THE

MOLLUSKS

OF

WESTERN NORTH AMERICA.

EMBRACING THE SECOND REPORT MADE TO THE BRITISH ASSOCIATION
ON THIS SUBJECT, WITH OTHER PAPERS; REPRINTED BY
PERMISSION, WITH A GENERAL INDEX.

WASHINGTON:
SMITHSONIAN INSTITUTION
DECEMBER, 1872.
The opportunity afforded by Mr. Carpenter's visit in 1859-60 to the United States, was embraced to secure his services in naming and arranging the shells collected by the United States Exploring Expedition and other parties on the Pacific Coast of North America. Mr. Carpenter, having previously presented to the British Association a report on the state of knowledge in regard to the mollusks of the west coast of North America, embodied the additional information which he obtained, chiefly through the Smithsonian Institution, in a second report to the same Association; and now, in order to facilitate the study of this class of animals by the American student, this work is re-published with supplementary papers, from stereotype copies of the original pages.

JOSEPH HENRY,
Secretary S. I.

Smithsonian Institution,
Washington, November, 1872.
TABLE OF CONTENTS.

Advertisement ........................................... ii
Introduction .............................................. v

LIST OF PAPERS REPRINTED IN THIS VOLUME ........ ix
" NOT REPRINTED IN THIS VOLUME .................. xi

ALPHABETICAL INDEX OF SPECIES ...................... 13

( iii )
INTRODUCTION.

AFTER the publication of my first "Report on the present state of our knowledge with regard to the Mollusca of the West Coast of North America," undertaken at the request of the British Association for the Advancement of Science, and printed in their Report for 1856, I visited America in order to arrange the first duplicate series of the great Reigen Collection of Mazatlan Shells which I had presented to the New York State Museum at Albany. It was one of the special objects of my visit to examine the types of previously described species in the United States, that I might compare them with those known in England. Having visited Washington to examine the types of the United States Exploring Expedition (Wilkes'), I was requested to spend the winter of 1859-60 in unpacking and arranging the shells belonging to the National Museum under its charge; and after my return to England I received from time to time the various collections sent to the Institution from the West Coast as they arrived; all of these were duly compared with the types in the Cumingian and other British collections.

Being thus in a position to correct a large number of unavoidable errors in my first Report, and to add a great deal of fresh information from American sources (chiefly obtained through the Smithsonian Institution), I was requested by the British Association to embody the material in a "Supplementary Report" on the same subject as the first. Knowing how difficult it is for American students to obtain access to serial publications, I obtained permission, in behalf of the Institution, to stereotype this second report, and the papers connected with it, which appeared in the "Proceedings of the Zoological Society," the "Annals and Magazine of Natural History," and the "Journal de Conchylologie."
The present volume consists, therefore, of a reprint from these stereotype plates, with the original paging at the top, and the Smithsonian paging at the bottom; and of a general index of species.

The index was prepared (at the expense of the Smithsonian Institution) by Mr. E. Taylor, Student at McGill College. It includes not only the present volume but all my previous English publications on the subject, of which the principal are the First British Association Report and the British Museum Mazatlan Catalogue. All references to these works not reprinted have the page-number prefixed by a Roman Capital (O to X), by which they can be at once distinguished from the simple numbers which refer to the foot-page in this volume. Students who want an index to the First Report will fix the eye on the initial O; to the Mazatlan Catalogue on P.

In an accompanying list will be found an enumeration of all my papers published in European journals relative to American conchology, and for the most part reprinted in the present collection. In this, however, is not included any of the contributions to American serials, as the Journal of the Academy of Natural Sciences of Philadelphia, the Proceedings of the California Academy, or the American Journal of Conchology.

My principal object in the preparation of these works has been to make out and compare the writings of previous naturalists, so that it might be possible for succeeding students to begin where I left off, without being obliged to waste so large an amount of time as I have been compelled to do in analyzing the (often inaccurate) work of their predecessors.

As the work of previous writers, whether satisfactory or otherwise, is duly tabulated in my Reports, so that others may judge of its value as well as I, it is not fair (as is often done) to quote from these Reports as on my authority. I was simply the historian, not the original writer. In the First Report I was a novice in the scientific world, and rarely ventured on criticisms; in the second, I allowed myself with more confidence to state my own conclusions, because I found that others had not enjoyed the remarkable facilities of comparing types which fell to my lot, and which (in many instances) cannot be renewed. Since that time, Nuttall, Gould, Rich, Judge Cooper, and especially Hugh Cuming, have been called to another world; their collections
have changed hands, and fresh causes of error have crept in. The present condition of the Cumingian Collection has been faithfully described by Dr. Gray in the Proceedings of the Zoological Society; and those who will take the trouble to compare his review of the Calyptreadæ, after the destruction of original labels consequent on Reeve's Monograph, with that which I gave in the Mazatlan Catalogue, while these labels were still fixed to the shells, will appreciate the advantages which I formerly enjoyed.

Readers who may discover any uncorrected errors in this volume, or in any of my other works, are urgently requested to apprise me of them (Box 193½ P. O., Montreal, C. E.), in order that they may be corrected in the Report of the Mollusca which Prof. Whitney has requested me to prepare for the California Geological Survey.

PHILIP P. CARPENTER.

MONTREAL, July 17, 1872.
LIST OF PAPERS
ON
AMERICAN MOLLUSCA
PUBLISHED IN EUROPEAN WORKS BY
P. P. CARPENTER.

REPRINTED.

A.

From the Report of the British Association for the Advancement of Science, for 1863, pp. 517-686. Published in August, 1864. Extra copies, with title-page, dated 1864.

B.


C.
Diagnoses of New Forms of Mollusks collected at Cape St. Lucas, Lower California. By Mr. J. Xantus. Page 207.


D.
Contributions towards a Monograph of the Pandoridae. Page 223.


1 The references are to the bottom paging. (ix)
LIST OF PAPERS.

E.
Diagnoses of New Forms of Mollusca from the Vancouver District.  Page 233.

F.
Diagnoses of New Forms of Mollusca from the Vancouver District.  Page 247.
From the Proceedings of the Zoological Society of London, pp. 201—204, February 14, 1865.

G
Diagnoses of New Species and a New Genus of Mollusks, from the Reigen Mazatlan Collection; with an Account of Additional Specimens presented to the British Museum.  Page 253.

H.
Descriptions of New Species and Varieties of Chitonidae and Acmaeidæ, from the Panama Collection of the late Prof. C. B. Adams.  Page 263.

I.
Diagnoses of New Species of Mollusks, from the West Tropical Region of North America, principally collected by the Rev. J. Rowell, of San Francisco.  Page 269.

K.
Diagnoses of New Forms of Mollusca, from the West coast of North America, first collected by Col. E. Jewett.  Page 277.
From the Annals and Magazine of Natural History. Third Series, Vol. XV., pp. 177—182 (Nos. 373—386), March, 1865. Ibid. pp. 394—399 (Mangelia variegata to end), May, 1865.
LIST OF PAPERS.

L.

Diagnoses of New Forms of Mollusca, collected by Col. E. Jewett, on the West Tropical shores of North America. Page 291.


M.


N.

On the Pleistocene Fossils collected by Col. E. Jewett, at Santa Barbara, California; with Descriptions of New Species. Page 319.

From the Annals and Magazine of Natural History, Third Series, Vol. XVII., pp. 274—278, April, 1866.

NOT REPRINTED.

O.

Report on the Present State of our Knowledge with Regard to the Mollusca of the West Coast of North America.

From the Report of the British Association for the Advancement of Science, for 1856, pp. 159—368. Published in 1857. Extra copies with title-page, list of plates with references to figures (4 pages), dated 1857. Not reprinted, but referred to under "O" in the general index.

P.


NOT REPRINTED (continued).

Q.
Descriptions of (supposed) New Species and Varieties of Shells, from the Californian and West Mexican Coasts, principally in the Collection of H. Cuming, Esq.

R.
Notes on the Species of *Hipponyx* inhabiting the American Coasts, with Descriptions of New Species.
Ditto, Part xxiv, 1856, pp. 3—5.

S.
Description of New Species of Shells collected by Mr. T. Bridges in the Bay of Panama and its vicinity, in the Collection of Hugh Cuming, Esq.
Ditto, pp. 159—166.

T.
Description of New Species and Varieties of *Calyptraeidae*, *Trochidae* and *Pyramidellidae*, principally in the Collection of Hugh Cuming, Esq. [From American and other seas.]
Ditto, pp. 166—171.

U.
Descriptions of Shells from the Gulf of California, and the Pacific Coasts of Mexico and California. Part II. By A. A. Gould, M.D., and Philip P. Carpenter.
Ditto, pp. 198—208.

V.
Monograph of the Shells collected by T. Nuttall, Esq., on the Californian Coast, in the years 1834—5.
Ditto, pp. 209—229.

W.
First Steps towards a Monograph of the Recent Species of *Petaloconclus*, a genus of *Vermetidae*.
Ditto, pp. 313—317. (With wood-cuts.)

X.
First Steps towards a Monograph of the *Cacidae*, a Family of the Rostriferous Gasteropoda." [Chiefly from the American seas.]
Ditto, Part xxvi, 1858, pp. 413—444.
A.

SUPPLEMENTARY REPORT

ON THE

PRESENT STATE OF OUR KNOWLEDGE

WITH REGARD TO

THE MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

BY

PHILIP P. CARPENTER, B.A., PH.D.

From the Report of the British Association for the Advancement of Science, for 1863, pp. 517—686. Published in August, 1864. Extra copies, with title-page, dated 1864.

(1)
SUPPLEMENTARY REPORT

THE PRESENT STATE OF OUR KNOWLEDGE

OF

THE MINERAL RESOURCES OF NORTH AMERICA.

(1)
Supplementary Report on the Present State of our Knowledge with regard to the Mollusca of the West Coast of North America. By PHILIP P. CARPENTER, B.A., Ph.D.*

The object of the present Report is (1) to correct the errors which have been observed in the first Report ("Report &c.") 1856, pp. 159-368; and (2) to point out the fresh sources of information which have been rendered available since that period. For convenience of comparison, the paragraph numbers refer to those of the first Report in the corrections, and are continued from them in the addenda. In the bibliographical portion, the criticisms by the writer of this Report are inserted in [ ]; a distinction not always attended to in the former volume, in consequence of which erroneous names and localities have been attributed to the reviewer, instead of to the authors quoted.

22. Introduction.—(Line 4 from bottom.) The river Willamette flows northwards (Gld.).


The types are too much worn to decide whether they came from the North Pacific or (as is more probable) from the Mediterranean. In Gmelin's edition of Linnaeus, Lipsie, 1788-1790,—which is, in great measure, a translation from a German work published a few years in advance [teste Hanley],—the following species are assigned to the "West Coast of America," probably on the authority of Martyn:—page 3529, Murex foliatus : 3702, Patella peetens : 3712, Patella calyptra. The last two seem exotic.

Many West-coast species had found their way into English collections during the last century, at a much earlier date than was expected at the time of the first Report. They were mainly derived from the voyages of Capt. Cook and other circumnavigators. Capt. Cook was accompanied by Solander, as naturalist, at the instance of Sir Joseph Banks. His shells passed into the hands of Mr. Humphrey, the dealer, at whose death the remainder, a thousand boxes, became the property of the elder Sowerby, and (in part) of Mawe [teste Hanley]. They took their chance of being figured or described by the early conchologists. The localities are (as might be expected) often interchanged, but have been quoted by later authors, who have not thought fit to avail themselves of more correct sources of information.

The first accurate delineations are by Thomas Martyn, in his "Universal Conchologist," London, 1784. Those who only know this book from Chenu's reprint, Paris, 1845, can form but a poor idea of the exquisite beauty of the original work. Of this, very few copies are accessible; but it may be consulted at the British Museum, the Royal Society, and the Royal College of Surgeons.

No. Plate. Fig.
16 5 3. Patella trimosocera, Mart. N.W.C. America, very rare. [N. Zealand.]
18 6 1. Patella calyptra, Mart. N.W. Coast of America, very rare. [Not identified: resembles Crep. adunca, without deck. Hanl. considers it a Hippopus, like australis.]
31 8 4. Trochus inaequalis, Mart. Friendly Isles, common. [Does not closely resemble the Japan and Vancouver species,—Pachypoma gibberosum, Chenn.]
32 10 1. Trochus canaliculatus, Mart. N. Zealand, rare.
33 10 2. Trochus annulatus, Mart. N. Zealand, very rare.
34 10 3. Trochus costatus, Mart. St. George's Sound, rare. [=Calliostoma filosum, castaneum, ligatum, and modestum.]

* In consequence of the expected arrival of fresh materials, this report has been corrected and continued up to the period of going to press.

Warrington Free Museum and Library, Aug. 1st, 1864.
Many of the figures of Martyn were reproduced by Chemnitz, in his comprehensive continuation of Martini's 'Conchylien Cabinet,' 1780-1795. Unhappily, though often quoted for generic and specific names, he did not adopt the binomial nomenclature (except in vol. xi.), but described each shell in two or more words, as it happened. For this reason he appears to have had no scruple in altering previous designations, as follows:


1634. Murex Glomus cenus, seu Cereus conglomeratus, "Mart. vol. ii. f. 43; Ridged Buccinum liratum from King George's Sound."

Vign. 21, f. A, B. Buccinum composum, "Mart. Un. Conch. vol. ii. f. 44; Plaited Buccinum from King George's Sound."

Vign. 23, f. A, B. Trochus gibberous Nova Zelandiae. "Forster's Cat. no. 1374; La Rabotense de la nouvelle Zelandie.—Mart. Un. Conch. vol. i. f. 31; Rugged Trochus inequalis from Friendly Is."

1579, 1580. Trochus dolitarius, "Mart. vol. i. f. 32, Fluted Trochus cancellatus from N.W. coast of America."


1841, 1842. Murex amphistre. N.W. coast of America. [This erroneous locality is copied from the Portland Cat. The species is quoted from Buccinum (Latiur) aplansttre, Mart., no. 3. pl. 1. f. 3, where it is rightly assigned to the Friendly Is. =M. argus, var. y. Gmel., teste Dillw. vol. ii. p. 783.]

The assignment of West American species to New Zealand, begun by Martyn, has continued a source of error to the present time. It occurs in Dr. Gould's 'Exploring Expedition Mollusca,' in the Cumingian Collection, and in the British Museum.

In the 'Travels in New Zealand,' by Ernest Dieffenbach, M.D., London, 1843, vol. i. pp. 228-264, is given a "Catalogue of the Species of Mollusca and their Shells, which have hitherto been recorded as found at New Zealand," &c., by J. E. Gray. The author premises that some of the species [marked *]
assigned by the older writers may be found erroneously placed. The following are probably from the West coast of North America, with the synonymy as understood by Dr. Gray:—


But the first authentic information on the molluscs of the North-western coast is given in the 'Voyage Round the World, but more particularly to the N.W. Coast of America,' by Capt. George Dixon, London, 1789: to which is added a Natural History Appendix.

Page 355, fig. 2. Solen patulus*. Cook's River. [= Machera Nuttalli, Conr.]

In the 'Conchology, or Natural History of Shells,' by George Perry, London, 1811, a work of no little pretension, yet singularly inaccurate, are figured the following species, but without authorities for the assigned localities:—

* As this extract is probably the first description on record of molluscs from the Pacific shores of N. America, by the original collector, and as the book is rarely to be met with, it may be interesting to quote the passage:—

"At the mouth of Cook's River [lat. 59°-61°] are many species of shell-fish, most of them, I presume, undescribed; and of all which I should have endeavoured to have got specimens, had business permitted. Among the bivalves we noticed some of a large species, of the Cardium or cockle-genus [Cardium corbis, Mart.], half-a-dozen of which would have afforded a good supper for one person; but, for a repast of that kind, our men preferred a large species of the Solen genus, which they got in quantity, and were easily discovered by their spouting up the water as the men walked over the sands where they inhabited: as I suppose it to be a new kind, I have given a figure of it in the annexed plate [Solen patulus; accurate external and internal views, size of life]. 'Tis a thin brittle shell, smooth within and without: one valve is furnished with two front and two lateral teeth [the 'lateralis' are the nymphæ for the ligament]; the other has one front and one side tooth, which slip in between the others in the opposite valve: from the teeth, in each valve, proceeds a strong rib, which extends to above halfway across the shell, and gradually loses itself towards the edge, which is smooth and sharp. The colour of the outside is white, circularly, but faintly, zoned with violet, and is covered with a smooth yellowish-brown epidermis, which appears darkest where the zones are: the inside is white, slightly zoned, and tinted with violet and pink. The animal, as in all species of this genus, protrudes beyond the ends of the shell very much, and is exceeding good food.—A fine specimen of this kind is in the Collection of John Swainson, Esq., of the Custom House, London.—We saw also, on this coast, a kind of muscle, in colour and shape much like the common eatable muscle of Europe, but differed in being circularly wrinkled, and a great deal larger [Mytilus Californianus, Conr.]. One valve I saw at Queen Charlotte's Islands measured above nine inches and a half in length.—With pieces of these muscles, sharpened to an exquisite edge and point, the Indians head their harpoons and other instruments for fishing. They fasten them on with a kind of resinous substance."—Dixon's 'Voyage.'
Solander made use of the materials he had collected in Cook’s Voyage, in compiling a work on Conchology of considerable merit. Dillwyn made a copy of it, and used it in preparing his own, allowing priority to its specific names; but it was never published. The types were lately parted-with by the Linnean Society, who had determined not to keep any collections except those of Linneus. The ‘Descriptive Catalogue of Recent Shells,’ &c., by L. W. Dillwyn: London, 1817, is considered by Dr. Gray to be the best conchological work arranged according to the old system. The following are quoted from the West Coast:—


Following Dillwyn, and nearly eclipsing his fame through the originality and excellence of his classification, appeared Lamarck’s ‘Animaux sans Vertébres,’ 1818–1822. Coordinate with or preceding this work are his Articles in the ‘Annales du Muséum’ and the ‘Encyclopédie.’ The fresh sources of his information are quoted in the first Report, p. 169.

In Delessert’s ‘Recueil,’ 1841, are figured

Pl. 10, fig. 2. *Cytherea semitamollosa*, Gaudichaud [= *C. lupinaria*]. China Seas.

In Deshayes’ invaluable edition of the ‘An. a. Vert.,’ Paris, 1835–45, are quoted a variety of West Coast species which have already appeared under their original authorities. The following may be added:—


The last of the early writers whose works should here be quoted, and whose ideas on the relations of genera were considerably in advance of the age, though somewhat fanciful, is Swainson, in his ‘Zoological Illustrations,’ 1820–1833; ‘Appendix to the Sale Catalogue of Mrs. Bligh’s Shells,’ 1822; and ‘Exotic Conchology,’ 1821–1835, reissued by Hanley, 1841. These works contain the following West Coast species:—

* This work has been translated into French, and republished, by Chenu; where the same species is found on page 8, pl. 3. f. 2.


6. *Harpa crenata*, Swains. [\textsuperscript{?}]

8. *Strombus granulatus*, Swains. [\textsuperscript{?}]

Exot. Conch. Plate.


55. *Solen ambiguus*, Lam. N. America, 1820. [This shell is conspecific with the "S. medius, Alashka," of the B. M. Coll.; differing somewhat from the *S. ambiguus* as figured by Delesser.] The B. M. locality is perhaps erroneous.

24. Valenciennes' Memoir on Humb. and Bonpl., 1833.—The following notes are from a study of the complete copy in the Libr. Roy. Coll. Surgeons.

Page.

292. *Donax radiata* [\textsuperscript{=} var. of *D. punctatostriatus*, H. n. 1843].

210. *Venus succincta* [\textsuperscript{=} Chione Californiensis, Brod. 1835].

245. *Bulinus undatus*. [The Caribbean, not the Mexican, type is here figured.]

287. *Haliotis Californiensis* [\textsuperscript{=} *H. rufescens*, Swains., not *H. Californiensis*, Swains.].

287. (Add) *Haliotis turbulenta*, Val. Tropical America. [The description accords with the young of *H. Cracherodii*, Leach.]

277. *Cerithium musca*. [Description accords with *C. maucolum*, Kien.]

278. *Cerithium granosum* [\textsuperscript{=} Cerithidea varicosa].

279. *Cerithium fragaria* [\textsuperscript{=} Rhinoclavis gemmata, Hds.].

282. *Cerithium vasicum* [\textsuperscript{=} Cerithidea varicosa, Sby.].

308. *Strombus cancellatus*. Closely resembles *Ilostellaria fisuurella*, from Grignon. [Perhaps E. Indian.]

338. *Conus scalalis* [\textsuperscript{=} *C. gradatus* (Mawe), Wood's Suppl.].


265. *Natica Bonplandi*. [The figure exactly represents *Neverita palata*, Sby.]


317. *Purpura semi-imbricata*, Lam. [An. s. Vert. vol. x. p. 84, no. 39; not since identified from the brief description. Perhaps = *Cuma costata*, B. inv.]

287. *Fusus turris* [\textsuperscript{=} *F. Dupetithouarssii*, Kien.].


295. *Ficula ficoides* [\textsuperscript{=} decussata].

296. *Pyraula spirata* [\textsuperscript{=} Rapa, jun.].

25. Coquille.—All the limpets quoted are South American.

26. Eschscholtz.—The following observations may be useful to the student:

10. *Murex fergusineus* [\textsuperscript{=} Purp. crispata, Chemn., var.; varices few, scarcely frilled].

11. *Murex lacteua* [\textsuperscript{=} Purpura crispata, Chemn.].

11. *Murex multicostratus* [is not *Trophon clathratus*, as supposed by Midd.; but probably = *T. Gunneri*. It resembles *T. laciniatum*, Mart. (Falkland Is.) on a small scale; varices coronated, without spiral sculpture].


18. *Aemoc mamillata*. [The 'crowded tubercles' were perhaps due to nullipore.]

19. *Aemoc cassis* [if a northern shell, is perhaps the strongly ribbed var. of *pelka*; but the figure accords best with the Cape Horn species, *P. enea*, Mart.].

20. *Aemoc digitalis* [is perhaps distinct from the variable *persona*; but passes into it by easy transitions].
27. Tankerville Cat., 1825.—The following species are also from the West Coast. The prices are added from the British Museum copy, as a record of their former rarity:

<table>
<thead>
<tr>
<th>No.</th>
<th>App. page</th>
<th>Price</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td></td>
<td>£10</td>
<td>Solen ambigua</td>
</tr>
<tr>
<td>161</td>
<td></td>
<td>10s.</td>
<td>Tellina operculata</td>
</tr>
<tr>
<td>162</td>
<td></td>
<td>5s.</td>
<td>Tellina juncea</td>
</tr>
<tr>
<td>206</td>
<td></td>
<td>30s.</td>
<td>Lucina Childreni</td>
</tr>
</tbody>
</table>

The only known locality is Cape St. Lucas.

In the 'Zoological Journal,' London, 1824–1829, appear descriptions of the following species:

Vol. i. March 1824, 60. Natica patula, Sby. "Brought from S. America by M. de Humboldt. 2 specimens only known."*

" Oct. 1824, 369. Cypraea subrostrata, Gray. Nehoue (Mus. Sby.). ['Probably fossil' (Gray): a white, smooth species, not to be confounded with Trivia subrostrata.]


363. Cypraea subrostrata, Gray [bis, Trivia]. ?—


28. Beechey's Voyage.—Increased study has supplied the following corrections:

* At p. 511, note * Dr. Gray states that the Natica patula, Barnes, Ann. Lyc. Nat. Hist. N. Y., Sept. 1824, i. 133, is "the shell described under that name by Sby. As there is another N. patula [? ubi], must be called by Mr. Barnes's MS. name of N. helicoides." Also that Dolium dentatum, Barnes, loc. cit. = D. ringens, Sby.
The types of the species described from this important voyage have been scattered. Some have been identified from Admiral Sir E. Belcher's Collection, which he kindly allowed me to examine for that purpose; others are in the possession of Mr. Hanley; but many appear hopelessly lost.

29. Wood's Ind. Test.—In Hanley's Revised Edition of this important work (London, 1856), several new localities are added from the writer's varied experience, and the synonymy is most carefully elaborated. No other book contains such a mass of trustworthy information on the old species in so small a compass. The following are quoted, either as original authorities, or for locality or synonymy:—

Page. Fig. 2 10. Chiton tunicatus, Wood, Gen. Conch. 1815, pl. 2. f. 1 [=Katherina Douglassia, Gray]. Sitka.
3 18. Chiton lineatus, Wood, Gen. Conch. 1815, pl. 2. f. 4, 5. Sitcha, North Calif. [Mr. Hanley believes that Sitka is the island in Lat. 55°, and that Sitcha is in the district now known as Washington Territory, olim Oregon.]
21 8. Tellina rugosa, Born. Is. of Opara, New California. [Pacific Is.]
88 31. Cyprea onyx, Gray (quasi Lin.) = C. adusta, Chemn. [Pacific Is. The San Diegoan shell is closely allied, = Luponia spadicea.] ‘Calif.’
99 35. Voluta incrassata, Dilly; posterior to O. angulata, Lam. Centr. Am.
REPORT—1863.

1. Donax stultorum, Mawe, l. e. pl. 9. f. 7; = Trigona st., Gray, Analyst, 1838. ? S. America [=B. crassatelloides, jun. Calif.]


3. Area pectiniformis, Gray (Pectunculus), non Lam. = P. inaequalis, Sby.


5. Voluta lena, Mawe. Pan.


8. Voluta tabescosa, Mawe = O. undulata, Ducl. (Lam.) Pan.


21. Trochus undosus, Wood = T. undatus, Mawe, Conch. no. 146 (not described); = T. baleinarum, Val. Calif.


31. Voy. Beagle.—The Triton scaber is rightly assigned to S. America: there is no satisfactory evidence for its appearance on the N. W. coast. The shells so quoted are probably either imported from the Magellan district, or are Priene Oregonensis, jun., or Ocinebra, var. aspera.

36. Duclos.—The original article is in the 'Annales Nat. Sc.,' May 1832, and contains the following species:—

1. Purpura canaliculata, Ducl., resembles P. succincta on a small scale. Cal.; very rare. [Figured with 10 principal and a few intercalary ribs. = P. decemcostata, Midd.]

2. Purpura melone, Ducl. ?—[Panama.]

3. Purpura centiquadra, Val. MS. [Ducl. states that Val. altered his own name to spectosa while the sheet was passing through the press. The latter, however, bears date 1833.]

4. Purpura sphæridia, Ducl. Cal. [A well-known Sistrum from the Pacific Is.]
The species quoted appear in the text from Guérin, which appear in the Mag. Zool. for 1844, also appear here with the early date. *Oliva polypaster*, a southern form, from Guayaquil, &c., is distinct from all varieties of the Gulf species, *O. Cumingii*; it bears date 1839. In the same vol. are described and figured—

2. *Calyptrae (Calypeopsis) rugosa*, Less. Payta, Peru. [=Cruc. imbricatum, without pits.]

23. *Conus hieroglyphus*, Ducl. Probably Cal. [A Pacific form, like *C. abbreviatus*.]

27. *Cypraea eglandina*, Ducl. Cal. [A starved var. of *Aricia arabica*, Pacific Is.]

38. *Lady Douglas* (afterwards known as Lady Wigram).—*Placunamonia cepio*. [The type is an old shell, with faint ribs.]

*Placunonmania alope*. [The type is a young shell, with small scars and faint ribs. The large series of specimens examined in the Smithsonian collections proves that these forms are among the many varieties of *P. macroschisma*. The Indians have a superstitious dread of handling it. Many more species have since been detected in the Brit. Mus., from the late Lady Wigram's valuable donations, including *Macoma inquinata*, Desh., described from her specimens; but, as they are evidently from mixed localities, it has not been thought necessary to catalogue them.]

39. *Nuttall*.—The verification of Conrad's species being of considerable importance, I made diligent search for the original types during a recent tour in the United States. The supposed collection at Harvard University, Cambridge, Mass., has not been discovered by Professor Agassiz. The inquiries which Professor Longfellow kindly made at my request resulted in information that it was "in Dr. Wyman's Mus. Nat. Hist., in the granite building on Howard Street;" but no opportunity has been afforded of collating it, or even of verifying its existence. Dr. Jay rendered me every assistance in studying the types which he has catalogued in his collection, now rearranging in his residence at Memironeck, near New York, and gave such duplicates as could be spared for the Smithsonian Museum. Several species, however, were not to be found, and some were clearly erroneous, as e.g. *Chama "exogyra", Conr.," which proved to be *C. lobata*, Brod.; *W. I.*, teste Cuming; China, Brit. Mus. The most satisfactory information was derived from an interview with Mr. Conrad himself at the Acad. Nat. Sci., Philadelphia, where the honorary curator, Mr. W. G. Binney, afforded us all possible aid in eliminating types from the collections of the Academy and of private conchologists in the city. Mr. Nuttall's death (the news of which was received soon after) prevented his revising the corrections thus obtained. As he had previously presented a duplicate series of his shells to the Brit. Mus., which had been incorporated with the general collection, and had signified to me his intention to leave the unique specimens to the nation, I at once communicated with the survivors and with Dr. Gray, who was fortunate enough to stop the intended sale, and to secure the shells, which were kindly presented by the executors. They are now mounted, and kept in drawers adjoining the Reigen collection, the Vancouver collection, and the Smithsonian typical collection of East Coast N. American shells. The following is a résumé of corrections obtained from these different sources, numbered, to correspond with the list, Rep. pp. 194–201:—

2. "Parapholas" *penita* [is a *Pholadidea*].

3. *Platypodon cancellatus* [= *Cryptadonta myoides*, Nutt. MS.].


11
Gray. Mr. Nuttall only brought home young specimens of this extraordinary shell. In its adult state it assumes either a transverse form (=copax) or the elongated condition, redescribed in a fossil state as new. Between these there is every gradation, as can be traced in the magnificent series in the Smiths. Mus.; and a caskful of the animals in spirits, of various ages, has affiliated the large shells to the original Nuttallian specimens.

10. *Pandora punctata* [is a Clidiothora. The series so named in the Nuttallian collection belongs, however, to the Atlantic *Cl. trilineta*].

11. *Solecurtus lucidus* [is almost certainly the young of no. 12. The amount of obliquity in the internal rib is extremely variable in the adult specimens].

12. *Solecurtus Nuttalli [=Machera patula, Dixon,=Animalis, Gmel., teste Hds. in Mus. Cum. Mr. C.'s "grandis, var." from Monterey, suits in its proportions for the adult of *S. lucidus*. The shell has been widely distributed by commerce, and appears to extend far in a northerly direction. The animal is very beautifully fringed].

14. *Solecurtus Californianus [=S. Dombeyi, teste Mus. Cuming; non Hanl. MS.].

15. *Psammobia Pacifica* [is a *Heterodonax*, probably identical with the W. Indian *H. bimaculata*, which is found abundantly in its many varieties at Acapulco; =*Tellina vicia*, C. B. Ad.].

17. *Sanguinolaria Californiana [=Macoma inconspicua, Brod. & Sby., and is a northern species].

18. *Sanguinolaria rubroradiata* [is the young of a large species of *Psammobia*].

22. *Tellina alta* [= (from types) *Scrobicularia biangulata*, Cpr.].

23. [=*Macoma edulis*, Nutt.; a northern variety of *M. secta*, no. 25, and quite distinct from *M. edentula*].

26. The locality is not confirmed, and it is probably erroneous.

27. [Dr. Gould considers his *D. obesus* a distinct species; from a large series, it appears identical.]

28. 29. [These species of *Stanella*, described from young specimens, were found of very large size by Dr. Cooper, with what may prove a third species, perhaps *S. nasuta*, Gld., *olim*.

30b. *Petricola carditoideï* [with *P. arcuata + cylindracea*, Desh., are varieties of *P. Californica*. The series preserved in the Smithsonian Museum connects all the extreme forms].

32. *Mysia tumida*, Conr. MS. [= *Diplodonta orbella*, Gld., and belongs to the section *Sphaerella*, Conr. The label had been assigned by accident to a young valve of a Chione, probably from the Sandwich Is.].

33. *Tapes staminea*. [This is the extreme southern form of a widely diffused and very variable species, of which the normal condition is *Saxidomus Petiti*, Desh., =*Venus rigidia*, Gld. *pars*. The principal varieties have been named *Tapes diversa*, Sby. =*Venus mundulus*, Rve., and *Venus ruderata*, Desh.]

34. [The Californian *Saxidomé* divide themselves into three groups: the large, southern, oval, grooved shells =*S. aratus*, Gld.; the subquadrature, comparatively smooth, northern shells =*S. squallidus + giganteus*, Desh.; and an intermediate form, which is the true *S. Nuttalli*, Conr. Some of Mr. Nuttall's specimens were, however, the young of *S. aratus*, of which the adult was not known till very recently.]

35. [The young of this *Pachydesma* is "Trigona stultorum, Gray." Desh. MS. in British Museum.]

36. *Cytherea callosa* [= *C. nobilis*, Rve. It is not a *Dosinia*, but the type of a new subgenus, *Amantis*, differing from *Callista as Mercenaria does from Venus*].

37. Plate 19, fig. 16 (not 14 nor 15). [The true *Venus Nuttalli* of Conr. (teste Conr. ips. and types in Mus. Phil. Ac. and Jay) is not the shell here catalogued, which generally goes by that name, but is a synonym for the *V. Californiensis*, Brod., =*succincta*, Val. The error was corrected in the Mus. Cum. in time for the right shell to be figured by Reeve in his recent monograph. It is doubtful what name Conrad intended for the shell here catalogued, which belongs to the group of *Stutchburyi, fluctifraga*, &c. If really distinct from the latter, it may stand as *Chione callosa*, Sby. jun. (no Conr.)]

38. *Venus Californiana* [(teste Conr. ips.) was intended for *V. Californiensis*, Brod. Not having access to the type, it could hardly be recognized by the
brief diagnosis. The name should therefore be dropped. The shell, pl. 19, fig. 15 (not 16)—*Chione simillima*, Sby., no. 39; a good Lower Californian species. It seems that the error was not in numbering of the figures, as Mr. Nuttall supposed, but in Conrad's identification of Broderip's species].

40. *Chione excava*ta [is closely related to *Ch. succinea*; the unique type, however, in Brit. Mus. displays characteristic differences of sculpture. It is singularly like the W. Indian *Ch. cancellata*, and may prove exotic.

41. *Cypricardia Californica [= C. Guinacea, Lam., = C. Duperyii, Desh. Almost certainly from the Sandwich Is.].

45. 45b. *Cardium Californianum [= C. Nuttallii, var. The species is named "C. corbis, Mart.," by Desh. MS. in Mus. Brit. and Cuming].

40. *Cardium quadrupenorum [= C. luteolabrum, Gld.].

51. v. anted, no. 32.

51. Madiola recta. [Described from very young specimens. The broad form is *M. flabellata*, Gld.]

50. *Mytilus bifurcatus*. [The type is lost; the figure and description would suit many species. It is allocated, in Mus. Cum., to the Californian *Septifer*, but by Pease to a Sandwich Island *Mytilus*.]

50. [None of Conrad's species of *Isogonocon* have been confirmed as from California. They are known to inhabit the Pacific Islands.]

62b. [Mr. Nuttall also brought an oyster, which he named in MS. *O. latecauda*, = *O. lurida*, var.; and *Hinnites giganteus*, Gray, = *H. Poulsomi*, Conr.]

64. [Dr. Gould states that *H. Nickliniana*, Lea, = *H. Californiensis*, Pfr., Chemn., Rve.; but that *H. Californiensis*, Lea, is distinct.]

65. Heliz Tonsenendiana [= *H. aeruginosa*, Gld. MS.].

74. Chiton Nuttallii [is an *Ischnochiton*.]


77. Patella mamillata, Nutt. [(non Esch.) is now assigned in Mus. Cuming to *Aeacea scabra*, Nutt., var. limatula].

63. Fissurella ornata, Nutt. [= *F. volcanica*, Rve.].

64. Glyphis densicostatrus, Rve. [V. anted, p. 522. The shell has been lost.]

65. *H. Californiensis*, Swains. [(not Californiana, Val., = *rufescens*), is an extreme var. of *H. Cracherodii*. The series in the Smithsonian Mus. have 5, 6, 7, 8, and 9 holes; as soon as it has 10 and 11, it passes into *Californiensis*, which was figured in 1821 with 9 holes. When these are numerous, they are generally small in proportion.]

91. Calioldostra dolhirum [= *C. canalicularum*, Mart. This and *C. annulatum*, Mart., are quite distinct from *C. flosum*, which = *C. costatum*, Mart.]

92. Omphalius aster [is the S. American species. The common Californian shell is]

94. O. marginatus, Nutt. MS. [= *funescens*, A. Ad.].

97b. The collection contains one specimen of *Crepidula dorsata*. [Is a *Serpulorbus*, without operc., teste Cooper.]

106. Litorina linebrata [should be patula, Gld. (non Jeffr.). Nuttall's MS. name was published by Phil. in 1845].

107. Nativa *maroccana* var. *Californica*. [The varietal name must be dropped. The shell certainly came from the Sandwich Islands.]

108. [The shell is *Vitularia sadlebrosa*, jun., and not] Ranella *triquetra*.

109. Mitra *maura* [Swains., teste Rve. (? ubi) = *M. orientalis*, Gray, = *M. "Chi-

110. Olivella glandinaria, Nutt. [= *O. biplicata*, Sby.,].

111. 113. *Perpura aperta* and *P. harpa* are certainly from the Sandwich Islands].

114. *Perpura emargi*nata [was described by Desh. from an immature specimen in which a half-formed knob caused an "emargination." The adult is one very extreme form; *P. ostrina*, Gld., is another; *P. fusca*ta, Fbs., is a third. The normal condition is *P. lapillus*, Cooper (non Linn.), = *saxicola*, Val. Mr. Nuttall's collection also contains *P. crispata*, var.]

115. *Monoceros brevidens* [is an accidentally short-toothed form of *M. lapilloides*].

115. *Cerostoma Nuttallii* [with *C. foliatum* and *C. monoceros*, Sby., belongs to *Per-
purida*].

13.


Area trapezia [= A. tuberculosa].

Saxicava lepum [= S. pholadis; from hole of Lithophagus].

Petricola arcuata [= the normal state of P. carduoides, Conr.].

Petricola cylindracea [= a short form of the same sp., developing ridges of growth, like Tapes ruderata, Desh.].

Venerupis gigantea [= Saxidomus squamulidus, Desh.].

Cymricardia Duperreyi [= C. Guinanaica, Lam., = C. Californica, Conr. A Sandwich Island species, twice quoted, but not confirmed, from Cal.].

Cardium Laperoussii [is an Aphrodite, like Granlandicum, but more transverse, and with lateral teeth less developed. This very rare and probably boreal shell has just been identified from Adm. Sir E. Belcher's coll.].

Cardium Californicum, Desh. [is not C. Californianum (= Nuttallii), Conr.; but = C. pseudofossile, Rve., 1844. The name of Desh. is unfortunate, as his shell is the Kamtschatkan form with strong ribs. The Californian form is smaller, with fainter ribs, = C. blandum, Gld.].

Purpurea Freydenii [is figured from a very extreme form of the Japanese species. P. ostrina passes into similar varieties].

Velutina Mülleri [probably = V. lavigata, which reaches Vancouver].

Lucina cristata [= Tellidora lumulata, Holmes; described from the Pleistocene of S. Carolina, and lately dredged alive by Dr. Stimpson; not T. Burnett].

The following may be added to Deshayes' list:—

Pl. 81. Tellina ligamentina, Desh., 1843. Hab. — [= Macoma secta, Conr.] Tellina Japonica, Desh., in Mus. Cum. [also appears to be M. secta, jun.].

In Valenciennes' plates to the Voy. Ven. have been recognized the following West Coast species and synonyms, in addition to those quoted in Rep. pp. 203-204:—

Plate. Fig.

2. Trochus diadematus, Val. [resembles Pomaulax undosus, jun., but the surface is faintly wrinkled all over; umbilical region not chiseled; and operic. not ridged. It is probably intended for Psachypoma gibberosum].

 medio-costatus; fig. with very broad, smooth, close ribs, scarcely indented, except in the middle].

3. Venus ectunculoides, Val. [is probably T. grata, not histrionica].

Cardium subelongatum (Rve.), Val. [appears = C. procervum, jun.].

10. Murex aciculiger, Val. [is represented with labral tooth and closed canal; but resembles C. festivus, Hds.].

16. Venus Thomsoni, Val. [= multicosata, Sby.]; figured with very broad, smooth, close ribs, scarcely indented, except in the middle].

4. Trochus rubiginosus, Val. [probably = T. annulatus, Mart.].

2. Trochus pellucidus, Val. [resembles T. luna, Panama].

Buccinum Prevosti, Val. [probably = Psama pagodus].

1. Purpura bufoides, Val. [appears one of the many vars. of P. biserialis].

9. Purpura ryestrasi, Val. [probably = Monoceros lugubre, jun.].

10. Murex aciculiger, Val. [is represented with labral tooth and closed canal; but resembles C. festivus, Hds.].

3. Murex tortus (Brod.), Val. [resembles Ph. princeps, with a very poor operic., badly drawn].

17. Cardium subelongatum (Rve.), Val. [appears = C. procervum, jun.].

18. Pecten comatus, Val. [may be = hastatus, jun.; but, although figured with out the red spot, it most resembles Hin. giganteus, jun.].

19. Pecten exovatus, Val. [= Janira dentata, Sby.].

3. Pomatia, Val. [may be = P. ventricosus, jun.].

4. Rastellum, Val. [= P. hastatus, jun.].

21. Ostrea gallo, Val. [= Acapulco,] with large plates, = O. megodon, Hanl.]

22. Cardita arcella, Val. [= Ven. radiata, Sby.].

2. Modula (Lam.), Val. [= Lazaris affinis].

3. Turida (Lam.), Val. [= Ven. laticostata].

5. Michelini, Val. [= V. Cevar].

23. Nucula diversicata, Val. [probably = N. castristaurus].

24. Penitella Conradii, Val. [may be = Pholadidea ovoidea].
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

Plate. Fig.

1. *Peniella xilophaga*, Val. [may be the adult of fig. 4].
2. *Peniella a tubigera*, Val. [may possibly be intended for *Ph. penita*].
3. *Pholax rostrata*, Val. [is probably = *Netastoma Darwinii*, Sby. jun.].
4. *Unguilla luticola*, Val. [may be an extremely bad *Petricola robusta*].
5. *Cerbula luticola*, Val. [is probably = *Sphenia fragilis*].
6. *Borrnia luticola*, Val. [= *Kellia Laperoussii*].

The identification of these species is attended with great uncertainty, as the types have not been seen, and the artist appears to have studied effect rather than accuracy.

42. *Voyage of Sulphur.*—The types of these species appear to have been scattered. Only a part are now to be found in the very valuable collection of Admiral Sir E. Belcher, in which most of the shells are, unfortunately, destitute both of names and of locality-marks.

*Murex Belcheri* [belongs to Purpuridae, and may be considered the type of the genus *Chorus*].

*Ranella Californica.* [After comparing a series with the Cumingian specimens of *R. ventricosa*, it appears that the diagnostic characters are not constant.]

*Marginella sapotilla.* [The type in *Mus. Cuming* is much smaller than the ordinary condition of *M. prunum = cerulescens*, Lam., to which species the common Panama shells were referred by Mr. Cuming. In his collection, however, they stand thus:—Ordinary Panamic type "sapotilla, Hds.: 5–13 fms., sandy mud, Panama, *H.C.*" Another tablet of the true Panama shells "Marginella, n. sp., Panama,"—"San Domingo"—having been crossed out. The small West Indian form, analogous to the typical *sapotilla*, is given as "glaens, Mke." The large West Indian shells, with violet tinge behind the labrum, are "cerulescens, Lam., Panama," without authority. Another series of the W. Indian type is given as "cerulescens, var., Lam., 10 fms., sandy mud, Panama," without authority. Either habitat-errors have crept into the Cumingian labels, or else Mr. Redpath's observation will not hold, viz. that the Atlantic shells have a posterior pinch on the labrum, which is not seen in the Pacific. All the authentic series examined from the two coasts bear out his view. There will be two opinions as to whether this be more than a mere local distinction.]

*Solarium quadriiceps.* [On comparing suites of *S. granulosum* from the Texan coast with series from the Gulf of California, it appeared that on each side of the Peninsula the shells went through similar changes in strength of sculpture, size of umbilicus, number of spiral granules, &c.; nor could any clue be obtained by which the coasts could be separated in a mixed collection. Hinds's shell stands at the furthest extreme of removal from *S. granulatum*.]

43. *U. S. Exploring Expedition.*—The shells of this Patent Office in Washington, D.C., where, notwithstanding the great care of Mr. Varden, the curator, they were not a little tampered-with. Dr. Gould laboured under great difficulties in his work of description; he had access only to that part of the collection which happened to be unpacked and exposed to view during the brief period that his professional engagements allowed of his visiting the capital; and his request to be allowed to take doubtful shells to Europe for identification was refused. The materials also were of an unsatisfactory kind, a large proportion of the specimens being much weathered, and many of the locality-marks being manifestly erroneous. If occasional errors have been detected in his great work, they may fairly be set down to causes over which the author had no control. Many of these 1863.
have been corrected by Dr. Gould himself, in his 'Otia Conchologica,' Boston, 1862, which contains the various papers in the 'Proceedings of the Boston Soc. of Nat. Hist.,' with an appendix. After the organization of the Smithsonian Institution, all the natural-history collections belonging to the Federal Government were transferred to its keeping, with liberty to exchange duplicates. The shells remained unopened, and the types not accessible, till, at the request of Professor Henry, I undertook the arrangement of the collections. Fortunately, a considerable part of the shells professing to be the figured types of the new species were found together, with the artist's marks corresponding with the plates and figures. The result of the examination, so far as the general collection is concerned, will shortly be prepared for the press; it is sufficient here to tabulate the observations on the N.W. American species, which were, as it happened, the most satisfactorily preserved in the whole series. The following additional particulars include the "Rectifications" in the 'Otia,' the paging of which is continued from the "Expedition Shells" quoted in Rep. p. 209. The quarto volume quoted in p. 210 is distinguished as "E. E. Mollusca." The folio atlas of plates bears date on title 1856, but was not published till 1861, teste Binn. Bibl. vol. 4, p. 504. The comparisons of types were made in 1860, from a proof copy.

Otia, Page.


220. **Chiton (Chetoopleura) vesprinetus.** Perhaps = Ch. lignosus, var. [A Mopalia, differing slightly in the amount of posterior wave. The fig. in E. E. Moll. is made-up from broken specimens.]

6, 242. **Chiton (Onithochiton) dentiens.** [The shell sent as type of this species, and all the others seen from the coast, agree in belonging to Ischnochiton, and are not dentate, as would be presumed from the figures and diagnosis. As Dr. Gould's toothed Onithochiton may hereafter be found, the Smithsonian shells have been named Isch. pseudodontiens.]

6, 242. **Chiton (Chetoopleura) muscosus.** [= Acanthopleura muscosa, H. & A. Ad. Gen., = Ch. ornatus, Nutt. P. Z. S. 1855, p. 232, + Mopalia consimilis, Nutt. MS. in B. M. This beautiful species is a true Mopalia.]

230. **Chiton (Leptochiton) intestrotontus.** Remsembles C. Sitchensis, Midd. [= Collochiton i., H. & A. Ad., Gen. It is a true Ischnochiton. The genera of Chitonidae cannot always be ascertainment by external characters alone, as indicated in Messrs. Adams's genera. All the species in the Smithsonian Museum have been dissected.]

7, 242. **Patella (Tectura) fimbriata** = P. cinis, Rve. [= Acmeea pelta, Esch.].

9, 242. **Patella (Nacella) instabilis.** [Varies greatly in proportions.]

9, 242. **Lottia (Tectura) pintadina.** [The types represent the normal condition of Acmeea patina. One variety is A. cribraria, Gld. MS. The specimens of A. mesoleus intermixed by Dr. G. in the Mexican War collections were, no doubt, affiliated by an oversight.]

10, 243. **Patella (Tectura) textilia** is a var. of T. persona, Esch. [A well-marked form of delicate growth, passing from A. persona into A. pelta, var.; from the young of which some specimens can hardly be distinguished, except by the frettet pattern.]

10, 243. **Patella (Tectura) scabra** = spectrum (Nutt.), Rve., not scabra (Nutt.), Rve. [The type-specimens belong to two species, f. 456, 456a, being A. spectrum, Nutt., while 456b represents the flattened variety of A. persona, Esch. (approaching the form digitals, Esch.). As the diagnosis best accords with the latter shell, P. scabra, Gld., may stand as a synonym of persona, var.; the intermixed specimen, accidentally figured as belonging to the species, being removed to spectrum, Nutt. Thus the name scabra, not being needed as first described, will remain for Nuttall's species, described by Rve., but first named in print by Jay.]
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 531

15. Crepidula lingulata. [Described from a worm specimen. Perfect shells cannot be separated from C. bilobata, Rve., = C. 2 dorsata, var. bilobata, Maz. Cat., nor from the supposed C. dorsata in Mus. Cum.] 15. Crepidula nummaria. [Described from an aberrant, worm, and rounded specimen. The normal state is C. narcicelloides, Nutt. When grown in hollow bivalves, it becomes nummaria: the contrary extreme, grown in crypts of borers, with another shell or crab over it, is explanata, Gld., = exuvia, Nutt., = perforans, Val. The Lessonoid form is C. fimbrirata, Rve. The young appears to be C. minuta, Midd. But the “C. nummaria, Gld.” of Mus. Cum., is quite a distinct species, not known from the American coast.

50, 244. Natica (Lunatia) caurina + [ = L. pallida, Br. & Sby.].
50, 244. Natica (Lunatia) soluta
52. Luctina carinata, Gld., Nov. 1848 [L. solidula, Lov., 1846. Finmark].
52, 53. Litorina lypida, scutulata, et plena [are shown by large series to be varieties of one species].
90. Litorina cineta, Gld., Aug. 1847, Puget Set. [ = L. Sitchana, Phil., 1845. This species appears to have been overlooked in the E. E. Moll.]
61. Cerithium irroratum, = C. obesus, Sby, sen., teste H. Cuming. The type proves this to be an E. I. species, and not the Panamic C. stercus-muscarn, Val., as supposed by Dr. Gld.: v. C. B. Ad. in loco.
64, 245. Fusus (Bela) fidicina.
64, 245. Fusus (Trophon) Orph danych [ = T. Fabricei, Moll., in Br. Mus.]
67, 245. Bucephum (Nassa, s. g. Trivia) fossatum. Cesia in Ind. p. 253. [= N. elegans, Rve., 1842, non Dujardin: = Zaphon e, Add.].
70, 245. Nassa (Trivia) mendica = N. Woodcardi, Fbs., 1850 [from types: + N. Gibbesi, Coop.].
71, 245. Columbiella (Alba) gausapata. [Belongs to the Nassoid group, Amycla.]
75. Mya preciosa [= M. trunciata. Scarcely even a variety; but approaches the form Aldrovandi.]
76, 245. Lutraria (Tresus) capax. [Dr. G. revives his excellent name; L. maxima, Jonas, 1842, being anterior to Midd. Conrad’s name, Schizothorus Nuttallii, is, however, very much earlier.]
77, 246. Ostoeodesma (Lyonia) bracteatum [= O. mldium, Gld., in different states of preservation, = L. Californica, Conr. The “golden nacre” of O. bracteatum is due to incipient decay, as generally happens in Anomiads].
83, 246. Cardita (Actinobolus) ventricosa. [Appears to be a local variety of the ancient Miocene species, Venericardia borealis; + C. occidentalis, Conr., + C. subtenta, Conr. (fossil) probably.]
83. Cardium blandum, 1850. [A finely grown var. of C. Californiense, Desh., 1839, Midd. (non C. Californiannum, Conr., 1837, = corbis, var.) = C. pseudo-fossil, Rve., 1844. The name is like the preoccupied Californiannum that it may advantageously be dropped.]
85. Venus rigida, 1850 [non Dillw. 1817. It is fortunate that the name is not needed, as the author has joined two very different species, both of which have other names. The original Latin diagnosis applies to the rough northern form of Tapes stamine, Conr., which is the Saxidomus Petiti of Desh., and includes V. ruderalis, Desh. But the “specimen, 3½ in. long,” which modified the description in the E. E. Moll., and is figured at f. 538, proves to be the adult form of Tapes tenerrina, Cpr., P. Z. S. July 1856, which is a Californian and not a Panamic species, as had been supposed from Col. Jewett’s label].
87, 246. Anodonta cognata = A. Orogenensis, Lea (probably).
87. Anodonta feminalis [ = A. angulata, var., teste Lea].
Otia, Page.
93. *Mytilus* (Modiola) *flabellatus*. [The northern form of *Modiola recta*, Conr. The "specimens from the Gulf of California" must have been *M. Braziliensis*, intermixed by accident.]

94. *Mytilus trossus* is a scarcely a variety of *M. edulis*, which is very abundant along the coast, under its usual modifications of form and colour; but generally of small size.

95. *Pecten hericus*, Gl. [= *P. hastatus*, Sby. sen.].

97, 246. *Terebratula* (Waldheimia) *pulcinata*.

97, 248. *Terebratula* (Terebratella) *caurina*.

E. E. Moll.

Page.

113. *Planorbis corpulentus* is of Say.

133. *Melania plicifera* is of Lea.

143. *Anodonta angulata* is of Lea.

206. *Scalariar* *australis* is abundantly confirmed from the Vancouver district. It should be called *Opalia borealis*, Gl.].

244. *Purpura ostrina*, Gl., "Otia," p. 225 [is an aberrant smooth var. of *P. lapillus*, Coop., non Ln.; the normal state being *P. saxicola*, Val.]

The following species, described in the 'Otia' and 'E. E. Moll.' as from 'N. Zealand' and an unknown locality, are really from Puget Sound.

Otia, Page.


B. A. Rep.

Page.

210. *Venus calcarea* [is correctly described by Dr. G. as from N. Zealand; although quoted by him as the Oregon analogue of *V. mercenaria*].

211. *Tellina California*, Conr. [= *Macoma inconspicua*].

211. *Triton tigrinum* [is from Central America, not Puget Sd.]

211. *Pecten Fabricii*, Phil. [is the young of *Islandicus*; Dr. G.'s shells are the young of *P.* ("rubidus, var.").] "Hindstei"

211. *Fusus cancellinus*. [Dr. G.'s shells are *Ocinebra*, var. *aspera*.]

212. *Purpura lagena*, Gl. [MS., is probably *saxicola*, var.].

213. *Pecten Townsendi* [has not been identified].

213. *Venus ampliata* [is believed by Dr. G. to have been first designated by him as a species, afterwards proved = *rigida* (Petitit), var.].

44. Middendorff.—The synonymy given in Rep. pp. 214-222 is that of the author, not of the writer of the Report, who is by no means prepared to accept the learned doctor's identification of species. The three Chitons quoted with doubt from Tilesius have not been confirmed, as from Kamtschatka, by any other writer. The *Ch. giganteus* has the aspect of the large *Ischnochiton Magdalenis*; the *Ch. maricatus* belongs to the *Lophyrus* group, which is not known so far north; and the *Ch. setosus* has also a S. American aspect. The treatise “De Chitone Giganteo Camtschatico additamentum ad Zoographian Rosso-Asiaticum, auctore Tilesio,” was read March 19, 1823, and published in 1824. It contains a very valuable and (for that period) remarkable account of the anatomy of Chitons, but it does not profess to name and describe species in the modern sense. The names, therefore, had better be dropped. Middendorff's new species were first described in the 'Bulletin de la Classe Physico-Mathématique de l'Académie Impériale des Sciences de St. Pétersbourg,' a work of which few complete copies are known in England, under the following dates.

April 20, 1847: vol. vi. No. 8 (total number 128).
Column.
117. Chiton Pallasi, n. s.
118. Chiton Brunetti, n. s.
119. Chiton Mertensi, n. s. [Ischnochiton].
120. Chiton Eschscholtzii, n. s.

119. Chiton Wosnessenskii, n. s. [A typical Mopalia: mantle indented behind.]
120. Chiton Merckii, n. s. [= Ch. lignosus, Gld., July 1846: = Mopalia Montereyensis, Cpr.].

126. Chiton lividus, n. s.
127. Chiton scrobiculatus, n. s., California.
128. Chiton Sitchensis, n. s.

Nov. 1847 (read April 28): vol. vi. No. 20 (total number 140).
317. Patella (? Acmea) ancyloides, n. s. [Probably a delicately grown young patina: the diagnosis, however, suits textilis. Name afterwards altered to personoides, to distinguish from Propildium ancyloide. Fbs.]
318. Patella (? Acmea) eruwigosa, n. s. [Probably = textilis, Gld., 1846; but the figure is more like scabra, Nutt.]
319. Patella (? Acmea) pileolus, n. s. [Probably the young of A. pelta; but assigned in Mus. Cum. to a very different shell, = A. rosea, Cpr.]
320. Patella (? Acmea) Asi, n. s. [A specimen of A. pelta, in Dr. Cooper's collection, began life as A. Asi.]
321. Patella (? Acmea) ceaco; genuine, vertice erecto, Atlantic.
322. Patella (? Acmea) ceaco, var. concentrica; vertice subinflexo; with crowded lamelle of growth.


241. Litorina gravis. [The specimens in B. M. and Mus. Cum. appear to represent a large var. of L. litorea.]
242. 2. Litorina Kurila (like tenebrosa).
243. 3. Litorina subtenebrosa. [Probably an extreme var. of L. Sitchana.]
244. 4. Tritonius (Fusus) antiquum, Ln., var. Behringiana.
245. 5. Tritonius (Fusus) Behringii.
246. 6. Tritonius (Fusus) Baerii.
247. 7. Tritonius (Fusus) Sitchense [probably = Chr. dirus, Rve., var.; but stated to be "e livido viridescente; columella sepius umbilicata"].
248. 8. Tritonius (Fusus) luridum [= Vitularia aspera, Baird, smooth form.]
249. 9. Tritonius (Buccinum) simplex.
250. 10. Tritonius (Buccinum) ochotense.
251. 11. Tritonius (Buccinum) undatum, Linn., var. Schantarica.
252. 12. Tritonius (Buccinum) ooides.
253. 13. Bullia ampullacea [is the genus Volutharpa of Fischer].
254. 15. Natella herculaea, North California [= L. Lewisii, Gld., July 1847].
255. 16. Margarita arctica, Leach, var. major.

In the text of the 4to volumes, the following corrections are suggested, the numbers referring to the page in the B. A. Report which contains the abstract.

Report, 215. Acmea scutum, D'Orb. [is quite distinct from A. persona, Esch. The latter, as figured by Midd., is a very young shell, not certainly belonging to the species].
216. Turritella Eschrichtii. [= Bittium filosum, Gld., May 1849. There being no month-date to Midd.'s species, the excellent name of Gld., which may also be of Phil. 1846, should be retained.]
217. Trochus ater and mastus [are well-marked South American species. Probably the shells intended are Chlorostoma funebrale, A. Ad., and its congeneres.]
218. Trochus euryumphalus [= Phoreus pulligo, Mart., teste Dohrn].
219. Trochus modestus, Md. [= filosus, Wd., = Calliostoma costatum, Martyn].
220. Trochus (Turbo) Fokkesii [is from the peninsula of Lower Cal.].
221. Natella flavo, Gld. "is entirely different from any of the synonyms under it," teste Gld.].
REPORT—1863.

Report, 216. Scalaria Ochotensis [appears an aberrant Opalia; but is the genus Acispa of Mörch, closely allied to Mesalia, teste A. Ad.].

216. Crepidula Sichana [is figured like the young of grandis; but the specimens in Mus. Cum., when compared with the similar stage of C. excaevena, display no differences either inside, outside, or in the nuclear whorls].

216. Crepidula minutula [appears the young of C. naccelloidea, Nutt.]

216. Crepidula grandis [fozai at Sta. Barbara, = C. princeps, Conr. Can hardly be distinguished from very fine specimens of C. fornicatea, sent from Halifax, Nova Scotia, by Mr. Willes].

217. Trichotropis cancellata, Hds. [is quite distinct from T. borealis].


217. Tritonium (Trophon) clathratum, Linn. [is distinct from the Shouldered M. multicostatus, Esch., = Gnenri, Lov.].

217. Tritonium (Fusus) decemcostatum [= Chir. Middendorffii, Cooper = Chir. litatus, Martyn.]

218. Tritonium (Buccinum) cancellatum [Midd., non] Lam. [= Prione Oxyenesus, Redf. =P. cancellata is the Cape Horn species. Some specimens in alcohol in Sir E. Belcher's collection, however, said to be from Icy Cape, greatly resemble the southern shell].

218. Tritonium (Polia) scabrum [is exclusively a S. American shell. Dr. M. 's shell may have been Oceanera, var. aspera].

218. Pecten rubicua, Hds. [non Martyn, = P. Islandicus, Mull. Midd.'s pl. 13. f. 1-3 are marked in expl. of plates "Islandicus, var. Behringiana;" they are probably ("rubicua, var.") Hindisi. But the fgs. 4-6 are certainly the young of Hinmites giganteus].

219. Venerupis gigantea. [Decorticated specimens of Saxidomus squallidus].

219. Petricola gibba. [Elongated form of cylindracea, Desh., = carditoides, var.]

219. Macarea costata. [The figures represent M. patula, Dixon.]

220. Cingula minutula ["is quite distinct from Hydrobia ulvae," teste Gld.].

220. Velutina cryptospira. [Probably a Lamellaria.]

220. Purpura Freycinetii, Desh. [is quite distinct from attenuata, Rve. It is doubtful whether Midd.'s shells belong to Desh. 's species].

221. Terebratula frontalis, Midd. 1851, named in 1849, [may be the young of Waldheimia Coreanica, Ad. & Rve., 1850, = Terebratella miniata, Glld., 1860, teste A. Ad., Rve.].

221. Astarte lactea, Glld. [is distinct from A. Scotica, teste Glld.].

221. Tellina fusca, Say [is distinct from T. solidula, though it may = T. balthisica; teste Glld. "Macoma insipicuus, Br. & Shy, is distinct from both].

222. Lyonsia hyalina [is distinct from L. Norvegica].

222. Macarea costata, Say. [Dr. Gould does not believe that any of Midd. 's synonyms belong to this species. Solen medius, in Br. Mus., appears = S. ambiguus, Lam., as figured by Swain. It is not a Macarea].

45. Samarang.—Litorina castanea, Ad. & Rve., 1850. "Eastern Seas," p. 49, pl. 11. f. 8 [appears identical with L. Sichana, Phil.].

46. E. B. Philippi.—Columella teniata, Phil., 1846 [is probably identical with Anachis Gaskoei, Cpr. But C. teniata, Ad. & Rve., 1850, is perhaps a Nitidella].

47. The "Mexican War Naturalists."—These were Major Rich and Lien. Green. Col. E. Jewett was not connected with the war, as would be supposed from the introduction to Dr. Gould's pamphlet. The following corrections apply to the new species tabulated in Rep., pp. 226-228. The species of Gould bear date April 1852 (teste Otia, p. 184) and Nov. 1851 (Otia, p. 210); the others, July 1856.

No. 3. Corbula polychemora [= C. biradiata, var.].

7. Tellina tera [=Macoma nasuta, jun. Cal., not Pan.].
No. 8. Tellina pura [= M. Mazatlaniaca, jun. Desh., Mus. Cum.].
11. Donac flexuosus [= D. Lamarckii, Desh., in B. M.].
21. Racta undulata [is distinct from Harvella elegans].
20. Cardium luteolabrum [= C. quadrigenarium, Consr.].
27. Modiola nitens [= M. subpurpuraceus, Mus. Cum., and is not from Cal.].
28. Adula falcata. [The locality of Mr. Cuming’s specimens has not been con-

firmed. For “species,” in note, read “specimens.”]
31. Lima tetrica. [The specimens from the Mediterranean, W. Indies, Gulf Cal.,
and Pacific Islands were all named L. squamosa by Mr. Cuming.]
40. Nacella pallacea. [Col. Jewett’s specimens appear distinct from N. depicta, Hds.]
41. Trochus marcidus. [This shell was called Omphalium Pfeifferi by Mr. Cuming,
from the resemblance of the figure, in which the umbilicus appears keeled;
but the shell marked type, answering to the diagnosis, along with Chloro-
stonia’ maculonum, A. Ad., are scarcely varieties of Thorus pulillo, Martyn.]
The finest series is in the B. M.]
43. Livona picoideae [has been heard of, but not seen since the explorations of Col. J.
Dr. Gld still considers the species distinct: among the very dissimilar varieties
from the W. Indies (vide suite in B. M.) it would probably not have been
singled out as a species, but for the theory of the author].
45. Crucibulum Jewettii [should be corrigatum, P. Z. S.].
47. Modulus dorsuosus. [Col. J. now thinks that the supposed Acapulco specimens
are W. Indian = lenticularis, Chem. When dead, the forms from the two
oceans can hardly be distinguished; but the aspect of his shells is Caribbean.]
54. Conus rauvius [= C. Californicus, Hds.].
56. Conus pusillius, Gld. [non Chem. = mut, small var., teste Cuming].
57. Obeliscus achatus [= O. clavatus, A. Ad., 1854].
58. Columella Sta.-Barbarensis [so named to correct the statement that California
was above the limit of the genus, proves to be a Mexican shell, and was
probably obtained at Acapulco. Having been redescribed by Reeve from
perfect specimens, it may stand as C. Reevei].
66. Nitetella Gouldii. [Not to be confounded with Col. Gouldiana, Agass., which
is probably Amyela].
67. Fusus ambitus [is a Californian species. The type stands in Mus. Cum. as
F. fragosus, Ree., but does not answer to the diagnosis. The typical fragosus
is marked fragosus, var. F. ambitus appears absolutely identical with F.
clavatus, Brocchi, Mediterranean. Some of the diagnostic marks are not con-
stant in the specimens].

Col. Jewett went to Panama, as a private collector, in January 1849,
spending ten weeks in that region, including Taboga. This was two years
before Prof. Adams’ explorations. Thence he sailed to San Francisco,
where he spent four months in exploring the shore for about 50 miles
from the head of the bay. After labouring for a week at Monterey, he
spent ten weeks at Sta. Barbara and the neighbourhood, thoroughly exploring
the coast for fifteen miles as far as Sta. Bonadventura. It was here, at the
“Rincon,” after a violent southern storm, that he obtained the specimens of
Livona picoideae, as well as many other rare species that have not been obtained by
any other explorer. “The storm tore up the kelp to such a degree that
it formed a bank for many miles on the beach, from 10 to 20 feet broad, and
at least 4 feet deep. Many of the plants were more than 60 feet long and 5
inches in diameter, having the appearance of vast cables.” Before his return
to the east, he also collected at Mazatlan (where he obtained some species
not included in the B. M. Catalogue) and at Acapulco. There can be no
doubt of the accuracy of the Colonel’s observations at the time they were
made. Unsurpassed in America as a field-paleontologist, possessed of accurate
discrimination, abundant carefnfulness, and unwearied diligence and patience, no one was better fitted to collect materials for a scientific survey of the coast. But, unfortunately for his (as for the Nuttallian) shells, he did not describe them at the time himself. They were subjected to all the derangements caused by frequent changes of residence, and transmission to various naturalists for identification. As we know what errors creep into the collections of the most learned under such circumstances, it is not surprising that they should now have lost much of their geographical value. After several days spent in a very searching elimination of the west-coast shells from his general collection, I was driven to the conclusion that several labels had become misplaced. This was so clearly the case as to certain N. England and W. Indian species interchanged with Pacific specimens, that it might also affect (e. g.) Sta. Barbara and Panama specimens as compared with each other. The kelp driven up by the great storm may have travelled from remote localities; which will account for tropical shells having been found at Sta. Barbara, as W. Indians occasionally are even on our own shores. It is possible also, as the Californian seas have as yet been but little dredged, that deep-water species live there which as yet are known only in the tropical province. Already some Gulf species have been thus obtained at San Diego and Catalina Island by Dr. Cooper, just as Mr. M'Andrew dredged Mediterranean species on the coast of Norway. But facts of such importance should rest on better evidence than chance shells picked on a beach, and subjected to dangers of altered labels afterwards. What was regarded by Dr. Gould as of authority is catalogued, according to his determinations of species, on pp. 226–231 of the first Report. The following is a list of the species which I found in the collection*, divided simply into the temperate and the tropical faunas.

* This collection belongs to his daughter, Mrs. Boyce, of Utica, N.Y. The Colonel's invaluable collection of U. S. Palaeozoic fossils (probably the largest made by any individual’s own hand) may be consulted at the State Museum in Albany, and will probably find its ultimate destination at one of the principal colleges. A large number of the fossils described by Prof. Hall were from this collection, though often without acknowledgment. Only a small proportion of the types of the celebrated 'Paleontology' are to be found in the State Collection, which was subjected to disastrous and very extensive curtailment before Col. J. entered on his present duties as curator.

† These species and marked varieties were first found by Col. J.

‡ Unless otherwise stated in the list, Report, pp. 228–231, it may be presumed that these species were from the neighbourhood of Sta. Barbara.

Species of the Temperate Fauna, collected by Col. Jewett.†

Pholadidea penita, ovoidea.
Saxicava pholadis.
Schizotheirus Nuttallii.
Cryptomya Californica.
Lyonsia Californica.
Solen ?sicarius, var. rosaceus †.
Machera patula.
Solecurtus Californianus, subteres.
Macoma nasuta, secta.
Lutrilocula alta.
Semele decisa, rubrolineata.
Donax Californicus, flexuosus ‡.
Standella ?Californica.
Trigona crassateloides.
Psephis tantilla ‡.
Amiantis callosa.
Chione succincta, fluctifraga, simillima.

Tapes staminia, tenerrima ‡.
Saxidomus squallidus.
Petricola carditoidea.
Rupellaria lamellifera.
Lazaria subquadrate ‡.
Chama pellucida.
Lucina Californica.
Diplodonta orbella.
Mytilus Californianus, edulis.
Modiola modiolus, recta, fornicata ‡.
Leda eelata.
Pecten hastatus, latiauritus, (fventrico-
sus, var.) aequisulcatus ‡, squarro-
sus ‡, paucicostatus ‡.
Amusmum caurinum, jun.
Hinnites giganteus.
Bulla nebulous.
Tornatina cerasalis*, culcitella*.
Cylhina (Cyclidracea, var.) attonsa*†.
Volvula cylindrica†.
Cryptochiton Stelleri.
Mopalia muscosa.
Nacella incessa, paleacea*.
Acmea patina, pelta, persona, seabra, spectrum, Asmi.

Scurria mitra.
Pissurella volano.
Glyphis densicalathra.
Haliotis Cracherodii, rufescens, splendens.
Phasianella (compta, var.) punctulata*, pulloides†, elatior**.
Pomuiax undosus.
Trociscus Norrisii, convexus†.
Calliostra canaliculatum, costatum.
Livona pioeides*.
Homalopoma sanguineum.
Chlorostoma funebrale, Pfefferi.
Crucibukmi lucerna.
Crepidula adunca, dorsata, rugosa.
Hhipponyx tumen*†.
Serpulorbis squamigerus.
Bittium esurients†, fastigiatum†.
Cerithdea sacrata.
Litorina planaxis, scutellata.
Amphithalamus inclusus†.
Laacuna unifasciata*.
Radius variabilis.
Luponia spadicae: Trivia Californica.
Erato colomba, vitellina.

Drillia inermis, moesta†.
Daphnella filosa†.
Mangelia variegata†, angulata†.
Myurella simplex†.
Conus Californiaicus.
Odostomia grava*, inflata†.
Cheinniata tenuicula*, torquata* (et ?var. stylina*†), virgo*†, aurantia*†, crebriflata†, tridentata†.
Dunkeria laminata†.
Eulima Thersites†.
Opalia bullata†.
Limatia Lewisi.
Cerithiopsis t tuberculata, fortior†, purpurea†.
Marginella Jewettii*, ?politita, regularis†, subtrigona*†. (Volvarina varia, serrata; perhaps imported, or label changed.)
Olivella bicipate, bextica† [=petolita, Gld.+, anazora, Gld., MS. (non Ducl.) =ruiflasciata, teste Czm., by error].
Purpura crispa, saxicola.
Niridella Goudii*.
Oicinebra Poulsoni.
Pteronotus festivus.
Columella carinata, Hindsii.
Amycla ?Limifotiana, gausapata, tuberosa†.
Nassa perpungia, mendica.
?Anachis penicillata†.
Siphonalia fuscostincta†.

Species of the Tropical Fauna, collected by Col. Jewett*.

Pholas crucigera (=lanceolata].
Dactylina laqueata.
Corbula bicarinata, biradiata, nasuta, tenuis, ovulata§, nuciformis§.
Sanguinolaria minusa*§.
Pammobia castra.
Tellina felix, puella*, punicea, "rubella."
Heterodonax bimaculatus et var.§.
Strigilla cararia (white and red vars.)§ pisiformis§, sincera.
Semele pulchra§, venusta§.
Iphigenia altior.
Donax transversus, navicula, gracilis, carinatus, rostratus§, punctatostriatus§, v. calatus§, assimilis.
Muline angulata.
Harvela elegans.
Trigona planulata‖, Hindsii§.
Dravia Dunkeri.

Callista aurantia, chionea, circinata§, tortuosa, lupinaria‖, rosea‖, v. puella‖.
Chione amathusia, susilata, neglecta.
Anomalocardia subimbricata, subrugosa.
Tapes graita, +vars. discors, fusceilineata.
Petricola phaladiformis, var.
Orasatella gibbosa.
Venericardia laticostata, radiata.
Lazaria affinis.
Chama frondosa, spinosa.
Cardium consors§, senticosum, procerum, oboval.
Hemiecardium angulatul§, graniferum.
Liocardium apiculum§.
Codakia tigerrina |||.
Lucina eburnea§, excavata§, pectinata.
Felaia tellinoidea§, var.
Modiola Brasiliensis, capax.
Lithophagus aristanus.
Arca grandis, tuberculosa.

* Unless otherwise specified, either by §, ||, or locality-marks in Rep. pp. 228–231, these species may be presumed to have come from the Panama district.

§ These species were probably from Acapulco.

‖ Probably from Mazawan.

Another specimen, 3’78 in. across, is marked “Sta. Barbara” on the shell.
Scapharca bifrons*, emarginata, labiata, nux.

Noëtia reversa.

Byssarca Pacifica, mutabilia.

Barbitia alternata, aviculoïdes, gradata, illota, solida.

Pectunculus inequalis, maculatus, par-cipitatus §, ?pectinoïdes §.

Leda Elenensis, polita.

Pinna maura, tuberculosa.

Avicula sterna.

Dryophila setosa *.

Isognomon Chemnitzianum.

Pecten ventricosus, subnodosus §.

Lima angulata §.

Spondylus calcifer.

Ostrea palmula.

Anomia lampe.

Bulla Adamsii, Quoii §.

Siphonaria gigas, lecanium § et var. maura, palmata §.

Patella Mexicana.

Aecema mesoleuca, mitella, vernicosa.

Fissurella rugosa, nigropunctata, ?macrocrena §.

Glyphis inequalis, alta.

Phiasianella perforata.

Callopoma saxosum.

Senectus squamigerus §.

Uvanilla inermis.

Callistoma lima, Leanum §.

Tegula pellis-serpentin.

Omphalhus Panamensis, coronulus *, ligulatus §, viridulus §.

Nerita Bernhardii, scabricosta.

Neritina picta, Guayaquilensis, intermedia [*globosa, Bred.*].

Crucibulum imbricatum, spinosum, umbrellata, radiatum, pectinatum *, corrugatum *.

Galerus conicus, mamillaris.

Crepidula aculeata §, excavata, incurva.

Hipponyx barbatus, Grayanus.

Aletes centiquadratus.

Vermetus eburneus.

Bivonia contorta, albida.

Petaoloconchus macrophragma.

Turritella goniostoma.

Cerithium maculosum, uncinatum, medioleve, interruptum, alboliratum.

Rhinoclavia gemmata.

Coritidea Montagnei, variocosa.

Litorina aspera, conspersa, Philippiii.

Modulus catenatus, ?disculus.

Rissolina firmata *, forte *, expansa ++, stricta §, Janus *, Woodwardii §.

Planaxis nigritella, planicostata.

Radius avena §, similis.

Carinea emarginata, jun.

Aricia punctulata.

Trivnia postulata, pulia, Pacifica §.

Erato scabriaculea §, Mangorico.

Strombus galeatus, gracilior, granulatus, Terebra robusta.

Euryta fulgurata, aciculata §.

Pleuronoma funiculata.

Drillia albovallosa, aterrima, ?exarata §, incassata, nigerrima, rudis, hexagona, ?gracilima, var.


Cithara stromboïdes [*triticea, Kien.].

Daphnella casta §.

Conus gladiator, mahogani, nux, purpura-rascens, regularis.

Solarium granulatum.

Torinia variegata.

Obeliscus achatæ *.

Chemnitzia calæta *.

Scardaria Hindii *.

Alora Gouldii *.

Cancellaria bulbulus, clavatula, decussata, goniostoma, tessellata, mitriformis.

Natica maroecana et var., Souleyetiana, zonaaria §, catenata §.

Polischus otis, uber.

Neverita patula §.

Ficula ventricosa.

Mallea ringens.

Bezoardica abbreviata.

Levenia coerectata.

Persona ridens [*] constictus.

Triton lignarius, tigrinus, ?pileare, jun.

Priene nodosa.

Ranella caelata, nitàda, triquetra, pyramidalis [like anceps and producta, Rve.].

Fasciolaria granosa, tulipa, jun. [*imported*].

Latirus castaneus, ceratus, rudis, tuberculatus.

Leucozonia cingulata.

Mitra lens, fumiculata, nucleola.

Strigatella tristis.

Lyria harpa.

Margellina ceruseusens, polita (?§).

Persicula imbricata §.

Volvarina triticea §, varia §, serrata §, fusca § [some of these are assigned to Sta. Barbara. West Indian specimens may have been intermixed: vide Cape St. Lucas list, infrï].

Oliva angulata, porphyria.

Olivella anazoma, gracilis §, inconspicua, semistriata, ?tergina, volutella, zonalis, Zancoti.

Agaronia testacea.

Harpa crenata.

Purpura biserialis, melo, patula, triangulæs, triserialis.

Cuma teota, kiosquiformis.
Rhizocheilus nutx.  
Vitularia salebrosa.  
Ocinebra erinaceaoides.  
Monoceros brevidentatum.  
Sistrum carbonarium §.  
Nitidella cribaria.  
Columbella festiva, fuscata, labiosa, major, Reevei*, uncinata §, îmille-  puntata, var. §  
Conella conformis.  
Truncaria modesta.  
Nassa collaria*, corpulenta, crebristri- ata, luteostoma, pagodus, scabrius-  
cula, tegula, versicolor, complanata,  
Stimpsoniana*, nodicincta.  
Phos gaudens.  

This list, of about 133 species from the northern and 328 from the  
southern fauna (nearly twice as large as that sent by Dr. Gould and printed  
in the first Report, and yet not containing several species there quoted), is an  
instructive instance of what may be accomplished in about three-quarters of  
a year, simply by picking up shore-shells. It contains about 48 species in  
the northern and 22 in the southern faunas not previously described.  

Besides the recent shells, Col. Jewett brought home a very interesting  
series of Pliocene fossils from the neighbourhood of Sta. Barbara. Almost all  
of them are species known to inhabit neighbouring seas, and are chiefly  
northern forms. Of some no recent specimens have yet been found in such  
perfect condition. The following is a list of the species, which is of the more  
value as they have not been intermixed with those of any other locality, and  
the spot does not seem to have been discovered by any succeeding geological  
explorer. It was two miles from the coast, and 150 feet high.  

Schizotheirus Nuttallii.  
Mactra planulata.  
Chione succincta*.  
Pachydesma crassatelloides.  
Psephis tantilla, ?salmonea.  
Rupellaria lamellifera.  
Cardium graniferau*.  
Venerocardia v. ventricosa†.  
Lucina Californica.  
Pecten floridus*.  
Hinnites giganteus.  
Planorbis, sp.  
Calliostoma costatum.  
Margarita pupilla†.  
Onephialus aureopectinatus.  
Galerus fastigiatu$.  
Crepidula grandis† [Midd., princeps,  
Cons., 3.5 inches long].  
Crepidula adunca.  
" navicelloides.  
Turritella Jewettii, n. s.  
Bittium rugatum, n. s.  
" armillatum, n. s.  
" filosum†.  
Lacuna solidula†.  

* These species are of a southern type.  
† These forms rank with the northern series. The rest belong to the present Californian  
fauna.
The following fossils were also collected by Col. Jewett:

<table>
<thead>
<tr>
<th>Purpura crispata</th>
<th>San Francisco, 160 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellina congesta</td>
<td>Conr. Monterey.</td>
</tr>
</tbody>
</table>

Scalaria: can scarcely be distinguished from planecostata, Kien., in Brit. Mus. (?= Greenlandia): Panama.

The collections of Major Rich, having been tabulated by Dr. Gould simply as from Upper or Lower California, I had expected to find of but little geographical value. They proved, however, to be of peculiar interest. Major Rich had been one of the naturalists in the U. S. Expl. Exp., and his warlike occupations did not prevent his remaining long enough at particular stations to pay close attention to the Molluscs. His forte lay in procuring shells in the best possible condition; and a study of them was very serviceable in explaining the dead shore-shells usually obtained from other sources. Fortunately, he was quite aware of the importance of geographical accuracy, and arranged those obtained at different places in separate drawers. The “Upper Californian” collections were made at Monterey, San Francisco, San Diego, and San Pedro; the “Lower Californian,” in the Gulf, principally at La Paz, partly at San Jose and Mazatlan. At the latter place he met M. Reigen, who had filled his house with decomposing molluscs to such an extent as to induce the neighbours to have recourse to the police. From him he obtained many species not in the Brit. Mus. Cat., and probably sent to Europe in the Havre collection. Major Rich’s beautiful series may be consulted at his residence, opposite the British Legation, Washington, D. C.; and are designed ultimately for one of the public museums in the neighbourhood. The following is a list of the species:

Shells collected by Major Rich, from the Californian Fauna.

Pholadidea ovoidea 1, 2. Parapholas Californica 1. (The young is very acuminate, with imbricated cups, as in P. calva.)

Netastoma Darwinii 1.

Saxicava pholadis 1, 2.

Platydont cancellatus 4.

Schizotheirus Nuttalli 1.

Cryptomya Californica 1.

Thracia curta 1.

Lyonia Calafornica 1.

Mytilus Littallii 1. (Very fine, with osscile.)

Solen sicarius 3.

Machera patula 1.

Solecurtus Californicus 3.

Sanguinolaria Nuttalli 4.

Psammobia rubroradiata 1.

Macoma nasuta 1, secta 14.

