranges from 10 to 50 fathoms, and the bottom is varied, being sandy in some places and rocky in others, the bay is a capital place for a dredging expedition.

In August, 1888, through the kindness of Mr. S. M. Robins, the managing director of the New Vancouver Coal Company, I was able to spend four days in dredging from a small steam launch belonging to the Colliery Company. Much time was wasted on this occasion in searching for suitable ground, but the result of the four days' work was by no means disappointing, as I took home with me more than five thousand (5,000) specimens of one hundred and ten different species. One of them, since named in manuscript by Mr. Whiteaves as *Pecten Vancouverensis*, was new to science, and several others were additions to our Vancouver lists.

In July of the present year, I spent three and one-half days in the same locality in company with Professor Macown, the well-known Canadian botanist and naturalist. We were determined, if possible, to beat the previous record, and therefore worked very industriously. We spent two and one-half days collecting on shore between tide marks, and one day was devoted to dredging over the ground prospected in 1888.

In the shore collecting my own captures amounted to nearly 2,500 shells of 61 species. In the dredging expedition our joint bag reached the grand total of over seven thousand (7,000) specimens of 88 species. This very satisfactory result was obtained from an ordi-

nary open sailing boat, with a crew of three men and a single home-made dredge. I should mention that 13 species were taken both between tides and by dredging, so that the actual number of different species taken in the three and one-half days was 136.

In shore collecting, no attempt was made to collect the very common shells in quantity, or the numbers might have been swelled indefinitely. In fact, I was looking more especially for Chitons, of which I took seven species (183 specimens), and the smaller shells, such as *Volutella pyriformis* Cpr. (40 specimens), and species of *Odostomia*, which occurs commonly under rocks at low water. I took also on this occasion a very fine series of *Terebratella transversa* Sby., which was found literally in thousands attached to the rocks on the south side of the bay.

Fine series of several *Macomas* were dug in the sand, and a few specimens of the curious *Lepton rude* Whiteaves were found attached (as is their habit) to the central segments of specimens of *Gebia pugetensis*, which we dug out of the muddy shores.

When dredging, everything that came up was preserved, and the finer sand and mud boxed, and afterward dried and examined at home.

Of the Pelecypoda dredged, by far the commonest specimen was *Acila Lyalli*, of which at least a couple of thousand specimens were taken. Another common bivalve was *Cryptodon sericatus* Cpr., about 300 specimens. *Venericardia borealis* Conrad, *Nucula tenuis* Mont., and *Lucina tenuisculpta* Cpr., came next in order, about 100 of each being taken.

Of rarer shells may be mentioned, *Pecten Vancouverensis* Whiteaves and *hastatus* Sby., *Amusium caurinum* Gould, *Modiolaria levigata* Gray and *nigra* Gray, *Crenella decussata* Mont., *Cardium blandum* Gould, *Fulvia modesta* Ad. and Rue., *Cryptodon flexuosus* Mont., *Astarte Esquimalti* Baird, and *undata* Gould, *Psephis Lordi* Baird, *Clementia subdiaphana* Cpr., *Venus Kennerleyi* Reeve, *Macoma yoldiformis* Cpr., *Cuspidaria pectinata* Cpr., *Kennerlia filosa* Cpr., etc.

Of the Gasteropoda the most abundant were, *Nassa mendica* Gould, *Nitidella Gouldii* Cpr., *Olivella baetica* Cpr., *Mesalia reticulata* Mighels, and the deep-water variety of *Margarita pupilla* Gould, of each of which more than one hundred specimens were obtained.

Of rarer shells the following is a partial list: *Drillia incisa* Cpr., and *cancellata* Cpr., *Mangilia sculpturata* Dall, *Cancellaria circumcincta* Dall, *Velutina laevigata* Linn., *Turbonilla torquata* Gould,

chocolata Cpr., and *Lordi* Smith, *Scala indianorum* Cpr., *Solariella peramabilis* Cpr., and *varicosa* Mighels, *Puncturella galeata* Gould, *cucullata* Gould, and *Cooperi* Cpr. (all living), *Cryptobranchia concentrica* Midd., *Ischnochiton interstinctus* Gould, and *cancellatus* Sby., *Placiphorella sinuata* Cpr., *Utriculus incultus* Gould, and *Rictaxis punctoculata* Cpr., this last being new to our Vancouver list.

I have not attempted to give a complete list, as such would take up too much of THE NAUTILUS'S valuable space, and would, moreover, be of little interest; but I think I have written enough to show how very abundant the Mollusca are in our seas, and how much may be accomplished in even a single day's collecting if one knows exactly how and where to look.

A REPLY TO "SOME (RESPONSIVE) REMARKS RELATIVE TO CYPRÆA GREGGORI, FORD."

BY EDGAR A. SMITH.

It is flattering to see that my remarks on Mr. Ford's so-called species of *Cypræa* have been deemed worthy of such lengthy consideration. It were easy to take Mr. Ford's paragraphs *seriatim*, to make sharp replies, and to confute them, but I value the pages of THE NAUTILUS too highly to occupy them with matter of that description. I will merely observe, then, that I have carefully reconsidered the subject, and I still am of opinion that Mr. Melvill's meaning is quite evident. It is to be regretted that Mr. Ford did not cut the leaves of the work he was consulting and carefully examine it, for, had he done so, he could not possibly have failed to see to which species Mr. Melvill assigned the var. *coloba*, and possibly he would have adopted that name. When I suggested that *even courtesy* directed us to employ Mr. Melvill's name, it occurred to me that possibly some persons might be ignorant of or disregard the friendly custom of adopting as a *specific* name one already used in a *varietal* sense by another, and the readers of THE NAUTILUS are now in a position to judge whether my supposition was well-founded.

In conclusion I would point out that it is hardly fair for a writer who is criticising the work of another, unnecessarily to put in inverted commas phrases and words which the general reader might estimate as quotations. The words "state of things," "reminded," "with thanks," do not occur among my observations, and the "bit of presumption" also emanates from Mr. Ford.

A LIST OF THE BRACHIOPODA, PELECYPODA, PTEROPODA, AND NUDI-BRANCHIATA OF JAMAICA, LIVING AND FOSSIL.

COMPILED BY T. D. A. COCKERELL.

No list of the bivalve Mollusca of Jamaica has ever been published, and many of the commonest species are unrecorded from the island. The present compilation was prepared during the time I was Curator of the Jamaica Museum, and is, I think, almost as complete as the present state of knowledge will permit. But for the kindness of Mr. H. Vendryes in permitting me the free use of his collections and MSS. the list could never have been prepared, and it is, in the main, a monument of his industry, extending over a great number of years. Mr. Vendryes informed me that the specimens recorded by him might be regarded as correctly identified, as not only has he given them careful study himself, but they were submitted to and verified by Messrs. Swift and Carpenter.

All records are given as I found them, in alphabetical order under each group; synonymy being indicated by cross references.

The solitary nudibranch at the end may serve to remind students that there is a rich but *unknown* nudibranch fauna in the seas around Jamaica.

[Since writing the above, I have submitted the list to Mr. E. A. Smith, who has most kindly indicated some rectifications in the generic nomenclature, and searched some works inaccessible to me, with the result of discovering several additional records. Mr. Smith thinks that a thorough search through the different monographic works, and the older books, would reveal many other records. I regret I have neither time nor opportunity to make this search, but I do not think many *reliable* records would be found. Mr. Smith has discovered seven records (indicated in the list within brackets) which are certainly erroneous, and in the case of easily-recognized species attributed by older authors to Jamaica, but not found there since, I think we may well express some doubt. Specimens of various kinds were frequently brought to me at the Jamaica Museum, which I might easily have supposed Jamaican, without careful inquiry; such specimens would be from Colon principally, but in former days, when Jamaica was on the highway to the Pacific and antipodes, they might have come from more distant

points. Undoubtedly, the marine shells of Jamaica are imperfectly known, but the additions will be made by dredging and such means, and will not be found in such collections as were probably examined by the earlier writers.]

I. BRACHIOPODA.

Cistella barrettiana, Dav. : Davidson, Zool. Challenger, 1, p. 22 ;
Zool. Rec., 1866, p. 212.

woodwardiana, Dav. : Davidson, Zool. Challenger, 1, p. 22 ;
Zool. Rec. 1866, p. 212.

Discina striata, Lam. : Vendryes Coll., =? antillarum, d'Orb., teste
E. A. Smith.

Terebratula sp. undet. : Barrett, Proc., Geol. Soc., 1866, p. 282.
(foss.).

Terebratulina caputserpentis, L. : Davidson, Zool. Challenger, 1, p.
13.

Thecidium barretti, Woodw. : Davidson, Zool. Challenger, 1, p. 23.
(foss. and viv.).

mediterraneum, Risso : Davidson, Zool. Challenger, 1, p. 23.

II. PELECYPODA.

Anomia ephippium? L. : Bowden, Vendryes MS. (foss.)=simplex ?
simplex, d'Orb. : Vendryes Coll.

Arca adamsi, Shuttl. : E. A. Smith, Jr. Linn. Soc., 1890, p. 499.

[*antiquata*, L. : Dillw. Cat. Rec. Shells, but not truly Jamaican,
teste E. A. Smith.]

candida, Chem. : Vendryes Coll.

carinifera, Adams : Jay, Cat. Shells, Ed. 1850, teste E. A.
Smith.

chemnitzii, Phil. : Vendryes Coll.=? inæqualvis.

consobrina, Sby. : Guppy, Geol. Mag., 1874 ; Ether. in Saw-
kins, p. 336 (foss.).

deshayesi, Hanley : Vendryes Coll.

domingensis, Lam. : Vendryes Coll.

d'orbigny, Reeve : Vendryes Coll.

imbricata, Brug. : Dillw. Cat. Rec. Shells ; Jay Cat. Shells,
Ed. 1850, teste E. A. Smith.

inequilateralis, Guppy : Guppy, Geol. Mag., 1874 (foss.).

jamaicensis, Gm. : Turt. Linn., iv, p. 555. =candida.

- listeri*, Phil. : Vendryes Coll. (viv.), Bowden, id. (foss.).
noae, L. : Ether. in Sawk., p. 336 (foss.); Vendryes Coll. (viv).
occidentalis, Phil. : Guppy, Geol. Mag., 1874 (foss.); Vendryes Coll. (viv.).
pexata, Say ; Vendryes Coll.
rhombea, Born : Hunt's Bay, Vendryes Coll.
 [*senilis*, Dillw. : Dillw. Cat. Rec. Shells, but recorded in error, teste E. A. Smith.]
tenera, C. B. Ad. : Vendryes MS. Cat.
umbonata, Lam. : Lamk., vi, p. 38.
Asaphis coccinea, Mart. : Vendryes Coll.
Avicula jamaicensis, Dunker : Dunker's orig. descr., teste E. A. Smith (viv. and foss.).
macroptera, Lam. : Vendryes Coll.
radiata, Leach : Vendryes Coll.
Barrettia monilifera, S. P. Woodw. : Ether. in Sawkins, p. 308-310 (foss.)=Hippurites.
Caprina sp. Ether. in Sawkins, p. 308 (foss.).
Caprinella sp. Ether. in Sawkins, p. 308 (foss.).
Cardita ovata, C. B. Ad. : Vendryes MS. Cat.
scabricostata, Guppy : Guppy, Geol. Mag., 1874 (foss.).
Cardium antillarum, d'Orb. : d'Orbigny's orig. descr., teste E. A. Smith.
 [*apertum*, Chem. : Jay. Cat. Shells, Ed. 1850, but record erroneous, teste E. A. Smith.]
 (*Fulvia*) *bullatum*, L. : Vendryes Coll.
 ? *citrinum*, Chem. : Bowden, Vendryes MS.=*serratum* (foss.).
domingensis, d'Orb. : Vendryes Coll.
 ? *dominicensis*, Gabb : Bowden, Vendryes MS. (foss.).
elongatum, Brug. : Vendryes Coll.
graniferum, Brod. and Sow. : Vendryes Coll.
haitense, Sby. : Guppy, Geol. Mag., 1874 (foss.).
inconspicuum, Guppy : Guppy, Geol. Mag., 1874 (foss.).
 (*Trachicardium*) *isocardia*, L. : North Side, Vendryes Coll.
 (*Lævicardium*) *levigatum*, L. : Kingston Harbor, Morant Bay, Vendryes Coll.
lingua-leonis, Guppy : Guppy Geol. Mag., 1874 (foss.)=sub-*elongatum*.
medium, L. : Vendryes Coll.

- muricatum*, L.: Kingston Harbor, Vendryes Coll. (viv.),
Bowden, id. (foss.).
- rusticum*, L.: (Lister) Lamk., vi, p. 12.
- serratum* L.: Vendryes Coll.=*lævicardium*, teste E. A. Smith.
- spinosum*, Meuschn.: Vendryes Coll.
- subelongatum*, Sby.: Vendryes Coll.
- Chama arcinella*, Linn.: Guppy, Geol. Mag., 1874 (foss.); Vendryes Coll. (viv.).
- gryphoides*, Linn.: (see Turt. Linn., iv, p. 247).
- involuta*, Guppy: Guppy, Geol. Mag., 1874 (foss.).
- [*lazarus*, L.: Dillw. Cat. Rec. Shells, but record erroneous, teste E. A. Smith.]
- lobata*, Brod.: Vendryes Coll.
- macrophylla*, Chem.: Mörch. Mal. Blätt., 1877, p. 119.
- ruderalis*, Lam.: Bowden, Vendryes MS. (foss.).
- Circe minima*, : Bowden, Vendryes MS. (foss.)? Kingston Harbor, id. (viv.).
- cerina*, C. B. Ads.: Kingston Harbor, Vendryes Coll.
- ? *Coralliophaga* sp. Ether. in Sawkins, p. 323 (foss.).
- Corbula barrattiana*, C. B. Ad.: Contr. Conch., p. 237.
- blandiana*, C. B. Ad.: Contr. Conch., p. 234.
- chittiyana*, C. B. Ad.: Contr. Conch., p. 238.
- contracta*, Say: Dall., Bull. 37, U. S. N. M., p. 70.
- cubaniana*, d'Orb.: Dall., Bull. 37, U. S. N. M., p. 70 (viv.; and ? foss.).
- dietziana*, C. B. Ad.: Contr. Conch., p. 235=*tahitensis*.
- disparilis*, d'Orb.: Kingston Harbor, Vendryes Coll.
- kjærjana*, C. B. Ad.: Contr. Conch., p. 237=*caribea*, d'Orb.
- knoxiana*, C. B. Ad.: Contr. Conch., p. 238=*cubaniana*.
- krebsiana*, C. B. Ad.: Contr. Conch., p. 234.
- lavalleana*, d'Orb.: Kingston Harbor, Vendryes Coll.
- operculata*, Phil.: Kingston Harbor, Vendryes Coll.
- swiftiana*, C. B. Ad.: Contr. Conch., p. 236=*caribea*.
- tahitensis*, Lam.: Kingston Harbor, Vendryes Coll.
- vieta*, Guppy: Guppy, Geol. Mag., 1874 (foss.)=*disparilis*.
- viminea*, Guppy: Guppy, Geol. Mag., 1874 (foss.)=*Bothrocorbula*.
- Crassatella Marylandica*? Conrad: Vendryes MS. (foss.).
- Crassinella*? *martinicensis*, d'Orb.: Bowden, Vendryes MS.=*Gouldia* (foss.).

- Cuspidaria cleryana*, d'Orb. (Sphena): orig. descr., teste E. A. Smith.
costellata, Desh.: Guppy, Proc. Geol. Soc., 1866, p. 575 (foss.)
 ==? *ornatissima* d'Orb.
- Cytherea carbacea*, Guppy: Guppy, Geol. Mag., 1874 (foss.).
planivieta, Guppy: Guppy, Geol. Mag., 1874 (foss.).
trigonella, Lam.: Vendryes MS. Cat.
affinis, Gmel.: Vendryes Coll.
- Dione*, Gray=Cytherea, subg.
albida, Gmel.: Desh., Cat. Conch. B. Mus., 1 (1853), p. 69.
convexa, Say: Bowden, Vendryes MS. (foss.).
maculata, L.: Vendryes Coll.
- Diplodonta candeana*? d'Orb: Bowden, Vendryes MS. (foss.).
janeirensis, Rve.: Hunt's Bay, Vendryes Coll.
soror, C. B. Ad.: Dall., Bull. 37, U. S. N. Mus., p. 52.

[To be concluded in next number.]

NOTICES OF NEW CHITONS, I.

BY H. A. PILSBRY.

Meturoplax n. subg. of *Acanthochites*.

Subg. char.:—valves i to vii as in *Acanthochites*, but dorsal (jugular) areas indistinctly differentiated; *valve viii* having the *mucro posterior*, the *insertion plate* strongly directed forward, with one slit on each side, and no sinus behind. Girdle as in *Acanthochites*. Type, *A. retrojectus*.

This group holds the same relation to *Acanthochites* that *Pallochiton* holds to *Chatopleura*. It is a variation distinctly in the direction of the *Cryptoplacidae*, recalling *Choneplax*, and clearly showing the *Acanthochitoid* genesis of that family.

A. retrojectus n. sp.

Shell small, narrow and elongated, convex, not carinated; black or black-brown, with a whitish "v" or three white stripes on each valve, sometimes broadly maculated with whitish at the sides.

Intermediate valves moderately beaked (except valve ii, the posterior margin of which is straight), sculptured with comparatively coarse, rounded, scattered pustules, which become smaller and more crowded toward the middle, and are lower and less distinct on the ridge, no areas being distinctly differentiated on the valves. End

valves similarly sculptured. Posterior valve small, having the mucro obtuse and posterior, the posterior slope short, vertical.

Interior green, marked with black in the cavity. Head valve having the insertion plate about one-third as long as the front slope of the tegmentum, with 5 small slits. Intermediate valves having very oblique plates with 1-1 minute posterior slits. Posterior valve having the insertion plate short and strongly directed forward, with a small slit on each side. Sutural laminae rather long and narrow, projecting far forward. Sinus wide, deep, and square.

Girdle microscopically chaffy, with a series of hyaline spicules at the edge, and 18 small and compact silvery tufts.

Length $9\frac{1}{2}$; width $3\frac{1}{2}$ mill. (dry specimen).

Port Jackson, near Sydney. Abundant. Collected by Dr. J. C. Cox.

GENERAL NOTES.

ALCYNA.—Specimens of the rare *Aelyna ocellata* A. Ad. are included in Mr. F. Stearns' last collection of Japanese mollusks. It proves to have a corneous operculum, and therefore belongs to the *Trochidae* instead of the *Phasianellidae*, where it has hitherto been placed.—*H. A. P.*

S. AUSTRALIAN MOLLUSCA.—“A Hand List of the Aquatic Mollusca Inhabiting S. Australia” has been issued by D. J. Adcock, Adelaide, S. Australia. It will prove very useful to those interested in this fauna.

CONTRIBUTIONS TO THE NATURAL HISTORY OF TEXAS.—I. TEXAS MOLLUSCA.—By J. A. Singley (Geol. Survey of Texas). A complete list of species known from the State, with useful notes. Mr. Singley's personal researches have covered a large part of the State, but he has supplemented them with citations of Texan localities by other authors, especially Binney and Dall. The paper forms a very useful basis for further operations in the field of Texas conchology.

REPORT ON THE ARTESIAN WELLS OF THE GULF COASTAL REGION (of Texas). By J. A. Singley (Geol. Survey of Texas, 4th Annual Report). This paper is evidently the result of much careful investigation, and will be especially valuable to those interested in Tertiary and Quaternary Geology of the Gulf region.

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12, 2/4

THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR:

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No. 10.

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A NEW SPECIES OF PATELLA.

BY H. A. PILSBRY.

Patella kermadecensis n. sp.

Shell large and massive, conical, the apex subcentral; slopes of cone nearly straight; outline short ovate, slightly narrower in front. Exterior whitish, apparently strongly ribbed when perfect, but the specimens described are everywhere deeply eroded. Border lightly scalloped by the ribbing, and finely puckered at the edge. Musclescar roughened, strongly marked, and either white or bright orange; rest of the interior white, stained in places with livid-brown or purplish.

Length 135, breadth 115, alt. 48 mm.

Length 111, breadth 102, alt. 45 mm.

Habitat, Kermadec Is.

The two specimens above described, of this large species of the subgenus *Scutellastra*, were sent to me by Mr. E. W. ROPER, of Revere, Mass., who obtained them from the original collector. The species can be compared only with *P. patriarcha* Pils. from the Cape of Good Hope, and *P. mexicana* Brod. & Sowb. from West Mexico. The former of these is a wider, more angular species; the latter is more oblong, and has more obvious primary ribs. Figures will be published later.

NOTES ON COLLECTING SHELLS IN JAMAICA.

BY CHAS. T. SIMPSON.

About the first of December, Mr. John B. Henderson, Jr., of Washington, and the writer visited the island of Jamaica for the purpose, principally, of collecting land, fresh-water and marine mollusks. We called on Mr. Henry Vindryes, a veteran collector and conchologist in Kingston, inspecting his magnificent set of Jamaica Shells, and receiving from him every possible courtesy and many useful notes as to localities.

As our stay was to be limited to some three weeks, we were anxious to begin work at once, to actually put our hands on some of the land snails in their homes. We hired a cab with a good natured darkey for a driver, and a miserable, little, bony horse, of uncertain color, and started for the suburbs, in the direction of Rockport with our eyes strained to catch sight of the splendid *Orthalicus undatus*, which we were told we might find on our way. The poor little horse, which wobbled about first from one side of the road to the other as if in search of snails, but probably from sheer exhaustion, was suddenly brought to a standstill without much exertion by the driver, who exclaimed as he pointed his whip to some low trees on the south of the road "Da de snail you want massa." I think we had all observed them at the same moment, and with a shout like boys we were out of the cab and racing across the road, through a terrible hedge of wild pinguin in less time than it takes to write it. There they were, great beautiful fellows, variegated with ash color and glossy black, one, a half dozen, fifty, a hundred, in fact without limit! They clung to all kinds of trees and shrubs in the low tangled scrub, and in great numbers to the tall cylindrical Spring Cereus; in almost every case glued by an epiphragm so solid that it was well nigh impossible to dislodge them, and invariably with the spire pointing downward.

When we came out of the woods an hour afterward we were as wet with perspiration as though we had been dipped in water, and covered with every description of sticking burrs; our flesh was lacerated, and our hands dirty and bleeding, for everything in the scrub bears villainous thorns. On the debtor side we had ruined two suits of clothes, and to our credit could be placed over five hundred superb living *Orthalicus*. We had learned a lesson, too,

worth remembering, viz, never wear anything decent when collecting in the tropics.

During our stay we drove around the entire island, visiting every parish. Owing to the worthlessness of our team, the illness of the driver, and the almost incessant rains we encountered on the north side, our opportunities for collecting were greatly diminished.

It was only when we stopped over a day or so at the towns that we were able to get any great amount of material. Strangely enough we found almost no marine species whatever. Occasionally on the rocky beaches we obtained *Neritina virginea*, a few *Littorinas*, *Tectarius* and *Neritinas*, but for miles, in fact along whole parishes, though the road ran near to the sea, and we watched closely, not even a valve was seen.

The lack of marine forms was made up in the abundance of the land snails, and in some cases the fresh water species. In a branch of the delta of Roaring River, under a great breadfruit tree, H. picked up a dead *Hemisinus lineolatus*. Then I looked on the rocky and sandy bottom and found it alive by handfulls, and we met with it in quantities elsewhere.

We kept an eager watch for the great white *Helix aspera*. My friend picked up a single dead specimen on the road near Falmouth, and this fairly turned our heads. We inquired of every darkey from that on, hearing of it often like the *Ignis fatuŭs*, just a little way out of reach. Near Montego Bay we got a few more dead ones, and again as it was growing dark we discovered a dozen or so on the bushes and vines when we were nearing Savanna la Mar. The next day I started out early for a walk, resolved to find this snail if thorough search would do it. I tramped the whole forenoon and got only a few *Ampullarias*, and two o'clock found me tired, hungry, and thoroughly disgusted, seven miles from our hotel, and uncertain whether to push on to some low hills a mile ahead, or to give it up and go back. My resolve determined me and I went on. The first rounded knoll looked well at a little distance—one learns in a short time to distinguish good from poor localities a long way off. The elevation did not occupy more than half an acre; red clay with decomposed limestone. It was originally a dwarf scrub which had been partly cleaved a couple of weeks before. The first thing I saw was a fine dead *Helix aspera* on the ground, then others, there they lay thickly all around me, bright and fresh, with the animals nicely cleared out by tropic showers, the sun, and swarming insects.