Scrobicularia alta 4.

Semele decisa 1.

Cumingia Californica 1.

Donax Californicus 1.

Mactra Californica 1.

Pachydesma crassatelloides 3

Amiantis callosa 4.

Chione succinella 4.

Tellina congesta, Conr. Monterey.

Scalaria: can scarcely be distinguished from planecostata, Kien., in Brit. Mus. (?= Greenlandia): Panama.

Tapes staminea et vars. 1, 24, lacinata 1.

Petricola carditoides 1.

Rupellaria lamellifera 1.

Chama Buddiana 4.

Cardium Nuttalli 4.

Lucina Californica 1.

Diplodonta orbella 4.

Kellia Laperousi 1.

Mytilus Californianus 1, edulis 1, v. glomera-

ratus 4.

Septifer bifurcastus 1.

Mudiola modiolus 4.

Lithophagus attenuatus 1.

Adula falcata 1.

Pecten v. equinaulatus 4, monotimeris 4.

Hinnites giganteus 1.

Placunomiomacroscismha 1.

Bulla nebulosa 4.

Katherine tunicata 1.

Mopalia museosa 1, Hindsii 1.

Nacella inessa 1.

Acmaea persona 2, pelta 2, spectrum 2, scabra 2, et var. limatula 1.

Lottia gigantea 4.

Scurria mitra 2.

Fissurella ornata 4.

1 Monterey. Fresh specimens of seven species from the southern fauna were also obtained at Monterey, probably from commerce.

2 San Diego.

3 San Francisco.

4 Same San Pedro.
Glyphis densiclavata 2.
Lucanina crenulata 1 (one spec. Catalina Is.).
Haliotis rufescens 14, Cracherodii 14, Kamtschatkana 11.
Poumalax undosus 1.
Trochiscus Norrisii 2 (and Catalina Is.).
Callostoma canaliculatum 1, annulatum 1, costatum 1.
Omphalius fusescens 4.
Chlorostoma fanebrae 1, brunneum 1, Pfeifferi 1.
Crucibulum spinosum 2.

Shells collected by Major Rich, near La Paz (west shore of the Gulf of Cal.).

(Thracia) Cyathodonta plicata.
Sanguinolaria miniata.
Tellina Cumingii.
Strigilla carnaria.
Heterodonax bimaculatus.
Iphigenia altior.
Donax navicula, punctato-str., rostratus.
Standella fragilis (common).
Mulinia angulata.
Trigona argentina, radiata, planulata.
Dosinia ponderosa.
Calissa concinna, chionaea.
Chione succincta, anathasia, gnidia, plicaria, var.
Anomalocardia subimbricata.
Tapes grata, histrionica.
Lazaria Californica.
Chama spinosa, producta, corrugata.
Cardium consors, biangulatum.
Liocardium elatum.
Codakia tigerrina (two fine specimens).
Cyrena olivacea, Mexicana.
Anodonta glauca.
Mytilus multiformis.
Modiola capax.
Arca multicolata.
Barbatia Reveiana, solida.
Pectunculus giganteus.
Pinna rugosa.
Margaritophora fimbriata.
Isognomon Chemnitzianum.
Pecten ventricosus, subnodosus.
Lima tetrica *.
Janira dentata.
Ostrea amara (Maz. Cat. 215. Is. Cresa-
tona, entrance of Gulf), Virginica (more pearly than the Atlantic shells, teste Rich).
Anomia lampe.
Bulinus sufflatus *, excelsus *, pallidior.
Physa elata *, aurantia.
Patella Mexicana.
Acmaea atrata, mesoleuca.
Fissurella rugosa, virescens.
Glyphis alta, inaequalis.

Crepidula rugosa 2, adunca 2, explanata 2.
Hipponyx antiquatus 4, tumens 1.
Serpolobis squamigerus 1.
Spirogyphus lituella 2 *.
Litorina planaxis 1.
Trivia Californica 1.
Conus Californicus 4.
Ranella Californica 4.
O. livella biplicata 1, baetica 1.
Purpura, vars. ostrina 1, emarginata 1.
Cerostoma Nuttalli 4.
Nassa mendsa 1, perpingius 1, fossata 1.
Helix, three sp.

Haliotis splendens (three fresh specimens from a resident at San Jose).
Callopoma fluctuosum.
Uvanilla olivacea.
Omphalius rugosus, coronulatus.
Nerita scabricosta, Bernhardii.
Neritina picta.
Crucibulum spinosum, imbricatum, pec-tinatum, umbrela.
Galerus mamillaris, conicus.
Crepidula aculeata, onyx, nivea, ungui-formis, arenata.
Hipponyx Grayanus, serratus, antiguatus.
Aletes centiquadrus.
Spirogyphus lituella (on Cr. umbrellata).
Turritella goniosoma, tigrina.
Cerithium maculosum, stercus muscarum.
Cerithidea Montagnei.
Litorina fasciata, conspersa.
Modulus catenulatus, disculus.
Cyprea exanthema.
Aricia arabicula.
Luponia Soverbii, albigenosa.
Trivia sanguinea, radians, Solandri, pustula, Pacifica.
Strombus granulatus, gracilior.
Eurya fulgaru.
Pleurotoma funiculata, maculosa.
Drillia Finermis.
Conus punctulatus, gladiator, purpurascens, regularis, arcuatux, nux.
Solarium granulatum, e. quadriceps.
Cancellaria obese, cassisiformis, solida, goniosoma, fcandida.
Natica maroccana, zonaria.
Polinices Recluziana, bifasciata, otis.
Neverita patula.
Sigaretus debilis.
Oniscia tuberculosa.
Levenia coarcata.
Bezoardica abbreviata.
Priere nodosa.
Turbinella caesu.
Fasciolariu princeps.
Leucozonia cingulata.
Mitra lens.
Oliva porphyria, Melchersii, Cumingii, subangulata.
Olivella tergina, gracilis, volutella (several taken alive).
Agaronia testacea.
Purpura patula, biserialis, triangularis, muricata, planospira.
Nitidella cribaria.
Columbella fuscata, var.
Conella cedo-nulli.

Nassa luteostoma, scabriuscula, corporata.
Pyraula patula.
Fusus Dupetitouarsii.
Siphonalia pallida.
Strombina (? new, deep water, San Jose).
Pisania sanguinolenta, insignis.
Murex plicatus, recurvirostris.
Phyllonotus nigritus, brassica, princeps, bicolor.
Muriidea dubia.

Lieut. Green having been obliged to pack up his collection and leave home on professional duty, I was not able to make any critical examination of it. Capt. Dupont also, of Delaware, was one of the "Mexican-war naturalists," and made a large collection of La Paz shells during his campaign; but I had no opportunity of seeing them.

Dr. Gould notes the following corrections in Lieut. Green's list, pp. 231-234:

_Somele flavicans_ should be _flavescens._

50. _Kellett and Wood._—The locality-marks, on further study, display still greater inaccuracies.

_Nassa Woodiearthis_, Fbs., Sandwich Islands [is the adolescent state of a very abundant Vancouver and Californian shell, _N. mendica_, Gld.].

_Nassa Cooperi_, Fbs., Sandwich Islands. [The type is immature and in poor condition; but it is a rare Californian species, since found by Dr. Cooper.]

_Trochita spirata_ [has not been confirmed from Gulf Cal., but appears in Brit. Mus. from St. Vincent, Cape Verd Is., on the excellent authority of Maggillivray, who did not visit the West Coast. The Cumingian specimens were from K. and W.; but the "spirata, var." from Magellan and Peru, are simply turrited forms of _T. radians_.]

_Chlorostoma aureotincta_ [= _C. nigerrima_ (Gmel.), Mus. Cum.; but it is unlikely that Gmelin knew the species. It is not quoted by Desh. (Lam. ix. 157): but the _Trochus in fave nigerrimus_, Chemn. f. 1529, = _T. melanostomus_, Gmel., is a Risella.]

_Margarita purpurata et Hillii_ [are South American shells].

_Purpura analoga_ [is the rough irregular form of _P. canaliculata = decemcostata_.]

"_fusca_, Fbs. [of which one brown and one whitish specimen (immature) are preserved in the Brit. Mus. as types, is the large, smooth, rather elevated var. of _saxicola_. It belongs to the Vancouver district].

_Purpura_, like _decem-costatus and Freycinetii_ [is the normal state of _saxicola_. The banded smooth var. is named in Brit. Mus. "? _Buc. striatum_, Martyn, Un. Conch. no. 7," but does not agree with the figure].

_Fusus Kellettii_. [This _Siphonalia_, after long remaining unique in the Brit. Mus. Col., has been twice confirmed from the San Diego district by the Smithsonian collectors. Dr. Cooper's living specimen is 6-25 in. long; and one specimen was dredged by A. Ad. in the seas of South Japan.]

51. _Reigen._—The type collection, presented to the Brit. Mus., contains about 8900 specimens. The first duplicate series, containing about 6000 shells, was presented to the State of New York at the urgent request of Dr. Newcomb (well known for his researches in _Achatinella_, made during his professional residence in the Sandwich Islands), and is arranged in the Albany Museum. Three other typical series were prepared for the Museums of Paris, Berlin, and St. Petersburg, and offered on the same terms, viz. that they should be arranged by the author, and preserved intact for the free use.

_Dead shells at La Paz; two fresh specimens in deep water from San Jose; ditto, Lieut. Green._

28
of students; but the donations were severally declined by the respective governments. They have since been offered to the Museums of Harvard University, Cambridge, Mass.; McGill University, Montreal, C. E.; and the Smithsonian Institution, Washington, D. C.; and accepted on the same conditions*. The writer of the Brit. Mus. Catalogue spared no pains in his endeavours to verify the previously described species of Prof. C. B. Adams; yet a subsequent comparison of types has developed very unexpected coincidences. Those who will take the trouble to compare the two diagnoses in the synonyms now given will add one to the many proofs of the uncertainty of the senses in observation, and the inaccuracy of language in description. The following corrections and additions should be made to the list in the British Association Report, pp. 243-264.

18. Parapholas acuminata is united to P. calva by Tryon, Mon. Phol.


24. Petricola robusta. The West Indian form of this species is the Choristodon typicum of Jonas; Mus. Cum.

35. Spharia fragilis is perhaps S. laticola, Val.

38. Solecurtus politus = S. Carpenteri, Dkr.

40. Should be Semele flavescens, Gld.

41. Semele ?vesusta should be S. bicolor, C. B. Ad. Panama. C. S. Lucas.

46. Should be Sanguinaria miniata, Gld., as in first Report.

48. Should be Tellina purpurea, Brod. & Sby., teste type in Mus. Hnl.

49. = T. pura, Gld., nom. prior.

54. Quite distinct from Tellina alternata, Say.

56. Tellina ?eburacea proves to be the type of a new generic form, probably belonging to Killiaede, viz. Cycladella pappacea. A perfect specimen, since found, is in Mr. Hanley's collection.

65. Tellidora Burnetii is not L. cristata: v. antea, p. 528.

66. = Strigilla fucata, Gld. (not miniata). Specimens received from different stations on the Pacific Coast vary very greatly in colour and markings.

68. The fragment of "?? Psammobia" is perhaps part of a Lepus-valve.

71 and 72. The names of these shells have been altered and re-altered in Mus. Cuming, as will be seen by comparing Brit. Mus. Maz. Cat., p. 43, with the note, p. 548, and with the present arrangement. Mr. Hanley states that no. 72, D. culminatus, Cpr., is his true carinatus; therefore 71, D. carinatus, Cpr., and of most collections, must stand as D. rostratus, C. B. Ad., teste type-valve in Mus. Amherst. The two species uniformly retain their distinctive characters.

78. Should be Mactrella exoleta = Latraria ventricosa, Gld., from type.

81. Should be Gnathodon mendicus, Gld.

83. T. Ilindsii is distinct, teste Hnl.

85. T. argyntata, Sby., 1835, = T. equulatera, Desh., 1839.

92-99. The generic name should be Callista.

* A few of the duplicate sets having been sent in exchange to one of the principal scientific dealers, he advertises a list of species in which he not merely alters the nomenclature, giving "Monoceros" cingulatum, "Pollia" inignis (with "Pisania" gemmata), "Trochus" olivaceus (with "Imperator" auguis), "Cerithium" montagni (for Cerithidea Montagni), Cyltheria "dione" (for Dione lupinaria), "Astarte" Dunkeri, "Cyltheria" Columbusis, &c., but inserts Californian species ("Ziziphius florusa," "Cardium Natali") as though from the Gulf, and adds others not known at all in the West Coast faunas, as "Columbella lavigata," "Patella plumbea," and "Chiton reticulata." All these, with such shells as Olica Cumingii, which belong to other regions on the Mexican coast, would be accredited by the reader on the supposed authority of "Carpenter's Catalogue." In these times it appears that naturalists must be content to resemble the dealers in patent medicines, and guard the accuracy of their works! With regard to the Mazatlan collections (now scarce), none can be trusted unless they present an unbroken seal, with the initials of the author.
98. *Callista alternata* has a very different aspect from the ordinary *C. circinata*; but several of the Pacific shells affiliate more naturally to the West Indian form.

99. *C. affinis*, *C. tortuosa*, and *C. concinna* appear to be one species.

100. Sir E. Belcher is confident that he dredged *C. petechialis*, in deep water, off S. Blas. He has the same confidence in regard to some of the East Indian Circuses. At this distance of time, a written locality-ticket would have had more authority.

105. The hinge proves that this species is distinct from the true *V. crenifera*, Sby. It has been named *V. sagitata* by Rve., Conch. Ic. sp. 48. It was also brought by Kellett and Wood, and is allied to *V. pulicaria*.

110. Among the Panama varieties of this very variable species is *Venus fuscoLineata*. *T. grata* takes the place of the Californian *T. staminea*, which is sometimes erroneously given as a synonym, and is not *straminea*, as often quoted.

116. It appears that *Gouldia* (Thetis, C. B. Ad., olim, non Sby. nec H. & A. Ad.) is congeneric with "Circe" *minima*, not with the Astartid. Prof. Adams' fresh specimens of his *G. Pacifica* prove to have the Crassatelloid internal ligament, and represent one of the many remarkable forms of that group.

117. Fresh specimens of *G. varians*, from Cape St. Lucas, have also the internal ligament, and must rank under *Crassatello* until that genus has been naturally divided.

118. *Lazaria Californica*. A well-marked group of species from the West Coast.

121. The purple and orange specimens, here treated as the adolescent state of *Chama Mexicana*, are certainly the *Ch. echinata* of collections, and may possibly prove a distinct species. A large series sent from Socoro Is. by Mr. Xantus confirms this view; but all the specimens seen are decorticated or incrustad.

121b. This is the *Chama Buddiana* of C. B. Ad., and probably distinct.

134. The specimens of *Cardium graniferum* in Mus. Cum., from St. Thomas, W. I., appear exactly identical.

130. The specimens from the Pacific coast, some of which are of very large size, have generally a red tinge round the inner margin; as have also the Fiji specimens brought by the U. S. Expl. Exp. In other respects they exactly accord with the W. Indian. The Pacific shells are generally called *C. exasperata*, Rve., a name first given to the rough Caribbean variety from Honduras, &c.

137. *Cedasia punctata*. This shell also, brought by the U. S. Expl. Exp. from the Fiji Is., is found sparingly along the American shores, and has the same coloured margin.

142. May possibly prove identical with *L. bella*, Conr., S. Diego.

150. The *Lucina orbella* of Gould, = *Spherella tumida*, Conr., MS., is the northern form; uniformly larger and smoother than *Diplodonta semisspera*. This last is fully confirmed from both oceans.

152. "Felania" *serricata* appears congeneric with *Mittha*, H. & A. Ad., = *Mittrea*, Gray, the type of which (*M. Childreni*) is a Gulf species.

154. *Lusea rubra*. Mr. J. G. Jeffreys does not consider the Brit. Mus. specimen identical with the British. The Mediterranean specimens are much more unlike. A colony of fresh shells from a burrow at Cape St. Lucas, when examined, under the microscope, side by side with Ilfracome specimens, did not present even varietal differences. The species also appears on the Californian and Japan coasts. Similar and perhaps conspecific forms are found on most coasts: among them is *Poronia Petitsiana*, Chen. Conch. Ill. p. 2, pl. 1. f. 2; Callao, not rare, *Petit.*

156. For this species, *corbolectodes*, and other angular forms, the name *Bornia* may be revived in a restricted sense. (A. Ad.)

157, 158. Mr. A. Adams, who is about to make the Kelliads a special study, thinks that these intermediate forms would rank better with *Montacuta* or *Tellimya*.

106. This is almost certainly = *Anodonta glauca*, Val.

168. Dr. Dunker renamed this shell *M. Adamsianus*, P. Z. S. Nov. 1856.

177. The subgenus *Abola* may be enlarged to include this and other nesting.? *Lithophagi*, which often adhere by byssus, like *Modiola*.

178. *Liosolenus* is quite distinct from *Mytiliniera*, which appears simply an aberrant form of *Lyonia*. Other " *Lithophagi" probably rank with it.
186. *Area semnis* is from W. Africa (not "E. Indies"); one of the many representative species between the two West Coasts.


188. *Argina brevifrons*, Sby.

189. This is the young of *Barbatia alternata*.

190-195 belong to the group *Barbatia*.

193. = *Barbatia Tabogensis*, from type.

201. The young of this shell is *Aricia libella*, Rve. Dr. Gould protests against some of the interpretations here given to his views.

204. The W. American pearl-oyster should stand as *M. Jimbriata*, Dkr. It has been redescribed as *M. Barbata*, Rve.

212. Dr. Gould protests against the Pacific shells being regarded as *O. Virginica*. Mr. Hanley adheres to his original opinion. Fossils sent from the Sandwich Is. by Mr. Pease (*O. Sandwichensis*, Pse.) appear scarcely to differ.

214a. The *O. palmula* appears a distinct species.

215. This species is identical with *O. no. 384* of C. B. Ad. It may take the name of *O. amara* from its "bitter flavour."

224. *Bulla Adamsi* = *B. punctulata*, C. B. Ad., non A. Ad.

229. *Haminea cymbiformis* is closely allied to *H. virescens*, Sby.

230. *Siphonaria lecianum*. *S. Maura*, Sby., is one of the varieties of this species. The *S. palmata* may prove distinct. *S. ferruginea*, Rve., is probably described from the intermediate form.

242. *Ianthina striolata*. Name given in ignorance of *striolata*, Ad. and Rve.; and not needed, teste Rve.

245. The *Dentalium hyalinum* of Phil. is probably the young of *D. semipolitum*; this species is distinct.

247. The *Dent. pretiosum* of Nutt. is a northern species; this is most likely *D. lac- teaum*, Phil.

248-250. This typical group of Chitonids retains the Linnean name in Dr. Gray's arrangement; and as he first pointed out the generic distinctions in the family, his judgment is to be preferred.

252-254, 256. These species belong to *Ischnochiton*, Gray.

255. *Lepidopleurus*, Risso, has sculptured valves and scaly margin, and is probably synonymous with *Lophrurus*, H. and A. Ad. The name may be retained for the "Lophyroid." *Ischnochiton* here described, the peculiarities of which have been confirmed by adult specimens in Mus. Cuming, and by other species.


258. = *Nacella peltoides*, n. s. (described from Cape St. Lucas specimens).

259. The true *Lottia pintadina* of Gld. (teste figured types) consists entirely of varieties of *A. patina*.

261. The "large flat shell" referred-to is *Tecturella grandis*, Gray. Brit. Assoc. Rep. 1861, p. 137. *Tecturella* is preoccupied by Stimps. Gr. *Manan Invert*. It being needful to divide the old genus *Acmea*, *Lottia* may be used for this section. By reviving synonyms as sectional names, when a genus is divided, good names may be retained in a restricted sense, and the burden of a spurious nomenclature lessened. The species is *Lottia gigantea* (Sby. Gen.).


262. This should stand as *Gadania stellata*, Sby., that name having been given to the normal form, Rep. pl. 7. f. 3a, of which *pentagonostoma*, f. 3f, is only an accidental variety.

263a. = *Callopoma Fokkesii* = *tesselatatum*, Rve., is the Lower Californian form, and probably distinct.


289. The first name is *T. erinicus*, Rve., P. Z. S. 1842, p. 185; Mke.'s shell bearing date 1850. It appears identical with "Javanicus, Lam." in Mus. Cum., and is extremely like "speciosus, Japan." *Trochus* being now generally retained for the Niloticus group, which contains the largest forms, it is best to revive Swainson's excellent name *Calliostoma* for the "Ziiphinus" group. A specific name should not be used for a genus, where a distinctive name has already been accurately described.

1863.
290. *Calliostoma M'Andreae* is the normal state, of which *C. Leanum* is the pale variety.

292. Mr. Pease considers that *T. Byronianus* represents a *Polydonta* from the Pacific Islands.

313–316. The non-pearly *Liottia* are *Conradia*, A. Ad.

322, 323. Mr. A. Adams thinks that the "Éthalia" amplexans is probably the young of "Teinostoma" a, as suggested in Brit. Mus. Cat. p. 253.


341. Should stand as *C. squama*: v. note on C. B. Ad. no. 351.


357. *Cerithium irroratum*, Gld. (teste type sp. in Mus. Smiths.), is a very distinct East Indian species, *= C. obesus*, Sby. sen.

388. This is not the *C. interrumptum* of C. B. Ad., Sby., and Mus. Cum. (hostie), which latter is the roughened form of *C. stercus muscarum*, Val. *C. Galla-

390–392. The genus *Triforis* should be removed to *Cerithiopsis*. The true "Triforis" infrequens of C. B. Ad. is a dextral shell, *= Cerithiopsis tuber-

391. Vertagus should be changed into *Rhoconia*, Swains.; v. note to 280.


411. "Not a Barlecia," teste Jeffr. MS. It seems, however, too closely allied to *B. rubra* to create a fresh genus for it, unless the animal should display differ-

412, 413. Belong to *Fenella*, A. Ad.* *E. excurvata* = *Rissoa inconspicua*, C. B. Ad., non Alder.

417. Fresh specimens prove this to be not a dead *Hydobia ulva*, but a *Barlecia*.

418, 421. Are very similar, and possibly conspecific forms of *Cythna*, A. Ad.

422. Is a *Gemella*, teste A. Ad.

426, 427. Belong to *Styliferina*, A. Ad.

430 et seq. Some of these forms may rank with *Gottoina*, A. Ad., and thus approach *Fossaurus*.

437. *Luponia spurca*. This shell is quite distinct from *L. albigniosa*, to which it was supposed to belong by Dr. Newcomb. It is probably a ballast specimen.

438. Quite distinct from the Panamic *A. punctulata*.

445, 446. *Cancelleriaide* should be removed to *Proboscidifera*, teste A. Ad.

450–452. Mr. Reeve unites all these species, with several others, to *M. variegata*; which is certainly the easiest way of meeting the difficulty.


477. *Conus regualitatis* = *C. purpurascens*, var. Most Cones vary in the same manner.

484. *Torinia variegata*. Mr. Hanley restores to this shell the uncomfortable name of Chemn. (*perspectivuncula*), and unites it to *areola*, Desh. A careful compari-

486. The genera in this family have lately been revised by Mr. A. Adams. A large number of his Japanese groups are here represented. This species

* The generic names here given were assigned by Mr. A. Adams, who kindly examined the figures of the minute Mazatlan shells, all of which have been drawn under the micro-

scope.
agrees with *Pyramidella*, sp. ind., C. B. Ad., no. 293 (not 294), and may be quoted as *Obeliscus Adamsii*.

487. 488. Belong to *Leda*, A. Ad.

489. Is a *Symulla*, A. Ad.

492. The peculiar appearance of the apex is due to decollation, as proved by the discovery of an adolescent and several adult specimens. It probably belongs to *Diala*, A. Ad., and = *Cingula paupercula*, C. B. Ad., no. 253.


503-500. The "Odostomoid Chrystallite" probably rank best with *Munida*, A. Ad.

512. *Chryssalida ovulum* = *Cingula inconspicua*, C. B. Ad.; non *Rissoa inconspicua*, C. B. Ad. nec Alder.

513-515. Are *Pyrgulina*, teste A. Ad. The Japanese species, however, seem more like *Parthenia*, no. 497.

517. Is a *Styloptygma*, A. Ad.

520. This is not the *Chemnitiaz similis* of C. B. Ad.; and is probably a variety of *Ch. Panamensis*.


535. Is perhaps a *Mornmula*, A. Ad.

545. The various shells grouped under *Aclis* require revision. Comp. *Onoba*, A. Ad., and *Ebala*, Gray, which is figured as *Aclis* in Add. Gen.

549. Ranks best with *Eulimella*.

550. This is not *Leiostraca recta*, C. B. Ad., and may be called *Mucronalia involuta*.

551. This is not *L. solitaria*, C. B. Ad., and may be called *L. producta*.

552. = *Mucronalia solitaria*, C. B. Ad.

553. Ranks best with *Eulina*, teste A. Ad.

555. *L. retexa*; distinct from *L. iota*, C. B. Ad.

556. Should be *Eulina*, teste A. Ad.

557. *Vide* note to 593.

560. Belongs to the subgenus *Seila*, A. Ad.

568. *Scalerna varicosata* is perhaps the young of *S. Elenensis*.

569. *S. funiculata* and *S. diadema*, with their congeners, should be removed from *Cirsotrema* to *Opalia*.

570. Dr. Gould dissents from the affiliation of this shell to the West African species on the ground that "he can separate the African from the Pacific shells as fast as we can hand them to him." So easily can any ordinary naturalist separate conspecific British and Mediterranean specimens, or Mazatlan and Panama specimens. It is not found in the West Temperate fauna; the "var. *Californica*" being the ordinary type from the Pacific Islands, which is much more entitled to be regarded as distinct than are the West American forms.

572. Is shown by perfect Cape St. Lucas specimens to belong to a natural group of species, resembling flattened, perforated *Phasianella*, to which the name *Euscomia* may be given.


580. This belongs to *Clostia*, Gray, = *Volutella*, Swains., non D’Orb. *The name of Klein in his ‘Tentamen’ and ‘Lucubratuicula,’ 1773, are not entitled to precedence (according to the Brit. Assoc. rules), because he evidently did not adopt the Linnean mode of binomial nomenclature. What he calls a ‘genus’ answers more to the modern idea of chapter or section. By chance, some of his names are allowable; but, if used, the genus must be regarded as that of Adams, Gray, Mörch, or other writer who defines it. The following will serve as illustrations of Klein’s ‘genera’ — *Sol*, *Luna*, *Stella*, &c.; *Auris*, *Anas*, *Tigris*, *Pes-anserinus*, *Tuba-phomurgica*, *Cochlea-lunaris*, *Cochlea-calata*, &c.; *Buccinum-lacerum*, *Buccinum-murictatum*, *Thema-musiceum*, &c.; *Ostreum-imbricatum*, *Ostreum-murictatum*, &c.; *Musculus-latus*, *Musculus-mammarius*, &c.; *Tellina-arcinata*, *Tellina-virgata*, &c.; *Concha-longa-biforis*, *Concha-longa-uniformis*; *Concha-rpilhos*.; and, in p. 167, "*Musculus-polyplepto-ginglymus*," under which remarkable generic name is given as the first species "Arca-Noa." According to the now fashionable transformation of mala-logical nomenclature into a branch of archeological research, under pretence of justice to ancient writers, the hitherto universally understood
592. *Olivella intertincta* is very close to the young of *O. subangulata*, but differs in the chestnut stain on the columella. I have not been able to compare it with the young of *O. Cumingii*.

594. Is an abundant species in the Eastern Islands, occasionally seen in West Coast collections.

595. Belongs to *Anazola*, Gray. The remaining Mazatlan species of *Olivella* are now called *Olivina*, Gray.


599. *Olivella inconspicua*, C. B. Ad., is probably the young of the colourless var. of *O. graecilis*, which must be excluded from the synonymy of *O. dama*, no. 600.

606. The figure of *Purpura biserialis*, jun., Brit. Mus. tablet 2232, is stated by Mr. A. Ad. to represent the genus *Sinussigera*, D'Orb., = *Chelitropis*, Fbs.; just as *Macgillivraya* is the young of *Dolium*.


612. The young of *Volutaria salebrosa* is named *Fusus tamellosus*, Hds., in Brit. Mus., and is also the " *Ranella triquetra* " of Nuttall's collection.

618. Is probably *C. baccata*, Gask., in Mus. Cum., though Mr. Gaskoin regarded it as new. The var. *obsoleta*, 618b, is probably *C. galaxias*, Rve.

610–622. These shells may perhaps be better studied under *Daphnella*.

631. Certainly = *N. gemmulosa*, C. B. Ad.

633. *Nassa crebristriata* may rank as a var. under *proxima*, C. B. Ad., which is probably itself a var. of *versicolor*.

639. This aberrant group of forms may be transferred to *Centharus* in Mus. Cuming. Perhaps they rank better with *Siphonalia*, A. Ad.

655. *Anachis riufoneta* ("new," teste Gaskoin) is probably = *Col. diminuta*, C. B. Ad., in Mus. Cum., but scarcely agrees with the diagnosis, nor was the accuracy noticed in the Amherst types.

659. = *P. elegans*, Gray, in Griff. Cuv. pl. 25. f. 2. (1834.)

The following species, since found, must be added to the catalogue of the Reigen Collection. The specimens are deposited in the British Museum. The descriptions of nos. 693–695 appear in the appendix to the Brit. Mus. Cat.; the remainder are ready for the press.


603. *Lyonsia*, sp. ind., 1 sp.

604. *Montacuta chaleedonica*, 1 sp.


605. *Crenella*, sp. ind., 1 sp.

633. *Pectunculus*, sp. ind., 1 sp.


638. *Scissurella rimuloides*, n. s., 1 sp.

690. *Vitrinella ornata*, n. s., 1 sp.

700. *Vitrinella tenuisculpta*, n. s., 1 sp.

701. *Vitrinella*, sp. ind., fragment.

702. *Mangelia sulcata*, n. s., 1 sp.

703. *Torinia*, sp. ind., 2 sp.


53. Hanley's Catalogue.—Mr. Hanley states that after the return of Prof. Nuttall, his duplicates were bought by the elder Sowerby, who sold part to

designations of Lamarck, &c., must give way to such names as the above; and if some other 'Attempt' or 'Little Lucubration' of a year's earlier date should be disinterred from now-fortunate concealment, the most modern 'Guides' and 'Books of Genera' will have to be re-written. Klein's idea of *Argobuccinum* appears to have been that of a "Spotted Whelk," probably *Ranella argus*. *Argobuccinum*, H. and A. Ad., may stand as defined in their 'Genera' for the thin ventricose Tritons. They have, however, divided the species between *Friea* and *Legena*.
Dr. Jay, and part to Mr. Stainforth. The specimens in Mus. Cum. were re-
ceived from Dr. Jay; those in Mus. Hanley from Mr. Stainforth. In the
third edition of Dr. Jay’s Catalogue, 1839, appear the following species which
have not been identified, and localities not confirmed.

15. Pecten tumidus, Brod. Upper California.
16. Chiton incarnatus, Nutt. ... Chiton texilis, Cour. ...
17. Patella plicata, Nutt. ...
18. Fissurella pica, Nutt. ...
19. Crepidula squamosa, Brod. ...
20. Bulla Californica, Nutt. ...
23. Monodonta fusca, Nutt. ...
24. Marmorostoma planospira, Nutt. ...
25. Litorina iostoma, Nutt. ...
26. Litorina maculata, Nutt. ...
27. Melongena occidentalis, Nutt. ...
28. Murex secostatus, Brug. ...
29. Monoceros plumbeum, Kien. ...
30. Buccinum Boysii, Nutt. ...

54. C. B. Adams.—After arranging the duplicate Reigen Collection in the
State Museum at Albany, New York, I proceeded to Amherst, Mass., to
study the type-collection from which Prof. Adams’s book was written. The
result is embodied in a “Review of Prof. C. B. Adams’s ‘Catalogue of the
Shells of Panama,’ from the Type Specimens,” written for the Zool. Soc. in
paper the synonymy between the Mazatlan and Panama Catalogues is pointed
out, and the species assigned to the modern genera. The following are the
principal corrections needed in the list, Rep. pp. 267–280. The results in the
succeeding paragraphs, pp. 280, 281, should be altered accordingly.
(M. = Brit. Mus. Maz. Cat.)

3. Ovula neglecta=avina, var.
8. Cyprea punctulata; quite distinct from C. arabicula.
15. Marginella sapotilla, C. B. Ad., is perhaps a large form of sapotilla, Hds. It
is destitute of the sharp posterior labral angle seen in the West Indian
specimens of cerasulescens.
43. Nassa canescens = dead sp. of N. pagodus.
51. Nassa Panamensis has the operculum of Phos and Northia, = exilis, Pws.
52. Nassa proxima+54 N. striata, C. B. Ad. [non Mus. Cum. = N. papyrea, Gld.],
+N. crebristratiata, M. 633, are probably vars. of N. versicolor.
70. Perpura foeculenta, probably = worn sp. of Cuma costata, M. 610.
74. Perpura osculata+Rh. Californicus + Rh. distans, are probably vars. of Rhizo-
chelus mix.
98. Columbella parva, C. B. Ad., = dead sp. of Anachis pygmaea.
103. Columbella tessellata, C. B. Ad. (non Gask.), = A. Guatemalensis, Rve.
110. Cassis abbreviata can scarcely be distinguished, in some of its many varieties
from the Texan Bezoardica inflata.
100. Cancellaria pygmea = C. goniostoma, jun., no. 157, = M. 446.
109. Pleurotoma discors, C. B. Ad., is probably a finely developed var. of D. aterrina.
194, 195, 201 belong to Cerithiopsis.
196. Cerithium famelicum must stand for the West Coast Uncinoids, M. 383; the Cumingian shell, and two out of ten in the type-series, belong to C. mcdoleae, M. 382.
200. Does not correspond with the diagnosis, and must stand as Chrysallida pasa-percula, a very distinct species.
209. Is scarcely a variety of Triforis alternatus, no. 207.
209. Both the specimens are dextral, = Cerithiopsis tuberculoides, M. 557.
220. Chemnitia acuminata is a very broad but typical species; not Chrysallida.
221. Chemnitia affinis, Mus. Cum. and M. 523, has sufficient correspondence with the diagnosis; but the type = Ch. undata, M. 531.
223. Chemnitia communis, the type of Chrysallida, M. 507, Cpr. (vix A. Ad.). The type-series also contains Chr. effusa + Chr. telescopium, M. 508, + Dunkeria subangulata, + fdo. var.
225. Chemnitia major ranks with Dunkeria.
227. Chemnitia Panamensis contains also Ch. Adamsii, M. 510, + Ch. ? gracilima, M. 530.
228. Chemnitia similis, like aequula; differs from Ch. ? similis, M. 520, which perhaps = Panamensis, var.
230. Chemnitia turrilata = 251, "Rissoa, sp. ind."
231, 235, 237, 238. These species of "? Litorina" belong to Fossar. Litorina atrata (+ adult) 257, ? Adecoris abjecta, are the same (variable) species of Fossarina, A. Ad.
239. Litorina parvula, C. B. Ad. (non Phil.), = L. Phillippii, M. 308.
244. Rissoa firmata (+ jun.) 250, R. scaliformis = Rissoa, sp. M. 409.
246. ? Rissoa inconspicua, C. B. Ad. (non Ald.), does not accord with the diagnosis, but is identical with Alvania tumida, M. 414.
249. Rissoa notabilis + Cingula ? turrilata belongs (with 252 and 254) to another suborder, = Parthenia quinquecineta, M. 498.
261. Vitrinella minuta. The original type accords better with Ethalia.
263. Vitrinella regularis is also an Ethalia.
293. Vitrinella valvoidea. Probably an Ethalia.
270, 271. Are apparently var. of Solarium granulatum.
272. May be distinguished as Torinia rostrata, from its great superficial resemblance to Helix rostrata.
275. Trochus Leamus is a pale var. of Calliostoma M'Andree.
276. Trochus lima can scarcely be distinguished from C. Antonii, Mus. Cum., dredged in the Japan seas by Mr. A. Adams.
282. Turbo phasianella, C. B. Ad., is probably the perfect form of Thasianella, ? var.

36
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 551

striolata, M. 283b. Its operculum proves it to be a true Phasianella, and not Melaraphe phasianella, Phil., of Add. Gen.

283. Turbo rutulus, the worm remains of what perhaps was once Pomaulax undosus, brought in ballast from Lower California.

280. Scolaria, sp. c., = Opalia funiculata, jun., M. 509.


292. Eulina [Mucronalia] so itarina=Leiostraca, sp. a, M. 552.


301. Natice, sp. a., = marocca, var. unifasciata.

318. ?? Truncatella dubiosa is probably a Paludinella.


325. Stomatella inflata is a Lamellaria.


329. Calyptrae aberrans is a valve of Anomia.

331. Calyptrae aspersa = Galerus conicus, broken, worn, and young; one sp. may be mamillaris.

332. Calyptrae conica. Most of the specimens are G. mamillaris, = 340, G. regularis; but a few may be the true G. conicus, worn, M. 332.

334. Calyptrae planulata is a young flat C. cepacea.


340. Crepidula squama. Some of the young shells belong to C. onyx; one perhaps to C. incurva.

350. Crepidula unguiformis. Some of the specimens belong to this species; others to C. nivea.

351. Crepidula nivea. The type-specimens are small, poor, and rough, of the var. striolata, passing into Lessoni. Perhaps, therefore, the first name squama should be retained for the species (nos. 343, 349, 350, part, and 351), leaving striolata and Lessoni for the vars.

352. Crepidula oscillans belongs to another order, = Scentelia navicelloides, M. 269.

353. Crepidula rostrata, C. B. Ad., Rve., = C. vacata, Mke., M. 333; and is perhaps distinct from C. adunca, Sby., = solida, Hds., = rostriformis, Gld.


367. Lottia ? patina, C. B. Ad. [non Esch.], may stand, until more specimens have been collated, as Acmea (?flaccata, var.) filosa.

368. Lottia, sp. ind. a, may be quoted as Acmea (?flaccata, var.) subrotundata.

369. Lottia, sp. ind. b, may rank, for the present, as Acmea (?vespertina, var.) vernicosa.

371. ?? Patella, sp. ind., resembles P. vulgata, but may be an Acmea.

372-376. There was no opportunity of dissecting the Amherst Chitons; but among the remaining duplicates of the collection (all of which were obtained and brought to England) were the following:—

373. Chiton dispar, C. B. Ad. (? non Sby.), including Lepidopleurus Adamsii and var. and L. teniscuclypus.
375. Chiton pulchellus, along with Ischnochiton Elemensis, and ?var. expressus.
376. Chiton Stokesii. Sent as C. patulus by Mr. Cuming.
377-379. Probably vars. of Anomia tenuis (non lampe).
380, 381. Ostrea, sp. ind. a and b, a peculiar corrugated species, which may stand
as O. Panamensis.
382. Ostrea, sp. ind. c, resembles O. rufa, Gld., MS. (not Lam. in Deless.), not
Columbiensis.
383. Ostrea, sp. ind. d, more like the Gulf Mex. shells than O. Virginica, M. 212.
384. Ostrea, sp. ind. e, may stand as O. amara. The “small var.” is O. concho-
phiila, M. 214.
393, 394. Perna, sp. a, b, = L. Chemnitianum. The Jamaica conspecific shells are
labelled “bicolar, Ad.”
399. Lithodontus, sp., includes L. aristatus, M. 170, L. attenuatus, M. 173, and
L. ?planula, jun., M. 175.
400. Modiola semisusica, C. B. Ad., = M. Braziliensiis, M. 171. More like the Atlantic
shells than are those from Gulf Cal, undoubtedly from N. Zealand, is pronounced conspecific by Mr. Cuming.
401-404. Modiola, sp. ind., contains M. capax, M. 170, Myt. multiformis [= Adam-
sianus, Dkr.], M. 168, several vars., and Adula cinnamomea, var. M. 177.
405. Chama Buddiana (in poor condition) = Ch. (?frondosa, var.) formicata,
M. 121 b.
406. Chama ?corrugata, small valve; large one? = Ch. Mexican a, reversed.
410. Arca pholadiformis = Barbatica gradata, var.
422. Arca similis, scarcely a variety of A. tuberculosa, no. 425.
423. Cardium planicostatum, C. B. Ad., may be a worn valve of Hemicardia bian-
gulata, but more resembles a ballast specimen of the W. Indian H. media.
435. Venus ?amathusiana, C. B. Ad., = Anomalocardia subimbricata, M. 113
450. Gouldia Pacifica, M. 116, does not belong to the Professor's genus, but is a
form of Crassatella.
451. Cyrena maritima. “The discovery of Cyrena in brackish water is a fact of
some importance to geologists, which was duly appreciated by D'Oorb.” (T.
457. Donax rostratus, C. B. Ad. (non Gld., MS., and from it Cpr. in M. Appendix,
p. 549), teste type-valve = D. carinatus, Mus. Cum. olim, and from it M. 71;
non D. carinatus, Mus. Cum. hodie, and type, teste Hanl., = D. culminatus,
M. 72.
458. Tellina cognata = Psammobia casta, Rve., teste Cuming.
465. Tellina felix. The affiliation of this shell to Strigilla fucata, Gld., MS., was
doubtless due to an accidental error in labelling. No. 476 is the same
species, dead.
471. Tellina simulans. The type-valve exactly accords with the Professor's W
Indian specimens.
473. Tellina vicina, C. B. Ad., = versicolor, C. B. Ad., MS. on label. Larger than
most W. Indian specimens, which exactly accord with the Acapulcas, and
are varieties of Heterodonax binaculatus. The Panamic shells resemble the
Lower Californian, which are Psammobia Pacifica, Conr.
477. Petricola cognata. Perfect specimens are P. pholadiformis, teste Cuming.
Ad. Gen. pp. 349-441, and better accords with the latter genus.
482. Cumingia coarctata = lamellosa, var. M. 42.
483. Cumingia, sp. c, = M. 45, and, if not described, may stand as C. Adamsii.
484. Cumingia, sp. d, = M. tablet 107, p. 31.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 553

485. Amphidesma bicolor = Semele ?venusta. M. 41 (non A. Ad.).
491. Amphidesma venticosum. Scarcely perfect enough to distinguish the genus.

The valve outside resembles Macoma solidula.

497. Anatina alta. A valve of Periploma; probably one of the Gulf species.

498. Pandora cornuta, named and described from a fractured growth; resembles Clidiodiora clariculata.

499, 500 are varieties of the same species of Azara, of which perhaps no. 501 is an extreme form.

500. Corbula rubra = C. biradiata, jun., no. 503, M. 31. No. 509 are dead valves of the same, = C. polychroma, Cpr.
508. Corbula, sp. a, resembles C. pustulosa. M. 32.
510. Solecurtus affinis, probably = S. Caribbeanus = Siliquaria gibba, Spengl., S. I. Check-List, no. 222. The W. African specimens are affiliated to the same species by Mr. Cuming. The Mazatlan shells, M. 37, have a different aspect, but closely resemble the Ariquibó specimens in Mus. Amherst.

511. Solen radiis is named Solena obliqua, Spengl., in Mus. Cum. It appears identical with Ensatella ambiguus, Lam., as figured by Deless.; but S. ambiguus (Lam.), Swains., is slightly different, and better agrees with the dead valves of "S. medius, Alataska," in Brit. Mus. These may, however, be only bivalve-valves. As S. ambiguus, Lam., was described from America, and the form is not known elsewhere, it probably represents the Panamic shell.

515. Pholos, sp. a, = laqueata, teste Cum.
516. Pholas, sp. b, closely resembles Dactylina dactylus; also La Paz, teste Rich.

The following species were collected by Prof. Adams, but do not appear in his Catalogue; they were found either mixed with others in the Amherst Museum or in the shell-washings of his duplicates.*

518. Mumiola ovata.
519. Chrysallida effusa.
520. Chrysallida telescopium.
521. Chrysallida fasciata.
522. Chrysallida, n. s.
523. Leiostraca retexa.
524. Euclisima yod.
525. Volutella margaritula.
526. Ceeum semilève.
527. Ceeum subquadratum.

528. Ceeum clathratum.
529. Lepidopleurus tenuisculptus.
530. Ischnochiton Elensiss.
531. Cerithiopsis, n. s.
532. Lucina capax.
533. Kellia suborbicularis.
534. Sphænia fragilis.
535. Tellina laminata.
536. Crenella inflata.

55. British Museum Catalogues.—To the list of Deshayes, Cat. Veneridae, may be added—

Page.
135. Chione callosa [Desh. et auct. Brit., = Ch. fluctifraga, var., quite distinct from Callista (Amiantis) callosa], Conr.

The authorities are rarely given for localities quoted in this elaborate work. The same species often occur under different names. The Veneridae

* With regard to the species which have received different designations in the Reigen and Adamsian catalogues, whether those names be retained of which the specimens exist, and have been widely distributed, in accordance with the diagnoses, or whether the prior ones be adopted of which the unique types do not represent the descriptions, is a matter of little moment to the writer of the Brit. Mus. Cat. He spared no pains in making-out his predecessor's species before describing his own, and has offered the best attainable list of the parallel forms in the review here quoted.

39
in the Brit. Mus. Coll. have received Deshayes' autograph names, in accordance with this Catalogue, generally on the back of the tablets.

In the Brit. Mus. Catalogue of *Volutidae*, 1855, Dr. Gray arranges the W. Coast species thus:

Page. No. 

56. Sailor's Coll.—*Pincta ?senatorius* may be a form of *sericeus*, Hds.

57. Gould's Collections.—"*Planorbus ammon*, = Traskei, Lea. *P. graci-lentus* ?= *Liebmanni*, Dkr., or *Haldemanni*," teste Gld. MS. The collections of Mr. Blake and others will be found under the "Pacific Railway Explorations," v. posteâ, par. 98.

58. Bridges.—Some of the species described as new on Mr. Cuming's authority appear, on further comparison, to be identical with those before known.

? *Serobicularia producta* = *Lutricola* † *Dombeyi*, Lam. 
*Strigilla disjuncta* appears to the author identical with *S. sineera*, Haul. ["Quite distinct," H. Cuming.] 
*Lysonia diaphana* = *L. inflata*, Conr. 
*Calliostoma M'Andree* = normal state of *C. Leamem*, C. B. Ad. 
*Natica crevata* + *N. Haneti*, Recl., appear varieties of *N. Elena*, Recl., the analogue of *lineata*, Chemn. 

59. Proc. Zool. Soc.—The following additional synonyms have been observed in the list, Rep. pp. 285–288:—

1835 43. *Venus leucodon* + *Californiwnsis* [= *Chione succineta*, Val. 1833].

1850 34. Pl. 8. f. 4. (Add) *Cumingia similis*, A. Ad. N.W. coast of America.

37. *Gena varia*, A. Ad. Mindoro, 9 fms., *Cuming*; Australia; Acaepulco, on the sands, Moffat. [Clearly imported.]

1851 153. *Infundibulum Californicum* [is a Pacific shell = *L. chloromphalus*, var.].

1856 168. *Ziziphinus Californicus* [= *Calliostoma eximium*, Rve.].


1854 316. *Chlorostoma funebrale* [= *Tr. marginatus*, Nutt. (non Rve.); = *T. mastus*, auct. nonnul.; non Jonas].

359. *Tellina Mazatlanica* [= *T. pura*, Gld., 1851].


321, 232. *Ch. Hartwegii* and *regularis* belong to *Ischnochiton*.

* In Donovan's "Naturalist's Repository," vol. ii. 1834, p. 61, appears (without authority) "*Voluta Dufresnii*, Don., California, S. America."

† This belongs to a group of species in which the cartilage is semi-internal, intermediate between *Scrobicularia* (= *Lutricola*) and *Macoma*. They are arranged under the former group in Add. Gen. ii. 409, as "subgen. *Capsa*, Bosc." That Lamarckian name being in common use for *Iphigenia*, Schum., and being also employed for *Asaphis* and *Gastrina*, it adds to the confusion to use it for a fourth group. The bulk of Blainville's old genus having migrated to *Lutraria* and *Scrobicularia*, his name may be revived for this group not otherwise provided-for. The species was redescribed in consequence of *Dombeyi* having been left among the true *Tellens* in Mus. Cum.
1855 234. Callopoma depressum [=Senectus funiculatus, Kien.: not American].

The following species appear in later numbers of the Proceedings:—


Dr. Gray, in his elaborate article on the Olividae, 1858, pp. 38 et seq., gives O. julietta, Ducl., O. araneosa, Lam., and O. venulata, Lam., as synonyms of Strephona reticularis, Lam.; and quotes as “species (?) more or less allied to it,” O. polpasta, Ducl., O. splendidula, Ducl., “O. jasidea, Ducl., = O. Duclosii, Rve.” [?], O. kaleontina, Ducl. (Gallapagos), O. Cumingii, Rve., and Oliva Schumacheriana, Beck, “California: front of pillar-lip brown” [? = O. Cumingii, var.].

For O. volutella, Lam. (including O. razamola, Ducl.), he constitutes the genus Ramola.

For O. undatella, Lam. (including O. ?hieroglyphica, Rve., O. nodulina, Ducl., and O. ozodina, Ducl.), and similar species, he forms the genus Anazola.

The restricted genus Olivella is altered to Olivina, and includes (from the West Coast) O. gracilis, Sby., O. anazora, Ducl., O. tergina, Ducl., O. lineolata = dana, Goodall*; and, in a section, O. columellaris, Sby., O. semisulcata, Gray, and O. zonalis, Lam.

The Californian species, O. biplicata, Sby., = O. nux, Goodall, in Wood, is placed in the genus Scaphula. This is constituted for an animal, “Olivancilla auricularia,” D’Orb., on which, in his work on S. America, he figures the shell of O. biplicata (testa Gray). The shell might in some way have become mixed with S. American specimens; but as D’Orb. could not possibly have there observed the living animal, the genus should be restricted to the latter. The shell of O. biplicata is very peculiar, and has not been found south of San Diego. D’Orbigny’s genus is Olivancillaria.


448-450. Review of Deshayes’ ‘Monograph of the Terebridae,’ 1850, by Mr. Reeve. His synonyms are quoted under par. 62, ‘Conch. Ic.’


* Many of the names given to the shells in Wood’s Suppl. were arbitrarily altered by Dr. Goodall, as the work passed through the press (teste Gray). However, if the first published, they will be allowed the right of precedence.
In the P. Z. S. 1861, pp. 145-181, is the first part of the long-expected "Review of the Vermetidae," by Otto A. L. Mörch. The species of the West Coast are arranged as follows:

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1861. 4. *Stephopoma pennatum*, Mörch, pl. 25. f. 3-8. Realejo, on *Calliophis.*  
152. *Stephopoma pennatum*, var. *bispinosa*, pl. 25. f. 9-10. and *Cruciluhmi.*  
153. 5. *Siphonium (Dendropoma) megamastum*, Mörch, pl. 25. f. 12, 13, "California; burrowing in *Haliotis nodosus,* Rve." [Not a Californian species.]  
155. *=Spirophyllus*, sp., Cpr., B. A. Report, p. 324. [Found on shells from Washington Terr. to Cape St. Lucas (also Socoro Is., *Xantus*) but it has not been observed on the Mexican or Central American coast.]  
182. Var. 1, from var. *d.* = *Vermus Hindsii*, Gray, Add. Gen. fig. 58, a, b. Puntarenas, Oersted.  
184. Var. 3, from var. *e.* Pl. 25. f. 17.  
186. 38. *Vermiculus effusus*, Val., = "*Vermus e., Val.*" Chen. Ill. pl. 5. fig. 4, a-c. = *Siphonium e., Chen. Man. fig. 2901. "Fig. 4 of Chen. is from specimen figured in Voy. Ven. as V. centiquadrus."  

In the second part of Mörch's "Review of the Vermetidae," 1861, pp. 326-365, occur the following. A portion of the genus *Bivonia* is united to *Spirophyllus.* *Petaloonchus, Aletes,* and part of *Bivonia* are united to *Vermus, Mörch* (non auct.). The name *Aletes* appears to be used in a varietal sense, in no respect according with the subgenus as described by the author.  

* I was perhaps wrong in referring the Mazatlan shells to Val.'s species; but if Mr. Mörch is right in his own determination, the Mazatlan synonymy and locality must be expunged. There was no evidence of a typical *Siphonium* when the Reigen Catalogue was published, nor have I seen such from the whole coast, unless th minute operculum *b*, Brit. Mus. Col., tablet 2537, be supposed the young. Mörch says, "the lid is unknown." The operculum of the similar Mazatlan species, on which the subgenus *Aletes* was founded, is described in Maz. Cat. p. 302.  

† "Cpr.'s observations respecting Chenu's plates (Maz. Cat. p. 306, lin. 18) are in part erroneous, it being overlooked that Chenu has two plates marked 'V.'" note *; p. 337.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

557


Forma 1. *Thylacoda* *contortus*, var. *indentata*, Cpr. "Corre-

346 4. Var. ε. *corrodens* (*Vermetus*). Is. Sibo (?Quibo), Spengler, on Pur-

350 20. *Vermetus* (*Siresbiloceras*) *anellum*, Mörch. California, on *Haliotis tiber-

362 24. *Vermetus* (*Aletes*) *centiquadrus*, Val. Puntarenas, Oersted + V. effusus, Val. (the same specimen).

Var. a. *maxima* = V. *Panamensis*, Chen. pl. 5. f. 1. Panama, C. B. Ad.; Mazatlan, Melchers.

Var. β. *Punctis impressa* destituta = V. *Pernoni*, Val.


*The Póina migrina* is from the E. I. = V. *tulipa*, Rouss.


The conclusion of the paper is in P. Z. S. 1862, pp. 54–83.


Var. β. *erythosclera*. Cal., on young *Margaritifera*. Mus. Cum. Very like *Biv. Quoyi, var. variegata*. [This species is on shells from the Mexican, not the "California" fauna.]


* Mr. Mörch has not seen any lamine inside, but, from the 3–5 spiral line on the columella, believes they will be found. The operculum supposed to belong to this species (Maz. Cat. p. 311) Mr. M. thinks more probably those of *Spiruglyphas albidus*. He states (erroneously) that the shell was not opened by the describer.

† Mörch supposes that *Bivonia contorta*, Cpr., may be the adult of *Petaloconchus macrophyragma*, and that both may be forms of *Aletes centiquadrus*. The nuclear portions are, however, quite distinct, and the three shells appear, from beginning to end, as far removed as any ordinary *Vermetis* can be from each other.

‡ The writer doubts respecting this species, and thinks the shell on which it is parasitical to be a *Melo*, and not *Strombus galea*, simply because named after *Périon*, who did not visit this district.
In P.Z.S. 1861, pp. 229–233, is given a “Catalogue of a Collection of Terrestrial and Fluvial Molluscs, made by O. Salvin, Esq., M.A., in Guatemala: by the Rev. H. B. Tristram.” But few of the 49 species occur in Mexican collections; none are identical with W. Indian species, except such as are of universal occurrence in tropical America; and the 16 new species show close generic affinities with the shells of the northern regions of S. America. The shells have been identified from the Cumingian collection. The new species are described, and some of them figured.
The vol. for 1863 contains Dr. Baird's descriptions of new species from the Vancouver collections of Lord and Lyall, which will be tabulated, \textit{infra}, par. 103; and the Review of Prof. Adams's Panama shells, which has already been quoted.

60. Sowerby, 'Conchological Illustrations,' 1841.—The following are additional localities or synonyms:—

No. Fig.
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2 46. Cardium Indicum [is exotic; closely allied to \textit{C. costatum}].
90 44. \textit{Murex imperialis}, Swains. Cal. = \textit{M. pomum}, var. Gmel. [Perhaps distinct; may be the \textit{W. I.} analogue of \textit{bicolor}.]
45 102. \textit{Cypraea albuginosa}, Gray. Mexico, Ceylon. [The Ceylon shell is probably \textit{poraria}, sp. 44.]
62 40. \textit{Fissurella Lincolnii}, Gray, MS. [An extremely fine specimen (supposed "unique") of \textit{Glyphis aspera}, Esch. Mr. Lincoln is also quoted for the "finest of the four known specimens" of \textit{Lucapina crenulata}, sp. 19, f. 31, 38: "Monterey."]
54 [Erase this line in the former Report, and substitute as follows:—]
55 \textit{Bulimus unifasciatus}, Sby. Galapagos.

'Thesaurus Conchyliorum,' G. B. Sowerby, \&c. To the list in Rep. pp. 288, 289, may be added:—

Page. Pl. Fig.
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51 12 23. \textit{Pecten circularis}, Sby. Cal., St. Vincents. [The name may stand for the \textit{W. Indian} shell, the Californian being \textit{P. ventricosus}, jun.]
261 59 144. \textit{Tellina sincera}, Hanl. N.W. Coast America. [=Panama.]
8 Sp. 47 43, 44. \textit{Conus* interruptus}, Mawe, Wood. [Slender, coronated sp.] \textit{non} Br. and Sby. \textit{Hab.}?

* Mr. Sowerby remarks, "As the collector's great object is to know the shells, I have preferred, in most cases, giving the species as they stand, stating the alleged differences, and leaving the final decision to individual taste." He further states, with regard to some groups, that "the characters of the shells are very uncertain, and the intentions of the authors still more so." The names, references, and localities are given on lists to face the plates, and the diagnoses separately, with a copious index. An attempt also is made to
REPORT—1863.

80. Conus tiaratus, Brod. Galapagos.
... 130. Conus puncclulatus, var. = papillosus, Kien.
... 391. Conus puncclulatus. [Mazatlan.]
... 392. Conus puncclulatus, var. = postulosis, Kien.: ?= Mauritianus, Lam.
33 190. Conus virgatus, Rve., = zebra, Sby., non Lam. [Resembles regularis var.] Salango, W. Col., Cuming.
... 193. Conus virgatus, var. = Lorenzianus, Rve., non Chem.
127 194. Conus incurvus, Brod. [Resembles specimens from La Paz.] Monto Christi, W. Col., Cuming.
84 384. Conus arcuatus, Br. and Sby. Mazatlan, Pacific [?].
15 26–28. Fissurella Mexicana, Sby. Real Llejos, Mexico. [Both localities are probably incorrect; it belongs to the Chilicha family.]
78 40. Fissurella rugosa, Sby. W. Indies [= W. Mexico].
68 154–156. Fissurella excelsa, Rve., + F. alta, C. B. Ad.
80 123. Fissurella Panamensis, Sby. "In Conch. Ill., this very distinct shell is united to that named F. excelsa, Rve."
115 187–189. Fissurella cancellata, Soland. St. Vincent's, Honduras Bay, Guadalupe, California. [No authority for the latter.]
1860.
2 57. Dentalium pretiosum, Nutt. "= striolatum, Stn. Massachusetts. Less curved and tapering near apex than D. entale, more cylindrical through, but a doubtful species." [The type-specimens are not striated.] California.
42 34. Dentalium pseudosezagonum, Desh. Masbate, Philippines: W. Columbia.
8 41. Dentalium splendidum, Sby. Xipixapi, W. Col.
48 31. Dentalium quadrangular, Sby. Xipixapi, W. Col. [Like tetragonum, but striated, and much smaller.]
40 21, 22. Dentalium tetragonum, Sby. W. Col. [Young shell square, adult round.]

In the very elaborate monograph of the Nuculidae, by S. Hanley, Esq., the following species, quoted as from the W. Coast, are minutely described:

2 33. Leda Sowerbiana, D'Orb. Xipixapi.
= N. elongata, Val.
= N. lanceolata, G. Sby., non J. Sby., nec Lam.
29 70–72. Leda Elenensis, Sby. Panama.
33 90. Leda eburnea, Sby., = hyrata, Hds. Panama: Bay of Caraccas.

classify the forms according to their natural affinities. It is rarely that monographers and artists take such laudable pains to supply the wants of students. In the monograph of Galeomma and Scutella, however, the locality-marks have not been observed to a single species, except the "British G. Turtoni" and its "Philippine analogue, G. macrochisma, Desh." This is the more remarkable, as most of the species were described by Desh., with localities, in P. Z. S. 1855, pp. 167–181.
In the 'Malacological and Conchological Magazine,' by G. B. Sowerby, London, 1838, is a monograph of Leach's genus Margarita. The following probably belong to the N. W. Coast, and are figured in the Conch. Ill.:—

Page.

Several West Coast species were named and figured in the elder Sowerby's 'Genera of Recent and Fossil Shells,' London, 1820–1824; a work of singular merit for its time, but left unfinished*. The stock was purchased by a dealer, with a view to completion; but newer works have occupied its place, and the valuable plates and text remain useless in his hands. As no dates appear in the bound copy of the work, it cannot be stated whether the species here named by Mr. Sowerby had been before published. The loss of the original work has been in some respects supplied by the completion of the extremely similar 'Conchologia Systematica,' by L. Reeve, vol. i. 1841, vol. ii. 1842. It might almost be considered a second edition of the 'Genera,' of which some of the plates occur in the quarto form. References are here given to the species reproduced from Sowerby's unfinished work, which is often quoted by Mr. Reeve according to the "Numbers" in which it appeared:—

Rve. Sby. Fig. Sowerby's Genera.
2. 2. Cumingia trigonulris.
3. 3. Cumingia lamellosa.
4. 4. Cumingia coerctata.
1. 1. Tellina opercularis ["= T. oerzulata, Gmel. = T. rufesces, Chem.," Rve.].
2. 25. Venus subrugosa.
3. 7. Venus gnidia.
2. 2. Cytherea planulata.
3. 3. Cytherea aurantiaca.
4. 4 [non 3]. Lithodomus caudigerus [Lam. = aristatus, Dillw.].
3. 3. [Appears to represent attenuatus, Dush.]
6. 6. Modiola semifusca [inside view; exactly accords with Braziliensis, Maz. Cat., but is not Lamarck's species, teste Hanl.].
2. 2. Lima squamosa [Lam.].
2. 2. Ostrea Virginica [Lam.].
1. 1. Placumomastis Cumingi. "Brought by Mr. Henry Cuming from the Gulf of Dulce, in Costa Rico."
1. 1. Lotia gigantea, Gray. Genus named in Phil. Trans. = Patelloides, Quoy and Gaim. ?South America. [The U. S. E. E. specimens were labelled "Valparaiso." It comes to us from many parts of the world, but is only known to live in Middle and Lower California. = Tecturella grandis, Cpr., B. A. Rep. 1861, p. 137.]
3. 3. Siphonaria Tristensis. [The figure is singularly like the Vancouver species, S. theresites.]
2. 2. Crepidula onyx.
4. 4. Crepidula aculeata; "= P. auricula, Gmel."
3. 3. Callipteris ?extinctorium. [Sby., non Lam. The non-pitted form of imbricata.]
4. 4. Callipteris spinosa.

* The last Part (no. 34) appeared "March 31, 1831," many years after the previous issues; teste Hanl.
1863.
The following additional West Coast species, figured in the 'Conch. Syst.' may be quoted for the synonyms. The authorities for all the species are given, but no localities:—

237 1. Solecurtus Dombeyi, Lam. [appears intermediate between S. Dombeyi, Mus. Cum., and S. ambigius, Lam.].
229 2. Turbinellus acuminatus, Wood, Kien. [closely resembles Latirus castaneus].
235 3. Buccinum elegans, Rve., P. Z. S. 1842, from Hinde's Col. [is the southern, highly developed form of B. fossatum, Gld. The name is preoccupied by a Touraine fossil, B. elegans, Duj., in Desh. An. s. Ver. x. p. 219, no. 22. As Rve.'s species is a Nassia, and there is another Duc. elegans; Kien., Coq. Viv. p. 56, pl. 24. f. 97, = Nassia e., Rve. Conch. Ic., it will save confusion to allow Gld.'s later name to stand].
233 5,6. Buccinum serratum, Dufr., = Nassia Northia, Gray [= Northia pristis, Desh.].

62. Reeve, 'Conchologia Iconica.'—The following corrections should be made in the abstract, Rep. pp. 289–293.

20. [Semele flavicans should be flavescens, et passim.]
33. Siphonaria amara [is a Sandwich Is. species, quite distinct from C. lecanium].
33. Patella cypeaster [is a S. American species, having no connexion with A. patina, or with Monterey].
69. Patella eimi [= A. pelta, not patina, var.].
67. Patella vespertina. [P. stipulata, sp. 117, is probably a var. of this species.]
90. Patella toreuma ["var." in Mus. Cum., "Mazatlan," probably = flavescens. No shell of this (N. Zealand) type has been found on the coast by any of the American collectors].

* Sowerby's (correct) name appears on Reeve's plate; but in the text of C. S., f. 9 is called "a species of Turbinellas inserted inadvertently."
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

61. Patella Nutalliana. [Mus. Cum., = A. pelta, typical. The figure looks more like patina.]

140. Patella mamillata, Nutt. [non Esch., is an elevated, stunted form of the black var. of scabra, Nutt. The name being preoccupied, this distinct form may stand as kimatula.]

64. Fissurella densicellathata [is distinct from G. aspera. Sta. Barbara, Jewett.]

57. Turbo marginatus [Rve., non] "Nut." [is a Pacific species, quoted by Messrs. Adams as the Collonia marginata of Gray; but that is a Gry-phon fossil, olim Delphinula (test: type in Brit. Mus.). The Nuttallian shell, published in Jay's Cat., was described by A. Ad. as Chlorostoma funebrale = Chl. mactum, aux. (non Jonas, the true T. mactus being S. American, teste A. Ad. and Mus. Cum.).]

39. Cyprea onyx [is the E. Indian, C. spadicea the similar S. Diegan species].

The following species, either quoted from the W. Coast, or known to inhabit it, or connected with it by synonymy, have been observed in Reeve's 'Conch. Ic.' since the date of the last Report. The number of the species also refers to the figure. For the remarks enclosed in [ ], the writer of this Report, here as elsewhere, is alone responsible.


76. Fasus Noce-Hollandiae, Rve., Jan. 1848. 'N. Hol., Metcalfe. [As Mr. Metcalfe gave numerous West Coast shells to Brit. Mus. under locality "N.H." this shell also was probably from W. Mexico, = F. Dupetilionaris, Kien.]


52. Cardium pseudofossil, Rve. "P. Z. S. 1844." Hab.? — [Not found in P. Z. S. = C. Californiense, Desh., 1839, non C. Californiannum, Conr., 1837. This is the Eastern form; the Californian var. = C. blandingii, Gl.]

67. Buccinum modificatum, Rve., Dec. 1848. Hab.? — [Agrees sufficiently well with worn specimens from La Paz, Mus. Smiths, = Siphonalia, closely allied to pallida.]


10. Mytilus ralliopunctatus, Dkr. Cal. and Mazatlan. [No authority for Cal.]

41. Mytilus bifurcatus, Conr., J. A. N. S. Phil. Hab.? [Conr. assigns his Nuttallian species to California; but it is the common Sandw. Is. species, teste Poe. The California shell, with the same sculpture, is a Septifer, and is the S. bifurcatus of Mus. Cum.]

44. Mytilus Sallei (Dreissenia), Recl. Central America. [? On which slope.]

52. Mytilus Cumingianus, Recl. Panama. [Septifer.]

60. Mytilus glom- ratus, Gl. Hab.? — [Gould's species is from California, but the name is attached to a very different shell in Mus. Cum.]

* Several species occur in the recent monographs without locality, which are well known to inhabit the W. Coast. This is partly due to the writer not thinking it necessary to refer to published books for information, and partly to the changes which have of late years been made in the principal authority, viz. the Cumingian collection. By the redistribution of species into the modern genera, the student is greatly aided in his search for special forms; but, for the sake of uniformity, the autograph labels of collectors or describers of species are generally rejected, the names being either in the handwriting of the clerk or from the printed index in the monograph, and representing only the judgment of the latest worker, which may or may not be correct. Synonyms, whether real
11. Modiola capax, Conr. Galapagos, Cuming. [Lower] California, Nuttall. Mazatlan, Carpenter. [Reigen is the authority for the shells described in the Maz. Cat., not Cpr.]

17. Modiola Brazilianis, Chem. "Brazil." [At f. 31, which appears the true Brazilian shell, we are informed that this specimen is a "variety from Guayaquil."

... Modiola silens, "Cpr. Cat. Reigen Col. Brit. Mus. California." [The shell was erroneously described as from "California" in P. Z. S., and does not appear in the Reigen Mazatlan Cat.: = M. subpurpureus, Mus. Cum.]


8. Lithodomus Cumingianus, Dkr., MS. "North Australia and Mazatlan." [The species is figured from the Mazatlan specimen, which may probably be the adult form of L. cayuleatus, Cpr.* The cup is not distinct, but shows a tendency to the peculiar formation described in Maz. Cat. no.174. Rve.'s diagnosis, however, appears written from Dkr.'s Australian species, so labelled in Mus. Cum.—a very distinct species, without incrustations. The name was given by Mr. Cuming to a large Chilian species brought by the U.S. Expl. Exp.]

12. Lithodomus Gruneri, Phil. MS. in Mus. Cum. "N. Zealand." [The species = L. falceatus, Gld., and is certainly from California, where it is found in the rocks with Pholadidea penita.]

13. Lithodomus teres, Phil. "Mazatlan." [The specimens in Mus. Cum. are labelled "Cagayan, Phil."]


16. Lithodomus cautigerus, Lam. "West Indies" [without authority]. "The calcareous incrustation produced beyond the ant. extremity is no specific characteristic. [Vide reasons for contrary opinion, Maz. Cat. no. 176: = L. aristatus. Dr. Stimpson has seen lithophagus arranging its peculiar incrustation with its foot.]


26. Lithodomus subula, Rve. Hab.?— [= L. plumula, var.]


9. Avicula barbata, Rve. Panama, under stones at low water, Cuming. [= M. fimбриata, Dkr., = M. Mazatlanica, Hanl.] "Differs from Cumingii in regular sequence of scales, developed only at margin, and yellowish tone of colour."

67. Avicula heteroptera, Lam. N. Holland. "= A. sterna, Gld." [Gould's species is from Gulf Cal.; but in Mus. Cum. it is marked inside "semisquitta."]


7. Placunomania macrochisma, Desh. "Onalaska, Cuming" [who never was there]. Kamtschatka, Desh. [Vancouver district, abundant.]

7. Thracia phacata, Desh. "Mr. Cuming has specimens from California and St. Thomas, W. L." [Cape St. Lucas, Xantus.]

Melania. [Various species are described from "Central America," &c., which

or supposed, are rejected altogether. Thus shells sent to Mr. Cuming, with authentic name and locality attached, may appear soon after without any, or with erroneous, quotation. The error is rendered graver by appearing with the weighty authority of "Mus. Cum."

* The species described in the Brit. Mus. Cat. seldom appear in the monographs, unless there happen to be a specimen in Mus. Cum. Some of the monographers often content themselves with figuring the shells that come most easily to hand; and do not seem to consider it a part of their work to pass judgment on previously described species, or to concern themselves with what are small or difficult.
may or may not belong to the Pacific slope. They should be studied in connexion with U. S. forms, but are not here tabulated.


Say's species is the well-known form from the Gulf of Mexico.]

5. Terebra striigata, Sby., + elongata, Wood., = flamma, Less., = zebra, Kien. "Pan-  

ama, Galapagos, and Philippines, Cuming; Moluccas, &c." [Painting  

in stripes.]


1850, p. 450. Painting splashed.]

12. Terebra variegata, Gray. "Mouth of the Gambia, Senegal, Mazatlan, Co-  

lumbia." It is well known to those who have studied the geographical  

distribution of animal life, that the fauna of the West African seas,  

north of Sierra Leone, is in part identical with the fauna of the seas of  

California and the W. Indies; and geologists, among whom was the late  

Prof. E. Forbes, have laboured, not unsuccessfully, to account for this  


instance, however, there will be more than one opinion as to the  

identity of the species here quoted.] + T. africana, Gray, + T. Hupeii, Lorois,  

+ T. intertincta, Hds., + T. marginata, Desh., + T. albocincta, Cpr., + T.  

Hindsii, Cpr., + T. subnodosa, Cpr.

72. Terebra armillata, Hds. "Panama, Galapagos. Somewhat doubtful whether  

this is not a var. of T. variegata." [If the others are, probably this is.  

Those species of Hinds, which Mr. Reeve has not altered, are not here  

repeated.]

32. Terebra dislocata [as Cerithium], Say. "Southern U. S. and California." [No  

authority given for Cal.]

34. Terebra rudis, Gray, "= M. Rufocinerea, Cpr. S. Carolina, Jay. Somewhat  

doubtful whether this is not a var. of dislocata." [The T. Rufocinerea is  

one of the difficult Mazatlan shells, and should share the fate of T. Hindsii  

and T. subnodosa.]

35. Terebra cinerea, Born. "W. Africa, Hennah; Japan, Hds.; Philippines,  

Cuming; W. I., C. B. Adams; Mazatlan, Cpr." [i.e. Reigen. The same  

remarks apply to this group as to variegata, &c.] + T. castanea, Kien., non  

Hds., + T. lavina, Hds., + T. luctuosa, Hds., + T. stylata, Hds., + T. Jumai-  

censis, C. B. Ad.


2. Calyptraea tortilis, Rve. Galapagos, Cuming.


dilatata.]


10. Crepidula rugosa, Nutt. Upper Cal. [An accidentally ribbed specimen,  

figured from Mus. Taylor.]

11. Crepidula fimбриata, Rve. (June 1850). Vancouver's Straits. [This is to  

naviculoides, Nutt., no. 57, as Lessoniis is to squama; simply an accidentally  

frilled var.]

12. Crepidula adunca, Sby. [Not] Panama. = C. solida, Hds., = rostriformis,  

Gld. [This is the northern species from Vancouver and Cal., and is not  

uncata, Mke.


22. Crepidula aculeata, Gmel. Lobos Is., Peru, Cuming; California, Nutt., Cpr.  

[i.e. Mazatlan, Reigen]; Honduras, Dyson; Sandw. Is., Austr., Kur-

* Several S. American forms are here quoted for the synonymy; because in Calyptraeidae the species often have a wide range, and should be studied in connexion with their neighbours.

51
rachee, mouth of Indus. + C. hystryx, Brod., + C. ecinus, Brod., + C. Californica, Nutt.

24. Crepidula rostrata, C. B. Ad. Panama. [= C. uncata, Mke., nom. prior. This tropical form presents distinctive marks.]


26. Crepidula bilobata, Gray [i.e. Cpr.], MS. in Mus. Cum. [= C. dorsata, Brod. Vide Maz. Cat. no. 390, where the origin of the MS. name would have been found explained. It appears to be principally a northern species = C. lingulata, Gld.]


9. " imbricatnm, Brod. Panama. [= C. imbricatnm, Sby., = C. scutellatum, Gray, no. 2, var.]


17. " auritum, Rve., = C. striata, Brod., non Sary. Valparaíso, Cuming. [Passes into Galerus.]

21. Crucibulum serratum, Brod. Real Llejos and Muerte, Cuming. [Like young of C. pectinatum; nearly transparent; white, with purple ray.]


13. Perna Californica [Rve., non] Conr. California, Conr. [i.e. Nutt.] Honduras, Dyson. "Distinguished by the Pedum-like form and clouded, livid purple colouring. [This is the well-known large flat West Indian species; not known in California.]

3. Umbrella ovalis, Cpr. Mouth of Chiriqui River, Bay of Panama, [not] Cuming [but Bridges]. The species was also found at Cape St. Lucas by Xantus.]

6. Ianthina fragilis, Lam., = I. striulata, Cpr. West Indies, Mazatlan, California. [Vide Maz. Cat. no. 242: non I. striulata, Ad. and Rve.]

19. Ianthina decollata, Cpr. Probably = I. globo, var. [Maz. Cat. no. 243. Of the two Maz. forms, provisionally named, this appears the least entitled to specific rank.]

40. Columbella Bridgesi, Rve. April 1858. Panama, Bridges. [Appears the small var. of C. major.]

43. Columbella Boivini [= Botinii, Kien.]. Gulf Nicoya, Hinds.
46. Columbella acicula, Rve. California. [No authority.]
57. Columbella vexillum, Rve. Gulf California. [No authority.]
62. Columbella cribaria, Quoy and Gaim. [i.e. Lam.] = C. guttata, Sby. Panama, common under stones, Cuming. [No other localities given. V. Niti-

della cribaria, Maz. Cat. no. 613.]
74. Columbella Pacifica, Gask. Galapagos.
100. Columbella pusilla, Sby. Island of St. Vincent, W. I. "=Nitinella Gouldii, Cpr." [The Nitinella is a distinct Upper Californian species.]
120. Columbella lactea, Rve. Gulf Calif., Mr. Babt, R.N. [A Nitinella, so trans-

parent that the axis can be seen throughout.]
122. Columbella Sta-Barbarensis, Cpr. Sta. Barbara. "Not merely faintly striated, teste Cpr., but unusually grooved." [Described from a worn specimen in Jewett's Col., and named to mark a more northern limit to the genus than had been assigned by Forbes. The label was probably incorrect, as the shell lives in the tropical fauna, C. S. Lucas, Xantus: Acapulco, New-

berry; Guacanaymo, Mus. Smiths. The name (as expressing error) should therefore be altered to C. Reevei, Cpr.]
130. Columbella venusta, Rve. [Mazatlán, E. Philippi.] = C. taniata, Phil. [in Zeit. f. Mal. 1846], not Ad. and Rve., [Voy. Samar. 1850; therefore Phil. has precedence. ?=Anachis Gaskoini, Maz. Cat. no. 652. The Same-

rang shell is probably a Nitinella.]
135. Columbella Gouldii, Agass., MS. in Mus. Cum., Nov. 1858. [ =Amycla Gould-

diana, Agass., Atlantic; non Nitinella Gouldii, Cpr.]
176. Columbella rorida, Rve. Lord Hood's Island*, Cuming. [Transparent, glossy, with necklace of opaque white dots.]

Genus Meta [=Conella, Swains, eliminated by Rve. from Columbella; but Anachis, Strombina, Amycla (pars), and Nitinella, which do not even belong to the same family, if the opercula are to be trusted, are left in the old place. Of the six species, the author only knew the locality for one], M. Dupontiae, Kien.—Ichaboe, South Africa; [but that of] M. ovuloides, "C. B. Ad., MS." [is shown by his published works to be Jamaica; and the following are from the West Coast].

25. Ziziphinus eximius, Rve., P. Z. S. 1842. Panama, sandy mud, 10 fms. [= T. versicolor, Mke., 1850, = Z. Californicus, A. Ad., 1851. Scarcely differs from "Javanicus, Lam.," in Mus. Cum. The form was dredged by Mr. A. Adams in the eastern seas.]
51. Ziziphinus Antonii, Koch, in Phil. Abbild. pl. 1. f. 4. Australia. [Scarcely differs from the shouldered var. of Callistoma lima (Phil.) C. B. Ad., which is called eximius, Rve., in Brit. Mus. Col.]
23. Trochus Japonicus, Dkr., [represents Pomaalaeus undosus on the east side].
24. Trochus digitatus, Desh. Distinct from anguis, with base like gibberous. Central America. [Mr. Reeve's distinct shell is perhaps not that of D-sch., and not from the West Coast.]

* Vide Report, 1856, p. 168, note §§.
† Mr. Reeve states that, although this species is most like gibberous, "Messrs. Gray and Adams contrive to place them in different genera." It is still more remarkable that, while

17. *Phasianella perforata*, Phil. Mazatlan, Panama + *Ph. compta*, Gld.* Rather out of place;† has neither form nor texture of *Phasianella*. [The aberrant form is due to the figured specimen being quite young; the adults in Brit. Mus. Col. prove the texture, colouring, and operic to be normal.]

Genus *Simulopsis*. This group, intermediate between *Vitrina* and *Succinea*, is stated to be peculiar to Brazil and Mexico, where *Vitrina* is not known.

In the Monograph of *Terebratulidae*, which is prepared with unusual care, and the general introduction to which is well worth attentive perusal by all students, occur the following species which bear upon the West Coast fauna or synonymy:

2. *Terebratula (Waldheimia) dilatata*, Lam., = *T. Gaudichaudi*, Blainv. "Str. Magellan," teste Gray, in Brit. Mus. Cat., without authority. [The E. E. specimens varied considerably in outline; and according to Darwin, and what we know of the variations of fossil species, it is quite possible to believe that this and the next species had a common origin. The great development of this most interesting form in the cold regions of South America is extraordinary.]

3. *Terebratula (Waldheimia) globosa* (Val.), Lam., from type. = *T. Californica*, Koch. "California, Coquimbo. Californian form well known; small specimen in Mus. Taylor, marked 'de Coquimbo.'" [There appears no authority for the general belief that this fine species is Californian. It was taken in abundance by the naturalists of the U. S. E. E. at Orange Bay, Magellan. The Californian shell, which is probably the original *Californica*, Koch. (not of authors) is a distinct species, teste Rve. from Dr. Cooper's specimens.]


6. *Orbicula Cumingii*, Brod. [Besides information in Rep. pp. 183, 244, is given] Is. Caña, Guatemala; sometimes 6-18 fms., Cuming. *O. striata*, Brod., is a less-worn state of this species. [The type-specimens of *Discina striata* in Brit. Mus., on *Pecten ventricosus*, appear very distinct, and are unusually shelly for the genus.]

excluding *Ziziphinus* (= *Calliostoma*), Mr. Reeve "contrives to place" in *Trocclus* animals shown by the opercula to belong to different subfamilies, as though we knew no more than in Lamarek's days; his motley group containing *Imperator* (= *Stella*, H. and A. Ad.) + *Lithopoma* + *Guldfordia* + *Chrysostronga* + *Bolina* + *Modelia* + *Polydonta* + *Testus* + *Pomaxla* + *Astrallium* + *Pachydoma* + *Uvenilla*. Also in a family the genera and species of which are mainly recognized by the base and mouth, most of the shells are only figured on the back. Very often the characters of the aperture are not even stated. Remarkable liberties are, moreover, sometimes taken with geographical facts, to the great astonishment of Americans, who expect even their schoolboys to avoid such statements as at sp. 57, *Tr. diminutivus*, Rve., "Oahu Islands;" and at sp. 1, *Lingula oralis*, Rve., "from W. II. Pease, Esq., residing at Honolulu, one of the Sandwich Islands."

* P. compta is a distinct Californian species; its ?varieties pass into *pulsa*. If Mr. Reeve can be followed in uniting to *pulsa*, *pulchella*, Recol.; *offina* + *tessellata* + *pulchella* + *concina*, C. B. Ad.; *tenus*, Phil.; *intermedia*, Seacci; *Cepanis*, Dkr.; *elongata*, Krauss, Gould's species should join this goodly company, rather than *perforata*. The same standard of union followed among the large shells would greatly lessen the size of this costly work.

† So is *Phasianella rubra*, Pease MS, sp. 18, which belongs to *Alegra*, A. Ad.; allied to *Eucelus*.