I hardly dared move for fear of stepping on them, and to calm my excitement, and assure myself that it was not all a wild conchologist's dream, I stood still and tried to count a hundred, but when I had got to twenty I saw half a dozen live ones clinging like a string of enormous white beads to a little shrub right beside me, and I quit counting and gathered them in. Then I sat down and without moving I picked up thirty fresh, cabinet specimens. About that time it just began to dawn on me that the great *Lucerna acuta* was as abundant as the *aspera*, and in no time I had my hands full of the fine, big, brown fellows. Afterward I got me eyes focussed down to seeing *Sagdas*, *Helix sinuata*, three or four *Cylindrellas* and as many *Tudoras*, and that under the leaves, and among rubbish there were quantities of small *Glandinas*, *Zonites* and *Microphysas*, that the ground when closely examined was literally bespangled with lovely little *Proserpinas*, that shone in the sun like polished opals.

To my dying day I never expect again to see such collecting unless I revisit Jamaica. Hunger, fatigue, headache, the flight of time were forgotten, and I was only warned that I must return by the fact that the sun was nearly down before I knew it, and that I had an eight mile walk and darkness before me. On a little spot no larger than a city lot, I had taken in a few hours over thirty species of land shells. As I reluctantly tore myself away I took fifteen *asperas* from a small Mango, and on the border of the clearing where some one had bent together a couple of young logwood trees, not as large as my wrist, I picked twenty-five more fully adult and one young one.

Shall I tell how in a narrow limestone gorge of the Rio Cobre near Bogwalk in the talus under a ledge some two rods long we found no less than forty-five species, all living, and nearly every specimen in perfect condition; or how at Mandeville the honey-combed rocks were crowded with lovely *Choanopomas*, rough as chestnut burrs, now H. wild with excitement and regardless of bats, centipedes, scorpions, and poisonous vines wedged himself into a dark cave whose mouth was at least two sizes too small for his body; how he stuck fast, and alone and far from help, could neither get forward or backward for awhile, how he pushed on to be rewarded by finding quantities of *Helix peracutissima* and the great purple *H. jamaicensis*, the latter clinging to each other on the roof like so many stalactites, a snail which, by the way, we had repeatedly been told was extinct! I fear it may be now.

It is enough to say that for the brief time and limited opportunities we had, our trip was a success, and we left with many regrets that we could not spend the rest of the winter on the island, and thoroughly explore it, and collect its inexhaustible treasures.

A LIST OF THE BRACHIOPODA, PELECYPODA, PTEROPODA, AND NUDI-BRANCHIATA OF JAMAICA, LIVING AND FOSSIL.

COMPILED BY T. D. A. COCKERELL.

[Continued from p. 107.]

- Donax denticulata*, L.: Milk River Beach, Pt. Morant, Vendryes Coll. (viv. and foss.).
 [rostratus, Adams: Jay, Cat. Shells, Ed. 1850, but record erroneous, teste E. A. Smith.]
- Dosinia concentrica*, Lam.: Vendryes Coll. (viv. and foss.).
incerta, Verkruzen (MS.?): Paetel, Cat. Conch. Samml., 1890, teste E. A. Smith.
- Ervilia nitens*, Montagu: Vendryes Coll.
- Erycina* sp. Bowden, Vendryes MS. (foss.).
- Gastrochaena chemnitziana*, d'Orb.: Vendryes Coll. (viv. and foss.).
cuneiformis, Spengler: Vendryes Coll.
- Eriphyla lunulata*, Conr.: Kingston Harbor, Vendryes Coll.
 var. *parva* C. B. Ads. Vendryes MS. Cat.
- Inoceramus* sp. Ether. in Sawkins, p. 308 (foss.).
- Leda acuta*, Conr.: Bowden, Vendryes MS. (foss.).
bisulcata, Guppy: Guppy, Geol. Mag., 1874 (foss.).
clara, Guppy: Guppy, Geol. Mag., 1874 (foss.).
corpulenta, Dall: Dall, Bull. 37, U. S. Nat. Mus., p. 44.
illecta, Guppy: Bowden, Vendryes MS. (foss.).
jamaicensis, d'Orb.: Vendryes Coll.
vitrea, d'Orb.: orig. descr., teste E. A. Smith.
- Lima carribea*, D'Orb.: Vendryes Coll.=? *squamosa*.
scabra, Born: Vendryes Coll.
- Limopsis aurita*, Brocchi, var. *paucidentata*, Dall: Dall, Bull. 37, U. S. Nat. Mus., p. 42.
- Lithophagus bisulcatus*, D'Orb.: teste E. A. Smith.
caudiger, Lamk.: Rockfort, Vendryes Coll. (as *Modiola*).

- Lithophagus cinnamomeus*, Chemn. : teste E. A. Smith.
gossei, Rve. : orig. descr., teste E. A. Smith.
 [*lithophagus*, L. : Dillw. Cat. Rec. Shells, but record
 erroneous, teste E. A. Smith.]
caudigera, Lam. : Rockfort, Kingston, Vendryes Coll.
forficatus, Ravenel : Dall, Bull. 37, U. S. Nat. Mus., p.
 38.
- Loripes anatelloides*, Rve. : Paetel, Cat. Conch. Samml. 1890, teste
 E. A. Smith.
- Lucina americana*, C. B. Ad. : Ad., Contr. Conch., p. 243=*quadri-*
sulcata d'Orb., teste E. A. Smith.
antillarum, Reeve : Ad., Contr. Conch., p. 243. (= *ornata*,
 C. B. Ad. non Rve.) (viv. and foss.).
candeara, d'Orb. : Vendryes Coll.
costata, d'Orb. : orig. descr., teste E. A. Smith.
crenulata, Say : Bowden, Vendryes Coll.
dentata, Wood : Vendryes Coll. (Subgen. *Divaricella*).
 [*digitalis*, Lam. : Jay, Cat. Shells, Ed. 1850, but the record
 erroneous, teste E. A. Smith.]
divaricata, L. : Bowden, Vendryes MS. = *dentata*, Wood.
 (viv. and foss.).
edentula, L. : Lam., V, p. 540. (C. B. Ad. also). = *Loripes*.
granulosa, C. B. Ad. : Ad., Contr. Conch., p. 245.
imbricata, C. B. Ad. : Ad., Contr. Conch., p. 245. (= *pecten*
 Rve.).
imbricatula, C. B. Ad. : Vendryes Coll.
jamaicensis, Chem. : Ad., Contr. Conch., p. 245.
janeirensis, Reeve : Ad., Contr. Conch., p. 245. (= *subglo-*
bosa, C. B. Ad.).
muricata, Chem. : fide d'Orb., teste E. A. Smith.
nasuta ? Conr. : Bowden, Vendryes MS. (foss.).
occidentalis, Reeve : Kingston Harbor, Vendryes Coll. =
imbricata, Ad.
pecten, Reeve (? Lam.) : Bowden, Vendryes MS. = *imbricata* ?
 (foss.)
pectinata, C. B. Ad. : Ad., Contr. Conch., p. 245-6. (viv. and
 foss.).
pectirella, C. B. Ad. : Ad., Contr. Conch., p. 246.
pennsylvanica, L. : Ad., Contr. Conch., p. 246 (viv.); Guppy
 Geol. Mag., 1874 (foss.).

- Lucina pulchella*, C. B. Ad.: Vendryes MS. Cat.
scabra, Reeve (? Lam.): Ad., Contr. Conch., p. 247.
soror, C. B. Ad.: Ad., Contr. Conch., p. 247.
subglobosa, Adams (MS.?): Jay, Cat. Shells, Ed. 1850, teste
 E. A. Smith.
 (*Codakia*) *tigerina*, L.: Ad., Contr. Conch., p. 247.
virgo? Reeve: Ad., Contr. Conch., p. 247.
- Macoma cerina*, C. B. Ad.: Dall, Bull. 37, U. S. N. M., p. 60.
Mactra alata, Spg.: Morant Bay, Vendryes Coll. = *carinata*, Lam.
 (viv. et. foss.).
 (*Spisula*) *bilineata*, C. B. Ad.: Vendryes MS. Cat.
braziliana, Lam.: Vendryes Coll.
 (*Spisula*) *subimbricata*? Mont.: Vendryes MS. Cat.
elegans, Sowb.: Vendryes Coll.
- Modiola americana*, Leach: Vendryes Coll. (Mr. Smith adds a?)
barbata, C. B. Ad.: orig. descr., teste E. A. Smith.
demissa, Dillw.: Vendryes Coll. (= *plicatula*, Lamk.,) teste
 E. A. Smith.
- Myonera lamellifera*, Dall: Dall, Bull. 37, U. S. N. M., p. 68.
Mytilus canalis, Lam.: Lam., VI, p. 123. (Mr. Smith adds a?)
exustus, L.: Bowden (foss.), Dry Harbor (viv.), Vendryes
 Coll. (viv. et foss.).
- Nuculocardia divaricata*, d'Orb.: orig. descr., teste E. A. Smith.
- Ostrea carinata*, : Cat. Sawkins Coll., No. 133. (foss.).
folium, L.: Dillw. Cat. Rec. Shells, teste E. A. Smith.
parasitica, Gmel.: Bluefield Point, Vendryes Coll.
plicatula, Gmel.: Vendryes Coll.
- Pecten exasperatus*, Sow.: Port Antonio, Vendryes Coll.
exasperatus (nec Sow.): Guppy, Geol. Mag., 1894. (foss.). =
oxygonus.
inaequalis, Sow.: Guppy, Geol. Mag., 1874. (foss.).
nucleus, Born: Vendryes Coll. (viv. et foss.)
ornatus, Lam.: Port Antonio, Vendryes Coll.
oxygonus, Sow.: Bowden, Vendryes MS. (foss.)
thetidis, Sow. (var.): Bowden, Vendryes Coll. (foss.).
zigzag, Chem.: Vendryes Coll. (viv. et foss.).
 var. *alba*, : shell white, Vendryes Coll.
gibba, L. (Turt, Lim. IV, p. 267).
- Pectunculus acuticostatus*, Sow.: Guppy, Geol. Mag., 1874. (foss.).
angulatus, Lam.: Vendryes Coll.

- Pectunculus angulosus*, Gmel.: Dillw., Cat. Rec. Shells, teste E. A. Smith.
castaneus, Lam.: Port Antonio, Vendryes Coll.
decussatus, L.: Guppy, Geol. Mag., 1874. (foss.).
pectinatus, Gmelin: Vendryes Coll.
pennaceus, Lam.: Ether. in Sawkins, p. 337. (foss.). =
decussatus.
undatus, L.: Dillw., Cat. Rec. Shells, teste E. A. Smith.
- Perna bicolor*, C. B. Ad.: Kingston Harbor, Vendryes Coll.
ephippium, Linn.: Dall, Bull. 37, U. S. N. Mus., p. 36.
obliqua, Lam.: Vendryes Coll.
rigida, Dillw.: Vendryes MS. Cat.
- Pholas clavata*, Lam.: (see Lam., V, p. 446). = *pusillus*, L.
corticaria, Sow.: C. B. Ad., Contr. Conch., p. 75. (= *Martesia*) teste E. A. Smith.
pusillus, L.: (see Turt. Linn., IV, p. 173). = *striata*.
striata, L.: Rockfort, Vendryes Coll. (= *Martesia*) teste E. A. Smith.
- Pinna muricata*, L.: Vendryes Coll.
- Placuna sinuosa*, : Ether. in Sawkins, p. 336. (foss.).
- Placunanomia echinata*, Brod.: Kingston Harbor, Vendryes Coll.
- Plicatula cristata*, Lam.: Paetel, Cat. Conch. Samml., 1890, teste E. A. Smith.
plicata, Chem.: Kingston Harbor, Vendryes Coll.
reniformis, Lam.: Lam., VI, p. 185. = *barbadensis*, Petiver.
vexillata, Guppy: Guppy, Geol. Mag., 1874.
- Psammobia affinis*, C. B. Ad.: Vendryes MS. Cat.
biradiata, C. B. Ad.: Vendryes MS. Cat.
cerina, C. B. Ad.: Vendryes MS. Cat.
purpureo-maculata, C. B. Ad.: Vendryes MS. Cat.
- Radiolites*, sp. Ether. in Sawkins, p. 308. (foss.).
- Sanguinolaria rosea*, Chem.: Lam., V, p. 511. = *sanguinolentus*, Gm., Vendryes Coll.
- Semele jayanum*, C. B. Ad.: Vendryes Coll. = *cordiformis*, Chem.
proxima, C. B. Ad.: Vendryes Coll. = ? *elliptica*, Sby.
reticularis, L.: Vendryes Coll.
variegata, Lam.: Vendryes Coll.
- Tagelus bidens*, Chem.: Kingston Harbor, Vendryes Coll.
caribæus, Lam.: fide d'Orb., teste E. A. Smith. = *gibbus*, Speng.

- Solen ambiguus*, Lam. : Vendryes Coll. (viv. et foss.).
- Spondylus bostrychites*, Guppy : Guppy, Geol. Mag., 1874. (foss.).
- Strigilla carnaria*, L. : Morant Bay ; Port Antonio, Vendryes Coll.
carnaria, var. *miocenica*, : Bowden, Vendryes MS.
 (foss.).
- flexuosa*, Say : Bowden, Vendryes MS. (foss.). Morant Bay,
 Port Antonio, Vendryes Coll.
- producta*, Tryon : Zool. Rec., 1870, p. 172. Morant Bay,
 Vendryes Coll.
- pisiformis*, L. : Morant Bay, Vendryes Coll.
- Tellina antonii*, Phil. : Kingston Harbor, Vendryes Coll.
- arcuata*, Sow. : Vendryes MS. Cat.
- (*Arcopagia*) *bimaculata*, L. : Kingston Harbor, Vendryes
 Coll.
- (*Peronæoderma*) *biradiata*, Schum. : Vendryes Coll.
- carribæa*, d'Orb. : Vendryes Coll.
- (*Angulus*) *constricta*, Phil. : Vendryes Coll.
- (*Angulus*) *cuneatus*, d'Orb. : Hunt's Bay, Kingston Harbor,
 Vendryes Coll.
- decussatula*, C. B. Ad. : Vendryes MS. Cat.
- (*Arcopagia*) *fausta*, Sol. - Vendryes Coll.
- (*Angulus*) *guadaloupeensis*: D'Orb. : Kingston Harbor, Ven-
 dryes Coll.
- jamaicensis*, : Turt. Linn., IV, p. 193.
- lineata*, Turton : Vendryes Coll.
- lutea*, Conrad : Dall, Bull. 37, U. S. Nat. Mus., p. 60.
- (*Angulus*) *martinicensis*, d'Orb. : Hunt's Bay, Kingston
 Harbor, Vendryes Coll.
- nitens*, Adams : orig. descr., teste E. A. Smith.
- punicea*, Born : Vendryes Coll.
- radiata*, L. : Vendryes Coll. (viv.) Bowden, Vendryes MS.
 (foss.) (viv. et foss.).
- var. *unimaculata*, Lam. : Vendryes Coll.
- striata*, Chem. : Vendryes Coll.
- subradiata*, Schum. : Hunt's Bay, Vendryes Coll.
- tumida*, Sow. : Vendryes MS. Cat.
- Teredo fistula*, Lea : Bowden, Vendryes MS. (foss.).
- navalis*, L. : Vendryes Coll.
- Trigonulina ornata*, d'Orb. : Vendryes MS. Cat. (ex Chenu.)
- Venus antillarum*, d'Orb., orig. descr., teste E. A. Smith.

- Venus blandiana*, Guppy : Guppy, Geol. Mag., 1874. (foss.).
braziliana, Gm. : Plumb Point L. Ho., Milk River Mouth,
 Vendryes Coll.
cancellata, L. : Pt. Morant, Vendryes Coll. (viv.), Bowden,
 id. (foss.).
cardioides, Lam. : Lam., V, p. 590.
flexuosa, Lam. : Port Antonio, Vendryes Coll.
granulosa, Gmel. : Pt. Morant, Kingston Harbor, Vendryes
 Coll.
listeri, Hanley : Port Antonio, Vendryes Coll.
maculata, L. : orig. descr., teste E. A. Smith.
macrodon, Lam. : Vendryes Coll.
paphia, L. : Guppy, Geol. Mag., 1874 (foss.); Vendryes
 Coll. (viv.).
reticulata, Lam. : Vendryes Coll,
rubra, Gm. : Turt. Linn., IV, p. 236. =? *Cytherea circinata*.
rugosa, Gm., Chem. : Guppy, Geol. Mag., 1874. (foss.), Ven-
 dryes Coll. (viv.).
subrostrata, Lam. : Vendryes Coll.
subrugosa, Sowb. : Port Antonio, Vendryes Coll.
walli, Guppy : Bowden, Vendryes MS. (foss.).
woodwardi, Guppy : Guppy, Geol. Mag., 1874. (foss.).
zigzag, L. : Pt. Morant, Vendryes Coll.
- Pisidium pygmaeum*, C. B. Ad. : (Cyclas) Contr. Conch., Vendryes
 List, p. 487. (= *jamaicense*, Prime) = *adamsi*, Desh. :
 Desh., 11, p. 184.
- Sphaerium veatleyi*, C. B. Ad. : (Cyclas) Contr. Conch., Vendryes
 List, p. 487. Desh., 11, p. 283.

PTERÓPODA.

- Cleodora* sp. Ether. in Sawkins, p. 319. (foss.).
pyramidata, L. : (See Turt. Linn., IV, p. 17).
retusa, : (see Turt. Linn., IV, p. 117)
- Creseis* sp. Ether. in Sawkins, p. 319. (foss.).
Cuvieria sp. Ether. in Sawkins, p. 319. (foss.).
Hyalæa (*Diacria*) *vendryesiana*, Guppy : Guppy, Geol. Mag., 1874.
 (foss.).

NUDIBRANCHIATA.

- Glaucus atlanticus*, Foster : R. Bergh, Chall. Rep., Zool., X, p. 11.

NOTICES OF NEW CHITONS, II.

BY H. A. PILSBRY.

Chiton Coxi, n. sp.

Shell oblong, much elevated, carinated; delicate bluish mottled or blotched with olive-brown, yellow and white; girdle delicate blue-green, with narrow white bars. Sculpture as in *Ch. jugosus* Gld., but grooves of the pleura shorter, straighter, narrower, and more spaced. Girdle-scales convex, shining, microscopically and superficially striated, each measuring about .30 mm. wide. Length 13, breadth $7\frac{1}{2}$ mm.; divergence, 90 to 110°.

Port Jackson (Dr. J. C. Cox!)

This is probably the *Lophyrus jugosus* of Angas' Port Jackson Catalogue, P. Z. S. 1867. It differs from Goulds' species in the totally diverse color-pattern, etc.

Acanthochites granostratus n. sp.

Elongated, the tegmentum occupying about one third the total width in dry specimens. Valves obtusely keeled, the dorsal ridge indistinctly clouded with whitish, orange and blackish; side mottled in varied patterns with olive and white. Girdle olive, the 18 tufts silvery stained with blue or dirty olive.

Valves distinctly imbricating; the dorsal areas rather wide, convex, distinct but not raised at the edges, having numerous rather weak longitudinal striæ. Side areas having elevated pustules arranged radially and connected by opaque lines giving the aspect of radial striæ. Tegmentum of post. v. subcircular, the mucro rather acute and elevated, at the posterior third. Length 9, breadth $3\frac{1}{2}$ mm. Port Jackson and Port Hacking, N. S. Wales (Dr. J. C. Cox!)

Acanthochites Coxi, n. sp.

Valves grayish, somewhat mottled with olive and fleshy, the dorsal areas dark red or marked with olivaceous. Girdle olivaceous. Valves nearly disconnected by spiculate bridges of girdle tissue at the sutures. Dorsal areas longitudinally striate; sides sculptured with convex pustules elongated radially. Tegmentum of posterior valve subcircular, slightly wider than long, the rather elevated, acute mucro slightly behind the middle. Interior rose colored.

Girdle densely clothed with short, hyaline spicules, the tufts represented by inconspicuous clumps of slightly longer spines. Length 23, breadth 13 mm.

Port Jackson, N. S. Wales, (Dr. J. C. Cox !)

Acanthochites Matthewsii Bednall & Pilsbry.

Much elongated, keeled, flesh-tinted with several olivaceous forward-converging zigzag bands on each valve. Posterior margins of valves i-vii concave, beaks small. Dorsal areas narrow, rounded, with very fine, indistinct striæ; side areas having an indistinct diagonal riblet; *pleura longitudinally ribbed*, lateral areas obliquely ribbed, the ribs more or less cut into granules. Tegmentum of post. v. short-ovate, slightly longer than wide, its front half ribbed, posterior half granulated. *Mucro* between the posterior third and fourth of the length of tegmentum, *strongly hooked backward, the slope behind it very concave*. Girdle narrow, tufts inconspicuous. Length, 26, breadth, 8 mm.

South Australia. Collected by Mr. E. H. Matthews. The sculpture is totally unlike that of any other known *Acanthochites*.

Illustrations of the above species will be given later.

GENERAL NOTES.

The death of DR. PAUL FISCHER of Paris has been announced.

MR. C. W. JOHNSON will spend the latter part of January in Cambridge, studying types of Diptera and Mollusca in the Museum of Comparative Zoology.

MR. E. W. ROPER of Revere, Mass., has sailed for Jamaica where he purposes spending some time.

MR. A. W. HANHAM, formerly of Quebec, is now permanently located at Winnipeg. His address is "The Bank of British North America, Winnipeg, Manitoba, Canada."

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A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

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MARCH, 1894.

No. 11.

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THE NAUTILUS.

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SHELL COLLECTING IN NORTHERN ALABAMA.

BY H. E. SARGENT, WOODVILLE, ALA.

Huntsville, Alabama, the county seat of Madison County, is a somewhat exceptional southern city in that it has an abundant supply of pure spring water bursting forth from its very foundations. This spring of sparkling lime water, beside supplying the city mains, affords a constant stream several feet in width and several inches in depth to go to waste. In this stream and also in the reservoir I have, upon several occasions, taken large numbers of *Gonio-basis nassula* Con., var. *perstriata* Lea. A recent visit, however, disclosed the fact that although still plentiful in the reservoir, this interesting species has almost disappeared from the stream. A flock of geese near by offered a possible solution of the mystery.

Upon this occasion, a more careful search was made than upon former visits, with very satisfactory results. The upper surfaces of the rocks were found to be covered with a species of *Ammicola* which the Editor refers to a form previously had from Florida, and for which he proposes the name of *Ammicola olivacea* Pils. In more secluded spots, several specimens of *Pleurocera brumbyi* Lea were also taken. These specimens were much larger than those found in other streams in this vicinity. A hand-dredge brought from the oozy bottom numerous beautiful clear specimens of *Pisidium* sp. *Physa halei* Lea and *Limnaea desidiosa* Say were found in considerable numbers. A single young specimen of *Planorbis trivolvis* Say, and a single valve of *Sphaerium* indicated their presence, although no good specimens were taken. Several dead specimens of *Cam-peloma coarctatum* Lea also came to light.

* * * * *

A two-hour hunt for *Helix carolinensis*, made December 1, upon the timbered flats of the Paint Rock River, resulted as follows: *Helix obstricta* Say, var. 4. Binn = *H. carolinensis* Lea, 59. *H. inflecta* Say, 22. *H. thyroides* Say, 13. *H. stenotrema* Fér., 3. *Zonites laevigatus* Pfr., 1, *Z. acerrus* Lewis 2. *Patula alternata* Say., var. *mordax* Shutt, 4. *Selenites concava* Say, 1 *Limacidae*, 8. A little later in the season, these flats will be inundated most of the time for several months. A visit to the same station a little earlier than this last year, yielded about the same results.

NOTES ON SOME NEW ZEALAND LAND AND FRESH WATER MOLLUSKS.

BY HENRY SUTER.

1. *Ancylus woodsi* Johnston. About one year ago, I discovered a small *Ancylus* in the River Avon, near Christchurch, which I recognized as being identical with *A. woodsi* from Tasmania. This was, to my knowledge, the first *Ancylus* ever found in New Zealand, and I mentioned the fact in Crosse's Journ. de Conch., vol. 32, p. 248. I can not recognize *Ancylus dohrnianus* Clessin as a New Zealand species, as long as Clessin can not give the exact locality where his species has been found, and thus enable us to verify its occurrence in this colony. There is no such *Ancylus* known to New Zealand conchologists, and it therefore will only help to swell the already large list of shells erroneously ascribed to New Zealand.