8. *Venus* *grata*, Sby., + *tricolor*, Sby. Gulf of Mexico, Mus. Cum. [= *Tapes grata*, Say, Panama. The locality-labels have probably been misplaced. These specimens are undoubtedly from the West Coast, nor has any authority appeared for the species in the Atlantic. The Gulf of Mexican "analogue" is *T. granulata*. The forms are intermediate between *Chione* and *Tapes*.]

9. *Venus multistriata*, Sby. Bay of Panama, in coarse sand at low water, Cuming. "Probably = *V. Listeri*, var., with ribs more tumidly thickened and rounded." [The West Coast shells are distinguished by the very slight crenulation of the ribs at the sides.]

10. *Venus asperrina*, Sby. Guacomayo, Centr. Am., sandy mud, 13 fms., Cuming. "A form of *pectorina*; shell of lighter substance, broader and more depressed; sculpture more elevately and definitely latticed." [This is the shell named by Mr. Cuming *V. cardioides*, Lam., and should take that name, as prior to Sby.'s, if really distinct from *pectorina*. Also from Panama. Mus. Smiths.]


26. *Venus eugnatha*, Lam., = *pulicaria*, Brod. W. Columbia, Cuming. [= *V. Phacatensis*, Sloat, MS. in Mus. Smiths. Guayas. The peculiar smoothing-off of the central sculpture in the adult may be varietal. It is improbable that Lam. was acquainted with the species.]


* Through the kindness of Mr. Reeve, with a view to the completion of this Report, I was enabled to compare the figured specimens in this genus with the text, and with the shells of the Smithsonian collection, before they were distributed. The bracketed notes in the text are based on this examination. They are given with unusual detail, because of the unique opportunity of throwing some light on a confessedly difficult family.

† The characters of the teeth and pallial line frequently afford satisfactory diagnostic marks between critical species, which are often overlooked by monographers.

‡ The descriptions of Dr. Kennerley's shells had long been written, and would have been published but for the American war. The localities of all the West Coast shells sent from the Smiths. Col. to Mr. Cuming were duly marked in the accompanying catalogues.
longer, and in the purple colour. This, however, in the figured specimen, has been brought out by the free use of acid, and the markings have been considerably obliterated by the “beautifying” process.

44. *Venus simillima*, Sby. San Diego, Cal. “Resembles *V. complta* in detail of sculpture” [but perfectly distinct, belonging to the *anathusia* group. It shows the evil of the very brief diagnoses of the earlier conchologists that so discriminating an author as Mr. Conrad should have taken this shell for the *V. Californiensis*, Brod.; and, quoting it (*lapsus*) as *V. Californiana*, redescribed the true *V. Californiensis* as *V. Nuttallii*. It is known by the great closeness of the fine sharp ribs.]

45. *Venus crenulata*, no. 33, very distinct var. Gulf Cal.; more globose, interior purple rose. [This was sent as “Cape St. Lucas, *Xantus*.” It appears truly distinct from the *V. I. crenulata*, and to be the normal form of which *pulicaria*, no. 26, is an extreme var. Inside, and outside in the adolescent state, they agree exactly; differing outside, in the adult, in smoothed-off ribs and more distinct V-markings. Mr. Reeve, however, still thinks it more like *crenifera*. It may stand as “? var. *likeae*.”]

47. *Venus gibbosula*, Desh., MS. in Mus. Cun. *Hab.*—[Guaymas = *V. Cortez*, Slott. This is the more rounded and procerous form of *V. fluctifraga*, = *V. Nuttallii* of Brit. Assoc. Report, and Nuttallian paper in *P. Z. S.* 1853, p. 21; but not the true *V. Nuttallii*, Conr., *v. infra*, no. 40. Interior margin very finely crenated on both sides of the hinge.]

48. *Venus complta*, Brod. Bay of Sechura, Peru, coarse sand and mud, 7 fms., *Coming*. [This rare species seems to represent *V. Californiensis* in the South American fauna. It is well distinguished by its shouldered form, produced ventrally, and by the Circoid pallial line, far removed from the margin. Guacomayo, Mus. Smiths.]

49. *Venus Nuttallii*, Conr. California. [Named from type, teste Conr. ips., *v. anted*, p. 526. This is the dull northern form of *V. succineta*, as *fluctifraga* is of *gibbosula*, the species appearing nearly in the same parallels in the Gulf and on the Pacific coast, but not found in the Liverpool Reigen Co. ; nor at Cape St. Lucas. In all essential characters, *Nuttallii* (though pointed) and *Californiensis* (though rounded) appear the same; but Mr. Reeve still thinks otherwise. The figured specimen has been altered with acid. The *V. excavata* is not noticed by Mr. R.]

51. *Venus mandtulus*, Rye. *Hab.*—[This shell was obtained by Dr. Stimpson in the N. P. Expl. Exp., and bears the Smiths. Cat. number “1845. San Francisco, very common at low water,” = *Tapes diversa*, Sby. jun. This is the highly painted, finely sculptured state of *T. stagna*, Conr. (not “*T. straminea*, Conr.” Sby., = *T. grata*, var.) The abnormally ridged form is *V. ruderata*, Desh. Conch. *Ic*. sp. 130. By its large pallial sinus and bifid teeth it is a true *Tapes*.

52. *Venus intersecta*, Sby. Puerto Puero [*Porter*, Centr. Am., *Coming*. [The shell is exactly identical with no. 19, *asperrima* = *cardioides*; but the figure might mislead, the colour-lines appearing as ribs.]

54. *Venus subrostrata*, Lam.* vi. p. 343, = *V. neglecta*, [Grav] Sby. *Hab.* Mazanthal and West Indies. “Lam. having cited a figure of the China species, *V. Lameriki*?, the species was lost sight of till Sby, renamed it.” [The *Lamarkian* species was probably West Indian. *V. neglecta* closely resembles the young of *V. Californiensis*, but has the ligamental area smooth only on one valve, instead of both.]

56. *Venus Stutchburyi* (Grav), Wood, Sandwich Is. Comes very near to the Californian *V. callosa*, [Sby., *non*] Conr., of which specimens have been found also at the Sandwich Is. [ *V. Stutchburyi* is the New Zealand species, which may easily be confounded with the Californian. Although both may be obtained at the Sandwich Is., there is no evidence that either

* In critical species, when it is impossible to be positive which of two or more was intended by an old author, it appears best to retain the name of the first *discriminator*. The old name belongs to the general form; the discriminator ought to retain it for a part; but if that has not been done, it avoids confusion to drop it.
lives there. The shell here figured is beaked like 
*Nuttalii,* no. 49; lunule very faint; concentric ridges very faint, but sharp; radiating ribs very coarse. Inside deeply stained; margin not crenated on the sharp anterior edge, though faintly on the lunule; hinge-teeth stumpy.

60. *Venus muscaria,* Rve. *Hab.?—* [Has the aspect of a West Coast species, between *cardioides* and fine var. of *staminaea*; sinus large; teeth strong, not bitid; lunule with radiating ribs.]

68. *Venus undulata,* Sby. Gulf Calif. [Not a satisfactory species, the type having the aspect of a poor specimen altered for cabinet. The "sculpture much changing in its development towards the margin" is an accident often seen in the cancelled species. Similar specimens of *V. neglecta,* no. 54, collected at Cape St. Lucas by Mr. Xantus, agree with *undulata* in all respects, except that this is violet within, *neglecta* being white. Ligament-area (as in *neglecta*) smooth in one valve only.]

77. *Venus Adamsii,* Rve. Japan. [Closely related to *Tapes lacinata,* San Diego, in size, aspect, hinge, &c. Differs in mantle-bend being not so long or pointed, and the radiating sculpture much finer: = *V. rigida,* Gld., Ms., in Stimpson's list; non Gld. in "Otia."]

80. *Venus ornatussum,* Brod. Panama, sandy mud, 10 fms., Cuming. Still unique. [Like *V. gnidia,* jun., but radiating ribs coarser and more distant; concentric frills not plicated; lunule pale, laminated.]

85. *Venus callosa* [Sby., non] Conr. Sandwich Is. and Calif. [Vide note to no. 59. This is the *V. Nuttallii* of the Brit. Assoc. Report. Those who regard it as distinct from *fluctifraga,* of which *gibbosula,* no. 47, is the extreme form, may retain the name *callosa* of Sby., but not of Conr. Conrad's species = *C. nobilis,* Rve.; differing from the true *Calliste,* as *Mercenaria* does from *Venus,* in having the ligament-plate rugose.] = *V. fluctifraga,* Sby., teste Rve. in errata.

105. *Venus bilineata,* Rve. Gulf Calif. Partakes of the characters of *compta* and *subbimetrica:* all three may indeed be different states of one and the same species. [The shell figured at 105b has all the peculiar features of *compta,* which are clearly marked within; only the concentric waves are closer than usual. The shell figured at 105d appears to be the true *undulata,* only in fine condition, the type being rubbed. It has exactly the same internal characters, including colour; only the colour-lines outside are arranged in rays instead of Vs. Mr. Reeve, however, retains his different opinion.]

116. *Venus Cypria,* Sby., P. Z. S. 1852. Is. Plata, West Columbia. [From same district, teste Schott in Mus. Smiths.] Has all the appearance of being an attenuately produced form of the West Indian *V. puphia* [which is also from Cape Verds. Is., teste Macgillivray in Brit. Mus.].

11. *Dione* *maculata,* List. West Indies; Brazil; Pacific Ocean. Widely distributed in both hemispheres. [No authority for the Old World; the Pacific shells are *Callista chionea,* var.]

15. *Dione nobilis,* Rve., 1849. Cal. [= *C. callosa,* Conr., 1837. The original name, from type, had been communicated to Mr. R., but is not quoted.]


22. *Dione multispinoso,* Sby. Peru. Concentric ridges thinly laminated; spines slender and numerous. [An extreme form of the Pacific *C. Dione* (t. &c. Haul.); distinct from *semilamellosa.*]

23. *Dione Veneris,* D'Arg. Conch. pl. 21. f. 2, = *V. Dione,* Lm. West Ind. and

* The figured types of this genus had been accidentally mislaid; and might alter the judgments given in the text.

† "For obvious reasons, I think it best to abandon the foul name given to this lovely species by Lesson." Rve. (Vide Maz. Cat. p. 70, note.) Would not the same reasons lead to the alteration of *meretrix,* *impudica,* &c.
Centr. Am. [The Pacific shells should rank with species 22, if supposed distinct. The fig. is 24, not 23.]

24. *Dione eszpinata*, Rve. Centr. Am. Distinct, if the others are; like *semilamellosa*, without spines. [Appears to be *C. rosea*, jun. The fig. is 23, not 24.]

25. *Dione circinalis*, Born. Mazatlan, Mus. Cum. [without authority.] = *V. rubra*, Gmel., + *V. Guineensis*, Gmel., + *C. alternata*, Brod. [f. 28 represents *alternata*; the other figures appear to be from West Indian specimens, though that ancient locality is not mentioned. Several of the reputed West Coast shells are, however, of the typical form and colour.]


27. *Dione proa*, Conr. "Cape St. Lucas, Xantus, California; Carpenter." [A very distinct form among the thin inflated species; only yet found at the Sandwich Is., v. no. 46.]

28. "(Mus. Smithsonian Institute of N. America.) This shell, from Cape St. Lucas, Xantus, California, proves to be the *Dione proa* (*Cytherea proa*, Conr.) of our preceding plate." [Mr. Sowerby's figure well represents the unique specimen from Cape St. Lucas, which was taken alive by Mr. Xantus. The quotations in Conch. Ic. would lead to the inference that "Xantus" was regarded as that part of "California" in which Cape St. Lucas is situated. Both the external and internal characters require that a separate name be given to the shell, which stands as *Callista pollicaris*, Annals Nat. Hist. vol. xiii. p. 312.]


30. *Dione pannosa*, Sby., = *Cytherea luba*, Koch, + *Callista puelia*, Cpr. Chili, Peru, Mazatlan. [No authority for Mazatlan. The name *puella* given to the Cape St. Lucas specimens was intended as varietal; although Mr. Cuming regards the Peruvian and Peninsular forms as distinct. It is not known along the Central American coast.]

31. *Circe nummula*, Lam. "Central America." [Probably not from the American seas. Admiral Sir E. Belcher is, however, confident that he dredged many well-known E. Indian forms in deep water, off San Blas.]

32. *Cytherea*. In this genus are grouped the *Trigona*; besides the typical species, = *Meretrix*, Gray.

33. *Cytherea crassatelloides*, Conr. "Bay of California." [Not known geographically. The shell is not found in the Gulf, being a most characteristic California species. San Francisco, S. Diego, &c.]

34. *Cytherea radiata*, Sby., + *C. gracilis*, Sby., = *V. Salangensis*, D'Orb. = *T. By-

35. *Cytherea nitidula*, Lam. Mediterranean. [The figures and descriptions of Sby. and Rve. well represent specimens from Cape St. Lucas, *Xantus*. Perhaps not identical with Lam.'s species.]

36. *Tapes gracilis*, Desh. Philippines. [May stand as *T. Deshayesii*, if it be con-


40. *Solarium quadripes*, Hds. Panama. Young state of same type as sp. 7 and 8, "from same locality (Pan., Mex., W. I.)," but grows much larger. [The Texan shells in Mus. Smiths. are as large as those from Cape St. Lucas: the variations on each coast are coordinate.]

63. *Kiener.* The following species may be added to the list quoted from "Coquilles Vivantes," in Rep. pp. 293, 294; —

Page 572

212. 100. 1,1,1. *Conus Largillierti*, Kien. Mexico. [Coast not stated.] 58

In the same author's great work, 'Monographia Heliceorum Viventum,' Lipsæ, 1847–8, occur—


In the 'Monographia Pneumonopomorum Viventium, &c., Cassellis, 1852,' by the same learned author, the following is the only species which occurs:—


In Wiegmann's 'Archives für Nat.,' 1837, vol. i. p. 255, occurs the following species, also without authority:—

Perna quadrata, Anton. California.

In Trochel's 'Archives für Natur' are quoted the following:—


In the 'Abbildungen und Beschreibungen neuer oder wenig gekannter Conchyleen, herausgegeben von Dr. R. A. Philippus,' Cassel, 1845–51, are figured the following, which must be quoted as being original descriptions, or for the synonymy:—

Page. Pl. Fig.
Feb. 1846. 4. 1. 9. Cyrena solida, Phil. - California, &c.
April 1847. 11. 7. 8. 1. Haliotis fulgens, Phil. ? California. = Hy. splendens, Rve.
July 1844. 7. 2. 5. Patella (Acmea) discors, Phil. Mexico.
April 1860. 9. 2. 8. Lucina obliqua, Phil. ? W. C. America.
9. 2. 9. Lucina pisum, Phil. Mazatlan.
5. 1. 5. Pecten Fabricii, Phil. Greenland. [= P. Islandicus, jen. Non P. Fabricii, Gld., = P. Hindsii, jen.]
11. 6. 9. Litorina aberrans, Phil., P. Z. S. 1845, p. 142. Panama, on rocks. [= Tall var. of L. conspersa.]

In Dr. L. Pfeiffer's 'Novitates Conchologicae,' Series II., Marine Shells, by Dr. W. Dunker, Cassel, 1858, occur the following species from Sitka:—

Page. Pl. Fig.
1. 1. 3, 4. Tritonium carinatum, Dkr. Sitka. [Should be pl. 2. f. 3, 4.]
[= T. angulosum, Möhrch, on plate.]
2. 1. 1, 2. Tritonium Mörchianum, Dkr. Sitka. [Should be pl. 2. f. 1, 2.]
3. 2. 5, 6. Tritonium rutilum, Möhrch. " [Should be pl. 1. f. 5, 6.]
4. 1. 5, 6. Tritonium Rombergii, Dkr. " [Should be pl. 2. f. 5, 6.]
2. 2. 3, 4. Neptunia harpa, Möhrch. " [Should be pl. 1. f. 3, 4.]
7. 2. 1, 2. Neptunia castanea, Möhrch. " [Should be pl. 1. f. 1, 2.]
[= N. badia, on plate.]
35. 10. 6, 7. Murex (Hemifusus) Belcheri, Hds., var. ? [= Chorus B., L. Cal.]

66. British Museum Collection.—"Lunatia ravidu, Souleyet, Panama,"

* A large number of Californian shells have been assigned to the, Sandwich Is., in consequence of the abundant trade between the two localities. They may often have been obtained at Honolulu by naturalists, who had no reason to doubt their having lived there. All that is known of the genuine Hawaiian fauna will shortly be published by Mr. Sowerby, for W. H. Pease, Esq., of Honolulu.
is given without authority; and the locality is probably erroneous. Various other shells are scattered in the national collection, assigned either generally to the West Coast or to special localities, which it has not been considered needful to tabulate without confirmation.

69. Various sources.—Under this head may be arranged gleanings from European authors not consulted in preparing the first Report.

In the 'Histoire Naturelle des Coquilles,' by L. A. G. Bosc, Paris, 1830, the following species, not previously quoted, are assigned to the West Coast, but without authority:—

Vol. Page
IV. 69. Helix peregrina. Island on
152. Trochus solaris. &c.
156. Trochus radiatus. &c.

In Lesson's 'Illustrations de Zoologie,' Paris, 1831–2, appear—

Plate.
2. Calyppeopsis tubifera, Less. [=Crucibulum spinosum].
48. Terebra flammea, Less. [? = T. striosa], Antilles; Isth. Panama.

The following West Coast shells are named and figured by Dr. Gray in 'Griffith's Edition of Cuvier's Animal Kingdom,' London, 1834. In some instances there are also a few words of description:—

Plate. Fig.
1. 3. Litorina pulchra.
41. 5. Turbenella ceratus [? Turbinellus].
41. 6. Columbella suturalis [Kiener figures this shell for Anachis fluctuata, Sby.,
1832. The original might stand for many species].
36. 2. Nassa Northia [=Northia serrata, Kien.].
36. 3. Turbinella tuberculata [=Lattus tuberculatus (=ceratus, C. B. Ad.)].
23. 5. Terebra Africana. [The Gulf Cal. shell, = variegata.]
25. 2. Triton (Tusio) elegans [=Psania insignis, Rve., 1846].
37. 2. Columbella harpiformis [=harpiformis, Sby.].
37. 6. Clavatula Griffthii. [Probably = Pt. funiculata. The shells in this plate are reversed, but are repeated correctly in pl. 37*].
19. 1. Cytherea Dronea, var. [=C. semilamellosa, Gaud.; perhaps intended for C. dione, var.].

In Woodward's most valuable 'Manual of the Mollusca,' London, 1851–6, the following species are quoted as from "California":—

Page. Pl. Fig.
108. 5. Cancellaria reticulata, Dillw. [?W. Indies.]
171. Physa Maugera. [? Ecuador.]

In the very valuable handbook of bivalves, 'Recent Shells, by S. Hanley, London, 1842–56,' will be found either quoted or original diagnoses of all West Coast species known to the learned, patient, and minutely exact compiler. As the locality-marks are simply transcripts, they are not here repeated, especially as "California" is used for both the temperate and the tropical faunas. The following synonyms will be serviceable to the student:—

Page. Pl. Fig.
61
Page 72. *Tellina inconspicua*, Br. and Sby., \(\neq\) *Sanguinolaria* [Californiana, Conr., non] *fusca*, Conr. [= the Eastern species].

In the Appendix are the following species, of which small figures are given to correspond with those in Wood's Ind. Test:

Page Pl. Fig.


The following are extracted from the *Journal de Conchyliologie*, Paris, 1850:


Vol. 3.
Page Pl. Fig.
1853. 53. 2. 11, 12. *Natica Taele*, Recl. Mazatlan.
1853. 154. 5. 9, 10. *Natica Mozquiniana*, Recl. ? West Coast of America.

Series II.

Vol. 3. 209.

The following species are figured in Chénu's *Illustrations Conchyliologiques*; but no authority is given for the localities, nor etymology for the remarkable names:

Page Pl. Fig.
15. 1, 2, 10, 11.
12. 10, 11.
17. 7, 8.
28. 27. 9, 10. *Oliva todosina*, Ducl. California.

An excellent commentary on the above species, and on the difficult genus to which they belong, is supplied in the *Revue Critique du genre Oliva*; by M. Ducros de St. Germain, Clermont, 1857. It was written, not from the well-known London collections, but from a very large series containing all the types figured by Duclos. The following is the author's arrangement of the West Coast forms, excluding citations of well-known species.

No. Page.
25. 49. *Oliva angulata* does not include *azemula*, Ducl., as Rve. says; that being a var. of *ponderosa* = *erythrostoma*.
26. 50. *Oliva Maria*, n.s., pl. 2. f. 26, a, b; intermediate between *Julietta* and *angulata*. California, teste Duclos. [Appears to be one of the vars. of *Cumingii*] *Oliva reticularia*. To the typical W. Indian shells are united those from California, Panama, Madagascar, Japan, N. Holland, N. Zealand, &c.
On Mollusca of the West Coast of North America.

The synonymy includes *venulata + araneosa + Cumingii + oiriola* (Duel. non Lam.) + *piudarina + fusiformis + timoria + obesa + tisiphone + menonnia + aldinia + onika + caldania + harpularia + candida + ustulata.*

63. *Oliva Sverjoe, Rve.* Mazalan, Ed. Verreaux. [= *testacea, var.*]

65. *Oliva Deshayesiana,* n. s. Atlas, pl. 3. f. 67, a, b; intermediate between *Braziliensis* and *auriculata.* California, teste Duclos. [Certainly not from the West Coast.]


70. *Oliva undulata,* Lam. + *nedulina,* Duel.; but not *ozodona,* Duel., as Rve. says.


75. *Oliva selasia,* Duc. "Acapulco; teste Duc. "We know nothing of this remarkable shell but the specimen figured by the author."

85. *Oliva mutica,* Say + *rafflesioida,* Rve. [assigned by error to the Californian *O. betica, var.*] + *limbricata,* Rve.

In the recent and among the most valuable of the contributions to our knowledge of local faunas, ‘Mollusques de l’ile de la Réunion, par M. G. P. Deshayes,’ Paris, 1863, occur very unexpectedly the following species connected with the West Coast, either by name or by identity. The list of 590 species from this little island, which the researches of M. Maillard has brought to light, contains several West Indian forms and a large number known in the Central Pacific and even the Sandwich Islands.

93. Smithsonian Institution.—At the time of the first Report, the temperate fauna of the West Coast was only known through sources liable to error, the collectors having visited other regions besides Oregon and California, and the species described by American authors being but imperfectly understood in this country. The large accession to the number of authentic species, the important elimination of synonyms, and the assignment of ascertained local-
lities, which are placed on record in this Report, are due almost entirely to the stimulus afforded to science in general, and to this branch especially, by the Smithsonian Institution at Washington, D.C. The fund bequeathed by Mr. Smithson, "for the increase and diffusion of knowledge among men," having been declined by the Universities to which it was offered in the Old World, is held (in trust only) by the U.S. Government. It is administered by a permanent body of Regents, according to a constitution drawn-out at their instance by the Secretary, Prof. J. Henry, LL.D. It may be safely stated that to his unswerving consistency, cautious judgment, and catholic impartiality it is mainly owing that, during various political and social changes, the Institution has not only steered clear of all party bias in the United States, but has distributed its advantages with equal hand on both sides of the Atlantic. The Natural History department is under the special superintendence of the Assistant-Secretary, Prof. Spencer Baird, M.D., whose indefatigable zeal, fertility of resource, and thorough knowledge of the requirements of the science have enabled the Institution, by a comparatively small outlay, not only to amass in a few years an enormous store of accurate materials, but also to eliminate from them a series of publications on various important branches of American zoology. The contributions of the Smithsonian Institution to our knowledge of the West Coast fauna may be considered under [A] its collections and [B] its publications.

[A] Smithonian Collections.—According to the present law, all collections made in expeditions fitted out by the Government become the property of the Smiths. Inst., with liberty to exchange duplicates. Its museum, therefore, is rich in types; and its liberal policy allows of all duplicates being transmitted to public collections, to schools of science, or to individuals engaged in special departments of study. Not being forced into an unalterable plan of operations, like many leading museums of the Old World, permission was given to send nearly the whole of the molluses to this country, that they might be compared with the Cumingian, the Brit. Mus., and other leading collections. The importance of thus establishing a harmony of nomenclature for species on both sides of the Atlantic can scarcely be over-estimated. The previous want of it can be abundantly seen by comparing paragraphs 39, 43, 54, &c., in the first and in this Report. The West Coast collections belonging to the Smiths. Inst. are mainly from the following sources:


c. The Pacific Railroad Expedition, 49th parallel, under Governor J. J. Stevens, 1853–54. Collections made in Puget Sound by Dr. Suckley, and at Columbia River by Dr. J. G. Cooper. Dr. Suckley also collected at Panama.

* The war has but to a limited extent curtailed the funds and interfered with the operations of the Institution.

† The Cunard Steamship Company have most liberally conveyed these stores across the Atlantic, free of cost. The British and American Governments have allowed special facilities for passing the Custom Houses without derangement. Similar acts of liberality and courtesy are continually afforded to the Smiths. Inst.—The materials for this Report have been placed unreservedly in the hands of the writer, although he went to Washington as a complete stranger, and with no other introduction than his published writings.
g. Colorado Expedition, under Lieutenant J. C. Ives. Collector, Dr. J. S. Newberry.
h. The United States North-West Boundary Survey, under Com. A. Campbell. Collectors, Dr. Kennerley and Mr. George Gibbs.

Besides the above official explorations on the American side, during a period in which the British Government only fitted out a single expedition coordinate with h, the Smiths. Inst. has received a large number of private collections from their correspondents, of which the following are the principal:
i. Mr. Jas. G. Swan, from Port Townsend, Cape Flattery, Neeah Bay, and the neighbouring shores of Vancouver; at intervals, during many years.
j. Dr. J. G. Cooper, early private collections from Shoalwater Bay and various stations in California and from Panama; and lately the dredged collections of the California State Geological Survey, of which a portion were sent in advance by Dr. Palmer.
k. California Academy of Natural Sciences, duplicates of their collection, with the privilege of inspecting unique specimens.
l. Dr. E. Vollum, U.S.A., from Fort Umpqua.
m. Lieutenant W. P. Trowbridge, from coast of Oregon and California.

a. Dr. J. A. Veach, from the peninsula of Lower California, and especially from Cerros Island.

o. Mr. A. S. Taylor, from Monterey.
p. Mr. Andrew Cassidy, from S. Diego.
q. Rev. J. Rowell, now of San Francisco, from various stations in both faunas, and especially from Sta. Crux, and the Farallones Is.
r. Mr. John Xantus, of the U. S. Coast Survey, from Cape St. Lucas. Specimens were received through him from Socorro Island (one of the Revillagigedo group), Tres Marias and Margarita Island.
s. Captain C. P. Stone, from Guaymas and the northern part of the Gulf of California.
t. Captain C. M. Dow, from the coast of Central America.
u. Dr. J. H. Sternberg, from Panama.
v. Dr. J. H. Frick, Mr. James Hepburn, and others, from San Francisco.
w. Mr. C. N. Riotte, U. S. Minister to Costa Rica, from Puntas Arenas.
x. Mr. W. H. Pease, of Honolulu, collections made by his agents at various stations on the coast, particularly at Margarita Bay.

Collections have also been received from various expeditions already tabulated in the first Report; and from stray quarters not here included because their accuracy may admit of doubt. The species received from the most important of these sources will be enumerated in their order; of the remainder, exact lists may be consulted by the student in the Smithsonian Catalogues, and the combined results will be found tabulated as 'Pacific Railroad Expeditions' or 'Smithsonian Collections.'

[B] Smithsonian Publications.—These may be classed under three heads. (1.) Works published by the U. S. Government, with more or less of assistance derived from and through the Smiths. Inst. (2.) The 'Smithsonian Contributions to Knowledge,' printed in 4to, and answering to the 'Trans-
actions' of English learned societies; and (3.) The ‘Miscellaneous Collections,’ in 8vo, answering to the ‘Proceedings’ of the societies:—

(1.) The series of ten 4to volumes, called 'Pacific Railroad Reports,' contains a complete résumé of the natural history of the western slope of North America. The Recent and Tertiary Fossil Mollusca will be analyzed in the following pages. Accounts have also been published of the natural history of other expeditions.—The annual volumes of 'Reports of the Regents of the Smithsonian Institution,' published by the U.S. Government, contain exact accounts of the assistance rendered to the expeditions by the Smiths. Inst., as well as lectures and articles on special subjects. In these will be found full particulars of the principles which regulate the natural-history workings of the Institution*.

(2) The only paper bearing on our present inquiry as yet published in the ‘Contributions’ is on the “Invertebrata of the Grand Manan,” by Dr. W. Stimpson, which should be consulted by all who desire to institute a comparison between the sub-boreal faunas on the two sides of the Atlantic.

(3) The ‘Miscellaneous Collections’ are all stereotyped, and very freely circulated. Among them will be found “Directions” for collecting specimens of natural history, with special instructions concerning the desiderata on the Pacific coasts. These have been widely distributed among the various government officials, the employés of the U.S. Coast Survey, and the variously ramified circulating media at the command of the Smiths. Inst.; and have already borne a fair share of important results, although the war has greatly impeded the expected prosecution of natural-history labours. “Check Lists” have been published “of the Shells of North America, by I. Lea, P. P. Carpenter, W. Stimpson, W. G. Binney, and T. Prime,” June 1860. No. 1 contains the Marine Shells of the “Oregonian and Californian Province,” and No. 2 of the “Mexican and Panamic Province.” They are chiefly compiled from the first British Association Report, with such elimination of synonyms and doubtful species, and addition of fresh materials, as had become available up to the date of publication. They were not intended to be quoted as authorities; and so rapid has been the accumulation of fresh information that no. 1 is already out of date. In the “Terrestrial Gasteropoda,” by W. G. Binney, list no. 1 contains the “species of the Pacific coast, from the extreme north to Mazatlan,” to which many additions have since been made. In the list of “Fluvatilis Gasteropoda,” also by W. G. Binney, “the letter W distinguishes those confined to the Pacific coast, WE is affixed to those found in both sections of the continent, and M designates the Mexican species. From the starting-point of this list considerable progress has already been made. In the brief list of “Cyclades, by Temple Prime,” the Mexican and Central American species are similarly designated; but the western species and those common to the Pacific and Atlantic United States are not distinguished. In the list of “Unioideae,” by Dr. I. Lea, whose lifelong devotion to the elucidation of that family is everywhere gratefully acknowledged, the Pacific species are designated by a P. The large series

* The ‘Lectures on Mollusca,’ in the Vol. for 1860, pp. 151–283, will perhaps be found useful as a digest of classical forms. It was to have been illustrated with copies of woodcuts, kindly promised by Dr. Gray, and since placed at the disposal of the Smiths. Inst. by the courtesy of the Trustees of the British Museum; but, unfortunately, the blocks were not to be found at the time. They will appear, however, in forthcoming Smithsonian publications. The ‘Lecture on the Shells of the Gulf of California,’ in the Vol. for 1859, pp. 195–219, contains in a popular form much of the information distributed through the Brit. Mus. Mag. Cat.
of specimens, representing varieties and ages, in Dr. Lea's private collection are well deserving of close study. Their owner shares the liberality of Mr. Cuming in making them available for all purposes of scientific inquiry.

The Smiths. Inst. has just issued from the press the first part of the 'Bibliography of North American Conchology, previous to the year 1860,' by W. G. Binney, containing references to all printed information on North American shells by native writers. It is divided into "§ A. American descriptions of North American molluscs; § B. American descriptions of foreign molluscs; § C. Descriptions of foreign species by American authors in foreign works." The work is prepared with unusual care and completeness, and with the accurate judgment which characterizes all Mr. Binney's writings. It contains, under every separate work or paper, "a list of species therein described or in any important manner referred-to, together with their synonymy, locality, and the volume, page, plate, and figure relating to them."

The second part, containing similar references to American species described by European writers, is now passing through the press. Mr. Binney has most kindly sent the proofs to the writer (as far as p. 287), which have been freely used in preparing this Report, and have supplied various important sources of information. It undertakes to provide for the whole North American continent what has been here attempted for the West Coast; and in much greater detail, as not only the first description, but all subsequent quotations are duly catalogued. It may be regarded as a complete index of references to all works on North American malacology. The student, in making use of it, will remember that it is only with the Pulmonates that Mr. Binney professes an intimate acquaintance. For these the work may be regarded as complete. But, in other departments of the science, only those shells which are assigned by the authors to North America are quoted; consequently a large number of species are passed-over which are truly American, but are assigned to other places, or described without locality. Also, species really belonging to other faunas, but falsely attributed to North America, duly appear as though genuine; and the additional localities frequently assigned by the authors (which are often the real habitats) are seldom quoted. Moreover the citations stop at Mazatlan; consequently, the tropical fauna of the West Coast is but imperfectly represented. Lastly, the authors are not presented in chronological or indeed in any other ostensible order; but it is promised that the necessary information will be given in the index on the completion of the work. The student will further bear in mind that for many reasons no second-hand reference can serve the same purpose as a consultation of the original book. With these cautions the work will be found invaluable by all who are engaged in working-out American species; and great thanks are due to Mr. Binney for undertaking the extreme labour of its compilation, and to the Smiths. Inst. for supplying the expense of its publication. Probably no such work has yet been printed on the malacology of any other country.

Lastly, there is now in preparation a complete series of hand-books on North American malacology, copiously illustrated with wood engravings, and containing a digest of all that is known in each department. The marine shells of the Atlantic are being described by Dr. Stimpson, who is now also engaged in the dissection of the Freshwater Rostrifers; the marine shells of the Pacific are placed in the hands of the writer; the Pulmonates will be thoroughly worked-out by Mr. Binney, the Melanidae by Mr. Tryon, and
the Cycladidae by Mr. Prime. Thus it appears that the malacologists have been unusually zealous in advancing their before somewhat slumbering study; and that the Smiths. Inst. has displayed unexpected liberality in preparing and issuing from the press works of a comprehensive character, for the "increase and diffusion of" what will hereafter be regarded as an important branch of "knowledge among men."

94. North Pacific Exploring Expedition.—In the year 1853, Dr. W. Stimpson, well known in very early life for his dredging-researches and observations on the marine animals of the Atlantic coast, accompanied Captain Lingold as naturalist to the U. S. "North Pacific Exploring Expedition." Its principal object was to obtain more correct information with regard to the Japan seas and the extreme north of the Pacific, and it was only incidentally that it visited the Californian province. However, Dr. Stimpson's extensive dredgings in the fiords of Japan developed the interesting fact, that while the southern shores presented a fauna essentially Indo-Pacific in its character, and abounding in the usual Cones, Cowries, Olives, &c., the northern slopes of the same islands presented an assemblage of forms far more analogous to the fauna of the Sitka and Vancouver region, and containing many species common to the American coast. During the course of the voyage dredging-collections† were made by Dr. Stimpson at Madeira, Cape of Good Hope, Sydney Harbour, Coral Seas, Port Jackson, Hong Kong (also by Mr. Wright; New Ireland, Lieut. Van Wycke; Gasper Straits, Squires; vicinity of Canton, presented by Mr. Bowring; interior of Hong Kong, Wright); China Sea; Whampoa; Bonin Island; Loo Choo Island; Ousima; Katonasima Straits; Kikaia; Kikaisima; Kagosima [alas!]; Hakodadi; Taniogesima (also Wright, Kent, Kern, Boggs, Carter); Simoda; Niphon (also Brook); Avratska Bay, Kamtschatka; Amincheeche Island, Avikamcheche Island, Behring Straits; Seniavine Straits, Arctic Ocean (also Captain Rogers); San Francisco; (Puget Sound and Shoalwater Bay, Dr. Cooper, Cat. no. 1849-1856); Tahiti (also Captain Stephens, Kern), Hawaii (also Garrett; Sea of Ochotsk, Captain Stevens). All these were duly catalogued, with stations, depths, and other particulars, and living animals preserved in spirits after being drawn. The expedition appears to have returned in 1856. Although Dr. Stimpson devoted his chief attention to articulate animals, and molluscs occupied but a subordinate share of his attention, it is safe to say that in this short period he collected more trust-worthy species of shells, with localities, than were received at the Smiths. Inst. from the united labours of the naturalists of Captain Wilkes's celebrated expedition. Through some unaccountable cause, certain of the most valuable boxes were "lost" between New York and Washington; the remainder were placed in the hands of Dr. Gould for description, with the MS. catalogue, a copy of which forms the "Mollusca, Vol. I.," nos. 1-2003, of the Smiths. Mus. Fortunately, Dr. Gould embraced the opportunity to bring the uncertain shells to London, and compare them with the Cumingian Collection.

† A fuller account of this expedition is here given than is justified from its contributions to the W. American fauna, because no other information respecting it is as yet available to the malacological student.
Thus a large body of species, named from types, was prepared for the New World; but, unfortunately, through imperfect packing and the practice of marking by numbers only, much of the value of this identification was lost. The new species were described by Dr. Gould in the †Boston Proc. Soc. Nat. Hist.,’ 1859–1861; and on completion of the series, the author collected the papers embodying the new species of the two great scientific expeditions, as well as his other scattered publications, and issued them in a most valuable book, entitled †Otia Conchologica: Descriptions of Shells and Mollusces, from 1839–1862,’ Boston, 1862; with “Rectifications,” embodying such changes of nomenclature and synonyms as he desired to represent his matured views. In quoting Dr. Gould’s writings, therefore, this table should always be consulted. A considerable portion of the specimens have been returned to the Smiths. Inst., of which the larger species are mounted in the collection, and the smaller ones have been sent to the writer to compare with those collected by Mr. A. Adams, which were unfortunately being described in the London journals almost simultaneously. The war has unhappily postponed the intention of publishing the complete lists of species collected and identified with so much accurate care. The following, however, have already been determined by Dr. Gould from the region in which American species occur. The list is given entire (so far as identified), because species as yet known only on one coast of the North Pacific may hereafter be found on the other. It contains (as in the comparison of the Caribbean and West Mexican fauna) (a) species certainly identical, (b) probably identical, (c) “interesting anagues,” and (d) representative forms.

81. Cat. no. 1263. Crepidula lystryx, var. Kagosima Bay, Japan. Dead on shore. [=aculeata, Maz. Cat. no. 334.]

1319. Poronia rubra, Mont. Kagosima Bay, Japan. [Vide Maz. Cat. no. 154.] Among sea-weeds and barnacles in 2nd and 3rd level; rocky shore.


1344. Aenea ?Sieboldi; very near patina. Kagosima Bay, Japan. Rocks at l. w.

1361. Turitila variegata, Lam. Kagosima Bay, Japan. [Vide Maz. Cat. no. 484.] Dead on shore.

1414. Nassia gemmulata, Lam. [non C. B. Ad.] Kagosima Bay, Japan. 5 fm. sd.


1502. Lima squamosa, Lam. Taniigesima, Japan. [=L. tetrica, Glid., teste Cumm.]

The remaining species from these localities are either local or belong to the Philippine and Polynesian fauna. At Simoda and Hakodadi we enter on a mixed fauna.

1574. Halotis discus, Rve. Simoda and Hakodadi. Rocks at low water, four fm. “Kamtschatkania seems to be the small growth of the same.” [It is locally abundant, however, on the West Coast; while discus has never been found there, and is much flatter.]


1582. Tritonium [Chrysodonus] antiquum, L. Hakodadi Bay (also Okhotsk and Arctic Oc., 1779). Low-water mark and laminarian zone, on weedy rocks.


1589. Mya arenaria, L. Hakodadi Bay.


69
The above occur in connexion with local and with diffused tropical species.


1704. *Mytilus edulis*. Hakodadi. Also Avikamecheche Is., Behring Str., and Arctic Ocean. Low-water mark, and in 3rd and 4th level.


1706. *Mya truncata*. Hakodadi; also Avikamecheche Is. Mud, 6–15 fm. Also Arctic Ocean, in mud, 30 fm.


1711. *Buccinum tortuosum*, Rve., = *scariforme + vars* Strains of Seniavine.


1732. *Bela turricula*, Mont. Awatska Bay; mud, 6–15 fm. Also Seniavine Str.; [no. 1782.]
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

S.I. Cat. no.


1735. **Toldia myalis** (or *hyperborea*). Awatska Bay. Mud, 10 fm.

1736. **Lea hallsia**. Seniavine Str.; Arctic Oc., near Behr. Str. Mud and pebbly sand, 15-30 fm.; coarse silex.

1737. **Lea minuta**, var. Ditto. Mud and pebbly sand, 5-20 fm.; fine silex.

1740. **Mucidae corrigata**. Ditto. Mud, in nests, 30 fm.


1747. **Fetulina halicoidea**. Ditto. Gravel, 10-25 fm.


1749. **Turritella** (sp.), Migh. Ditto. Mud, 30 fm.; clean gravel, 4-20 fm.

1750. **Triechotomus bicarinate**. Ditto. Pebbly mud, 5-6 fm.


1755. **Mucidae myalis**, Midd. Also Hakodadi; sandy mud, 10 fm.; no. 1657.


1760. **Lunatia pallidioide**, Ditto. Mud, 30 fm.


1769. **Buccinum *mundatum* (probably bicarinate var. of glaciale). Arctic Ocean.

1774. **Buccinum *mundatum*, var. pelagica. Arctic Ocean.

1776. **Buccinum *Ochotense*, Midd. Arctic Ocean.

1777. **Buccinum angulosum**, Gray (= glacie, var.). Arctic Ocean.


1783. **Turritella erosa**. Seniavine Str. Mud, 10-20 fm.


1786. **Bela decussata**, Couth. Seniavine Str. Sandy mud, 10-20 fm. Also Awatska Bay; no. 1730.

1790. **Yolda myalis**, Couth. Seniavine Str. Mud, 10-20 fm.; pebbly mud, 5 fm.

1791. **Bela harraralia**, Couth. Pebbly mud, 5 fm.


1821. **Chama lobata** [= *exogyra*, Say, non Conr.]. China Sea, west of Formosa.

Shell-gravel, 30 fm.


1840. **Macoma nasuta**, Conr. San Francisco. Common in sandy mud, l. w. 10 fm.

1843. Mytilus edulis, var. San Francisco. On rocks and gravel, 4th level.
1845. Tapes diversa, Sby. San Francisco Bay. Very common, low-water mark

The shells brought back by the Expedition from Puget Sound and Shale-water Bay were collected by Dr. Cooper, whom Dr. Stimpson met at San Francisco, and are not here catalogued, as they appear again in his own collections, v. infra, par. 101.

1858. Cerastoma foliatum, var. Burnettii, Ad. and Rve. Hakodadi Bay and N. E. part of Niphon. Low-water mark, on rocks and boulders.
1859. Purpura Freycineti, var. with muriciform lamelae. N. E. shore of Niphon.
1859. Flumeannoma macrochisma, Desh. West Coast of Jesse. Gravel, 30 fm.


The following, from among the new species described by Dr. Gould in his 'Otia Conch.' belong to the same province, and to forms which may be expected to appear on the northern shores of West America. They were first published in the Proc. Bost. Soc. Nat. Hist., under the dates quoted:—

100. 1859. June. Natica severa, Gld., like heros, but with umbilicus resembling unifasciata. Hakodadi, W. S.
115. " Acmaea dorsosa, Gld., like patina, var. monticula [monticola], Nutt. Hakodadi, on rocks of 2nd and 3rd lamin. zone. W. S.
117. " Chiton (Leptochiton) concinnum, Gld., like albus, but with lines of punctures. Hakodadi, W. S.
118. " Chiton (Acanthochates) ochates, Gld. Kikaia, Hakodadi, W. S.
120. 1860. Sept. Terebratula (?) Waldheimia) transversa, Gld., like Grayi, with shorter internal supports: [=Grayi,teste A. Ad.] Hakodadi, W. S.
120. " Rhyynchonella lucida, Gld.; in aspect like T. vitrea, jur.
121. " Trichotrops (Iphinoe) coronata, Gld.; like T. cihiata, Kruger. Straits of Semiavine, Arctic Ocean, 20 fm. mud. W. S.

Neptunea (Siphon) terebralis, Gld.; like Icelandica. Arctic Ocean.

Trophon incomptus, Gld.; like crassus. Hakodadi, W. S.

Bela fervida, Gld. Kamtschatka, W. S.

Margarita ianthina, Gld.; like Schantarica. Arctic Ocean.

Margarita albula, Gld.; like an overgrown arctica. Arctic Ocean, W. S.

Margarita muscelina, Gld. Hakodadi; low water, W. S.

Gibbula redinita, Gld.; like nivoso, A. Ad. Hakodadi, W. S.

Lyonsia ventricosa, Gld.; shorter than Norvegica. Hakodadi, 2–6 fm., sandy mud, W. S. ["= navicula, jun." A. Ad.]

Lyonsia (Pandorina) flabellata, Gld.; like arenosa. Arctic Ocean, W. S.

Theora lubrica, Gld. Hakodadi; common in mud, 6 fm., W. S.

Panopea fragilis, Gld. Hakodadi, W. S.


Corbula venusta, Gld. Hakodadi, 5–8 fm., shelly sand, W. S.

Solen strictus, Gld.; like cornes. Hakodadi, W. S.

Solen gracilis, Gld. [non Phil.] Hakodadi, sandy beaches, W. S.

Machera soralis, Gld.; like costata. Hakodadi, W. S.

Solemya pusilla, Gld.; like velum. Hakodadi, 5 fm., mud, W. S.

Tellina lubrica, Gld.; like felixa and fabagetta. Hakodadi, 6 fm., sandy mud, W. S.

Saxidomus aratus, Gld.; like V. maxima. Phil. San Francisco. [Described as 4'5 in. long, yet] smaller than Nuttallii. ["= Open bays at Sir F. Drake's: f. w., sand." Smiths. Cat. 1842.]

Venus (Mercenaria) Simpsoni, Gld.; like the Atlantic forms. Hakodadi, 6 fm., W. S.

Mysia (Felania) usta, Gld.; like an Astarte. Hakodadi, 8 fm., sandy mud, W. S.

Montacata diericata, Gld. Hakodadi, on Spatangus-spires, W. S.

Nucula (Acila) insigina, Gld.; like mirabilis; [identical, teste A. Ad.] E. Japan, lat. 37*, and Hakodadi, W. S. ["= 20 fm. black coarse sand."—Smiths. Cat. 1028.]

Mytilus coruscus, Gld.* Hakodadi; common on rocks between tide-marks, W. S. ["= M. splendidus, no. 1950.]


95. The United States Expedition to Japan, under Commodore M. C. Perry, 1852–4, was not undertaken for scientific purposes; and no special provision was made either for collecting or describing objects of natural history. A large number of shells, however, were obtained, and identified by Dr. Jay of New York. In Vol. II. of the 'Narrative of the Expedition, &c.' (Washington, 1856, pp. 289–297) is given a list of Japanese shells, with descriptions and figures of the (supposed) new species. The following are related to the molluscs of the West Coast. Specimens of the most important may be seen in the Cumingian Collection.

* The M. mutabilis, described on the same page from Kagosima, is a Septifer; it is presumed that the learned author did not open a specimen.

† The student should also consult, for related forms, the 'Mollusca Japonica' by Dr. W. Dunker, Stuttgart, 1861;—like all the other works of the same author, most valuable for the patient care, accurate judgment, and enlarged experience displayed; but relating chiefly to the subtropical portion of the fauna.
292. 1. 8,9. *Pemannobia olivacea*, n. s. Bay of Yedo. [Nearly allied to *Hiatula Nuttalli.*]

293. 3, 4. 1, 2. *Pecten Tesssensis*, n. s. Hakodadi. [Resembles *Amusium caurinum*, Gld.]


296. 5. 29, 30, 31. *Bulloia Perryi*, n. s. Bay of Yedo, one sp. dredged. [= *Volutospicata*, Miss.


296. 1. *Tapes decussata*, Lm. [Probably *T. Petitii*, var. or *Adamsi*. Japan.]


96. At the time that Dr. Gould was describing Dr. Stimpson’s Japanese shells in the Boston Proc. Ac. N. S., Mr. A. Adams, R.N., one of the learned authors of the ‘Genera of Recent Mollusca,’ was making extensive and accurate dredgings in the same seas. The new genera and species have been and are being published, in a series of papers, in the Ann. & Mag. Nat. Hist. and in the Proc. Zool. Soc., preparatory to an intended complete work on the mollusc-fauna of the Eastern North Pacific. The collections of Mr. Adams have already displayed the Japanese existence of several species, as *Siphonalia Kelletii*, *Solen sicarius*, *Homalopoma sanguineum*, &c., before supposed to be peculiar to the West coast. Unfortunately for our present purpose, while the comparison of specimens was going on, Mr. Adams was unexpectedly called to service on board H.M.S. ‘Majestic,’ and was obliged to pack up his collections. Enough has been ascertained, however, to prove that it will be unsafe henceforth to describe species from either coast without comparison with those of the opposite shores.

97. Pacific Railroad Reports.—As it is necessary, in studying any fauna, to make comparisons far round in space, so it is essential to travel far back in time. The fullest account of the fossils of the West Coast of America is to be found in the ‘Explorations and Surveys for a Railroad Route from the Mississippi River to the Pacific Ocean,’ which form ten thick quarto volumes, copiously illustrated with plates, and published by the U.S. Senate, Washington, 1856*. The natural-history department was conducted under the superintendence and with the aid of the Smithsonian Institution; and science is under special obligations to Prof. Spencer S. Baird, the Assistant Secretary, for his Reports on the Vertebrate Animals. It would hardly be expected in Europe that the best résumé of the zoology, the botany, and the geology of the vast region between the Great American desert and the Pacific should be found in a railroad survey. Unfortunately, it has not been the custom to advertize and sell the valuable documents printed at the expense of the U.S. Government, in the ordinary channels of trade. They often become the perquisites of the members of Congress, and through them of the various employés, by whom they are transferred to the booksellers’ shelves. The fifth volume of the series is devoted to the explorations of Lieut. Williamson; the second Part contains the Report by W. P. Blake, geologist and mineralogist of the expedition. In the Appendix, Art. II., are found ‘Descriptions of the Fossil Shells,’ by T. A. Conrad. They were first published in the

* This extremely costly and valuable assemblage of documents was selling in Washington, in 1860, at £5 sterling the set.
Appendix to the Preliminary Geological Report,’ Svo, Washington, 1855. They are divided into, I. ‘‘Eocene,” and II. ‘‘Miocene and Recent Formations.”

I. Eocene (all from Cañada de las Uvás *).

Plate. Fig. No.
        2. 2. Dosinia alta, Conr., n.s.
        3. 3. Meretrix Uvasana, Conr., n.s.
        4. 4. Meretrix Californiana, Conr., n.s. Allied to M. Poulsont, Conr.
        5. 5. Crassatella Uvasana, Conr., n.s.
        6. 6. Crassatella alta, Conr., n.s. In small fragments, but abundant, as at Claiborne, Al.
        7. 7. Mytilus numerus, Conr., n.s.
        8. 8. Cardita planicosta, Lam., = Venericardia ascia, Rogers. First discovered in Maryland in 1829, by Conr.; occurs abundantly in Md., Va., Al., and is quite as characteristic of the American as of the European Eocene period.
        10. 10. Natica gibbosa, Lea, 1833, or N. semihastata, Lea; also found at Claiborne, Al.
        11. 11. Natica alcesta, Conr., n.s.

II. Miocene and Recent Formations (from various localities).

III. 15. 16. Cardium mo’estum, Conr., n.s. San Diego. [May be Hemicardium biangular, jun.]
        17. 18. Corbula Diegoana, Conr., n.s. San Diego.
        20. 20. Meretrix decisa, Conr., n.s. Ocoya Creek.

* The existence of Eocene strata on the Pacific slope is ascertained by a single boulder of very hard sandstone, which, though very small, furnished fifteen species. Of these, three correspond with forms from Claiborne, Alabama; and the “finger-post of the Eocene” appears in its usual abundance. Mr. Conrad characterizes the specimens as “beautifully perfect,” which would not have been supposed from his descriptions and figures. They “ seem to indicate a connexion of the Atlantic and Pacific Oceans during the Eocene period;” and the author expects that “when the rock shall have been discovered and investigated in situ, fresh forms will be obtained, with which we are already familiar in eastern localities.”

75
Plate  Fig.  No.  
IV.  31.  23.  Tapes diversum, Sby.  [=Tapes staminea, Conr., var. Petiti, 
(III. in text).  Recent formation.  San Pedro.
III.  25.  27.  Saxicava abrupta, Conr., n.s.  [Probably the shortened form of 
Petricola carditoidees, Conr.]  Recent formation.  San Pedro.
"  24.  23.  Petricola Pedroana, Conr., n.s.  [Allied to P. ventricosa, Desh.]  
Recent formation San Pedro.
IV.  33.  29.  Schizothorus Nutalli, Conr., "n.s." = Tresus capaz, Gld.  Recent 
formation.  San Pedro.
III.  23.  30.  ?Lutraria Traski, Conr., n.s.  [Not improbably = Saxidomus 
V.  45.  31.  Macra Diegoana, Conr., n.s.  Like M. albaria, of the Oregon 
"  35.  32.  Modiola contracta, Conr., n.s.  [Very like M. recta, Conr.]  ?Miocene.  
Monterey Co.  Recent formation.
"  40.  33.  Mytilus Pedroanus, Conr., n.s.  [Probably = M. edulis, jun.]  
Recent formation.  San Pedro.
"  41.  34.  Pecten Deserti, Conr., n.s.  [Resembles P. circularis.]  Miocene.  
Carrizo Creek, Colorado Desert.
"  34.  35.  Anomia subcostata, Conr., n.s.  [=Placunonomia macrochisma.]  
"  30-38.  33.  Ostrea vespertina, Conr., n.s.  [Resembles O. lurida, var.]  Miocene.  
Colorado Desert.  Like O. subfalcata, Conr.
"  43.  38.  Peniella-spelea, Conr., n.s.  Recent formation.  San Pedro.
"  44.  39.  Fissurella crenulata, Sby.  [=Luecina c.]  Recent formation.  
San Pedro.
VI.  52.  40.  Crepitudula princeps, Conr., n.s.  [=C. grandis, Midd.]  Recent 
formation.  Santa Barbara.
"  42.  42.  Trochita Diegoana, Conr., n.s.  [Like T. ventricosa; but may be 
"  46.  43.  Crucibulum spinosum, Conr., n.s.† Recent formation.  San Diego.
VI.  49.  44.  Nassa interstriata, Conr., n.s.  [=N. mendica, Gld.]  Recent 
formation.  San Pedro.
"  48.  45.  Nassa Pedroana, Conr., n.s.  [Comp. Amycila gausapata and its 
congeners.]† Recent formation.  San Pedro.
"  51.  46.  Strophona Pedroana, Conr., n.s.  [Comp. Olivella botica.]  Recent 
formation.  San Pedro.
"  50.  47.  Litorina Pedroana, Conr., n.s.  [=L. piena, Gld.]  Recent formation.  
San Pedro.
"  47.  48.  Sitemonita petrosa, Conr., n.s.  [Is perhaps Monoceros lugubre.]  
†—Tulare Valley.

* Mr. Conrad regards the "coriaceous cup as characteristic of the genus." It appear
a subgenus of Pholadidea, differing in the form of the plate.  Mr. Tryon, "Mon. Pho-
lad.," p. 66, restricts it to the Peniella penita, which (according to his diagnosis) ha-
one central and two anterior dorsal plates.  The closely related P. ovoidea he leaves in 
the original genus, as having "two dorsal accessory valves," although he allows that "its 
position cannot be accurately determined on account of the loss of its dorsal valves."  
Conrad's fossil has the shape of P. ovoidea; but although he says that it is "widely dis-
tinct" from P. penita, I am unable to separate it from the ovoid form of that species, 
which will be found in the Smithsonian series.
† This is certainly Sowerby's species, to which Conrad gives a doubting reference.  In 
the text he gives it as "spinosum, Conr.," in his table marking it as "nov. sp."
‡ Conrad compares N. interstriata to N. trivittata, Say, and N. Pedroana to N. lunata, 
Say, and states that the two Atlantic species are "associated with each other both in the sea 
and in the Miocene deposits of Virginia and Maryland."  As the two correlative species 
found together, living and fossil, on the Pacific side, there is presumptive evidence for 
their having descended from a common stock.
The following species are not described in the text, but quoted in the list.

_Vide_ p. 320:—

VIII. 758. 63. _Cardium_, sp. ind. Ocoya Creek.

64. _Arca_, sp. ind. Ocoya Creek.

76. 80. 65. _Solen_, sp. ind. Ocoya Creek.

78. 81. 66. _Dosinia_, sp. ind. Ocoya Creek.

79. 67. _Venus_; sp. ind. Ocoya Creek.

68. _Cytherea ?decisa_, Conr. Ocoya Creek.

69. _Ostrea_, sp. ind. San Fernando.

70. _Peetz_, sp. ind. San Fernando.

71. _Turrithella biseriata_, Conr., ?n.s. San Fernando.

VII. 758. 72. _Trocus_, sp. ind. Benicia.

73. _Turrithella_, sp. ind. Benicia.

74. _Buccinum ?interstitium_. San Pedro.

75. _Anodonta Californiensis_, Lea. Colorado Desert.

Mr. Conrad, than whom there is no higher authority for American Tertiary fossils, considers the age of the Eocene boulder ascertained; and that the deposits of Santa Barbara and San Pedro represent a recent formation, in which (test Blake) the remains of the Mammoth occur: and the shells indicate little, if any, change of temperature since their deposition." But he acknowledges that the intermediate beds are of uncertain age. Those on Carrizo Creek he refers to the Miocene, some characteristic species being either identical with the Eastern Miocene or of closely related forms. In addition to the species tabulated in this Report, he quotes, as having been collected in California by Dr. Heermann, " _Mercenaria perlaminosa_, Conr., scarcely differing from _M. Ducatelli_, Conr.; and a _Cemoria, Pandora_, and _Cardita_ of extinct species, closely analogous to Miocene forms." The casts from Ocoya Creek were too friable to be preserved, and are figured and described from Mr. Blake's drawings; these also are regarded as Miocene. The San Diegan specimens are too imperfect for identification; they are referred to the Miocene by Conrad, but may perhaps be found to belong to a later

* Several fossils are figured in plates vii. and viii., to which no reference is made in the text. It is unsafe to conjecture the genus to which many of them belong, but it is presumed that they relate to the indeterminate species here quoted.
age. The types of these species in the Smithsonian Museum are, too imperfect to determine specifically with any confidence; and by no means in a suitable condition to allow of important conclusions being drawn from them.

98. The third article in the Appendix to the same volume of Reports contains a "Catalogue of the Recent Shells, with Descriptions of the New Species," by Dr. A. A. Gould. The specimens were (apparently) in the hands of Dr. Gould for examination when he prepared the MS. for the first Report; and some of them were included in the "Mexican War Collections," B. A. Report, pp. 227, 228. "The freshwater shells were collected in the Colorado desert and other localities; the land and marine shells between San Francisco and San Diego." The following is the list of species as determined by Dr. Gould, pp. 330–336. The specimens belong to the Smithsonian Institution, where a large portion of them were fortunately discovered and verified. They were collected by W. P. Blake, Esq., and Dr. T. H. Webb.

Plate. Fig. No.

1. Ostrea, sp. ind. Parasitic on twigs; thin, radiately lined with brown. [= O. conchaphila, Cpr.] Another species, elongated, solid, allied to Virginica [var. rifoides]. San Diego.


3. Pecten ventricosus, Sby., tumidus, Sby. [Dead valves, of the form aguisuleatus.] San Diego.


9. Tapes gracilis, Gld., n.s. Prel. Rep. 1855. [Quite distinct from every other Tapes known from the coast. It is supposed by Dr. Cooper to be the young of Saxidomus aratus, which in shape and pattern exactly accord with the figure and diagnosis. But the "Tapes" is figured without sculpture. The shell was not found at the Smiths. Inst.] San Pedro, Blake.


20. Gnathodon Lecontii, Consr., = G. trigynum, Petit. Colorado Desert. [Lecontii is probably the large Texan species: trigynum = mendicus is a very distinct shell from Mazatlan.]

* Neither Dr. Gould, nor Conrad himself, in his later geological writings, appears to have called to mind the true T. staminea, to which the Smithsonian shells belong. It is the northern representative of T. grata, but quite distinct: e. synonomy under Venus Nutallii = rigida, pars.

† No "Mesodesma" was found among the shells returned to the Smithsonian Institution, nor has any been heard-of from the coast. Dr. Gould's shell may have been Semele pulchra, which was in the collection.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 5

Plate. Fig. No.
24. Calyptraea hirsuta, Brod. [= Crucibulum spinosum, Sby.] San Pedro; San Diego.
27. Bulla (Haminea) viridescens, Sby. San Diego.

32. Litorina, sp. ind. [var. plena, Gld.] San Diego.
33. Melampus, sp. ind. [olivaceus, Cpr.] San Diego.
34. Olica biplicata, Sby. San Pedro.


40. Succinea, sp. ind. Ocoya Creek.
42. Helix San-Diegoensis, Lea. Point Reyes. [No such species, teste Binney.]
44. Helix Oregonensis, Lea. Cypress Point.

Dr. Newberry's Californian Fossils.

99. The fossils of the various Western expeditions were being arranged in 1860 in the Smithsonian Museum by Prof. J. S. Newberry, M.D., a naturalist of rare experience and accomplishments, and author of "Reports on the Geology, Botany, and Zoology of Northern California and Oregon" Washington, 1857. They are embodied in vol. vi. of the 'Pacific Railroad Reports.' The following is a list of the fossils, which were described by Mr. Conrad in pp. 69-73, having first appeared in the Proceedings of the Academy of Natural Sciences, Philadelphia, Dec. 1856, to which page-references are added.

* The Crepidula returned in this collection were adunca and rugosa, var.
<table>
<thead>
<tr>
<th>Page</th>
<th>Plate</th>
<th>Fig.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.</td>
<td>II.</td>
<td>4.</td>
<td><em>Mya Montereyana</em>, Conr., p. 313. [Figure resembles <em>Periploma argentiaria.</em>] Monterey Co.</td>
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<td></td>
<td>&quot;</td>
<td>5.</td>
<td>?<em>Mya subsimilis</em>, Conr. [Comp. <em>Macoma inquinata.</em>] Monterey Co.</td>
</tr>
<tr>
<td>71.</td>
<td>III.</td>
<td>11.</td>
<td><em>Axinea Barbarensis</em>, Conr. [Closely resembles <em>Pect. intermedium.</em>]</td>
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**Fossils of Gatun, Isthmus of Darien.**


The northern fossils are supposed by Mr. Conrad to be of the Miocene period, and not to be referable to existing species. Those from Sta. Barbara, however, are clearly of a very recent age, and probably belong to the beds searched by Col. Jewett. But by far the most interesting result of Dr. Newberry's explorations was the discovery of the very typical Pacific shell, *Malea ringens*, in the Tertiary strata on the Atlantic slope of the Isthmus of Darien, not many miles from the Caribbean Sea. The characters of this shell being such as to be easily recognized, and not even the genus appearing in the Atlantic, it is fair to conclude that it had migrated from its head waters in the Pacific during a period when the oceans were connected. We have a right, therefore, to infer that during the lifetime of existing species there was a period when the present separation between the two oceans did not exist. We may conclude that species as old in creation as *Malea ringens* may be found still living in each ocean; and there is, therefore, no necessity for creating "representative species," simply because, according to the present configuration of our oceans, we do not see how the molluses could have travelled to unexpected grounds.

100. In vol. vii. of the Pacific Railroad Reports, part 2, is the Geological Report, presented to the Hon. Jefferson Davis, then Secretary of War, by Thos. Antisell, M.D. He states reasons for believing that during the Eocene period the Sierra Nevada only existed as a group of islands; that its final uplifting was after the Miocene period; and that during the whole of that
period the coast-range was entirely under water. The Miocene beds are above 2000 feet in thickness, and abound in fossils generally distinct from those of the eastern strata. There is nothing in California answering to the Northern Drift of the countries bordering on the Atlantic. The molluscs of Dr. Antisell's Survey were described by Mr. Conrad, pp. 189-196. He remarks that "the fossils of the Estrella Valley and Sta. Inéz Mountains are quite distinct from those of the Sta. Barbara beds, and bear a strong resemblance to the existing Pacific fauna. The Miocene period is noted, both in the eastern and western beds, for the extraordinary development of Pectinidae, both in number, in size, and in the exemplification of typical ideas." It also appears to be peculiarly rich in Arcaden, which are now almost banished from that region, while they flourish further south. The large Amusium caurinum and the delicate Pecten hastatus of the Vancouver district, as well as the remarkable Janira dentata of the Gulf, may be regarded as a legacy to existing seas from the Miocene idea; otherwise the very few Pectinids which occur in collections along the whole West Coast of North America is a fact worthy of note. Mr. Conrad has "no doubt but that the Atlantic and Pacific oceans were connected at the Eocene period;" and the fossils here described afford strong evidence that the connexion existed during the Miocene epoch.

All the species here enumerated (except Pecten deserti and "Anomia subcostata") were believed to be distinct from those collected by the preceding naturalists.

**Dr. Antisell's Californian Fossils.**

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<thead>
<tr>
<th>Page.</th>
<th>Plate.</th>
<th>Fig.</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>190.</td>
<td>II.</td>
<td>1, 2</td>
<td>Hinmites crassa, Conr. [? = H. gigantea, Gray.] Sta. Margarita.</td>
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<td></td>
<td>I.</td>
<td>1</td>
<td>Pecten Meeckii, Conr. San Raphael Hills.</td>
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<td></td>
<td>II.</td>
<td></td>
<td>Pecten deserti, Conr. Blake's Col., p. 15. Corrizo Creek.</td>
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<td></td>
<td>II.</td>
<td>2</td>
<td>Pecten altiplicatus, Conr. San Raphael Hills.</td>
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<td></td>
<td>III.</td>
<td>3, 4</td>
<td>Pallium Estrellanum, Conr. [Janira.] Estrella.</td>
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<tr>
<td></td>
<td>I.</td>
<td>3</td>
<td>Spondylus Estrellanus, Conr. [? Janira.] Estrella.</td>
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<td>192.</td>
<td>V.</td>
<td>3, 5</td>
<td>Tapes montana, Conr. San Buenaventura.</td>
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<td></td>
<td>VII.</td>
<td>1</td>
<td>Tapes Inezensis, Conr. Sta. Inez.</td>
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<td></td>
<td>IV.</td>
<td>1, 2</td>
<td>Venus Pajaroana, Conr. Pajaro River.</td>
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<td></td>
<td>VII.</td>
<td>4</td>
<td>Cyclas permacra, Conr. Sierra Monica. Resembles C. panderata, Conr., = Lucina compressa, Lea.</td>
</tr>
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<td></td>
<td>VI.</td>
<td>6</td>
<td>Cyclas Estrellana, Conr. Estrella.</td>
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<td></td>
<td>V.</td>
<td>1</td>
<td>Arca Obispoana, Conr. San Luis Obispo.</td>
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<tr>
<td>193.</td>
<td>V.</td>
<td>2, 4</td>
<td>Pachydesma Inezana, Conr. [Like P. crassatatoides.] Sta. Inez Mts.</td>
</tr>
<tr>
<td></td>
<td>VI.</td>
<td>1, 2</td>
<td>Crassatella collina, Conr. Sta. Inez Mts.</td>
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<td></td>
<td>II.</td>
<td>3</td>
<td>Ostrea subjecta, Conr. &quot;May be the young of O. Panzana.&quot; Sierra Monica.</td>
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<td></td>
<td>VII.</td>
<td>2</td>
<td>Ostrea longula, Conr. Salinas River.</td>
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<tr>
<td>194.</td>
<td>VI.</td>
<td>4</td>
<td>Dosinia alta, Conr. Salinas River.</td>
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<td></td>
<td>VI.</td>
<td>5</td>
<td>Dosinia subobliqua, Conr. Salinas River. Also a small Venus, a Natica, and a Pecten.</td>
</tr>
<tr>
<td></td>
<td>VIII.</td>
<td>2, 3</td>
<td>Mytilus Inezensis, Conr. Sta. Inez.</td>
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<tr>
<td></td>
<td>V.</td>
<td>6</td>
<td>Lutaria transmontana, Conr. Allied to L. papyria, Conr. Los Angeles; also San Luis.</td>
</tr>
</tbody>
</table>
As before, the fossils appear to be in very bad condition. The succeeding palæontologists who have to identify from them are not to be envied. Their principal value is to show what remains in store for future explorers. The extreme beauty of preservation in the fossils collected by Col. Jewett, rivaling those of the Paris Basin, and sometimes surpassing the conspecific living shells, makes us astonished that so large a staff of eminent men, employed by the Government, made such poor instamments of contribution to malacological science. The plan, too often followed, of remunerating naturalists, not according to the skilled labour they bestow, but according to the number of "new species" they describe, is greatly to be deprecated. Further knowledge concerning the old species may be more important in scientific inquiries than the mere naming of new forms. It is generally a much harder task to perform, and, therefore, more deserving of substantial as well as of honourable acknowledgment.

101. The shells collected on the North Pacific Railroad Survey were intrusted to W. Cooper, Esq., of Hoboken, New Jersey, for description: Dr. Gould being occupied with preparing the diagnoses of the N. Pacific E. E. species. Judge Cooper was at that time the only naturalist in America known to be actively engaged in studying the marine shells of the West Coast, of which he has a remarkably valuable collection. He had rendered very valuable service to the Smithsonian Institution by naming their specimens. Unfortunately, there is such great difficulty even in New York city (of which Hoboken is a suburb) in obtaining access to typically named shells, as well as to many necessary books*, that, notwithstanding the greatest care, errors of determination are almost sure to arise.

The "Report upon the Mollusca collected on the Survey, by Wm. Cooper," forms No. 6 of the Appendix, pp. 369-386, and errata. (Unfortunately the

* Both Judge Cooper and Dr. Lea informed me (1860) that they had not been able to obtain a copy of the plates to the U.S. Expl. Exped. Mollusca. Through special favour, I was enabled to obtain a series of the proofs to work by. The Smithsonian Institution, though intrusted with the keeping of the collections, was not favoured with a copy until after the war began, when the whole series was granted by Congress. Judge Cooper had derived great assistance from the British Association Report, and has communicated many corrections in it. In the alterations of synonymy, and in defining the limits of specific variation, I have had the benefit of his counsel and experience; and have rarely felt compelled to differ from him. Having himself collected extensively in the West Indies, he had excellent opportunities of comparing fresh specimens from the now separated oceans. I was fortunate enough to meet his son, Dr. J. G. Cooper, at the Smithsonian Institution, and to examine the types of the species he collected (which are here enumerated) with the advantage of his memory and knowledge. His later contributions to the malacology of W. America will be afterwards enumerated: his valuable Treatise on the Forests and Trees of North America will be found in the Smithsonian Reports, 1858, pp. 246-280.
work had been carelessly printed.) It contains the following species, the localities quoted in the text from other sources being here omitted:—

Murex festivus, Hds. Dead. San Diego, Cassidy.
Triton Oregonensis, Redfield (non Jay, nec Say) = T. cancellatum, Midd., Rve., non Lam. Straits of De Fuca, Suckley, Gibbs, J. G. Cooper.

370. Chrysodomus antiquus, var. Behringiana, Midd., one specimen. Straits of De Fuca, Suckley. [Comp. Chr. tabulatus.]
Chrysodomus Middendorffii, Coop., n. s., = Tritonium decemcostatum, Midd. One specimen on the shore of Whidby's Island. Straits of De Fuca, J. G. Cooper. (= Buc. litatum, Mart. This being a remarkable instance of a "representative species," it requires to be minutely criticized. Judge Cooper compared his specimen with 130 eastern shells, and noted the differences with great fulness and accuracy. A series of Middendorff's Pacific shells having been brought to England by Mr. Damon, and sold at high prices, I made a searching comparison of one of them with the eastern specimens furnished me by Judge Cooper and other most trusty naturalists. According to the diagnosis of Middendorffii, it should be referred to C. decemcostatum, Say, and not to De Fuca species, as it agrees in all respects with the eastern peculiarities quoted, except that the riblets near the canal are rather more numerous and defined. As it might be suspected that Mr. Damon's shells were mixed, I have made a similar comparison with a shell from the N. W. coast, sent to the Smiths. Inst. by Mr. Pease, and with the same result. On examining the specimens in the Cumingian Collection, in company with A. Adams, Esq., we were both convinced that the eastern and western forms could not be separated. In the similar shells collected by Mr. Adams in the Japan seas there are remarkable variations in the details of sculpture.]

Nassa mendica, Gld. Puget Sound, Suckley.
Nassa Gibbii, Coop., n. s. "Resembles N. trivittata more than N. mendica." Port Townsend, Puget Sound. [In a large series, neither Dr. Sibbison nor I were able to separate the species from N. mendica. Similar variations are common in British Nasses. Picked individuals from the Neah Bay series would probably be named trivittata, if mixed with eastern shells.]
Parpyra lactua, Esch., + M. ferrugineus, Esch., = P. septentrionalis, Rve. Puget Sound, Suckley, Gibbs; Shoalwater Bay, Str. de Fuca, J. G. Cooper. "Abounds on rocks and oyster-beds in Shoalwater Bay, the form and amount of rugosity depending on station. The oyster-eaters are smooth even when young." — J. G. C.

[Some varieties run into the New England form of P. lapillus, sufficiently nearly to justify the identification; but the bulk of the specimens are easily distinguished by the excavated columnella. They pass by insensible gradations to P. ostrina, Gld., which is a rare and extreme variety. Many of the shells of the Freycinetii by Midd. are certainly referable to this species. Some forms pass towards the true P. Freycinetii, Desh., while others are equally close to the very different P. emarginata, Desh.]
Parpyra emarginata, Desh., = P. Conradii, Nutt. MS. “Upper California,” Trask; San Diego, Trescbridge. [This appears to be exclusively a southern form = saxicola, var.]
Monoceros engonatum, Cont., = M. unicarinatum, Sby. San Pedro, Dr. Trask.

373. Monoceros lapilloides, Cont., = M. punctatum, Gray. San Pedro, Dr. Trask.
COLUMBIA GAUSAPODA, Gld. Str. de Fuca, Suckley.

COLUMBIA PULCHRA [Cooper, non] Gld. [=Buccinum corrugatum, Rve.] Str. de Fuca, Suckley.

NATICE LEWISII, Gld., =N. Hercules, Midd. Puget Sound, J. G. Cooper, Suckley. “Shell sometimes remarkably globose, sometimes with spire much produced.” W. C. “Abundant throughout the N.W. sounds, and collected in great numbers by the Indians for food. In summer it lives above high-water mark to deposit its eggs” in the well-known sand-coils, which are “beautifully symmetrical, smooth, and perfect on both sides.”—J. G. C.

POTAMIS PULLATUS, Gld. A variable species. U. Cal., Trask.


MELANIA SILICULA, Gld. [=one of the many vars. of M. plicifera, teste Lea]. In rivers, W. T., Nisqually and Oregon, J. G. Cooper.


AMMICKULA SEMINALIS, Hds. U. Cal., Trask. [Belongs to Dr. Stimpson’s new genus, Flammulina.]

TURRITELLA ESCHRICHII, Midd. [=Bittium filosum, Gld.]. Puget Sound, Suckley, Gibbs.

“Litorina rudis, Gld., Stn.” [Cooper, non Mont.]. Shoalwater Bay, De Fuca, J. G. Cooper, Suckley, Gibbs. “Very abundant on the N.W. coast, where it presents the same varied appearances as our eastern shell.”—W. C. [To an English eye, it appears quite distinct. L. rudis, Coop., with subterenbrosa, Midd., and modesta, Phil., are probably vars. of L. Stukana, Phil., =L. sulcata, Gld.]

LITORINA SCUTULATA, Gld. On rocks, from the head of Puget Sound to De Fuca, J. G. Cooper.

LITORINA PLANAXIS, Nutt. [=L. patula, Gld.]. San Luis Obispo, Dr. Antisell.

TRACHUS FJLOSUS, Wood, =T. ligatus, Gld., =T. modestus, Midd. Str. de Fuca, J. G. Cooper; U. Cal., Trask. [=T. costatus, Mart.]


HALIOTIS CORRUGATA. San Diego, Cassidy.

HALIOTIS SPLENDENS. San Diego, Cassidy.

HALIOTIS RUFESCENS. San Diego, Cassidy.

HALIOTIS CACHERODII. (None of the rare var. Californiensis.) S. Diego, Cassidy.

FISSURELLA NIGROPUNCTATA, Sby. Two specimens sent by Dr. Trask as coming from Catalina Is., U. Cal. [Imported].

FISSURELLA ASPERA, Esch., =crtitidis, Gld., =densicrathatra, Rve., [=Lincoln, Gray. This is certainly Gould’s species from type; but Reeve’s shell is southern, and appears distinct.] U. Cal., Lieut. Trowbridge.

NACELLA INSTABILIS.

AECMAE PETEA.

AECMAE PERSONA.

AECMAE SPECTRUM.

AECMAE SCABRA.

AECMAE AERUGINOSA.

SCURRIA MITRA.

CHITON MUSCOSUS.

CHITON SUBMARMOREUS.

CHITON TUNICATUS.

CHITON IGNOUS.


The few shells collected of this family are mostly imperfect, but appear to belong to the species quoted: for the synonymy of which, reference is made to the British Association Report.

Still fewer materials, among which the quoted species were identified. [The “submarmoreus,” both of Midd. and Coop., may prove to be Tunicia lineata, var.] Chiefly from Oregon.

ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.


**Helix tudiculata**, Binn. Rare, with the last, Vancouver; also Washington Territory, J. G. Cooper.

**Sucinea Nuttalliana**, Lea. Rare and dead, at Vancouver, J. G. Cooper.

**Lumax Columbianus**, Gld. "Abundant in dense, damp spruce-forests, near Pacific coast; grows to 6 inches, and is smooth, not rugose, when living," J. G. Cooper.


**Bulla tenella**, A. Ad., in Sby. Thes. pl. 134. f. 104 [?]. Puget Sound, one sp., Suckley. ["? = *Haminea hydatis*"]

**Ostrea edulis**, Coop. [non Linn.: = *O. lurida*, Cpr.]. De Fuca and Puget Sound, Gibbs; Shoalwater Bay, Cooper. "Small in Puget Sound; finer in Shoalwater Bay, which supplies S. Francisco market; large at Vancouver's Island; very large near mouth of Hood's Canal."


**Pecten caurinus**, Gld. De Fuca, Suckley. One of the specimens measures 23 inches in circumference and 8 in. across.


**Mytilus edulis**, Lm. Shoalwater Bay, Cooper. "As abundant as in Europe and N. England, with the same variations, and when eaten occasionally causing urticaea."—J. G. Cooper.

**Mytilus Californianus**, Conr. Puget Sound, Port Townsend, Suckley, Gibbs; Upper Cal., Trask. One specimen is 9½ inches long.

**Modiola capaz** [Cooper, non] Conr. [= *M. modiolus*, Lm.]. Not common. Str. de Fuca, Gibbs, Cooper.

**Modiola flavellata**, Gld. Puget S. and Str. de Fuca, Gibbs. [= *M. recta*, var.]

**Lithophagus**, sp. ind., like *falcatus*. [Probably *Adula stylinia*, Cpr.]. Rocks near mouth of Umpqua River, Oregon, Dr. Vollum.

381. **Arca grandis**, Coop. [non Brod. and Sby., = *A. multicostata*, Sby.]. One sp. living. San Diego, Cassidy.

**Margaritana margaritifera**, Lea., = *Alasmomonta falcata*, Gld. River Chehalis, &c., W. T., Cooper; Shasta River, Or., Trask. After careful comparison with eastern U. S. specimens, and those from Newfoundland and Europe, Judge Cooper agrees with Dr. Lea that the N. W. shells are at most a slight variety. "The most abundant of the freshwater bivalves, and the only one yet found in the Chehalis, the streams running into Puget Sound, and most branches of the Columbia. No species is found in the streams running into Shoalwater Bay. Eaten by the Indians E. of the Cascade Mountains," J. G. C.
Page 331. Anodonta angulata, Lea.+ A. feminalis, Gld. Plentiful in Yakima River, W. T., Cooper. A series of specimens of various ages leads Judge Cooper to endorse Dr. Lea's opinion of the identity of the two species.

" Anodonta Oreganensis, Lea. Rivers of W. T., Cooper.

" Anodonta Wahlannatensis, Lea. Lagoons in Sacramento River, Dr. Trask.

332. Cardium Nutalli, Conr. Shoalwater Bay and Puget Sound, Cooper; San Franc., Dr. Bigelow, Trask. "The most abundant clam of Shoalwater Bay, inhabiting sandy mud, a few inches below the surface. The Indians feel for them with a knife or sharp stick with great expertness. In July many come to the surface and die, ? from the sun's heat."

" Cardium quadragenarium, Conr. One valve. San Luis Obispo, Dr. Antisell.

" L lucina Californica, Conr. San Diego, Cassidy.

Cyclus, sp. ind. Whidby's Island; pools near Steilacoom, Cooper.

" Venus staminea, Conr.,+ Venerupis Petitii, Desh.,+ Venus rigida, Gld. [pars], +Tapes diversa, Sby. Shoalwater Bay and Puget Sound, Cooper, Suckley; San Francisco, Trask; San Diego, Lieut. Troubridge. [To the above synonymy, by Judge Cooper, the large series of specimens in the Smithsonian Mus. compels an assent. He considers Tapes straminea, of Sby. Thes., to be a variety of V. histrionica, but it more probably = T. grata, as Dr. Gould appears to have considered it, having copied Sowerby's error. Conrad named it, not from the colour, as was supposed when quoting it as "straminea," but from the thread-like sculpture (test).] Whatever be the form, colour, or sculpture of the shell, Judge Cooper remarks in all the same characters of teeth and hinge; we may add also, of the pallial sinus.

333. Saxidomus Nutalli [Coop., non] Conr.,+ Venerupis gigantea, Desh.,+ Venus maxima, Phil. [?]. Near Copalux River, south of Shoalwater Bay, common at Puget Sound, Cooper; Bodega, Cal., Trask. "Much superior to the Atlantic quaahog as food, but called by the same name. Its station is in somewhat hard sand, near l.-w. mark." J. G. C. [Judge Cooper regards all the Saxidomi of the coast, except S. aratus, as one species. The southern form, "with rough concentric striae and brown disc," is Conrad's species; "others from Oregon are much smoother, without regular striae." These are S. squallidus, Desh. Dr. Cooper found a fossil variety, in coast-banks 10 feet above sea-level, which is well figured in Midd. and (less distinctly) by Desh. A Californian specimen measures 4 8 in. across." The fossils, through disintegration, often assume the aspect of Venus Kennerleyi, the former margins remaining as varical ridges, while the softer interstices have perished.

" Venus lamellifera, Conr.,= Venerupis Cordieri, Desh. San Diego, Cassidy.