Only a few weeks ago, I collected a good number of *A. woodsi*, and this time alive. To my great astonishment I found several specimens with a septum more or less in process of formation, so that there could be no doubt but that this mollusk is not an *Ancylus* at all, but a *Gundlachia*. This was further confirmed by examining the radula, which perfectly corresponds with the radula of a *Gundlachia* collected and kindly sent to me by my friend, Dr. V. Sterki, of New Philadelphia, Ohio. Having come into possession of some literature on Tasmanian mollusks, I now find that Johnston, in his description of *A. woodsi* (Proc. Roy. Soc. Tasm., 1878, page 25) says: "Animal and teeth almost similar to *Gundlachia petterdi*." And in the description of *G. petterdi* (l. c. page 23) he writes: "In the young state the shell is simple, and resembles the common *Ancylus*." I really do not understand why Johnston established the n. sp. *A. woodsi*, when he must have been fully aware of the fact that it

was a young *Gundlachia*! In his list of Tasmanian mollusca, 1890, he simply drops his *A. woodsi* without mentioning that it is a young *Gundlachia*. I have not yet found full-grown specimens of our *Gundlachia*, but I hope to succeed later on, and it is to be expected to be a similar form to *G. petterdi* Johnston.

Prof. Hutton suggested to me that this *Gundlachia* might, perhaps, have been introduced from Tasmania on aquatic plants, which were used in packing trout ova, and as our fish-hatching ponds are in communication with the river Avon, there is all possibility of this being really the case. However, there is one objection. Up to the present day I found our *Gundlachia* only on aquatic plants in the lower parts of the river, from the outflow of Horseshoe Lake to New Brighton, but not upward between this outflow and the fish-hatching ponds. This makes it very likely that *Gundlachia* occurs in the swampy Horseshoe Lake, difficult of access, and was washed down in the river Avon when the canal was cleared from *Anacharis* weeds. If this mollusk is really indigenous, it will, no doubt, be found in localities where the introduction from Tasmania is out of question, but as long as this is not the case, we must remain doubtful on this point.

In the "Reference List" I published with my friend Mr. Ch. Hedley, of Sydney (Proc. Linn. Soc. N. S. W., vol. VII (2) p. 624), he put down *Ancylus tasmanicus* Tenison-Woods, as being synonymous with *A. woodsi*. This is wrong, as the former is quite different, and I believe it to be really an *Ancylus*. *A. australicus* Tate and *A. smithi* Cox are very likely also young forms of *Gundlachia*. *A. assimilis* Pett. and *A. oblonga* Pett. I have not seen. It would be of highest interest to examine the dentition of the Caledonian *A. reticulatus* Gassies and *A. noumeensis* Crosse, which Mr. Hedley thinks to be nearly allied to the so-called *A. woodsi*.

2. *Rhytida meesoni* Suter (Reference List, l. c. page 631) is no *Rhytida*, but a *Paryphanta*, as the animal lays calcareous eggs, whilst the genus *Rhytida* is considered to be viviparous. The genera *Paryphanta* and *Rhytida* are in the shells, the exterior of the animals and the radula so nearly allied, that it is not always easy to separate them. Very likely the genital organs will show generic differences, and it is my intention to study the anatomy of these genera as soon as opportunity offers and time permits.

3. *Thalassohelix ziczac* Gould. There was always some doubt whether this shell was really a New Zealand species or not, and at

the request of Mr. Hedley, when we worked out our "Reference List," I tried to solve the question. I came to the conclusion that *Th. portia* Gray must be the same species, and therefore they appear as synonyms in our list. I then selected two perfectly similar specimens, and sent one to Mr. Edg. A. Smith of the Brit. Museum for comparing it with Gray's type of *H. portia*, the other to Dr. Dall, Washington, to compare it with Gould's type of *H. ziczac*. Both gentlemen very kindly acceded to my request, and I herewith wish to express my gratitude to them.

Mr. Edg. A. Smith writes: "*Helix portia* Gray. Right, but I doubt if Gould's *ziczac* is the same species." And Dr. Dall reports: "There is no doubt whatever of the identity of your shell with Gould's type. He, in his preliminary report (*Otia Conch.*, p. 17), refers it to New South Wales, but in his final report (*Moll. U. S. Expl. Exp.*, p. 41), he says that it was collected by Dr. Pickering in a crater at Taiamea, New Zealand. His type was a little faded, hence the prominence of the dark variable lines and the straw color of the shell." These reports set all doubts at rest.

4. *Thalassohelix zelandiæ* Gray. In a letter to me, Mr. H. A. Pilsbry expressed his opinion that the shell Prof. Hutton and I considered to be Gray's *Hel. zelandiæ* might, perhaps, be another species. I therefore forwarded a specimen to Mr. Edg. A. Smith, and he kindly compared it with Gray's types. His opinion is as follows: "The shell under this name is, I think, a form of that species. It is larger than any of our typical examples and more brightly variegated, and the whorls are perhaps, a trifle flatter, still I think it is only a variety." To this I would remark that most species of *Thalassohelix* are subject to great variation, and I am confident that we identify the right shell as *Th. zelandiæ* Gray.

5. *Endodonta varicosa* Pfeiffer, I considered to be synonymous with *E. timandra* Hutton (*Reference List*, l. c., p. 651). Mr. H. A. Pilsbry, however, denies their identity (*Man. Conch.* (2) VIII, p. 84), and I therefore also sent specimens of *E. timandra* to Mr. Edg. A. Smith for comparing them with *varicosa* Pfr. He kindly sent me the following information: "*E. timandra* Hutt. This is distinct from *varicosa* Pf. It is smaller, more openly umbilicated, has more riblets, and the armature of the mouth is different. There are three teeth in *timandra* and one (overlooked by Pfeiffer and Reeve) in *varicosa*, situated on the body-whorl. It is a very slender lamella, and might easily be overlooked." After receiving this report, I

looked all specimens of *E. timandra* in my collection carefully through, and had the great satisfaction to find a few specimens of *E. varicosa* Pf. The two species differ in the characters mentioned by Edg. A. Smith; however, I have one specimen of *E. varicosa* with two lamellae in the body-whorl. If not very carefully examined, the two species may very easily be confounded. It seems that *E. timandra* occurs only on the North Island, while *E. varicosa* seems to be limited to South Island.

6. *Charopa sylvia* Hutton. I thought this species to be identical with *Ch. tau* Pfeiffer (Ref. List., l. c., p. 657), but felt always more or less doubtful. I therefore sent specimens with the others to Mr. Edg. A. Smith, and he very kindly wrote to me: "*Ch. sylvia* Hutt. You question this being the same as *Hel. tau* Pfr. We have not yet the latter in the Museum, but Pfeiffer's description of the sculpture '*subdistantum costato-plicata*' scarcely applies to your specimens. They are undoubtedly identical with Pfeiffer's *Hel. gamma*. I have compared them with the types, and they agree in every respect, excepting that yours are fresher." Therefore:

Charopa buccinella Reeve, sp., 1852 (= *gamma* Pfeiffer, 1852 (? 1853) = *sylvia* Hutton, 1883).

Now it remains to identify *Ch. tau* Pfr. It may be that my *Charopa mutabilis* is this species; I have sent a specimen to Vienna to have it compared with Pfeiffer's type, and am awaiting a report.

New Zealand, Christchurch, Sept. 6, 1893.

SHELLS OF THE SAGINAW VALLEY, MICHIGAN.

BY BRYANT WALKER, DETROIT, MICHIGAN.

Some twenty-five years ago the late Dr. George A. Lathrop, while residing at East Saginaw in this State, made a considerable collection of the shells, which he found in that vicinity.

After lying packed away for many years, the collection has recently come into my possession, and as it contains some material of considerable interest, and no local catalogue from that part of the State has ever been published, the following list of the species represented has been deemed worthy of a permanent record.

I am indebted to Dr. V. Sterki for the determination of the Pupidæ and to Mr. A. A. Hinkley for the identification of Goniobasis

semicarinata Say and *depygis* Say. Unless otherwise specified the locality is in all cases East Saginaw.

Selenites concavus Say.

Zonites nitidus Mull.

Zonites indentatus Say.

Zonites arboreus Say.

Zonites minusculus Binn.

Zonites radiatulus Alder.

Zonites fulvus Dr.

Zonites multidentatus Say. Heretofore cited only from the western part of the State.

Patula alternata Say.

Patula perspectiva Say.

Patula striatella Anth.

Patula lineata Say.

Punctum pygmæum minutissimum Lea.

Helix multilineata Say.

Helix thyroides Say.

Helix albolabris Say. Above the average in size and one example an almost perfect albino.

Helix albolabris dentata.

Helix exoleta Binn.

Helix sayii Binn. Port Austin. A new locality for this (in Michigan) rare species.

Helix mondon fraterna Say.

Helix leaii Ward.

Helix tridentata Say.

Helix palliata Say.

Helix virgata Da Costa. A single well marked example of this species, apparently of the variety called "*alba*" by Taylor, occurs in the collection with the following label: "From Dr. Clark of Flint, Michigan, where he says it was found." Dr. Clark was a well known physician of Flint in times past; but as both he and Dr. Lathrop are dead, it is not probable that any further information in regard to the circumstances under which this shell was found can be had. The specimen though mature, is not quite fresh, and as the body whorl was filled with hard packed fine sand it seems very probable that it was imported in the earth about some foreign plants.

Vallonia pulchella Mull. Determined by Dr Sterki.

Strobilops labyrinthica Say.

Pupa corticaria Say. These are the first specimens seen from the eastern part of the State.

Pupa armifera Say.

Pupa contracta Say.

Vertigo ovata Say.

Vertigo gouldii Binn. Quite abundant apparently, and exhibiting some considerable variation in size. A single albino example is included, of which Dr. Sterki writes "This is a very interesting and valuable specimen; the only true albino among many thousand specimens of our *Vertigos* I have seen."

Vertigo ventricosa elatior Sterki. Not heretofore known from Michigan.

Vertigo pentodon Say.

Vertigo curvidens Gld.

Ferussacia subcylindrica L.

Succinea oblivua Say.

Succinea peoriensis Wolf.

Succinea avara Say.

Succinea sp.

Succinea ovalis Gld.

Succinea sp.

There are four forms of *Succinea* in the collection, which group around *S. ovalis* Gld. as a type. The first is the form usually called *ovalis* characterized by the short; rather blunt spire, elongated body whorl and effuse aperture. The second is the *peoriensis* of Wolf, a very widely extended form in Michigan and easily separated from the "*ovalis*" by reason of the shorter body whorl and more nearly oval aperture, which though somewhat narrowed posteriorly lacks the patulous expansion anteriorly so characteristic of the former. The third resembles *ovalis* in the shape of the aperture, but is a more slender shell and has the spire more elongated than either the preceeding forms. It appears to range generally over the State and is the same form noticed as "*S. higginsi* Bld." in my catalogue of Michigan shells (NAUT. VI, p. 19).

The fourth form is quite remarkable. Having the general shape, characteristic of the group, it far exceeds them all in dimensions, equalling in length a good sized *S. obliqua* Say. These shells were labeled by Dr. Lathrop as "*S. sillimani* Bld.?" They agree substantially in form and size with figures of that species given by Binney. Some individuals, however, have the spire more produced, resembling in that respect the figures of *S. hawkinsi* Bd.; but the suture is not impressed to the extent represented in that species. None of them have the blunt apex, which seems to be characteristic of *S. haydeni* W. G. Binn., though fully equalling that species in size. Cockerell (NAUT. VI, pp. 23 and 29) refers all these forms to the *S. elegans* Risso of Europe. It is possible that these specimens

are similar to the Canadian examples, which he refers to that species.

Carychium exiguum Say.

Limnæa stagnalis L.

Limnæa catascopium Say.

Two forms of this species are represented in the collection. One from the Saginaw River is of the usual form, but of unusual size, one example being nearly one and one-fourth inches in length.

The other form from Saginaw Bay is characterized by its greatly inflated body whorl and very short, rapidly acuminate spire. A single specimen from Lake Huron represents the form usually found in the Great Lakes.

Limnæa reflexa Say. Bayou, East Saginaw and Saginaw Bay. The latter somewhat smaller and more slender than the former.

Limnæa reflexa scalaris. Intermediate between the type and the variety.

Limnæa palustris Mull. Larger than the average in size. The striped variety corresponding to form of *L. reflexa* known as *zebra* Tryon, is also represented.

Limnæa cubensis Pfr.

Physa ancillaria Say. Saginaw Bay.

Physa sayii Tapp.

Physa gyrina hildrethiana Lea.

Aplexa hypnorum L.

Planorbis trivolvis Say.

Planorbis bicarinatus Say.

Planorbis campanulatus Say.

Planorbis albus Mull.

Planorbis exacutus Say.

Planorbis parvus Say. Among a number of the usual form of this species occurs one of the curiously distorted examples, in which the whorls almost from the apex are entirely detached from each other and coiled obliquely like a ram's horn.

Segmentina armigera Say.

Ancylus fuscus Ad. Saginaw River.

Ancylus parallelus Hald. Saginaw River. Much narrower and with the sides more flattened and hence more nearly parallel than in specimens from other localities.

Lyogyrus pupoidea Gld. Heretofore this species has been cited only from the western part of the State.

Campeloma decisa Say. Cass River.

Amnicola porata Say.

Bythinella obtusa Lea.

Goniobasis livescens Mke. Saginaw Bay.

Goniobasis semicarinata Say. Saginaw River.

This is the first time this species has been cited from this State.

Goniobasis depygis Say. Saginaw River.

This species, although cited in the earlier lists of Sager and Miles, has not been found by any of the more recent collectors.

Goniobasis milesii Lea. Cass River.

Two specimens "from Dr. Miles," which seem to justify Tryon's doubt as to whether the species is more than a globose form of *G. livescens* Mke.

Unio alatus Say. Saginaw River.

Unio asperimus Lea. Saginaw River. This is the first recorded occurrence of this species in the eastern part of the State. It may be of interest to add that Dr. W. H. DeCamp of Grand Rapids informs us that the species has also been recently found in the Grand River, so that the doubt formerly cast upon its occurrence in Michigan must be considered as entirely removed.

Unio cornutus Bar. Another addition to the fauna of the eastern part of the State. One example, probably a female, is unusually elongated.

Unio ellipsis Lea. This and all the following species are from Saginaw River.

Unio gibbosus Bar.

gracilis Bar.

ligamentinus Lam.

luteolus Lam.

nasutus Say.

novi-eboraci Lea.

phaseolus Hild.

rectus Lam.

rubiginosus Lea.

schoolcraftii Lea.

ventricosus Bar.

Margaritina deltoidea Lea.

Anodonta benedictii Lea.

footiana Lea.

imbecilis Say.

Sphærium striatinum Lam.

rhomboideum Say.

occidentale Pme.

partumeium Say.

truncatum Lam.

Pisidium virginicum Lam.

abditum Hald.

compressum Pme.

variabile Pme.

NOTES AND NEWS.

MR. JOHN RITCHIE, JR. of Boston paid a short visit to his conchological friends in Philadelphia Feb. 3d and 4th, being the guest of Mr. Ford.

TULOTOMA IN THE TENNESSEE DRAINAGE.—As the Paint Rock River is a tributary of the Tennessee and hence in the Ohio drainage, it may be of interest to note that a fossil specimen of *Tulotoma magnifica* Con. was recently found about 20 miles from its mouth. *T. magnifica* is a living species of the lower Coosa.—*H. E. Sargent, Woodville, Ala.*

REV. SAMUEL LOCKWOOD, PH. D., well known in New Jersey as an enthusiastic student of the Natural History of the State, died at his residence in Freehold, N. J., on Jan. 10th.

SOME FINAL REMARKS RELATIVE TO CYPRÆA GREGORI, FORD.—Since Mr. Smith has, in the January number of the NAUTILUS, deemed it expedient to make a purely scientific subject, the vehicle of remarks chiefly personal in character, it is just possible that comment is uncalled for from me. It might be prudent, however, to notice one or two of the gentleman's statements, especially that touching the ease with which he could take Mr. Ford's paragraphs *seriatum*, and confute them, etc. In respect to this show of confidence, I have nothing to suggest beyond referring him to the following not very classic, but rather trite saying, viz.: "The man who is always sure that he could have managed things better had he been there, is usually the one who never gets there."

Regarding the quoted phrases so pathetically alluded to by the gentleman, I cannot believe that any reader save himself ever supposed they were presented as parts of his communication.

Certainly such a thought never occurred to me. The "inverted commas" were added to them simply as evidence of their general use. Was this fact apparent to Mr. Smith? Perhaps not, and yet—Perhaps.

As my reasons for claiming priority for the name *C. Gregori* were fully explained in the NAUTILUS for Nov., 1893—and as the justice of this claim has been heartily conceded by very many of our ablest conchologists, I do not propose inflicting the reader with any further

remarks on the subject, now or hereafter.—*John Ford, Philadelphia, Jan., 1894.*

The collection of DR. WM. D. HARTMAN of West Chester, Pa., is offered for sale. It is one of the richest in America in Melanians, *Partula*, *Achatinella*, *Bulimus*, etc., and comprises the types of Dr. Hartman's new species, as well as duplicate types from Lea, Anthony, Wheatley, and many other conchologists. It will prove a very valuable collection to whoever may purchase it.

NOTES ON NEW PUBLICATIONS.

PRELIMINARY REPORT ON THE MOLLUSCAN SPECIES collected by the U. S. Scientific Expedition to West Africa in 1889-90, pp. 32.

ON RARE OR LITTLE KNOWN MOLLUSKS from the west coast of North and South America with descriptions of new species, pp. 11 and plate.

REPORT ON THE MOLLUSK-FAUNA OF THE GALAPAGOS ISLANDS, with descriptions of new species etc., 97 pp., plate and map.

The foregoing are the titles of recent papers on Mollusca by Dr. Stearns published in the proceedings of the U. S. National Museum, in Volume XVI, which includes the various articles for the year 1893. The first of the above, is an annotated catalogue of the shells collected by the Eclipse Expedition so-called, that went to the west coast of Africa for the purpose of observing the total eclipse of the sun, that occurred on the 22nd of December 1889. The Natural History work was of course incidental; it includes also the forms collected at the Azores, where the *Pensacola* touched on her way. The total number of molluscan species collected foots up 120, the greater portion, over one hundred, at various African points, Ascension Island and Cape de Verde, etc. Several of the species are shown to have a wide distribution, from the Gulf of Mexico and the Caribbean waters to the African region; and *Trochatella radians* "not before reported outside of Peru and Chili," was detected, a single example, at Cape de Verde; many other forms have nearly as wide a range.

The second paper embraces several forms, some of which were preliminarily described in "The NAUTILUS" in May, 1893. Many

species of a decided Polynesian aspect are reported from the Gulf of California region; among these are *Chicoreus palmarosæ mexicana*, *Ranella cruentata*, *Purpura hippocastanum*, *Casmaria vibex* and *Luponia isabella mexicana*. This paper includes also revised descriptions of species previously described by the author, notably, *Dolabella californica*, *Onchidella binneyi*=*O. carpenteri* Stearns not Binney, etc. A new species of *Tectarius*, *T. atyphus*, the first of this group detected on the West Coast is described; it occurs at Manta on the coast of Ecuador. Other species are referred to and commented upon.

The last of the foregoing titles relates to a paper hitherto briefly noticed in "The NAUTILUS," (December, 1893). This includes a list of Galapagos shells, compiled from the collections made by the *Albatross*, Dr. Habel, Dr. Wolf, the *Petrel*, Dr. W. H. Jones and the papers and publications of Carpenter, Albers, E. A. Smith, Wimmer, Ancy, Reibisch, Dall, etc., etc. The *Albatross* collectors obtained 109 species and several varieties; of these 59 were not before reported as occurring at the Galapagos. A few new species were detected and are described by the author. The total as shown in the summarized list is 288 species and 30 varieties.

The land shells are of a distinctly West American type, comparable with Chilean and Peruvian forms, and with the exception of half a dozen local species, the marine forms are West American—with a slight color of Caribbean or Antillean types.

NOTES ON RECENT COLLECTIONS OF N. A. MOLLUSKS, ETC., by R. E. C. Stearns (Proc. U. S. Nat. Mus. 1893). Dr. Stearns records numerous new localities for various land and fresh-water shells, discussing particularly the range of *Patula strigosa Hemphilli*, and its occurrence in Arizona at Coon Mountain, that problematic crater. *Triodopsis Levettei* is reported from Fort Huachuca and Tucson Arizona (a large form). Ft. Huachuca is so near the Mexican boundary that Stearns believes both *P. hemphilli* and *T. Levettei* will eventually be found in the Mexican state Sonora. *Helicina orbiculata* was collected by Mr. V. Bailey near Marble Cave, Stone Co., Mo., probably near its northern limit. Attention is called to the discontinuous distribution of the section *Mesodon*, which is represented by several western species, among them *townsendiana* and *ptychophora*; records of North Dakota and eastern Montana localities for *Mesodon* are still lacking. In this tract *multilineata* and *thyroides* are to be expected, we think, but suitable stations are not very numerous west of Minnesota and Iowa.

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THE NAUTILUS

A MONTHLY
DEVOTED TO THE INTERESTS
OF CONCHOLOGISTS.

EDITOR:

H. A. PILSBRY, Conservator Conchological Section, Academy of Natural Sciences, Philadelphia.

ASSOCIATE EDITOR:

C. W. JOHNSON, Curator of the Wagner Free Institute of Science.

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No. 12.

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THE NAUTILUS.

VOL. VII.

APRIL, 1894.

No. 12

THE CALIFORNIAN SPECIES OF THE GENUS NUTTALLINA.

BY W. J. RAYMOND, OAKLAND, CALIFORNIA.

In the Manual of Conchology, Vol. 14, p. 280, after directing attention to the differences existing between *Nuttallina californica* Nutt. and *N. scabra* Rve., Mr. Pilsbry remarks that data are desirable concerning the areas of distribution of the two species along the Californian coast, especially between San Diego and Point Piedras Blancas, near San Simeon. Having collected numerous specimens of this genus at various points between Bolinas and Santa Barbara, I can offer the following notes.

A glance at a map of the West Coast will recall certain geographical features bearing upon the distribution of marine life. Going southward from San Francisco, the coast line which has followed a general southeasterly direction, bends abruptly to the east at Point Concepcion. As a result of this, the great ocean current from the north which has held to a course near the coast and parallel with it, all the way from Alaska, leaves it for the first time and flowing southward, is still further deflexed by the chain of the Santa Barbara islands. From Point Concepcion eastward, the ocean is warmer and the other conditions surrounding marine life are such as to warrant the expectation of an assemblage of species, different from those found north of the cape. While many species of mollusks are common to our whole Californian coast, *Terebra simplex*, *Drillia hemphilli*, *Marginella varia*, *Cypraea spadicea*, *Trivia solandri*, *Turritella cooperi*, *Norrisia norrisii*, *Trophon belcheri*, *T. triangulatus*, *Periploma planiuscula* and *Barbatia gradata* are species of a more southern fauna, found in Santa Barbara county, which do not as far

as we know pass Point Concepcion. Many other examples might be noted.

This is not the place to enter into a discussion of the West Coast marine faunal provinces. But it is interesting to note that as far as the material at hand gives evidence, the two West Coast species of *Nuttallina* are sharply divided by this natural boundary. At Carpinteria, ten miles east of Santa Barbara and at points west of that town, to Santa Anita, within ten miles of Point Concepcion, the specimens are uniformly *N. scabra*, as are also the more southern examples of the genus. Specimens collected at Point Sal, thirty-five miles northward from Point Concepcion, together with those collected at San Simeon, at Monterey, at Purissima and at points near San Francisco are uniformly *N. californica*. No intergrading forms were observed. While the external appearance is not always a sure guide to specific position, disarticulation of the plates has, in all cases examined, revealed the species with certainty.

A study of numerous specimens from the localities mentioned, shows the following differential characteristics, in addition to those cited by Mr. Pilsbry. Whether they would hold good in specimens from other localities or not, I do not know. In color *N. scabra* is externally more varied than *N. californica*. Specimens of the former from Santa Barbara are clouded and mottled with greenish upon a buff ground-tint, on the second, third, fifth and sixth valves. The remaining valves are much darker and less variegated. In single valves of *scabra*, viewed from above, the broad curving outline of the tegmentum on each side is bordered by a small spot of brown, placed centrally on the light blue surface of the sutural plates. This feature is constant in all of the specimens examined. In *N. californica* the spots are wholly absent, or in some cases replaced by indistinct clouds of a color darker than the surface of the sutural plates. Of course no one would separate the species because of these slight color differences, but taken in conjunction with the weightier points of difference furnished by the shape of the plates, sculpture and character of the girdle, they are interesting as showing how far these geographical races have become differentiated from the parent stock.

LAND AND FRESH-WATER SHELLS OF ALLEGHENY COUNTY, PA.