334. Lutraria maxima, Midd., = L. capax, Gld. [= Schizothoeus Nutalli, Conr.] Shoalwater Bay, Cooper. San Francisco, Trask. "Lives buried nearly 2 feet in hard sand, near l.w. mark, its long siphons reaching the surface; also in many parts of Puget Sound up to near Olympia. It is excellent food, and a chief article of winter stores to the Indians, who string and smoke them in their lodges. Length, 7\frac{3}{4} in. The burrows are found in the cliffs, 10 feet above high water, with all the other Mollusca now living; and two, not now found, were then common [viz. ?...]. The Indians have no tradition as to the elevation, and the ancient trees show no signs of the irregular upheavings which raised the former levels of low water, by successive stages, to a height now nearly 100 feet." J. G. C.

" Tellina nasuta, Conr. Common, from L. Cal. to the Arctic Seas. Shoalwater Bay, Cooper; Puget Sound, Suckley; San Francisco, Trask.

" Tellina edentula [Cpr., Coop., not Brod. and Sby.,= Maoma secta, var. edulis, Nutt.]. Puget Sound, Gilbs.

Tellina Bodegaensis, Hds. Shoalwater Bay, rare, Cooper; mouth of Umpqua River, Vollum.

335. Sanguinolaria Californiana, Conr. "Common at the mouth of the Columbia and other rivers, and high up salt-water creeks," Cooper. [= Maoma inconspicua, Brod. and Sby.]
Solen sicarius, Gld. One dead shell, near Steilacoom, Puget Sound, Cooper. "Probably abundant on the mud-flats near the mouth of the Nisqually River," J. G. C.

Machera patula, Portl. and Dix. (Coop. errata; Nuttalli in text), =Solen maximus, Wood, non Chemn., =Solecurtus Nuttallii, Conr., = Machera costata, Midd., non Say. Washington Ter., Cooper. "Burrows a few inches from the surface, at the edge of the usual low tide; is justly considered (except the oyster) the best of the many fine eatable molluscs of the coast. It is the only truly marine mollusc found near the Columbia River; extends northwards wherever the beach is sandy, but not known in the Straits of de Fuca," J. G. C.

Mya cancellata, (Platydont), Conr. Dead valves, St. Luis Obispo, Dr. Antisell.

Sphenia Californica, (Cryptomya), Conr. San Francisco, Trask.

Mytilamera Nuttallii, Conr. A group, nestling in a white, friable, arenaceous substance, was obtained at San Diego by Lieut. Troubridge.

Pholas [Pholadidea] penita, Conr., = P. concamurata, Desh. From worn rock which drifted into Shoalwater Bay, attached to the roots of Macrocystis, the giant seaweed, Cooper; De Fuca, Suckley; mouth of Umpqua River, Oregon, Dr. Vollum.

The above list must be considered as a résumé, not merely of the shells of the N. P. Railroad Survey, but also of all those examined by Judge Cooper, from the Smithsonian Museum and from his own private collection. It is peculiarly valuable as preserving the notes concerning station, &c., of the original explorers, and has therefore required a more lengthened analysis.

The land-shells collected by Dr. Newberry in the Pacific Railroad Survey were described by W. G. Binney, Esq., with his accustomed accuracy. His paper will be found in the Reports, vol. vi. pp. 111–114. The following are the only species enumerated:—


102. The U. S. Government also sent out a "North-west Boundary Commission," in charge of Archibald Campbell, Esq. The natural-history arrangements were superintended by the Smithsonian Inst., and Dr. C. B. R. Kennerly was appointed naturalist to the Expedition. At his request, I undertook to prepare a Report of the Mollusca, to be published and illustrated in a form corresponding to the Pacific Railroad Reports; Dr. Alock kindly undertaking to dissect the animals, and Mr. Busk to examine the Polyzoa. Dr. Kennerly died on his return from a three years' exploration; and the civil war has thus far delayed any further publication. The materials have, however, been thoroughly investigated. They consist principally of dredgings in Puget Sound. On reference to the maps published by the U. S. Coast Survey, it will be seen that this inland sea consists of a remarkable labyrinth of waters, fiord within fiord, and only indirectly connected with the currents of the Pacific Ocean. It might therefore be expected to furnish us with the species of quiet migration, and perhaps with those still living from a period of previous altered conditions. No doubt it will furnish new materials to reward the labours of many successive naturalists. The pre-
maturely closed investigations of Dr. Kennerley are only the beginning of a rich harvest. Dr. George Suckley, late assistant-surgeon of the U. S. army, was appointed to complete the natural-history work, after his lamented death. A complete list of the species collected will be found in the fifth column of the Vancouver and Californian table, *infra*, par. 112. The particulars of station, &c., and all the knowledge which the laborious explorer had collected, are lost to science. It is quite possible that some of the species here accredited to Puget Sound were obtained in neighbouring localities in the Straits of De Fuca. The specimens are in beautifully fresh condition, and of most of them the animals were preserved in alcohol. The following are the shells first brought from the Vancouver district by the American N. W. Boundary Commission, the diagnoses of new species being (according to custom) first published in the *Proceedings of the Ac. Nat. Sc. Philadelphia*.

No.
1. *Zirphea crispa*. Two living specimens of this very characteristic Atlantic sp.
2. *Saxicava pholadis*. Several living specimens.
3. *Sphaeria ovoidea*, n. s. One sp. living.
4. *Cryptomya Californica*. Several living sp.
6. *Mytilusmeria Nuttalii*. Three sp. living at base of test of Ascidian. [The animal appeared too peculiar to venture on a dissection. It has been entrusted to Dr. Alcock, of the Manchester Museum.]
10. *Macoma (? v.) expansa*. Adult broken; young living. Belongs to a group of forms classed together by some writers under *lata* or *praxima*, but the characters of the hinge and mantle-bend have not yet been sufficiently studied.
12. *Angulus modestus*, n. s., but closely allied to the eastern *A. tener*, Say. Two sp. living.
12b. *Angulus (?modestus, var.) obtusus*. Several fresh specimens.
14. *Psophis Lordi*, Baird. Several living sp. from which the subg. was eliminated.
15. *Venus Kennerlyi*, Rve. Very rare. One sp. living. Some of the shells called *V. asteroideus* by Midd. may be the young of this.
17. *Astarte (? var.) compacta*. One sp. living; may hereafter be connected with *A. compressa*.
19. *Lucina temisculpta*, n. s. Two living specimens, of which one had the surface disintegrated.
20. *Cryptodon servicatus*, n. s. One living sp.
27. *Modiolaria marmorata*. One sp. living. (A shell in the U. S. E. E. Col., though marked "Fiji" in Dr. Gould's MS. list, probably came from Puget Sound, being thus confirmed.)
28. *Nucula tenus*. Two sp. living*.
29. *Acila castrensis*. One sp. living.

* These species were kindly determined by Mr. Hanley.
32. *Yoldia lanceolata*, J. Sby. Two sp. living.
33. *Yoldia amygdala*. One sp. living.
34. *Haminea hydatis*. Two sp. living.
35. 36. Two species of *Tectibranchiates*, not yet worked-out by Dr. Alcock.
38. *Cylindrus* (?var.) *attonsa*. One living sp. Probably a variety of *cylindracea*.
40. *Acanthopleura scabra*. One young living sp.
41. *Mopalia Grayii*, n. s. One living sp.
42. *Mopalia Hindii*. One living sp.
44. *Mopalia imporea*, n. s. Two sp. living.
45. *Ischnochiton (Trachydermon) tridens*, n. s. One living sp.
46. *Ischnochiton (Trachydermon) flectens*, n. s. One living sp.
47. *Ischnochiton (Trachydermon) retiporosus*, n. s. One living sp.
48. *Ischnochiton (Lepidopleurus) Mertensii*. Rare, living.
49. *Lepeta ceceoids*, n. s. Three sp. living.
50. *Callistoma variegatum*, n. s. One living sp.
52. *Margarita (?v.) tenusculpta*. Perhaps a var. of *Vahlhii*, but sculptured. Several living specimens.
54. *Margarita inflata*, n. s. Two sp. living.
55. *Mesalia lacteola*, ?n. s. Two sp. living, but eroded. May prove a var. of *lacteola*, but with different sculpture.
56. *Mesalia (?lacteola, var.) subplanata*. Two sp. living, but eroded.
57. *Lacuna cineta*. One fresh specimen.
59. *Drilli incisa*, n. s. Two fresh specimens.
60. *Drilli cancellata*, n. s. One adolescent specimen.
62. *Mangelia angulata*†. One fresh specimen.
63. *Bela excavata*, n. s. (Like *Trevelyanu*). One fresh specimen.
64. *Chemnitzia (?v.) aurantia*†. One fresh specimen.
65. *Chemnitzia torquata*†. Two fresh specimens.
66. *Chemnitzia tridentata*†. Two fresh specimens.
68. *Velutina lexiciga*. Several fine living specimens.
69. *Ocnebra interfossa*. Rare, dead.
70. *Niitella Gouldii*†. Two living specimens, proving the genus.
71. *Trophon multicostatus*. Two fresh specimens.
73. *Chrysodorus rectirostris*, n. s. One living sp.
74. 75. Two species of *Cephalopods*, not yet affiliated.

Besides adding more than 70 marine species to the Vancouver branch of the Californian fauna, from specimens in good condition, without a single balleast or exotic admixture, the confirmation of many species, which before rested only on the uncertain testimony of the U. S. E. E. labels, and the affiliation of others which, on the same testimony, had been wrongly assigned to distant and erroneous localities, was no slight benefit to science. The land and freshwater species of the Expedition will be found tabulated, with others, in the separate lists; par. 115.

103. While the American naturalists were thus actively engaged in ex-
ploring the regions south of the political boundary, similar explorations, on
a less extensive scale, were being made under the direction of the British
Government. The naturalist to the British North American Boundary Com-
mission, during the years 1858–1862, was J. K. Lord, Esq., F.Z.S. He made a
very valuable collection of shells in Vancouver Island and British Columbia,
the first series of which was presented to the British Museum. The new
species were described by W. Baird*, Esq., M.D., F.L.S., in a paper com-
municated to the Zool. Soc., and published in its 'Proceedings,' Feb. 10th,
1863, pp. 60–70.—Another series of shells, from the same district, was pre-
presented to the Brit. Mus. by the Lords of the Admiralty, collected by Dr. Lyall,
of H. M. Ship 'Plumper.' Two new species from this collection were described
by Dr. Baird, in a separate paper, P. Z. S., Feb. 10th, 1863, p. 71. The new
species from Mr. Lord's collections have been drawn on stone by Sowerby.
The figure-numbers here quoted correspond with the proof-copy kindly fur-
nished by Dr. Baird.—A third series was collected by Dr. Forbes, R.N., in the
same Expedition. After Mr. Cuming had made his own selections, this passed
into the ordinary London market. It contained several species of peculiar
interest. The following are the (supposed) new species of the Survey:

<table>
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<th>P.Z.S.</th>
<th>Plate</th>
<th>Page No.</th>
<th>Fig.</th>
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| 65    | 1     | 1. Chrysomus tabulatus, Baird. One broken specimen, Esquimalt Harb.,
      |       | Vancouver Island, Lord. [One perfect shell, Neesh Bay, Seatn.] |
|       | 2     | 2. Vitularia aspera, Bd. Several living specimens, Esquimalt Harb.,
      |       | Vanc. Island, Lord. [Belongs to a group of grooved muricoid Pur-
      |       | purids, intermediate between Rhizoechilus and Ceratoma, for which
      |       | the subgenus Ocinebra may be reconstituted. These shells are the
      |       | rough form of Ocinebra lurida, Midd.] |
| 67    | 3     | 3. Chenmitzia Vancouverensis, Bd. [= torquata, Gld.]. Esquimalt Harb.,
      |       | Vanc. Island, Lord. From the crop of a pintail Duck. [The artist
      |       | has failed to represent the peculiar character of the species,
      |       | which is, that the ribs end above the periphery, so that a smooth
      |       | belt appears round the spine above the sutures.] |
|       | 4     | 4. Amnicola Hindii, Bd. Seven sp., River Kootanie East; nine sp.,
      |       | Wigwam River, west slope of Rocky Mts., 4620 ft. high, Br. Col.,
|       | 5     | 5. Bullina (Tormalina) eximia, Bd. Esquimalt Harb., V. I., Lord. Alive
      |       | in 12 fm.; dead in Duck's stomach. [Not Bullina, Add. Gen.] |
      |       | 7. Limnea Sumassis†, Bd. Like L. elodes, Say. Plentiful. Sumass
      |       | Prairie, Fraser R., Brit. Col., Lord. [Extremely like L. palustris.] |
      |       | [Larger than Ph. numerosa, Gld., and with strong columellar fold.] |
| 69    | 9     | 9. Ancylus Kootaniensis, Bd. Six sp., River Kootanie East; five sp.,
      |       | River Spokane, British Columbia, Lord. |

* It is due to the memory of Dr. Kennerley, as well as to the other naturalists con-
  nected with the various American surveys, and the officers of the Smiths. Inst., who so
generously entrusted to the writer their unique specimens for comparison with the
London museums, to state, that (with two exceptions) the new marine species of the
British Survey would have been published long before the appearance of Dr. Baird's
paper, but for the derangements of the U. S. natural-history publications, consequent on
the secession movement. Although the Smithsonian Inst. had offered to present to the
Brit. Mus. their first series of duplicate specimens from these expeditions, which
was exhibited at the Manchester Meeting of the Brit. Assoc., where this Report was
called for, no notice was given to the writer of the valuable results of the British
survey; and it was only through the private kindness of Drs. Sclater and Baird that
he was prevented from adding to the list of synonyms, already, alas! so numerous
and perplexing.

† These species are named after places, not after persons, as would be supposed by the
terminations.


18. Netastoma Darrinii. Esquimalt Harb., Lord. One adult but injured specimen. [For this singular Pholad, with duck-bill prolongations of the valves, a subgenus of Pholadidea is proposed, as its characters do not accord with Jousnetta, under which it is placed in the Cumingian Collection.]

19. "Saxicava rugosa." Several typical specimens; Esquimalt Harb., Lord, taken out of interior of hard stone, into which they appear to have bored.


21. "Tapes rigida." Esquimalt Harb., Lord, common. [An instructive series, some with very close and fine, others with distant, strong ribs. Some have ribs large and rounded, approaching the sculpture of Cardia. Some change suddenly from one form to another. = T. staminea, var. Petiti.]


Anodonta ?Oregonensis, jun. Freshwater Lake, Nootka, V. I., Lord; one sp.


27. *Anodonta angulata*. Fort Colville, Columbia R., Lord; one specimen [irregular and much eroded. The hinge-line is waved and a false "tooth" produced, in consequence of which it has been named] "Alasmodon."

28. "*Pecten rubidus*, Hds." Vanc. Is., Lyall. [Hinds's type in Br. Mus. appears the ordinary form, of which *P. hastatus = hericus* is the highly sculptured var. This shell, which is more allied to *Islandicus*, may stand as *P. hindii*.]


32. "*Chiton (Platysaenus) Wosnessenskii*, Midd., = *C. Hindsii*, Rye." Esquimalt Harb, Lord. One very fine specimen. [Quite distinct from *Mopalia Hinsidi* (Gray); differs but slightly from *M. muscosa*, Gld.]

33. "*Chiton ?laevigatus*." Esquimalt Harb, Lord. One specimen. [= *Ischnochiton flectens*.]

34. "*Chiton dentiens*, Gld., = *marginatus*." Esquimalt Harb., Lord. Two specimens. [= *Ischnochiton pseudodontiens*. Not congeneric with the British *Leptochiton cinereus = marginatus*.]

35. *Acmea* "mitella*, Mike."

36. *Acmea* "testudinalis*, jun." Esquimalt Harb., Lord. One young sp. [with extremely close fine stria; colour in festoons of orange-brown pencilling on white ground. Might stand well for *A. testudinalis*, but probably = *A. patina*, var. *pintadina*.]


38. *Crepidula lingulata*, Gld. Esquimalt Harb., Lord. Three young sp. [Apex smooth, imbedded, passing into the *aculeata* type. The species probably = *C. dorsata*, Brod.]

39. "*Melania silicula*, Gld., = *rudens*, Rye." Attached to weeds and float'ng sticks in swift stream on prairie, at Nisqually, W. T., Lord. [= *plicifera*, small var.]

40. *Priene Oregonensis*. Port Neville, 6 fm., *Lyall*. [Very fine; but opercula probably misplaced.]

41. "*Nitidella* gausapata*, Gld. Esquimalt Harb., Lord. [A beautiful series of highly painted specimens. Operculum Nassoïd, not Purpuroïd; therefore ranks under *Amycla*.]

42. "*Vitularia lactuca*." Vancouver's Island, *Lyall*. [A fine series of *Purpura crispa* and vars., among which is a lilac-tinted specimen.]


47. "*Helix Townsendiana*, small var." Fort Colville, Columbia R.; also sum-


49. "*Helix fidelis*. Large but very pale var. Sumass Prairie, Fraser R., Lord.

50. "*Helix labiata = Columbiana*, var." Vancouver Is., Lord, [closely resembling *H. rufescens*.]

51. "*Helix vellicata*, Fbs." Sumass Prairie, Fraser R., Lord. [= *Vancouverensis*.]

52. *Helix* [like *rotundata*]. Fort Colville, Columbia R., Lord. Two specimens.


[Genus not found before, north of California.]

92
No. 53. "Succinea rusticana, Gld." Sumass Prairie, Fraser R., Lord. [Scarcely to be distinguished from the European S. putris.]


58. Limnea stagnalis, long narrow spire, mouth swollen, closely fenestrated. Marshy stream, Syniakwateen, Lord.

56. "Limnea ?desidiosa, Say." Lake Osoyoos; three sp., Lord. [Exactly resembles a var. of the widely distributed L. cataracta, which was found in profusion in the Madison Lakes, Wisc.]


Besides the shells preserved in the National Collection, the following species were also brought by the Expedition:

63. Terebratula unguiculus, n. s. Vanc. Is., Forbes. One adult specimen, Mus. Cum. [Extremely interesting as being the only sculptured species found recent. The young shells from California were naturally affiliated to Terebratella caput-serpentis by Messrs. Reeve and Hanley; but the adult has the loop similarly incomplete.]


65. Darina declivis, n. s. Vanc. Is., Forbes. One specimen. [The only other species of Darina is from the West Coast of S. America.]


67. Saxidomus brevisphonatus, n. s. This unique shell is marked "Vancouver Island" in Mr. Cuming's Collection, and is believed by him to have formed a part of Dr. Forbes's series. The shape resembles Callista, without lunule. The mantle-bend is remarkably small for the genus.

63. Melania, n. s., teste Cuming. Vanc. Is., Forbes. [Two specimens, with very fine spiral striae, sent to Philadelphia for identification.]


70. Pteropoda, several species, of which two are new, teste Cuming; but they may have been collected on the voyage. Forbes.

The collections made on the British Survey are peculiarly valuable to the student in consequence of the great perfection of the specimens. They have generally been obtained alive, and are often the finest known of their kinds. The occurrence, however, of a specimen of the tropical Orthalicus zebra, marked "Vancouver's Island," in Mr. Lord's collection*, is a useful lesson. When such reliable data are thus found possessed of adventitious materials, it will not be regarded as a slight on the collections of the most careful naturalists when specimens are regarded as of doubtful geographical accuracy. In Dr. Lyall's collections there also occur specimens of the well-known Patella Magellania and Trophon Magellanicus, duly marked "Vancouver's Island," though no doubt collected in the passage round Cape Horn. The naturalists of the American Expl. Expeditions generally travelled across the continent.

104. The latest exploration undertaken for State purposes is also for our present object by far the most important, both as relates to the number of

* Mr. Lord writes, "The fact of my having found this shell, alive, on Vancouver Island is beyond question. How it got there I do not pretend to say; it was very possibly brought by some ship."
species authentically collected and the thoroughly competent and accurate manner in which the necessary information is being recorded. It is no longer left to the great nations bordering on the Atlantic to send exploring expeditions to the Pacific. The State of California, only born in 1850, has so rapidly attained maturity that when she was barely ten years old she considered science a necessary part of her political constitution, and organized a "State Geological Survey," under the direction of Prof. Whitney. To this survey Dr. J. G. Cooper (whose collections for the Pacific Railway Explorations have already been reported, vide pp. 597–601) was appointed zoologist, and Mr. W. M. Gabb (formerly of Philadelphia) palæontologist. The friendly relations established with both these gentlemen at the Smithsonian Institution not only put them in possession of the special desiderata on the present branch of inquiry, but have resulted in unreserved interchange of facts and opinions, by means of which a large instalment of the malacological results of the Survey can be embodied in this Report. Dr. Cooper has not only explored the whole coast and the neighbouring islands from Monterey to San Diego, but has dredged extensively from shoal-water to 120 fathoms, keeping accurate lists of all acquisitions from each locality. Having an artist's pencil as well as a naturalist's eye, he has drawn the animals from life, and already subjected many of them to dissection. The war has to some extent suspended the operations of the survey; but it is confidently expected that the State will do justice to herself by issuing, with suitable illustrations, the full results of her officers' labours. The first public notice of the mollusces appears in the Proc. Cal. Ac. N. S., Nov. 3rd, 1862, pp. 202–207. Here Dr. Cooper, speaking of the new species, writes with a modesty which is not always credited to American naturalists by Europeans,—"As they may have been collected either by the N.W. Boundary Survey or at Cape St. Lucas, it has been considered safest, in order to avoid confusion, to send specimens or drawings of them to [the writer], that he may compare them with the above collections, and decide whether they are really new." He gives valid reasons, however, for describing the following soft Mollusca. Unfortunately for French and German naturalists, the diagnoses are in English only.

Page.

202. Strategus (n. g.) inermis, n. s. More highly organized than any other genus of Opisthobranchiata; creeps slowly among the grasses in the muddy parts of San Diego Bay, looking like a large caterpillar. Not uncommon.

203. Pleurophyllidia Californica, n. s. Closely resembles P. lineata of S. Europe. "From the distance of locality there can, however, be no identity of species." [?] Numerous in Dec., crawling and burrowing on sandy flats in San Diego Bay; none in Jan., after the floods. [Dr. Cooper writes that the body of fresh water was so great in some places as to kill the marine mollusces for a considerable distance beyond the estuaries, and thus materially alter the pre-existent fauna.]


204. Doris (Asteronotus) sanguinea, n. s. Under stones in San Diego Bay; rare.

204. Doris (? Asteronotus) alabastrina, n. s. Under stones in S. Diego Bay. One sp.

204. Doris (? Actinocyclus) Sandiegensis, n. s. Very active among grass on mud-flats near low-water mark, San Diego Bay; common before the flood.

205. AEdis (? Flabella) opalescens, n. s. Common among grass in San Diego Bay.

205. AEdis (? Thudiana) iodinea, n. s. Among algae on rocks outside San Diego Bay.

207. Tritonia Palmeri, n. s. San Diego, common "in same localities as the Di-

phyllidia. Named after Mr. Edward Palmer, a zealous naturalist, who assisted me while at San Diego."
Dr. Cooper's second paper "On New or Rare Mollusca inhabiting the Coast of California," in the Proc. Cal. Ac. N. S., Aug. 17, 1863, contains (English) descriptions of the following species. He observes that "Santa Barbara and Santa Barbara Island are very different in the groups of animals inhabiting them, although the island is only thirty-five miles from the mainland. Catalina Island is twenty-four miles from the mainland, and the molluses are very different from both the mainland and the other islands, being the richest locality on our shores." Page.

57. Aplysia Californica, Cp.; for which is constituted a subgenus, Neaphysia; 15 inches by 5*. Three specimens; San Pedro beach, after storm; stomach full of algae. Fig. 14.


"Doris albopunctata, Cp. Santa Barbara, 20 fm., rocky bottom. Catalina Island, rocks, l. w.

"Doris Montereyensis, Cp. Santa Barbara Island, rocks, l. w.

"Doris sanguinea, Cp. 4 sp. with the last. "Stellate structure not discovered."

"Doris Sundiegensis, Cp. 2 sp., with the last. "All these species belong to Doris, typical."

59. Trypa Catalinae†, Cp. 4 sp., on algae among rocks, l. w. Catalina Island.


"Æolis Barbarensis, Cp. 1 sp., 16 fm., rocky bottom, Santa Barbara.

60. Flabellina opalescens, Cp., =Æolis o., Cp., antea. With the last: also shore of Santa Barbara Island, rare.

"Phidiana ivindeca, Cp., =Æolis i., Cp., antea. Santa Barbara, beach, 1 sp.

"Chiorera leonica, Gld. 1 sp., in 20 fm. Santa Barbara.

Sept. 7th, 1863. Dr. Cooper described a very interesting new genus of Pulmonates, only found at the head of one ravine in Santa Barbara Island, with "myriads of Helix Kellettii [=H. Tryoni, v. note *, p. 116], and two other species, probably new." Full particulars of its habits are given. It has the mantle of Limax, dentition of Helicidae, and shell resembling Daudebardia and Homalonyx [=Omalonyx, D’Orb.].

62, 63. Binneya notabilis, Cp. 3 living and 18 dead shells. Fig. 15 (five views).

Jan. 15th, 1864. The remaining land-shells of the Survey were described (with Latin diagnoses) by Dr. Newcomb, in a paper communicated to the Academy by Dr. Cooper. Specimens of many of them will be found in the Cumingian Collection.


"Helix crebristriata, Newc. San Clemente Island; abundant. "Closely allied to H. intercisa, and very variable."


"Helix Gabbii, Newc. San Clemente Isl. 1 sp., like H. facta.


"Helix Whitneyi, Newc. Near Lake Tahoe, Sierra Nevada, 6100 feet high. 3 sp. under bark, near stream, with H. Breveri and H. chersina. Resembles H. striatella.

* Molluscs, as well as trees, assume giant proportions in California: e. g. Schizothorax (with siphons) 16 in., Amusium 8 in., Lunalia (crawling) 16 in., Mytilus 9 in., &c.
† Vide note 7, p. 604.

1863.
Dr. Newcomb also identified the following species in the State Collection:—


Dr. Palmer sent a valuable consignment of shells collected by him between San Diego and S. Pedro to the Smithsonian Institution. Dr. Cooper obtained permission to send the first series of duplicates, duly numbered, for identification, to the Smithsonian Institution. This invaluable series was lost in the "Golden Gate." The gold was recovered, and much of it stolen; the far more precious shells remain, unnaturally located, in their native element—a puzzle, perhaps, to paleontologists in some coming age. Other series, though not so complete, have since been received in safety; and through the liberality of the Californian Survey and of the Smithsonian Institution, as well as through the energy and kindness of Dr. Cooper, they are already being distributed to the Cumingian Collection, the British Museum, the museums at Cambridge, Mass., Philadelphia, Albany, Montreal, &c., as well as to the collections of working naturalists. The stations being now discovered, it is to be hoped that in a few years Californian shells will cease to be objects of great rarity in this country. At the request of Dr. Cooper, in order that he might proceed with other departments of his labours, all the new species which have been seen in England have been described in conjunction with those from other sources. On those which are only known here by the beautiful drawings sent by the collector, it would be unsafe and premature to impose a name. The diagnoses are being published in the Proc. Cal. Ac. N.S., and should be accredited to the zealous zoologist of the Survey, rather than to the mere artist-in-words who endeavours to represent their forms to the reader. It will be understood that the lists now to be presented, though corrected to the date of going to press, are still incomplete; and that the information has been
compiled from Dr. Cooper's letters received at different times, without opportunity for his revision. Should errors, however, have escaped detection, they will, no doubt, be corrected, and omissions supplied, in the forthcoming Reports of the Survey. The species either new to science, or now first found in the Californian branch of the fauna, are as follows:

2. Terebratula unguiculus. Monterey to S. Diego; young shells in 6–20 fm.: not rare.
5. Zirphaea crisipata. Fragments from S. Diego appear (very unexpectedly) to belong to this northern species.
6. Corbula luteola, n.s. S. Pedro—S. Diego; common near shore.
10. Plectodon scaber, n.g. and n.s.; 2 similar valves, 40–60 fm.
11. Macoma inquinata. S. Francisco; rare.
17. Semele rupestris. Catalina Is.; not rare. (Also Galapagos.)
18. Semele pulchra. S. Diego. (Also Cape St. Lucas, Acapulco.)
22. ?Astarte fluctuata, n.s. Cat. Is.; 2 similar valves; 40 fm. (Very like the Crag fossil, A. omaria, jun.; but Dr. Cooper considers it a Crassatella.)
24. Miodon prolongatus. (Neeah Bay, Swan.) Identified from tracing only.
27. Cardium (?)modestum, var. centifilosum. Cat. Is., 30–40 fm. [The differences between this and the Eastern Pacific shell are probably only varietal.]
29. Licocardium elatum. S. Diego; very large (Maz. Cat., no. 124).
33. Kellia (var.) Chironiti. S. Diego. (Also Neeah Bay, Swan.)
34. Kellia rubra. Cat. Is., shore (typical).
35. Lepton meroeum, n.s. S. Diego.
36. Tellima tumida. S. Diego. (Also Puget Sound, Kennerley.)
37. Pristes oblongus, n.g., n.s. S. Diego.
40. Aricea intermedia. Monterey—S. Diego, Cat. Is., 40–60 fm. [Scarcely differs from the South American shell. It is the A. Barbarensis, Conr., of Pac. R. R. fossils, teste Cooper.]
ACILLA castrensis. Cat. Is., 40–60 fm. (Also Puget Sound, Kennerley.)

Leda cuneata, teste Hanl. Mont.—S. Diego; Cat. Is., 10–60 fm.

Leda hamata, n.s. Santa Barbara; Cat. Is., 20–60 fm.; common.

Verticordia ornata, D'Orb. Santa Barbara; Cat. Is., 20–40 fm. [Exactly accords with the Japanese species, novanostata, teste A. Adams.]

Bryophila setosa. (Cape St. Lucas, Xantus.) Identified from tracing, no. 980.

Lima orientalis (in Mus. Cum., = dehiscens, Cou., teste Cooper). Mont.—San Diego; Cat. Is., beach to 20 fm.; common.

Linatula subauriculata. 40–120 fm., Cat. Is.; not rare: 1 valve in 4 fm., San Diego. [Exactly agrees with British specimens.]

Janira dentata. Monterey, S. Diego, beach to 20 fm. (Also Cape St. Lucas, Xantus.)

Cavolina telemus. Cat. Is.; dead in 30–60 fm. (Also Vancouver, Lyall.)

Tornatina carinata. S. Diego. (Also Mazatlan, Reigen.)

Pedipes liratus. S. Diego. (Also Cape St. Lucas, Xantus.)

Dentalium (var.) Indianorum. Mont.—Cat. Is., 20 fm.; common. [Probably a striated var. of pretiosum, which Sowerby doubtfully, and Dr. Baird confidently, affiliate to D. entale.]

Dentalium semipollutum. S. Diego. (Also La Paz.)

Dentalium hexagonum. S. Diego. (Also W. Mexico.)

Acanthochites acicula, n.s. Cat. Is., 8–20 fm.; rare.

Acanthopleura flava. n.s. Cat. Is.


Ischnochiton (Lepidopleuris) pectinatus, n.s. Cat. Is., beach.

Ischnochiton (Lepidopleuris) scabricostatus, n.s. Cat. Is., 8–20 fm.

Ischnochiton (Trachydermon) pseudodentienis. S. Diego. (Also Puget Sound, Kennerley.)

Ischnochiton (Trachydermon) gothicus, n.s. Cat. Is., 8–20 fm.


Nacella (?paleacea, var.) triangularis. Monterey.

?Nacella subsespiralis. Cat. Is., 10–20 fm. [May be the young of the long-lost Patella calyptra, Mart.; unless that be a broken Crepidula africana.]

Scurria (?var.) funiculata. Monterey; rare.

Puncturella cucullata. Monterey. (Also Puget Sound, U. S. E. E.)

Puncturella Cooperi, n.s. Cat. Is., 30–120 fm.; not rare.

?Imperator serratus, ??n.s. Monterey; Cat. Is., 10–20 fm. [Dr. Cooper thinks this shell probably the young of Pomalaud.]

Lepotonyx bacula, n.s. Cat. Is., beach, dead.

Gibbula optabilis, n.s. S. Diego.

Calliostoma supragranosum, n.s. S. Diego.

Calliostoma gemmulatum, n.s. S. Diego.

Calliostoma splendens, n.s. Mont.; Cat. Is., 6–40 fm.

Margarita (?var) salmones. Mont.; Cat. Is., 6–40 fm. [Intermediate between undulata and pupilla.]

Margarita acuticostata. Mont.; Cat. Is., 8–20 fm. [Fossil, Santa Barbara, Jewett.]

Solarilina peramabilis, fn.s. Cat. Is., 40–120 fm.; living. [Differs but slightly from S. aspecta, Japan, A. Ad.]

Ethalia supravallata, n.s., and ?var. invallata. S. Diego.

Liutia fenestrata, n.s. Cat. Is., beach to 40 fm.; dead.


Crepidula excavata, var. jun. Santa Barbara Island.

Galerus contortus, n.s. Mont.—S. Diego, 20–40 fm.

Hippomyx serratus. Santa Barbara Island; 1 sp. Maz. Cat., no. 346.

Cecum orebricintum, n.s. Mont.—S. Diego; Cat. Is., 8–20 fm.

Cecum Cooperi, n.s. S. Diego. [Two fine species of the Anellum group.]

Turrilarella Cooperi, fn.s. S. Diego; Cat. Is.; common. [May prove identical with one of Conrad's imperfectly described fossils in P. R. E. E.]

Mesalta tenuisculpta, n.s. S. Diego; shoal water.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

88. *Bittium armillatum*. S. Diego. [Fossil, Santa Barbara, Jewett.]
89. *Bittium asperum*. S. Diego; Cat. Is., beach to 40 fm. [Fossil, Santa Barbara; Jewett.]
90. *Isopis fenestra*, n.s. S. Diego. (Also Neeah Bay, Swan.)
91. *Isopis obtusa*, n.s. Mont.—S. Diego; Cat. Is., 10-20 fm.
95. *Amphithalamus lacanatus*, n.s. S. Diego. 1 immature specimen.
97. *Diaia marmorea*, n.s. Monterey, S. Diego; very rare.
100. *Cynthia albida*, n.s. S. Diego.
102. *Ogeliscus variogatus*. S. Diego. (Also La Paz, Cape St. Lucas.)
103. *Chrysalidella pumila*, n.s. S. Diego; Cat. Is.
108. *Eulima compacta*, n.s. S. Diego. | [Dr. Cooper has not decided whether
114. *Scalaria ? Indianorum*, var. S. Diego. [Probably conspecific with the Van-
115. *Opalia borealis*. Farallones Is. (Also Neeah Bay, Swan.)
120. *Triforis padovani*. Cat. Is., 10-40 fm., very rare. [The specimens sent
cannot be distinguished from the Herm shells.]
121. *Priene Oregonomensis*. "Comes south to Monterey."
126. *Trophon triangulatus*, n.s. Cat. Is., 60 fm. [Resembles the young of
127. *Argonauta argo* "Hundreds on beach at Sta. Cruz Is."

Besides the above, several species are now satisfactorily assigned to the fauna,
for the evidence for which was before considered doubtful. Such are—

133. *Chitonophora punctata*. S. Diego to Sta. Cruz; valves common, but rare living.
134. *Stanella Californica, planulata*, et ? nasuta. Conrad's types being lost,
and his species imperfectly described from very young specimens, a difficulty

* Most of the minute shells from S. Diego, quoted without station, were found in
the shell-washings of the consignments from Dr. Cooper and Dr. Palmer.
attends their identification. Dr. Cooper found very large valves (resembling *Schizothaerus*) in abundance, but much deformed by the entrance of sand, and apparently killed by the fresh waters of the great flood. The large shells belong to two very distinct species, which are probably those of Conrad; among the small shells is perhaps a third, which may be Dr. Gould's suppressed *nasuta*.

136. *Raeila undulata.* This remarkable reverse of the Atlantic *R. canaliculata* is also confirmed by rare valves from the S. Diegan district. It is not con- generic with *Harvella elegans,* to which it bears but a slight external resemblance.

137. *Tapes tenerrima.* Large dead valves of this very distinct species were found with the *Standella,* and confirm Col. Jewett's young shells described as from Panama.

141. *Acmea rosacea.* Monterey to S. Diego. This shell is named *pilcolus,* Midd., in Mus. Cuming, but does not agree with the diagnosis. It can hardly be distinguished from Herm specimens of *A. virginea.* It was first brought by Col. Jewett, but referred to Panama.
142. *Amphithalamus inclusus.* S. Diego. [Several specimens of this minute but remarkable new genus confirm a solitary shell in Col. Jewett's mixed collections.]

143. *Myurella simplex.* Very variable in sculpture, as befits the species which forms the northern limit of a group common between the tropics. Col. Jewett's shell was in poor condition, and supposed to be the young of a Gulf species.

144. *Volutrina varia.* S. Diego, Cat. Is. [Sta. Barbara, Jewett; also C. S. Lucas.]
145. *Nassa Cooperi,* Fbs. S. Diego, Cat. Is. [This Kellettian shell has a double right to its name, now that Dr. Cooper has ascertained its habitat.]

The information on station, &c., which Dr. Cooper has sent with regard to previously known species, will be found incorporated in the general table of the fauna. The following notes, extracted from his letters, are too valuable to be omitted:—

*Haliotis Californiensis.* "This form is so rare that I think it only a var. of *Cracherodii.*"

*Haliotis.* Several specimens from the Farallones present characters intermediate between *corrugata,* rufescens, and *Kamtschatkana.* It is not yet ascertained whether they are hybrids or a distinct species.

"*Livona picoides* I have not found, though I have seen fresh ones from Pt. Conception."

"*Serpulorbis squamigerus.* Common south of Pt. Conception; has no operculum." [The young begins like *V. anellum,* Mörch.]

*Macron lividus.* Point Loma, S. Pedro, common; extends northwards to the Farallones. [= *Planaxis nigritella,* Newcomb, MS.; non auct.]

"*Olivella semistriata,* Gray, fide Newc., is a species found N. of Monterey only."
[As Dr. Gray's species is from Panama, that of Newcomb is probably *O. botica.*]


"*Pissurella violacea* I have seen from Catalina Is." [Esch.'s shell is generally considered S. American. *May* Dr. Cooper's be a form of *volcano.*]

*Acmea.* With regard to limpets and other variable shells, Dr. C. writes:—

"From my examination of large numbers of specimens, I am more and more compelled to believe that hybrids are very frequent between allied

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* *Nassa elegans* was first published, by J. Sowerby, in the Min. Conch. 1824.
species, and that the comparatively few links that are met-with in large series of two forms should not be allowed to unite them, but be considered as hybrids."

_Lunatia Lewisii._ Abundant on beach. [One sp. measures 5½ in., and the animal of a much smaller one (4 in.) is 11 inches long.]

_Ostreà._ "The same species throughout to S. Franc.: S. Diego," Cooper. [Besides the typical northern shell, _O. lurida_, are well-marked _var._ laticaudata, rufoides, and expansa.]

There are also several species which are, quoted in Dr. Cooper’s letters, or appear from his sketches to be quite distinct, or at least new to the fauna; but they have not yet been sent for identification. Among these the following are the most important. The MS. numbers refer to the tracings which Dr. Cooper kindly copied from his original drawings. Where a "—" appears, the information is derived from his letters only.

MS. No. 402. Allied to _Thracia._

— _Cyathodonta_, probably _plicata_, Desh. (Cape St. Lucas, Xantus). 620a. Figure accords exactly with _Porus toreum_, Gld. Catalina Is., beach.

1058. Figure accords with _Lioconcha hieroglyphica._ Catalina Is., 120 fm.

1060. Resembles _Sunapta._ Catalina Is., 40 fm.

676. Resembles _Crassatella Pacifica._

784. _Lucina._


— _Yoldia._ One fresh valve of a large and remarkable species, 2-6 by 1-2 in., with fine concentric sculpture, very inequilateral. Sta. Cruz; on beach. 751a. ?_Yantinina._


— _Gadinia._ Cat. Is., Cooper; Farallone, Is., Rowell. "The animal differs in having pectinated flattened tentacles. It may be the type of a new genus _Rowellia._"

406. _Emarginula._ [The first appearance of the genus on the W. American coast.]

415a. _Glyphis._

354a. Like _Haplococcles._ Sta. Barbara, 15 fm.

504. Like _Tyrsgola._ 40 fm.

— _Trivia sanguinea._ Dredged dead in Cat. Is.

— _Trivia._ "Thinner and larger than _sanguinea._ Common in Lower Cal." [? = Pacifica.]

— _Terebra specillata._ One sp. near S. Pedro.

_Pleurotomidae._ Several species are represented only by single specimens. Among them are

588. _Drillia._

1021. _Drillia_, 2 in. long, shaped like _Mitra._ One worn sp. Catalina Is., 120 fm.


1852. ?_Clathurella_, 40 fm.

1053. ?_Daphnella_, 60 fm.

419, 420. Two species of shells resembling _Daphnella._

1055. ?_Beta_, 80 fm.


1028. ?_Actis_, reversed. One sp., Cat. Is., 120 fm. [The figure more resembles a young Vermetid.]

463. "_Cancellaria _Tritonie_, Shy. Agrees with Dr. Newcomb’s specimen." S. Diego, one dead on beach, 2½ in. long.

817. _Cancellaria._ Fragment of a second species equally large.

1038. _Sigaretus._ 40 fm., dead, Cat. Is.


(385a, 464, 381.) _Naticidae._ 3 sp.
MS. No. 676. Possibly a scaly var. of Monoceros engonatum; like the Purpura, var. imbri- cata, of Europe, but of different colour and texture; ?=? spiratum, Blainv.

1001. Figure resembles Texilla fuscolineata, Pse. Sandwich Is.

— "Nassat, smooth, with thick lip." Cat. Is., 30 fm. [Comp. insculpta.]
— Fusus, "like geniculus, Conr." Farallones Is.

411. Trophon, like multicosatus.

515b. Muricidae. Cat. Is., 40 fm. [The young shells called Trophon, Typhis, &c., by Dr. Cooper can scarcely be identified without a series, and from tracings only.]

520. Pieronotus cen trifugus, jun. S. Pedro; rare on beach.

In Prof. Whitney’s Preliminary Report on the Survey, Proc. Cal. Ac. p. 27, May 4th, 1863, he states approximately as the result of Dr. Cooper’s mala- cological labours, up to the close of 1862:

No. of species in the collection ........................................ 335
Of which are new to California, and believed to be undescribed .... 123
Other supposed Californian species not yet collected ............... 65

In a Survey conducted with such care, even negative evidence is of some importance, though not conclusive. Dr. Cooper has not been able to obtain the following species:

Discina Evansii.
Strigilla carinaria. [Mr. Nuttall’s specimens were probably Atlantic.]
Venus dispar.
Trapezium Californicum. [=? Duperryi, = Guinacum.]
Lucina bella. [Perhaps =pectinata, Cpr.; but the type seems lost.]
Modiola nitens. [Probably an error in the Cumingian label.]
Mytilus glomeratus, "=edulis, var." [Perhaps an accidental var. from being crowded on a floating stick.]
Barbatia pernoides. [Very probably an error in Dr. Gould’s label.]
Arca multicosata. "Must have been brought to S. Diego.”
Ptenan purpuratus. [Ascribed to the fauna from abundant valves marked “Cal.” in the U. S. E. E. collections, but certainly from S. America. Dr. Cooper has unfortunately not been able to discover any of the species described by Hda.]
Radius variabilis. " Doubtless exotic."
Polinices perspicua. "Probably Mexican."

105. Having now presented to the student an analysis of all that is yet known of the results of public surveys, it remains that we tabulate what has been accomplished by private enterprise. Mr. J. Xantus, a Hungarian gentle- man in the employ of the United States Coast Survey under the able direction of Professor Bache, was stationed for eighteen months, ending July 1861, at Cape St. Lucas, the southern point of the peninsula of California. It is a source of great benefit to natural science that the Secretary of the Smithsonian Institution is also one of the acting members of the Coast Survey Board; and that a harmony of operations has always existed between the directors of these two scientific agencies in Washington. The publications of the Coast Survey have earned for themselves a reputation not surpassed by those of the oldest and wealthiest maritime nations. For obtaining data on geographical distribution, Cape St. Lucas was a peculiarly valuable station, being situated near the supposed meeting-point of the two faunas (v. B.A.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

Rep. p. 350); and also, not being a place of trade, or even an inhabited district, likely to be free from human importations, although we should be prepared to find dead exotics thrown on its shores both by northern and by tropical currents. In his solitary and what would otherwise have been monotonous life, Mr. Xantus found full employment in assiduously collecting specimens in all available departments of natural history; having received ample instructions, and the needful apparatus, from the Smithsonian Institution, the bulk of the shells at first received from him were worn beach specimens; but afterwards several species were preserved, with the animals, in alcohol. Mr. Xantus generously presented the first series of the molluses to the Smithsonian Museum, reserving the second for his native land. The first available duplicates of the shells not occurring in the Reigen collection will be found in the British Museum or in the Cumingian cabinets*. Although the whole series would have found little favour in the eyes of a London dealer or a drawing-room collector, it proved a very interesting commentary on the Reigen and Adams Catalogues: it added about sixty new forms to the accurately located species of the marine fauna, besides confirming many others, which rested previously on doubtful evidence; and disproved the intermixture of northern species, which, from the map alone, had before been considered probable.

The collection is not only essentially tropical, but contains a larger proportion of Central American and Panama species than are found in the Reigen Catalogue. This may partly be due to the accidents of station, and partly to this projecting southern peninsula striking the equatorial currents. It must also be remembered that the Reigen Catalogue embraces only the Liverpool division of his collection; and that many more species may have existed in that portion of the Havre series which did not find its way to the London markets. Mr. Xantus also obtained individuals of identical species from Margarita Island, and a series containing living specimens of Purpura plano-spira (only thrown up dead on the promontory), from Socorro Island, one of the Revilla-gigedo group. A very few specimens of Haliotis and of Pacific shells may have been given to him by sailors or residents: they were not distinguished from his own series in opening the packages. The collection is not yet complete. In consequence of the French occupation of Mexico, it was with difficulty that Mr. Xantus himself "ran the blockade" at Manzanillo; and he was compelled to leave there thirty-one boxes of shells, alcoholics, &c., subject to the risks of war.

The Polyzoa were placed in the hands of Mr. G. Busk for examination, and the alcoholics were intrusted to Dr. Alcock, the Curator of the Manchester Natural History Society. Neither of these gentlemen have as yet been

* During the period that Mr. Xantus was out of employment, owing to the derangements of the war, a portion of the duplicates were offered for sale, and will be found in some of the principal collections.

103

A. N. H. Vol. XIII.

1. 311. *Asthenothesus villosior*, n.g. 1 living sp. and fragm.
6. " 312. *Callista (?pannosa, var.) puella*. Extremely abundant, living. Also *Acapulco, Jevett.* (Very variable, yet always differing from the typical South American shells.)

7. 313. *Liocardium apicinum*. Extremely abundant, living. Also *La Paz; Acapulco, Jevett.*
9. " 313. *?Crenella inflata*. Valves; very rare. (An aberrant form.) Also *Panama, C. B. Ad.*
10. 314. *Bryophila setosa*, n.g. Abundant; living among sea-weed, on *Purpura pinnospa.* Also *California, Cooper.*
11. " 313. *?Atys casta*. Rare: allied to *Cylichna.*
31. 478. *?Hydrobia compacta*. May be a *Barlesea*. 1 sp.
33. " 478. *?Dila electrina*. 1 sp.
34. " 479. *Acris* [testae A. Ad.] *menesthoedes*. 1 sp.

Vol. XIV.

37. 45. *Mangelia subdiaphana*. 1 sp.
38. 46. *Drillia appressa*. 1 sp.
41. " 46. *?Odostomia* *Evelea aequisculpta*. 1 sp.
42. " 46. *?Odostomia* *Evelea delicateula*. 1 sp.
43. " 46. *Chrysalidea angusta*. 1 sp.

104
Eulimafuscostrigata. 1 sp.

Opalia crenatoidea. 1 perfect and a few rubbed specimens. This, and the Santa Barbara fossil, O.?var. insculpta, are so close to the Portuguese O. crenata, that additional specimens may connect them.

Truncaria erytoides. Common; rubbed. Also Guacomayo, in the Smithsonian Museum.

Sistrum (?ochrostoma, var.) rufonotatum; connected with type by a few intermediate specimens. Rare; dead.


Nuditella densilineata. Very rare; dead.

?Anachis tineta. 1 sp.

Anachis fuscostrigata, 1 sp.

Pisania elata. A few worn specimens; like Peristernia, without plait.

The following table contains the species previously described, with the addition of the other localities in which they are known to occur. The numbers in the first column are those in Prof. C. B. Adams's Panama Catalogue; a P in the same column signifies that the species has been found at Panama by other collectors. The second column contains the shells of La Paz, collected by Major Rich and others, and are marked by an italic P. In the third column, A shows that the shell has been found at Acapulco, on good authority; and C, that it is known at other stations on the Central American coast. The fourth column exhibits the corresponding numbers of the species in the B. M. Reigen Catalogue; and G shows that the shell has been found in the Gulf district by other collectors. In the fifth column, Cal. stands for Upper, and L for Lower California; Marg. for Margarita Bay, Gal. for the Galapagos, E for Ecuador and the tropical shores of S. America, and WI for the West Indies. The sixth column continues the numbering of the species from the list in the 'Annals.'

<table>
<thead>
<tr>
<th>Pan. Cat.</th>
<th>La Paz</th>
<th>Acapulco</th>
<th>Max. Cat.</th>
<th>Other habitats</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>517 P</td>
<td>A</td>
<td>14 E</td>
<td></td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>463 P</td>
<td>C</td>
<td>55</td>
<td></td>
<td></td>
<td>62</td>
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<td>469 P</td>
<td>A</td>
<td>67</td>
<td></td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>485 P</td>
<td>G</td>
<td>40 L</td>
<td></td>
<td></td>
<td>69</td>
</tr>
<tr>
<td>480 P</td>
<td>A</td>
<td>43 E</td>
<td></td>
<td></td>
<td>70</td>
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<tr>
<td>473 P</td>
<td>A</td>
<td>WI</td>
<td></td>
<td></td>
<td>71</td>
</tr>
</tbody>
</table>

List of Cape St. Lucas Shells.

Discina Cumingii. On Margaritiphora.
Gastrochaena ovata. In Spondylus.
Saxicava pholadis. In Spondylus.
Eucharis, sp. ind. 1 dead valve, resembling W. Indian species.
Sphænia fragilis. In Spondylus.
Thracia squamosa. 1 broken pair.
Thracia (Cyathodonta) plicata ("P = truncata, Migh."). 1 sp., jun.
Lyonsia inflata. 1 sp.
Lyonsia pica. 1 valve.
Tellina Cumingii. 1 pair.
Tellina rubescens [= Hanley]. Smashed valve.
Strigilla sucura. 1 valve.
Strigilla lenticula. Valves.
Lutricola viridotincta. 2 valves.
Semele bicolor. Valves.
Semele Californica, var. Valves.
Semele flavescens. Rare.
Cumingia trigonularis, jun. In Spondylus.
Heterodonax bimaculatus. Abundant; normal, and numerous vars.
<table>
<thead>
<tr>
<th>Pan. Cat.</th>
<th>La Pau.</th>
<th>Acapul.</th>
<th>Max. Cat.</th>
<th>Other habitats</th>
<th>No.</th>
<th>List of Cape St. Lucas Shells</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>75b</td>
<td>(Mar.)</td>
<td></td>
<td></td>
<td>72</td>
<td>Donax, var. costatus. Valves.</td>
</tr>
<tr>
<td>456</td>
<td>P</td>
<td>C</td>
<td>L</td>
<td></td>
<td>73</td>
<td>Donax ? Conradi, jun.</td>
</tr>
<tr>
<td>453</td>
<td>P</td>
<td>C</td>
<td>WI</td>
<td></td>
<td>74</td>
<td>Donax ? navicula, var.</td>
</tr>
<tr>
<td>P</td>
<td>79</td>
<td></td>
<td></td>
<td></td>
<td>75</td>
<td>Mulinia angulata. Valves.</td>
</tr>
<tr>
<td>446</td>
<td>P</td>
<td>C</td>
<td>E</td>
<td></td>
<td>76</td>
<td>Standella fragilis. 1 sp. living, and numerous adult valves.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>77</td>
<td>Trigona radiata, jun.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>78</td>
<td>Trigona nitida, Sby. Several living sp. agree exactly with Sby.'s figure. [Perhaps Lam.'s Mediterranean shell is different.]</td>
</tr>
<tr>
<td>448</td>
<td>P</td>
<td>C</td>
<td>E</td>
<td></td>
<td>79</td>
<td>Dosinia Dunkeri. Rare.</td>
</tr>
<tr>
<td>444</td>
<td>P</td>
<td>A</td>
<td></td>
<td></td>
<td>80</td>
<td>Dosinia ponderosa. Several pairs [jun. = distans].</td>
</tr>
<tr>
<td>447</td>
<td>P</td>
<td>A</td>
<td>E</td>
<td></td>
<td>81</td>
<td>Callista aurantium.</td>
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<tr>
<td>P</td>
<td></td>
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<td></td>
<td></td>
<td>82</td>
<td>Callista chionea.</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>83</td>
<td>Callista vulnerata. Living, and dead valves.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>84</td>
<td>Callista (? var.) alternata. 1 living.</td>
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<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>85</td>
<td>Amiantis callosa. Rare, living [= C. nobilis, Rve.].</td>
</tr>
<tr>
<td>G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>86</td>
<td>Chione succinea. Very rare.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>87</td>
<td>Chione pulicaria, var. lilicina. Valves, abundant.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>88</td>
<td>Chione neglecta. Living and valves.</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>89</td>
<td>Chione undulata + var. bilineata, Rve. (pars). Very rare. [Probably = neglecta, var.]</td>
</tr>
<tr>
<td>435</td>
<td>P</td>
<td>C</td>
<td>E</td>
<td></td>
<td>90</td>
<td>Asomolocardia subimbriecta. Valves.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>91</td>
<td>Tapes squamosa. 1 sp.</td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>92</td>
<td>Petricola robusta. In Spondylus.</td>
</tr>
<tr>
<td>492</td>
<td>P</td>
<td>C</td>
<td>E</td>
<td></td>
<td>93</td>
<td>Crassatella varians. Living. Large and abundant.</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>94</td>
<td>Crassatella gibbosa. Valves.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>95</td>
<td>Lazaria Californica. Very rare.</td>
</tr>
<tr>
<td>405</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>96</td>
<td>Venericardia crassa. 1 valve.</td>
</tr>
<tr>
<td>407</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>98</td>
<td>Chama echinata, Brod. Living, from Socorro Is.</td>
</tr>
<tr>
<td>P</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>99</td>
<td>Chama frondosa, var.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
<td>Chama ? ergygua. Worn valves.</td>
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<td>A</td>
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<td></td>
<td></td>
<td>101</td>
<td>Cardium consors. Valves. (Very fine at Acapulco.)</td>
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<tr>
<td>433</td>
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<td>A</td>
<td>E</td>
<td></td>
<td>102</td>
<td>Cardium procerum. Valves.</td>
</tr>
<tr>
<td>434</td>
<td>P</td>
<td>A</td>
<td>L</td>
<td></td>
<td>103</td>
<td>Cardium senticosum. Valves.</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>104</td>
<td>Hemicardium biaugulatum. Valves.</td>
</tr>
<tr>
<td>P</td>
<td></td>
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<td></td>
<td></td>
<td>105</td>
<td>Codakia tigerrina. Living. Very large, and young valves. [Of the Pacific Is. type.]</td>
</tr>
<tr>
<td>P</td>
<td></td>
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<td></td>
<td></td>
<td>106</td>
<td>Codakia ? punctata, jun.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>107</td>
<td>Lucina eburnea. Living, rare.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>108</td>
<td>Lucina excavata. 1 valve.</td>
</tr>
<tr>
<td>143</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110</td>
<td>Lucina cancellaris. Valve.</td>
</tr>
<tr>
<td>P</td>
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<td></td>
<td></td>
<td>111</td>
<td>Diplodonta subquadrate. 1 sp.</td>
</tr>
<tr>
<td>P</td>
<td></td>
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<td></td>
<td></td>
<td>112</td>
<td>Diplodonta calculus. Several living sp.</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>113</td>
<td>Millha Childreii. [A few fresh specimens correct the habitat &quot;Brazil,&quot; previously assigned to this extremely rare and remarkable shell, which appears to be a gigantic Felania.]</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>114</td>
<td>Kellia suborbicularis. In Spondylus.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>115</td>
<td>Lasea rubra. 6 sp. living.</td>
</tr>
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<td>P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>116</td>
<td>Mytilus palliopunctatus. Fragment.</td>
</tr>
<tr>
<td>P</td>
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<td></td>
<td></td>
<td></td>
<td>117</td>
<td>Mytilus multiformis. Abundant.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
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<td>118</td>
<td>Septifer Cumingianus. Common.</td>
</tr>
</tbody>
</table>

106
<table>
<thead>
<tr>
<th>Pan.</th>
<th>La.</th>
<th>Aca.</th>
<th>Max.</th>
<th>Other habitat</th>
<th>No.</th>
<th>List of Cape St. Lucas Shells</th>
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<td>P</td>
<td>A</td>
<td>170</td>
<td>L.Mar.</td>
<td></td>
<td>119</td>
<td><em>Modiola capax</em>. A few living sp. “Gal.”[?].</td>
</tr>
<tr>
<td>A</td>
<td>172</td>
<td>Gal.</td>
<td></td>
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<td>120</td>
<td><em>Crenella coeretata</em>. In <em>Spondylus</em>.</td>
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<td>P</td>
<td>A</td>
<td>176</td>
<td></td>
<td></td>
<td>121</td>
<td><em>Lithophagus aristatus</em>. In <em>Spondylus</em>.</td>
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<td>P</td>
<td>A</td>
<td>175</td>
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<td>122</td>
<td><em>Lithophagus plumula</em>. In <em>Spondylus</em>.</td>
</tr>
<tr>
<td>P</td>
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<td>181</td>
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<td>123</td>
<td><em>Area multicosata</em>. Adult valves, and jun. living.</td>
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<tr>
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<td>C</td>
<td>189</td>
<td>E</td>
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<td>124</td>
<td><em>Byssocara Pacifica</em>. Rare.</td>
</tr>
<tr>
<td>418</td>
<td>P</td>
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<td>E</td>
<td></td>
<td>125</td>
<td><em>Byssocara multabilis</em>. Valve.</td>
</tr>
<tr>
<td>420</td>
<td>P</td>
<td>192</td>
<td></td>
<td></td>
<td>126</td>
<td><em>Barbatia Reeiana</em>. Valves.</td>
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<td>P</td>
<td>193</td>
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<td></td>
<td>127</td>
<td><em>Barbatia vespertilio</em>. Valves.</td>
</tr>
<tr>
<td>423</td>
<td>C</td>
<td>193</td>
<td></td>
<td></td>
<td>128</td>
<td><em>Barbatia iliola</em>. Valve.</td>
</tr>
<tr>
<td>416</td>
<td>A</td>
<td>194</td>
<td>E.Mar.</td>
<td></td>
<td>129</td>
<td><em>Barbatia solida</em>. Rare.</td>
</tr>
<tr>
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<td>336</td>
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<td>130</td>
<td><em>Barbatia gradata</em>. Valve.</td>
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<tr>
<td>395</td>
<td>P</td>
<td>200</td>
<td></td>
<td></td>
<td>131</td>
<td><em>Axiacea gigantea</em>. Large valves, and jun. living.</td>
</tr>
<tr>
<td>391</td>
<td>P</td>
<td>202</td>
<td></td>
<td></td>
<td>132</td>
<td><em>Axiacea</em>. sp. ind.</td>
</tr>
<tr>
<td>390</td>
<td>P</td>
<td>204</td>
<td>E</td>
<td></td>
<td>133</td>
<td><em>Pinna lanceolata</em>. Fragment.</td>
</tr>
<tr>
<td>395</td>
<td>P</td>
<td>200</td>
<td></td>
<td></td>
<td>134</td>
<td><em>Pinna maura</em>. 1 sp., jun.</td>
</tr>
<tr>
<td>391</td>
<td>P</td>
<td>202</td>
<td></td>
<td></td>
<td>135</td>
<td><em>Pinna rugosa</em>. 1 sp., jun.</td>
</tr>
<tr>
<td>391</td>
<td>P</td>
<td>204</td>
<td></td>
<td></td>
<td>136</td>
<td><em>Margaritiphora jimbrata</em>. Living.</td>
</tr>
<tr>
<td>393</td>
<td>P</td>
<td>205</td>
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<td></td>
<td>137</td>
<td><em>Avenia Peruviana</em>. Valves.</td>
</tr>
<tr>
<td>393</td>
<td>P</td>
<td>206</td>
<td></td>
<td></td>
<td>138</td>
<td><em>Isoxomon Chenutizianus</em>. Common, living.</td>
</tr>
<tr>
<td>337</td>
<td>P</td>
<td>207</td>
<td>E.Mar.</td>
<td></td>
<td>139</td>
<td><em>Isoxomon Janus</em>. 4 sp. living. [One has close ligament-pits, passing into <em>costellatus</em>, just as no. 138, var. passes into <em>incisus</em>.]</td>
</tr>
<tr>
<td>P</td>
<td>G</td>
<td>201</td>
<td>E</td>
<td></td>
<td>140</td>
<td><em>Pecten subdunosus</em>. Several valves, and 1 living.</td>
</tr>
<tr>
<td>389</td>
<td>P</td>
<td>207</td>
<td>E.Mar.</td>
<td></td>
<td>141</td>
<td><em>Pecten ventricosus</em>. Valves. [The young is P. circularis, Sby., pars.]</td>
</tr>
<tr>
<td>385</td>
<td>P</td>
<td>208</td>
<td></td>
<td></td>
<td>142</td>
<td><em>Janira dentata</em>. Very plentiful.</td>
</tr>
<tr>
<td>385</td>
<td>C</td>
<td>210</td>
<td></td>
<td></td>
<td>143</td>
<td><em>Lima tetrica</em>. 1 living, and valves [= <em>L. squamosa</em>, teste <em>Cuming</em>. W. L., Mediter., Pac. Is.].</td>
</tr>
</tbody>
</table>
| 385 | P   | 211  |      |              | 144 | *Lima arcuata*. 1 fresh pair. [Can hardly be separated from L. fragilis, Gal., Pac. Is., in Mus. Cüm.]
| 384 | P   | 213  |      |              | 146 | *Plicata penicillata*. 1 sp. on Fasciolaria. |
| 383 | P   | 214  |      |              | 147 | *Ostrea iridescens*. A few living. |
| 384 | P   | 216  |      |              | 149 | *Ostrea Columbiensis*. Valves. |
| 384 | P   | 217  |      |              | 150 | *Ostrea amara*. On Pomatia. |
| 381 | A   | 218  |      |              | 151 | *Cucullia ?telemus*. Fragment. (Pelagic. |
| 336 | C   | 219  |      |              | 152| {Nudibranchs and *Aplysia*. Not yet determined.} |
| 321 | P   | 221  |      |              | 154 | *Bulla nebulosa*. Rare. |
| A   | 222  | L.Gal.|      |              | 159 | *Bulla Quoyi*. Very rare. |
| 240 | Marg.| 162  |      |              | 161 | *Haminea cymbiformis*. 1 sp. [Closely related to H. virescens.]
| 239 | Marg.| 163  |      |              | 164 | *Siphonaria equilirata*. Dead. |
| 240 | Marg.| 165  |      |              | 166 | {The rest of the Pulmonates will be tabulated afterwards, vide p. 630.} |
| 239 | L   | 167  |      |              | 172 | *Siphonaria lecanium*, with var. *palmata*, &c. Plenti- |

107
<table>
<thead>
<tr>
<th>Pan. Cat.</th>
<th>La Pol.</th>
<th>Cat. in M.</th>
<th>Other habitats.</th>
<th>No.</th>
<th>List of Cape St. Lucas Shells.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 252 E</td>
<td>175</td>
<td>Ischnochiton limaciformis. 2 specimens.</td>
<td></td>
<td></td>
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<tr>
<td>256 E</td>
<td>176</td>
<td>Ischnochiton Beami. 1 sp.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>258 E</td>
<td>177</td>
<td>Actinochides arragonites. A few living sp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C 261 A</td>
<td>178</td>
<td>Patella discors. Dead.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A 260</td>
<td>179</td>
<td>Patella pediculus. Dead.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>264 Marg. 180</td>
<td>Aemaea fascicularis. Abundant, living.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

P A 273 Gal. 182 Fissurella rugosa, jun. [A var. is first black, with two white rays; afterwards changes to whitish.]

357 P A 274 Gal. 184 Fissurella nigrocineta. 1 young sp. |
|          | 279 E 185 Glyphis inequalis. Rare. |
|          | 281 E 186 Rimula Mazatlanica. 2 sp. |
|          | L. Cal. 187 Haliotis Cracherodii. (Turtle Bay.) |
|          | L. Cal. 188 Haliotis splendid. (Margarita Island, with 4, 5, and 6 holes.) |
|          | L 189 Callopora Fokkeisi. Dead. |
|          | L. Cal. 190 Pomaullus endosus. Fresh, with Gulf Polyzoa. |
|          | 296 C 191 Uranilla olivacea. Dead. |
|          | 288 C 192 Uranilla unguis. Dead. |
|          | 280 Marg. 193 Callistoma eximium. Dead. |
|          | 274 P 194 Omphalia coronulatus. Dead; not uncommon. |
|          | 293 P 195 Vitrinella Panamensis. 1 sp. off Spondylus. |
|          | 304 P A 198 Nerita scabricosta. Abundant. |
|          | 305 P C 197 Nerita Bernhardi. Abundant. |
|          | 336 P A 198 Crucibulum imbricatum. Dead. |
|          | 337 P A 194 Crucibulum spinosum. Dead. |
|          | 344 P A 200 Crepidula aculeata. Dead. West and East Indies. |
|          | 345 P A 201 Crepidula ?arenata, jun.* |
|          | 346 P A 202 Crepidula excavata, jun. et var.* |
|          | 347 E 203 Crepidula onyx. Dead. |
|          | 328 P A 204 Hippomphx antiquatus. Dead. |
|          | 327 A 205 Hippomphx barbat. Pacific Is. Fresh sp. |
|          | 329 A 206 Hippomphx Grayanus. Rare. |
|          | 328 A 207 Aletes centiquadratus. On Margaritaphora, &c. |
|          | 355 A 208 Bivonia conferta. Frequent, on shells. |
|          | 350 A 209 Petaloconchus macrophragma. Frequent, on shells. |
|          | 210 P L 210 Spir Glyphus lutella. On Purpura planospira and muricata, from Socorro Is. |
|          | 367 P A 211 Cecum subimpressum. Very rare. |
|          | 380 P A 212 Turritella tyrrina et var. Cumingii. |
|          | 213 P Turritella sanguinea. (Whirls not shouldered.) |
|          | 188 P A 214 Cerithium maculosum and dwarf var., like medicere. Abundant. |


200 P A 216 Cerithium stercus murcarum. Rare; dead. |


197 P A 218 Rhinoclavis gemmata. Rare. |

197 P A 219 Marg. 219 Pyrazus incisus. Rare. |

196 P A 220 Cerithidea Mazatlanica. Dead. |

* A difficulty attends the identification of young specimens of these rare species, no series having yet been obtained. "C. excavata, var.,” in Mus. CUM. Is exactly intermediate between the two. The young of excavata has a large swelling umbon projecting beyond the margin; the umbon in “ ? var.” has the margin spreading round it, as in onyx, jun., and in consequence appears turned in the contrary direction. The umbilicus above the deck exists in both forms; but it is not an absolutely constant character, even in adunca.
### List of Cape St. Lucas Shells

<table>
<thead>
<tr>
<th>Pan. Cat.</th>
<th>La Ac.</th>
<th>Cat.</th>
<th>Marg.</th>
<th>Other habitats</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>232</td>
<td>C</td>
<td>397</td>
<td>221</td>
<td>Litorina aspera. Very rare.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>244</td>
<td>C</td>
<td>396</td>
<td>222</td>
<td>Litorina conspersa. Common. A distorted specimen has a Lacunoid chink; another a Nassoid shape.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>238</td>
<td>P</td>
<td>398</td>
<td>223</td>
<td>Litorina Philippii. Rare; var. anted, var. penicillata.</td>
<td></td>
<td></td>
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<tr>
<td>233</td>
<td>E</td>
<td>401</td>
<td>224</td>
<td>Modulus catenatulus, jun.</td>
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<tr>
<td>244</td>
<td>P</td>
<td>225</td>
<td>225</td>
<td>Rissolina firmata. Rare.</td>
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</tr>
<tr>
<td>245</td>
<td>A</td>
<td>408</td>
<td>226</td>
<td>Rissolina fortis. Very rare.</td>
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<td></td>
</tr>
<tr>
<td>243</td>
<td>A</td>
<td>414</td>
<td>227</td>
<td>Rissolina clandestina. Dead.</td>
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<td></td>
</tr>
<tr>
<td>247</td>
<td>C</td>
<td>417</td>
<td>228</td>
<td>Rissolina infrequens. Dead, worn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>246</td>
<td>C</td>
<td>414</td>
<td>229</td>
<td>Alvania tumida. 1 sp., off Spondylus.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>230</td>
<td>L</td>
<td>417</td>
<td>230</td>
<td>Barlecia subtenuis. 1 sp.</td>
<td></td>
<td></td>
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<tr>
<td>231</td>
<td>L</td>
<td>411</td>
<td>231</td>
<td>Barlecia lirata. 1 sp.</td>
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<tr>
<td>232</td>
<td>C</td>
<td>422</td>
<td>232</td>
<td>Oemella, sp. 1 sp.</td>
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<tr>
<td>233</td>
<td>L</td>
<td>420</td>
<td>233</td>
<td>Jeffrey sia Alderi. 1 sp.</td>
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<tr>
<td>240</td>
<td>L</td>
<td>419</td>
<td>234</td>
<td>Jeffrey sia bifasciata. Very rare.</td>
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<td></td>
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<tr>
<td>236</td>
<td>C</td>
<td>427</td>
<td>236</td>
<td>Alaba terebralis. 1 dead, broken specimen.</td>
<td></td>
<td></td>
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<tr>
<td>237</td>
<td>A</td>
<td>424</td>
<td>237</td>
<td>Planaxis nigritella. Dead; some of the specimens may be a dwarf form of</td>
<td></td>
<td></td>
</tr>
<tr>
<td>239</td>
<td>E</td>
<td>438</td>
<td>239</td>
<td>Arcicia arabicula. Very rare.</td>
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<td></td>
</tr>
<tr>
<td>243</td>
<td>P</td>
<td>241</td>
<td>241</td>
<td>Luponia Soverbyi. 1 living and several worn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>242</td>
<td>P</td>
<td>242</td>
<td>242</td>
<td>Luponia albuginosa. Dead; plentiful. [Cyprea tigris and Pteroceras lambis; doubtless received through traders.]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>243</td>
<td>P</td>
<td>439</td>
<td>243</td>
<td>Trivia postulata. Dead.</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>P</td>
<td>440</td>
<td>244</td>
<td>Gal. E</td>
<td>244</td>
<td>Trivia radians; intermediate specimens towards</td>
</tr>
<tr>
<td>245</td>
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<td>245</td>
<td>245</td>
<td>Trivia Solandri. Dead.</td>
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<td>12</td>
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<td>442</td>
<td>246</td>
<td>Gal.</td>
<td>246</td>
<td>Trivia Pacifica. 1 sp.</td>
</tr>
<tr>
<td>13</td>
<td>A</td>
<td>248</td>
<td>248</td>
<td>Gulf E</td>
<td>249</td>
<td>Erato Maugerie. [Exactly like the W. Indian specimens: also Crag fossil, testa S. Wood.]</td>
</tr>
<tr>
<td>122</td>
<td>C</td>
<td>447</td>
<td>250</td>
<td>Strombus galeatus, jun. 1 sp.</td>
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<tr>
<td>252</td>
<td>P</td>
<td>449</td>
<td>252</td>
<td>Strombus gracilior. 1 dead specimen.</td>
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<td></td>
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<tr>
<td>253</td>
<td>C</td>
<td>454</td>
<td>253</td>
<td>Subula striata. 2 dead specimens.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>254</td>
<td>E</td>
<td>254</td>
<td>254</td>
<td>Subula ? lucutosa, jun.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>255</td>
<td>P</td>
<td>455</td>
<td>255</td>
<td>Euryta fulgurata. Dead.</td>
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<td></td>
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<tr>
<td>256</td>
<td>A</td>
<td>456</td>
<td>256</td>
<td>Euryta asciculata. Dead.</td>
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<tr>
<td>257</td>
<td>C</td>
<td>257</td>
<td>258</td>
<td>Terebra linguatula. 1 sp.</td>
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<tr>
<td>259</td>
<td>G</td>
<td>458</td>
<td>258</td>
<td>Myarella variegata. Very rare.</td>
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<tr>
<td>250</td>
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<td>450</td>
<td>259</td>
<td>Myarella albocincta. 1 dead specimen.</td>
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<tr>
<td>260</td>
<td>C</td>
<td>452</td>
<td>260</td>
<td>Myarella subnodosa. 1 dead specimen.</td>
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<tr>
<td>261</td>
<td>P</td>
<td>457</td>
<td>261</td>
<td>Pleurotomaria fungiculata. Rare; dead.</td>
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<tr>
<td>262</td>
<td>P</td>
<td>262</td>
<td>262</td>
<td>Drillia aterrima. Rare; and var. Melchersii.</td>
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</tr>
<tr>
<td>263</td>
<td>C</td>
<td>461</td>
<td>263</td>
<td>Drillia albocentralis. 1 sp., dead.</td>
<td></td>
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<tr>
<td>264</td>
<td>E</td>
<td>465</td>
<td>264</td>
<td>Drillia lucutosa. 1 sp., dead.</td>
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<tr>
<td>265</td>
<td>P</td>
<td>265</td>
<td>265</td>
<td>Drillia maura, Val. Fragment.</td>
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<tr>
<td>266</td>
<td>C</td>
<td>467</td>
<td>266</td>
<td>Daphnella casta. 1 sp. [Coarser strias than W. I. species, but scarcely differs from cerebriplicata, Rve., &quot;Philippines.&quot;]</td>
<td></td>
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</tr>
<tr>
<td>267</td>
<td>A</td>
<td>467</td>
<td>267</td>
<td>Cithara stromboides 1 sp. [Probably = triticea, Kien.]</td>
<td></td>
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<tr>
<td>117</td>
<td>P</td>
<td>A</td>
<td>E</td>
<td></td>
<td>268</td>
<td><em>Conus princeps</em>. Dead.</td>
</tr>
<tr>
<td>118</td>
<td>P</td>
<td>A</td>
<td>476</td>
<td></td>
<td>270</td>
<td><em>Conus purpurascens</em> and var. <em>regalialis</em>. Dead.</td>
</tr>
<tr>
<td>114</td>
<td>P</td>
<td>A</td>
<td>480</td>
<td></td>
<td>271</td>
<td><em>Conus gladiator</em>. Dead.</td>
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<tr>
<td>116</td>
<td>P</td>
<td>A</td>
<td>481</td>
<td>Gal.</td>
<td>272</td>
<td><em>Conus nux et var. pusillus</em> [Gld. non Chem.]. Living; plentiful.</td>
</tr>
<tr>
<td>118</td>
<td>P</td>
<td>P</td>
<td>E</td>
<td></td>
<td>273</td>
<td><em>Conus scalaris</em>. 1 sp., dead.</td>
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<td>270</td>
<td>P</td>
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<td></td>
<td></td>
<td>274</td>
<td><em>Conus tornatus</em>. Rare, dead.</td>
</tr>
<tr>
<td>254</td>
<td>A</td>
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<td>480</td>
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<td>276</td>
<td><em>Odostomia</em> ? <em>straminea</em>. 1 sp.</td>
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<tr>
<td>257</td>
<td>A</td>
<td></td>
<td>501</td>
<td></td>
<td>277</td>
<td><em>Syrnola lamellata</em>. 1 sp., off <em>Spondylus</em>.</td>
</tr>
<tr>
<td>223</td>
<td>A</td>
<td></td>
<td>507</td>
<td></td>
<td>278</td>
<td><em>Ocelia exarata</em> = <em>terebellum</em>. 1 sp.</td>
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<td>227</td>
<td>A</td>
<td></td>
<td>518</td>
<td></td>
<td>279</td>
<td><em>Chrysalida communis</em>. 1 sp., off <em>Spondylus</em>.</td>
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<tr>
<td>194</td>
<td>A</td>
<td></td>
<td>519</td>
<td></td>
<td>280</td>
<td><em>Chenmitzia Panamensis</em>. Very rare.</td>
</tr>
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<td>207</td>
<td>A</td>
<td></td>
<td>524</td>
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<td>281</td>
<td><em>Chenmitzia Adami</em>. 1 sp., off <em>Spondylus</em>.</td>
</tr>
<tr>
<td>208</td>
<td>A</td>
<td></td>
<td>527</td>
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<td>282</td>
<td><em>Chenmitzia prolongata</em>. 1 sp., off <em>Spondylus</em>.</td>
</tr>
<tr>
<td>205</td>
<td>P</td>
<td>A</td>
<td>532</td>
<td></td>
<td>283</td>
<td><em>Chenmitzia flavescens</em>. 1 sp., off <em>Spondylus</em>.</td>
</tr>
<tr>
<td>205</td>
<td>P</td>
<td>P</td>
<td>563</td>
<td>L</td>
<td>284</td>
<td><em>Cerithiopsis assimilata</em>. 1 sp., off <em>Spondylus</em>.</td>
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<tr>
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<td>P</td>
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<td>557</td>
<td>L</td>
<td>285</td>
<td><em>Cerithiopsis tuberculoides</em>. 1 sp.</td>
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<td></td>
<td>P</td>
<td></td>
<td>566</td>
<td>L</td>
<td>286</td>
<td><em>Triforis alternatus</em>. 1 sp., off <em>Spondylus</em>.</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td></td>
<td>570</td>
<td>Gal.</td>
<td>287</td>
<td><em>Sclaria tiiara</em>. 1 sp.</td>
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<td>288</td>
<td><em>Natica zonaria</em>. Common. Operc. grooved as in <em>canvrena</em> [= <em>alapapilionis</em>, var., teste Rve.: non Chem.].</td>
</tr>
<tr>
<td></td>
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<td></td>
<td><em>Polinices uber</em>. Common. [The young shells go through all shapes, from globose to pointed. Operc. thin, light green, horny.]</td>
</tr>
<tr>
<td>P</td>
<td>A</td>
<td>G</td>
<td></td>
<td>Gal.</td>
<td>292</td>
<td><em>Polinices otis et var. fusca</em>. Rare; dead.</td>
</tr>
<tr>
<td>P</td>
<td>P</td>
<td>G</td>
<td></td>
<td>Marg.</td>
<td>293</td>
<td><em>Polinices bifasciata</em>. Living; rare.</td>
</tr>
<tr>
<td>P</td>
<td>A</td>
<td>G</td>
<td></td>
<td>E</td>
<td>294</td>
<td><em>Neverita glauca</em>. 1 sp.</td>
</tr>
<tr>
<td>146</td>
<td>A</td>
<td></td>
<td>579</td>
<td></td>
<td>295</td>
<td><em>Lamellaria</em>, sp. ind. 1 sp.</td>
</tr>
<tr>
<td>66</td>
<td>C</td>
<td>G</td>
<td>E.Mar.</td>
<td></td>
<td>297</td>
<td><em>Malea ringens</em>. 1 dead sp. [Fossil, Atlantic shores, Newberry.]</td>
</tr>
<tr>
<td>112</td>
<td>P</td>
<td>A</td>
<td></td>
<td>Gal.</td>
<td>298</td>
<td><em>Oniscia tuberculosa</em>. Very rare.</td>
</tr>
<tr>
<td>110</td>
<td>P</td>
<td>C</td>
<td></td>
<td></td>
<td>300</td>
<td><em>Bezardia abbreviata</em>. 1 living, with very small normal operculum. Common; dead. [Varies greatly in form and sculpture, like the Texan &quot;analogue,&quot; which may be conspecific.]</td>
</tr>
<tr>
<td>131</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>301</td>
<td><em>Triton vestitus</em>. 1 sp. [Scarcely differs from <em>pilearis</em>.]</td>
</tr>
<tr>
<td>132</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>302</td>
<td><em>Ramella cestata</em>. 1 sp., dead.</td>
</tr>
<tr>
<td>151</td>
<td>P</td>
<td>A</td>
<td></td>
<td>Gal.</td>
<td>304</td>
<td><em>Latirus ceratus</em>. 2 dead sp.</td>
</tr>
<tr>
<td>18</td>
<td>A</td>
<td></td>
<td></td>
<td>E</td>
<td>305</td>
<td><em>Fasciolaria princeps</em>. 2 dead sp.</td>
</tr>
<tr>
<td>20</td>
<td>A</td>
<td></td>
<td></td>
<td>E</td>
<td>307</td>
<td><em>Mitra solitaria</em>. C. B. Ad. 1 sp.</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td></td>
<td></td>
<td>586</td>
<td>308</td>
<td><em>Strigatella tristis</em>. Rare.</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td></td>
<td></td>
<td>580</td>
<td>309</td>
<td><em>Aneta harpa</em>. 1 sp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>587</td>
<td>310</td>
<td><em>Volutella margaritula</em>. Off <em>Spondylus</em>; common.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>588</td>
<td>311</td>
<td><em>Marginella minor</em>. Off <em>Spondylus</em>; rare.</td>
</tr>
<tr>
<td>Pan. Cat.</td>
<td>La Paz</td>
<td>Acapul. Max. Cat.</td>
<td>Other habitats</td>
<td>No.</td>
<td>List of Cape St. Lucas Shells</td>
<td></td>
</tr>
<tr>
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<tr>
<td></td>
<td>A</td>
<td></td>
<td></td>
<td>312</td>
<td><em>Volvarina varia.</em> Rare. [Cannot be distinguished from some W. I. specimens.]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>?WI</td>
<td></td>
<td>313</td>
<td><em>Persicula imbricata.</em> 1 sp. [Can scarcely be separated from <em>interrupta</em>, jun. Also Guacumayo.]</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>314</td>
<td><em>Persicula phrygia.</em> Rare. [Closely allied to <em>frumentum.</em> Differs from the W. I. <em>sagittata</em> by having the painting in loops instead of zigzag, and an orange callosity over the sunken spire, bordered by a spotted sutural line.]</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>P</td>
<td>G Marg.</td>
<td></td>
<td>315</td>
<td><em>Olica porphyria.</em> 1 sp.</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>P</td>
<td>A 501 Marg.</td>
<td></td>
<td>316</td>
<td><em>Olica Melcheri,</em> var. <em>Rare.</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>317</td>
<td><em>Olica subangulata.</em> Very common, dead. [This species, very rare elsewhere, is known by the shouldered shape, toothed paries, and violet-stained mouth and columella.]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>C 506</td>
<td></td>
<td>318</td>
<td><em>Olicella dama.</em> Rare; dead.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>A 505</td>
<td></td>
<td>319</td>
<td><em>Olicella tergina.</em> Rare; dead.</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>P</td>
<td>C 601</td>
<td></td>
<td>320</td>
<td><em>Olicella undulata.</em> 3 sp.; dead.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A 508 ?WI</td>
<td></td>
<td>321</td>
<td><em>Olicella zonalis.</em> Rare; dead.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>P A</td>
<td></td>
<td>322</td>
<td><em>Olicella v. aureocincta.</em> 3 sp.; dead.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>507 E</td>
<td></td>
<td>323</td>
<td><em>Olicella anazora.</em> Very rare; dead. Perhaps a var. of <em>Olicella gracilis.</em> Extremely abundant. [With many varieties: among which is one with dark median and sutural bands and light spire; another with dark spire; another pure white, of which the young is <em>inconsipica,</em> C. B. Ad. The Acapulcan varieties are somewhat different.]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>G</td>
<td></td>
<td>324</td>
<td><em>Harpia crenata.</em> Dead.</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>P</td>
<td>A 606 E Mar.</td>
<td></td>
<td>325</td>
<td><em>Parpura biserialis.</em> Abundant.</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>P</td>
<td>A 603 G Mar.</td>
<td></td>
<td>327</td>
<td><em>Parpura triangularis.</em> Not uncommon.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>C 605 E</td>
<td></td>
<td>328</td>
<td><em>Parpura patula.</em> Common. Also West Indies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>329</td>
<td><em>Parpura muricata.</em> Rare; dead at C. S. L.; living at Socorro Island.</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>P</td>
<td>A 611 Gal.</td>
<td></td>
<td>330</td>
<td><em>Parpura planospira.</em> Dead shells at C. S. L. and La Paz; abundant and fine at Socorro Island.</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>P</td>
<td>A Gal.</td>
<td></td>
<td>331</td>
<td><em>Rhizocheilus maculatus var. [= Californicus.]</em></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>P</td>
<td>A 613 WI</td>
<td></td>
<td>332</td>
<td><em>SISTRUM CARBONARIUM.</em> Living; plentiful.</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>P</td>
<td>A 615 E</td>
<td></td>
<td>333</td>
<td><em>NITIDILLA CRIBRARIA.</em> Abundant.</td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>P</td>
<td>A 617 E</td>
<td></td>
<td>334</td>
<td><em>Columella major.</em> Rare.</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>P</td>
<td>A Gal.</td>
<td></td>
<td>335</td>
<td><em>Columella fuscata.</em> Abundant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>336</td>
<td><em>Columella fuscata.</em> Abundant.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>337</td>
<td><em>Columella festiva.</em> Not rare.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>338</td>
<td><em>Columella kemastoma.</em> Not rare.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>339</td>
<td><em>Columella solidula.</em> Abundant *;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>340</td>
<td><em>Columella Reevei [Sta. Barbarensis, Cpr. (error)].</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>341</td>
<td><em>Columella haxata.</em> Rare.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>342</td>
<td><em>Conella cedoni.</em> 1 sp.</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>P</td>
<td>C 632 L Mar.</td>
<td></td>
<td>343</td>
<td><em>Nassa tegula.</em> Rare; pale var.</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>P</td>
<td>A</td>
<td></td>
<td>344</td>
<td><em>Nassa vescicolor.</em> Rare; dead.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>345</td>
<td><em>Nassa corpulenta.</em> Very rare.</td>
<td></td>
</tr>
</tbody>
</table>

* The young shell is thin, semitransparent, with Alaboid tuberous vertex. The nuclear part is rather more timid than the next whorl, and set slanting as in some *Chrysodomi.* Adolescent, whirs smooth, except a sutural line. Sculpture of adult gradually developed, with spiral lines, sometimes all over, sometimes only anteriorly and posteriorly. Last whir with radiating ribs, but generally smooth. Siphonal notch deeply cut back, as in *Stronbina,* to which the species may belong. 1863.
<table>
<thead>
<tr>
<th>Pan. Cat.</th>
<th>La Paz</th>
<th>Acapulco</th>
<th>Mazatlan</th>
<th>Other habitats</th>
<th>No.</th>
<th>List of Cape St. Lucas Shells</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>Gal.</td>
<td>346</td>
<td><em>Fusus Thouarsii [+ Nove-Hollandiae, Rve.]</em>. Rare; dead.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>Gal.</td>
<td>348</td>
<td><em>Engina Reeveiana</em>. 1 sp.</td>
</tr>
<tr>
<td>P</td>
<td>647</td>
<td></td>
<td></td>
<td>Gal.</td>
<td>349</td>
<td><em>Engina crocostoma</em>. 1 sp.</td>
</tr>
<tr>
<td>P</td>
<td>652</td>
<td></td>
<td></td>
<td>E</td>
<td>350</td>
<td><em>Anacis coronata</em>. Very rare.</td>
</tr>
<tr>
<td>99</td>
<td></td>
<td></td>
<td></td>
<td>E</td>
<td>351</td>
<td><em>Anacis tenuata [= Gaskoina</em>]. Very rare.</td>
</tr>
<tr>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td>E</td>
<td>352</td>
<td><em>Anacis pulchrior</em>. Very rare.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td></td>
<td></td>
<td>650</td>
<td>354</td>
<td><em>Anacis sparsa</em>, var. Dead shells: may be <em>pygmea</em>, var.</td>
</tr>
<tr>
<td>P</td>
<td>C</td>
<td></td>
<td>657</td>
<td></td>
<td>355</td>
<td><em>Anacis serrata</em>. A few perfect specimens.</td>
</tr>
<tr>
<td>87</td>
<td></td>
<td></td>
<td></td>
<td>E</td>
<td>356</td>
<td><em>Anacis pygmea</em> (var. auriflua). Rare.</td>
</tr>
<tr>
<td>64</td>
<td>P</td>
<td>A</td>
<td>662</td>
<td></td>
<td>357</td>
<td><em>Strombina muculosa</em>. Very rare.</td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>358</td>
<td><em>Strombina gibberula</em>. Very rare.</td>
</tr>
<tr>
<td>P</td>
<td>C</td>
<td>664</td>
<td></td>
<td></td>
<td>359</td>
<td><em>Pisania sanguinolenta</em>. Dwarf var.; common.</td>
</tr>
<tr>
<td>140</td>
<td>P</td>
<td>A</td>
<td>665</td>
<td></td>
<td>360</td>
<td><em>Pisania lugubris</em>. Rare; dead.</td>
</tr>
<tr>
<td>140</td>
<td>P</td>
<td>A</td>
<td>669</td>
<td></td>
<td>361</td>
<td><em>Murex pilcatus</em>. Rare; dead.</td>
</tr>
<tr>
<td>136</td>
<td>P</td>
<td>A</td>
<td>671</td>
<td></td>
<td>362</td>
<td><em>Murex recurvirostris</em>. 1 sp.; dead.</td>
</tr>
<tr>
<td>P</td>
<td>A</td>
<td>673</td>
<td></td>
<td></td>
<td>363</td>
<td><em>Phyllonotus bicolor</em>. Rare.</td>
</tr>
<tr>
<td>136</td>
<td>P</td>
<td>A</td>
<td></td>
<td></td>
<td>364</td>
<td><em>Phyllonotus princeps</em>. Rare; dead.</td>
</tr>
<tr>
<td>136</td>
<td>P</td>
<td>A</td>
<td></td>
<td></td>
<td>365</td>
<td><em>Muricidea dubia</em>. Rare; dead.</td>
</tr>
<tr>
<td>366</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>366</td>
<td><em>Argonauta argo</em>. 1 large sp. of the ?var. papyracea*. Pelagic.</td>
</tr>
<tr>
<td>367</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>370</td>
<td><em>Octopus</em>, sp. Pelagic.</td>
</tr>
</tbody>
</table>

As would be expected, the bulk of these species (203 out of 367) are the same as have been already enumerated in the Reigen Catalogue. Of those which do not appear in the Mazatlan lists, no fewer than 37 appear in the Panama collections (beside 10 others, known to inhabit the equatorial region). Of those not quoted from Mazatlan, 34 are also found in the Acapulco region, and 30 at La Paz. Of the whole number, 79 have also been found in South America, and 28 in the Galapagos. 38 have also been found in Margarita Bay, of which *Pyrazus incisus* and *Siphonaria equilirata* are Lower Californian rather than Gulf species; but only 13 belong to that portion of the Lower Californian fauna which is known to reach S. Diego, exclusive of the same number of Gulf species, which also stray into the S. Diegan district. There are also 10 species, which (with more or less distinctness) represent West Indian forms. Of these, five, viz. *Heterodonax bimaculatus*, *Erato Maugerie*, *Volvarina varia*, *Persica* *imbiricata* and *phrygia*, are new to the Gulf fauna: the other five appear in the Reigen Catalogue.