COLLECTED BY S. H. STUPAKOFF OF PITTSBURGH, PA.,
FROM JAN., 1890 TO DEC., 1893.¹

Mesodon albolabris Say.	Hyalina wheatleyi Bld.
Mesodon var. dentata Binn.	Conulus fulvus Drap.
Mesodon dentifera Binn.	Gastrodonta multidentata Binn.
Mesodon profunda Say.	Ferussacia subcylindrica Linn.
Mesodon pennsylvanica Green.	Leucocheila contracta Say.
Mesodon thyroides Say.	Leucocheila armifera Say.
Mesodon exoleta Binn.	Vertigo ovata Say.
Triodopsis tridentata Say.	Vertigo pentodon Say.
Triodopsis palliata Say.	Vertigo milium Gld.
Triodopsis fallax Say.	Succinea avara Say.
Stenotrema monodon Rack.	Limnæa columella Say.
Stenotrema var. fraterna Say.	Limnæa humilis Say.
Stenotrema hirsuta Say.	Limnæa palustris Müll.
Helicodiscus lineata Say.	Limnæa desidiosa Say.
Vallonia pulchella Mull.	Planorbis bicarinatus Say.
Vallonia excentrica Sterki.	Carychium exile Lea.
Patula alternata Say.	Carychium exiguum Say.
Patula solitaria Say.	Helicina occulta Say.
Patula perspectiva Say.	Physa heterostropha Say.
Patula striatella Anthony.	Ancylus fuscus Adams.
Punctum pygmæum minutissimum Lea.	Sphærium striatinum Lam.
Selenites concavus Say.	Pisidium ?
Mesomphix fuliginosus Griff.	Goniobasis ?
Mesomphix ligerus Say.	Margaritana rugosa Barnes.
Mesomphix intertextus Binn.	Unio ligamentinus Lam.
Mesomphix inornatus Say.	Unio gibbosus Barnes.
Hyalina arborea Say.	Unio ellipsis Lea.
Hyalina indentata Say.	Unio cariosus Say.
Hyalina minuscula Binn.	Unio pyramidatus Lea.
Hyalina milium Morse.	Unio trigonus Lea.
Hyalina radiatula Alder.	Unio alatus Lea.

¹ The present list is the first essay toward a knowledge of the snail fauna of western Pennsylvania. The region is an interesting one, combining the features of the Atlantic slope and the Ohio valley; and it is desirable to have a complete and accurate catalogue of the fauna. The fresh-water fauna will prove especially interesting, as we know little of the range of the Ohio River types of Unionidae and Strepomatidæ in the headwaters of that river system.—ED. NAUTILUS.

In addition to the above the following species were collected by Mr. Geo. H. Clapp; these complete to the present date all the species found in Allegheny County, Pennsylvania.

Strobila labyrinthica Say.
Mesodon clausa Say.
Mesomphix lævigatus Pfr.
Gastrodonta suppressa Say.

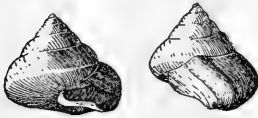
Vitrina limpida Gld.
Vertigo bollesiana Mse.
Pupa corticaria Say.

A NEW PAPUINA.

BY CHARLES HEDLEY, SYDNEY, AUSTRALIA.

Papuina cerea Hedley.

Shell thin, translucent; contour trochoidal, color waxen white, becoming yellowish on the 3rd and 4th whorls, encircled below the suture by an opaque white thread, *nowhere are translucent lines or spaces visible*. Sculpture: surface of



a waxen polish; transverse growth lines can be detected by the unaided eye, and spiral grooves, almost effaced above but plainer on the base, may be

deciphered with a lens. Whorls $5\frac{1}{2}$, flattened, regularly increasing, the last constituting five-eighths of the shell's height, angled at the periphery, descending considerably and abruptly at the aperture, gibbous at the point of flexure. Suture impressed. Aperture very oblique, anterior margin waved; *columella* oblique, wide, *extending nearly to the angle of the aperture, subtruncate below*. A thin, translucent, shining callus extends over the imperforate axis to the insertion of the anterior margin of the lip.

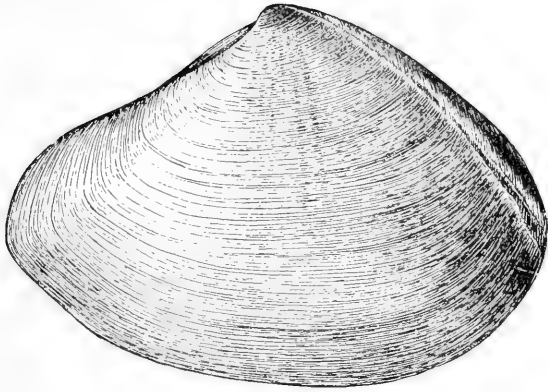
Height $13\frac{1}{2}$, major. diam. 16, min. diam. 14 mm.

Hab. Bloomfield River, North Queensland.

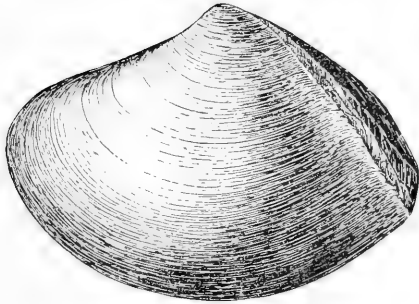
ON THE SPECIES OF MACTRA FROM CALIFORNIA.

BY WM. H. DALL.

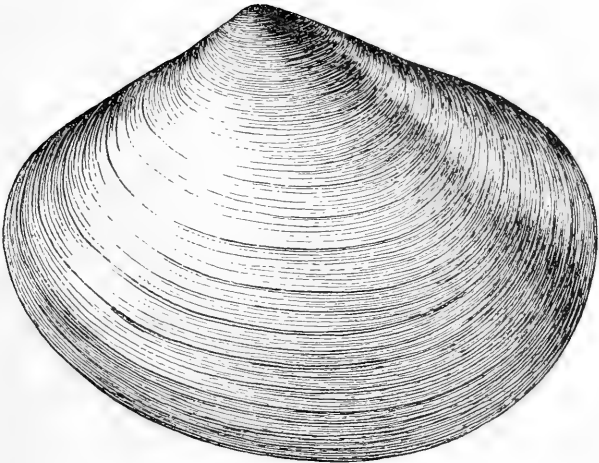
In revising the Tertiary *Maत्रacea* of the southeastern United States, it became necessary to examine the recent species and work



No. 1.

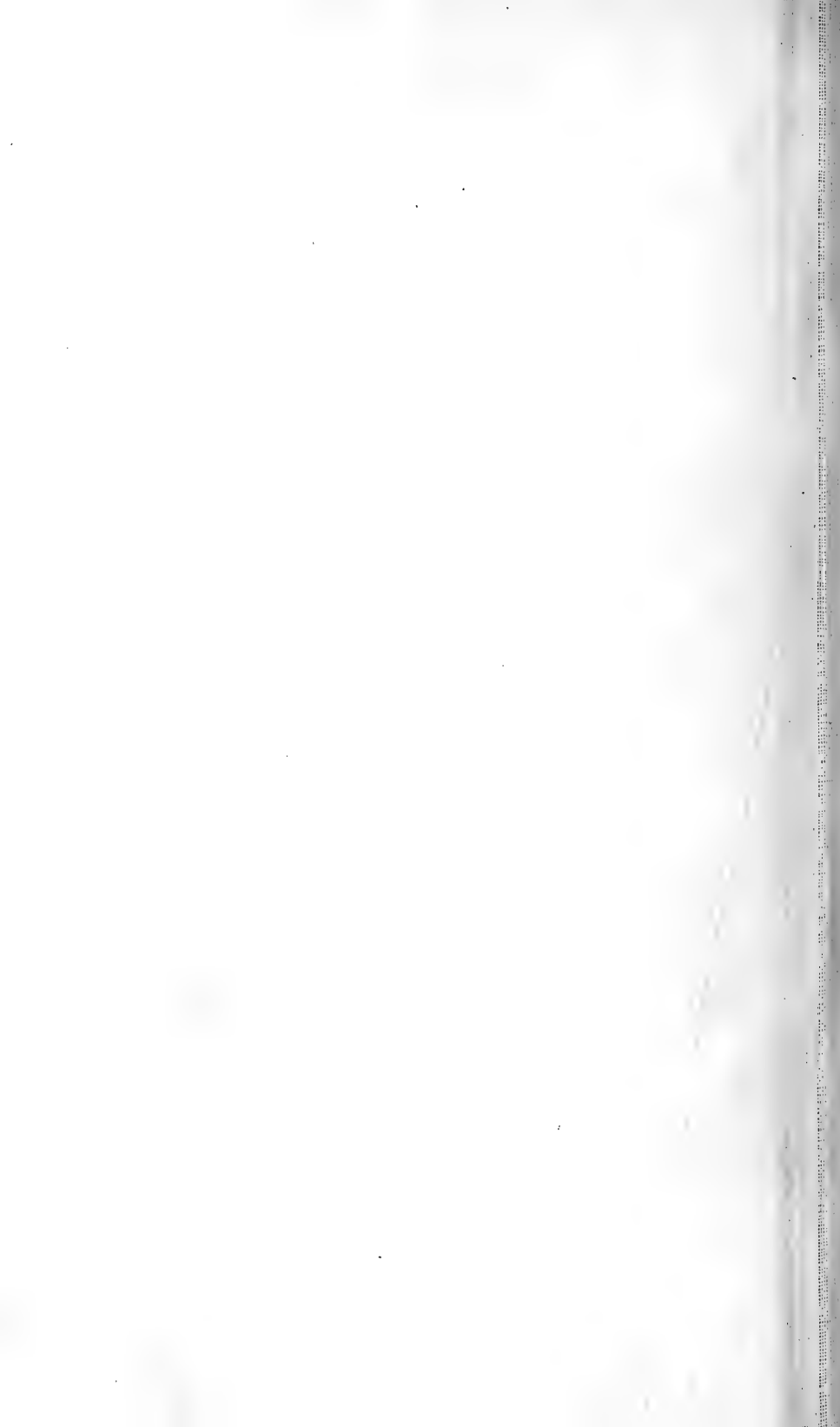


No. 2



No. 3.

DALL.—Californian Mactridæ.



up their synonymy. The species of the Pacific coast especially have long been known to be in a very bad state as regards nomenclature, etc. Several long known forms appear, on investigation, to be really nameless, the titles belonging to other less conspicuous species having been applied to them, while some of the earliest named forms have been lost sight of. I hope to furnish the NAUTILUS, shortly, with synonymic lists of the east and west coast Mactras, pending the completion of which the following descriptions are offered.

Mactra catilliformis Conrad. Pl. V, fig. 3.

Shell large, thin, whitish or straw color, irregularly concentrically striated, with a gray, wrinkled epidermis, inflated short-oval subequilateral valves and closely adjacent inconspicuous beaks; anterior end of shell evenly rounded in front, a little shorter than the posterior end; lunule narrow, impressed, escutcheon narrow, longer, rather obscure; posterior end of valves rounded, slightly compressed and with a narrow gape when closed; hinge resembling that of *M. polynyma* Stm., but more concentrated, cartilage pit large, rather produced; posterior muscular impression larger, pallial sinus rather large, rounded in front. There is a faint posterior flexure of the valves and a feebly marked area above it, on which the epidermis is more conspicuous. Lon. 108°0, alt. 87°0, diameter 45·0 mm., in a moderately sized pair, but the adult reaches 140·0 mm. in length.

Distribution: Neeah Bay to San Diego, Cala.

This is *Standella californica* Carpenter, but not of Conrad or Deshayes. It was imperfectly described without a figure by Conrad in the Am. Journ. Conch. vol. iii, p. 193, 1867, and erroneously stated to come from Panama. *M. lenticularis*, Gabb, 1866, from the Miocene of California is closely related.

Mactra Hemphillii n. s. Pl. V, fig. 2.

Shell large, thin, inflated, subequilateral, creamy white with a yellow thin epidermis, which over the body of the shell in young shells is beautifully evenly concentrically striated and on the posterior dorsal area is irregularly wrinkled, with an elevated raphe of epidermis at the margin of the area; beaks rather prominent, the anterior end of the valves longer than the posterior; posterior dorsal slope excavated; lunule obscure, escutcheon marked by prominent elevated radial lines of epidermis; the dorsal margin pouting in front of the ligament, the posterior slope convex, the posterior flexure

faint, but marked by a recession of the ventral border of the valves, which gape but very little and not at all in front; anterior end rounded, but smaller than the posterior; ventral border arcuate; hinge and pallial sinus much as in the last species, except that the sinus is somewhat smaller and less depressed. Lon. 120, alt. 93, diam. 50 mm.

Distribution: San Diego, Hemphill and Cooper.

This fine and perfectly distinct species appears rare and I have seen but two specimens, both from San Diego.

The preceding species belong to the subgenus *Standella* as adopted by H. and A. Adams, but the following is a true *Mactra*, with the ligament separated from the cartilage pit by a shelly plate.

Mactra dolabriformis Conrad, 1867. Pl. V. fig. 1.