106. The most extensive collections in the Vancouver district, both as far as the number of species and of specimens is concerned, have been made for the Smithsonian Institution by Mr. J. G. Swan, teacher at the Indian Reserve, Neeah Bay, W. T. For several years* valuable consignments have been received from him of shells collected at Cape Flattery, Port Townsend, and other stations. Latterly he has trained the native children to pick up shore-shells in large quantities. The labour of sorting and arranging these has been enormous; it has, however, been repaid not only by observing the

* In consequence of boxes having been received at different times, through the accidents of transit, it has not always been possible to ascertain with certainty to whom, among simultaneous collectors, should be allowed priority in the discovery of new species.

112
variations of form in large numbers of individuals, but by the discovery of several new species and the addition to the district-fauna of many others. The duplicates are made-up in series for distribution by the Smithsonian Institution; and, though of the worst quality from a "collector's" point of view, they will be found very serviceable by real students, being carefully named in accordance with this Report. He has now received a dredge, constructed for him by Dr. Stimpson; and if he succeeds in training the young Indians to use it, there is little doubt that a rich harvest of fresh materials will shortly be obtained. Some of the collections were made on the neighboring shores of Vancouver's Island, among which was a large series of Pachypoma gibberosum, Chem., with attached Bivonia, both of an essentially Eastern Pacific type, the former having been brought from Japan by Mr. A. Adams. The Indians have taken a fancy to the opercula of this shell for the purpose of ornamenting their canoes. As it is an article of trade among themselves, it is remarkable that so large a shell should have so long escaped the notice of collectors. Dead specimens have been washed-up in California; but it is not known even to enter the Straits of De Fuca alive. The shore-pickings of the Indian children, which have already added 25 species to science, are singularly free from ballast-importations, although they present a few (supposed) extra-limital shells, probably washed-up by the ocean currents. The following are the species new to the Vancouver fauna; the remainder will be found tabulated in the 7th column of the general Table, par. 112, infrà.

No.
1. Waldheimia Coreanica, valves.
2. Xylotrya penнатiftera, teste Jeffr.
3. Ciliophora punctata, one worn valve.
4. Macoma ? edentula. Two living shells may be the young of this species, or an extreme var. of inquinata.
5. Mera salmonoea. Plentiful.
6. Angulus variegatus. Rare.
7. Semele rubrolineata. One large valve may belong to this species, or (more probably) be distinct and new.
9. Midon prolongatus, n. subg., n. s. Several valves of this curious shell, intermediate between Lucina and Venericardia, accord with forms not before eliminated, from the Coralline Crag and Inferior Oolite.
15. Siphonaria Thersites, n. s. Rare, dead. Like tristensis and other Cape Horn and N. Zealand types. The genus was not known north of Margarita Bay.
16. Mopalia (Kemnerley, var.) Steamn. One sp. and valves.
17. Ischnochiton (Trachydermon) Nutallii. One sp.
20. Leptonyx sanguineus, Linn. Very plentiful. (Japan, A. Ad.; = Homalopoma sanguineum, ante p. 588 (nom. preoc.); Mediterranean, Philipp.)
21. Chlorostoma funebralé (et var. subapertum. One sp.)
22. Calliostoma canaliculatum. Living; abundant.
23. Margarita cidaris, n. s. One fresh specimen, with aspect of Turcica.
25. Gibbula parcipecta. One sp.
26. Gibbula succincta, n. s. Rare.
27. Gibbula lacunata, n. s. One sp.
30. *Bicornia compacta*, n. s. Frequent on *Pachyoma*; externally resembles *Peta-loconcha macrophragma*.
34. *Lacuna variegata*, n. s. Not common; resembles the Japanese *L. decorata*.
35. *Isapis fenestrata*, n. s. Very rare.
37. *Alecania flosa*, n. s. One specimen.
38. *Assiminea subrotundata*, n. s. One specimen.
41. *Mangelia interfossa*, n. s. Several dead specimens.
42. *Mangelia tabulata*, n. s. Several dead specimens.
43. *Daphnelia effusa*, n. s. One broken specimen.
46. *Odostomia inflata*. Very rare.
47. *Odostomia temusculpta*, n. s. Very rare.
49. *Opatia borealis*. Very common. This fine species, indicated by Dr. Gld. (E. E. Mol., p. 307) under *Scalaria australis*, closely resembles *Ochotensis*, Midd. It is not referred to in the 'Otia,' and the locality was naturally suspected.
50. *Cerithiopsis munita*, n. s. Rare.
52. *Cerithiopsis tuberculata*. Very rare. No differences have been detected on comparing the Herm and Neeah Bay specimens.
53. *Triforis adversa*. Rare. The Herm and Neeah Bay specimens differ from the decorted *T. cancelata*.
54. *Trichotropis inermis*. A few specimens differ from the decorted *T. cancelata*.
55. *Cancellaria modesta*, n. s. One sp. and fragment.
57. *Olivella biplicata*. Very fine and abundant.
58. *Purpura (var.) fusca*. Forbes's species, the locality of which was before uncertain, is here connected by easy transitions with the normal saxicola.
59. *Colubella (var.) Hindsii*. May be a stunted form of *A. gausapata*.
60. *Amycla tuberosa*. Rare.
61. *Chrysodoma tabulata*. One beautifully perfect specimen; described and figured from Mr. Lord's broken shell, sent simultaneously.

The following appear to be due to currents:—

63. *Fissurella volcano*. One broken specimen.
65. *Odostomia inflata*, n. s. Young shells, abundant, in *Haliotis rufescens*.
66. *Ocinebra lurida*.
67. *Ocinebra interfossa*, n. s.

Collections from the same locality were afterwards sent by the Rev. J. Rowell, and are tabulated with the rest of the Smithsonian series in the 4th column of the general Table, par. 112.
108. In 1860, previously to the commencement of the Californian Geological Survey, Dr. J. G. Cooper joined a military expedition across the Rocky Mountains, under the command of Major Blake, U.S.A. Having forwarded his notes and specimens to Judge Cooper, they were placed in the hands of Mr. Thomas Bland, of New York. He prepared a "Notice of Land and Freshwater Shells, collected by Dr. J. G. Cooper in the Rocky Mountains, &c.," which appears in the 'Ann. Lyc. N. H. of N. York,' 1861, pp. 362 et seq. We have here the judgment of one of the most distinguished students of American land-shells, whose labours on the tropical forms have accumulated facts so important in their bearing on the Darwinian controversy *. The following is an outline of the Report, which is peculiarly valuable for the copious notes on the station and distribution of species:—

No.
1. *Helix Townsendiana*, Lea. "Both slopes of the Bitter Root Mountains, from 2200-5600 ft. high. Large var. at the base of the range to 4800 ft. Small var. in dry prairie at junction of Hell-Gate and Bitter Root Rivers; also in Wash. Ter., west of the Coast Mountains. The most wide-spread of the species," J. G. C.; Puget Sound, Cape Disappointment, teste Bland.


4. *Helix Vancouverensis*, Lea.=*H. concava*, Bin. sen. olim, non postea, nec Say; =*H. vellicata*, Fsbs., certainly; =*H. sportella*, Gld., probably. "West side of Cœur d'Alène Mountains, W. T., in forests of Conifers, such as it inhabits west of the Cascade Range. Between these two ranges, for 200 miles, is a wide plain, quite uninhabitable for snails, on account of drought. This sp. and *H. Townsendiana* probably travel round it through the northern forests in lat. 49°," J. G. C. Also Crescent City, Cal., Newcomb; Oregon City, Whidby's Is., W. T.; Mus. Bland. Found on the Pacific slope, from Puget Sound to San Diego.

5. *Helix strigosa*, Gld. "Estivating under pine-logs, on steep slope of shale, containing veins of lime, 4000 ft. high, near Bitter Root River, Rocky Mountains," J. G. C.; Big Horn Mountains, Nebraska; Rio Piedra, W. New Mexico; teste Bland. One sp. reached N. York alive, and deposited six young shells. [May not these have been abnormally hatched in the body of the parent, from the unnatural confinement.]

6. *Helix Cooperi*, Binn., jun. "East side of Mullan's Pass, Rocky Mountains, W. T., at an elevation of 5500 ft.," J. G. C.; Black Hills of Nebraska, Dr. V. Hayden; Big Horn Mountains, Nebraska; west side of Wind River Mountains; Rio Piedra, W. N. Mexico, teste Bland. Passes by varieties towards *H. strigosa*, Gld. Hayden's shell from Bridger's Pass, Nebr., referred to by Binn., jun., Journ. A. N. S. Phil. 1858, p. 115, as *H. solitaria*, var., is the young of this species.


8. *Helix arborea*, Say. "Damp bottom lands, along the lower valley of Hell-Gate River, 4500 ft. high," J. G. C. Found from Labrador to Texas, and from Florida to Nebraska; also on the River Chama, N. Mex.; also Guadalupe, teste Beau and Férussac, letter to Say, 1820; teste Bland.

The freshwater shells collected on the Rocky Mountains by Dr. Cooper were determined, with the assistance of Dr. Lea and of Messrs. Binney and Prime, as follows:

11. *Limnea fragilis* [as of] Linn. [Binney]. Hell-Gate River; Missouri River, above the Falls. [= *L. palustris*, auct.]
22. *Annincola*, sp. ind.
24. *Sphaerium* [*Cyclas*] *striatinum*, Lam. Missouri River, above the Falls.
26. *Margaritana margaritifera*, Linn. Missouri River, above the Falls; also Spokane River, below Lake Cœur d'Alène, = *A. falcatus*, Gld.; the purple var. hitherto only found on the Pacific slope.

109. The land-shells of the peninsula of California present points of great interest to the student of geographical distribution. While those of the eastern shore of the Gulf belong exclusively to the Mexican or Central American fauna, those of the western present in their general features that form of the South American type which belongs to the region of the Andes. The contrast between the Glandine and painted Bulimids of Mazatlan, and the small dull forms, or solid white shells of the peninsula, is evident even to the superficial observer. They are catalogued by Mr. Binney in the *Proc. Ac. Nat. Sc. Philadelphia*, 1861, pp. 331-333, and are as follows, outline-figures being given of the new species:

6. *Bulimus proteus*, Brod. One large and many young specimens; Cape St. Lucas, *Xantus*. (Mountains of Peru, teste Pfeiffer.) [C.S. L., no. 167.]
8. *Bulimus artemisia*, n.s. Promontory of St. Lucás. 1 sp. on small species of *Artemisia*; *Xantus*. [C. S. L., no. 169.]
10. *Bulimus incendens*, n.s. In great numbers with *B. pallidior*, Sby., climbing high "copal" or copaiba trees, on dry hills 800-1000 ft. high; Cape St. Lucas, Margarita Bay, *Xantus*. Resembles *B. excelsus*, Gld. [No. 171.]

116
110. At the time of the preparation of the first Report, not a single naturalist was known in Europe to be resident on the western slope of North America, to whom communications could be addressed on the subject of it. There was, however, even at that time, a "Californian Academy of Natural Sciences," which met at S. Francisco, and published its 'Proceedings.' This Academy is now in a flourishing condition, under the presidency of Col. L. Ransom. The general zoological department is under the care of Dr. J. G. Cooper; the shells under that of Dr. J. B. Trask, Vice-President of the Academy, whose name has already appeared in Judge Cooper's Report, ante, p. 597; and the fossils under that of Mr. W. M. Gabb. The corresponding secretary is Dr. W. O. Ayres; and the librarian Prof. J. D. Whitney, the director of the State Geological Survey. Already the nucleus has been formed of a very valuable collection, many of the critical species in which have been sent to England for identification. The coasting-trade between S. Francisco and many stations in L. California, the Gulf, and the Mexican coast, offers peculiar facilities for obtaining valuable information. Two of the contributors to the Californian Academy require special and grateful mention. Dr. Wesley Newcomb (whose labours had greatly enriched the State Collection at his native city, Albany, New York, and whose researches among the Achatinellae in the Sandwich Islands are well known) is stationed at Oakland, near Francisco, and has already furnished valuable papers, an abstract of which is here given, as well as emendations and additions to the British Association Report, which are included in their appropriate places*. The Rev. J. Rowell has long been a regular correspondent of the Smithsonian Institution, and has submitted the whole of his West-coast collections for analysis. He has displayed peculiar industry in searching for small species on the backs of the larger shells, especially the Haliotids of the Californian coast, and the Ostrea iridescens, which is imported in large quantities from Acapulco for the San Francisco market.†

In the 'Proc. California Ac. Nat. Sc.,' vol. i. pp. 28–30, Feb. 1855, Dr. J. B. Trask published descriptions of Anodonta Randallii, Trask, Upper San Joaquin; Anodonta triangularis, Trask, Sacramento River; Anodonta rotund-ovata, Trask, Sacramento Valley; A. aspera, Trask, Yuba River.


* The "Chiton amiculatus," Newc., MS., = Cryptochiton Stelleri. "Rare near S. Francisco; somewhat more abundant in the Bay of Monterey." His "Panopea generosa," in the Albany Museum, was found to be Schizothorus Nutallii.

† As an instance of the way in which mistakes arise, may be placed on record a series of shells sent to Mr. Rousseau, of Troy, New York, by Mr. Hilman, formerly of that city, now a resident at S. Francisco. They were sent as Californian; yet, of the thirty-four species which it contained, only one could be called a native of that province. All the rest were tropical, and of that peculiar character which belongs to Acapulco. No doubt, the gentleman had obtained them from a trader to that city. If only a few species had been sent, mixed with Californian shells, they might have puzzled the learned; for they were obtained, on the spot, by a gentleman of known integrity. As it was, the magnitude of the error led to its discovery: but in how many similar cases such error is thought impossible! — Strigilla cornaria; Donax carinatus, puncto-atriatus; Heterod. bimaculatus; Calista aurantia, chionea; Petr. robusta; Card. consors, biangulatum; Lioeard. apicinum; Trigona radiata, Hindssii; Anom. subhirsuta; Lima tetraca; Siphonaria gigas, lecanium; Patella discoana, pediculus; Fiss. rugosa; Cruc. imbricatum, spinosum, umbrella; Crep. aculeata; Hipp. antiquatus, barbatus; Cerith. uncinatum; Modulus discuslus; Nat.ca marocacana, catenata; Polinices uberc; Lenc. cingulata; Eneta harpa; Purp. triangularis. The single shell from the temperate fauna is Glyphis aspera.


In the 'Proc. Ac. Nat. Sc. Philadelphia, 1861,' pp. 367–372, Mr. W. M. Gabb published "Descriptions of New Species of American Tertiary Fossils," in which occur several Californian shells. The authorities for the localities are not given, and the diagnoses are in English only. Considerable confusion often arises from the study of tertiary fossils without knowledge of recent shells, and *vice versa*. Mr. Gabb's writings on the Cretaceous fossils of America display an ability with which this paper is perhaps not commensurate. Some errors which had been found very difficult to understand are here corrected by the author himself, who regrets the incompleteness of his earlier work.


"*Modelia striata*, Gabb. Sta. Barbara, ?Miocene. [=*Lacuna carinata*, Gld. teste Gabb MS. and specimens. Mr. Gabb considers that *Litorina Pedrotina* Conr., is the same species, which is probably not correct.]

369. *Sphenia bilirata*, Gabb. Sta. Barbara. [Description accords with *Saxicava arctica*, jun., var.; but Mr. Gabb considers it a good species.]


371. *Cardita monnicosta*. ?Miocene, Sta. Barbara. [Description accords with *Venericardia ventricosa*, Gld. jun.; but Mr. Gabb considers it a good species.]


In the 'Proceedings of the Calif. Ac. Nat. Sc.' for April 7th, 1862, pp. 170–172, Mr. W. M. Gabb published detailed English "Descriptions of two Species of Cephalopoda in the Museum of the Academy," of which one, *Onychoteuthis fusiformis*, is said to be from Cape Horn, the other from California.


* That the race of small *Pupa* is very ancient on the North American continent, as in Europe, is evident from the very interesting discovery, by Prof. Dawson, of a fossil *Pupa*, *in situ*, nesting in an upright tree, fossilized in the Nova Scotian coal-beds; which can scarcely be distinguished, even specifically, from some living forms.
From the 'Proc. Cal. Ac. N. S.,' 1863, p. 11, it appears that at least one mollusc, a Teredo or Xylotrya, has already established for itself an economic celebrity. Piles have been entirely destroyed in six months from the time they were placed in the water.

On March 2, 1863, Mr. Auguste Remond published, in the same Journal, English "Descriptions of two new Species of Bivalves from the Tertiaries of Contra Costa County:"

13. Cardium Gabbii, Rem. Late tert. deposit near Kirker's Pass, in shelly sand, with Tapes regularis, Gabb, and Murex ponderosus, Gabb, both extinct. "Easily recognized by heavy hinge and enormous laterals; lunule carinated." [? Liocardatum.]

Ostrea Bourgeoisii, Rem. Same locality.

On April 20, 1863, Dr. Cooper described (in English) the following mollusce, of which the only species previously known is from Cuba:

21. Gundalia California, Rowell. Fig. 5 (three views). Fifty specimens on water-plants in clear, stagnant ponds, at Marysville, Feather River, Rowell.

On January 8, 1864, Dr. Newcomb described (in Latin) the following, with other Pulmonates from the State Survey, already tabulated in p. 609:


The latest contribution to the malacology of California is one of the most interesting. It is described (in Latin) by Dr. Newcomb, Feb. 1, 1864:

121. Pedicularia California, Newc. One specimen from coral growing on a monster Echidnocerus, very deep water, Farallones Is., D. N. Robinson. "As beautiful as P. elegantissima, Desh., from Is. Bourbon." [Mr. Pease also obtained a deep-water Pedicularia from coral in the Pacific Is., which Mr. Cuming affiliated to the Mediterranean P. Sicula. Dr. Gould (Otia, p. 215) also describes P. decussata, coast of Georgia, 400 fm., U. S. Coast Survey.]

111. The following descriptions of species, and notes on habitats and synonymy, have been collated from various American scientific periodicals, chiefly by the assistance of Mr. Binney's 'Bibliography.'

In the 'American Journal of Science and Art,' O. S., vol. xxxviii. p. 396, April 1840, Dr. A. A. Gould records the following species, said to be from "California." His Trochus vittatus is not known:

Murex tricolor et bicolor.              | Trochus vittatus.
Cardium Californianum.               | Bulimus undulatus.

In the 'Annals of the New York Lyceum of Natural History,' vol. iv 1846, No. 5, p. 165, Mr. John H. Redfield first described Triton Oregonense, Straits of San Juan de Fuca: plate 11. fig. 2.

In the 'Proceedings of the Academy of Natural Sciences of Philadelphia,' 1848, vol. iv. p. 121, Mr. T. A. Conrad described new genera, and gave notes or Parapholas Californica, CRYPTOMYA CALIFORNICA, and Psammobia Californica, altering Osteodisma hyalina (nom. prec.) into Lyonia Floridana. In the same work, March 1854, vol. vii., Mr. Conrad described Cyathodonta undulata. He also states that Gnathodon trigonum. Petit, is probably identical with G. Lecontei, Conr. [7] (nom. prior), and alters genus Trigonella to Pachydesma.

In the ‘Proceedings Ac. Nat. Sc. Phil.,’ April 1856, vol. viii. pp. 80, 81, Dr. Isaac Lea described the following species of new freshwater shells from California:

- *Pompholyx effusa*. Sacramento River.
- *Melania migrina*. Clear Creek, Shasta Co.
- *Physa trilacea*. Shasta Co.
- *Planorbis Traskii*. Kern Lake, Tulan Co.
- *Lymnaea proxima*. Arroya, St. Antonio.
- *Ancylus patelloides*. Sacramento River.

and offered notes on

- *Helix Nickliniana*, Lea. Tomales Bay and Dead Man’s Island.

In the New Series of the ‘Proc. Ac. Nat. Sc. Philadelphia’ occur descriptions and notes on species, as under:

<table>
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<th>Page</th>
<th>Description</th>
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<tr>
<td>1857. March 41.</td>
<td>Mr. T. A. Conrad described the genus <em>Gonidea</em> for <em>A. angulata</em>, Lea; and for <em>Gonidea Randallii</em>, Trask, and <em>Gonidea feminalis</em>, Gld.; regarding the three species as probably distinct. [Dr. Lea, however, considers them varietal.]</td>
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In the “Notes on Shells, with Descriptions of New Genera and Species,” by T. A. Conrad, reprinted from the ‘Journ. Ac. Nat. Sc. Phil.,’ Aug. 1849, are given the following synonyms, pp. 213, 214:—

On Mollusca of the West Coast of North America.

In his "Synopsis of the Genera Parapholas and Penitella," from the same source, p. 335, are given as synonyms—

*Penitella melanura*, Sby., = *Penitella Wilsoni*, Conr. (not *Parapholas bisulcata*).

In the elaborate but somewhat intricate "Monograph of the Order Pholadacea," &c., by G. W. Tryon, jun., Philadelphia, 1862, the following species are quoted from the West Coast, and form the conclusion of the marine shells hitherto described, so far as known to the writer:

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74. *Pholas (Cytropleura) truncata*, Say. Massachusetts; S. Carolina; Payta, Peru, Ruschenberger; Chili.


67. *Penitella penita.* [Mr. Tryon erroneously quotes (Netastoma) Darwinii, as well as *Ph. cornea*, as synonyms.]


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112. The following Table contains a complete list of all the Molluscs which have been identified, from Vancouver Island to S. Diego, arranged so as to show at the same time their habitat, and the principal collectors who have obtained them. The species in the first column were obtained by Prof. Nuttall; in the second, by Col. Jewett. The third column (marked B.A.) contains the species tabulated from other sources in the First Report. Those to the right of the double column are the fresh explorations recorded in this Supplementary Report. The fourth column contains the shells brought by the Pacific Railroad Expeditions, as well as the species sent to the officers of the Smithsonian Institution by the Rev. J. Rowell and their various correspondents. The fifth column ('Ken.') contains the species of the American, and the sixth ('Lord') of the British North Pacific Boundary Survey. The seventh records the collections of Mr. Swan and his Indian children; the last, those of Dr. Cooper in the Californian Geological Survey. As a large proportion of the species are as yet unknown, and the diagnoses will be found scattered in various periodicals, some of which are rarely accessible in this country, it has been judged needful to add a few words of description, with references to well-known books. By this means the student will have before him a compact handbook of the fauna, and will distinguish at a glance the range of localities, and the amount of authority for each. For the full synonymy, the previous pages of the two Reports must be consulted.

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121
Results of the Explorations in the Vancouver and Californian Province. 1864. (Omitting the doubtfully located and undetermined species.)

The letters stand for the localities in which the shells were collected, as follows:

V. Vancouver Island, Straits of S. Juan de Fuca, and adjoining shores of Washington Territory, formerly known as 'Oregon.'

P. Puget’s Sound and the neighbourhood.

O. Oregon; and the region on each side of the Columbia River.

C. California; or the district north of the peninsula, generally.

L. Peninsula of Lower California.

F. Neighbourhood of S. Francisco.

M. Neighbourhood of Monterey.

B. Sta. Barbara.

D. The region between S. Diego and S. Pedro.

I. The islands: in the 4th column, generally the Farallones; in the last, the Sta. Barbara group.

H. Species obtained from the backs of Haliotids; locality unknown; probably Lower California.

fr. Fragments only.

fos. Only found fossil.

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<td>1. Lingula albida</td>
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<td>2. Rhyconella psittacea</td>
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<td>3. Terebratula unguiculus</td>
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<td>4. Waldheimia pulvinata</td>
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<td>5. —— Californica</td>
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<td>7. Terebratella Coreanica</td>
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<td>9. Xylotrya pennatifera</td>
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<td>10. —— fimbriat</td>
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Guide to the Diagnosis of the Vancouver and Californian Shells.

Class Polyzoa. Family Discoporidea.

Defrancia intricata, Bisk. Maz. Cat. no. 13. From Southern fauna. The remaining species in this class have not yet been determined.

Class Palliobranchiata. Family Lingulida.


Family Terebratulidae.

3. Terebratula unguiculus, n. s. Like Terebratula caput serpentis in size, shape, and sculpture; but loop incomplete in adult, as in T. vitrea. 6-20 fm. nov. r. Cp.


5. ? Waldheimia Californica, Koch, non auct. Colour ashy. Intermediate between Coreanica und globosa, Lam., Rve. (which is Californica, auct. non Koch).


8. Terebratella caurina, Gld. E.E. Like dorsata; subtriangular, ashy, with strong or faint ribs.

Class Lamellibranchiata. Family Tereididae.


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<td>12. Pholadidea penita</td>
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<td>14. Netastoma Darwinii</td>
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<td>15. Martesia intercalata</td>
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<td>16. Parapholas Californica</td>
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<td>17. Saxicava pholadis</td>
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<td>18. Glycimera generosa</td>
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<td>19. Mya truncata</td>
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<td>20. Platyodon cancellatus</td>
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<td>21. Cryptomya Californica</td>
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<td>22. Schizothaerus Nuttallii</td>
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<td>23. Darina declivis</td>
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<td>24. Corbula luteola</td>
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<td>25. Sphaena ovoidea</td>
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**Family Pholadidae.**


**Family Saxicavidae.**

17. *Saxicava pholadis*, Linn. auct. + var. arctica, Linn. auct. Maz. Cat. no. 23 + var. gastrochaenoides, ovoid and gaping like Maz. Cat. no. 21 + var. legumen, Desh., elongate, cylindrical, scarcely gaping.

**Family Mydae.**


**Subfamily Lutrariae.**


**Family Corbulidae.**

25. *Sphaena ovoidea*, n. s. Siphonal area small; front excurved; mantle-bend large.
26. *Neerea pectinata*, n. s. Principal ribs about 12; beak smooth. Like *sulcata*.

40–60 fm. *Cp.*
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<td>27.</td>
<td>Clidiophora punctata</td>
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<td>28.</td>
<td>Kenmeria filosa</td>
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<td>— bicarinata</td>
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<td>Periplomaargentaria</td>
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<td>Thracia curta</td>
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<td>Lyonsia Californica</td>
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<td>— Entodesma saxicola</td>
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<td>— inflata</td>
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<td>Mytilimeria Nuttallii</td>
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<td>36.</td>
<td>Plectodon scaber</td>
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<td>Solen siciarius</td>
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<td>Machera patula</td>
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<td>Sanguinolaria Nuttallii</td>
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<td>42.</td>
<td>Psammobia rubroradiata</td>
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**Family Pandoridae.**

27. Clidiophora punctata, n. g. (Type of genus=Pandora claviculara, P. Z. S. 1855, p. 228.) Teeth \( \frac{1}{2} \), posterior long, with oscilse. Conr. sp.; like Cl. trilineata, but teeth more divergent; inside strongly punctate.


**Family Anatinidae.**


**Family Soleinidae.**


37b. Solen = var. rosaceus. Straight, narrower, longer, smaller; glossy, rosy.

**Family Solecirtidae.**


**Family Tellinidae.**


42. Psammobia rubro-radiata, Nutt. Large: shape of vesertina: rayed with lilac.

124
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<td>43 b.</td>
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<td>54. Tellina Bodegensis</td>
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<td>Arccapogia lamellata</td>
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<td>56.</td>
<td>Ædalia subdiaphana</td>
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<td>Cooperella scintilleformis</td>
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<td>Lutricola alba</td>
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43. **Macoma secta**, Conr. Hanl. Large, flat, rounded, glossy; winged behind ligament.

43 b. **Macoma var. edulis**, Nutt. Northern form, less transverse; texture dull.

44. **Macoma indentata**, n. s. Like secta, jun., but beaked, indented, and ventrally produced.

45. **Macoma yoldiformis**, n. s. Small, white, glossy, very transverse; ligament-area scooped-out.

46. **Macoma nasuta**, Conr. auct. + tersa, Gld. Large, beaked, twisted; mantle-bend touching opposite scar in one valve. From Kamischatka to S. Diego. Cape Lady Franklin, 76°; Becher, 1826. 3 ft., mud, between tide-marks, Lord.

47. **Macoma inquinata**, Desh. P. Z. S. 1854, p. 357. Like degraded nasuta; mantle-bend a little separated from scar in both valves.

47 b. **Macoma ?edentula**, Brod. & Sby. jun.; or an abnormal var. of inquinata.

48. **Macoma var. expansa**. Scars like lata and calcarea in Mus. Cum., but teeth not bifid, very thin, glossy. Scarcely differs from lata, Desh. in B. M. Greenland.


50. **Angulus modestus**, n. s. (Subg. of Tellina.) Like tener, Say; but with callus between mantle-bend and scar. White.

50 b. **Angulus ?var. obtusus**. Inside like modestus; but beaks obtuse.


55. **Arccapogia lamellata**, Maz. Cat. no. 58. One fine pair in shell washings.

56. **Ædalia subdiaphana**, n. g., n. s. Thin, swollen, shape of Kellia, ligament surrounding beaks: hinge with 5 bifid teeth (3-2); no laterals; large mantle-bend.

57. **Cooperella scintilleformis**, n. s. New subgenus of Ædalia. Cartilage semi-internal: only 1 tooth bifid.

58. **Lutricola alba**, Conr. (Tellina). For this group (= Capsa, “Bosc,” Add. non Lam.), scarcely agreeing with either Macoma or Scrobicularia, Blainville’s 125
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<td>59.</td>
<td>Semele decisa</td>
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<td>61.</td>
<td>— — rubrolineata</td>
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<td>— — incongrua</td>
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<td>64.</td>
<td>Cumingia Californica</td>
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<td>69b.</td>
<td>—— nasuta</td>
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<td>— — planulata</td>
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<td>— — falcata</td>
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<td>72.</td>
<td>Raëta undulata</td>
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<td>73.</td>
<td>Clementia subdiaphana</td>
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<td>75.</td>
<td>Pachydesma crassatelloides</td>
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<td>Psephis tantilla</td>
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Synonymic name may be revived in restricted sense. Species = biangulata, P.Z.S. 1855, p. 230.

59. Semele decisa, Conr. auct. Large, rough, like Peruvian corrugata, but truncated.


61. Semele rubrolineata, (? Conr.). Flattened, same shape, with faint sculpture each way, and pink rays. [Conrad’s lost shell may be young decisa.]

62. Semele pulchra, Sby. Transverse, crowded concentric sculpture, with radiating lines at sides. Southern fauna.

63. Semele incongrua, n.s. Like pulchra, with concentric sculpture differing in r. and l. valves: fine radiating striae all over. 40–60 fm. c. Cp.

64. Cumingia Californica, Conr. auct. Maz. Cat. no. 44.


66. Donax flexuosus, Glid. Like punctostrates jun. with stronger keel, and no punctures.

67. Donax navicula, Sby. Maz. Cat. no. 77. From Southern fauna.


Family Macrider.  

69. Standella Californica, Conr. (non Desh.). Large, shaped like Schiz. Nuttali, but beaks narrow. Mantle-bend separate from ventral line.

69b. Standella ? var. nasuta, Glid. (suppressed). Revived for young shells between Californica and planulata, till more is known.  

70. Standella planulata, Conr. Nearly as large; shape approaching Mactrella exotea.

71. Standella falcata, Glid. Otia. Shape like planulata, but flatter.


Family Veneride.  

73. ? Clementia subdiaphana, n.s. Hinge normal, very thin, ashy.


75. Pachydesma crassatelloides, Conr. auct. Subgenus of Trigona, with fewer teeth: jun. = stultorum, Gray.


126
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79. *Psephis tellimaalisa*, n. s. Shape of *Tellima*: central tooth minute; outside teeth long.


86. *Tapes lacinata*, n. s. Large, swollen, brittle, ashen; sculpture pectinated.


90. *Saxidomus squallidus*, Desh. Large, variable outline, broader, scarcely sculptured.

91. *Saxidomus brevisiphonatus*, n. s. Smaller, *Callista*-shaped; close, faint concentric lines over distant waves; mantle-bend very small.

Family *Petricolidae*.


Family *Chamidae*.


127

Family Cardiidae.


98. Cardium quadrangularam, Conr. = luteolabrum (=xanthochileum), Gld. Very large; 40 ribs, with aculeate spines.


Family Astartidae.

105. Astarte compacta, n. s. Like compressa, but closer; dorsal margins straight, at right angles.


108. Miodon prolongatus, n. g., n. s. Outside Lucinoid; hinge and scars nearer to Venericardia. Congeneric with Astarte orbicularis, J. Sby. Min. Conch. pl. 444. f. 2, 3 (non ejusdem, pl. 520. f. 2). G. Oolite; and with the Crag Cardia corbis.


110. Lazaria subquadrata, n. s. Hinge of Lazaria; outside like Cardia variagata, jun.

Family Lucinidae.

111. Lucina Nutalli, Conr. Hanl. Like muricata, with more delicate sculpture.


113. Lucina bella, Conr. Shell not known; may be =pectinata, Maz. Cat. no. 142.

114. Lucina teniscula tu. n. s. Like Mazaltinica, Cat. no. 144, more convex, with finer sculpture. 4 fm. living, Cp. The island var. is intermediate. 120 fm. dead, Cp.
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<td>124. Lepton merœicum</td>
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<td>125. Tellimya tumida</td>
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<td>126. Pristes oblongus</td>
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<td>127. Mytilus Californianus</td>
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<td>133. — recta</td>
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117. Cryptodon saccatus, n.s. Small, circular, flat; epidermis silken. ? Cat. Is. Cp. 120 fm.

**Family Diplodontaide.**


**Family Kelliaide.**

120. Kellia rotundata, n.s. Larger, flatter, and less pearly than suborbicularis. Margin circular.
123. Pythina rugifera, n.s. Large, thin, slightly indented; teeth minute; epidermis shaggy.
124. Lepton merœicum, n.s. Small, shaped like Sunapta.
125. Tellimya tumida, n.s. Between bidentata and substriata: ossicle minute.
126. Pristes oblongus, n.g., n.s. Like Tellimya, with long marginal teeth, serrated near hinge.

**Family Mytilide.**

127. Mytilus Californianus, Conr. 9 in. long: stained with sienna: obsoletely ribbed.
128. Mytilus edulis, Linn. auct. = trossulus, Gld. Abundant on whole coast, with the usual Atlantic vars. Between tide-marks, Lord: also brown var. on floating stick.
132. Modiola fornicatea, n.s. Short, swollen, like large M. marmorata; but smooth, not crenated.
133. Modiola recta, Conr. 6 in. long, thin, narrow, rhomboidal. Chaff-like hairs over glossy epidermis.

9

129


135. *Adula stytila*, n. s. Shorter, broader; epidermis brown, glossy.


**Family Arcade.**


144. *Axineea (? septentrionalis*, Midd. var.) subobsoleta. Sculpture much fainter than in *Midd.*'s fig.

**Family Nuculide.**


151. *Leda hamata*, n. s. Like *Steinstrupi* and *pernuloides*, but very hooked, sculpture strong. 20-60 fm. c. *Cp.*
OX MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

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<td>— amygdala</td>
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153. Yoldia amygdala, var. teste Hanl. Like lanceolata, without posterior wing, and anterior sculpture.

Family Trigonidae.


Family Auriculidae.


Family Pectinidae.


158. Pecten hastatus, Sby. = hericcus, Gld. Elongated; a few principal ribs serrated; ears unequal. In var. rubidus, Hds. (non Mart.), the ribs are equal, not serrated.

159. Pecten (? var.) Hindsi. Broader; ribs close, small, smooth, bifurcating. Passes from hastatus towards Islandicus.

160. Pecten equisulcatus, ? n. s. Thinner and flatter than ventricosus, with narrower ribs.

161. Pecten paucicostatus, ? n. s. Somewhat resembling very young caurinus; but ribs fewer, stronger.


Family Spondylidae.


Family Ostreidae.

66. Ostrea lurida, n. s. Shape of edulis: texture dull, lurid, olivaceous, with purple stains. 2–3 fm. on mud flats, Lord.

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166d. *Ostrea* ? var. *expansa*. Flat, affixed to whole surface, like *Columbiensis*. Round, or winged to left, or right, or both, like *Malleus*. Also passes into *Ostrea conchaphila*, Cpr. Maz. Cat. no. 214. From Southern fauna.

**Family Anomiadea.**


**Class PTEROPODA.**

**Family Hyaleide.**

170. *Cavolina telemus*, Linn. = *Hyalea tridentata*, Forsk. non Lam. Pelagic. 30-00 fm. dead, Cp. [Other Pteropods were brought by the Brit. N. P. Boundary Survey, but may have been collected on the voyage: e. p. 607.]

**Class GASTEROPODA.**

**Subclass Opisthobranchiata.**

**Order Tectibranchiata.**

**Family Bullidæ.**


**Family Philinide.**

Two species not yet dissected: one with internal shell like *Phanerophthalmus*.

**Family Tornatellidæ.**


**Family Cylindraceæ.**

ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

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<td>180. Cylichna eylindracea</td>
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<td>183. Volvula cylindrica</td>
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<td>184. Neaplysia Californica</td>
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177b. Tornatina cerealis, Gld. Otia. Small, white, smooth: but probably = worn young culicetella.


179. Tornatina carinata, Maz. Cat. no. 223.

180. Cylichna eylindracea, Linn. auct. Intermediate specimens, passing into

180b. Cylichna var. ationsa, rounded off at apex.

181. Cylichna planata, n. s. Like mamillata, with apex flattened-off, and fold distinct.


183. Volvula cylindrica, n. s. Like grain of rice, pointed at one end.

Family Aphysiade.


Family Pleurophyllidiade.


Order Nudibranchialta.


Subclass Pulmonata.

For land and freshwater species, both of Pulmonates, Rostrifers, and Eivizer, vide postei, paragraphs 115-119.

Family Auriculide.


Family Siphonariade.

201. Siphonaria Thersites, n. s. Like lateralis: with strong lung-rib and obsolete sculpture.
Subclass Prosobranchiata.  Order Lateribranchiata.

Family Denticulidae.


204. Dentalium semipolitum, Br. & Sby. ? = hyalinum, Phil. not Maz. Cat. no. 245. From Southern fauna.

205. Dentalium hexagonum, Sby. From Southern fauna.

Order Scutibranchiata. Family Chitonidae.


209. Tonicia submarmorea, Midd. Perhaps = lineata, var. without lines.


211. Mopalia Wosnessenskii, Midd. Mantle slit behind, with few hairs. Sculpture like muscosa.


212b. Mopalia Kennerleyi, var. Swanni: red, ridge arched; less sculptured.


214. Mopalia Simpsonii, Gray, in B.M. Col. Like Hindisi, with valves beaked.

215. Mopalia vespertina, Gld. E. E. Shape of Hindisi, with very faint sculpture and slight wave. Olive clouded with brown.


218. Mopalia simnata, n. s. Small, raised sharp back, red and blue, engine-turned; post. valve deeply notched.

219. Mopalia imporcata, n. s. Pale: central areas ribbed: post. valve slightly notched. Indications of sutural pores in these two species, if confirmed, will require a new genus.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 649

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221. Acanthopleura fluxa, n. s. Green, mottled with orange-red; not beaked; with only marginal and diagonal ribs.  
223. Ischnochiton vere dentiens, n. s. Margin similar. Small, arched, sculptured like Mertensi, but with 2 rows of bosses, one of which dentates the sutures, 10-20 fm. Cp.  
228. Trachydermon retiporosus, n. s. Subgenus of Ischnochiton: mantle-scales very small, close, smooth. Sp. like scrobiculatus, central pattern in network, 3-6 side ribs.  
230. Trachydermon trifidus, n. s. Centre-punctures few, deep: 2-4 blunt ribs: side plates with 2 slits.  
231. [ Trachydermon dentiens, Gld. E.E. No shell known answering to diagnosis and figure.] The 4 following species have incisors blunt, eaves not projecting.  
231 b. Trachydermon pseudo dentiens= type specimen of dentiens. False appearance of teeth due to colour or ridges of growth. Closely granular: areas indistinct. Sinus broad, square: eaves spongy.  
235. Trachydermon flectens, n. s. Mantle-margin scarcely granular. Rosy, very small, scarcely sculptured: valves beaked and waved as in M. Simpsonii; eaves and incisors normal.  

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Family Patellidae.


Family Acmaeidae. (For synonyms, v. Reports in locis.)

244. Acmea pelta, Esch. More conical; border narrow; smooth, with blunt ribs often obsolete. Between tides, Lord.
247. Acmea spectrum, Nutt. Rve. Flattened, with very strong ribs, irregular.
250 b. Scurria ?var. funicularata. With rounded riblets, somewhat nodulous.

136

Family *Gadiniidae*.


Family *Fissurellidae*.


Family *Haliotidae*.


Family *Trochidae*.

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208. *Imperator serratus*, n. s. Small, finely sculptured, base stellate, nucleus Plan-orboid: operc. flat, with more whirls. 10–20 fm = 260 or 267 jun. teste *Cp*.

209. *Leptonyx sanguineus*, Linn. n. g. Like *Collonia*, not umbilicate. Operc. with horny and shelly layers, many whirls, outside flattish, not ribbed, margin broad. Species red or purple, lirate. *Bch.*–20 fm. *Cp*.


276. *Trochiscus convezzus*, n. s. Small, subburrited, whirls swollen: umbilicus with 2 ribs, the outer crenated.


277 b. *Chlorostoma funebrale*, var. subapertum, with umbilical pit.


286. *Calliostoma variegatum*, n. s. Small, more conical, nodes more distant, white on rosy ground.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 653

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287. *Calliostoma supragranosum*, n. s. Swollen, with sharp ribs; posterior 1–4 granular.


292. *Gibbula optabilis*, n. s. Wider; decussated between ribs: 2 spiral lines inside umbilicus.


294. *Gibbula succincta*, n. s. Small, scarcely sculptured, with spiral brown pellcillings.


297. *Margarita cidaris*, A. Ad. n. s. Large, knobby, like thin *Turricula*, with simple pillar and small umbilicus.


300. *Margarita inflata*, n. s. Thin, whirs very swollen; sculpture very fine; spiral hollow inside keeled umbilicus.


139
Order Pectinibranchiata. Suborder Rostrifera.

Family Calypteridae.

311. Crepidula navicelloides, Nutt. Shape of squama, with nucleus of unguiformis (Maz. Cat. no. 342). Rounded var. in hollow bivalves==membranis, Gld. Var. drawn out in layers like Lessoni==fimbriata, Rve. Var. elongated in crypts, scooped by crab or bivalve==explanata, Gld.==exuviata, Nutt.==perforans, Val.

Family Capulidae.

314. Hippomyx cranioideus, n. s. Large, rough, flat, intermediate between planatus and

Family Vermetidae.

319. Biconia compacta, n. s. Entirely open within: but colour and growth like
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Family **Cecidae**.

322. *Cecum crebricinctum*, n. s. Large, with aspect of *Elephantum*, but very fine close annular sculpture; plug subungulate. 8–20 mm. *Cp.*

323. *Cecum Cooperi*, n. s. Small, with 30–40 sharp narrow rings.

Family **Turritellidae**.


325. *Turritella Jewettii*, n. s. Like *sanguinea*, with very faint sculpture.


Family **Cerithiidae**.


331. *Bittium quadrifilatum*, n. s. Broad: 4 threads, equal from beginning, coiling over strong radiating ribs.


333. *Bittium armillatum*, n. s. Same aspect: 3 nearly equal rows of knobs.


Family **Litorinidae**.


* These species have so peculiar a nucleus that they can scarcely rank near *Cerithium* or *Kossa*; perhaps they are related to *Aiaba*. The nucleus of *esuriens* and *attenuatum* has not been seen.
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<td>Amphithalamus inclusus</td>
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339. ? *Paludinella*, sp. May be an aberrant *Assiminea*.


343. *Lacuna variegata*, n.s. Very small, effuse, irregular with wide chink: clouded or with zigzag stripes: like *decorata*, A. Ad.


345. *Isapis fenestrata*, n.s. Like *oorideia*, with sharp distant ribs.


**Family Rissioideae.**

347. *Rissoina interfossa*, n.s. With 5 sharp keels crossing 14 strong ribs. 8–10 fm.


351. *Alvania filosa*, n.s. Turrited: pillar purple-stained: 18 close spiral striae, passing over very faint waved riblets.


355. *Amphithalamus inclusus*, n.g., n.s. Habit of minute *Nematura*; labrum not contracted, but labium in adult travels forward to meet it, leaving a chamber behind. Nucleus cancelled: base bluntly ribbed.

142
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356. ?Amphithalamus lacunatus, n.s. Same nucleus; base chinked, not keeled. (Adult not found.)

Family Truncateallidae.


Family Jeffreyisidae.


359. Jeffreyisia transducens, n.s. Possibly a Barleeia; pillar thickened, base rounded.

360. Cithna albida, n.s. Very close to C. tenuis, Maz. Cat. no. 421, but umbilicus angled, not keeled.

Family Planaxide.

361. Diala marmorea, n.s. Solid, glossy, clouded with red; base faintly angled.


363. Styliferina turrita, n.s. Minute, slender, base rounded.

Family Oselide.


Family Cypride.

365. Luponia spadicea, Gray. Like onyx, but light-coloured.

366. Trivia Californica, Gray. Small; ribs sharp, distant.


Suborder Toxifer. Family Terebride.


Family Pleurotomide.


372. Drillia incisa, n.s. Like inermis; spiral sculpture grooved, not raised.

373. Drillia maesta, n.s. Like large luctuosa; middle whirls with long transverse ribs and posterior knobs; adult obsolete.

374. Drillia torosa, n.s. Whirls rounder, olivaceous: with one row of strong bosses throughout: no posterior knobs.

374 b. Drillia ?var. aurantia. Orange, with sutural riblet and faint spiral sculpture. 1863.
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375. Drillia penicillata, n. s. Like *inermis*, with delicate brownish pencillings.
376. Drillia* cancellata, † n. s. Like the young of *incisa*, but nodosely cancellated.
377. Mangelia levidensis, n. s. Stumpy, purplish brown, with rough sculpture.
379. Mangelia interfossa, n. s. Like *attenuata*, delicately cancellated.
380. Mangelia crebricostata, n. s. Like *septangularis*, with closely set ribs.
381. Mangelia variegata, n. s. Small, slender, thin, zoned with brown: 9 narrow ribs, and strong spiral striae.
382. Mangelia angulata, n. s. Shape of variegata, but brown, whirls broad, angular.
385. ?Daphnella † aspera, n. s. Elongated, with coarse fenestration.
386. ?Daphnella † filosa, n. s. Small, diamond-shaped, but rounded periphery; spirally threaded.

Family Conida.


Suborder Proboscidifera. Family Pyramidellidae.

390. Odostomia nuciformis, n. s. Very large, solid, Tornatelloid.
390 b. Odostomia *var. avellana*. Shape of conoidalis.
391. Odostomia satara, n. s. Large, with swollen whirls like *Bithinia similis*.
392. Odostomia gravida, Gld. Ota. Like conoidalis, but nucleus minute.

* A peculiar group of species, resembling *Chionella* (marine, teste *Stimpson*).
† Generic position of all these doubtful; perhaps they belong to genera not yet eliminated: *filosa* resembling the Eocene forms between *Conus* and *Terebrata*.

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394. **Odostomia straminea**, n. s. Like tall var. of *inflata*, with straw-coloured epidermis, not striulate.

395. **Odostomia tenuisculpta**, n. s. Like *sublirulata*, Maz. Cat. no. 487, with obsolete sculpture throughout.


397. **Chrysallida pumila**, n. s. Like *ovulum*, Maz. Cat. no. 512, but slender; spiral lines delicate.


399. **Chemnitzia tridentata**, n. s. Large, chestnut: 19–24 ribs, evanescent at periphery: waved interspaces with 8–10 spiral grooves: labrum with 3 teeth, hidden as in *Obeliscus*: base round.

400. **Chemnitzia chocolata**, n. s. Same size and colour: not toothed: base prolonged: crowded ribs minutely striulate between.

400b. **Chemnitzia var. aurantia**. Intermediate between the above: orange, base round: 16 ribs, striulate between.


401b. **Chemnitzia var. subcuspidata**. Ribs more distant, muricated at sutures.

402. **Chemnitzia crebriflata**, n. s. Slender, whitish: with 8 spiral threads passing over 24 ribs, evanescent round base.


403b. **Chemnitzia var. styliana**. Like *torquata*, tapering, less swollen in front, with more ribs, band less marked.

404. **Chemnitzia virgo**, n. s. Very slender, with short, smooth base: 18 ribs, evanescent at periphery, and 8 spiral grooves.

**Family Eulimidae.**


406. **Eulima compacta**, n. s. Small, with blunt spire and elongated base.


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<td>419.</td>
<td>Cerithiopis tuberculata</td>
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<td>422.</td>
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<td>425.</td>
<td>Triforis ?adversa</td>
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<td>426.</td>
<td>Cancellaria modesta</td>
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<td>V</td>
</tr>
</tbody>
</table>

Family Scalariidae.


411. Scalaria subcoronata, n. s. Like young communis, with more and sharper ribs, faintly coronated when adolescent.


413. Scalaris bellastrata, n. s. Shape like pretiosa, jun.: ribs very close, spinous at shoulder, crossed by spiral riblets.


415. Opalia (Perenatoideas, var.) insculpta. Like the C. S. L. form and crenata, but ribs closer, without spiral sculpture, sutural holes behind the basal rib.

416. Opalia spongiosa, n. s. Like small, very slender granulata: surface riddled with deep punctures in spiral rows.


418. Opalia bullata, n. s. Shape of Rissoina: with sutural bosses: no basal rib.

Family Cerithiopsidae.

419. Cerithiopis tuberculata, Mont. Fbs. & Hanl. Agrees with the British rather than with the Mazatlan form, Cat. no. 557.


423. Cerithiopis fortior, n. s. Sculpture open: strong basal rib.


Family Cancellariidae.

426. Cancellaria modesta, n. s. Like Trichotropis borealis, with two slanting points and spiral ribs travelling up the paries. See also p. 615, nos. 463, 817.
### ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 661

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<td>Velutina lavigata</td>
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<td>Natica clausa</td>
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<td>Lunatia Lewisi</td>
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<tr>
<td>434.</td>
<td>Neverita Recluziana</td>
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<tr>
<td>435.</td>
<td>Priene Oregonensis</td>
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<td>436.</td>
<td>Ranella Californica</td>
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<td>MitrA maura</td>
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<tr>
<td>438.</td>
<td>Marginella Jewettii</td>
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<tr>
<td>439.</td>
<td>— subtrigona</td>
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<td>B</td>
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<tr>
<td>440.</td>
<td>— regularis</td>
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<td>441.</td>
<td>Volutella pyriformis</td>
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<td>442.</td>
<td>Volvarina varia</td>
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<td>443.</td>
<td>Olivella biplicata</td>
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<td>C</td>
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<tr>
<td>444.</td>
<td>— bætica</td>
<td>—</td>
<td>B</td>
<td>OC</td>
<td>M</td>
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</table>


#### Family Velutinidae.


#### Family Naticidae.


434. *Neverita Recluziana*, Petit, Rve. Large, solid, raised, with brown grooved lump on pillar. Also Guaymas.

#### Family Tritonidae.


#### Family Fasciolariidae.


#### Family Marginellidae.


439. *Marginella subtrigona*, n. s. Shape of *Erato columbella*.


#### Family Olividae.


444. *Olivella bætica*, n. s. Narrow, dull, thin: has been erroneously called *amazora*, *tervina*, *petiolata*, and *rufifasciata*.

147
<table>
<thead>
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<td>445.</td>
<td>Nassa fossata</td>
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<td>446.</td>
<td>—— perpinguis</td>
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<td>447.</td>
<td>—— insculpta</td>
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<tr>
<td>448.</td>
<td>—— mendica</td>
<td></td>
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<td>C</td>
<td>P</td>
<td>POF</td>
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<td>449.</td>
<td>—— Cooperi</td>
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<td>450.</td>
<td>—— tegula</td>
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<td>LC</td>
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<tr>
<td>451.</td>
<td>Amycla gausapata</td>
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<td>B</td>
<td>P</td>
<td>VD</td>
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<tr>
<td>452.</td>
<td>—— ? Californiana</td>
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<td>453.</td>
<td>—— tuberosa</td>
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<td>454.</td>
<td>—— chrysalloidea</td>
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<td>455.</td>
<td>—— undata</td>
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<td>456.</td>
<td>—— ? Truncaria corrugata</td>
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<td>457.</td>
<td>Columbella carinata</td>
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<td>457b.</td>
<td>—— ? var. Hindsii</td>
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<td>458.</td>
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<td>459.</td>
<td>—— canaliculata</td>
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<td>460.</td>
<td>—— saxicola</td>
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<tr>
<td>460b.</td>
<td>—— var. fuscata</td>
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<tr>
<td>460c.</td>
<td>—— var. emarginata</td>
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<td>B</td>
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<td>C</td>
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<tr>
<td>460d.</td>
<td>—— var. ostrina</td>
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</tbody>
</table>

**Family Bucinidae.**

453. *Amycla tuberosa*, n. s. Very close to minor, Sicachi, but with different nucleus. 8–10 fm. e. Cp.
454. *? Amycla chrysalloidea*, n. s. Shape of *Truncaria eurytoides*, but mouth not effuse: spirally furrowed. Shoal-water, Cp.
455. *? Amycla undata*, n. s. Like stumpy, small corrugata, with waveld sculpture. 40 fm. n. r. Cp.

**Family Purpuridae.**

460b. *Purpura var. fuscata*, Fbs. Raised thin form, dull, with faint sculpture.
460d. *Purpura var. ostrina*, G. E. E. Short, swollen, nearly smooth. 148

461b. Monoceros var. spiratum (Blainv.). Light colour; scaly; horn not developed.

462. Monoceros lapilloides, Conr. = punctatum, Gray + brevidens, Conr. Not shoul-
dered: shape of lapillus.


463b. Ocenebra var. aspera, Baird. Sculpture rough.

463c. Ocenebra var. munda. Tall, with faint sculpture.

464. Ocenebra interfossa, n. s. Purple-brown, with latticed sculpture.

465. O. Ocenebra Poulsoni, Nutt. Shape like M. monoceros, with brown spiral lines.

466. Ceratoma foliatum, Gmel. = monodon, Esch. Large, with winged varices.


468. Ceratoma monoceros, Sby. Spire raised: whirling rough, rounded.


471. Pedicularia Californica, Newc. Small, purple, highly sculptured.

Family Muricide.


475. Trophon Orpheus, Ghd. E. E. Like the last, with distant spiral riblets.


478. Siphonidia fuscolineta, n. s. Like the above in extreme miniature.


481. Chrysodomus dirus............ J. B. A. VI P V V
482. — rectirostris.............. B.f.s. C FMI P — — BDI
483. Fusus ambustus............. L L — — — — I
484. Macron Kellettii.......... — — I — — — I
485. — lividus.............. — — — — — — D
486. Anachis subturrita........ — — — — — — DI
487. ? — penicillata........... B — — — — I
488. Argonauta Argo.............. — — — — — — I
490. Ommastrephes giganteus.... — — — — — — I
491. — Ayresii................ — — — — — — I
492. Onychoteuthis fusiformis.. — — — — — — I

482. *Chrysodomus rectirostris*, n. s. Small, white, smooth, with straight canal.

Class CEPHALOPODA. Family *Argonautidae*.

Family *Octopidae*.

Family *Loligidae*.

113. It remains to tabulate the shells which have been received from special localities, south of the State of California, either by the writer or by the Smithsonian Institution; *vide* Br. Assoc. Rep., par. 77.

The promontory of Lower California has been so little explored, that the existence of a large inland fiord, in lat. 28°, was not known to the authorities. It appears that the whales have long delighted in its quiet waters: and those whalers who were in the secret carefully preserved the exclusive knowledge of so profitable a hunting-ground. All that we know at present of the molluscs of that region is from collections made at Cerros Island, by Dr. Ayres and Dr. Veitsch. They are mostly shore shel’s, and are sadly intermixed with an abundance of cowries, cones, strombs, and other clearly Pacific species, which throw great doubt upon those which may be truly from the coast. As it is manifestly a “hotbed of spurious species,” nothing can safely be built upon the data, which present a singular intermixture of northern and southern forms. Excluding the Central Pacific importations, the lists stand as follows, the temperate species being distinguished (as in the first Report) by a *, the tropical by a †:—

150
The shells of Margarita Bay, on the Pacific coast of Lower California, in lat. 24°, have become known through W. Harper Pease, Esq., of Honolulu, Sandwich Islands. Through his labours we are likely soon to be favoured with accurate accounts of the distribution of species in the various parts of the Pacific Ocean. Already his researches have greatly enriched our knowledge of the quaint fauna of the Sandwich Islands, from which he has eliminated the spurious species, and added those erroneously ascribed to California by previous naturalists. The principal trade from these islands is with San Francisco; and "the coast," in Mr. Pease’s writings, signifies the coast of California or (generally) of Western America. Many of our best specimens of rare West-coast shells have been received from him, and in remarkably fresh preservation. The Margarita Bay species were obtained by one of his trained collectors, and are as follows:

Martesia intercalata.
Saxicava pholadis
Solcercus violascens.
Hiatula compacta.
Tellina secta.
Strigilla carmaris (pink).
Senele Californica.

* Trochiscus Norrisii.
* Omphalius fusescens.
* Omphalius aureotinctus.
* Crucibulum imbricatum.
* Crucibulum spinosum.
* Crepidula arenata and var.
* Cerithium uncinatum.
* Cerithidea pullata.
* Cerithidea Montagnii.
* Litorina planaxis.
* Luponia sp. ind., jun.
* Trivia Solandri.
* Trivia Californica.
* Drillicia penicillata.
* Myurella, sp.
* Neverita Reclusiana.
* Natica Maroccaana.
* Scalaria (Ind. var.) tintca.
* Bezoardia abbreviata.
* Leucozonia cinuglata.
* Strigatella tristis.
* Ol vella biplicata.
* Purpura ostrina, vars.
* Purpura biserialis.
* Monoceros lugubre.
* Vitularia salebrosa.
* Cerostoma monoceros.
* Ocmebra Poulsoni.
* Chorus Belcheri.
* Columbella fusca.
* Columbella carinata.
* Strombina gibberula.
* Anachis coronata.
* Nassa tegula.
* Nassa complanata.
* Macron Kellettii.
* Macron lividus.

Callopoma tessellatum = Fokkesii.
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>Tapes staminea</td>
<td>Crepidula onyx.</td>
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<tr>
<td>Chama frondosa</td>
<td>Crepidula excavata.</td>
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<tr>
<td>Cardium procerum</td>
<td>Galerus conicus.</td>
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<tr>
<td>Liocardium elatum</td>
<td>Cerithium stercus muscarum.</td>
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<tr>
<td>Modiola capax</td>
<td>Pyrazus incisis and var.</td>
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<tr>
<td>Modiola Brasiliensis</td>
<td>Rhinoclavis gemmata.</td>
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<tr>
<td>Lithophagus attenuatus</td>
<td>Cerithidea Mazatlanica.</td>
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<tr>
<td>Barbata gradata</td>
<td>Litorina fasciata.</td>
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<tr>
<td>Pecten ventricosus</td>
<td>Litorina aspera, var.</td>
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<tr>
<td>Ostrea Virginica (Maz. Cat.)</td>
<td>Conus &quot;reticulatus&quot; (Pease). Dead.</td>
</tr>
<tr>
<td>Ostrea lurida, var.</td>
<td>Conus &quot;emarginatus&quot; (Pease). Dead.</td>
</tr>
<tr>
<td>Ostrea conchaphila.</td>
<td>Conus interruptus.</td>
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<tr>
<td>Ostrea amara</td>
<td>Neverita Recluziana.</td>
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<tr>
<td>Siphonaria aequilirata (=leviuscula, Sby., teste Cuming)</td>
<td>Polinices bifasciata.</td>
</tr>
<tr>
<td>Siphonaria gigas</td>
<td>Cancellaria urceolata.</td>
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<tr>
<td>Helix areolata, Fbs. (The only land-shell received from the Bay.)</td>
<td>Cancellaria goniostoma.</td>
</tr>
<tr>
<td>Dentalium tetragonum, Sby.</td>
<td>&quot;Cypreccasis testiculus&quot; [perhaps tenus].</td>
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<tr>
<td>Dentalium semipolitum</td>
<td>Malea ringens.</td>
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<tr>
<td>Dentalium lacteum, Phil.</td>
<td>Priene nodosa.</td>
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<tr>
<td>Acmae strigatella</td>
<td>Oliva subangulata.</td>
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<tr>
<td>Acmae atrata</td>
<td>Oliva porphyria.</td>
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<td>Gadinia reticulata</td>
<td>Purpura patula.</td>
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<td>Calliostoma versicolor</td>
<td>Purpura biserialis.</td>
</tr>
<tr>
<td>Chlorostoma gallina</td>
<td>*Purpura ostrina. [Normal, living.]</td>
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<tr>
<td>Chlorostoma aureotinctum</td>
<td>Vitularia salebrosa.</td>
</tr>
<tr>
<td>Nerita scabriosta</td>
<td>Monoceros lugubre, var.</td>
</tr>
<tr>
<td>Nerita Bernhardi</td>
<td>Cerostoma monoceros.</td>
</tr>
<tr>
<td>Crucibulum spinosum</td>
<td>Nassa tegula.</td>
</tr>
<tr>
<td>Crucibulum imbricatum</td>
<td>Siphonalia anomala.</td>
</tr>
<tr>
<td>Crepidula onyx</td>
<td>Phyllonotus nigritus.</td>
</tr>
</tbody>
</table>

In the above list, the only strictly Californian species are those marked with an *.

The following species have been received from La Paz, besides those tabulated in Major Rich’s list, p. 541, in the C. S. L. list, p. 619, and the B. A. Rep. p. 352. It is clear that the fauna of the district is essentially tropical, and remarkably free from Californian species.

- **Dentalium semipolitum.**
- **Turridella punctata.**
- **Modulus cerodes.**
- **Olivella fulgida,** Lieut. Trowbridge [teste W. Cooper; but probably added by him accidentally from his W. African collections. It has not been received from any other West-coast source].
- **Siphonalia modificata.** Dead.

A very interesting series of shells were collected at Guaymas and Pinacati Bay, by Capt. Stone and Mr. Sloat. The latter gentleman affixed MS. names to those which he regarded as new. They were in remarkably beautiful condition, the bivalves having an unusually porcellaneous aspect, and many of the species presenting local peculiarities.

- **Mulinia carinulata,** Desh., = *Mactra modesta*, Sloat MS.
- **Dosinia ponderosa.** Very large.
- **Chione fluctifraga,** Sby., = *V. Cortezii*, Sloat MS. [= gibbosula (Desh.), Rve., = callosa, Sby., non Conr.].
- **Chione succinca,** Val., = *Californiensis*, Brod., = *V. crassa*, Sloat MS. [Very variable in sculpture; also, with the last, varies greatly in shape, some of the specimens being much produced, others rounded.]
- **Chione gnidia**, Brod. Passing into amathusia.
Chione pulicaria, Shy., var., = V. Pinacatensis, Sloat MS. Sculpture pressed smooth in the middle.
Cardium elatum. Fine.
Cardium procerum. Fine.
Modiola capax. "Choros." Also St. Inez Bay.
Modiola Brasiliensis. (Typical.)
Byssarca Pacifica.
Ostrea conchaphila et amara, Maz. Cat. 215.
Chiton (Lophyurus) Stokesii. Also San Salvador, Capt. Dow.
Calloploma fluctuatum.
Bivonia contorta.
Turritella goniostoma.
Turritella tigrina (light var.), = leucostoma, Val.
Cerithidea albonodosa. Common. [Probably a var. of Mazatlanica.]
Strombus gracilis. Also Mulege Bay.
Neverita Reculziana. [Operc. strong, horny.]
Ranella triquiets. [Operc. sub-Buccinoid, oval; nucleus internal, near middle of labrum; scar with few ridges, as in Purpura.]
Oliva angulata. Not rare.
Oliva Cumingii, very callous var.
Agaronia testacea.
Monoceros lugubre. Very tall var.
Phyllonotus nigritus. Very large, of form described by Philippi, with Pholads in situ. Agiobampo Bay.
Phyllonotus bicolor. [Operc. thin, without frills or raised layers; of uniform colour.] Also Angeles Bay.

To these may be added, from a second voyage by Capt. Stone to the northern part of the Gulf of California, and in equally good condition—

Area grandis. Agiobampo Bay.
Callista semilamellosa. Agiobampo Bay.
Lazaria pectunculus (teste Cuming). St. Luis Bay.
Cardium consors. St. Luis Bay.
Avicula Peruciana. Mulege Bay.
Margaritiphora fimbriata. "Topo."
Bulla nebulosa. "Huevitos."
Glyphis inaequalis. St. Luis Bay.
Crucibulum imbricatum. St. Luis Bay.
Cypraea exanthema. (Large.) Cape de Haro.
Myurella variegata. Mulege Bay.
Solarium granulatum et var. quadriceps. Agiobampo Bay.
Polinices bifasciata. Angeles Bay.
Cypraeopsis tenuis [= Marsene, Kien.]. Carmen Island.
Bezoardica abbreviata. Mulege Bay.
Ficula decussata. Angeles Bay.
Pyura patula. Agiobampo Bay.
Malea ringens. Lobos Island.
Argonauta hians. 1 fine sp. Upper part of Gulf of California.

To the Guaymas fauna must be added, from Dr. Gould’s portion of the same collection, "Pecten pyxidatus" [= subcrenatus, jun.). Also from the collection of the Calif. Ac. Nat. Sc., Nassa nodocincta, A. Ad. [Galapagos, Cuming]. On comparing these lists with the shells given in B. A. Rep. p. 352 (in which the Venus quoted is not "stamina, Conr.," but a southern species), it will be seen that the fauna of the upper part of the Gulf, as far north as it has been explored, is essentially tropical. The Chione fluctifraga.
and C. succineta, however, and the Polinices Recluziana indicate a connexion with California which may have been, at a previous age, more direct than at present.

114. (See first Report, pars. 79-83.) Acapulco being notorious for the exotic species quoted in its fauna, it is desirable to examine all authentic collections from that prolific locality. The Smithsonian series were obtained by Dr. Newberry* (N.), after his Pacific R. R. Explorations (vide p. 593); by Mr. Belcher (B.); and by the Rev. J. Rowell (R.), who obtained them principally from the valves of the large oysters. The private collections of Judge Cooper, Col. Jewett (J.), and other American naturalists have also afforded valuable information. The species from these various sources, which were also found by Mr. Xantus, are tabulated with his Cape St. Lucas series, ante, pp. 619-626. The following have not been obtained from the northern localities:

<table>
<thead>
<tr>
<th>Species</th>
<th>Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tornatina infrequens, B.</td>
<td></td>
</tr>
<tr>
<td>Dentalium ×hexagonum, var., B.</td>
<td></td>
</tr>
<tr>
<td>Fissurella nigropunctata, J.</td>
<td></td>
</tr>
<tr>
<td>?macrotrema, J.; alba, Jm., B.</td>
<td>(1 worn sp.)</td>
</tr>
<tr>
<td>Calliostoma lima, var. equisculpia, N.;</td>
<td></td>
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<tr>
<td>Leanum, J.</td>
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<tr>
<td>Senectus squamigerus, J.</td>
<td></td>
</tr>
<tr>
<td>Galerus conicus, N.; mammillaris, N.</td>
<td></td>
</tr>
<tr>
<td>Crepidula nives, R.; incurva, N.</td>
<td></td>
</tr>
<tr>
<td>Turritella Banksii, N.; leucostoma, B.</td>
<td></td>
</tr>
<tr>
<td>Ampullaria Colombiensis, B. [West Mexico; locality uncertain.]</td>
<td></td>
</tr>
<tr>
<td>Truncatella Bairdiana, B.</td>
<td></td>
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<tr>
<td>Radius arena, J.</td>
<td></td>
</tr>
<tr>
<td>Cypraea exanthema, N.</td>
<td></td>
</tr>
<tr>
<td>Luponia fiabriolata, Beck, N.</td>
<td>[Probably imported. and perhaps an imperfectly developed form of semiplicata, Migh.]</td>
</tr>
<tr>
<td>Terebra tuberculosa, N.</td>
<td></td>
</tr>
<tr>
<td>Drilla incrassata, B.; eburnea, n. s., R. [W. Mexico; locality uncertain.]</td>
<td></td>
</tr>
<tr>
<td>Mangelia subdiaphana, J.</td>
<td></td>
</tr>
<tr>
<td>Conus Interruptus, Br. &amp; Sby., B.; machogani, N.; puncticulatus, N.</td>
<td></td>
</tr>
<tr>
<td>Eulima hastata, R.</td>
<td></td>
</tr>
<tr>
<td>Eulima, like yod, R.</td>
<td></td>
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<tr>
<td>Eulimella, sp. (worn), B.</td>
<td></td>
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<tr>
<td>Chemnitzia tennillaria, B.</td>
<td></td>
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<tr>
<td>Fasciolaria, sp. [size of tulipa, but with row of knobs and serrated lip], N.</td>
<td></td>
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<tr>
<td>Latirus castaneus, N.</td>
<td></td>
</tr>
<tr>
<td>Volvarina ? fusca, J.</td>
<td>[More regularly cylindrical than the W. I. specimens, broader in proportion near suture and at base, spire much shorter; but locality uncertain.]</td>
</tr>
<tr>
<td>Oliva Julietta, B. 1 worn sp. [probably imported]; ?kaleontina, dead, N.</td>
<td></td>
</tr>
</tbody>
</table>

* The collections of Dr. Newberry passed principally into the hands of Dr. E. For- man, late of Washington, who kindly presented a series to the Mus. Smiths.
Agaronia testacea, N.

Ithizocheilus madreporarum. 2 living

sp. on coral, J.

Columella uncinata, J.; humerosa, n. s., R.; varians, var., N. [Imported from Sandw. Is.]

Nassa collaria, N.; ambigua, Mont., testo

Hant., N. [Probably imported from W. I.]

Anachis coronata, N.; Californica, J.

Muricidea alveata, J.

Phyllonotus brassica, N.

The following species are part of a collection received at the Smithsonian Inst. from Real Llejos, and fill up gaps which existed in the Central American fauna at the time of the first Report:—

Discina Cumingii.

Trigona Hindsi.

Hemicardium obovale.

Crassatella gibbosa.

Kellia suborbicularis.

Barbata mutabilis.

Noetiia reversa.

Axineae fmulticostata.

Fissurella rugosa.

Phasianella perforata.

Omphalius viridulus.

Hipponyx barbatus.

Cæcum liratocincumtum.

Cæcum leve.

Cerithium interruptum, var.

Barlecia subtenuis.

Aricia punctulata.

Terebra strigata.

Cerithopsis assimilata.

Triforis alternata.

Olivella gracilis.

†Nitidella millepunctata.

Northia pristis.

Pisania sanguinolenta.

The collections received at the Smithsonian Inst. from Panama consist, in the main, of species already tabulated from that region. The following, however, are new to that well-searched portion of the fauna:—

Tellina striata (teste Cuming), Rowell, Pease.

Tellina (Angulus) amplexans, n. s., Rowell, Pease.

Adula stylisten. { Californian species: either ballast or error in num-
Pecten aquisulcatus, jun. } bering: Rowell.

Litorina. Small spotted species, n. s., teste Cuming, but appears identical

with the W. Indian: probably imported: Rowell.

Fluminicola, sp., Rowell.

Drillia albolaqueata, n. s., Rowell.

Natice catenata, Rowell.

Cuma costata, Rowell.

115. The Pulmonates of the Pacific slope have not formed a special study

with the writer of this Report, as they were already in the abler hands of Messrs. Binney, Bland, and other eminent Transatlantic naturalists. The opinions of Mr. Binney as to synonymy, &c., with descriptions of new species and details of those previously known, were given in papers published in the 'Proc. Ac. Nat. Sc. Phil.' as follows:—"Descriptions of American Land Shells," Feb. 1857; "Notes on American Land Shells," Oct. 1857, May 1858, Nov. 1858, July 1859: and also in the 'Proc. Bost. N. H. S.,'

"Description of two supposed new species of American Land Shells," Apr. 1857. These are embodied in 'The Terrestrial Air-Breathing Mollusces of the United States and the adjacent Territories of North America,' vol. iv., by W. G. Binney, Boston, 1859. It was first printed in the 'Boston Journal of Natural History,' vol. vii., and is intended as a Supplement to the great treatise by his father, vols. i.–iii., on the same subject. It is impossible to speak in too high terms of commendation of the manner in which this work has been prepared and executed, and of the beautiful figures drawn by Otto Köhler. The more matured views of the author were embodied in the 'Check-List of the Terrestrial Gasteropoda of North America,' published by the Smithsonian Inst., June 1860, of which a second edition was soon issued. The species were divided into three series,—(1) those of the Pacific coast,
from the extreme north to Mazatlan; (2) those of eastern N. A., from the boreal regions to the Rio Grande; (3) those found in Mexico, to which sixteen from the first series are added. The freshwater Pulmonates are catalogued by the same most industrious author, in the 'Check-List of the Fluvialite Gastropoda of N. America,' which contains the Melaniadæ, Paludinidæ, Ampullariadæ, Valvatidæ, and Limaxidæ; the West Coast species being distinguished by the letter W, and the Mexican by M. Mr. Binney next undertook a monograph of the Paludinidæ, &c., the proofs of which were widely distributed in 1862. Afterwards, assisted by the extensive series of specimens received from the Smithsonian Museum, and with access to those of the principal public and private collections in the U. S., and with the benefit of Say's types preserved in the Acad. Nat. Sc. Phil., he prepared a preliminary synopsis of the Limaxidæ, with full synonymy, proofs of which were issued by the Smithsonian Inst., May 4th, 1863. Last of all, under date Dec. 9, 1863, the Smithsonian Inst. has distributed proof copies of a complete 'Synopsis of the Species of Air-Breathing Molluses of N. A., as eliminated from their synonymy by Mr. Binney.' Of all these works the author not only sent the earliest slip-proofs to assist in the preparation of this Report, but in several instances took the pains to write separately what related to the W. coast, and even sent the manifold-duplicate of part of the printer's copy. It is not considered necessary to tabulate each of these publications separately, as they can easily be obtained by post, on application to Professor Henry, Washington, D.C. The following list embodies—(1) the classification and nomenclature of Dec. 9th, 1863; (2) the synonymy as given in previous synopses; and (3) the localities and authorities supplied by Mr. Binney in M.S. The following reservation requires attention:—"As a mere proof, which will undoubtedly receive many corrections, this list should not be quoted as authority, or referred to as a published work."

Mr. Binney's Arrangement of the West Coast Pulmonates. ♠

The species thus marked have not been seen by Mr. Binney.

PHANEROPNEUMONA.

ECTOPHTALMA. (None known in the region.)

OPISTHOPHTALMA. Fam. Truncatellidæ.

1. Truncatella Californica, Pfr., + T. gracilenta, Gld. S. Diego, Cooper. [Comp. Maz. Cat. no. 423.]

PULMONATA.


†2. Glandina (Glandina) turris, Pfr. (= Achatina = Oleacina, Pfr.) W. Mexico, Maz. Cat. no. 231.


* The first Transatlantic attempt to revise the genera of N. A. Helicidae was made by Mr. Bland, in his "Remarks on Classifications of N. A. Helices by European authors, and especially H. and A. Adams and Albers," printed in the 'Annals of the Lyceum of Nat. Hist. N. York,' Oct. 1863. In an addendum, he gives a list of the Pacific species, with an account of two "genera" not represented in the eastern division. Mr. Binney, continuing Mr. Bland's labours, issues the species for the most part in the trinomial nomenclature, which now appears to be taking the place of the Linnean binomial system. No attempt is here made to review the work, as the writer felt justified in doing with reference to marine shells; the only alterations made consisting of corrections in some of the citations with which he happened to be more familiar.

Subfam. Vitrinae.

15. Helix (Triodopsis) Mullani, Bland. Washington Territory and Oregon:
   —St. Joseph's River, 1st Camp.

* In the Check-List of Dec. 9th, sportella does not appear. It is generally treated by Mr. Binney as a small variety of Vancouverensis, with stronger radiating and spiral lines; but in the MSS. sent for publication in this Report it takes rank as a species. Mr. Bland considers the two identical; yet in Add. Gen. the form is thus divided:—"Iberus (Cypaea) sportella, in fam. Helicidae," and "Discus Vancouverensis, in fam. Stenopidae." In Albers it is divided as "Macrocyclis vellicata," "M. Vancouverensis," and "Helix (Patula) sportella."


Subfam. *Orthalicinae."


44. *Bulimus (Mesembrinus) pallidior*, Sby., = *B. vegetus*, Gld., teste Cum., Binn. SAN DIEGO TO CAPE ST. LUCAS:—C. S. Lucas, Xantus.


46. *Bulimus (Mesembrinus) inscendens*, Binn. LOWER CALIFORNIA:—Margarita Bay, and C. S. Lucas, Xantus.

†47. *Bulimus (Thaumastus) Californicus*, Rve.


49. *Bulimus (? Mornmus) pilula*, Binn. LOWER CALIFORNIA:—Todos Santos Mission, Margarita Is., Xantus.

50. *Bulimus (Scutalus) proteus*, Brod. Cape St. Lucas, Xantus.

51. *Bulimus (Scutalus) Xantusi*, Binn. Cape St. Lucas, Xantus.

52. *Bulimus (Peronea [non Peronea, Poli]) artemisia*, Binn. Cape St. Lucas, Xantus.


Subfam. *Pupinæ."


* See also Dr. Newcomb's new species, tabulated in pp. 609, 633.

† Included among the doubtful species by Mr. Binney; but the shell so named in the Maz. Cat., no. 234 (perhaps erroneously), was certainly found on opening the Mazatlan boxes by Mr. Archer.

§ Mr. Binney follows Pfr., in his later works, in separating these ? varieties. The shells in the Reigen Collection were clearly conspecific. Vide Maz. Cat., no. 232.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

Subfam. Succineine.

58. Succinea (Succinea) cingulata, Fbs. Mazatlan, Kellett and Wood.
59. Succinea (Succinea) rusticana, Gld. OREGON AND CALIFORNIA:—Oregon, U. S. E. E.; Ocoee Creek, California, Williamson.

Subfam. Limacine.


Subfam. Arioninea.


Subfam. Zonitiæ.


Fam. Onchidiæ.

65. Onchidium Carpenteri, Binn. Cape St. Lucas, Xantus.

LIMNOPHILA. Fam. Auriculideae.

Subfam. Melampinæ.

66. Melampus olivaceus, Cpr. San Diego to Mazatlan:—Mazatlan, Reigen; San Diego, Blake, Cooper.
67. Pedipes livata, Binn. Lower California:—C. S. Lucas, Xantus; San Diego, Cooper.

Fam. Limneideae.

Subfam. Limneæine.

69. Limneæ (Limneæ) lepida, Gld. Lake Vancouver, U. S. E. E.
71. Limneæ (Limnophyla) Sumassii, Baird ||.

* So great is the difficulty of ascertaining (even approximately) the specific relations of Succinea without a comparison at least of single specimens, that Mr. Binney considers it safest, until series have been examined, simply to quote the species which have been described by other authors. He has followed the same course with Ancylylus, and for the same reason.
† "Has a pore. Why not Arion?"—Binney, in MS. list.
§ This appears among "doubtful species" in the MS., but is printed in the text of the Check-List.
|| Probably a variety of palustris = Nuttaliana, Lea. British authors have as yet had but poor opportunities of studying typically-named American freshwater Pulmonates, 1863.

159


90. *Physa (Physa) humerosa*, Gld. Rio Colorado, Williamson; San Diego, P. R. R. E.

91. *Physa (Physa) virgata*, Gld. San Diego, Webb; Los Angeles; Cal. Ax. N. S.

several of which are perhaps but modifications of circumboreal species which have been already traced to Eastern Asia. Even the series in Mus. Cam. are far from being accurate or complete. The inflexible rules of the British Museum have not yet allowed a single specimen of Dr. Baird’s species to be transmitted to America, even for comparison.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA.

92. Physa (Physa) trivoca, Lea, Binn. MSS. * California, Cooper.
95. Bulinus (Bulinus) elongatus, Gld. Mazatlan, Reigen.

Subfam. Planorbine.
98. Planorbis (Planorbis) tumens, Cpr., = P. tenagophila, Mke. (non D'Orb.), = P. affinis, Cpr. [Cat. Prov., non C. B. Ad.] Mazatlan, Melchers, Reigen. San Francisco, Cooper; Petaluma, teste Gld.
99. Planorbis (Planorbis) vermicularis, Gld.
100. Planorbis (Helisoma) ammon, Gld., = P. Traskei, Lea. Klamath Lake, Or. and Rhett Lake, Cal., Newberry. Ocoo Creek, Cal., Williamson; Kern Lake, Cal., Cooper; Monterey Co., Trask; Lagoons, Sacramento Valley, teste Lea.
104. Carinifex || Newberryii, Lea. Klamath Lake and Canoe Creek, Cal., Newberry; Clear Lake, Cal., Veatch.

Subfam. Ancylina.
†106. Ancylus erasus, Hald. "W." [Check-List.]
107. Ancylus carinivus, Coop. California, Cooper.
110. Ancylus fragilis, Tryon. "W." [Check-List.]
111. Acroloxus Nuttalli, Hald. [Velleia N., Binn. in list, May 4th.] Oregon, Nutt.
112. Gundiacliaca Californica, Rowell.

* So in first printed list and in two MSS.; but in Check-List of Dec. 9, Ph. Troostiana, Lea, is assigned to the West, instead of this species. The MSS. are probably correct.
† Non Bulinus, Sby., olim, = Bulinus, auct. However clearly Bulinus, Binn., may be right according to the antiquaries, it is far too like Bulinus, which has taken complete possession of the entire malacological world, to be allowed a resurrection in the same order. Surely burial for a given number of years ought to be allowed as a evidence of death, especially if the infant-name scarcely even breathed the air of use, and its resurrection would breed malaria among terms thriving in the vigorous manhood of universal acceptance.
§ It is quite possible that this may prove a very finely grown specimen of P. lentus. Dr. Kenmerley's shells are intermediate.
† Thus in Check-List, Dec. 9th. In that of May 4th, it appears as Planorbis N.; in the MS. list as Carinifera.
Suborder Thalassophila.

Fam. Siphonariade.


†115. [*Siphonaria thersites*, Cpr. Neenah Bay, *Sewan.*]

Doubtful, spurious, and extralimital species:


*Helix arbustorum*, Linn.

*Helix Sagratina*, D'Orb. [Certainly Cuban.]


*Helix peregrina*, Bosc.

*Bulimus Hamboldtii*, Rve. "Mazatlan."


*Melania [Bulimus] striata*, Perry. [Vide ante, p. 520.]


†*Siphonaria amara*, [Nutt. Admitted into the list by Mr. *Binney*, on the authority of Rve., as of Nutt.; but it lives on the Sandwich Is.; teste *Pease*, *Newcomb, U. S. E. E.*]

116. The Smithsonian Institution has lately issued a "Descriptive Catalogue of the species of *Amnicola, Vivipara, Bithynia, Valvata, and Ampulalaria*," by Mr. W. G. *Binney*. It is abundantly illustrated with outline-woodcuts, and contains the synonymy corrected from all the accessible types. Dr. *Stimpson* is at present engaged in dissecting the molluscs; but none of his investigations have yet been published. The following is a résumé of the West Coast species, from a proof kindly furnished by the author.


12. 46. *Vivipara*, Lam. = *Paludina*, Lam. [This genus, so fine and plentiful east of the Rocky Mountains, does not appear on the west.]


The following are added by Mr. *Binney* in his later MS. list:

*Valvata virrens*, Tryon. Clear Lake, Calif. [The Smithsonian duplicates have been unfortunately distributed under the name "*V. sincera*, Say," which had been previously given to the specimens, and under which they are quoted in the Check-List of 1860, no. 456. According to Mr. B., *V. sincera* is "like
ecarine forms of *V. tricarinata*, Say," to which the Clear Lake specimens
bear but slight resemblance.]

*Pomatiopsis Binneyi*, Tryon.


117. Of the West Coast species of Melaniadæ we are unable to offer any
list embracing the synonymy, as the materials are at present in the hands of
Mr. Tryon for elimination, and his labours are not yet sufficiently advanced
to furnish a report. His Manual of the North American Melaniadæ will be
published by the Smithsonian Institution. The animals of many species have
already been dissected by Dr. Stimpson*. It is unfortunate that in the two
most important branches of North American freshwater molluses, the Me-
laniadæ and the Unionidæ, there exists a radical difference of opinion between
the leading writers, which has sometimes assumed the appearance of per-
sonal animosity. Malacologists east of the Atlantic, unwilling to become
partisans when the leading nomenclators of the rival schools are equally
honoured, have to a great extent declined to pay attention to the unexhausted
riches of the American waters, regarding any settlement of the disputed
points as hopeless. Dr. Isaac Lea, who has spared no expense in illustrating
his publications of the results of a life-long study, follows the restrictions
on the priority-rule allowed by the British Association Committee. Other
writers, however, claim a certainty in identifying the supposed species of
Rafinesque and other similarly inaccurate authors, which would be considered
by most English naturalists as not warranted by the few loose words of de-
scription given. It would be well if the student were permitted to start from
the first carefully ascertained landmark, rather than from the defaced tracks
of the first hunter.

In the Check-List of North-American Fluviatile Gasteropods, published by
the Smithsonian Institution, June 1860, which contains the names of 405
(supposed) species of *Melania, Lithasia, Gyrotona, Leptoxis*, and *Jo*, Mr. Binney
assigns the following eleven to the West Coast. None of them are accredited
to the eastern division.


177. *Melania nigrina*, Lea. Clear Creek,

Shasta Co.


and Scott Rivers.

243. *Melania silicula*, Gld. [≡ *M. plici-
fera*, small var., teste Lea.]


118. Dr. Lea's Check-List of the Unionideæ (June 1860), after eliminating
synonyms, assigns to America, north of Mexico, no fewer than 552 species of
*Unio, Margaritana*, and *Anodonta*. The type-specimens of the species
described by Dr. Gould from the United States Exploring Expedition were
submitted to Dr. Lea's inspection, and confirmed his previous opinion that
they were varieties of those before known. The *U. famelicus*, Gld., he pro-
nounced to be a South-American shell; but it appears, without note, in the
Check List, no. 133, probably by oversight. The only widely diffused species
is the long-famed "pearl-mussel" of the Conway and other British streams.
The following seven are accredited to the Pacific coast:—

* See his very interesting and important paper "On the structural Characters of the so-
called Melanians of North America." in the 'American Journal of Science,' vol. xxxvii.,
July 1864, pp. 41–53. It appears that the sexual system is quite distinct from that of the
ordinary Ctenobranchiate Gasteropods, and approaches the Cyclobranchiates.
Besides these, 36 species of *Unio* and *Anodonta* are assigned to Mexico and Central America in a separate list; but no distinction is indicated between the Pacific and the Atlantic slope of the mountain-range.

119. At the request of the Smithsonian Institution, Mr. Temple Prime, of New York, well known for his special devotion to this department, has consented to prepare a Manual of the Cyrenidae inhabiting American waters. All the accessible materials from the West Coast are in his hands for examination. The first part of his "Monograph of the Species of *Sphaerium* of North and South America" is printed in the *Proc. Ac. N. Sc. Phil.* 1861, pp. 402 et seq., and contains quotations of five species, nos. 4, 7, 9, 10, 11, with synonymy, from Washington Ter., Oregon, and California. He has kindly (in advance of his intended publications) furnished to Mr. W. G. Binney the following MS. "Synopsis of the Corbiculidae of the West Coast of North America," with liberty to publish in this Report. It is here condensed, with synonyms and references, in the nomenclature of the writer.

*Mr. Prime's List of West North-American Corbiculidae* [Cyrenidae].


* The name *Corbicula*, having been first given to a species, and being itself a diminutive, is scarcely fitted to displace long-used generic appellations in marking the family-group.
ON MOLLUSCA OF THE WEST COAST OF NORTH AMERICA. 679


120. Of the tertiary fossils throwing light on existing species no additional information has yet been published. We cannot but hope that the researches of Mr. Gabb, on the fossils collected by the Californian Geological Survey, will develop relations of great interest between the existing and former conditions of the continent. The Astorian fossils described by Mr. Conrad from the U. S. Exploring Expedition (vol. x., Geology, Philadelphia, 1849), and tabulated in the first Report, p. 367, belong to the Smithsonian Institution, but were not discovered there in 1860. All of them, however (including the indeterminate species), are figured in the atlas of plates. They resemble the fossils of the Pacific Railroad Expeditions in being very imperfect, for which reason the following criticisms may prove erroneous. The general aspect of the collection betokens the Miocene period.

Mya abbrevia, Conr., may be the young of Glycineris generosa, Gld.

Thracia trapezoides, Conr., may be curta, Conr.

Solenomya ventricosa, Conr., has the aspect of a large Lazzia.

Tellina arctata, Conr., closely resembles Macoma var. expansa.

Tellina emacerata, Conr., is perhaps Bodegensis, Hds.

Lucina acutilineata, Conr., appears to be borealis, Linn.

Cardita subdentata, Conr., = Venericardia borealis, Conr.

Nucula darivatica, Conr., = Acula castrensis, Hds.

Pectunculus patulus, Conr., may be septentrionalis, Midd.

Pectunculus nitens, Conr., resembles Psphis tontilla, Gld.

Pecten proptatulus, Conr. A very fine specimen, enclosed in a large nodule from Oregon, was presented to the Brit. Mus. by Mr. C. Pace. If not identical with Amusium cairinum, Gld., it is most closely allied, especially to the Japanese form.

Mr. Prime assigns no reason for changing Dr. Gould's Lucina into a Cyclas, nor any authority for 'California.' He was, perhaps, misled by the artist's engraved references to the figures 528, a, b, where he has drawn a rule, referring to the Cyclades above, instead of writing Lucina. It is assigned to ' ?Coast of Patagonia' in 'Otia,' p. 63, and to ' ?R. Janeiro' in 'E. E. Moll.,' p. 414. In each place the shell is compared to an Astoaria or Cyprina, with lateral teeth. The type was not returned to the Smithsonian Institution; but the diagnosis states that it is 'chalyck, thickened within the deep and jagged pallial line, sculpture faint but decussated, and margin finely crenulated,'—characters more consistent with Lucina, s. g. Myrtea, than with Cyclas. If the type cannot be recovered, perhaps the species may be dropped, as it is not the Lucina (Myrtea) lenticula, Rve.
Terebratula nitens, Conr., is very probably Waldheimia pulvinata, Gld. 
Bullo petroza, Conr., has the shape of Tornatina eximia, Bd. 
Crepidula prorupfa, Conr., is certainly princeps, Midd. 
Turriluta, sp. ind., resembles Mesalia lactea. 
* Dolium petrosum, Conr., resembles the young of Priene nodosa, Chemn. 
* Fusus geniculatus, Conr. A similar shell has just been taken at the Farallones 
by Dr. Cooper.

121. To correct the general table of "Mollusca of the West Coast of N. America" (First Report, pp. 298–345), and the deductions founded upon it (pp. 346–367), would involve the necessity of reprinting a considerable portion. The student, being now in possession of all the known sources of fresh information, can with his own pen strike out the spurious species, alter the synonyms, insert the newly discovered forms, and make the requisite corrections in the classified results.

122. With regard to the tropical fauna, the researches at Cape St. Lucas and in the interior of the Gulf of California, though leaving much to be desired, bear-out the general conclusions arrived-at in paragraphs 78–87. The evidence for the identity of specific forms on the Atlantic and Pacific sides of Central America has been greatly confirmed. Dr. Gould writes, "The doctrine of local limitations meets with so few apparent exceptions that we admit it as an axiom in zoology that species strongly resembling each other, derived from widely diverse localities, especially if a continent intervenes, and if no known or plausible means of communication can be assigned, should be assumed as different until their identity can be proved (vide E. E. Moll. Intr. p. xi). Much study of living specimens must be made before the apparent exceptions can be brought under the rule." It has, however, to be borne in mind that the researches of modern geology clearly point to considerable alterations in the existing configuration of continents, and in the consequent direction of ocean-currents, during the ascertained period of many species now living. Nor are we warranted in the belief that the existing fauna in any locality has been created at any one time, or has radiated from any single spot. To study the relations of living shells simply in connexion with the existing map of the world must lead but to partial results. The facts accumulating with regard to the British species, by tracing them through the northern drift (now found even on the Snowdonian range), to the oldest crag deposits when Europe was contained in far different boundaries, show how altered may have been the configuration of the new world when the oldest of its molluses were first created. Coordinately with the glacial period, Central America may have been a group of islands; coordinately with the creation of Saxicava pholadis and Chrysodoros antiquus, the gulf-weed may have floated between the Rocky Mountains in the archipelago of West America, and Japanese molluses may have known how to migrate to the Mediterranean shores. Dr. Gould's position may therefore be accepted in theory; yet, in practice, the "imperfection of the geological record"*, and even of our knowledge of existing species and their variations, demands that the greatest caution be exercised in building results on deductions from our ignorance. Already the fossil Malea ringens of the Atlantic has proved a "Rosetta Stone" to interpret the Cyprica exanthesma, Purpurapatula, and other Caribbean shells of the Pacific; and as the geology of the West Coast advances, so may we expect to find traces of previous denizens of

* No student of geographical distribution should omit to weigh carefully the chapter on this subject in Darwin's 'Origin of Species,' and the information given in Lyell's 'Antiquity of Man.'
American waters, which have bequeathed some species now flourishing, and others dying-out, to the existing seas. The present faunas of West America are perhaps the most isolated on the surface of the globe; yet, if we knew the ancestry of each specific form, we might find some first appearing with man on this planet, others first living even in historic times, others tracing their descent from remote periods, and it may be very distant localities, in the ages of the Miocene, possibly even of the Eocene oceans. These suppositions are not set forth as theories, but simply to guard against interpretations of facts based on conclusions which may be only the results of our necessarily imperfect information.

123. With regard to forms offering local peculiarities sufficient to distinguish them from correlative forms offering equal peculiarities in some other fauna, we are by no means warranted in assuming that these have sprung from different creations. If a race of men, migrating to a new continent, in a very few generations, or even in the next, develop an essentially different physique, it is fair to conclude that molluscs, borne by a change of currents to a distant region, or steadily migrating to the extreme limit of their conditions of life, will also change their appearance. If the publication of the "Darwinian Theory" has had no other effect, it has at least checked the propensity to announce "new species" for differences which may fairly be regarded as varietal. It must also be borne in mind, that if the views of Mr. Darwin be only a theory, such also is the name required for the prevalent opinion of separate creations for all diverse forms. What indeed can we possibly know of the mode of original creation of a single species? We can only prove that one or the other supposition best explains a certain class of facts. It is not necessary for a working naturalist to commit himself to an exclusive belief in either of these theories. He may perhaps best explain some facts by the doctrine of separate creation, others by that of natural selection. In either case it is his duty to trace-out, as far as possible, the limits as well as the powers of variation in every living form, and to guard against seeing that only which accords with his prevailing belief.

124. The study of European shells, as they exist in Norway, in Britain, in the Mediterranean, at the Canaries, or as they appear at different depths and stations in our own seas, still more as they occur in the widely separated periods of the later and middle tertiary ages, is an excellent preparation for the examination of either recent or fossil faunas in districts where our knowledge is fragmentary and unconfirmed. It may be safely stated that there are, in the American waters, many tropical forms from the West Indies and the Pacific shores, some temperate forms from California and the Atlantic, and many sub-boreal species in the Vancouver district and the European seas, not differing from each other more or even so much as forms universally allowed by malacologists to have had a common origin from Britain and the Mediterranean, from the Red and the Coralline Crag.

125. It is interesting to observe that, notwithstanding the probable connexion of the oceans through the Rocky Mountains during the Miocene age, there is extremely little similarity between the special temperate faunas of East and West America. Not a single species has yet been proved identical, and the allied forms are but few in number. They appear as follows:—

### Californian species.
- Clidiophora punctata.
- Lyonsia Californica.
- Macoma inconspicua.
- Angulus modestus.
- Raeta undulata.

### U. S. Atlantic species.
- C. trilineata (? = nasuta).
- L. (hyalina = ) Floridana.
- M. fusca.
- A. tener.
- R. canaliculata.
---|---
Liocardium substratum. | L. Mortoni.  
Lunatia Lewisi. | L. heros.  
Nassa mendica. | N. trivittata.  
Amycla (species). | Amycla (species).

126. When, however, we approach the region in which boreal and subboreal forms occur, many species are found in common, and between others there is but slight difference. Yet even here there are more British than New England species in the West-coast fauna. As might be expected, the British species are for the most part those which are also found fossil, and therefore have had time to diffuse themselves widely over the hemisphere. It is, however, remarkable that many Crag species have reached Eastern Asia and West America which are not found in Grand Manan and New England. It is also extraordinary that certain special generic forms of the Crag, as Acila, Miodon, Verticordia, and Solarilla, reappear in the North Pacific*. When seeking for an explanation of so remarkable a connexion between faunas widely removed in space and time, the correlative fact must be borne in mind, that the northern drift†, so widely diffused over Europe and Eastern America, has not yet been traced in the western region. The following Table exhibits, not only the identical but the similar species belonging to the northern faunas of the Atlantic and Pacific. In the Asiatic column, K denotes that the species occurs in the Kentschata region, J in Japan. In the second column, V signifies the Vancouver district, C the Californian, and I the Sta. Barbara group of islands. The species marked F are also fossil. In the third column, C denotes the Coralline, R the Red, and M the Mammaliferous Crag. The fourth contains the species living in the British seas; the fifth, on the American side of the Atlantic, Gr. standing for Greenland.

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</thead>
<tbody>
<tr>
<td>K</td>
<td>V Rhyconella psittacea</td>
<td>(Pleistocene)</td>
<td>psittacea</td>
<td>psittacea</td>
</tr>
<tr>
<td>—</td>
<td>V C Xylotrya pennatifera</td>
<td>—</td>
<td>pennatifera</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>V Xylotrya limbriata</td>
<td>—</td>
<td>limbriata</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>V C Zirphia crispa</td>
<td>C R M</td>
<td>crispa</td>
<td>crispa</td>
</tr>
<tr>
<td>K</td>
<td>V C Saxicea pholadis</td>
<td>C R M</td>
<td>pholadis</td>
<td>pholadis</td>
</tr>
<tr>
<td>J</td>
<td>V Glycimera genera</td>
<td>Faunasi, C R</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>V Sphaenia ovalis</td>
<td>Binghamii †</td>
<td>Binghami</td>
<td>—</td>
</tr>
<tr>
<td>J K</td>
<td>V Mysa truncata</td>
<td>C R M</td>
<td>truncata</td>
<td>truncata</td>
</tr>
<tr>
<td>J K, lata</td>
<td>V Macoma inquinita</td>
<td>lata, R M</td>
<td>proxima</td>
<td>proxima, &amp;c</td>
</tr>
<tr>
<td>K</td>
<td>V Serripes Groenlandicus</td>
<td>R M</td>
<td>—</td>
<td>Greenland</td>
</tr>
<tr>
<td>K</td>
<td>V I Venericardia borealis</td>
<td>—</td>
<td>—</td>
<td>borealis</td>
</tr>
<tr>
<td>—</td>
<td>V Astarte (compacta)</td>
<td>compressa, R M</td>
<td>compressa</td>
<td>compressa</td>
</tr>
<tr>
<td>—</td>
<td>V Miodon prolongatus</td>
<td>corbis, C R</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>I F Lucina borealis</td>
<td>C R M</td>
<td>borealis</td>
<td>—</td>
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<tr>
<td>—</td>
<td>I Cryptodon flexuosus</td>
<td>C</td>
<td>flexuosus</td>
<td>—</td>
</tr>
<tr>
<td>China</td>
<td>I Verticordia 9-costata</td>
<td>cardiiformis, C</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>—</td>
<td>V C Kellia suborbicularis</td>
<td>C R</td>
<td>suborbicul.</td>
<td>—</td>
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</table>

* Whether there be any similar correspondence in the Polyzoa is not yet known, Mr. Busk not having had time to complete his examination.
† See, in this connexion, a very accurate Table of the species which travel round Cape Cod, with their distribution in existing seas and over different provinces of the various drift-formations in the Old and New World, by Sanderson Smith, in Ann. Lyc. Nat. Hist. N. York, vol. vii. 1860, p. 166.
‡ From the Coralline Crag. Looks more like ovalis.
<table>
<thead>
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<tbody>
<tr>
<td>J</td>
<td>VC Lasea rubra</td>
<td>C</td>
<td>rubra</td>
<td></td>
</tr>
<tr>
<td>J K</td>
<td>VC Mytilus edulis</td>
<td>R M</td>
<td>edulis</td>
<td>modiolus</td>
</tr>
<tr>
<td></td>
<td>VC Modiolus modiolus</td>
<td>R M</td>
<td>modiolus</td>
<td>marmorata</td>
</tr>
<tr>
<td></td>
<td>V Modiolaria marmorata</td>
<td>C R</td>
<td>marmorata</td>
<td></td>
</tr>
<tr>
<td>J K</td>
<td>V Modiolaria levigata</td>
<td>—</td>
<td>levigata</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I Cremina decussata</td>
<td>—</td>
<td>decussata</td>
<td>glandula</td>
</tr>
<tr>
<td>J K</td>
<td>V Nucula tenuis</td>
<td>C R M</td>
<td>tenuis</td>
<td>tenuis</td>
</tr>
<tr>
<td>insignis, &amp;c.</td>
<td>V C I F Acila castrensis</td>
<td>Cobboldiae, R M</td>
<td>—</td>
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<tr>
<td>J K</td>
<td>V Yoldia lanceolata</td>
<td>R M</td>
<td>—</td>
<td>lanceolata</td>
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<tr>
<td></td>
<td>V Ledna minuta</td>
<td>R M</td>
<td>caudata</td>
<td>minuta</td>
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<tr>
<td></td>
<td>I Limnea subauriculata</td>
<td>C</td>
<td>subauricul.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>V Hinmites giganteus</td>
<td>Cortesyi, C</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>(Asia)</td>
<td>V Limnea palustris</td>
<td>M</td>
<td>palustris</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V Cylichna attonsa</td>
<td>cylindracea, CR</td>
<td>attonsa</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>V Haminea hydatis</td>
<td>M</td>
<td>hydatis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V Dentalium Indianorum</td>
<td>entale, M</td>
<td>striolatum</td>
<td>—</td>
</tr>
<tr>
<td>J K, ceeva</td>
<td>V Lepeta ceeviana</td>
<td>(ceeva, Nor)</td>
<td>ceeva, Gr.</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>V Margarita helicina</td>
<td>—</td>
<td>helicina</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V Margarita ?Vahlíi</td>
<td>—</td>
<td>Vahlíi, Gr.</td>
<td>—</td>
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<tr>
<td></td>
<td>V Messalia lacteola</td>
<td>—</td>
<td>lactea, Gr.</td>
<td>—</td>
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<td></td>
<td>V Lacuna vincta</td>
<td>M</td>
<td>vincta</td>
<td></td>
</tr>
<tr>
<td>K (turricula)</td>
<td>V Bola fidicula</td>
<td>turricula, R</td>
<td>turricula</td>
<td>turricula</td>
</tr>
<tr>
<td></td>
<td>V Bela excurvata</td>
<td>Trevelliana, R</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>V Scalaria Indianorum</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>K</td>
<td>V Velutina levigata</td>
<td>M</td>
<td>levigata</td>
<td>laevigata</td>
</tr>
<tr>
<td></td>
<td>V Natica clausa</td>
<td>R</td>
<td>(Norway)</td>
<td>clausa</td>
</tr>
<tr>
<td></td>
<td>V C I Eulima micans</td>
<td>polita, CR</td>
<td>micans</td>
<td>—</td>
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<tr>
<td></td>
<td>V Cerithios tubercularis</td>
<td>C</td>
<td>tubercularis</td>
<td>—</td>
</tr>
<tr>
<td>VI</td>
<td>Triforis adversus</td>
<td>C</td>
<td>adversus</td>
<td>—</td>
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<tr>
<td></td>
<td>C I Erato columbia</td>
<td>Maugeriae, CR</td>
<td>—</td>
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<tr>
<td></td>
<td>V Purpura saxicola</td>
<td>—</td>
<td>—</td>
<td>lapillus</td>
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<tr>
<td></td>
<td>V Chrysodorus liratus</td>
<td>—</td>
<td>—</td>
<td>10-costatus</td>
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<tr>
<td></td>
<td>V Trophon multicostatus</td>
<td>—</td>
<td>—</td>
<td>Gunneri</td>
</tr>
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</table>

127. The following species (besides others dredged by Mr. A. Adams, but not yet determined) have been found on both the Asiatic and American shores of the N. Pacific, in addition to those recorded by Middendorff, v. Brit. Assoc. Report, p. 223.

Terebratella Coreanica. Cardium modestum.
Waldheimia Californica. Amusium caurinus.
Waldheimia pulvinata. Placunamonia macroschisma.
Waldheimia Grayi. Crepidula grandis.
Glycimeris generosa. Drillia inermissa.
Schizothaerus Nuttalii. Lunatia pallida.
Solena sicaria. Priene Oregonenesis.
Sanguinolaria Nuttalii. Cerostoma foliatum.
Tellina Bodegensia. Siphonalia Kellettii.

128. The Vancouver and Californian districts have so many characteristic species in common (111 out of 492), that they must be regarded as constituting one fauna, differing as do the British and Mediterranean regions. Full particulars as to the range of the different species may be expected in Dr. Cooper's Report to the Californian Geological Survey. One fact must, however, be here specially noted, viz. the great peculiarity of the island-fauna. Although the Sta. Barbara group are so near the mainland, the dredge has not only produced many species not known on the continent, but also many
before considered as essentially tropical. Along with these are not only some species of types hitherto regarded as almost exclusively Asiatic, as *Verticordia, Solariella*, and *Fulvia modesta*, but also some which belong to the sub-boreal district, as *Lucina borealis, Venericardia borealis*, and *Crenella decussata*. The latter belongs to the British, and not to the N. England form.

129. Of the blending of the temperate and tropical faunas on the peninsula of L. California we are still in ignorance. All we know is, that at Margarita Bay the shells are still tropical, and that at Cerros Island they are strangely intermixed. There is peculiar evidence of connexion between the faunas of the peninsula and of S. America, not only in the land-shells (*v. anted, p. 630*), but in some of the marine forms. Beside identical species with wide range, as many Calyptraeids, the following are coordinate between the North and South Pacific:—

<table>
<thead>
<tr>
<th>Upper and Lower California</th>
<th>South America</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Netastoma Darwinii</em></td>
<td><em>N. Darwinii</em></td>
</tr>
<tr>
<td><em>Solecurtus Californianus</em></td>
<td><em>S. Dombeyi</em></td>
</tr>
<tr>
<td><em>Semele rupium</em></td>
<td>(Ditto, Galapagos.)</td>
</tr>
<tr>
<td><em>Callista var. puella</em></td>
<td><em>C. pannosa</em></td>
</tr>
<tr>
<td><em>Ohama pellucida</em></td>
<td><em>C. pellucida</em></td>
</tr>
<tr>
<td><em>Lioecardium substriatum</em></td>
<td><em>L. Elenense</em></td>
</tr>
<tr>
<td><em>Axinea (Barbarensis,)</em></td>
<td><em>A. intermedia</em></td>
</tr>
<tr>
<td><em>Verticordia novemcostata</em></td>
<td><em>V. ornata</em></td>
</tr>
<tr>
<td><em>Pecten equisulcatus</em></td>
<td><em>P. ventricosus</em></td>
</tr>
<tr>
<td><em>Siphonaria thersites</em></td>
<td><em>S. lateralis, &amp;c.</em></td>
</tr>
<tr>
<td><em>Tonicia lineata</em></td>
<td><em>T. lineolata</em></td>
</tr>
<tr>
<td><em>Acmea patua</em></td>
<td><em>A. &quot;Oregonia,&quot; H. C.</em></td>
</tr>
<tr>
<td><em>Acmea persona</em></td>
<td><em>S. securra</em></td>
</tr>
<tr>
<td><em>Scurria mitra</em></td>
<td><em>C. mcestum</em></td>
</tr>
<tr>
<td><em>Chlorostoma funebralis</em></td>
<td><em>M. maura</em></td>
</tr>
<tr>
<td><em>Mitra maura</em></td>
<td><em>R. ventricosa</em></td>
</tr>
<tr>
<td><em>Ranella Californica</em></td>
<td><em>P. cancellata</em></td>
</tr>
<tr>
<td><em>Priene Oregonensis</em></td>
<td><em>T. Magellanicus</em></td>
</tr>
<tr>
<td><em>Trophon multicoostatus</em></td>
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</tbody>
</table>

Time and space do not allow for pointing out further relations with exotic faunas; which indeed will be performed with greater correctness after Dr. Cooper shall have published his complete lists.

130. For the sake of avoiding the inconvenience of trinomial nomenclature, the subgeneric and varietal names have often been cited in this Report instead of the generic and specific, in order that the exact form of the shell quoted might be more quickly determined. The diagnoses of all the new species here tabulated are written for the press, and will shortly appear in the different scientific journals. Additional specimens will probably prove several forms to be conspecific which are here treated as distinct. In the present state of the science, absolute certainty is not to be attained. The object of the writer* has been principally to bring together the works of his predecessors, and so to arrange and describe the new materials that those who continue his labours may be able to draw their own conclusions from existing data. In order to facilitate reference, a brief index is here given of the subject-matter of the former and of the present Reports.

* The best thanks of the writer are due to Hugh Cuming, Esq., for the free use of his collection; to Messrs. H. & A. Adams, Hanley, Reeve, and Sowerby, for aid in identifying specimens; to the officers and naturalists connected with the Smithsonian Institution; to Dr. A. A. Gould, for very valuable corrections; and generally to authors and friends, who have kindly rendered him all the assistance in their power. He earnestly invites criticisms on the subject-matter of the two Reports; in order that they may be embodied, and errors corrected, in the Manuals of the West-Coast Mollusca which he has undertaken to prepare for the Smithsonian Institution.

*Warrington, Aug. 22nd, 1864.*
## TABLE OF CONTENTS.

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page in Report L</th>
<th>Report 1L</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5. Physical Condition of West America</td>
<td>159</td>
<td></td>
</tr>
<tr>
<td>6–12. Errors respecting Habitat...</td>
<td>162</td>
<td></td>
</tr>
<tr>
<td>13–21. Errors of Nomenclature</td>
<td>164</td>
<td></td>
</tr>
<tr>
<td>22. Table of Localities...</td>
<td>167</td>
<td>517</td>
</tr>
<tr>
<td>23. Table of collectors. Early Writers. Linnaeus, Solander,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martyn, Cemmritz, Dixon, Domby, Perry, Leach,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dillwyn, Lamarck, Swainson</td>
<td>168</td>
<td>517</td>
</tr>
<tr>
<td>24. Humboldt and Bonpland (Valenciennes)</td>
<td>169</td>
<td>521</td>
</tr>
<tr>
<td>25. Voyage of 'Coquille': Lesson</td>
<td>172</td>
<td>521</td>
</tr>
<tr>
<td>26. Eechscholtz</td>
<td>172</td>
<td>521</td>
</tr>
<tr>
<td>27. Tankerville Catalogue: Zoological Journal</td>
<td>174</td>
<td>522</td>
</tr>
<tr>
<td>28. Voyage of 'Blossom': Beechey, Belcher</td>
<td>175</td>
<td>522</td>
</tr>
<tr>
<td>29. Wood's 'Index Testaceologicus' and Supplement</td>
<td>178</td>
<td>523</td>
</tr>
<tr>
<td>30. Voyage of 'Astrolabe': Quoy and Gaimard</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>31. Voyage of 'Adventure' and 'Beagle': King</td>
<td>179</td>
<td>524</td>
</tr>
<tr>
<td>32. Hugh Cuming's Researches</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>33. D'Orbigny's S. America</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>34. Botta</td>
<td>191</td>
<td></td>
</tr>
<tr>
<td>35. Blainville's Purpure</td>
<td>191</td>
<td></td>
</tr>
<tr>
<td>36. Guérin's Magasin: Duclos</td>
<td>191</td>
<td>524</td>
</tr>
<tr>
<td>37. Voyage of 'Beagle': Darwin (see also p. 359)</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>38. Lady Katherine Douglas (afterwards Wigram)</td>
<td>192</td>
<td>525</td>
</tr>
<tr>
<td>39. Nuttall; Conrad</td>
<td>192</td>
<td>525</td>
</tr>
<tr>
<td>40. Voyage of 'Bunite': Eydoux and Souleyet</td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>41. 'Venus': Deshayes, Valenciennes</td>
<td>202</td>
<td>523</td>
</tr>
<tr>
<td>42. 'Sulphur': Hinds</td>
<td>204</td>
<td>529</td>
</tr>
<tr>
<td>43. U. S. Exploding Expedition; Gould</td>
<td>208</td>
<td>529</td>
</tr>
<tr>
<td>44. Middendorff</td>
<td>214</td>
<td>532</td>
</tr>
<tr>
<td>45. Voyage of 'Samarang': Adams and Reeve</td>
<td>224</td>
<td>534</td>
</tr>
<tr>
<td>46. E. B. Philippi</td>
<td>224</td>
<td>534</td>
</tr>
<tr>
<td>47. Mexican-War Naturalists, Rich and Green; also Jewett</td>
<td>225</td>
<td>535</td>
</tr>
<tr>
<td>48, 49. Melchers; Menke</td>
<td>235</td>
<td></td>
</tr>
<tr>
<td>50. Kellett and Wood; Forbes</td>
<td>239</td>
<td>542</td>
</tr>
<tr>
<td>51. Reigen; Br. Mus. Mazatian Catalogue</td>
<td>241</td>
<td>542</td>
</tr>
<tr>
<td>52, 110. Conrad on Wilson's shells</td>
<td>264</td>
<td>634</td>
</tr>
<tr>
<td>53. Jay's Catalogue</td>
<td>265</td>
<td>548</td>
</tr>
<tr>
<td>54. C.B. Adams; Panama Catalogue</td>
<td>265</td>
<td>549</td>
</tr>
<tr>
<td>55. Br. Mus. Catalogues; Veneride</td>
<td>251</td>
<td>555</td>
</tr>
<tr>
<td>56. Sailor's Collection</td>
<td>251</td>
<td>554</td>
</tr>
<tr>
<td>57, 98. Gould's Collection</td>
<td>253</td>
<td>554</td>
</tr>
<tr>
<td>58. Bridges</td>
<td>254</td>
<td>554</td>
</tr>
<tr>
<td>59. Proceedings of the Zoological Society</td>
<td>283</td>
<td>554</td>
</tr>
<tr>
<td>60. Sowerby; 'Conchological Illustrations'</td>
<td>288</td>
<td>555</td>
</tr>
<tr>
<td>61. 'Thesaurus Conchyliorum' and 'Malacological Magazine'</td>
<td>288</td>
<td>561</td>
</tr>
<tr>
<td>'Sowerby's 'Genera'; Reeve's 'Conchologia Systematica'</td>
<td>288</td>
<td>561</td>
</tr>
<tr>
<td>62. Reeve's 'Conchologia Iconica'</td>
<td>280</td>
<td>562</td>
</tr>
<tr>
<td>63. Kiener, 'Coquilis Vivantes'</td>
<td>293</td>
<td>563</td>
</tr>
<tr>
<td>64, 65. German authors; Pfeiffer, Menke, Philipp, Küster, Dunker</td>
<td>294</td>
<td>573</td>
</tr>
<tr>
<td>66. British Museum Collection</td>
<td>296</td>
<td>574</td>
</tr>
<tr>
<td>67. Cumingian Collection</td>
<td>297</td>
<td></td>
</tr>
<tr>
<td>de Conch., Chenu, Duclos, Deshayes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>69, 121. General Table of the Western Faunas</td>
<td>297</td>
<td></td>
</tr>
<tr>
<td>70, 71. Isolation from other Provinces</td>
<td>346</td>
<td></td>
</tr>
<tr>
<td>72, 73. Boreal and Sitcha District</td>
<td>347</td>
<td></td>
</tr>
<tr>
<td>74–76. Fauna of Oregon and Upper California</td>
<td>348</td>
<td>635</td>
</tr>
<tr>
<td>77, 78. Lower California; S. Diego, S. Pedro, S. Juan, La Paz, Guaymas</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>79–83. Tropical Fauna; Galapagos</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>84–87, 122. Comparison with other Faunas</td>
<td>362</td>
<td>680</td>
</tr>
</tbody>
</table>

171
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page in Report I</th>
<th>Page in Report II</th>
</tr>
</thead>
<tbody>
<tr>
<td>88. Land and Freshwater Shells</td>
<td>366</td>
<td>366</td>
</tr>
<tr>
<td>89. Polyzoa</td>
<td>367</td>
<td>367</td>
</tr>
<tr>
<td>90, 120. Fossil Species; U. S. Expl. Exp.</td>
<td>367</td>
<td>679</td>
</tr>
<tr>
<td>90, 92. Conclusion of First Report</td>
<td>367</td>
<td>367</td>
</tr>
<tr>
<td>93. Smithsonian Institution; Collections and Publications</td>
<td>577</td>
<td>577</td>
</tr>
<tr>
<td>94. N. Pacific Exploring Expedition; Stimpson, Gould</td>
<td>581</td>
<td>581</td>
</tr>
<tr>
<td>95. U. S. Japan Expedition; Jay</td>
<td>587</td>
<td>587</td>
</tr>
<tr>
<td>96. A. Adams; Japan</td>
<td>588</td>
<td>588</td>
</tr>
<tr>
<td>97. Pacific Railroad Reports; Blake's Fossils</td>
<td>588</td>
<td>588</td>
</tr>
<tr>
<td>98. &quot; &quot; Gould's Shells</td>
<td>592</td>
<td>592</td>
</tr>
<tr>
<td>99. &quot; &quot; Newberry's Fossils</td>
<td>593</td>
<td>593</td>
</tr>
<tr>
<td>100. &quot; &quot; Antisell's Fossils</td>
<td>594</td>
<td>594</td>
</tr>
<tr>
<td>101. W. Cooper's Shells (Coop.)</td>
<td>596</td>
<td>596</td>
</tr>
<tr>
<td>102. U. S. N. Pacific Boundary Survey; Kenmerley</td>
<td>601</td>
<td>601</td>
</tr>
<tr>
<td>103. Brit.</td>
<td>603</td>
<td>603</td>
</tr>
<tr>
<td>104. Californian State Geological Survey; J. G. Cooper (Cp.)</td>
<td>607</td>
<td>607</td>
</tr>
<tr>
<td>105. Cape St. Lucas Shells; Xantus</td>
<td>616</td>
<td>616</td>
</tr>
<tr>
<td>106. Neah Bay, Vancouver, &amp;c.; Swan</td>
<td>626</td>
<td>626</td>
</tr>
<tr>
<td>107. Farallone Islands</td>
<td>628</td>
<td>628</td>
</tr>
<tr>
<td>108. J. G. Cooper's Land Shells; Bland</td>
<td>629</td>
<td>629</td>
</tr>
<tr>
<td>109. Land Shells of Lower California</td>
<td>630</td>
<td>630</td>
</tr>
<tr>
<td>110. Californian Naturalists: Trask, Newcomb, Rowell, Gabb, Remond</td>
<td>631</td>
<td>631</td>
</tr>
<tr>
<td>111. Various American publications</td>
<td>633</td>
<td>633</td>
</tr>
<tr>
<td>112. General Table of the Vancouver and Californian Fauna</td>
<td>635</td>
<td>635</td>
</tr>
<tr>
<td>113. Additional Shells from Lower California and the Gulf; Cerros Island, Margarita Bay, La Paz, Guaymas</td>
<td>664</td>
<td>664</td>
</tr>
<tr>
<td>114. Additional Shells of Tropical Fauna; Acapulco, Real Llejos, Panama</td>
<td>668</td>
<td>668</td>
</tr>
<tr>
<td>115. General List of Land, Freshwater, and Marine Pulmonates; Binney</td>
<td>669</td>
<td>669</td>
</tr>
<tr>
<td>116. Paludinidae, &amp;c.; Binney</td>
<td>676</td>
<td>676</td>
</tr>
<tr>
<td>117. Melaniidae; Binney</td>
<td>677</td>
<td>677</td>
</tr>
<tr>
<td>118. Unionidae; Lea</td>
<td>677</td>
<td>677</td>
</tr>
<tr>
<td>119. Cyrenidae; Prime</td>
<td>678</td>
<td>678</td>
</tr>
<tr>
<td>91, 120. Tertiary Fossils</td>
<td>367</td>
<td>367</td>
</tr>
<tr>
<td>69, 121. Corrections of General Table</td>
<td>679</td>
<td>679</td>
</tr>
<tr>
<td>84, 122. Comparison with other Faunas</td>
<td>680</td>
<td>680</td>
</tr>
<tr>
<td>123. Local peculiarities</td>
<td>681</td>
<td>681</td>
</tr>
<tr>
<td>124. Comparative study of European Fauna</td>
<td>681</td>
<td>681</td>
</tr>
<tr>
<td>125. Comparison with Eastern American Fauna</td>
<td>682</td>
<td>682</td>
</tr>
<tr>
<td>126. Comparison with the Crag Fossils</td>
<td>683</td>
<td>683</td>
</tr>
<tr>
<td>127. Comparison with Asiatic Shells</td>
<td>684</td>
<td>684</td>
</tr>
<tr>
<td>128. Peculiarities of the Island Fauna</td>
<td>684</td>
<td>684</td>
</tr>
<tr>
<td>129. Comparison of the West Coast of N. and S. America</td>
<td>684</td>
<td>684</td>
</tr>
<tr>
<td>130. Explanation of Nomenclature</td>
<td>684</td>
<td>684</td>
</tr>
</tbody>
</table>
REVIEW

OF

PROF. C. B. ADAMS'S CATALOGUE

OF THE

SHELLS OF PANAMA, FROM THE TYPE SPECIMENS.

BY

PHILIP P. CARPENTER, B. A., PH. D.


(173)
Review of Prof. C. B. Adams's 'Catalogue of the Shells of Panama', from the Type Specimens. By Philip P. Carpenter, B.A., Ph.D.

A résumé of this important contribution to our knowledge of local faunas, and a comparison with the British Museum 'Descriptive Catalogue of the Reigen Collection of Mazatlan Mollusca,' is given in the 'Report of the British Association' for 1856, pp. 265-281. Full series of the old species, and the first specimens of the new, were deposited by Prof. Adams in the Museum of Amherst College, which also contains similar series of the Professor's Caribbean collections. The second specimens of new species were sent to Mr. Cuming, and through his kindness were freely used in preparing the Mazatlan Catalogue, thus avoiding the necessity of many synonyms. An instructive lesson in candour and forbearance may be learnt by comparing together the works of any two naturalists of equal celebrity, or by comparing either of them with the types. With the best desires for accuracy, and the greatest care, it is hardly possible for an author to describe so that his readers shall see shells as he sees them. If this be true of such full and precise diagnoses as those of Adams and Gould, how much greater must be the difficulty to foreigners of recognizing shells from the brief descriptions of Broderip, Lamarck, and the older writers generally. The careful


175
preservation of types therefore, and the interchange of specimens named from types, is of the first importance to save the time and ensure the accuracy of succeeding writers. The Smithsonian Institution has fully recognized this principle by directing that the first available duplicate of all type species described from its collections shall be deposited in some museum open to students on the other side of the Atlantic.

As the authorities of Amherst College had not taken any steps to figure their unique specimens, and as Prof. Adams's determinations of old species had not been verified, I made it my business (when visiting America to deposit the first duplicate series of the Mazatlan Shells in the New York State Museum at Albany) to compare Prof. Adams's collection, on the spot, with his published book, in my copy of which I made my notes and sketches at the time. Every facility was afforded me by the Curator. I was allowed freely to handle the specimens in the presence of his assistant, and to draw the minute species under my microscope. I took with me for comparison the drawings of the minute Mazatlan shells in the British Museum. The species being numbered in both the Panama and the Mazatlan lists, it is easy now to institute a comparison between them. They are here distinguished by the initials P. and M.

P. 1. _Ovula avena._ May be distinct from _Radius variabilis_, M. 435, being much more stumpy, with a thicker lip; but the few specimens are in poor condition, and the differences may be accidents of station.

2. _Ovula emarginata = Carinea e._ Quite distinct from its Caribbean analogue _C. gibbosa._

3. _Ovula neglecta_, C. B. Ad., is probably a small variety of _Radius variabilis._


5. _Ovula_, sp. ind., probably = _variabilis_, jun.

6. _Cypraea arabicula = Aricia a._, M. 438.

7. _Cypraea cervinetta = C. exanthema_, M. 436. Having now examined a multitude of specimens from different stations on the west coast, which differ from each other quite as much as they do from the typical Caribbean forms, I am confirmed in the belief of their identity.

8. _Cypraea punctulata = Aricia p._ Erroneously given, in M. p. 374, as a probable synonym of _A. arabicula_. It is less thickened at the sides, with smaller spots. Although specimens of _arabicula_ graduate into it at the back, it may always be known by the mouth, which has its teeth much further apart.

10. *Cyprea radians* = *Trivia r.*, M. 440.
11. *Cyprea rubescens* = dead sp. of *Trivia sanguinea*, M. 442.
12. *Cyprea sanguinea* = *Trivia s.*, M. 442.
15. *Marginella sapotilla*. The Panama specimens collected by Prof. Adams, and abundantly by others, more closely resemble *M. prunum* than the type *M. sapotilla* of Hinds, which is a much smaller shell. The Caribbean shells (which are found across the Isthmus at Aspinwall) differ only in having a sharper angle in the labrum at the posterior notch. Adanson’s habitat, doubted by Prof. Adams (note, p. 41), is confirmed by specimens in the Bristol Institution brought from Sierra Leone by Chief Justice Rankine. The Pacific shells are probably conspecific, sufficient evidence being now in our possession that the two oceans were united at least as late as the Miocene epoch.*

19. *Mitra solitaria*, C. B. Ad. = *Zierliana s*. Other specimens have since been found of this characteristic species. The “transverse ribs” can scarcely be said to be “obsolete anteriorly.”
20. *Mitra tristis* = *Strigatella t.*, M. 586.
21. *Terebra elata* = *Myurella e*.
22. *Terebra larvacformis* = *Myurella l*.
25. *Terebra tuberculosa* = *Myurella t*.
26. *Terebra varicosa*. This may possibly be a very young specimen of *Subula v.*; but I think it distinct.

27–31. Sp. ind. A specimen of *Euryta fulgurata*, M. 455, is in the museum, as from Panama, but not of Prof. Adams’s collecting.

32. *Oliva angulata*, M. 590.

* The specimens in the Cumingian Museum, named *M. ceruleascens* at the time of the British Association Report, are now labelled “sapotilla,” Hds., 5–13 fathoms sandy mud, Panama, H. C.” Another set of Pacific shells (notch-angle rounded) are given as “Marginella n. s., Panama,” “San Domingo” having been erased. The large West Indian form (notch-angle sharp) is given as “cerulescens, var., Lam., 10 fathoms sandy mud, Panama” Another set of large shells, with sharp angle, and labrum tinted behind, is given as “cerulescens, Lam., Panama,” but without authority. The small West-Indian form (like the typical sapotilla) is given as “glans, Mke.” Either in this, as in other instances, error has crept into the locality-marks, or else even the distinction pointed out by Mr. Redfield (who has given peculiar study to this genus) cannot be relied on for separating the species geographically.
33. *Oliva araneosa* = *O. meichersii*, M. 591. Prof. Adams's shanty specimen can scarcely be distinguished from that which he marked "*O. literata*, Alabama." But the ordinary aspect of the shells *O. reticularis* from the Caribbean Islands, *O. literata* from the coast of the Southern States, and *O. melchersii* from the Pacific, is sufficiently distinct (for the genus).

34. *Oliva inconspicua*, C. B. Ad. = *Olivella i*., M. 599. Some of the shells referred to this species from Panama, Mazatlan, and Cape St. Lucas graduate into the Caribbean *O. oryza*; others into dwarf forms of *O. gracilis*. The species either needs revision from fresh specimens, or should be merged into *O. gracilis*.


37. *Oliva semistriata* = *Olivella s*. Closely resembles *O. columellaris*.
38. *Oliva testacea* = *Agaronia t*., M. 602.
39. *Oliva undatella* = *Olivella u*., M. 595.

40. *Oliva venulata*. This shanty specimen is *O. angulata*, jun. The *O. venulata*, M. 593, is named by Prof. Adams *O. julietta*, as also by Mke. (non Ducl.). The true *O. julietta* (Guacomayo, Mus. Smiths.) is the Pacific "analogue" of *O. fusiformis*.

41. *Oliva volutella* = *Olivella v*. It is surprising that this species, so immensely common at Panama and up the coast, should not reach the Gulf, and that the equally common *O. tergina* of Mazatlan and *O. gracilis* of Cape St. Lucas and Acapulco should be rare elsewhere, while the larger Olives are found from Guaymas to the equator. *O. dama* (= *lineolata*, Gray, C. B. Ad.), abundant at Mazatlan, was bought, not collected, by the Professors at Panama.

42. *Planaxis planicostata*. Stet. Also immensely common at Panama, though absent from Mazatlan.

43. *Nassa canescens*, C. B. Ad. Having compared this unique specimen with *P. 50*, q. v., I can speak to their complete identity. The "pale grey" of the "interspaces" is due to the shell being dead.

44, 45. Stent.
46. *Nassa gemmulosa* = *M. 631*, exactly.
47. Stet.
48. *Nassa luteostoma* = *M. 623*.
49. *Nassa nodifera*. Also found at Guaymas.

50. *Nassa pagodus*, C. B. Ad. (+ *N. canescens*, P. 43) = *N. pagodus*, var.) *acuta*, M. 625. It is certainly the *N. decussata* of Kien., but probably not of Lam. Whether it is the *Triton pagodus* of Rve. I am still unable to say, the type being apparently lost. We are bound to suppose that Mr. Reeve could not mistake so de-
cided a Nassa for a Triton; so that if Lamareck's is a similar Eastern species, the West American may stand as N. acuta.

51. Nassa panamensis, C. B. Ad. The Professor rightly marked his duplicates "exilis, Pws." This abundant shell, having a Pisloid, not a Nassoid operculum, probably belongs to Phos, Northia, or some genus not yet eliminated. N. obsoleta, Say, has a similar operculum, and appears nearly related.

52. Nassa proxima. The unique specimen appears to be an extreme form of N. versicolor, P. 55.


54. Nassa striata, C. B. Ad. The two type specimens, one young, the other adult, both belong to a variety of versicolor. The phrase, "last whorl spirally canaliculate on the left side," simply expresses the ordinary character of Nassa. The specimens in Mus. Cuming, however, from another source, differ somewhat in the nucleus from the small form of N. versicolor. These = N. paupera, Gld., teste Cuming, and should take that name.

55. Nassa versicolor, C. B. Ad., M. 632. The revolving striae vary so greatly in this species, as well as the size, obesity, and colour, that it is hard to assign its limits. The specimens marked versicolor by the Professor vary much more among themselves than the extreme ones do from his proxima and striata. The apex and early whorls of each are exactly the same under the microscope. It is possible that the unique crebristriata, M. 633, is also an extreme variety.

56. Nassa wilsoni appears to be only a dwarf form of P. 53, N. complanata.

57. Buccinum crassum = Phos c.

58. Buccinum distortum = Clavella d.


60. Buccinum lugubre, C. B. Ad. The Professor marked this shell on his card "Murex ??"; then "Fusus?"; then "Fusus nodulosus, Ad., n. s."; then "Buccinum (?) lugubre, Ad., n. s."; so that the old genera were sometimes as badly defined as the new ones. It may rank with Pisia.


63. Buccinum ringens = Pisia r., M. 663.

64. Buccinum sanguinolentum = Pisia s., M. 662.

65. Buccinum stimpsonianum = Nassa st.

66. Dolium ringens = Malea r.

67. Monoceros brevidentatum. This species, very common at Panama, has been transported over (not through) the Pacific, to San Francisco and Monterey. v. P page 75.

179
68. Monoceros cingulatum = Leucozonia c., M. 583.

69. Purpura carolensis = P. triangularis, M. 608.

70. Purpura foveolata = Cuma costata, M. 610, probably; but the markings have been too much obliterated to decide with confidence.

71. Purpura kiosquiformis = Cuma k., M. 609. There are in the collection three shells, labelled by the Professor "P. purpuroides (Fusus), Orb., Panama" = Pisania d'orbignyi, Rve. No authority is given, and they probably came from Peru.

72. Purpura, sp. ind. This shell is not to be found. It has probably been put with the last, of which it is no doubt a variety; v. M. p. 482.

73. Purpura melo. Stet.

74. Purpura osculans appears to be the young of Rhizocheilus nux, M. 611; of which R. distans, Cpr., and probably R. californicus, A. Ad., are only varieties.

75. Purpura tecta = Cuma t.

76. Purpura undata = P. biserialis, M. 606.

77. Columbella atramentaria = Anachis a.

78. Columbella bicanalifera = Strombina b.

79. Columbella boivini. This species must rank with (Anachis or) Engina*, the operculum being Pisanoid.


82. Columbella diminuta = Anachis d.

83. Columbella dorsata = Strombina d.

84. Columbella fluctuata = Anachis f.


86. Columbella fuscata, M. 617. The small var. is C. festiva, Kien.

87. Columbella gibberula = Strombina g.

88. Columbella gracilis = Anachis g.

89. Columbella guttata = Nitidella cribraria, M. 613.

90, 91, 92. Stent.

93. Columbella lyrata = Anachis l

94. Columbella major, M. 615.

95. Columbella modesta = Truncaria m. It might be convenient to leave this genus as arranged by Messrs. H. and A. Ad. Mr. Henry Adams desires to restrict it to the type species, in which

* Of the shells called by French authors Semi-Ricinula, these with a Purpuroid operculum may be retained as Sistrum, while those with Pisanoid operculum should be removed as Engina, with Anachis, to the Muricidae.
case this and similar species must be moved to Nitidella, if the operculum be (as is presumed) Purpuroid; or to Amycla, if Nassoid.

96. Columbella moesta = Anachis n.
97. Columbella nigricans = Anachis n.
98. Columbella para. This appears to be only a dead specimen of C. pygmaea, P. 100.
99. Columbella pulchrior is probably a Nitidella.
100. Columbella pygmaea = Anachis p., M. 651.
101. Columbella rugosa = Anachis r. This appears to be the commonest and most variable species of the genus. The typical specimens are somewhat stumpy, with stout knobs. Then the knobs pass into long, compressed ridges, and finally change into narrow bars. These are wide apart, or close, or nearly evanescent on the back. The shape passes from the stumpy to an acuminate form like costellata. Some adults are more than twice the size of others; but the same variations are found in both extremes. The colours are generally laid on in patches on the knobby specimens; in fine flames, on the smoother ones. In all varieties, it is known from fluctuata by the spiral strie over the whole surface; and from varia by the shoulder, more or less developed into a keel, on the whorls of the spire.

102. Columbella strombiformis, M. 616.
103. Columbella tessellata, C. B. Ad. (non Gask.) = Anachis guatemalensis, Rve.
104. Columbella turrita = Strombina t.
105. Columbella varia = Anachis v.
106. Columbella sp. ind. is the young of a species in Mus. Cuming., resembling harpaformis.
107. Ricinula carbonaria = Engina c.
108. Ricinula jugosa may be an Engina, but has more the aspect of the Pacific group Peristernia.
110. Cassis abbreviata = Bezoardica a. On comparing a large series of specimens from Cape St. Lucas with a similar series of C. inflata from Texas, I was unable to discover any specific differences. It varies greatly, from each ocean, in painting, sculpture, height of spire, &c.
111. Cassis coarctata = Levenia c.

112, 113, 114 (= M. 480), 115, 116 (= M. 481), 117, 118* (= M. 476), 119* (= M. 477), 120 (= M. 475), 121, 122 (= M. 381, Galeatus), 123 (= M. 449), 124 (= M. 448), 125. Steut.

* Having now examined a large number of specimens of these two forms, I have no hesitation whatever in regarding Conus regaliatiss as simply a variety of C. purpurascens. Similar differences may be observed in comparing large series of almost all Cones.
126. *Triton chenmitzii* = *Argobuccinum nodosum*, M. 580. These shells are small and turreted. Those Prof. Adams marked " *T. cingulatum*, Lam., E. Indies," are much more like the Mazatlan shells.

127. *Triton constrictus* = *Distortio c*. The specimens of this group from the Pacific Coast, from the Gulf of Mexico, and from the China Seas are very difficult to discriminate.

128. *Triton fusoides*. This unique and very elegant shell can scarcely be called a *Triton*, even of the *Epidromus* type. It may perhaps rank with *Euthria*, but is peculiar in possessing a distinct anterior sinus, near the canal, like *Rosellaria*.


136. *Murex dubius* = *Muricidea dubia*, M. 673.

137. *Murex erosus* = *Muricidea e*.

138. *Murex radix* = *Phyllonotus r*. The Professor’s specimens of this species are remarkably fine, more nearly resembling the Gulf *niyritus* than the heavy stumpy shells usually seen. His young specimens are heavier, but more turreted, than the young *niyritus*. The opercula appear to have fewer frills; but such differences may be due only to station. The specimens he marked *ambiguus* (without locality) belong to the typical *niyritus*. *Phyllonotus radix* and *niyritus* graduate into each other almost as freely as the latter does into *ambiguus*: v. M. 666.

139. *Murex rectirostris*. This and kindred species run into each other too closely, when adult, to speak with any confidence on so young a specimen in bad condition.

140. *Murex recurvirostris*. This specimen is also far too imperfect to affiliate: v. M. 665.

141. *Murex regius* = *Phyllonotus r*, M. 670.

142. *Murex salebrosus* = *Vitularia s*., M. 612. The curious group of Muricoid Purpurids culminates on the West American shores. It is represented in the north temperate regions by *Cerastoma*, on the warmer shores by *Chorus*, and in the tropical regions by *Vitularia*. The Lower Californian *Murex belcheri*, Hds., belongs to the group. Dr. Alcock (who has succeeded the late Capt. Brown as Curator of the Manchester Natural History Museum) has pointed out very well-marked physiological distinctions between the two families, which are coordinate with the differences in the opercula.

* Dr. Gray (Guide to Mollusca, pp. 39, 42) leaves the round-variced Ranellids, as *Apollon*, in the *Tritoniidae*, "operc. annular, nucleus subapical, within the apex," but removes the sharp-variced species, as *Ranella*, to the *Cassidiidae*, and figures the operculum like *Bezoardica*, "half-ovate, nucleus central, lateral, internal." The operculum of *R. celata*, No. 132, is almost identical with *Murex*, and the shell accords with *Apollon*; but *R. nitida*, No. 134, which has very sharp varices, has its operculum widely removed from *Bezoardica*. It is closely related to that of *Cerastoma*, *Rhizocoeilus*, and some of the *Ocinabre*: nucleus near the anterior end of the labrum; labral portions of the annular layers eroded; scar as in *Purpurids*, with about three roughly angular ridges of growth.
143. *Murex vibex*. This Peruvian species also probably belongs to the Purpurid group.

144. *Murex vittatus* = *Muricidea v.*

145. (= *M. 638*), 146 (= *M. 579*). Stent.

147. *Fusus bellus*, C. B. Ad. This is a pretty little shell, resembling a young *Metula*, and is probably one of the species assigned with doubt to that genus, *M. 619–622*, or to *Fusus*, *M. 642*. I should erase the words, "some of which are varicoid" (referring to the radiating ribs), as my glass did not enable me to detect a single one.

148. *Fasciolaria granosa*. A minute specimen is of the size and general appearance of the fry of *Chrysoilomus antiquus*, with one and a half irregular nuclear whorls. An adult has its operculum broken and mended from a subcentral nucleus—a mode of proceeding which I have now observed in such a multitude of species belonging to different families of Proboscidifers and Toxifers that I venture to assign it as the original type of their opercula, from which the special family forms are modifications of high development. Of the spiral Rostifiers there is not yet sufficient evidence to speak.*

149. *Turbinella ceestus*, *M. 581*.

150. *Turbinella castanea* = *Latirus c*.

151. *Turbinella cerata* = *Latirus c.*, *M. 582*.

152. *Turbinella rudis* = *Latirus r*.

153. *Turbinella spadicea* = *Latirus s*.


155, 156, 157 (= *M. 446*), 158, 159. Stent.

160. *Cancellaria pygmaea* is simply a young specimen of *C. gecnostoma*, no. 157.

161, 162. Stent.

163. *Pleurotoma aterrima* = *Drillia a*.

164. *Pleurotoma atrior*. This is a fine specimen, not quite mature in the lip, of *Drillia aterrima*, var. *melchersi*, *M. 461*.

165. *Pleurotoma bicanalifera* = *Clathurella b*.

166. *Pleurotoma collaris* = *Drillia c*.

167. *Pleurotoma concinna* = *Cithara c*.

168. *Pleurotoma corrugata* = *Drillia c*.

169. *Pleurotoma discors* = *Drillia d*. Probably a finely developed variety of *aterrima*.

* When at Charleston, S. C., I had an opportunity of examining many very fine specimens of the giant *Fasciolaria*, so seldom seen in this country, of which a broken specimen in my collection measures 20 in. In sculpture, colour, and general appearance some were so very like *F. princeps*, *M. 584*, that I was tempted to consider the latter a degraded local variety, till I found the operculum, which is destitute of the singular grooving of the Gulf species.
170. *Pleurotoma duplicata* = *Drillia* d.

171. *Pleurotoma excentrica* = *Drillia* e. I cannot endorse this and some other determinations of critical species of Pleurotomids, not being able to remove the specimens for comparison with types. Even the types in Mus. Cuming, do not always present satisfactory diagnostic characters.

172. *Pleurotoma exigua* = *Mangelia* e. I could not discover "the rest in pairs."

173. *Pleurotoma gemmulosa* = *Mangelia* g.

174. *Pleurotoma grandimaculata* = *Drillia* g.

175. *Pleurotoma incrassata* = *Drillia* i, M. 459. The collection contains *D. luctuosa*, M. 467, as from Panama, but not of the Professor's collecting.

176. *Pleurotoma nigerrima* = *Drillia* n.

177. *Pleurotoma obeliscus* = *Drillia* o. Very worn and doubtful.


179. *Pleurotoma pallida* = *Drillia* p.

180. *Pleurotoma rigida* = *Clathurella* r.

181. *Pleurotoma rudis*. It is probable that this is not the true *Drillia rudis*, being distinguished by white spots on the knobs: v. M. 460.

182. *Pleurotoma rustica* = *Drillia aterrima*, var. melchersi, M. 461. These specimens being very worn, their specific identity with *P. 164* was not recognized by the Professor. One shell, marked "rustica, var.,” may be the true *rustica*—a species by no means satisfactorily distinguished.

183. *Pleurotoma striosa* = *Drillia* s.

184. *Pleurotoma conulata* = *Drillia* z., M. 463.


186. *Pleurotoma*, sp. b. A slender, pure-white, ribbed shell; probably a *Cithara*.


188. *Mangelia*, sp. d. A very worn, black shell; with white, knobby ribs.

189. *Mangelia*, sp. e. A very small, white shell; resembling a young *Bela turricula*.

190. *Mangelia*, sp. f. A very small, white *Drillia*, with distinct posterior notch; spirally striated, with rather sharp ribs.

191. *Mangelia neglecta*. Of the "elevated spiral line on the middle of the whorls” I could discover no trace, except of colour. It is therefore probable that it = *M. acuticostata*, M. 473.
192. Mangelia sulcosa is the true Columbella s of Sby.
193. Cerithium adustum = C. maculosum, M. 381.
194. Cerithium assimilatum = Cerithiopsis a., M. 563.
195. Cerithium binmarginatum = Cerithiopsis b. A good species; but I could not detect the "intermediate raised line." The apical whorls are almost smooth. The "prominent spiral fold" on the columella is simply that which bounds the recurved canal.
196. Cerithium famelicum. Confusion has arisen from the Professor having sent to Mr. Cuming as his type a shell which does not answer to the diagnosis, and which is described as (? var.) mediolææ, M. 382. Ten specimens are retained in the Amherst Museum, of which eight are of the uncinatum type, = M. 383, and two of the Cumingian. C. uncinatum, being an old species, is probably from the Atlantic or E. Indies: if this should prove identical, the name famelicum must be dropped; if distinct, retained for the west coast uncinoids, according to the diagnosis. After an examination of a large series of specimens collected by Mr. Xantus at Cape St. Lucas, I am confirmed in the belief that the Cumingian shell is a distinct species, which must stand as C. mediolææ.
197. Cerithium gemmatum = Rhinoclavis gemmatus, M. 389. So much confusion has arisen from raising specific names to the generic peerage, that whenever a good distinct name has been given, it appears best to retain it—the unbending rule of mere priority for work which is sometimes slovenly, and therefore best forgotten, notwithstanding.
198. Cerithium ? interruptum, C. B. Ad. (non Mke. = M. 383). Great confusion has arisen from this erroneous determination, as may be seen by comparing the Maz. Cat. in loco with the monograph of Sowerby, jun., who has redescribed the southern, highly sculptured forms of the true interruptum as C. galapaginis.
198 and 199 are regarded by Messrs. Cuming and Sowerby as varieties of
200. Cerithium irroratum, C. B. Ad. (Gld. ipse et MSS., non Gld. in Expl. Exp.) = C. stercusmuscarum, M. 387. The aspect of the Panama shells is so different from that of the Mazatlan specimens that I did not wonder at Dr. Gould's opinion that they were distinct. He was, however, misled in affiliating the former to his C. irroratum, of which I fortunately discovered the figured type in the Smithsonian Institution, and which proves to be (according to Mr. Cuming) the C. obesum of Sby. sen., from the Philippines. It is fortunate therefore that the name may be entirely dropped. Some of the specimens of no. 198 graduate sufficiently closely to the Mazatlan form; those of no. 199 are intermediate; while those of no. 200 present a stronger but smaller shell, well armed with small nodules, which are not to be seen in the fine Gulf specimens.
201. Cerithium neglectum = Cerithiopsis n.
203. *Cerithium pauperculum* is a good, new species of *Chrysallida*. The Professor probably did not recognize the Chemnitzoid apex and the Odostomoid plait. The following alterations may be made in the diagnosis:—Shell pale orange [not horn], with six [not five] keels on the spire; spiral ridges anteriorly fainter [not obsolete]; apex sinistral [not acute], of three Paludinoid whorls, the last large in proportion; columella effuse [not canaliculated], with a long, slender, slanting plait.

204. *Cerithium pulchrum* = *Cerithidea p.* A distinct and truly beautiful species, seldom obtained by collectors.

205. *Cerithium reevianum* = *Cerithidea montagnei*, M. 394.

206. *Cerithium validum* = *Cerithidea varicosa*, M. 395. The Southern shells, in all their changes, present such a different aspect from the Gulf specimens, that I am inclined to regard the form *Mazatlanica* as distinct, of which *C. albonodosa* may prove a variety.


208. *Triphoris inconspicuus* is scarcely even a variety of the last; and does not differ so much as the specimens described under the same name, M. 392.

209. *Triphoris infrequens* is not the shell described, under the same name, M. 393, but is the *Cerithiopus tuberculoides*, M. 557. It would have been strange if I had recognized the shell from the diagnosis; for *both of the specimens are dextral*. The apex is nearly smooth. I forbear to redescribe nos. 392, 393 of the Maz. Cat., as they were separated principally in deference to Prof. Adams's authority, until more numerous specimens should have been examined.


211. *Cæcum diminutum* = *Cæcum firmatum*, jun., with numerous close rings. All the Professor's specimens of this genus were dead; most of them pierced by Probuscidifers. They fully confirmed the judgments I ventured to form of them in the Maz. Cat. and in the "Monograph of the Cæcidæ," P. Z. S. 1858, p. 413 et seq.

212. *Cæcum eburneum* = *C. firmatum*. The rings vary from twenty-six to thirty-three.

213. *Cæcum firmatum*, M. 368. Add to the diagnosis in Maz. Cat. p. 320, last line, "operculo vix concavo, suturis minus definitis."

214. *Cæcum laeve*. The two specimens are too worn for identification, but will pass sufficiently for the species described under the same name, M. 372.


216. *Cæcum monstrorum* = *C. firmatum* in the adolescent stage.

217. *Cæcum parvum* turns out, as was expected, to be = *C. undatum*, M. 371. The unique specimen is stunted and dead.

218. *Cæcum pygmaeum* is a small but nearly adult *C. firmatum*. 186

220. Chemnitzia acuminata is a true Chemnitzia, and not a Chrysallida, as supposed in the Br. Assoc. Report, p. 334. The name misleads, as it is a peculiarly broad species. The vertex consists of three Paludinoid whorls, of which the apex is visible, projecting a little beyond the spire. The ribs, instead of "terminating abruptly on the periphery of the last whorl," become gradually evanescent round the base*.

221. Chemnitzia affinis. Comp. M. 523, which was identified from Mr. Cuming's specimen. The diagnosis needs the following corrections from the type. The "ribs terminate" not very "abruptly at the periphery." Anteriorly very finely striated [not "smooth"]: "Last whorl" not "angular at the periphery." Base prolonged. It is probably the adult form of my Chemnitzia undata, M. 531, the characteristic fine, waved, spiral striae having escaped the Professor's notice. The only difference is that the ribs evanesce more suddenly in the Panama than in the Mazatlan shell, which may be due simply to age.

222. Chemnitzia clathratula, part. = Chrysallida clathratula, M. 513, which was identified from the Cumingian specimen. The specimens preserved as types contain, along with this species, one of Chrysallida communis, one (almost certainly) of Chrysallida effusa, M. 510, and one of Dunkeria subangulata, M. 537. Some parts of the description appear taken from the latter species: e.g. the "five or six" spiral lines, of which there are only four in the Chrysallida; and the angle on the "upper part" of the whorls, which in the latter are well rounded.

223. Chemnitzia communis, M. 507. This is the type of the genus Chrysallida: v. M. pp. 416, 420. Prof. Adams's tray contains also one specimen of Chrysallida effusa, M. 510; one of Chrys. telescopium, M. 508; one of Dunkeria subangulata, M. 537; and one which may be a variety of the latter, or a distinct species.

224. Chemnitzia gracilior. The "well-impressed spiral line" is only seen in some of the whorls.

225 Chemnitzia major belongs to the section Dunkeria. I counted eighteen (not twenty-four) ribs.

226. Chemnitzia marginata is a good species of Chrysallida; but I could not find the "spiral, compressed ridge."

227 Chemnitzia panamensis, M. 518. I counted twenty-four (not twenty-seven) ribs. The tray also contains one specimen of

* As several errors are here pointed out in the diagnoses of small shells, it is right to state that Prof. Adams had not the advantage of a microscope during a considerable portion of the work; nor was the instrument a good one when obtained. Moreover the incessant demands on his attention as Professor of Astronomy and Mathematics, as well as of Natural History, and his duties as State Geologist of Vermont, did not leave him much time for original research. What he accomplished during his short life is marvellous. Had that life been spared to revise his works, the necessity for this friendly criticism would not have arisen.
228. Chemnitzia similis. This species most nearly resembles aculeus, but is broader, larger, and with more ribs, of which I counted from twenty to twenty-two (not twenty-six). I should not call the whorls "convex." They are, however, more rounded, and the base is more produced, than in the shell called "? similis," M. 520, which is perhaps a variety of panamensis.

229. Chemnitzia striosa. The early whorls are very slender. The spiral striae are on the tops of the ribs, of which I counted from twenty-four to thirty-two (instead of "about forty").

230. Chemnitzia turrita. This species includes the "Rissoa, sp. ind." no. 251.

231. ? Littorina angiostoma is a Fossarus.

232. Littorina aspera, M. 397. The Mazatlan periwinkles, being in good condition, divide themselves very naturally into three species. The Panama specimens, being generally eroded, are not so easily dealt with. Of Prof. Adams's specimens here retained, the majority belong to aspera, although several of the smaller ones are philippii, M. 398. The young appear to be of both species mixed. The "variety" consists of the abnormal tall specimens of conspersa, M. 396, with a few very large philippii intermixed.

233. Littorina atrata. This abundant little shell is a Fossarus, of which the Professor's ? Adeorbus abjecta, no. 257, is a more advanced form. It is possible that one of the Fossari described in Maz. Cat., nos. 404, 405, may be conspecific; but among the multitude of specimens I could not find one with the nuclear whorls sufficiently perfect to decide. The shells vary extremely in shape and sculpture.

234. Littorina conspersa, M. 396. Smaller and generally more stumpy than the Mazatlan shells, but containing a few specimens of the same extreme forms.

235. ? Littorina excavata = Fossarus e.

236. Littorina fasciata, M. 400. The specimens of this species and of L. varia graduate rather closely towards each other.

237. ? Littorina foveata. A good species of Fossarus. Read, "Last whorl angular" at the umbilicus [not "below the middle"].

238. ? Littorina megasoma. This is also a good species of Fossarus. The Professor was doubtful whether to refer these forms to Littorina or to Narica.

239. Littorina ? parvula, C. B. Ad. This is not Philippi's L. parvula, but is a dwarf form of the L. philippii, M. 398. The Professor suggests the name L. dubiosa for this sufficiently well-marked species; but as he catalogued and distributed his specimens under ? parvula, and kept others under aspera, it may be best to retain
the name philippii under which it has been very extensively circu-
lated.

240. Littorina pulchra. A very rare species, belonging (with fasclata and varia) to the Melaraphe group.

241. Littorina puncticulata. This is the normal state of L. conspansa: v. M. 396.


243. Rissoa clandestina. Three specimens appear of this species of Rissoina, closely resembling R. woodwardii, M. 410, but with more ribs, and not displaying the intercostal striæ.

244. Rissoa firmata. Another species of Rissoina, resembling R. stricta, M. 408, but smaller. The Professor did not observe the fine spiral sculpture, as described in no. 250; q. v.

245. Rissoa fortis. A good species of Rissoina, differing from R. janus in the absence of spiral punctures.

246: ? Rissoa inconspicua, C. B. Ad., non Alder. The name being preoccupied, it is fortunate that the unique shell proves identical with Alvania tumida, M. 414. I found twenty (not "twelve or fourteen") ridges, which are not "obsolete," but become fainter anteriorly. The two upper whorls are very finely cancelled.

247. Rissoa infrequens. The unique specimen of this Rissoina is too much worn for description. It has more than the sixteen ribs; and the diagnostic marks must be received with caution.

248. Rissoa janus. The description of this Rissoina is drawn from a very small, dead, broken specimen, from which the sculpture is almost entirely worn away. The "var. a" should be considered as the type, being in perfect condition, and the diagnosis be altered as follows:—The "fine crowded spiral striæ" are seen all over, as are also the "ribs," which on each whorl "appear as striæ," and are not "obsolete near the periphery." The diagnostic character is that the spiral striæ are composed of rows of minute dots.

249. Rissoa notabilis. After drawing this unique shell carefully under the microscope, and making copious notes on the diagnosis from the specimen, an untoward cough lodged it among the meshes of the Curator's carpet, whence I endeavoured in vain to extricate it. This unfortunate accident is, however, the less to be regretted, as I can state with perfect confidence that it was exactly identical with another shell in the collection, P. 255, q. v.; and with M. 493, Parthenia quinquecineta. The "concave summits" of the ribs imply that the ribs are sharp, with concave interstices; and the "upper keel" is simply due to the angulation of the whorls. Though the lip was broken, the columnellar plait, as well as the sinistral apex, escaped the Professor's notice.

250. Rissoa scalarisformis. This unique specimen is simply the young of Rissoina firmata, P. 244; and probably = Rissoina sp. ind. M. 409.
251. Rissoa, sp. ind. This is a broken specimen of Chemnitzia turrita, P. 230.

252. ? Cingula inconspicua. This unfortunate name, liable to be confounded with Rissoa inconspicua, Alder, and ? Rissoa inconspicua, C. B. Ad., will not be needed, as the type belongs to another sub-order, and = Chrysallida ovulum, M. 512. The Professor did not observe its close relationship with his Chemnitzia communis.


254. ? Cingula terebellum = Parthenia exarata, M. 501. Although I took every pains, in preparing the Maz. Cat., to identify Prof. Adams's species, I was not prepared, in the writings so careful a naturalist who had devoted special attention to the minute species, to find a Pyramidellid under Trochidæ, especially with the mark "apex subacute." The finding of a more perfect Mazatlan specimen enables me to add to the diagnosis:—"vertice nucleoso parvo, satis extante, decliviter sito; interstítiiis carinarum transversim rugulosis; labro solidoire. Long. '087, long. spir. '057, lat. '038."