Shell much compressed, polished white under a dull brown epidermis, subequilateral with inconspicuous beaks. It closely resembles *M. falcata* Gould (from type) but has higher beaks more centrally set, the anterior end more attenuated and less truncate, the left anterior lateral tooth single and distally more prominent; the left cardinal larger and wider; the posterior adductor scar horizontally elongate and smaller. Lon. 90, alt. 63, diam. 26 mm.

Distribution: San Diego, Cala. to Guaymas, Mexico; "Panama" Conrad.

This remarkably handsome shell has not unnaturally long been confounded with *M. falcata*, from which the hinge separates it subgenerically.

The true *M. californica* of Conrad is a *Mactrinula* and can at once be recognized by its sulcate beaks. It reaches 36 mm. in length. The *M. planulata* is also a small species, resembling *M. polynyma* in miniature. The northern form generally referred to *M. falcata* is a barely separable variety of *M. polynyma* which may take the name of *Alaskana*.

NOTICES OF NEW CHITONS, III.

BY H. A. PILSBRY.

Certain rectifications of the previously accepted nomenclature have become necessary, and may be made here.

Genus *Phacellozona* Pilsbry (new name).

Synonymy: *Angasia* CPR., Table Reg. Chitons, 1873. DALL, Proc. U. S. Nat. Mus., 1881, pp, 283, 286, 289, 290. PILSBRY, Manual of Conchology, XIV, p. 286.

Not *Angasia* White, Proc. Zool. Soc. Lond., 1863, p. 498 (Crustacea).

The type of the genus will, of course, remain *Angasia tetrica* Cpr.

Genus *Chorioplax* Pilsbry (new name).

Synonymy: *Microplax* AD. & ANG., Proc. Zool. Soc. Lond., 1864, p. 194. PILSBRY, Manual of Conch.. XIV, p. 21.

Not *Microplax* Fieber, Europ. Hem., p. 53, 1861 (Hemiptera).

Type *Microplax grayi* AD. & ANG. This is an extremely peculiar and isolated genus, and forms, I am disposed to believe, a distinct family of the *Eoplacophora* or slitless Chitons—that is, if the slits really prove to be completely absent, for the unique type has not been disarticulated. In some features it recalls the *Acanthochitidæ*. The single species was described and illustrated from the unique type in the British Museum, in the Manual of Conchology, vol. XIV.

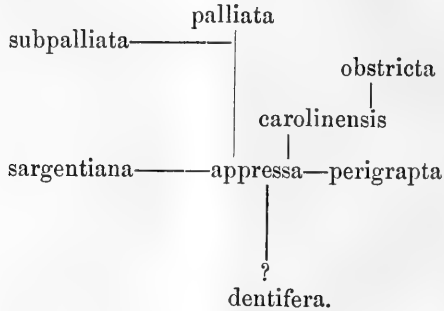
 DESCRIPTIVE NOTES ON CERTAIN FORMS OF POLYGYRA.

BY H. A. PILSBRY.

The genus *Polygyra* is one of the most numerous and characteristic groups of North American land snails. It ranges over the whole of the Eastern United States, from Canada to Florida, and from Manitoba to Yucatan, with species in Idaho and on the Pacific slope. A few stragglers have reached Cuba, the Bahamas and Bermuda.

Many of the species exhibit a great amount of variation, and in some cases the variations of several allied species form chains of mutations almost or quite connecting very unlike species. This is the case in the group of *Polygyra appressa*. Typical *P. appressa* is a snail having the aperture three-toothed, but the upper lip tooth is often small or wanting. It varies toward *P. obstricta* var. *carolinensis*, which is close to *P. obstricta*, and less so to *P. palliata*. In another direction *P. appressa* is allied to *P. sargentiana*. In fact, *appressa* is not far from the ancestral form from which all the spe-

cies mentioned above have been differentiated. This diagram expresses roughly the relationships of the species and varieties:



***Polygyra appressa* Say.**

Surface striate, but having no spiral incised microscopic lines; outer lip frequently having an upper tooth, or the indication of it; parietal tooth generally long, curving downward and nearly joining the columellar lip.

This species was collected by Say on Long's Expedition. It is abundant in Illinois, Arkansas, Missouri, etc. Say's types are lost, but his description unmistakably indicates this form.

***Polygyra appressa perigrapta* Pils.**

Surface striate and having crowded microscopic spiral incised lines, especially beneath; outer lip with no upper tooth; parietal tooth short, not connecting with columella.

Distribution mainly southern; Woodville, Ala.; Cherokee Co., N. C.; Columbus, Ga.; etc. The types are Woodville specimens.

***Polygyra fallax* Say.**

This is, as the writer has elsewhere shown, the *H. introferens* of Bland. It is not the *fallax* of all modern writers and collectors.

***Polygyra fallax obsoleta* Pils.**

General features as in the type, but all teeth of the aperture much reduced in size, the upper lip tooth nearly or wholly obsolete. Newbern, N. C.

***Polygyra tridentata edentilabris* Pils.**

General characters as in the type, but lip teeth wanting in perfectly mature examples.

Polygyra hirsuta altispira Pils.

Size large; spire high and conical; notch of the basal lip very large. Alt. 7, diam. 9 mm.

Specimens are before me from near Magnetic City (Wetherby) and from the Black Mountains, N. C. (Hemphill).

REMARKS ON *ASTYRIS GOULDIANA*.

BY A. H. GARDNER, FORT HAMILTON, N. Y.

In a careful examination of the Columbellidæ dredged by me last summer in Long Island Sound, I find amongst specimens of *Astyris lunata*, taken from a muddy bottom with eel grass, in 2 to 3 fathoms of water in Lloyd's Harbor, 3 shells which are typical examples of *Astyris gouldiana* Agassiz in litt. (*vide* Stimpson) and again recorded from this same locality by Mr. Sanderson Smith in "The Mollusca of Long Island and its dependencies," Smith & Prime. The species seems to have been considered as of doubtful validity by Prof. Verrill, as in "The Invertebrate of Vineyard Sound," he includes it in the synonymy of *Astyris lunata*, referring to it as a color variety identical with the *Wheatleyi* of DeKay, but I think the characteristics of the shell entitle it to rank as a good species.

The shells measure in length 4 to $4\frac{1}{3}$ mill., and have 8 whorls. *A. lunata* rarely exceeds 3 mill. and has from 6 to $6\frac{1}{2}$ whorls; in *Astyris gouldiana* these whorls are more convex and inflated.

The apical termination of the shell resembles that of *Belemnitella americana*, whilst in the general outline of its whorls it is very much like the well known land mollusk, *Ferussacia subcylindrica*. The rostrum is not only much produced but is curved to such an extent in two of the specimens as to give the aperture a decidedly auriform appearance. The thick loosely appressed callus on the pillar lip of *A. lunata* is represented in this shell only by a very fine glaze. The specimens all exhibit clear zigzag markings of a brownish red, which are more pronounced than those found on any examples of *A. lunata* in my collection.

The division line between the two species seems to me to be quite sharp, both as regards size and form. I have seen no shells which

might be classed as intermediate, which would seem to confirm my conclusions.

NOTE ON *PATELLA KERMADECENSIS*, PILSBRY.¹

BY GEO. W. TAYLOR.

More than a year ago a little parcel of limpets from Kermadec Islands was sent to me by a correspondent in New Zealand. They were sent by way of England and were there delayed so that they did not reach me until about a month ago.

I at once perceived that they belonged to an unknown species and I promptly sat down and wrote a note, with a diagnosis of the species for the NAUTILUS, but on a second thought decided not to be too hasty, and so instead of sending my note, I sent a specimen (a young one) of the shell itself to the Associate Editor asking him kindly to compare it with the series in the Philadelphia Museum and let me have his opinion.

I did this because I thought and still think it possible that the young shell may have been already described.

This morning I received the February NAUTILUS, and I find that some one else has a correspondent in Kermadec Island and that Mr. Pilsbry has been beforehand with me and named the new shell most appropriately, *Patella kermadecensis*.

However, as Dr. Pilsbry has only 2 specimens and I have 14, I venture to write a line or two to supplement his description.

I may say that in my opinion, the shell is very nearly related to *pica* Reeve which by the way is a South Pacific species according to the original descriptions, although Mr. Pilsbry in his "Manual" has transferred it to the Mauritius.

My suite of *kermadecensis* consists of 2 full grown shells and a series of 12 others ranging from 75 mm. down to 6 mm. in length. The large ones are respectively 130 mm. x 109 mm. x 41 mm. and

¹ This remarkable limpet seems to have been received by Mr. Taylor and Dr. W. H. Dall at about the same time. Dr. Dall sent to the NAUTILUS a description of the species under the name *P. Kermadecensis*, but after the Editors' description was already in print. Dall's description of the young and adult shells, with figures, will shortly be published in the Proc. Acad. N. S. Phila.—ED.

130x109x34 mm., being both considerably flatter than the specimens described by Mr. Pilsbry.

All my specimens are distinctly narrowed in front, and in this particular the species differs essentially from *P. patriarcha*, which is very round in outline. I have a specimen of *patriarcha* exactly the same *width* as the two shells above mentioned, namely, 109 mm., but its *length* is only 119 mm. Our species is further distinguished by its sculpture from both *patriarcha* and *mexicana*—the ribs being narrower and much more numerous than in *patriarcha* and decidedly heavier than in *mexicana*. Every 5th or 6th rib in the adult shell seems to be more prominent.

Although my shells are not badly eroded there is but little color observable outside, except in spots where smaller limpets have had their stations. In such places the peculiar burnt red color so characteristic of *P. argenvillei* is seen, and the same color, with an occasional spot of black, edges the interior of the shell and in a paler and browner shade blotches the spatula, which in the young shells is sometimes entirely brown. It would seem that the color of the interior becomes lighter with age, as is the case in many other species.

The muscle scar is, as Mr. Pilsbry remarks, strongly marked and callous in the adult shell, but in the young, it is not at all noticeable. This is the case also with the 2 species with which *kermadecensis* is compared.

On the whole this is the very finest of the many fine species of limpets that Mr. Pilsbry has made known to science during the last few years. It has no rival in size save *P. mexicana*, except it be the at present unrecognized *P. gigantea* of Lesson from the Society Islands, which may be found to be nearly allied or perhaps identical with the present shell.

NOTICES OF NEW JAPANESE MOLLUSKS, I.

BY H. A. PILSBRY.

The species described below were collected by Mr. Frederick Stearns of Detroit, Michigan, during his second visit to Japan, in 1892. They will be illustrated in his Catalogue of Japanese shells, now in preparation.

Sepia Hercules n. sp.

Shell having the general form of that of *S. esculenta* Hoyle but more convex ventrally; chitinous margin narrow; dorsal surface tuberculate-rugose as in *esculenta*, but more coarsely so, the posterior part having the tubercles very deeply separated, flat-topped, and leaning posteriorly; dorsal surface evenly rounded, with no trace of a median longitudinal rib. Ventral surface as in *esculenta*, but the striation is much closer although the shell is triple the size. Last loculus has an index of 22. Inner cone well developed, its limbs arising about one-third the length of the shell from the posterior end, gradually rising along the sides, posteriorly reflexed and appressed on the outer cone, leaving below a narrow small cavity. The anterior edge of the inner cone does not form a shelf across the posterior end of the outer cone as is the case in *esculenta*, and the cavity is much smaller, shallower and narrower than in a specimen of *esculenta* 155 mill. in length. Spine very stout, conical, its root excavated ventrally.

Length 425 mill.; greatest breadth 160 mill.; length of spine 19 mill.

This species is the giant of the genus, the shell being about $16\frac{1}{2}$ inches long. It is allied to *S. esculenta* Hoyle, but differs as above indicated. The dorsal slope does not descend abruptly to the spine as in that species. Of *S. esculenta* a good many specimens are before me collected by Mr. Stearns. They agree well with the "Challenger" specimens. The size of *esculenta* is moderately constant, those seen by Hoyle, Appellöf and myself being from 155 to 163 mill. long (about $6\frac{1}{2}$ inches). In color, *S. Hercules* is white in the middle, faint pink at the sides; whitish beneath.

A second specimen from the Loo Choo Is. exhibits the same characters throughout.

NOTES AND NEWS.

The Rev. Geo. W. Taylor reports the appearance of *Paludina Japonica* Mart. in the Chinese Market at Victoria, B. C. These Mollusks are accounted dainties by the Chinese and are retailed to them at 25 cents a pound. The occurrence of this species in the San Francisco markets was noted by Mr. W. M. Wood in the NAUTILUS, Vol. V, p. 114.



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