255. ? Cingula turrita (+ P. 249, Rissoa notabilis) = Parthenia quinquecincta, M. 498. When a shell is described under two genera in the same sheet, the advocates of unbending priority will find it difficult to decide. As each name belongs to a widely removed family, that last given is at least the most correct and distinctive.

256. ? Litiopa saxicola. The Professor states that this "shell has the appearance of a Litiopa," but it wants both the peculiar nucleus and the semitruncated columella; also that the "labium has a distinct deposit," of which I could not see any trace in either of the specimens. It is probably a Cingula.

257. ? Adeorbis objecta. This is the adult form of the shell, of which P. 233, Littorina atrata, is the young. The striae are seen on the lower as well as the "upper part of the whorls." The umbilicus, though "small" for an Adeorbis, is rather large for a Fossarus, to which genus the species undoubtedly belongs.

258. Vitrinella concinna. I could not find the "more or less distinct ridge between the first two keels."

259. Vitrinella exigua = M. 305. The omissions in the Professor's diagnoses of this and other species, being supplied in the Maz. Cat., need not be repeated here: v. M. pp. 236-247.

260. Vitrinella janus. The Professor does not mention the fifth keel, which bounds the umbilicus, and within which are the "minute spiral striae." The "transverse striae" are strong between keels 2, 3, and 4; faint between 4 and 5, and between 1 and 2; and evanescent near the suture.

261. Vitrinella minuta. The original type of this species accords better with Ethalia than with Teinostoma, to which I had referred the Cumingian type.

262. Vitrinella modesta. The "modesty" of this unique shell is
coordinate with considerable attrition, and an umbilicus filled with dirt. It appeared to me regularly rounded, without any keel. The “few spiral striae” are probably the remains of what once covered the whole surface.

263. *Vitrinella panamensis* = M. 295.


265. *Vitrinella perparva* = M. 304. The coronation of the upper keel is seen (though not described) in the type specimen.

266. *Vitrinella regularis*. The unique shell can hardly be called “subdiscoidal,” since the “spire is convex, moderately elevated.” I could not find the “impressed spiral line.” It belongs to *Ethalia*.

267. *Vitrinella seminuda*. The unique type of this species also is much worn. I could not discover the “minute striae of growth.” Beneath, there are five spiral lirae, and a few spiral striae near the mouth. The umbilical region and the base have fine radiating distant striae. It comes nearest to *V. carinulata*, M. 309, but is distinct.

268. *Vitrinella tricarinata*. This unique type is also worn. The spiral keels are scarcely “prominent,” that on the periphery being decidedly faint. The “transverse striae” are between the suture and the nearest rib. The umbilical striae are very faint.

269. *Vitrinella vulvatooides*. This species probably belongs to *Ethalia*. Beside the keels, there are three obsolete spiral lirae—two on the base, and one above the periphery. The umbilicus is bounded by a long, thin callosity, which gives a character to the shell intermediate between the two genera.

270. *Solarium*, sp. ind. *a*. Of the form represented by this species and the next I have been able to examine a large number of specimens collected at Cape St. Lucas by Mr. Xantus, and in the Gulf of Mexico. I know of no mark by which to distinguish the shells from the two oceans. From each locality they vary greatly in the size of the umbilicus, and in the strength of sculpture, number of knobs, &c. I should consider them all as varieties of *S. granulatum*, Lam. *S. quadriceps*, Hds., appears distinct, though it may only be an extreme variety.

271. *Solarium*, sp. ind. *b*. This contains the specimens with coarser sculpture than the last.

272. *Solarium*, sp. ind. *c*. This is a distinct species of *Torinia*, having the size and general aspect of *Helix rotundata*.

273. *Trochus catenulatus* = *Modulus c.*, M. 401:

274. *Trochus coronulatus* = *Omphalius c*. This species reappears at Cape St. Lucas, and is closely allied to *O. ligulatus*, M. 293.

275. *Trochus leanus* = *Calliostoma l*. This distinctive generic name is strongly to be preferred to the specific *Ziziphinus*.

276. *Trochus lima*. This shell exactly accords with *Calliostoma antonii*, Koch, in Mus. Cuming.

191
277. *Trochus lividus* = *Modulus disculus*, M. 403.

278. *Trochus panamensis* = *Omphalius p.* A good species, though apparently very rare; for I had the pleasure of adding it to the Cumingian collection.

279. *Trochus pellis-serpentis* = *Tegula p.*

280. *Trochus reticulatus* = *Omphalius viridulus*, M. 292. This is the common Trochid of the Panama region, as is *ligulatus* of the Mazatlan.

281. *Turbo buschii* = *Uvanilla inermis*, M. 287. This shell appears to replace *U. olitacea* in the southern fauna. Besides the differences indicated in Maz. Cat. p. 229, the operculum is quite distinct.

282. ? *Turbo phasianella* = *Collonia ph.*: not (*Melaraphe*) *phasianella*, Phil.

283. *Turbo rutilus*. The unique type is in miserable condition, to which the "bright red with pale streaks" is owing. The shell may possibly have been originally a *Pomaulax undosus*, which is truly a Lower Californian species. It appears, however, to be a favourite with sailors, as specimens are continually appearing, not only high and low on the West Coast, but also from the Pacific Islands. The specimens brought by Comm. Wilkes's U.S. Expl. Exp. were obtained in N. S. Wales! Prof. Adams's fragments were probably due to ballast.

284. *Turbo saxosus* = *Callopora saxosum*. This replaces the *C. fluctuosum* of the Gulf, M. 282, and the *C. tessellatum* of Lower California. The "var. depressum" of P. Z. S., 1855, I believe to be really a *Senectus* from the Pacific Islands.

285. *Scalaria hexagona*, C. B. Ad.: non Sbv., M. 564. The Professor's shell is (I think) one of the species I described in P. Z. S. from Mr. Bridges's collection; but the distinctions in this genus are too critical to decide without comparison of types. This shell is broad; whorls very separate; varices long and sharp; spirally finely striated.

286. *Scalaria obtusa*, C. B. Ad.; ? non Sbv. This also appeared to me one of Mr. Bridges's species. It is a very pretty shell, with close, sharp, coronated varices.

287. *Scalaria*, sp. ind. a. Like the next, but larger, and with spiral striae between the extremely crowded, sharp varices.

288. *Scalaria*, sp. ind. b. Of the *Clathratula* type, without spiral sculpture.

289. *Scalaria*, sp. ind. c, is probably the young of *Cirrotrema funiculatum*, M. 569, which, with its congeners, may be removed to *Opalia*.

290. *Eulima iota*. This shell, which is a *Leiostraca* (not "? *Sty- lipera*"); is probably distinct from the Mazatlan form, M. 555, which should stand as *L. retexta*.
291. *Eulima recta*. The type is a very good species of *Leiostraca*; but I doubt its identity with the Cumingian specimen, with which the Mazatlan shell, M. 550, was compared. It most resembles the *L. linearis*, M. 554, with which it agrees in divergence and general shape; but that is very much smaller, with the upper whorls more tumid. In the Professor's type of *L. recta*, I searched in vain for traces of the "two brown spots." They were probably thrown by defective light. The "two opaque spiral bands" are simply the effect of the suture, and the previous whorl showing through. For the Mazatlan shell, M. 550, I propose the name of *L. involuta*.

292. *Eulima solitaria*. This also is a *Leiostraca*, not "?Stylifer," and accords exactly with the *Leiostraca*, sp. ind. *a*, M. 552, but not with the supposed *L. solitaria*, M. 551. The latter agrees in shape with the unique Panama shell, whorl for whorl; but its base and labrum are much more produced anteriorly. For this reason, it may be known as *L. producta*.

293. *Pyramidella*, sp. ind. This is probably the *Obeliscus* described in Maz. Cat. no. 486.


295. *Natica chemnitzi* = *N. maroccana*, M. 570. The Professor first labelled these shells "*N. ? maroccana*, Chem.," but crossed it off in pencil. Another tray appeared (without number) labelled "?unifasciata, Lam." They all belong to the large West Coast form of *maroccana*. [N.B. The shells described in P. Z. S. as "var. californica," on the authority of the late Mr. Nuttall, are (with others from the same source) undoubtedly from the Sandwich Islands. The Pacific specimens (of which I have examined many thousands, brought by Comm. Wilkes’s E. E.) present a very different type from those of the west coasts of Africa and America; but are regarded by Mr. Cuming as only a local variety.]

296. *Natica ? lurida*. These shells are simply a pale variety of *N. maroccana*.

297. *Natica otis*, C. B. Ad. (not Brod. & Sby.). These shells appear to be the young of *Polinices "salangonensis,"* P. 298.

298. *Natica ? salangonensis*. I had no opportunity of comparing this *Polinices* with the species of Récluz.

299. *Natica souleyetiana*. The shells closely resemble *N. maroccana*, but with a larger umbilicus.


301. *Natica*, sp. ind. *a*. There is no ticket answering to this number, which was probably intended for the *N. maroccana*, var. "unifasciata."

302. *Natica*, sp. ind. *b*. The shells are marked e, and are the young of *Polinices uber*, P. 300, M. 576.
303. *Natica*, sp. ind. *c*. The shell is marked *f*, and is probably =*N. haneti*.

304. *Nerita scabricosta*= M. 326. After examining a multitude of specimens from different parts of the coast, I have not the slightest doubt of the identity of the forms called *ornata* and *deshayesii*.

305. *Nerita*, sp. ind. *a*=*N. bernhardi*, M. 327.


308–316. Stent. The shells described as *"Auricula"* belong to *Melampus*.


318. ?? *Truncatella dubiosa*. This belongs to *Hydrobia* or some similar Rissoid.

319. *Bulla* (*Tornatina*) *infrequens=* *Tornatina i.* , M. 222.

320. *Bulla* (*Cylichna*) *laticola=* *Cylichna l.* , M. 221. The Mazatlan shell is much more constricted than most of Prof. Adams's specimens.


323. *Vermetus? glomeratus*, C. B. Ad. (not *Bivonia glomerata*, Lam.)= *V. eburnens*, M. 354. The shells sometimes assume a rufous tint in the later whorls, in which state (if the Turritelloid apex be concealed) it is liable to be confounded with *Aletes centiquadrus*. Some of the Professor's shells belong to the latter species.


325. *Stomatella infata* is a *Lamellaria* with broken lip and very much curved columella: v. M. 577. [A *Sigaretus*, with somewhat sharper columella than the ordinary W. Indian form, was found among the Professor's duplicate Panama shells; but as it does not occur either in the catalogue or the collection, it was probably dropped in from the Jamaica series.]

326. *Hipponyx*, sp. ind. Of the Professor's "two small specimens" marked "*subrufa*, jun.," one is *H. grayanus*, jun., M. 350. The other may be the same, but is probably the young of *H. barbatus*. Neither are sufficiently perfect to determine with confidence.

327. *Hipponyx? barbata*. Part of these specimens belong to *H. barbatus*, M. 349; part to *H. grayanus*; part are too much worn to determine; and one is a valve of *Discina cumingii*.

328. *Hipponyx panamensis=* *H. antiquatus*, M. 347. The species is very widely diffused, and varies greatly in each locality.

329. *Hipponyx radiata*= *H. grayanus*, M. 350. The collection 194
also contains a tray labelled "Panama: C. B. Ad. don.," in which are *Hipponyx serratus*, M. 346, *H. barbatus*, and *Gadinia pentagonostoma*, M. 270. This last name should be dropped, except as a variety of *G. stellata*, Sby., which is the normal state: v. B. A. Rep. 1857, pl. 7. f. 3, a-g.

330. *Calyptreæ aberrans*. The Professor candidly allows that "in texture this shell much resembles a valve of an *Anomia*," which it undoubtedly is, the supposed "probably imperfect cup" being the ligamental pit. The large muscular scar is very clearly developed; but the others are faint, as is customary in young shells, and might stand for either *Anomia* or *Placunanomia*. The valve is thin and glossy inside. The outside is smooth, excepting the lines of growth, and is encrusted with beautiful zoophytes. A tiny *Ser- pula*, which has coiled itself close to the umbo, carries out the idea of a Calyptraeid spiral apex; but a careful microscopic examination displayed the true Anomoid nucleus, at a little distance from the margin, as is common in the Mazatlan specimens of *A. lamoid*, M. 219.

331. *Calyptreæ* (*Syphopatella*) *aspersa* = *Galerus conicus*, very worn and young, with the *lamina* broken away. One of the specimens may perhaps be *mamillaris*.

332. *Calyptreæ cepacea* = M. 345.

333. *Calyptreæ conica*. These are dead specimens, of which a few may be the true *Galerus conicus*, M. 332. But most of them belong to the brown-tinted variety of (the Professor's *G. regularis*) *mamillaris*: v. no. 340.

334. *Calyptreæ dentata* = *Crucibulum imbricatum*, M. 343.

335. *Calyptreæ hispida* = *Crucibulum spinosum*, M. 344.

336. *Calyptreæ imbricata*. The two specimens are too much worn to affiliate with confidence, the cups being broken out. The outside is ribbed, with arrow-headed striae between the ribs. They probably = *Crucibulum i.*, var.

337. *Calyptreæ maculata* = *Crucibulum spinosum*, M. 344. See the attempt to unravel the confusion in the synonymy of this family in Maz. Cat. pp. 264–295. Three specimens marked by the Professor "*C. maculata*, var," are young, dead *radiata*, no. 339.

338. *Calyptreæ planulata*. This unique shell is simply a young, flat *C. cepacea*, with the cup prominent, and the outside sculpture faintly developed, from living in a hollow place. The striae are not "obsolete around the apex."

339. *Calyptreæ radiata* = *Crucibulum r*. This rare and beautiful species is quite distinct, even in the early stages, from all varieties of *C. spinosum*.

340. *Calyptreæ* (*Syphopatella*) *regularis* = *Galerus mamillaris*, M. 333.

341. *Calyptreæ umbrella* = *Crucibulum u.* (= *C. rudis*, Brod.).
342. Calyptraea unguis, C. B. Ad. = Crucibulum spinosum, jun. (not Galerus unguis, Brod.).

343. Crepidula cerithiicola. Most of the specimens are the young of C. onyx, M. 340; but a few are of C. incurva, M. 339.


345. Crepidula excavata, M. 337.


347. Crepidula incurva, M. 339. A very interesting series of specimens; of which two or three are probably the twisted form of C. onyx. One tray contains specimens adhering to other shells. One, fixed diagonally on a Calliostoma, takes exactly the arrow-headed sculpture of the var. Calliostoma imbricata, Brod. Another, grown diagonally on Pisania gemmata, has the general aspect of a Chiton. One, fixed on the back of its neighbour which has grown on a Calliostoma, has the granular interruptions of the ribs transmitted through the first specimen. The same is true of one which has grown on another which was planted on a Pisania. One specimen, which had established itself on a Calliostoma, and began with normal ribs, is losing these at the margin, adopting the sculpture of the Trochid. An extremely twisted specimen in the tray of separate shells has a bifid deck. A young one had edged itself into the apical part of the deck, as into a maternal pouch; so the old one made a fresh deck over it.

348. Crepidula lessonii. Most of the specimens are of C. nivea, var., M. 341. Two shells, which have the apex perfect, display the characteristic nuclear riblets. One dark-coloured specimen may be a hybrid, and another (though too much worn for confident affiliation) appears to be C. unguiformis. Among the duplicates, all the specimens which were perfect at the apex presented the niveoid nucleus, though white; but generally the riblets were more or less worn off.

349. Crepidula squama. These are the flat form (mostly dead and worn) of C. nivea, M. 341. Some of them pass into lessonii. Some are highly coloured, and may be the young of C. onyx; one even of C. incurva. One of the young shells in phial appears to be C. onyx; but whenever the apex is perfect, it presents the typical riblets: v. Maz. Cat. in loco.

350. Crepidula unguiformis. The apex being hidden in dead shells, which I was not at liberty to break away, I could only examine one specimen, which appeared to be a C. nivea, var., as supposed in Maz. Cat. p. 285. Of the loose specimens, scarcely any are sufficiently perfect at the apex to speak with confidence. Most of them, however, have the characteristic painting of the variety squama; and all may belong to the common species (C. nivea), except one which is a true C. unguiformis, M. 342, on the back of another shell, and a few which are probably C. onyx, var. Of the duplicates, which I was at liberty to extract from the dead shells,
some undoubtedly *C. nivea*; others truly *C. unguiformis*; and others probably *C. nivea*, but with the riblets worn away by the crabs.

351. *Crepidula nivea*, M. 341. The specimens are small and poor; mostly rough, of the variety *striolata* passing into *lessonii*. Wherever the apex is perfect, it presents the characteristic riblets, but is generally white, not brown as in most of the finely grown Mazatlan shells.

352. *Crepidula osculans*. This is a perfect and extremely beautiful specimen of *Scutellina navicelloides*, M. 269. The Professor did not observe the non-spiral patelloid apex, and regarded the "navicelloid" columella as an extremely narrow deck. To the diagnosis in the Maz. Cat. may now be added "apice obtuso, subdextusi; vertice hanc spirali, vic conspicuo."

353. *Crepidula rostrata= C. adunca*, M. 338, ?non Sby. The examination of a large series of specimens from the temperate fauna has led me unexpectedly to confirm Mr. Reeve's opinion that they are distinct. The northern shell is *C. adunca*, Sby. (=Garotti [Gray] *solida*, Hds.= *C. rostriformis*, Gld.); and the tropical shell must take the prior name, *C. uncata*, Mke. (=*C. rostrata*, C. B. Ad., Rve.=*C. adunca*, Maz. Cat., non Sby.).

354. *Fissurella aequalis= Fissurellidea æ*.

355. *Fissurella alta= Glyphis alta*, M. 280.


357. *Fissurella microtrema*. These are dead specimens, of which some are *F. rugosa*, var., M. 273.

358. *Fissurella mus=Glyphis inæqualis*, var., M. 279. These shells are intermediate between the typical form and *pica*.

359, 360. Stent.

361. *Fissurella virescens*. It is doubtful whether any of the specimens are of the true *virescens*, M. 271, as they run into *nigropunctata* by insensible gradations. Perhaps both species may prove identical.


366. *Siphonaria ?pica*. These are young dead limpets (not *Siphonaria*).

367. *Lottia ?patina*, C. B. Ad. (non Esch.). These shells differ from *Acmœa mesoleuca*, M. 263, in being black instead of green, and are prettily striped.

368, 369, 370. *Lottia*, sp. ind. There may be two or even more species of *Acmœa*, but it is not impossible that there is only one among the professor's *Lottia*, some of the specimens being the young of ? *Patella*, no. 371.
371. *Patella*, sp. ind. This has the general appearance of *P. vulgata*, but may be an *Acmæa*.

372. *Chiton clathratus*. (Genus indet.)

373. *Chiton dispar*, C. B. Ad.; not *Lophyrus dispar*, Sby. I doubt whether any of the Professor’s specimens belong to Sowerby’s species, which is black mixed with grey; area-sculpture very faint; and sides imbricated, not rugulose. Among the duplicates were two (if not three) species:—the principal one with side-sculpture in lobated knobs, which may be named *Lophyrus adamsii*; a variety with simple knobs; and a well-marked species without distinct side areas, which may be called *Lophyrus tenuisculptus*.


376. *Chiton stokesii = Lophyrus s.*

377. *Anomia lampe*, C. B. Ad. It is doubtful whether this is identical with the northern species, *M. 219*.

378. *Anomia tenuis*. This is probably the young of the last species, and may give it a name, if new. It is doubtful how the diagnosis of the scars was made out; as they were not visible in either of the specimens retained, being encrusted with dead animal matter. They were not distinct even after its removal.

379. *Anomia*, sp. ind. *a*. Probably the same species as the two last, although far too dead, worn, and young to decide. See notes on the variations of *A. lampe*, Maz. Cat. p. 168.

380. *Ostrea*, sp. ind. *a*. The hinge notches of the upper valve fit between corresponding teeth in the lower. Inside rather flesh-coloured; white, round margin. Scar kidney-shaped, dark in one valve, light in the other. A young valve is white, and as pearly as *O. tridescens*, *M. 211*. The species is best known by its tendency to make a very broad limb in the exterior coloured part, spreading out into palnations. A very young specimen, though covered above with *Membranipore*, shows the characteristic corrugations through. It may stand provisionally as *O. panamensis*.

381. *Ostrea*, sp. ind. *b*. This is probably a variety of *O. pana-

382. *Ostrea*, sp. ind. *c*. Rather square hinge, without plications; one shell with an umbonal cavity. Pearly white. One specimen is tinted on the scar, which may become coloured in the adult. It is by no means “pentangular,” and is more probably *O. rufa*, Gld., than *O. columbiensis*, *M. 213*.

383. *Ostrea*, sp. ind. *d*. The shells are broader than the Mazatlan specimens of *O. virginica*, *M. 212*, probably from not growing on twigs. The younger shells are very like *O. edulis*; the older ones 198
have hollow umbos. One long shell, first marked \( e \), but altered to \( d \), is the adult form; several of the younger shells are doubtful.

384. Ostrea, sp. ind. \( e = \) Ostrea, M. 215. Being a good species, I propose the name of \( O. \) amara. The Professor's "small var." is not plicated, and appears to belong to \( O. \) conchaphila, M. 214. [N.B. Additional specimens confirm me in the belief that \( O. \) palmula, M. 214 \( b \), is a distinct species.]


386. Spondylus, sp. ind. \( a = \) Plicatula penicillata, M. 210.

387. Pecten incr. = P. ventricosus, Sby., as in errata.

388. Pecten tumbezensis = P. aspersus, Sby., Hanl. (? Lam.).

389. Lima angulata. Shells inflated, not gaping.

390. Lima pacifica (= L. arcuata, Sby., Hanl.). Young shells, species uncertain.


392. Avicula sterna, M. 203. A. libella, Rve., appears to me the young of this species.

393. Perna, sp. ind. \( a = \) Isognomon chemnitziana, M. 205.

394. Perna, sp. ind. \( b = I. \) chemnitziana, var. Rather more finely grown, and with less colour, but certainly the same species. The Professor's Jamaica specimens are labelled " bicolor, Ad."


396. 1\( ' \)i'na tuberculosa. Three of the specimens appear to me = P. maura, jun. The other may be the same, but is worn nearly smooth.

397. Mytilus, sp. ind. \( a \). Resembles the young of Modiola brasiliensis, but with a few hinge-teeth, as in M. edulis.

398. Lithodomus, sp. ind. \( a \). Most of these specimens are of Lithophagus aristatus, M. 176; one (perhaps two) are L. attenuatus, M. 173 (which is found from Lower California to Chili); and one appears to be L. plumula, M. 175; but they are too young to decide with confidence.

399. Modiola ? semifusca. These specimens all belong to the M. brasiliensis, M. 171, but are much more like the ordinary Brazilian specimens than are those from Mazatlan. As compared with the latter, the Panama shells are more rounded, with stronger posterior grooving, and with the angular ridge less marked. A similar shell, undoubtedly from New Zealand, is considered by Mr. Cuming con-specific.

400-404. Modiola, sp. ind. \( a, b, c, d, e \). I could find no \( a \) or \( e \) in the collection; but there were two trays marked \( f \). Tray \( b = M. \) capax, M. 170. \( c \) contains several specimens of Mytilus multiformis, M. 168, strongly ribbed variety, perhaps intended for \( b \), no. 401.
d contains parts of six specimens, and perhaps should be a, no. 400. They appear to be a variety of Lithophagus cinnamomeus, M. 177, but with broken shells, &c., agglutinated on the posterior side. f(1) contains four specimens of M. multiformis, the semigreenish variety (Maz. Cat. p. 119), and are probably intended for e. f(2) contains two specimens of the same variety of M. multiformis, in the burrow of a Lithophagus, and may stand for d or e.

405. Chama buddiana = C. (frondosa, var.) fornicata, M. 121, b. Additional specimens confirm me in regarding this species as distinct from all varieties of frondosa. The Professor's shells not being very characteristic, the diagnoses do not exactly accord. The shell stands as C. buddiana.

406. Chama corrugata. The large valve appears a dead reversed C. (frondosa) mexicana, M. 121, with the teeth perforated by Lithophagi. The other may be corrugata, very dead, of sienna-tint, very pointed dorsally.

407. Chama echinata. These appear to me to be the young, partly of C. buddiana, but principally of C. mexicana.

408. Nucula elenensis = Leda e., M. 199.


413. Arca alternata = Barbatia a., M. 188.


416. Arca gradata = Barbatia g., M. 194.


418. Arca mutabilis = Byssolarca m., M. 190.

419. Arca (Byssolarca) pholadiformis. This is simply an elongated form of Barbatia gradata, probably from growing in the hole of a Lithophagus. The umbos are "flattened" by erosion; teeth not "obsolete" under the glass; "ligament concealed" simply by the compressed and elongated growth.

420. Arca reviana = Barbatia r.

421. Arca reversa = Noetia r., M. 185.

422. Arca similis. This is scarcely a variety of A. tuberculosa, M. 184. The specimens are dead and oiled, with most of the epidermis abraded.


424. Arca (Byssolarca) tobagensis = Barbatia illota, M. 193.


426. Arca, sp. ind. a. These little shells approach the Noetia
type. Ribs fine, tuberculous, coarse on the angular side. Ligament very narrow, truncated.

427. Cardita affinis. (Lazaria.)
428. Cardita laticostata = Venericardia l.
429. Cardita radiata. (Lazaria.)
430. Cardium graniferum, M. 134.
431. Cardium obovale = Hemicardia o.
432. Cardium planicostatum, C. B. Ad., not Sby. This looks like a dead ballast-valve of Hemicardia media; but it may be H. biansulata.

433. Cardium procerum, M. 125.
434. Cardium senticosum, M. 126.
436. Venus discors = Tapes gratus, Say, M. 110. The Professor's specimens of this species and T. histrionicus are somewhat intermixed.

437. Venus gnidia, M. 101. Dead specimens; of which one may possibly be Chione amathusia, M. 102.
438. Venus multicolostata. Closely resembling the West Indian form.
440. Venus subrugosa = Anomalocardia s., M. 112.
441. Venus, sp. ind. a. A small species with concentric laminae, armed with one posterior row of blunt spines. Interstices with minute concentric striae.

442. Venus, sp. ind. b = Chione crenifera, M. 105 = V. sugillata, Rve. C. I. no. 43.
444. Cytherea aurantiaca = Callista aurantia, M. 92.
445. Cytherea consanguinea = Callista e. Messrs. H. and A. Adams have not made a subgenus to include this group of thin, inflated, almost colourless species.

446. Cytherea radiata = Trigona r., M. 83.
447. Cytherea squalida = Callista chionea, M. 93.
448. Artemis dunkeri = Dosinia d., M. 90.
449. Artemis saccata = Cyclina subquadrata, M. 91.

451. Cyrena maritima. Stet. The collection also contains two tubes, containing a very young "?Cyclas" and another "Cyrena, jun.," marked "Panama, C. B. Ad."

452. Lucina tellinoides = Felania t. Differs from F. sericata, 201
M. 152, in having a yellow, not silky, epidermis. The specimens vary considerably in thickness. The genus scarcely differs from *Miltha*.

453. *Capsa altior* = *Iphigenia a.*, M. 69.

457. *Donax rostratus*. This single valve proves to be the true *D. carinatus*, M. 71, and not the shell which I called *D. culminatus*, M. 72 (= *carinatus*, var., Hanl. in Mus. Cum.), which I subsequently affiliated to the supposed *rostratus*, Maz. Cat. p. 548, on the authority of Dr. Gould’s specimen. We were probably both misled by the "very sharp angle," which (as compared with the other form) I should call *rounded*, and the "concave" surface, which I should translate into flat. The names have been altered in the Cumingian collection since the Mazatlan shells were identified; but Mr. Hanley informs me that they are now correct; that the *D. culminatus*, M. 72, is his own original *carinatus*; and that the *D. carinatus*, M. 71 (olim Mus. Cum.), which is certainly *D. rostratus*, P. 457, must stand under Prof. Adams’s name.


459. *Tellina cognata*, C. B. Ad.=*Psammobia casta*, Rve., teste Cuming. The sculpture consists of semidiagonal striae passing over the lines of growth. In other specimens examined from Panama these are sometimes crowded, sometimes distant, occasionally flexuous, sometimes almost evanescent.

460. *Tellina columbiensis*. (*Peronæa*.)

461. *Tellina concinna* = *Macoma c*. The "slight tinge of pink" I could not discover.

462. *Tellina crystallina* = *Tellidora c*.
464. *Tellina dombeyi* = *Macoma d.*, M. 50.
465. *Tellina felix*, M. 51. (*Angulus.*)
466. *Tellina laceridens*. (*Peronæoderma.*)
467. *Tellina prora*. (*Peronæoderma.*)
469. *Tellina rubescens*. (*Peronæoderma.*)

470. *Tellina siliqua*. The two odd valves belong probably to a *Macoma*, in shape resembling *Thracia phaseolina*.

471. *Tellina simulana* = *T. (Peronæoderma) punicea*, M. 54. The species was described, for geographical reasons, from a young, pale, and undeveloped valve. On comparing it with the Professor’s own West Indian specimens, I could detect no difference.
472. *Tellina sincera* = *Strigilla* s.

473. *Tellina vicina* = *Heterodonax victinus*. The shells are labelled *T. eversicolor* by the Professor. They are larger than the general run of West Indian specimens; but the form is probably a local variety of the old *Heterodonax bimaculatus*.

474. *Tellina*, sp. ind. a. The doubt concerning "concave" and "convex" probably arises from an error in description.

475. *Tellina*, sp. ind. b. Looks exactly like the young of No. 474, but with lateral teeth.


477. *Petricola cognata*. More characteristic specimens from the same coast are affiliated by Mr. Cuming to *P. pholadiformis*, from which this would probably not have been separated had it appeared on the Atlantic coast.

478. *Saxicava ?tenuis*. The Panama shell is more like *Petricola* than *Saxicava*, having two teeth in each valve, one of which is bifid. Sowerby's species is called by Messrs. H. & A. Adams "Saxicava tenuis" (ii. p. 349) and "Petricola tenuis" (ii. p. 411). Shell with very fine radiating striae, crossed by irregular striae of growth.

479. *Cumingia coarctata* = *C. lamellosa*, var., M. 42.

480. *Cumingia trigonularis*, M. 43.

481. *Cumingia*, sp. ind. a = *C. trigonularis*, No. 480.

482. *Cumingia*, sp. ind. b = *C. var. coarctata*, No. 479.

483. *Cumingia*, sp. ind. c = M. 45. This appears a distinct species, and may be quoted as *C. adamsii*, in remembrance of the labours of Messrs. H., A. and C. B. Adams.

484. *Cumingia*, sp. ind. d = Maz. Cat. tablet 107, p. 31; well rounded, with close striae. Probably distinct.

485. *Amphidesma bicolor* = *Semele ?venusta*, M. 41 (non A. Ad.). The "species" in this genus are often separated by very variable characters.

486. *Amphidesma ?ellipticum* = *Semele* e.

487. *Amphidesma proximum*. The type is not quite so elliptical as the last species; but as this is a very variable character (v. Maz. Cat. p. 28), I should regard it as the same. It is not the *Semele proxima*, M. 40 (= *S. flavescens*, v. Maz. Cat. p. 548).

488. *Amphidesma pulchrum* = *Semele* p.

489. *Amphidesma striosum* = *Semele* s. I should describe the shell as smooth, with very fine diagonal striae crossing the lines of growth. It has the general aspect of *S. pulchra*. The teeth in one valve are long and sharp.

490. *Amphidesma tortuosum* = *Semele* t. Teeth short and faint.

491. *Amphidesma ventricosum* = *Semele* v. The "zones" are very
“ill-defined.” Teeth scarcely visible. It looks outside like a dead valve of *Macoma solidula*.

492. *Crassatella gibbosa*. Also found at Cape St. Lucas.

493. *Mulinia donaciformis* = *M. angulata*, M. 80.

494. *Mulinia ventricosa* = *Mactrellaexoleta*, M. 78.

495. *Lutraria elegans* = *Harvella elegans*; ascribed by Messrs. H. & A. Adams to Florida (ii. p. 378), from which I have never seen it. It is rare, but (under different names) somewhat widely diffused west-tropical shell. Its “analogue” from Florida and Carolina is *Raëta canalicularata*.

496. *Mactra velata* = *Standella v. Vide* M. 79. The “small variety” is conspecific.

497. *Anatina alta*. This valve of *Periploma* may prove identical with one of the four Gulf species. The spoon is supported underneath by a linear plate.

498. *Pandora cornuta*. It is singular that neither Prof. Adams nor Dr. Gould observed that the peculiar characters of this species are due to a fracture, producing a beak and sinus which are not seen on the lines of growth. The sentences about the “rostriform projection,” the “sinus,” and the “prominent angle,” should therefore be erased from the diagnosis. The hinge-teeth consist of a long sharp tooth, very pointed, in one valve, fitting against a less prominent one in the other; a slight ligamental tooth in the first valve only; and a very long, sharp, clavicular tooth in each valve, running near the posterior margin, against the inside umbonal portion of which the ligament is attached. Should it prove identical with *P. claviculata*, the earliest name (as being given in error) may advantageously be dropped. It is surprising that Messrs. H. & A. Adams have not divided the old Lamarckian genus even into subgenera.

499. *Potamomya aequalis*. 500. *P. inflata*. 501. *P. trigonalis*. These three forms of *Azara inflata* differ in outline, but not more than do some other species of Corbulids and such shells as *Trigona radiata*. The teeth, pallial lines, and general characters are the same in each. The first two I should consider certainly identical; and a large series of specimens would probably graduate to the third.


505. *Corbula ovulata*, M. 33.

506. *Corbula rubra*. A young orange-tinted specimen of *C. biradiata*, No. 503. The “broad flexure” is an accidental growth, not shown in the lines of growth of an earlier stage.


508. *Corbula*, sp. ind. a. A very small angular valve, with sharp concentric ridges. It may belong to *C. pustulosa*, M. 32.
509. *Corbula*, sp. ind. *b.* Dead valves of *C. biradiata*, No. 503. To the same species may be referred *C. polychroma*. We were misled by the different appearance of the dead shell, and by the locality-mark in Col. Jewett’s collection. His specimens were probably from Panama or Acapulco.

510. *Solecurtus affinis*, M. 37. It is probable that this species is identical with *S. (?) Novaculina* *caribbeus*. The Ariquibo specimens of the latter in Mus. Amherst are more like the Mazatlan shells than those are to the Panama type. Shells from Cape Palmas were affiliated to the Caribbeæan species by Mr. Cuming.

511. *Solen rudis*—*Ensatella r.* This interesting form passes towards *Pharella*. It is called "*Solen obliqua*, Spengl., var." in Mus. Cuming.

512. *Pholas crucigera*. With the general aspect of *Barnea candida*.

513. *Pholas tubifera*—*Pholadidea t.* Of the *melanura* type, with a solid tube fitting on to the ends of the cups.

514. *Pholas xylophaga*. Of the *Martesia* type, without cups. Dorsal and ventral plates long; umbonal plates moderate; wave of the adolescent gape rather suddenly arched.

515. *Pholas* —, sp. ind. *a*. Col. Jewett’s specimens of the same shell are named *laqueata* by Mr. Cuming. It is of the non-waved, concameroid type; without radiating sculpture; concentric lamellæ beautifully frilled.

516. *Pholas*, sp. ind. *b*. So like *P. dactylus* that it might be taken for a worn valve from ballast. The sculpture-ridges are, however, further apart; hinge-chambers larger and more numerous, with a little twisted lamina beyond; gape less conspicuous.


The shells unfortunately are all loose, in trays, with the autograph names on tickets. Prof. Adams’s West Indian collections are in the same condition; and both series are arranged together, in zoological order, in the midst of the general collection. There is no evidence, however, that they have been handled since the Professor left them, none of the leading conchological writers in the New World having thought it needful to go out of their way to complete a review of the Professor’s work. Amherst is situated on a branch railway, and is within an easy walk of Northampton, Mount Holyoak, and the delicious scenery of the Connecticut River. In the College buildings are also deposited the most complete series of the Fossil Footprints of the Connecticut River, and the mineralological collection (including the meteorolites) belonging to Prof. Shepneru.
11. It may be considered as a matter of national policy that the

12. The following are the principal features of the national policy that

13. The national policy is based upon the following principles:

14. The national policy is characterized by the following features:

15. The national policy is designed to achieve the following objectives:

16. The national policy is expected to have the following effects:

17. The national policy is expected to result in the following outcomes:

18. The national policy is expected to bring about the following changes:

19. The national policy is expected to lead to the following improvements:

20. The national policy is expected to yield the following benefits:

21. The national policy is expected to promote the following values:

22. The national policy is expected to foster the following developments:

23. The national policy is expected to encourage the following activities:

24. The national policy is expected to facilitate the following progress:

25. The national policy is expected to support the following initiatives:

26. The national policy is expected to contribute to the following goals:

27. The national policy is expected to ensure the following conditions:

28. The national policy is expected to uphold the following principles:

29. The national policy is expected to safeguard the following rights:

30. The national policy is expected to protect the following interests:

31. The national policy is expected to enhance the following capacities:

32. The national policy is expected to improve the following situations:

33. The national policy is expected to address the following challenges:

34. The national policy is expected to resolve the following issues:

35. The national policy is expected to overcome the following obstacles:

36. The national policy is expected to navigate the following complexities:

37. The national policy is expected to navigate the following terrains:

38. The national policy is expected to achieve the following milestones:

39. The national policy is expected to reach the following endpoints:

40. The national policy is expected to attain the following targets:

41. The national policy is expected to attain the following horizons:

42. The national policy is expected to achieve the following milestones:

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DIAGNOSES

OF

NEW FORMS OF MOLLUSKS COLLECTED AT CAPE ST. LUCAS BY MR. J. XANTUS.

BY

PHILIP P. CARPENTER, B. A., PH. D.


(207)
DIAGNOSIS

OF

NEW MORBID OR MORALISMS COLLECTED AT CAFE

AT MUNICH BY MM. J. XANTUS.

BY

JENS HANSEN, M.D., L.P.S.D.

(continued)
DIAGNOSES

OF

NEW FORMS OF MOLLUSKS

COLLECTED AT CAPE ST. LUCAS BY MR. J. XANTUS.

BY

PHILIP P. CARPENTER, B.A., PH.D.

The specimens here described belong to the Museum of the Smithsonian Institution, Washington, D. C. The first available duplicates will be found in the British Museum or in the Cumingian Collection. An account of the labours of Mr. Xantus will appear in the forthcoming volume of British Association Reports; and detailed notes on the species may be consulted in the American scientific periodicals for the current year.

Genus Asthenothœrus*.

Testa extus "Thracicè" similis: intus cardine edentulo, haud spathulato; cartilagine infra umbones sita.

1. Asthenothœrus villosior.

A. testa inæqualvi, inæquallaterali, umbonibus ad trientem longitudinis sitis; tenuissima, alba, (sub lente) omnino minuittissime et creberrime pustulosa; rugis incrementi obtusissimis, irregularibus, maxime t. junioire, ornata; epidermide tenui, pallide olivacea induta; parte postica trunca, parum hiante; antica valde rotundata; marginibus dorsalisbus et ventralibus parum excursatis; umbonibus angustissimis; regionibus lunulari et nymphali subcarinatis: intus, margine cardinali utriusque valvæ acuto; ligamento inospicuo; cartilagine subspongiosa, satis elongata, postice deflecta; fovea haud indentata; cicatricibus adductorum parvis, subrotundatis; sinu pallii majore, ovali, ad dimidium interspatis porrecto. Long. 38, lat. 26, alt. 14 poll.†

*Asthênês, weak; ònîda, hinge.
† The measures of length are taken from the anterior to the posterior margins. The "detailed notes" are still in MSS.
2. Dr. P. P. Carpenter on new Forms of Mollusks

2. Solemya valvulus.

S. testa minore, tenuissima, diaphana, vix testacea, cornea, pallidior.

ineis tenuibus, distantibus, fuscis, radiatim ornata; postice tenuiter radiatim striata; tumente, satís elongata, margínibus antíco et postico regulariter excurrátis; umbonibus vix conspicuis; línea antícis divaricantibus, extús parentibus, intus laecum cartilaginæm definitíbus; cardine edentulo; ligamento postice elongato, antice curto, latiore, bifurcato; cicatricibus adductorum subrotundatis. Long. '85, lat. '25, alt. '14 poll.

3. Tellina (Peronæoderma) ochracea.

T. testa majore, parum inæquilaterali, tenui, satís planata; carneo-ochracea, intus intensiore; levi, nitida, marginem versus stríis incrementi; postice vix radiatim striatula; ventraliter antice valde excurrata, postice vix angulata; marginibus dorsalibus obtuse anguláti, umbonibus conspicuis; ligamento tenui et cartilaginé subinternís; nymphis intortís; dent. card. utiusque valvæ ii., quärum i. bifidus; dent. lat. valvæ dextræ ii.; sinu pallii irregulárité ovali, per duoඈ tres interstitii porrecto; cicatr. adduct. subovátis, nitidissimís. Long. 1'9, lat. 1'4, alt. 44 poll.

4. Psammobia (?Amphichæna) regularis.

P. testa minore, regulariter ovali, subæquilaterali; violacea, plus minusvæ radiata seu maculata; levi, striolis incrementi ornata; epidermide tenui, flavido-olivacea induta, postice rugulosa; marginibus undique regulariter excurrátis; umbonibus vix projectis; ligamento conspicuo: intus dent. card. ii.—i., haud bifidis; cicatr. adduct. postica rotundata, antica ovali; sinu pallii elongato, haud incurvato, per duas trientes interstitií porrecto. Long. 1'05, lat. 5', alt. '26 poll.

5. Callista pollicaris.

C. testa magna, ventricosa, solidiore; epidermide tenuissima induta; sordide albida, umbonibus rufo-fusciis; (t. adolescens) punctulis crebris rufo-fusciis, et teenis paucis circa nymphas ornata; levi, striis incrementi exceptis; postice, et paululum antice, quasi police impresso notata; latiore, antice producta, sed haud angulata; postice unda depressa, supra nymphas radiante, inter costas duas obsoletas sinuante, margine subtruncato; marginibus ventrali regulariter excurrató, dorsali rectióre; lunula elongata, linea impressa definità, medio tumente, postice falcida: intus candida; dent. card. normalibus; deute laterali valvæ dextræ postico, valvæ sinistræ antico, usque ad extremitatem lunulæ porrecto; cicatr. adduct. subrotundatis; sinu pallii magno, rotundato, usque ad medium interstitii porrecto. Long. 2'58, lat. 2'25, alt. 1'43 poll.

Figured by Mr. Reeve (Conch. f. 45) as "Dione prora, var." The above diagnosis proves it to be a distinct and (considering the general similarity of the thin, colourless, inflated group) a well-marked species.
6. Callista (? pannosa, var.) puella.

C. testa "C. pannose" similis, sed multo minore, tenuiore, plerumque latiore; sinu pallii majore, eleganter incurvato; dent. card multo teniuribus, lat. ant. magis elongato; lamina cardinali unbones versus sinuata: colore maxime variante; nonnumquam ut in C. pannosa triangulariter maculata; plerumque ut in Tapete virginea notata; interdum albida, seu aurantia, seu fusca, haud maculata; rarius ut in Tapete fuscolineata penicillata; rarissime paucistrigata, seu maculis paucissimis. Long. '66, lat. '35, alt. '32 poll.

Variat t. transversa. Variat quotque t. subtrigona, et formis intermediis.

Quoted by Mr. Reeve, under Dione pannosa, as "D. puella, Cpr."; but the name was only given in MS. in accordance with Mr. Cuming's assertion that it was distinct. The colourless subtrigonal shells were regarded by Mr. Reeve as a separate species; but he did not allude to them in his monograph.

7. Levicardium apicinum.

L. testa subtrigona, parva, tenuissima, nitidissima, subcompressa, epidermide tenui inducta; radiis seu striis radiantibus nullis; striis concentricis satis regularibus, subobsoletis, t. jun. magis extantibus; umbonibus angustis, parum incurvatis; margine ventrali satis excurvato, antico parum producto, postico subtruncato, dorsalibus obtuse angulatis: colore valde variante; plerumque pallide viridi-cinereo, rufo-fusco seu angulatim tenui maculato seu punctato; regione umbonali plerumque pallida, interdum rufo-fusca seu aurantia; parte postica haud intensiore: intus plerumque citrina, hepatico varie penicillata; dent. card. et lat. acutis, tenuibus; margine minutissime subobsoletim crenulato. Long. '55, lat. '35, alt. '32 poll.

Variat t. latiore. Variat quoque colore fere omnino hepatico, seu carneo, seu pallide aurantiaco, seu pallide cinereo, seu albido: rarissime ut in Tapete fuscolineata ornata.

8. Lucina lingualis.

L. testa solida, linguiformi, valde prolongata; plerumque aurantiaco-carnea, intus intensiore: lirulis concentricis obtusis crebre ornata; marginibus undique excurratis; lunula minima, altissime excavata; parte postica obscure biangulata, seu subrotundata; umbonibus anticus incurvatis; ligamento subinterno, lamina valida; dent. card. et lat. normalibus, validis; cicatr. adduct. posticus subovalibus, anticus satis elongatis; linea pallii lata, rugosa; margine interno crenulato. Long. '88, lat. '92, alt. '4 poll.

Variat t. minus prolongata. Variat quoque t. pallide viridi, seu pallide carneo, seu alba.


? C. testa valde inflata, minuta, albida, subrhomboido-orbiculari;
Dr. P. P. Carpenter on new Forms of Mollusks

diagonaliter parum producta; marginibus subquadrationulatim rotundatis; umbonibus prominentibus, vale antice intortis; tota superficie ut in C. decussata sculpta, costulis crebris radiantibus æque distantibus, hic et illic aliis intercalatis; lirulis concentricis decussantibus: intus margine dorsali brevissimo, arcuato, dentato; ligamento curtissimo, in fossa omnino interna, celata, lamina definiunte, sito; lamina cardinali sub umbonibus intus perrecta, dentibus validis instructa; marginibus internis omnino crenatis; ligamento curtosso, in fossa omnino interna, celata, lamina definiente, sito; laminae cardinali sub umbonibus intus rectae, dentibus validis instructa; marginibus internis omnino crenatis; cicatr. adduct. subequalibus, ventraliter sitis. Long. '1, lat. '12, alt. '09 poll.

Located provisionally in Crenella from its likeness to C. decussata, but with peculiarities of hinge and adductors which approach Nuculina on one side and Cardilia on another.

Genus Bryophila*.


B. testa parva, regulari; cinerea, salmoneo seu chocolateo, intus subnacreo, exquise tincta: t. jumine planata, semirotundata, dorsaliter recta, æquilaterali, conspiciue punctata: t. adolescentae subdiaphana: t. adulta solidis; umbonibus rectis, terminalibus, intus alte excavatis; marg. dorsali breviore, recto; antico recto; ventrali et postico late rotundatis: extus epidermide subpongeiosa vestita, radiis setarum subdistantibus, marginibus eleganter pectinati; intus margine dorsali breviori, recto; antico recto; ventrali et postico late rotundatis: extus epidermide subpongeiosa vestita, radiis setarum subdistantibus, marginibus eleganter pectinati; ligamento solido dorsaliter producto; limbo pallii eequaliter prope marginem decurrente; cicatr. adduct. submediana, inconspicua; postice hiante; antice propter byssum tenuem suynuata. Long. '13, lat. '2, alt. '1 poll.

Like a minute Pinna, or a transverse Margaritiphora without ears, or an Isognomon without pits. Differs from the other Aviculids in being viviparous, like some other minute bivalves.

11. Atys casta.

?A. testa elongata, tenui, subdiaphana, albida; antorsum paulum tumidiore; spira celata, lacunata, (t. adultæ) haud umbilicata; columella paulum intorta, effusa; umbilico antico minimo; labro postice producto, obtuse angulato; tota superficie subtiliter spiraleriter striatula. Long. '4, lat. '18 poll.

On the confines of the genus, related to Cylichna.

12. Ischnochiton parallelus.

I. testa ovata, subelevata (ad angulum 120°); rufo-fusca, olivaceo tincta; valvis latis, marginibus parum rotundatis, interstitiiis par-

* De'vo, sea-moss; φίλος, loving.
collected at Cape St. Lucas.

vis; valvis intermediis valde insculptis; areis lateralibus seriebus granulorum a jugo radiantibus circiter vi.; interdum irregularibus, granis rotundatis, separatis, extantibus; areis centralibus clathris creberrimis, jugo parallelis, horridis, extantibus, interdum grannulosis, ornatis; valvis terminalibus seriebus granulorum, circ. xx., interdum bifurcantibus, ut in areis lateralibus, ornatis; mucrone vix conspicuo; limbo pallii angusto, pilulis furvicaeis creberrimis minutis conferto; lobis valvarum bifidis, terminalibus fissis is circ. xi. a parte externa simplici disjunctis. Long. '7, lat. '48, alt. '16 poll.

Belongs to the group with minute setose scales.

13. Ischnochiton (? var.) prasinatus. I. testa I. parallelo forma et indole simili, sed vivide viridi; ar. diag. seriebus bullularum ir:egulariter ornatis; ar. centr. clathris valde extantibus, acutis, jugo obtuso parallelis, utroque laterè circ. xvi.; valv. term. seriebus bullularum circ. xviii.; mucrone submedianio, inconspicuo; umberonis hand prominenter; tota superficie minutissime granulosa: intus valvarum lobis mediarum i.- term. circiter x.-fissis; sinu lato, planato; suturis planatis; limbo pallii angusto, minutissime squamulis furvicaeis creberrime instructo; interdum pilulis intercalatis. Long. '8, lat. '4 poll., div. 125°.

14. Ischnochiton serratus. I. testa parva, cinerea, olivaceo hie et illic, praecipue ad suturas, punctata, interdum sanguineo maculata; ovali, subdepressa, suturis indistinctis; tota superficie minutissime granulata; ar. diag. valde distinctis, costis latissimis obtusis ii.-v. munitis, interstititis nullis; marginibus posticis eleganter serratis; ar. centr. costis acutis, parallelis, utroque laterè circ. xii.; jugo obtuso, hand umbonato; costis transversis, subradiantibus, fenestratis, interstititis impressis: mucrone mediano, obtuso: intus valvarum mediarum lobis bifissis, terminalium circ. ix.-fissis; lobis suturalibus magnis: limbo pallii squamulis majoribus, imbricatis, vix striatulis. Long. '34, lat. '2 poll., div. 115°.

Differs from Elenensis in the sculpture of the terminal valves.


16. Acmaea (? var.) atrata. A. testa solida, rugosa, conica, apice paulum antorsum sito; extus costis crebris rotundatis irregularibus, hic et illic majoribus sculpta, haud apicem versus discordanter corrugatis; interstitiiis 213
Dr. P. P. Carpenter on new Forms of Mollusks

minimis; intus alba, castaneo et negro varie maculata; margine latiore, negro tessellato. Long. 1·3, lat. 1·0, alt. 5 poll. Variat margine negro-punctato, punctis plerumque bifidis. Variat quoque costis parvis, crenerrimis; margine negro.


17. Acmaea strigatella.

A. testa A. mesoleucae similis, sed minore, hand viridi; striolis minimis, confluentibus erectis tenuissime sculptis; albida, strigis olivaceo-fuscis, plerumque radiantiibus, interdum confluentibus pictis; apice seepius negro; intus albida, margine satis lato, strigis tessellato. Long. 9, lat. 7·4, alt. 3 poll. Variat colore hie et illic aurantiaci tincto: strigis omnino tessellatis.

According to Darwin, this might be regarded as a cross between the northern forms A. pelta and A. patina, about to change into the Gulf species, A. mesoleuca. The dark variety resembles A. cantharus, but the very delicate crowded striæ well distinguish it when not abraded.

18. Glyphis saturnalis.

G. testa G. inaequali similis, sed minore, latiore, lineari, mediocreatcule umbilicata: peritrema vix continuum, hand callosum.

Subgenus Eucosmia.*

Testa solida, nitida, variegata, hand naerea: apertura et anfractus rotundati: conspicue umbilicata: peritrema vix continuum, hand callosum.

The shells here grouped are like small, round-mouthed, perforated Phasianella. The animal and operculum of the Cape St. Lucas species are unknown. The Phasianella striulata, Maz. Cat. no. 283 b (= Turbo phasianella, C. B. Ad. Pan. Sh. no. 282), and even the Lunatia tenuilirata, Maz. Cat. no. 572, are perhaps congeneric.


E. testa parva, laevi, turbinoidea, nitente, marginibus spirae valde occurratis; rosaceo et rufo-fusco varie maculata; anfr. nucleosis regularibus, vertice mamillato; normalibus Iv., valde tumentibus, rapide augmentibus, suturis impressis; anfr. ultimo antice productum; osi rotundata; umbilico carinato; apertura vix a pariete inden-

* Th. ëz, well; kosµia, adorned.

214
collected at Cape St. Lucas.

Variat interdum rugulis incrementi ornata.

20. Eucosmia (? variegata, var.) substriata.
E. testa E. variegatae simillima, sed anfr. circa basin et supra spiram (nisi in anfr. nucl. laevibus), interdum tota superficie tenuiter et crebre striatis; striis anfr. penult. circ. x.


22. Eucosmia cyclostoma.
E. testa parva, valde obtusa, lata, regulari, valvatoidea; marginibus spire vix excurvatis; pallide cinerea, fusco-olivaceo dense punctata seu maculata; anfr. nucleosis pallidis, mamillatis; normalibus iii., valde tumentibus, suturis valde impressis; apertura vix a parieta indentata; umbilico magni, subspirali. Long. *05, long. spir. *025, lat. *05 poll., div. 90°.
Curiously like a small depressed Valvata obtusa, but with the texture of Phasianella.

Genus Haplocochlias*.
Testa Colloniam simulans, sed haud margaritacea: apertura circularis, varicosa: columella haud callosa.
The animal and operculum are unknown. Its affinities may be with Ethalia.

23. Haplocochlias cyclophoreus.
H. testa compacta, parva, solidiore; albida, seu pallide aurantiaca; anfr. v., rapidis augentibus, suturis impressis; tota superficie minutissime spiraler striolata, nitida; apertura rotundata; peritremate continuo, incrassato, extus varicoso; labio distincto; axi t. jun. umbilicata, adultae lacunata. Long. *19, long. spir. *06, lat. *2 poll., div. 100°.
When laid on its base, this shell resembles Helicina; but the mouth is more like Cyclophorus. The young shell is semi-transparent, and resembles a Vitrinella with thickened lip.

N. testa parva, inflata, tenui, alba; anfr. nucl. ? ...; norm. rapidis augentibus, lirulis crebris spiralis, in spira hic et illic majoribus, a striolis creberrimis radiantis minutiissime decussatis; suturis valde impressis; apertura subcirculares; umbilico maximo.
* Th. áπλον, unadorned; κοχλίας, snail.
carinato, anfractus intus monstrante. Long. '28, long. spir. '08, lat. '3 poll., div. 110°.

25. *Fossarus parcipictus.*

*F.* testa parva, solidiore, spira plus minusve elevata; albida, rufouscus variac maculata; carinulis spiralibus acutioribus, quorum circ. vi. majores, striolisque crebris cincta; anfr. ultimo tumidiore; labro acuto, haud intus incassato; umbilico satis magno, ad marginem carinato: operculo normali. Long. '24, long. spir. '06, lat. '2 poll., div. 90°.

The few specimens found are very variable in outline.

26. *Fossarus purus.*

*F.* testa *F.* angulato similis, sed alba, subdiaphana; anfr. nuclei ii., fuscis, ut in *F.* tuberoso cancellatis; norm. ii. et dimidio, altis, valde tumentibus, carinatis; carinis iv., validissimis, acutissimis, quorum ii. in spira monstratur; carinulis alis antice et postice minusve expressis; tota superficie minute spiraliter striata; carinularum basalium interstitiis subobsolete decussatis; tota superficie minute spiraliter striata; apertura late semilunata; labro a carinis valde indentato; labio recto, angusto; umbilico magno, carinato; operculo fusco, valde paucispirali, minutissime ruguloso, nucleo antico. Long. '08, long. spir. '03, lat. '08 poll., div. 90°.

27. *Litorina pullata.*

*L.* testa parva, solidiore, luctuosa; spira satis exserta; nigrescente, seu livido-fusco tincta, lineis spiralibus exilissimis pallidiioribus ornata; interdum obscure tessellata; anfr. v., subplanatis, suturis parum impressis; sublævi, striolis spiralibus tenuiter insculpta; columella intus incassata; parieta haud excavato. Long. '4, long. spir. '18, lat. '29 poll., div. 60°.

= *Litorina*, sp. ind., Maz. Cat. no. 399, p. 350.

28. *Litorina (Philippii, var.) penicillata.*

*L. Ph.* testa parva, lineis radiantibus, variantibus, delicatulis, rarius ziczacformibus, et cingulis duobus spiralibus, quorum unum in spira monstratur, elegantissime penicillata. Long. '33, long. spir. '14, lat. '2 poll., div. 50°.

Closely resembling the West-Indian *L. ziczac*, var. *lineata*, D'Orb. Intermediate specimens, however, clearly connect it with the common Mazatlan form.


*R.* testa parva, alba, crystallina, normali; marginibus spiræ undatis; anfr. nuclei iii., levibus, mamillatis; norm. iv., medio subconvexis, postice supra suturas planatis; basi subplanata, effusa, haud umbilicata; lirulis spiralibus crebris, obtusis, quorum circ. x. in spira monstratur; apertura subovata, peritremate continuo; labro 216
Dr. P. P. Carpenter on new Forms of Mollusks.

arcuato, vix antice et postice sinuato, calloso; labio valido. 
Long. '1, long. spir. '08, lat. '04 poll., div. 25°.

30. Fenella crystallina.

F. testa alba, subdiaphana, turrita, radiore; marginibus spiræ rectis, 
parum divergentibus; anfr. nucl.?... (decollatis); norm. v., valde 
rotundatis, suturis impressis; costis radiantibus circ. xvi.; valde 
rotundatis, haud extantibus, interstitiis latis; striis spiralis 
regularibus, in anfr. penult. xvi.; apertura rotundata; basi ro-

tundata; peritremate continuo; labro extus varicoso; labio cal-

loso. Long. '14, long. spir. '11, lat. '05 poll., div. 20°.

31. ? Hydrobia compacta.

II. testa alba, subdiaphana, turrita, radiore; marginibus spiræ vix ex-
curvatis; anfr. nucl. normalibus, apice mammillato; norm. iv., tu-
midis, suturis distinctis; spira curtiore; basi rotundata; apertura 
subovata; peritremate continuo; labio definito. Long. '04, long. 
spir. '02, lat. '03 poll., div. 70°.

This unique shell may be a Barleeia.

32. Hyala rotundata.

II testa (quoad genus) magna, tenui, alba, diaphana; anfr. nucl. 
normalibus, apice mammillato; norm. iv., globosis, rapide augenti-
bus, suturis valde impressis; basi rotundata; apertura subrotun-
data, ad suturam subangulata; peritremate continuo; labio a 
pariete separato, rimulam umbilicalem formante; columella valde 
arcuata. Long. '18, long. spir. '09, lat. '1 poll., div. 40°.

A unique shell, resembling a marine Bithinia.

33. ?Diala electrina.

D. testa subdiaphana, rufo-cornea, nitida; marginibus spiræ parum 
excurvatis; vertice nucleoso, helicoideo; anfr. iii., tumidis, suturis 
haud impressis, apice magni mammillato; anfr. norm. iii., subplanâtis, 
suturis distinctis; sculptura haud expressa; tota superficie cos-
tulis obscuris, latis, spiralisibus, quorum vi.–viii. in spira monstran-
tur, et iii.–v. circa basim rotundatam, interdum obsoletis, cineta; 
costulis radiantibus circ. xviii., subobsoletis; apertura regulariter 
ovo, ad suturam angulata, peritremate continuo; basi haud um-
bilicata; columella regulariter arcuata. Long. '09, long. spir. '07, 
lat. '03 poll., div. 30°.

34. Acirsa Menesthoides.

A. testa nitida, turrita, magiore, solidiore, pallide fusca; anfr. nucl. 
lavibus; norm. vi., subplanatis, suturis distinctis; lineis crebris 
spiralisibus insculpta, quorum circ. viii. in spira monstrantur; testa 
asolvente lirulis radiantis obsOLEtis decussata; apertura sub-
valu; columella solida, imperforata. Long. '42, long. spir. '3, 
lat. '16 poll., div. 25°.
35. *Cythia asteriaphila.*

*C. testa C. tumenti* simillima, sed umbilico minore, haud carinato, tenuissima, diaphana; anfr. iv., tumidis; vert. nucl. normali, haud stylineo, apice mamillato: operculo tenuissimo, elementis concentricis, nucleo submediano sinistrorum sito. Long. '03, long. spir. '015, lat. '025 poll., div. 60°.

A solitary specimen was found by Dr. Stimpson, imbedded in a star-fish, like *Stylina*; from which genus the vertex and operculum distinguish it.

36. *Bittium nitens.*

*B. testa regulari, rufo-fusca, hic et illic pallida, maxime nitente; anfr. nucl. iii., laevibus, tumidis, apice submamillato, subdeelivi; norm. vi., tumidis, saturas impressis; costis radiantiibus circ. xiv., haud contiguis, angustis, interstitii undatis; costulis rotundatis, spiraliibus, in spira iv., quarum postica multo minor, supercurrentibus, ad intersectiones subnuodosis; costulis circa basim subrotundatam iv., haud decussatis; apertura subquadrata; columella haud truncata, obtuse angulata; labro acuto, a costulis indentato; labio inconspicuo. Long. '21, long. spir. '16, lat. '06 poll., div. 20°.

37. *Manyelia subdiaphana.*

*M. testa parva, subdiaphana, albida, interdum rufo-fusco pallide tincta; satis turrita, marginibus spirae parum excurvatis; anfr. nucleosis iii., laevibus, diaphanis, apice mamillato; norm. iv., satis excurvatis, haud angulatis, saturas impressis; fascia super spiram pallide fusca, alteraque candida contigua; costulis radiantiibus xiv.–xviii., acutis, subrectis, distantibus, interstitii undatis; tota superficie minute et creberrime spiraliiter striata; basi producta, striis magis expressis; apertura subelongata; labro ad dorsum increasato, postice distincte emarginato, intus haud dentato; labio tenuissimo; columella recta, antice late canaliculata. Long. '19, long. spir. '1, lat. '06 poll., div. 30°.

38. *Drillia appressa.*

*D. testa parva, compacta; rufo-fusca, interdum supra costas pallide; marginibus spirae excurvatis; anfr. norm. vi., planatis, saturas indistinctis; costis tuberculosis radiantiibus circ. xiv., antice et postice obsoletis; striolis spiraliibus creberrimis; costa spirali irregulari postica, tuberculosa, super saturas appressa; area sinus parvi vix definita; basi satis prolongata; apertura subquadrata; labio distincto. Long. '3, long. spir. '17, lat. '12 poll., div. 40°.


*C. testa parva, satis turrita, tenui, albida; postice lineæ, seu serie macularum, rufo-fusca, interdum altera peripherali ornata; marginibus spirae rectioribus; anfr. nucl. ii., rotundatis, apice mamillato; norm. vi., in spira rotundatis, saturas impressis; basi satis rotundata; costis radiantiibus circ. ix., acutis, distantibus, antice
et postice subobsoletis; tota superficie spiraliter sulcata, sulculis subdistantibus, undatis, costas superantibus; apertura subovali, satis elongata, postice valde sinuata; labro acuto, dorsaliter costulato, intus hau dendato; labio tenui. Long. '36, long. spir. '18, lat. '16 poll., div. 40°.

40. *Obeliscus variegatus.*

*O. testa O. hastato simili; nitidissima, striolis incremen\textes{t}i exilissimus; livido et castaneo varie nebulosa; prope suturam canaliculatum lineis albidis picta; hic et illic callositate alba interna; peripheria circa basin insculpta, unicola; plica superiore acuta, exstante, circa basim continuu; plicis antecis parvis, spiralibus. Long. '44, long. spir. '3, lat. '15 poll., div. 23°.*

41. *Odostomia (Evalea) aequisculpta.*

*O. testa parva, ovoidea, alba, subdiaphana; marginibus spirae subrectis; vert. nucl. ?... normaliter truncato; anfr. norm. iv., parum arcuatis, suturis impressis; tota superficie costulis spiralibus circ. xiv., quarum vi. in spira monstrantur, latis, planatis, aequidistantibus; interstitiis parvis; basi rotundata; apertura ovata; peritremate haud continuo; labro acuto; labio subobsoletto; plica juxta parietem conspicua, acuta, transversa; columnella arcuata, rimulam umbilicalem formante. Long. '07, long. spir. '04, lat. '03 poll., div. 40°.*

42. *Odostomia (Evalea) delicata.*

*O. testa tenuissima, alba, diaphana, nitente, elongata; marginibus spireae eleganter excurvatis; vert. nucl. laevi, globoso, decliviter immerso; anfr. norm. iii., subplanatis, suturis impressis; liris subacutis, spiralibus, quarum v. in spira monstrantur; interstitiis latis, undatis, cereberrime decussatis; basi elongata; apertura oblonga, peritremate haud continuo; labro tenui; labio vix conspicuo; plica juxta parietem exstante, declivi. Long. '075, long. spir. '04, lat. '03 poll., div. 30°.*

43. *Chrysallida angusta.*

*C. testa parva, satis elongata, nitida, alba, sculptura minus expressa; marginibus spirae parum excurvatis; vert. nucl. parvo, subito immerso, dimidium truncatius tegente; anfr. norm. v., planatis, elongatis, suturis minus impressis; costis radiantis circ. xiii., plerumque lineis continuis marginibus utrinque parallelis, circa basim productam obsoletis; lirulis spiralibus angustis, in spira circ. v., interstitiis decussantibus, supra costas haud nodulosis; apertura ovali; peritremate parum continuo; labro tenui, translucido; labio tenui; plica juxta parietem parva, obtusa. Long. '995, long. spir. '065, lat. '028 poll., div. 20°.*

44. *Eulima fuscostrigata.*

*E. testa minore, gracillima, albida, striga latiore rufo-fusca supra 219*
Dr. P. P. Carpenter on new Forms of Mollusks

peripheriam ornata; basi quoque rufo-fusca, valde prolongata, regulariter excurvata; anfr. nucl. ii., tumidioribus; norm. viii., planatis, suturis hand conspicuis; varieibus nullis; apertura valde elongata; labro vix sinuato; labio vix caloso. Long. •17, long. spir. •12, lat. •05 poll., div. 20°.

45. Opalia crenatoides.

O. testa turrita, alba, marginibus spirae rectis; anfr. nucl. ?.....

norm. vi., compactis, attingentibus; costis radiantibus circ. x., in spira plerumque obsoletis, ultimo anfractu validioribus,-latis, haud exstantibus, attingentibus, spiram lineis fere rectis ascendentibus; suturis inter costas altissime indentatis; carina obtusa basali, surrea continua; inter costas radiantes undique, ut in suturis, indentata; costis interdum, propert lirulas spirales subobsoletas, subnodosis; columella hand umbilicata; basi antice laevi. Long. •54, long. spir. •38, lat. •23 poll., div. 30°.

Additional specimens may connect this with the Portuguese O. crenata.

46. Truncaria eurytoides.

T. testa parva, turrita, gracili; albida, seepius fascia circa peripheriam maculis fusco-aurantiacis picta; anfr. nucl. mamillatis, laevibus; norm. v., effusis, subplanatis, ultimo paulum constricto; costulis radiantibus circ. xx., apertura versus evanidis; apertura subquadrata; labro haud incrassato, interdum intus subtiliter striato, haud dentato; labio appresso; columella abrupte truncata. Long. •3, long. spir. •2, lat. •11 poll., div. 23°.

Variat basi fusco tincta, seu tota superficie ut in Nitidella eibriaria picta.

47. Sistrum (? ochrostoma, var.) rufofuscatum.

S. testa S. ochrostomati simili, sed minore, angustiore, vix tabulata; alba, linea punctorum rufo-fuscorum subperipherali, interdum lineis spiralibus, interdum ejusdem coloris maculis, ornata; vert. nucl. mamillato, anfr. iii., laevibus, vix castidis; norm. v., plus minusve elongatis, in medio nodoso-angulatis, postice planatis, suturis ad angulum valde obtusum conspicuis; seriebus nodulorum spiralibus iii., quorum postica major, secundum costas radiantes obsoletas circ. vi.-viii. ordinatis; seriebus antieis inconspicuis ii.; interdum costulis spiralibus intercalatis; canali brevi, rectiore, aperto, angusto; apertura subovali, vix subquadrata, intus pallide aurantiaca; labro acutior, dorsaliter subvaricoso, postice sepe sinuato, intus obscure vi.-dentato; labio conspicuo, interdum exstante. Long. •5, long. spir. •23, lat. •32 poll., div. 60°.

Variat testa obesa, nodulis validis. Variat quoque testa acuminata, nodulis subobsoletis. Long. •52, long. spir. •23, lat. •25 poll., div. 42°.


?N. testa parva, nitida, livida; spira exstante, anfractibus subplanatis, suturis distinctis; anfr. nucl. laevibus, adolescentibus obso-
collected at Cape St. Lucas.

Ilete radiatim lirulatis, adultis lævibus; zona alba postica, suturam attingente, aurantiaco maculata; tota præter zonam superficie aurantiaco puncticulata, punctis minimis, cereberrimis, in quiueunces dispositis; apertura subquadrata; labro incassato, intus vi.-dentato; labio exstante, a lirulis circa basim spiralibus indentato. Long. '3, long. spir. '17, lat. '15 poll., div. 40°.

Differs from Columbella albuginosa, Rve., in its peculiar and constant painting.

49. ?Nitidella densilineata.

?N. testa ?N. millepunctatam forma et indole simulante, sed omnino nitida, anfractibus planatis, suturis indistinctis, striolis circa basim minimis; livida, lineolis aurantiaco-fuscis divaricatis, sepe ziczac-formibus, densissime signata. Long. '25, long. spir. '15, lat. '1 lat. •1 poll., div. 35°.

The opercula of these two species being unknown, their generic position remains doubtful. The same is true of the two following.

50. ?Anachis tincta.

?A. testa parva, turrita, albida, rufo-aurantiaco supra costas tincta; anfr. nucl. lævibus; norm. iv.-v., subplanatis, suturis valde impressis; costulis x. radiatibus, et liris spiralibus transeuntibus, in spira iii. supra costas conspiciuis, unaque in sutura, dense in-sculpta; interstitiis alte caelatis; apertura subquadrata; labro in medio incassato. Long. '19, long. spir. '12, lat. '08 poll., div. 30°.

51. ?Anachis fuscostrigata.

?A. testa parva, turrita, livida, nitida; zonis rufo-fuscis, subspiralibus, in spira circ. iii., interdum, maxime ad basim, confluentibus, conspiceue cincta; lirulis radiatibus subobsoletis, circ. x., prope suturam se monstrabantibus; apertura subquadrata. Long. '13, long. spir. '095, lat. '045 poll., div. 20°.

52. PIsania elata.

P. testa minore, valde turrita, Latiroidea; alba, rufo-fusco antice et postice varie maculata seu strigata; anfr. nucl. ? . . . ; norm. vi., convexis, suturis impressis; costis radiatibus vi.—viii., obtusis, interstitiiis undatis; lirulis spiralibus distantibus, in spira plerumque iii., aliis minoribus intercalantibus; canali angusto, sub-recurvato; apertura subovata; pariete postice dentata; columellae parum contorta. Long. '68, long. spir. '37, lat. '29 poll., div. 38° 221
CONTRIBUTIONS

TOWARDS A

MONOGRAPH OF THE PANDORIDÆ.

BY

PHILIP P. CARPENTER, B.A., Ph.D.


( 223 )
CONTRIBUTIONS

HISTORY OF THE FABRIC OR

PITHYRUS AND BERYNTEUM.

FROM THE PROCEEDINGS AT THE PHYSICAL SOCIETY, APRIL 1889.
CONTRIBUTIONS TOWARDS A MONOGRAPH OF THE PANDORIDÆ.
BY PHILIP P. CARPENTER, B.A., PH.D.

It is remarkable that, notwithstanding the zeal with which most of the old genera have been divided, to meet the wants of modern malacology, the genus Pandora, Lam., has been left untouched by Dr. Gray, Messrs. Adams, and their follower, Chenu. Yet the species known to the elder Sowerby present three distinct types of hinge, which were well figured by him in his 'Conchological Illustrations.' Specimens and even species of Pandora (except of the well-known N. Atlantic forms) being very rarely seen in collections, it is presumed that naturalists have had but few opportunities of studying them. Mr. Cuming having most kindly allowed me to examine the hinge of all the species in his collection, it has appeared desirable to propose two new genera, and also to group part of the typical species under a subgenus.

It was at one time thought that the presence of an ossicle in the cartilage was a family mark of anatinidae, to which Myadora from Pandoridae, and Tellimya from Kelliade, were consequently removed. One of the new genera of Pandorids, however, possesses a well-developed ossicle; and a small one is seen even in some species of the normal genus.

The most highly organized structure in the family is found in the North American genus Clidiophora, which has both clavicle* and ossicle; the next is the East-Indian group Caelodon, which wants both clavicle and ossicle, but possesses a tent-shaped dentition in the left valve. The simplest form is the well-known Pandora, which has neither clavicle, tent, nor ossicle; but in the subgenus Kennerlia the ossicle is present. The genus Myodora is quite distinct, but connected with Pandora through Kennerlia.

Genus Clidiophora†.

Testa Pandoriformis, ventraliter expansa; valva dextra tridentata, dente postico elongato; valva sinistra saxius bidentata, dente antico simplici; cartilagine ossiculo firmata; sinu pallii nullo.

1. Type, Clidiophora claviculata, Cpr. (Pandora cl.) P.Z.S. 1855, p. 228.

* The word "clavicle" is used (in default of a better) to denote a linear dental process running into the body of the shell, often serving as a support to the cardinal plate, as in Anatina and some species of Placunomia.

† Th. κλειϊον, a clavicle; φέρω.
In the dentition of the right valve this genus resembles Caelodon; except that the posterior lamina is greatly developed, resembling a clavicle. The left valve wants the central tooth and chamber of that genus. This structural deficiency, however, is compensated by the development of an ossicle in the long cartilage. As far as is known, all the species are from North and Central America, and are swollen ventrally.

2. Clidiophora cristata.

C. t. securiformi, minus transversa, tenui, subplanata; umbonibus ad \( \frac{3}{4} \) longitudinis sitis; ventraliter maxime excurvata; marginibus dorsalisibus, post. maxime incurvato, ant. hic et illic alulis triangularibus cristato: intus marginibus posticis utraque in valva erectis: v. dextr. dente postico satis longo, cicatrice adductoris tenus haud porrecto; dente centrali extante; dente antico a margine separato, usque ad cic. anticam porrecto, hauad extante: v. sinistr. dente post. bifido, hauad extante, alterum recipiente, fossa cartilaginea configua; d. centr. nullo; d. ant. satia extante, usque ad cicatr. anticam porrecto; linea palliari a margine valde remota, regulariter in puncta divisa; radii ab umbonibus usque ad puncta conspicuis, equalibus; ossiculo tenui, elongato.

Long. 1'0, lat. '6, alt. '1 poll.

Hab. in sinu Californiensi; legit Conway Shipley diligentissimus; sp. un. in Museo Cumingiano.

This species is known from C. claviculata by the much greater posterior curvature of the beaks, and anteriorly by the beautiful triangular wing-like serrations of the margin, in which it resembles Tellidora burneti. The inside has elegant rays from the umbo to the dotted pallial line.

3. Clidiophora tabacea, Meusch. (Mus. Gron.).

Specimens under this specific name are preserved in the Cumingian collection.

3 a. Clidiophora trilineata, Say (Pandora tr.), Hanl. Rec. Shells, p. 49.


It is probable that these are simply varietal forms of the well-known New England species. Say’s name and Sowerby’s excellent figure prove that the peculiar hinge of the genus was observed by both authors. Mr. Cuming gives “Philippines” as the habitat of his specimens of C. nasuta, probably in error. Mr. Hanley quotes it as a synonym of C. trilineata. An examination of a large series from Staten Island proves that the outline varies considerably. The tablet in the Nuttallian collection at the British Museum, marked Pandora punctata, belongs to this species. Young shells, when quite perfect,
4. **Clidiophora punctata**, Conr.

This very rare species was only known in England by worn left valves in the British Museum, and in Mr. Cuming's and Mr. Hanley's collections. The first perfect specimens were dredged by Dr. J. G. Cooper (Zoologist to the Californian State Survey) at San Pedro. A young shell, sent by him to the Smithsonian Institution, displays a dentition agreeing in the main with *C. trilineata*. In the flat valve, the central and anterior teeth are close together and nearly parallel; the anterior short, nearly obsolete; the middle long and sharp, corresponding with the long, sharp tooth in the convex valve, which points to the outside of the anterior scar, instead of to the middle, as in *C. trilineata*. The (posterior) clavicle-tooth in the flat valve is longer than in the Eastern species, with the cartilage on it for two-fifths of the length. In *C. trilineata* it lies by the side, nearly the whole way. The posterior margin of the convex valve fits between the clavicle and the margin of the flat valve. The ossicle is remarkably long and thin. The punctures are extremely conspicuous even in this young, transparent, and papyraceous specimen; and, what is more peculiar, the dried remains of the animal are covered with minute pearl-shaped grains of shelly matter corresponding with them.


The "posterior" dilated side of Sowerby is the "anterior" of Hanley. The species was constituted from a "very few specimens, all of them much worn down, as if they had been used as ornaments." The hinge therefore may not have been accurately observed: They were part of the Humphrey collection, and perhaps from the Californian region. Judging from the shape (for no type has been discovered), it may be identical with *C. punctata*, Conr.

5. **Clidiophora acutedentata** (vice C. B. Ad.).

*C. t. parum "elongata, ovata; parte postica" haud rostrata, latiore, obtusa; "marginis dorsalis" postico "subrecta; marginis ventralis rotundato," haud tumente; parte antica curtiore; "umbonibus subaequaliter subconvexis, unoane dextro postice angulato": intus, v. convexa dente antico magno, acutissimo, medio parvo, postico valido, maxime elongato; v. planata dentibus antico et postico acutis; ligamento juxta dentem posticum sito.

"Long. '7, lat. '42, alt. '11 poll."


Prof. Adams's "appropriate name suggested by Dr. Gould" being calculated to mislead, I have thought it necessary to change it.
Most of the original diagnosis must also be dropped, the parts above quoted being all that it is desirable to retain. The present description is written from notes and drawings made on a careful examination of the broken type. The lines of growth show that, so far from being "cornute," the species is remarkable for the absence of beak,—the margins being more equally rounded even than in P. obtusa, which in shape it somewhat resembles. The hinge is almost exactly like that of C. claviculata, jun., but differs in the somewhat greater proportionate length of the clavicle, and in the unwonted size and sharp pointing of the anterior tooth. The new name has been chosen to record this peculiarity, rather than follow the modern custom of naming from the author of the mistake. The best naturalists occasionally err; but corrections can be made without affixing a false compliment in perpetuity.


The type has not been discovered; the figure and diagnosis only relate to the outside; and the habitat is not stated. The genus is therefore doubtful; but in shape it resembles the young of C. claviculata.


The worn valves in the Cumingian collection do not allow of a confident determination of the genus.

Genus Ccelodon*.

Testa Pandoriformis: valva sinistra dentibus duobus, cicatricem adductoris anticam versus radiantibus, lamina infra cavernosa junctis: ossiculo nullo: sinus pallii nullo.

The shells of this group vary considerably in shape and dentition in the different species; but agree in this, that in the left valve there is a kind of tent, formed by a thin laminated roof lying on the top of two diverging teeth. It is hard even to guess what is the use of this (perhaps unique) structure; especially as its opening is not towards the body of the shell, but directly facing the anterior adductor. It is seen at once on opening the typical species, which was well figured by Sowerby, Sp. Conch. f. 22. In the aberrant forms it might easily be overlooked, and a glass is needed to detect it in small specimens; but if it exists, the shell can be supported on a pin thrust into the "hollow tooth." When more species are known, the group may require subdivision, the C. flexuosus especially presenting a marked transition to Clidiophora. In that genus the posterior part excels in development; in Ccelodon, the anterior. All the known species are from the Eastern seas, but are very seldom seen in collections. An enlarged diagnosis of the type species is offered.

* θλ. κοιλος, hollow; δεοιν, tooth.
1. **Cælodon ceylanicus.**


*C. t. planata*, rostrata, securiformis; ventraliter maxime, antice satis excurvata; margine postico dorsali valde incurvato: intus, valva dextra, margine postico rectangulatur superstante, dentibus anticos ii. prælongis, satis extantibus, usque ad cicatricem adductoris continuas, dentem cavernosum vaivæ amplectantibus; dente postico curtiore, extante, fossam cartilagineam per totam longitudinem gerente: valva sinistra, margine postico subrectangulatur superstante; sulco postico dentem v. alt. recipiente; dentibus anticos usque ad cicatricem adductoris continuas, centrali longiore, plus quam dimidio interstitii lamina tenui tecto, ventraliter arcuato.

Under this species, of which the correct locality appears in the name, Mr. Sowerby quotes "a single specimen obtained at Island Muerte, W. Columbia, 11 fm., by Mr. Cuming." The hinge may not have been examined. The shell quoted does not now appear in the Cumingian collection, and probably belonged to Clidiohora claviculata, which in shape resembles the typical Cælodon.


This agrees with the last species in shape and dentition, and is probably only a variety.

*Hab.* Philippines (Cuming).

2. **Cælodon delicatus**, A. Ad. (Pandora d.) P. Z. S. (diagn. auct.).

... marginibus dorsali ad angulum circ. 1600 divergentibus: cardine v. dextr. dente postico satis elongato; centrali curto, ad umbonem valde calloso; antico longissimo, cicatricem ant. superante, margini contiguus: v. sinistr. dente centrali curto, supra cavernam erecto, in anticum prælongum continuo.

In this species, the shape of which is not unlike *P. obtusa*, though less transverse, the anterior teeth are enormously developed at the expense of the central. These are short, but prominent; in the left valve bent over, along the whole length, to form the roof of the chamber, and then drawn on into the anterior tooth.

3. **Cælodon elongatus**, d. s.

*C. t. parva*, tenuissima, maxime planata; parte antica minore, excurrata; ventraliter valde excurrata, postice maxime elongata, rostro angustiore; dorsaliter valde incurvata: intus, v. dextr. dente post. satis longo; d. centrali prælongo, postice flecto, cicatricem adductoris parum superante; d. antico minore: v. sinistr. cartilagine valde elongata, postice sita; d. 229
centrali prælongo, postice flecto; d. antico minore a margine remoto, lamina totius longitudinis ad centralem juncto.
Long. .65, lat. .3, alt. .05 poll.

Hub. in China et Borneo (Mus. Cuming).

This species is the Eastern representative of P. rostrata, as is C. delicatulus of P. obtusa. It has the reverse dentition, the central tooth being very long, and the anterior short, bridged over to meet it at the whole length. In the Borneo shell, which is larger, the anterior tooth is rather longer, with the front margin of the ceiling more incurved; but the differences are probably due to increased age only.


... cardine v. dextra dente postico prælongo, a margine separato, usque ad cicatr. adduct. porrecto; fossa cartilaginea curta, inter dentes post. et centr. sita; d. centr. curtissimo, maxime extante, retrorsum deflecto; d. ant. minimo, pene obsoleto: v. sinistr. sulco prælongo postico; fossa cartilaginea separata, curtissi; d. centr. extante, curtissimo, supra cavernam pyrim-formem, in dentem anticum usque ad cicatr. adduct. prolonga-tum, porrecto.

This long-known but rare Red Sea species is to Pandora what Trisis (Gray) is to Arca. It is swollen and twisted, and, by its long clavicle, forms an interesting transition to Clidiophora.


The type has not been found of this species, which was described from a convex valve only. It clearly belongs to the same section as C. flexuosus, and, though the shape is somewhat different, perhaps it is only a variety.

Genus Pandora, Lam.

It is proposed to limit this genus according to the diagnosis of Sowerby, founded on Lamarck’s. Succeeding naturalists have adopted the diagnosis, while they have included in it species to which it did not apply*. It presents a very simple type of hinge, as though the Pandorid idea were gradually fading away towards Myodora. The P. wardiana is the finest species in the group; but it is scarcely typical, having the radiating grooves of the section Kennerlia. The Lamarckian type is the Tellina inæqualis of Linnaeus.


* Chenu, however (Man. Conch. ii. p. 51), gives an original and extended diagnosis, in which he accredits to the whole genus “une dent triangulaire, aplatie, bifurquée, dont la portion antérieure, plus longue, se prolonge jusqu’à l’impression musculaire antérieure”—a character which only belongs to the section Cælodon.
2. **Pandora obtusa**, Lam., auct.


   
   This species is not quoted in the index to the **E. E. Moll.**, but appears in the text (p. 396) and in the Atlas (f. 500). In shape, but not in texture, it resembles **P. oblonga**.

   
   The unique type of this species, from Humphrey's collection, has not been found; it was not described in the **P. Z. S.**, and very closely resembles **P. rostrata**.


   
   No ossicle has been observed in any of the above species. If it be found hereafter in living specimens of the grooved **P. radiata** and **P. wardiana**, they should be removed to the subgenus. The group is not local, as appears to be the case with **Cælodon** and **Clidiophora**, being found in both hemispheres and on both sides of the equator.

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**Subgenus Kennerlia**.

* **Pandora cartilagine ossiculo tenuiore instructa**; lamina exteriore prismatica valvæ planatae radiis plerumque insculpta.

The typical species have radiating grooves in the exterior prismatic layer of the right valve. These have not been observed in **K. glacialis**, but perhaps the specimens are somewhat decorticated. The essential character is the possession of an ossicle. This is well developed in **K. glacialis**, but so thin in the other species that it is often hidden in dried shells by the contraction of the cartilage. The first species in which it was observed (Dr. Kennerley having sent several fresh specimens, preserved in alcohol, to the Smithsonian Institution) was

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1. **Kennerlia filosa**, n. s.

**K. t. tenui**, planoconvexa, maxime rostrata; marginibus dorsalis rectis, ad angulum circ. 160°; ventrali regulariter et modice excurvato, postice vix sinusato; epidermide olivacea, plerumque erosa, postice corrugata; lamina externa prismatic; spongiosa; valva planata radiatim sulcata (quasi filosa), sulcis distantibus; valva convexa, costa obtusissima postice decurrente;

* Named in grateful remembrance of the services rendered to science by the late Dr. Kennerley, the naturalist to the American N. Pacific Boundary Survey; whose premature death has interrupted, almost at the onset, our knowledge of the dredging-fauna of Puget Sound
lineis seu undis incrementis conspicuis: intus dente cardinali uno, parvo, extante; callositate claviculoidea antica, margini contigua; fossa cartilaginea postice sita; cicatricibus adductorum rotundatis, margini dorsali contiguis; linea pallii simplici.

Long. -8, lat. -4, alt. -12 poll.

Hab. in sinu Pugetiano (Kennerley).

2. Kennerlia bicarinata, n. s.

K. t. "K. filose" simili, sed haud rostrata; postice latiore; carinis in valva convexa duabus, in valva planata una, ex umbo-nibus postice decurrentibus; lamina prismatic radiatim sulcata, haud spongiosa; valva convexa tenuiter indentata; ligamento elongato, tenuissimo.

Long. -5, lat. -25, alt. -06 poll.

Hab. in insula Catalina, Californiae; 40-60 uln., rara (Dr. J. G. Cooper. State Geological Survey Coll. no. 1063; Mus. Smithsonian Inst.).

The shape and keels at once distinguish this beautiful little species from its Northern ally, with which, in the hinge and threading of the outer layer, it exactly agrees. The ligament in both species is extremely thin, holding the valves together from the umbo to the posterior end. The fossil Pandora bilirata, Conr., may prove identical with this recent species; but the diagnosis, figure, and type specimen are so imperfect that it would be too hazardous to affiliate them.


... valva dextra callo conspicuo fossam cartilagineam firmante; ossiculo fortiore.

The known species of Kennerlia are thus confined to the North Pacific and the Arctic seas. The diagnosis of No. 1 belongs to a paper on Dr. Kennerley’s new species in the Journ. Ac. N. S. Philad.; and that of No. 2 to a series of papers on Dr. Cooper’s new species in the Proc. Calif. Ac. N. S. They are inserted here to complete the monograph, as far as known to the writer. The “Pandora striata, Quoy” (Add. Gen. ii. p. 371), is a Myodora. The latter genus is so well defined that no alteration is proposed in it.

232
DIAGNOSES

OF

NEW FORMS OF MOLLUSCA

FROM

THE VANCOUVER DISTRICT.

BY

PHILIP P. CARPENTER, B.A., PH.D.

THE shells here described were mostly collected by Indian children for their excellent teacher Mr. J. G. Swan, in the neighbourhood of Neeah Bay, W. T. They were presented by him to the Smithsonian Institution, Washington, D. C.; and, in accordance with their liberal policy, the first available duplicates will be found in the British Museum or in Mr. Cuming's Collection. The species are numbered to correspond with the list in the British Association Report for 1863, pp. 626-628; see also pp. 636-664.

5. M. testa parva, solida, compacta, subquadrata; laevi, nitente, epidermide tenui cinerea induta; extus pallide, intus vivide salmoneo tineta; marginibus dorsalis rectis, ad angulum 120° separatis, umbonibus haud extantibus; marginibus antice et ventrali regulariter late excurratis; parte postica brevissima, haud angulata: intus, dent. card. utraque valva i., quorum unus bifidus; lateralisibus v. dextr. aequidistantibus, ant. extante, post. parvo; nymphae rectis, haud conspicuis; cicatr. add. post. subrotundata, ant. subrhomboidea; sinu pallii satis regulariter ovali, per iv. inter v. partes interstitii porrecto. Long. ½7, lat. ½5, alt. ½1 poll. 

Variat testa aurantiaca, rarius albida, rosacea tineta.

Hab. San Francisco (Pac. Rail. E. E.); Neeah Bay (Swan), plentiful; Monterey, 20 fathoms (Cooper).

In shape almost close to Macoma crassula, Desh. (Arctic); but that species is thinner, not glossy or salmon-coloured, and has no lateral teeth.

6. Angulus variegatus.
A. testa forma A. obtuso similis, sed costa interna omnino carent, valde inaequilaterali, solidiore, nitente, rosaceo et flavido subra.
tim eleganter variegata; striis incrementi concentricis, postice ex-
tantioribus; umbonibus postice flectentibus, obtusis; parte antica
prolongata, regulariter excurrvata; marginibus dorsali et ventrali
subparallelis, subrectcis; parte postica curtiore, subangulata: intus,
dent. card. utraque valva ii. minuitis, quorum alter bifidus; v. de-
xt. dent. lat., ant. curto, satis extante, post. nullo; nymphis
curtis, latis, parum concavis, subito sectis, valvis postea subalatis;
sinu pallii fere cicatr. attr. tenus porrecto. Long. *72, lat. 42,
alt. '15.

Hab. Neeah Bay (Swan); Monterey and Catalina Island,
20–60 fathoms, rare (Cooper).

Subgenus Miodon*.

Testa Lucinoidea, dentibus cardinalibus, ut in Cardita, elongatis ;
laterali antico parvo instructa.

This little group of species is intermediate in character be-
tween Astarte, Venericardia, and Lucina. It first appears in
the Great Oolite, where it is represented by Astarte (Miodon)
orbicularis, J. Sby. Min. Conch. pl. 444. f. 2, 3. This must not
be confounded with a second and true Astarte orbicularis, by
the same author, pl. 520. f. 2. It appears in Mr. Searles Wood's
Crag-series as Astarte corbis. The following is the only recent
species at present known.

9. Miodon prolongatus.

M. testa parva, solida, tumida, compacta, albida; ventraliter antice
valde prolongata, excurrvata; lunula longa, rectiore, haud impressa;
umbonibus antice inflcentis, obtusis, valde prominentibus; margine
dorsali postico parum excurrvato; costis radiantibus x.–xii. latis,
obtusis, marginem attingentibus, parum distantiis, obsoletis, a li-
ris incrementi concentricis, plus minusve distantibus, ex-
pressis, lie et illic interruptis: intus, margine a costis plus minusve
obsoletim crenulato; cardine dentibus v. dextr., uno postico, inter
duas fossas elongato, et lat. ant. lunulari; v. sinistr., dent. ant. trian-
gulari, post. valde elongato, lat. ant. minimo, obsoleti; cieat. add.
subrotundatis, ventraliter sitis. Long. 23, lat. 24, alt. 16.

Subgenus Adula, Add. (diagn. auct.).

Testa inter Modiolam et Lithophagum intermedia, cylindracea;
umbonibus obtusis; parte antica longiore; ligamento subinterno,
valde elongato; epidermide haud testacea.

Animal byssiferum, in cryptis affixum; musculis adductoribus
majoribus, antico ovato.

Constituted by Messrs. Adams for A. soleniformis, D'Orb.,
which very closely resembles the young of the Vancouver species:
enlarged to receive the shells of Lithophagoid shape which are

* Th. µειω, smaller; δοιος, tooth.
moored by byssus, like *Modiola*. The largest known species is *A. falcata*, Gld., which is normally straight, but often grows in a twisted burrow. *A. parasitica*, Desh., and the long-known *A. cinnamomea* appear congeneric.

13. *Adula stylina.*

* A. testa cylindracea, lithophagoidea, lævi, tenuissima, parum arcuata, subnuarea, albida, postice interdum livido tineta; epidermide nitente, lævi, solidiore, nigro-fusca: testa jun. typice modio-læformi, umbonibus subantecis, obtusissimis; margine dorsali antice (rarissime paululum, testa minima, postice) tenuiter crenulato: testa adulta marginibus dors. et ventr. fere parallelis, ant. et post. rotundatis; umbonibus detritis, haud conspicuis, circiter sextantim antice sitis; incrustatione haud solida, densissime spongiosa, aream posticam diagonalem tegente, supra valvas prolongata, appressa; ligamento interno, postice valde prolongato; pagina interna pallida; cicatr. add. postica tumida, pyriformi, antica (quoad familiam) maxima, haud impressa, oblonga; cicatr. pedali antica magna, circulari, impressa; callositate subumbonali (testa jun.) cicatr. pedalem versus conspicua. Long. '155, lat. '4, alt. '5. Variat t. magis arcuata; ut in *A. falcata*, antice tumidiore, subangulata.

Variat quoque testa attenuata. Variat interdum ventraliter late hiante.

_Hab._ Neeah Bay, abundant *(Swan)*; Monterey *(Taylor)._ On smashing a large lump of hard clay, bored by Pholads, Petricolids, &c., large numbers of this species, with a few of *A. falcata*, of all ages from ‘06 onwards, were found _in situ_. Several struggled for room in a single crypt. The umbos are abraded by the wide opening of the valves.

14. *Axinea (? septentrionalis, var.) subobsoleta.*

* A. testa *A. septentrionali* simili, parum inæqualilaterali, haud tumida; umbonibus obtusis, latis, satis prominentibus; cinerea, rufo-castaneo varie picta; epidermide copiosa, sublaminata; marginibus ventrali et postico valde rotundatis, antico parum producto, dorsali recto; sulcis radiantis subobsoletis sculpta, dorsaliter sepe evanidis: intus, marginibus ventrali valde, ant. et post. parum crenatis; lamina cardinis subangulata; dentibus paucioribus, validis, angustatis; cicatr. add. antica castanea, callosa; ligamento subcato. Long. ‘13, lat. ‘12, alt. ‘7.

_Hab._ Neeah Bay *(Swan)*; Shoalwater Bay *(Cooper)._ Middendorff’s shell is figured with much stronger ribs, but may have been described from decorticated specimens.

15. *Siphonaria Thersites.*

* S. testa parva, tenui, haud elevata, valde inæqualilaterali, dense nigro-castanea, lævi, seu interdum costulis paucis, obtusis, obsoletis,
Dr. P. P. Carpenter on new Forms of Mollusca

4

radiatim vix ornata; epidermide lævi, tenui, fugaci; costa pulmonali intus et extus valde conspicua, tumente; vertice obtuso, plerumque ad quadrantem, interdum ad trientem totius longitudinis sito; intus intense nigro-fusco, margine acuto. Long. 46, lat. 33, alt. 17.

Hab. Neeah Bay (Swan).

This genus, which culminates in western tropical America and at Cape Horn, is not known in California. The Vancouver species resembles S. lateralis and its congeners, but differs in having an enormous lung-rib and no colour-rays.

16. Mopalia (Kennerleyi, var.) Swannii.

M. testa M. Kennerleyi typice simili, sed jugo fornicate, hauud carinate; omnino rubida, sculptura multo minus expressa; areis lateralibus vix definitis; latera versus subgranulata; dorsum versus lineis jugum versus procedentibus, interstititis punctatis; sinu postico latio; limbo pallii lato, coriaceo, vix piluloso. Long. 24, lat. 11, div. 120°.

Hab. Tatoocche Island (Swan).

23. Margarita Cidaris, A. Ad.

M. testa magna, conica, Turricoidea, tenni; albido-cinerea, nacreo-argentato; anfr. nucleosis…(decollatis), norm. viii., subplanatis; suturis alte insculptis; superficie spire tota valde tuberculosa, seriebus tribus, alteris postea intercalantibus; peripheria et basi rotundatis, carinatis; carinis circ. viii., hauud acutis, irregularibus, scabris, hauud tuberculosis; lacuna umbilicali vix conspicua; apertura subrotundata; labro tenuissimo; labio obsolete; columella arcuata. Long. 11, long. spir. 65, lat. 75, div. 60°.

Hab. Neeah Bay (Swan).

Mr. A. Adams suggested the above expressive name for this very remarkable and unique shell.

25. Gibbula parcipicta.

G. testa solidiore, parva, conica, pallida, purpureo-fusco varie nebulosa et maculata; anfr. v., rotundatis; carinis ii. validis in spira se monstrantibus, minore intercalante; interstitiis subsuturalibus, sublevibus, inter carinas obtuse decussatis; lira peripherica definita, sæpe in spira se monstrante; basi valde rotundata; lirulis basalius circ. v. rotundatis, subdistantibus; apertura subcirculari; columella arcuata; umbilico majore, infundibuliformi, hauud angulato. Long. 14, long. spir. 07, lat. 13, div. 70°.

Hab. Neeah Bay (Swan); Santa Crux (Rowell).


G. testa parva, subelevata, solidiore; livida, testa jun. strigis angustis, creberrimis, fusco-purpureis penicillata, testa adulta maculis quoque magnis nebulosa; anfr. v., subquadratis; liris obtusis medianis
et striis suboboletis cineta, suturis valde impressis; basi rotundata, obtuse angulata, striis sœpe evanidis spiralis ornata, testa adulta circa umbilicum magnum, infundibuliformem, vix angulatum, sœpe tumidiore, medio obtuse impressa; apertura subquadra, parum declivi; columella subarcuata. Long. '16, long. spir. '07, lat. '16, div. 70°.

_Hab._ Neeah Bay (Swan); Lower California, on Haliovis (Rowell).

27. _Gibbula lacunata._

_G. testa parva, fusco-purpurea, solidiore; marginibus spiræ valde excurvatis; anfractibus nucleosis normalibus, postea iv. subplana, suturis distinctis, apice mamillato; subbas, circa basin vix angulatam striolata, striolis spiralis distantibus; aperture suborbiculari, parum declivi; labio juxta umbilicum constrictum, quasi lacunatum, lobato; columella callositate parva umbilicum constringente._ Long. '11, long. spir. '05, lat. '11, div. 80°.

_Hab._ Neeah Bay (Swan).

28. _Gibbula funiculata._

_G. testa parva, elevata, compacta, fusca; marginibus spiræ excurvatis; anfr. vi., haud tumidis, suturis parum impressis; lirulis cerebris rotundatis undique cineta, quarum v. in spira monstrantur; interstitiis parvis; basi rotundata, haud angulata; umbilico parvo, haud carinato; aperture suborbiculari, parum declivi; columella vix arcuata._ Long. '24, long. spir. '11, lat. '2, div. 70°.

_Hab._ Neeah Bay (Swan), specimen unicum.

29. _Hipponyx cranioides._

_H. testa valde planata, majore, albida; vertice nucleoso? ...; testa adulta apice interdum subcentrali, sæpius plus minusve postico; laminis incrementi confertis, undique rapide augentibus; striis radialibus fortioribus, confertissimis, lamarinum margines sœpe crenulatius; margine acuto; cicatr. musc. angusta, margini contigua, regione capitis minore, sœpe dextrorsum torsa; epi-dermide?... Long. '85, lat. '75, alt. '3.

_Hab._ Neeah Bay (Swan).

30. _Bivonia compacta._

_B. testa satis magna, sœpe solitaria, purpureo-fusca, spiraliter ple-rumque satis regulariter contorta, obsoletim cancellata seu sculptura fere evanida; testis tenacissime adhaerente._ Long. (plerumque) '7, lat. '3, diam. apert. '1.

_Hab._ Barclay Sound; abundant on _Pachypoma gibberosum_ (Swan).

Belongs to _Bivonia_, Gray (not Mörch). Has the aspect of _Petaloconchus macrophragma_ on a large scale, but is entirely destitute of internal laminae. One specimen had a faint colu-
mellar thread for two whirls only. Operculum normal, with thin edge, dark red.

32. *Lacuna porrecta*.

*L. testa L. puteolo* simili, sed multo majore, spira magis exserta; seu omnino fusa, seu zona pallidiore, seu pallida lineolis fuscescentibus tenuissime spiraliter ornata; epidermide tenui tenui striata olivacea seu viridescente induta; tenuiore, spiraliter tenui tenui striata; anfr. v., vix planatis, rapidite augentibus, suturis impressis, vertice mamillato; apertura tumente; labio tenui, vix parietem attingente, intus subrecto; lacuna maxima, elongata, ad basin arcuata; peripheria expansa. Long. '52, long. spir. '2, lat. '4, div. 80°.

?Var. *effusa*: testa *L. porrecta* simili, sed multo majore; spira elevata, satis effusa; anfr. tumidioribus, suturis valde impressis; apertura versus magis expansa. Long. '65, long. spir. '25, lat. '5, div. 60°.


*Hab.* Neeah Bay (Swan).

The form *L. exaequata* is intermediate between the very different *L. porrecta* and *L. effusa*. The *Lacucae* vary so much (*vide* Forbes & Hanley *in loco*) that, even with a large multitude of specimens, it is not easy to state what constitutes a species.

33. *Lacuna* (? *solidula*, var.) *compacta*.

*L. testa L. solidula*, var., simili; parva, solida, compacta, angusta, subturrita, marginibus spire excurvatis; aurantiaca, interdum pallidiore zonata; anfr. subplanatis, suturis distinctis; tota superficie confertissime spiraliter striolata; basi valde angulata, subplanata; apertura subquadrata; columella vix lacunata. Long. '23, long. spir. '1, lat. '17, div. 60°.

*Variat* testa elongata: variat quoque columella normaliter lacunata.

*Hab.* Neeah Bay (Swan).

Possibly an extreme form of the very variable *L. solidula*, Lov. (*= L. carinata*, Gld., non A. Ad., *= Modelia striata*, Gabb), yet distinct in all ages. The young shells resemble small *Litorina*.

34. *Lacuna variegata*.

*L. testa* tenui, plus minusve elevata, soluta, irregulare; adolescete fusco-purpureo; adulta livida, radiatim seu diagonaliter varie irregulare striata, strigis fusco-aurantiacis, ssepe ziczaformibus; anfr. vi., quorum primi compacti, apice submamillato; dein solutis, postice planatis, antice expansis; basi rotundata seu angulata; apertura subovata; labro postice porrecto; labro ssepe parietem vix attingente; columella intus recta, extus valde lacunata. Long. '3, long. spir. '16, lat. '17, div. 50°.

*Hab.* Neeah Bay (Swan).

Painted like *L. decorata*, A. Ad., which differs in having a normal growth, with very slight chink.
35. *Isapis fenestrata*.

I. *testa* *I. ovoidea* forma et inde simili; carinis ix. acutis (quarum iv. in spira monstrantur) cineta; interstitiiis duplo latioribus, concinne quadratim decussatis, *liulis* radiantisibus acutissimis; *anfr.* postice tumentibus, suturis valde excavatis; peritremate continuo; labro a carinis pestinato; labio parietem parum attingente, medio calloso; umbilico angusto. Long. *18*, long. spir. *13*, lat. *19*, div. 70°.

*Hab.* Neeah Bay (Swan); S. Diego and Sta. Barbara Island (Cooper).

Dr. Cooper's shells are much smaller than those from the Vancouver district, which are white and eroded, varying much in the size of the umbilicus.

36. *Alvania reticulata*.

*A. testa* parva, subturrita, rufo-fuscus, marginibus spiræ rectis; *anfr.* nucleosis ii. et dimidio, naticoideis, laevibus, tumentibus, apice mamillato; norm. iii., tumidis, suturis impressis; *liiris* angustis, distantibus, spiralibus circ. xii. (quarum iv.-vi. in spira monstrantur), et *liulis* radiantisibus, supra transeuntibus, haud noduleosis, secundum interstitiis incurvatis, elegantem exsculptam; interstitiiis altis, quadratis; peritremate continuo, subrotundato, acutiore. Long. *085*, long. spir. *05*, lat. *04*, div. 30°.

*Hab.* Neeah Bay; two specimens in shell-washings (Swan).

37. *Alvania filosa*.

*A. testa* *A. reticulatae* indole et colore, haud sculptura, simili; multo majore, elongata; *anfr.* nucl. ?... (detritis), norm. iv.; striis parum separatis circ. xviii. (quarum circ. xii. in spira monstrantur) cineta; *rugulis* radiantisibus posticis creberrimis, haud expressis, circa peripheriam evanidis; peritremate continuo; *columella* rufo-purpurea. Long. *13*, long. spir. *09*, lat. *06*, div. 20°.

*Hab.* Neeah Bay; one specimen in shell-washings (Swan).

38. *?Assiminea subrotundata*.

*A. testa* haud parva, laevi, tenui, fusco-olivacea; *anfr.* nucl. ?...(de-collatis); norm. v., rapidé augentibus, subrotundatis; marginibus spiræ rectis, suturis valde impressis; basi rotundata, haud umbilicata; apertura rotundato-ovali, intus fuscescente; peritremate continuo; labro acuto; labio parum calloso; *columella* arcuata. Long. *28*, long. spir. *13*, lat. *2*, div. 65°.

*Hab.* Neeah Bay; one specimen among *Lacuna* (Swan).

May prove to be a large *Hydrobia*.

39. *?Paludinella castanea*.


*Hab.* Neeah Bay; one specimen among *Lacuna* (Swan).
Dr. P. P. Carpenter on new Forms of Mollusca

Margaribus; rugulosa, lineis distantibus spiralis irregulariter in-
sculpta; anfr. nucleosis?. . . (detritis), vertex late mamillato;
norm. iv., rapidius augmentibus, tumidioribus, suturis satis im-
pressis; basi regulariter excrurata, vix rimata; aperture suborbicu-
laris, hand continua; labro acuto; labio supra pari etem obsoletu, 
supra columellam arcuatum inbus caloso: operculo, anfr. iv. hand 
rapi de augmentibus. Long. ’21, long. spir. ’09, lat. ’17, div. 70°.

Hab. Neeah Bay; one specimen among Lacunæ (Swan).

May be an aberrant Assiminea.

40. Mangelia crebricostata.

M. testa tereti, rufo-fusca, albo zonata; anfr. nucl. ?. . . (decollatis);
norm. v. elongatis, subrotundatis, suturis impressis; costis radi-
antibus, obtusis, subrectis, circ. xv., spiram ascendentibus; sculp-
tura spirali? . . . (detritis); aperture pyriformi, antorsum in ca-
nalem brevem attenuata; labro postice parum sinuato; labio con-

Hab. Neeah Bay; 1 specimen (Swan).

41. Mangelia interfossa.

M. testa parva, valde attenuata, rufo-fusca, marginibus spirae parum 
excervatis; anfr. nucl. ii., ut in Chrysodomo irregularibus, apicu 
mamillato; norm. vi., parum excervatis, hand tabulatis, suturis 
distinctis; costis radiantis circ. xv., angustis, extantibus; cos-
tulis spiralis circ. xv., quarum circ. v. seu vi. in spira monstrantur, 
angustis, supra costas transeuntibus, ad intersectiones parum no-
dulosis; interstitii altis, quadratis; basi effusa; aperture sub-
pyriformi; labro acuto, postice vix emarginato; labio tenui. 

Hab. Neeah Bay; very rare (Swan).

42. ?Mangelia tabulata.

?M. testa parva, solidissima, luride rufo-fusca, marginibus spirae ex-
curvatis; vertex nucleosum chalcedonico (eroso); anfr. norm. v., 
postice rectangulatim tabulatis, suturis impressis; costis radianti-
bis circ. xvi., validis, obtusis, circiter basim attenuata obsoletis; 
costis spiralibus in spira iii.-iv. angustis, extantibus, supra cost.
rad. nodosis; interstitiis alte insculptis, subquadritatis; costis circa 
basim circiter vii., quadratin extantibus, interstitiis a lineis incre-
menti vix decussatis; canali curta, aperta; labro acutiorre, ad an-
gulum posticum vix sinuato; labio tenui; columnella obsoletae uni-
plicata. Long. ’45, long. spir. ’26, lat. ’2, div. 35°.

Hab. Neeah Bay; several worn specimens (Swan).

The distinct fold near the base of the pillar may require the 
formation of a new genus.
from the Vancouver District.

43. ?Daphnella effusa.

?D. testa gracillima, maxime effusa, rufo-fusca; anfr. angustis, elongatiis, suturis impressis; striis spiralibus erubesis a lineis incrementi decussatis ornata; labro tenui, postice vix sinuato. Long. 35, long. spir. 43, lat. 22, div. 30°.

Hab. Neeah Bay; one broken specimen (Swan).

44. Odostomia satura.

O. testa magna, alba, laevi, solidiore, satis elevata; anfr. nucl. ii., angustis, subplanorboideis, valde decliviter sitis, dextrorsum immersis, sinistrorsum extantibus; norm. v., tumidioribus, regulariter convexis, suturis impressis; basi rotundata, tumente, quasi umbilicata; apertura ovata; labro vix sinuato; labio tenui, appresso; plica columnellari valida, subantica, pari eti haud contigua, transversa. Long. 36, long. spir. 14, lat. 13, div. 40°.

Hab. Neeah Bay; rare (Swan).

Var. puliformis: anfr. primis valde depressis, planatis; vertice mammillato; anfr. ult. normali. Specimen unicum, quasi monstruosum. Long. 19, long. spir. 1, lat. 12, div. 45°.

44 b. Odostomia (?var.) Gouldii.

O. testa solida, alba, ovoidea, marginibus spira valde excurvatis; vert. nucl. decliviter immerso; anfr. norm. v., subplanatis, suturis valde impressis; peripheria haud angulata; basi excurvata, haud tumida; apertura ovata, postice parum constricta; labro solido; labio conspicuo, rimam umbilicalem formante; plica submedianam, solida, extante, haud declivi. Long. 23, long. spir. 13, lat. 1, div. 30°.

Hab. Neeah Bay; very rare (Swan).

Agrees in some respects better with the diagnosis of O. gravidula, Gould, than do Col. Jewett’s shells, from which it is presumed the species was described. These large forms appear very variable.

45. Odostomia nuciformis.

O. testa magna, compacta, laevi, solida, alba; anfr. nucl. ? . . . (erosis), vertice submammillato; anfr. norm. v., subplanatis, subelongatis; spira brevi, marginibus valde excurvatis; basi elongata, haud umbilicata; apertura subovalis, postice angusta; labro solido; labio tenui; plica antica, solida, obtusa, transversa, parietem haud attingente. Long. 32, long. spir. 14, lat. 18, div. 70°.

Hab. Neeah Bay; extremely rare (Swan).

45 b. Odostomia (?var.) avellana.

O. testa O. nuciformis indole simili, sed spira valde prolongata. Long. 32, long. spir. 16, lat. 16, div. 50°.

Hab. Neeah Bay; one specimen (Swan).

Like a gigantic form of O. conoidalis.

243
47. Odostomia tenuisculpta.

*O.* testa ovoidea, subelevata, albida, tenui, diaphana; anfr. nucl. subverticaliter immersis, angustis; norm. iii., parum tumidis, suturis impressis, sulculis spiralibus latioribus haud impressis, distantibus, in spira iii., circa basins rotundatam circ. vi. subobsoletis; apertura ovata; plica acuta, declivi, parva, parieti contigua; labro acuto; labio indistincto; columella antice parum effusa.

*Hab.* Neeah Bay; one specimen (Swan).

48. Scalaria Indianorum.

*S.* testa gracili, turrita, alba; anfr. circ. x., rotundatis, parum separatis, levibus; basi simplici, haud umbilicata; costis viii.—xv. (plerumque xii.), acutioribus, subreflexis, interdum latis, plerumque lineis irregularibus marginis spirae recto parallelis ascendantibus, rarius juxta suturam subnodosis; apertura ovata. Long. 1'03, long. spir. '08, lat. '36, div. 28°.

*Hab.* Neeah Bay (Swan).

Strung as ornaments by the Indian children. Intermediate between *S.* communis and *S.* Turtonis, and scarcely differs from "*S.* Georgettina, Kien.," Mus. Cum. no. 34, Brazil.

48 b. Scalaria (? Indianorum, var.) tineta.

*S.* ?Indianorum costis acutis, haud reflexis; anfractibus postice fusco-purpureo tinctis.

*Hab.* Cerros Island (Ayres); S. Pedro (Cooper).

The Lower-Californian shell may prove distinct. It is like *S.* regularis, Cpr., but without the spiral sculpture.

Subgenus **Opalia**, H. & A. Ad. (diagn. auct.).

**Scalaria** varieibus obtusis, irregularibus, parum definitis: sculptura basim versus interrupta.


The species of this very natural group were arranged by Messrs. Adams partly under *Opalia* and partly under *Cirsotrema*.

49. **Opalia borealis**, Gld.

*O.* testa *O.* australi simillima, valde elongata; anfr. xii., planatis, suturis parum impressis; testa jun. costis validissimis viii. latis, rotundatis, peripheriam attingentibus, interdum interruptis; testa adulta septius 244
from the Vancouver District.

obsoletis, ad peripheriam evanidis; circa basim totam usque ad peripheriam angulatam lamina spirali, planata; apertura ovali; tota superficie minutissime spiraliiter striolata: operculo pance-spirali, nucleo ad trientem longitudinis sito, lineis incrementi validis. Long. 1·7, long. spir. 1·3, lat. .53, div. 20°.

Hab. Puget Sound (U. S. Expl. Exp.); Neeah Bay and Tatooch Island (Swan).

This species was doubtfully indicated, not described, by Dr. Gould, in the 'E. E. Moll.' p. 207. It appears to be exactly identical with "crassicostata, Australia," in Brit. Mus., and is nearly related to Ochotensis, Midd. It must not be confounded with Acirsa borealis, Beck. One young specimen has the ten ribs of O. australis.

50. Cerithiopsis munita

C. testa C. purpureae simili, sed angustiore, marginibus spirae fere rectis; costis spiralisbus magis expressis, testa adulta minus nodulosis; basi æqualiter lilulata. Long. .34, long. spir. .24, lat. .11, div. 20°.

Hab. Neeah Bay; common (Swan).

51. Cerithiopsis columna.

C. testa majore, valde elongata, purpureo-fusca; anfr. norm. ix., planatis, suturis distinctis; seriebus iii. nodulorum spiralisbus valde appressorum, creberrimorum, interstitiis parvis, altis; alis interdum intercalantibus; lira quarta supra suturam haud valde nodulosa, liris duabus haud expressis aream suturem circumaeuntibus; basi planata, haud sculpta, ad peripheriam obtuse angulata; apertura quadrata. Long. .38, long. spir. 32, lat. .1, div. 10°.

Hab. Neeah Bay; several worn specimens (Swan): Monterey; rolled fragment of larger shell (Cooper).

Easily recognized, even in portions, by the "strung-fig" pattern.

55. Cancellaria modesta.

C. testa elata, subrubra, trichotropiformi, marginibus spiræ rectis; anfr. norm. v., rotundatis, postice subtabulatis, suturis impressis; costis spiralisbus obtusis, distantibus, in spira circ. iv., circa basim prolongatam circ. vii., alis minoribus interdum intercalantibus; interstitiiis secundum incrementa, decussatis; apertura subquadrata; columella pliis duabus declivibus anticus et costulis basilibus ornata; labio nullo. Long. .68, long. spir. .34, lat. 34, div. 50°.

Hab. Neeah Bay; one specimen and fragment (Swan).

56. Velutina prolongata.

V. testa majore, subplanata, tenuiore, carnea, spira minima; anfr. iii.
Dr. P. P. Carpenter on new Forms of Mollusca.

et dimidio, rapidissime augentibus; vertice vix conspicuo; anfr. ult. antice valde porrecto; regione columnellari incurvata; labio valido; axi haud rimata; epidermide tenui, rugis incrementi ornata, spiraliter haud striata. Long. '1, long. spir. '15, lat. '95, div. 140°.

Hab. Nceah Bay; rare (Swan).

246
F.

DIAGNOSES

OF

NEW FORMS OF MOLLUSCA

FROM

THE VANCOUVER DISTRICT.

BY

PHILIP P. CARPENTER, B.A., Ph. D.

From the Proceedings of the Zoological Society of London, pp. 201–204, February 14, 1865.

( 247 )
Diagnoses of New Forms of Mollusca from the Vancouver District. By Philip P. Carpenter, B.A., Ph.D.

Tebebratula unguicula, n. s.

T. t. juniore "Terebratulinae capiti-serpentis" simillima, sed latiore, subtriangulata; punctis valde conspicuis; costis conspicuis, interdum obtusioribus, aliis intercalantibus; intus, amento suboctiformi, postice aperto, cruris diagonalibus cardini affinis: testa adulta valva inferiore subtortundata, marginem versus haud planata; umbone valde tumente, latiore; striis radiantibus, ut in "T. capite-serpentis" conspicuis; marginibus crenulatis, haud undatis; intus amento majore, bisinuato, dorso saliter haud continuo, calcaribus duobus munito.


The specimens sent by Dr. Cooper were all of small size, and, from the intercalation of riblets near the margin, clearly immature. They presented the incomplete loop of the restricted genus to which Dr. Cooper affiliated them. Notwithstanding, as both Davidson and Woodward state that the young of the British species has the loop similarly open, it remained doubtful whether this might not prove conspecific. Messrs. Reeve and Hanley unhesitatingly pronounced them to be "caput-serpentis, jun.,” the latter gentleman stating that they presented the peculiar form of that species which belongs to the Mediterranean examples. Dr. Forbes, however, was fortunate enough to
obtain an adult shell, which passed into the Cumingian Collection. Having removed the animal matter with great care, the loop was found to retain the form seen in the young shell, only perhaps still more open. This is the first recent species of the genus which has been discovered with a sculptured surface, and affords an instructive lesson not to rely on external characters.

_Terebratula unguicula_: 1, 2, outside views of Mr. Cuming's adult specimen, natural size: 3, 4, inside views of the upper valve, slightly magnified.

The outline of the adult is much rounder, and the margin blunter, than in _T. caput-serpentis_. Inside, the noncompletion of the somewhat ω-shaped loop is a very obvious character. This is large in proportion, extending to about two-fifths of the length and one-third of the greatest breadth of the shell. It is bent upwards in the middle, as seen from the partly opened valves; with a double wave at the sides, as seen from the direction of the opposite valve. Two spurs ascend from the crests of the side waves, as though preparing to complete the loop. The similar _Terebratella angustata_ from Japan, when of the same size as Dr. Cooper's specimens, has the loop quite continuous.*

**Subgenus Nettastomella†.**

_Pholadidea_: _valvis postice in calyce testaceum planatum prolongatis_; _calyce coriaceo nullo._

_Nettastomella Darwinii_, Sby. (diag. auct.).

_N. t. minore, elongata, tenuissima_; _parte postica costis radian-tibus acutioribus circ. vii. et laminis concentricis acutissimis, distantibus, antice continuis, elegantissime ornata_; _rostris pla_

* Dr. Cooper having forwarded for my inspection a large and beautifully perfect specimen of the true _Waldheimia Californica_, I have compared it with the series of the very variable _W. globosa_ in the Smithsonian Museum, undoubtedly from Orange Harbour. The California shell, however, has a strong brownish-red tinge, and does not display the beautiful veining of the Magellan species.

† Th. νυττα, a duck, στόμα, mouth. The name _Nettastoma_, given in the 'Brit. Assoc. Report,' 1863, being preoccupied in another subkingdom, according to Dr. Cooper, it is thought necessary to vary the termination.
natiss, postice divergentibus, striis incrementi crebris acutis, alter hauud sculpta; parte antica t. jun. aperta, adultæ clausa; clausis tenuissimis, secundum incrementa undulatis, super umbones prolongatis, umbilicos postice formantibus; epidermide fugaci, tenui, pallide viridi.

_Hab._ Monterey, Rich.; Vancouver, Lord; S. Diego, Cooper.

= Pholas darwinii, Sby.

= Jouanettia durcinii, Mus. Cuming.

= Parapholas penita, Tryon, Mon. Phol.

This remarkable shell differs from _Jouanettia_ in having both valves equal; from _Pholadidea_ proper in having no coriaceous cup, its place being supplied by a flattened prolongation from each valve, like a duck’s bill in miniature. In Mr. Lord’s specimen (preserved in the British Museum), though the valves are closed, the prolongations are widely divergent, as when the bird utters its cheerful “quack.” The loose, thin epidermis appears to have covered the bill as well as the valves. Mr. Tryon had probably not seen a specimen, else he could hardly have affiliated so very different a shell to _Pholadidea penita_. The original specimen is said to have come from Chili.

**DARINA DECLIVIS.**

_D. t. tenuissima, planata, elliptica, Machæreiformi, utroque latere hiante; cinerea, epidermide fortiore induta; marginibus regulariter excurratis; umbonibus hauud conspicuis, ad duas inter quinque partes longitudinis postice sitis: intus cartilagine spathula elongata, dorsum versus utroque valva decliviter sita, a ligamento lamina extante tenuissima separata; dente cardinali laminato, extante, curtiore; lateraliis vix conspicuis; sinu pallii ovali, fere ad medium prorecto._

*Long._ 1°77, lat. 8°53, alt. 34 poll.

_Hab._ Vancouver’s Island (Forbes).

The only other species of _Darina_ known is from the Straits of Magellan. The northern shell may have been passed over as the young of _Machæa patula_, to which it bears a strong external resemblance.

**SAXIDOMUS BREVISIPHONATUS.**

_S. t. subovali, tenuiore, subplanata, albida, epidermide pallide olivacea induta; tota superficie rugis concentricis, crebris, valde obtusis, et undis incrementi interdum majoribus, ornata; marginibus subequaliter excurratis, maxime ventrali: intus cardine tenuiore, dente antico elongato; sinu pallii parvo, ad trientem interstitii prorecto, latiore._

*Long._ 2°65, lat. 2°05, alt. 1°15 poll.


A very distinct species, in shape and hinge not unlike _Callista_, but without lunule. It is more rounded and flatter than the three typical Californian species, and known at once by the very small mantle-bend. From four to six blunt riblets are seen on each of the very
blunt waves of growth. The shell was sent me as from Dr. Forbes's Vancouver collections, and is so quoted in the Br. Assoc. Rep. 1863, p. 607; but Mr. Cuming subsequently stated his belief that it came from Japan. It may be allowable to state that many of the species included in Saxidomus by authors are more correctly rough forms of Tapes, of the decussata-type; the true Saxidomi differing from that genus (as Callista does from Venus) in having an additional pseudolateral anterior tooth. This is very evident in the young shell, which has a much rounder outline than the adult, and can scarcely be distinguished from Callista, except by the absence of lunule.
G.

DIAGNOSES

OF

NEW SPECIES AND A NEW GENUS OF MOLLUSKS,

FROM

THE REIGEN MAZATLAN COLLECTION;

WITH AN ACCOUNT OF ADDITIONAL SPECIMENS PRESENTED TO THE BRITISH MUSEUM.

BY

PHILIP P. CARPENTER, B.A., PH.D.


(253)
Diagnoses of New Species and a New Genus of Mollusks from the Reigen Mazatlan Collection: with an Account of Additional Specimens Presented to the British Museum. By Philip P. Carpenter, B.A., Ph.D.

After the publication of the British Museum Mazatlan Catalogue, the backs of several fresh Spondylus-valves were examined by Mr. R. D. Darbishire and myself. Among the specimens were several which were deemed worthy of being added to the national collection; they were deposited there, with a MS. appendix to the Catalogue, in 1858. As it is not judged necessary to print this separately, I have (with the permission of Dr. Gray) transcribed what should be placed on record, in hopes that it may not be judged out of place in the 'Proceedings.' Those who use the Mazatlan Catalogue are requested to observe not only the corrections in the Appendix, pp. 547–552, but also those made in the Review of Professor C. B. Adams's Panama Catalogue, P. Z. S. 1863, p. 339; and in the British Association Reports, 1863, pp. 543 et seq. The numbers, both of species and of tablets, are continued from the Mazatlan Catalogue, and correspond with those in the Report. The student of the Gulf fauna should also consult the account of Mr. Xantus's
Cape St. Lucas shells in the 'Annals Nat. Hist.' 1864, and in the Report, pp. 616-626 *.

704. Cellepora areolata, Busk †.
Tablet 2540 contains a specimen on Omphalius ligulatus.

705. Membranipora ?flemingii, Busk †.
Tablet 2541 contains a group on O. ligulatus.

* The following additional specimens from the Reigen Collection have been presented to the British Museum.—

Tablet.
12* A group on Omphalius ligulatus.
13* Lepralia adpressa and Membranipora, sp. ind., on ditto.
42. Young opposite valve of ? Solecurtus, perhaps conspecific.
201*. Four young valves (smallest 05 by 034) probably of this species.
206* Minute transparent valve, 023 across, teeth unformed; perhaps of this species.
358*. Two specimens; margin irregular.
604*. Several specimens in Uvanilla unguis; one, not having room within, has made a case for itself outside the Uvanilla.
642* A pair, 3 by 15; probably an older state of the same species, Barbatia alternata.
486* A young shell, 06 across, laid open; crowded inside, especially near the umbones, with a pinkish mass of young ones, about 0018 in length.
500. A younger pair, much more transverse, transparent, without concentric ridges, the lateral teeth in one valve being simply the raising of the dorsal margins.
833*. Two young specimens, nesting among Nullipore on Fissurella alba.
869*. Two specimens, with egg-cases arranged in pattern like Orbitolites.
876*. One specimen, curiously mended after fracture.
877*. One specimen, with columella curiously contorted.
1023*. One specimen, with ribs rounded and aspect of Siphonaria lecanium; probably a distinct species.
1058*. One young specimen, probably conspecific, though only 07 by 047; there is no trace of spire.
1069*. Three specimens; broad form.
1468*. Fragment of Spondylus calcifer, with basal supports of Hipponyx ?ser- ratus, in burrow of Lithophaga plumula.
1795*. Two specimens with five intercalary teeth.
1834*. One specimen with the canal bent back, as in Cassidaria.
2221*. One specimen, mended after severe fracture.
2223*. One specimen; columella fold bifid.
2224*. Two specimens; columella bent and straight.
2225*. One specimen; labrum thin.
2226*. One specimen; ribs close.
2376*. One specimen, dwarf form; nodulous, as in N. nodulifera, Phil.
2516. An opposite larger valve, since found, in which there is only one distinct posterior tooth, and the anterior hooked tooth is separating into two.

[2534. One specimen of Vitrinella ? tricornata, Jun., of which the ribs are nodulous in the young state. If rightly determined, this adds no. 710 to the list of species.]

2536. A nuclear shell, 046 across, of Naticoid shape, very finely striated in each direction. It is probably a young Hipponyx

† Both of these species were kindly identified by Mr. G. Busk.

256
OF MOLLUSKS FROM MAZATLAN.

Genus Cycladei la.

Testa bivalvis, tenuis, aequilateralis, aequivalvis, haud hians, umbonibus planatis. Ligamentum tenuissimum, externum. Cardo lineae curvata, dent. lat. distantibus, card. transversis, haud radiantis.

56. CYCLADELLA PAPYRACEA, n.sp.

C. t. tenuissima, subdiaphana, epidermide tenui induta, planata, suborbiculari; concentrice fortiter lirata, liris rotundatis, intus excavatis; tota superficie lineis granulosis radiantis crebrimis minuitissime induta; dent. card. i.–ii. transversis, margini dorsali subparallelis; dent. lat. validis.

=="Tellina ?eburnea, Hanl." (fragments only), Maz. Cat. no. 56.

Mr. Hanley kindly sent for my inspection a perfect pair (as "Lepton "), which he had found nesting in a burrow in Spondylus. The hinge more resembles Cyclas (Lam.) than any other known genus. Its great peculiarity is, that the cardinal teeth, instead of radiating from the umbo, fall in the curve of the hinge-line, as though uniting the lateral teeth. The shell is too thin (being deeply indented within by the concentric waves) to make out the pallial line; but no trace of sinus is visible. It may therefore rank, provisionally, under Kelliadace, although in other respects its affinities appear to be with Edalia and Cooperella. The ligament appears little more than a prolongation of the epidermis. Beside the transverse cardinal teeth, there is in each valve a curved line, slightly raised, like the end of a finger-nail, which bounds what would be the lunule in other shells.

Long. '1, lat. '123, alt. '045.

Hab. Mazatlan; one perfect specimen from Havre Collection (Mus. Hanl.); fragments, Liverpool Collection.

706. ?MONTACUTA OBUSTA, n.sp.

?M. t. planata, valde inaequilaterali, subrhomboidea; subdiaphana seu chalcedonica, haud punctata, laevi; marginibus pleurunque regulariter ecurvatis, dorsali recto, umbonibus haud prominentibus; cardine, utraque in valva, dente uno cardinali et fossa ligamentali; dent lat. altera valva elongatis, rectis, altera vix conspicuis.

Differs from ?M. dionaea in the elongation of the lateral teeth, and in the possession of a distinct cardinal tooth in each valve.

Long. 047, lat. '06, alt. '01.

Hab. Mazatlan; two fresh specimens, Liverpool Collection.

Tablet 2530 contains the larger specimen; the other is transparent.

696. PECTUNCULUS, sp. ind.

Tablet 2531 contains a minute valve, '033 across; outside with close, prominent concentric ridges, foliated by about twenty-five...
rounded ribs, which are evanescent near the umb. Inside with a very few strong teeth, developed in a curved line.

698. Scissurella rimuloides, n. sp.

S. t. rapide augente, albida, tenuissima; apice celato; anfr. iii., radiatim liratis, liris subdistantibus, acutis, obliquis; umbilico magno; labro deslivi, haud fisso, sed apertura postica, ut in "Rimula" formata, subquadrata, elongata; liris transversis gradus testae increscentis definientibus; peritremate continuo, obliquo.

Only one specimen was found of this beautiful little species, the first known from America. It looks like a Velutina crossed by sharp ribs in the direction of the slanting mouth. In the first whorl the ribs are very close. It then assumes its normal sculpture, but there is nearly a whorl before there is any trace of incision. This appears to have begun as a slit, which was afterwards closed up. A band, marked off by ten transverse ribs showing stages of growth, encircles the shell as far as the hole, which is long and somewhat \-etangular; but there is no band between the hole and the outer lip. The shell furnishes a complete transition to Rimula. It is preserved on tablet 2532.

Long. \-023, long. spir. \-003, lat. \-03; div. 140°.

Hab. Mazatlan; off Spondylus calcifer; Liverpool Collection.

699. Vitrinella ornata, n. sp.

V. t. subdiscoidea, diaphana, tenuissima; anfr. iv., quorum iii. primi nucleosi, insculpti; ultimo carina maxima circa peripheriam; postice subangulata, rugis radiantis et striolis spiralibus ornata; antice carinata, carina nodosa; basi carina altera et rugis radiantis ornata; umbilico angulato, satis magno; labro a carina indentato.

Long. \-015, lat. \-028--035; div. (cerc.) 175°.

Hab. Mazatlan; one specimen off Spondylus, on tablet 2533; Liverpool Collection.

700. Vitrinella tenuisculpta, n. sp.

V. t. planata, diaphana, tenuissima; anfr. iii. et dimidio, quorum iii. nucleosi; striis elevatis, spiralibus, quorum una magna, quasi carina prope suturam sculpta; peripheria haud angulata; basi bis angulata, interdum rugis radiantis distantibus ornata; umbilico satis magno, carinato; apertura undata, subquadrata.

The sculpture is not uniform over the last whorl. The principal diagnostic features are the biangulated base, the infrasutural keel, and the rounded periphery.

Long. \-016, long. spir. 0, lat. \-023--03; div. 180°.

Hab. Mazatlan; one specimen off Spondylus, on tablet 2534; Liverpool Collection.

258
701. ? Vitrinella, sp. ind.

Tablet 2535 contains a fragment, 0.085 across, of what was probably a gigantic species of this genus or of Cyclotrema, strongly keeled.

492. Diala paupercula, C. B. Ad.

= Cingula paupercula, C. B. Ad. Pan. Shells, no. :

mutata.

=? Odostomia mamillata, Maz. Cat. no. 492: diagnosi aueta.

D. t. nitida, solida; vert. nucl. anfr. tenuiter decussato; t. adulta decollata, vertice mamillato; anfr. norm. iv.; peritremate continuo; basi obtuse angulata, lacuna umbilicalia a labio separato formata.

Long. 0.085, long. spire 0.055, lat. 0.05; div. 34°.

The fortunate discovery of a perfect young specimen and some adult shells in the shell-washings of Professor Adams's collection enables us to explain the anomalies described in the Mazatlan Catalogue, where the solitary dead shell was referred, with doubt, to Odostomia, in consequence of its truncated apex. It was not possible to recognize in it Professor Adams's "Cingula," since that was described as having the apex "subacute," and the angular base and continuous peritreme were not mentioned. The nuclear whorls are sculptured as in Alaba supralirata; but the vertex, instead of being persistent as in that genus, appears to be always decollated in the adult. The shell has the peculiar glossy texture of Diala.

702. Mangelia sulcata, n. sp.

M. t. subturrita, albida, apice obtuso; anfr. vii., tumidioribus, liris vii., obtusis, rectis, vix angulatis; sulcis spiralibus creber-rimis, circa basim continuis; labro? . . . [fraclo].

Long. 2; long. sp. 0.12, lat. 0.07; div. 35°.

Hab. Mazatlan; one specimen off Spondylus, on tablet 2538; Liverpool Collection.

703. ? Torinia, sp. in.

Tablet 2539 contains a small shell, 0.035 across, consisting of 3 1/4 smooth, flattened, sinistral whorls; with a distinct suture, but not umbilicated. In a larger specimen (unfortunately lost), under the microscope this sinistral vertex appeared turned completely upside down, with more than half a whorl of an orbicular shell, white, sculptured like Vitrinella, with a very strong peripherical keel, and other smaller keels, decussated by radiating ruge. This mode of growth is exactly as in the young Torinia; but the adult must have been very distinct from any known species, and perhaps did not belong to any described genus.

550. Mucronalia involuta, n. sp.

M. t. parva, tenui, albida, irregulares, marginibus spireae valde excervatis; vertice declivi; anfr. norm. vi. + . . . satis excrv-
vatis, suturis valde impressis; basi prolongata, obtusa; apertura ovali, postice angusta; labro acuto; labio tenuissimo.

Long. '105, long. spir. '068, lat. '033; div. 20°.

=Leiostraca ?recta, Maz. Cat. in loco: non C. B. Ad.

551. Leiostraca producta, n. sp.

L. t. parva, albida, subfusciformi, marginibus spirae rectis; vertice acutiore, recto; anfr. norm. ix., planatis, suturis vix conspicuis; periphera satis rotundata; basi rapide angustata, postea producta; apertura subrhomboidea, axi antice acuta, angulata; labro acuto; labio tenui.

Long. '123, long. spir. '08, lat. '046; div. 23°.

=Leiostraca ?solitaria, Maz. Cat., in loco: non C. B. Ad.

This species is easily recognized by its very peculiar sharply-pointed beak; in shape like a young Rostellaria, without the canal.

652. Anachis tæniata, Phil.

Columbella tæniata, Phil. in Zeit. 2. Mal. 1846, no. 26 (non Ad. & Rve. in Voy. Samaran).

=Anachis Gaskoin, Cpr. in Maz. Cat. p. 510, no. 652.

Variat lineis spiralis fusci viii., quorum iii. in spira monstrantur; maculis alternatis inter secundam et tertiam sitis.

Variat quoque maculis evanescentibus.

Hab. Callao (teste Gaskoin); Mazatlan (E. B. Philipippi, Reigen); Cape St. Lucas (Xantus).

It appears that Mr. Gaskoin was not acquainted with Philipippi's species, which had not then reached the Cumingian Collection; as he pronounced M. Reigen's specimen to be new, and suggested the specific name in the Mazatlan Catalogue. It would have avoided a double synonymy, could the name tæniata have been retained for the Samarang shell, and Mr. Gaskoin's for this. The Cape St. Lucas shells vary as above indicated.

650. ?Anachis serrata, Cpr.

Maz. Cat. no. 650, p. 509. Perfect specimens of this singular species having been found at Cape St. Lucas by Mr. Xantus, the diagnosis may be thus completed:—

Épidermide fimbrata, lirulas spirales eleganter decussante; labridenticulis variantis, interdum subobsoletis.

Long. '28, long. spir. 15. lat. '13; div. 40°.

With the sculpture and general aspect of a small Cantharus, it has the mouth of an Anachis. The operculum, and therefore the generic relations, are not yet known*.

* The following additions and corrections may be useful to the students of the British Museum Catalogue:—

Species 181. Arca multicoastata further differs from A. grandis in the epidermis being soft and very finely hairy.
OF MOLLUSKS FROM MAZATLAN. 274

223. The length should be 1'1.
319. For "labio nudo" read "tenuissimo"
320. The nuclear shell has two whorls, Ampullaria-shaped.
327. Add to diagnosis, "operculo concavo, linea elevata suturam definitae."
328. Add to diagnosis, "operculo vix concavo, suturis minus definitis."
323. Add to diagnosis, "operculo concavo, suturis distinctis, peripherian versus linea elevata instructis." The species was found living among the small Olivellae.
326. Add to diagnosis, "operculo concavo, suturis vix definitis." Living among Olivellae.
501. Instead of the specimen from which the description in the text was written, tablet 1966 contains a much finer shell, since found, which allows of the following additions to the diagnosis:—"vert nuc. parvo, satis extante, dech viter sito; anfr. norm. v.; interstitii carinarum transversim rugulosis; labr solidiore. Long. 057, long. spir. 037, lat. 038."
510. A very beautiful shell, found in the refuse of Professor Adams's Panam collection, is probably of this species, though the sutural cancellations are close. It has one more whorl, vortex Chemnitzoid, of three Helicoid whorls, scarcel, projecting; apex hidden.
650. From perfect Cape St. Lucas specimens, add the following to diagnosis—"epidermide fimbriata, lirulas spirales elegant decussante."
Page 312. Add to the diagnoses of opercula of Vermetidae:—"(h.) Operculum corneum, intus convexum, nitidum, umbone magno extante estus concavum, paucispirale, lamina extante suturas definitae. Diam. 045."
Tablet 2537 contains the only specimen found, resembling Siphonium, from the Spondylus-washings.
Tablet 447 is Liocardium apicinum, which should stand as species 700.
Page 314, note * (et seq.), for "Inflatulum" read "Mioceras."
Page 350, line 18, for "regular" read "irregular."
DESCRIPTIONS

OF

NEW SPECIES AND VARIETIES OF CHITONIDÆ AND ACMAEIDÆ,

FROM

THE PANAMA COLLECTION OF THE LATE PROF. C. B. ADAMS.

BY

PHILIP P. CARPENTER, B.A., PH. D.

From the Proceedings of the Zoological Society of London, pp. 274–277,
March 14, 1865.

( 263 )
DESCRIPTION

NEW SPECIES AND VARIETIES OF CONIFEROUS TREES.

By

[Signature]

Printed for the Late James Muir, A.D. 1839

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DESCRIPTIONS OF NEW SPECIES AND VARIETIES OF CHITONIDÆ AND ACMÆIDÆ, FROM THE PANAMA COLLECTION OF THE LATE PROF. C. B. ADAMS. BY PHILIP P. CARPENTER, B.A., PH.D.

LEPIDOPLEURUS ADAMSII.

L. t. "L. dispari" similis; pallide rufo-fusca, colore intensiore irregulariter strigata seu maculata; sapius maculis albidis regione diagonalis ornata; jugo vix acuto; areis centralibus et valvis terminalibus conspicue granulosis; areis lateralibus irregulariter verrucosis, verrucis plerumque lobatis; mucrone antico, vix conspicuo: intus, valvis centralibus uni-, terminalibus viii.—x.—fissis; subgrundis parvis, dentibus acutis; suturis medianis postice rectis, antice laminas haud attingentibus, sinu planato, latissimo: limbo pallii imbricatim squamoso.

Long. 6, lat. 3 poll.; div. 110°.

Variet verrucis minus expressis, simplicioribus.

=Chiton dispar, C. B. Ad. no. 373, par.


Unfortunately for those who do not like to remove the non-testaceous portion from their Chitons, as they do from their other shells, the mantle-margin by no means affords a safe clue to the structure of the valves. Among the species of the genus Ischnochiton, Gray,
DR. P. P. CARPENTER ON NEW SPECIES

(=Lepidopleurus, Add.,) known by the sharp incisor-teeth lying within a projecting lip, there are three types of mantle-margin, which may be conveniently separated as subgenera, to aid in the difficult task of describing and identifying species. The typical forms, for which the name Ischnochiton should be retained, have the scales somewhat chaffy, and very finely striated. I. magdalensis and I. sanguineus well represent the group. But another series have the mantle-scales imbricate and strong, as in Chiton, Gray, (=Lophrurus, Add.,) from which they cannot be distinguished without dissection. For this Messrs. Adams's name Lepidopleurus may be retained in a restricted sense. It is uncertain what Risso's original genus was meant to include: his diagnosis applies to all Chitons with distinct side-areas and scaly margins.

A third group, separated by Dr. Gray in his 'Guide,' p. 182, as having the "mantle-scales minute, granular," has been named Trachydermon: it abounds in the Californian region.

The specimens of L. adamsii were found among the duplicates named Chiton dispar by the Professor; one was attached to Discina cumingii.

**Lepidopleurus tenuisculptus.**

L. t. "L. adamsii" similii; olicatea, colore pallido seu intensor minute variegata; tota superficie minute granulosa; areas lateralibus vic definitis; suturis plerumque albido maculatis; mucrone antico, satia conspicuo, parte postica concava: intus, ut in "L. adamsii" formata.

Variet: t. pallidore, ad jugum rufo-tincta.

=Chiton dispar, C. B. Ad. no. 373, pars.

The outside of this shell so much resembles the young of Chito: (Lophrurus) stokesii, that specimens may have been distributed under that name. Very few individuals were found.

**Ischnochiton eelenensis** (diagn. auct.).

Extus areis centralibus clathris parallelis circ. xx. decussatis, ar. lat. costis ii., validioribus, tumidis, tuberculosis: intus marginibus suturalibus posticis reflexis, tuberculatis, simu ad jugum parvo; laminis insertionis unifissis, ad laminas suturales anticos junctis, simu latissimo. Valea antica extus costis xii., haud validis; intus fissuris x., dentibus acutis, subgrunda parva. Valea postica mucrone subpostico, depresso; parte postica expansa, concava, costis circ. xi. subobsoletis; intus lamina insertionis circ. ix.-fissa, dentibus curtis, subgrunda parva, intus callosa.

The central valves in this species are normal; but the posterior valve offers a transition towards Callochiton, the outside being concave posteriorly, the insertion-teeth short and the eaves callous.

**Ischnochiton (? var.) expressus.**

I. t. "L. eeleneni" similii, sed carneae; areis centr. clathris x.,
With a strong general resemblance to *I. elenensis*, the differences in detail in the only two specimens examined, as above stated, appear of specific importance. If only varietal, it is equally important to notice how much change is tolerated by the habits of the animal. It may be the shell called *Chiton elathratus* by Prof. Adams, of which there were no duplicates to compare. It offers a still more marked transition to *Callochiton*, the margin of the posterior valve being somewhat pectinated by the great projection of the ribs.

"**Callochiton**" **pulchellus**: diagn. auct.

Extus areis centr. lineis interdum parallelis, interdum radiantibus, rufose scrobiculatis; ar. lat. costis ii., validissimis, imbricato-nodosis: valva antica costis similibus circ. ix.: v. post. area centrali lata; mucrone subpostico, planato; parte postica costis vii. similibus, medianis curtissimis, excurvatis: pallio squamulis minutis imbricatis. Intus v. ant. subgrunda (ut in *Ischnochitone*) munita, sed a costis pectinata; dentibus acutis, intus linea undulata secundum costas instructa, extus concavis, parte convexu costarum incisis: v. medianis similiter pectinatis, laminis secundum costas diag. uniscissis: laminis sutralibus medio continuis, late sinuatis; suturis posticis a sculptra externa granulatis: v. post. vii.-lobata, marginibus planatis, laminis dense compressis incrassatias; dentibus obtusissimis, appressis, haud extantibus, subobsolletis, extrorsum planatis, ut in v. ant. fissis; interdum fissuris quoque in partibus concavis.

As I have seen no published diagnosis of the very peculiar type of insertion-plates observed in this species, which has hitherto been too rare to allow working naturalists an opportunity of dissection, I have given a minute description. The plates of insertion, as well as the exterior eaves, are scalloped by the strong ribs, and alternate with them. In the posterior valve the eaves are flattened outwards, in closely appressed layers, the blunt, ill-developed insertion-teeth lying flat upon them. The valves easily separate from the mantle, when immersed in water. Outside, the species is easily recognized by the two strong ribs of the diagonal areas, the central pitted in somewhat branching rows, and the ribs on the curiously flattened posterior valve resembling a clenched fist.

**Acmaea** (? *flocata*, var.) **filosa**.

A. t. "A. mesoleucae" forma et indole simili; sed sculptra multo

267
DR. P. P. CARPENTER ON CHITONIDÆ AND ACMEIDÆ.

tenuiore; t. jun. levi; dein lirulis delicatulis, acutis, hauñ;
granulosis, valde distantibus, interdum obsoletis, filosa; inter;
stiitiis latis, levibus; tenui, planata, ovali, subdiaphana; nigro-
fuscó, corneo radiatim strigata, seu varie maculata: intus;
livida seu albida, coloribus externis transeuntibus; limbo lato,
acuto.

Long. 7, lat. 56, alt. 12.
Hab. Panama (C. B. Adams).

There is no described west-tropical species to which these;
shells can be affiliated, unless they prove to be a very delica;
te variety of A. floccata, Rve. Unfortunately the Panama li;
ments have never been collected in sufficient numbers to make;
out their specific limits satisfactorily. The names here given;
may stand as species or varieties, according to future eluci;
dation. In shape and texture, but not in colour or sculptu;
re, these shells resemble A. fascicularis; in the latter respe;
ts, A. strigatella. They were named " tenera, Ad." by Dr. Do;
hn, but are sufficiently distinct from that West-Indian spec;
ies.

ACMEA (? floccata, var.) SUBROTUNDATA.

A. t. "A. var. filosæ" simili, sed subrotundata, magis elevata;
vertece subcentrali; colore intensiore, lineis corneis crebrioribus;
angustis; t. jun. sepe pallidiore, radiis duobus postice trian-
gulata: intus callo livido, tenuiore.

Long. 53, lat. 45, alt. 15.
=Lottia, sp. ind. a, C. B. Ad. Pan. Shells. no. 368.
Hab. Panama (C. B. Adams).

ACMEA (? var.) VERNICOSA.

A. t. parva, subrotundata, depresso-conica, apice ad duas quinta;
partes sito; albidó-viridi, strigos paucis rufo-fuscis hic et illic;
orната, sapius radiis duobus candidis, postice triangulata; extus;
lineis acutis radiantibus, valde distantibus, sepe obsoletis;
vis sculpta: intus livida, callosa, sapius spathula candida orna;
ta; basi subplanata, limbo angusto.

Long. 3, lat. 24, alt. 1.
Hab. Panama (Jewett, C. B. Adams).

Had this form been brought from the China Seas, it might have;
been taken for the young of A. biradiata, Rve. From its solidi;
ity, however, its rough exterior, and its callous interior, it appears;
to be adult. It is barely possible that it may develope into A.
vesper-tina. It differs from the young of A. subrotundata in being much;
thicker and less spotted with the green tint.
I.

DIAGNOSES

OF

NEW SPECIES OF MOLLUSKS,

FROM

THE WEST TROPICAL REGION OF NORTH AMERICA,

PRINCIPALLY COLLECTED BY THE REV. J. ROWELL, OF SAN FRANCISCO

BY

PHILIP P. CARPENTER, B.A., Ph.D.


(269)
NEW SPECIES OF WUTZER'S
Diagnoses of new species of mollusks, from the West Tropical Region of North America, principally collected by the Rev. J. Rowell, of San Francisco. By Philip P. Carpenter, B.A., Ph.D.

Of the new species quoted in the "Supplementary Report on the present state of our knowledge of the Mollusca of the west coast of North America," published in the Transactions of the British Association, 1863, pp. 517-686, the principal portion (namely, those dredged by Dr. J. G. Cooper, Zoologist to the Californian State Geological Survey) are described in the 'Proceedings of the California Academy of Sciences,' for 1864-65; those dredged in Puget Sound, during the U.S. North Pacific Boundary Survey, by the late Dr. Kennerley, are described in the 'Journal of the Philadelphia Academy of Natural Science,' for the present year. The species obtained by the naturalists of the British Survey are described in three papers by Dr. Baird and myself, P. Z. S. 1863-65. The new species sent by Mr. J. Xantus from Cape St. Lucas, and by Mr. J. G. Swan from Neah Bay, appear in the 'Ann. and Mag. Nat. Hist.,' 1864-65. In the same Journal are described the new species which I found in Col. Jewett's collection. Those sent to Dr. Gould from the same collection had been previously analyzed in the 'Proc. Zool. Soc.' 1856. The above are the principal sources of fresh knowledge; but a number of species from the Californian province, which do not range under any of these heads, will be found in the 'Journal de Conchyliologie' for the current year.

In separate papers communicated to the Zoological Society are the diagnoses of additional species from Prof. Adams's Panama and from Mr. Reigen's Mazatlan collections. The remaining species, from the tropical province, are embodied in the present paper. The types (unless otherwise stated) are in the Museum of the Smithsonian Institution.

(Tellina) Angulus decumbens.

A. tenui, subplanata, alba seu rosacea; lavi, striolis incrementi insculpta; epidermide pallide straminea induta; antice et ventraliter valde producta; postice truncata, angulata; umbonibus acutioribus, vix prominentibus; marginibus dorsalis postico recto, antico ad angulum parum excrurato, antico et ventrali valde et regulariter excurvatis; parte postica v. dextr. subito angulata, v. sinistr. parum sinuata; nymphis angustis, elongatis, cartilagine omnino externo: dent. card. m* minimis; dent. lat. v. dextr. antico satis conspicuo, postico obsoleto; v. sinistr. nullis; cicatr. adduct. posticus subrhomboideis, anticis valde elongatis, angustis; sinu pallii maximo, subtrian- angulari, usque ad cicatricem alteram utraque valva porrecta. Long. 1-7, lat. 1-2, alt. *68 poll.

Hab. Panama (teste Rowell, Pease).

This shell was affiliated by Mr. Hanley to the W. African T.
nymphaeis, but differs in the internal scars. Externally it resem-
T. dombeyi, Lam. (= Scrobicularia producta, Cpr. P. Z. S. 1835,
p. 230), but is easily recognized by the strictly Tellinoid ligament
and anterior lateral tooth, by the posterior portion being pinned
instead of waved, and by the junction of the pallial sinus with the
opposite scar. By the same characters it is distinguished from T.
terza, Gld., which closely resembles S. dombeyi, var., in Mus. Cum.
Like many other Tellens, it has a white and a pink variety. The
name was printed by an oversight in Brit. Assoc. Rep. 1863, p. 669,
as A. amplexans; but as it was unaccompanied by a diagnosis, and
does not describe the shell, no confusion will arise from reverting
to the name first given.

Lucina undata.

L. t. convexa, tenuiore, albida; tota superficie lirulis concentricis
crassissimis, compressa, haud acutis ornata, interstitiis minimis;
parte ventrali costis radiantibus iii., obtusis, latis, vali-
dissimis, interstitiis parvis; lunula maxima, a sulco bene defini-
ta, sub umbonibus incurvatis fossa alta minuta indentata; parte
postica alata; margine a costis valde undato, minute
crenulato; ligamento quasi interno: intus dent. card. parvis,
a fossa lunulari intortis; lat. curitis, obtusis; cicatr. adhuc
tantica irregulares, postica subovali; linea palliari prope mar-
ginem sita, undata.
Long. •45, lat. •44, alt. •3.
Hab. Gulf of California (teste Rowell).
The outline somewhat resembles Cryptodon; but the aspect
is more that of Verticordia, while the minute subbursal pit
is suggestive of Opis. The shell is sexpartite; the portion between
the anterior rib and the lunule resembles a fourth rib, while the
projecting lunule and the posterior wing are quite distinct from the
body of the shell. The specimen sent by Mr. Rowell to the Smith-
sonian Institution was completely smashed. The diagnosis is written
from a perfect shell sent by Dr. Newcomb to Mr. Cuming.

Calliostoma (? Lima, var.) æquisculpta.

C. t. "C. limae" simili; sed anfr. planatis, suturis haud dis-
tinctis; sculptura regulari; jun. monilibus spiralibus inter se
æqualibus; t. adulta majore et minore alternantibus; co'ore
rufescente, granulis interdum rufo-fusco maculatis.
Hab. Acapulco (Newberry).

Dr. Newberry's specimens agree in most essential respects with
"Trochus limae, Phil.,” in C. B. Ad. Pan. Shells, no. 276, which
appears identical with the shells marked “Ziziphus antonii, Koch,
N. Zealand,” in Mus. Cuming. The Acapulcan shells are quite
flat, while those from Panama are for the most part shouldered as
However, there is no little variation among the Professor's speci-
mens of C. lima, and some are so slightly shouldered that the Aca-
pulcan form may be a local variety.
Narica insculpta.

N. t. "N. aperta" similis, sed magis compacta; paullum angustiorem, umbilico tampe majore; lineis spiralibus circ. xxvi. distantiibus insculptis cineta, quorum x. in anfr. penult. monstratur; postice lineis incrementi vix conspicuis.

Long. '3, long. spir. '08, lat. '28; div. 100°.

Hab. Acapulco, on Ostrea iridescens, Rowell.

The Cape St. Lucas species (vide Ann. Nat. Hist. 1864, xiii. p. 476) has the sculpture in irregularly raised lirulae, while this has minute grooves chiselled out of a smooth surface. It appears that the San Franciscans import the huge tropical oysters in large quantities, their own species having the coppery flavour which Americans dislike in the British species. From the outside of the valves, Mr. Rowell obtained this and many other interesting species.

Drillia eburnea.

D. t. turrita, carneo-albida, tenuiore, levi, maxime nitente; marginibus spira rectis; anfr. nucl.? . . [decollatis]; norm. circ. ix., postice planatis, supra suturas appressis, medio satis excurratis; hic et illic rugis radiantis, obsoletis, irregularibus exsculptis; basi prolongata, canali conspicio, apertis; sinu postico minore, in sulco lato, haud definito, spiram ascendente sito; labro acuto; labio indistincto; columella planata.

Long. 1-3, long. spir. '8, lat. '45; div. 30°.

Hab. Near Gulf of California (teste Rowell).

 Easily recognized by its smooth glossy aspect and French-white colour; the notch lying along a broad spiral channel, which throws the junction of the whorl as it were up the suture.

Mangelia albolaqueata.

M. t. solida, turrita, alba, rudi, marginibus spira rectis; anfr. nucl.? . . [decollatis]; norm. circ. ix. subrotundatis, costis circ. xi.–xv., declivibus, satis anguatis, postice obsoletis, lineis subregularibus spira ascendentiibus; lirulis spiralibus anticis crebris, postice obsoletis; basi elongata; labro? . . .; labio ralloso; sinu postico majore, suturam attingente.

Long. '88, long. spir. '55, lat. '34; div. 30°.

Hab. Panama (teste Rowell).

 Described from an imperfect and worn specimen, but easily recognized by its ivory-white colour, and ribs in slanting rows, as though the creature were roofed with white tiles. It was erroneously quoted in the Brit. Assoc. Rep. 1863, p. 669, as a Drillia.

Eulima falcata.

E. t. valde tereti, valde curvata, alba, politissima, solidiore, marginibus spira meniscoideis; anfr. nucl.? . . [detritis]; norm. circ. x., planatis, lente augmentibus; axi hamata; suturis indistinctis; basi elongata, haud tereti; apertura pyriformi, antice latiore; labro acuto; labio tenui, appresso.
Long. 31, long. spir. 21, lat. 09; div. 12°.
Hab. Acapulco, on Ostrea iridescens, Rowell.
The spire-outlines are scythe-shaped. It is much larger and more solid than _L. distorta_ and (?var.) _yod_.

**Cerithiopsis intercalaris.**

_C. t. valde elongata, rufo-fusca, marginibus spirae rectis, suturi impressis; anfr. nucl. iii. + (? decollatis), radiatim distanter liratis; norm. x., planatis; costis radiantisibus primum xii., dein circ. xxii., angustis, haud extantibus, ad peripherian continued, interstitiis quadratis; carinis spiralis primum ii. nodulosis, dein alteris ii. minoribus inter eas intercalantibus; carina postica suturalis haud nodulosa, secunda valde nodulosa, tertia intercalante equeante sed haud nodosa, quarta antica valde nodosa, quinta circa peripheriam, prima et tertia similis, haud nodosa, alteraque contigua, minima, inter quas sutura gyrat; basi concava, lævi; columella valde contorta; canali brevi, aperto; labro? . . . *

_Hab._ Guacomayo.

This beautiful species comes nearest to _C. bimarginata_, C. B. Ad., of which, indeed, the type does not agree with the diagnosis so well as does this specimen. It differs in having other spiral ribs intercalating between the two principal ones, and in the radiating sculpture being continued to the periphery. One specimen only was found in the shell-washings, not perfect at the mouth.

**Columbella humerosa.**

_C. t. parva, turrita, alba, linea seu maculorum serie fusca interdum spiram ascendente; marginibus spirae parum excurvatis; anfr. nucl.? . . [detritis]; norm. vi., convexis, postice tumentibus, suturis valde impressis; costis radiantisibus vii.–viii., distantiibus, validissimis, rotundatis; interstitiis late undatis; lirulis validis spiralis extantibus, interstitiis eas aequantibus, costas et narum interstitia transeuntibus; basi angusta; labro rix varicoso, postice emarginato, intus solidiore, dentibus circ. iv. munitis; apertura late undata, compacta.

Long. 26, long. spir. 15, lat. 13; div. 38°.
_Hab._ Acapulco, on Ostrea iridescens, Rowell.

The sculpture resembles that of _Rhizocheilus_, and the tall spire that of _Anachis_; yet it appears to belong to the restricted typical genus.

**Muricidea dubia, var. squamulata.**

_Variat i. omnino albida; sculptura tenuiore; spira elevata; tota superficie minute squamulata, squamulis imbricatis._

_Hab._ Cape St. Lucas (Xantus).

The opercula in the beautiful specimens sent by Mr. Pease are

* I forgot to measure the specimen before returning it to the Smithsonian Inst.; but it is about the size of _C. assimilata._
typically Muricoid. The essential features are those of *M. dubia*; the pale colour and delicate sculpture and imbrication may arise from a deep-water station, as is seen in similar European shells. Mr. Cuming, however, regards it as distinct.

275
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DIAGNOSES

OF

NEW FORMS OF MOLLUSCA,

FROM

THE WEST COAST OF NORTH AMERICA,

FIRST COLLECTED BY COL. E. JEWETT.

BY

PHILIP P. CARPENTER, B.A., PH. D.

From the Annals and Magazine of Natural History. Third Series, Vol. XV., pp. 177-182 (Nos. 373-386), March, 1865. Ibid., pp. 394-399 (*Mangelia variegata* to end), May, 1865.

(277)
DIAGNOSIS

OF

THE WEST COAST OF NORTH AMERICA

FIRST DISCOVERED BY CAPT. JAMES COOK

BY

PHILLIP T. COOKSBERY, M.D.

(576)
DIAGNOSES

OF

NEW FORMS OF MOLLUSCA

FROM

THE WEST COAST OF NORTH AMERICA,

FIRST COLLECTED BY COL. E. JEWETT.

BY

PHILIP P. CARPENTER, B.A., Ph.D.

An account of Col. Jewett's shells will be found in the British Association Reports for 1856 (pp. 226-231) and 1863 (pp. 534-539). The exact localities are often uncertain; but many of them have been fixed by subsequent explorers. Being generally worn beach-specimens, the diagnoses have been written (wherever practicable) from perfect shells, and especially from the beautiful series dredged by Dr. J. G. Cooper, in the Californian State Survey. The types belong to Mrs. Boyce, of Utica, N.Y., and are at present in my keeping. The numbers, in the species from the temperate fauna, refer to the table in the British Association Report for 1863, pp. 636-664.

37 b. Solen (?sicarius, var.) rosaceus.

S. testa S. sicario simili, sed minore; multo angustiore, elongate, recta, extus et intus rosacea; epidermide tenui, valde nitente. Long. ·27, lat. ·5, alt. ·32 poll.

Hab. Sta. Barbara (Jewett); S. Pedro (Cooper).

74. Subgenus Amiantis*.

Callista: dente postico utraque valva ruguloso.
Type: Amiantis callosa, = Cytherea callosa, Conr., = Dosinia

* Th. ἀμιατρος, ὁ κατ θ, unpolluted.
Dr. P. P. Carpenter on new Forms of Mollusca


Hab. Sta. Barbara (Nuttall, Jewett) ; S. Pedro (Cooper) ; Cape St. Lucas (Xantus).

This section differs from the typical Calliste as does Mercenaria from Venus. Whether the other peculiarities of the species (redescribed by Reeve as Cytherea nobilis) are coordinate, cannot yet be stated, as it stands alone. In sculpture and colour it resembles Dosinia; in its ponderous growth, Pachydesma.

110. Lazaria subquadrata.

L. testa extus Cardita variegata jun. simili; pallida, castaneo tineta; subquadrata, antice truncata, subregulariter ventricosa, dorsaliter tumida; costis radiantisibus circ. xiv.—xvi., tumidis. nodosis, diagonalibus majoribus; interstitiis plus minusve insculptis: intus, valva dextra dente cardinali triangulari, inter duas fossas sito, haud elongato; dent. lat. a cardine separatis, ant. extante, post. obsolete, calloso: v. sinistrali dent. card. ii. angustis, subequalibus, radiantisibus, lat. ant. et post. extantibus: cicatr. adduct. subrotundatis. Long. 37, lat. 23, alt. 34.

Hab. Sta. Barbara (Jewett); Monterey, and along the coast to S. Pedro (State Coll. no. 403) (Cooper).

The outside of this remarkable little species is typically Carditoid; the hinge is intermediate between Lazaria and Cypriocardia.

132. Modiola fornicata.

M. testa curta, laevi, latiore, maxime fornicata; pallide carneae, epidermide rufo-fusca, rugis incrementi et incrustatione densissime pilosa induta; umbonibus maximis, spiralibus, antice torsiis, per tres quadrantes totae latitudinis devectis: area ligamentalis curvata; arcuata; margine dorsali antice nullo, postice longo, arcuato; margine ventrali recto, vix propter byssum hiante; postico lato, antico angusto; altitudine dorsaliter valde elevata, ventraliter plane declivi, cuneiformi; umbonibus trans marginem anticam per sextam totius longitudinis excurrentibus: intus, sub umbonibus excavata; cicatr. adduct. ant. ventraliter sita. Long. 14, lat. 76, alt. 95.

Hab. Sta. Barbara (Jewett); Monterey (Taylor).

160. Pecten (? var.) aquisulcatus.

P. testa P. ventricoso simili, sed tenuiore, minus ventricosa; costis piuribus angustioribus xx.—xxi.; interstitiis (praecipue valva superiore) fere equalibus; auriculis magis productis, acutis; sinus serrato: testa jun. interstitiis alte insculptis, laminis concentricis.
from the West Coast of North America.

crebris, vix extantibus, interstitia, costas auriculasque transeuntibus. Long. 3° 2', lat. 3° 33', alt. 1° 3'.

Hab. Sta. Barbara (Jewett); S. Diego (Cassidy, Newberry, Cooper).

Intermediate between the tropical P. ventricosus and the Atlantic P. iradians.

161. Pecten paucicostatus.

P. testa subconvexa, vix æquilaterali; castaneo seu rubido seu electrica; valva dextra convexa; costis xi.-xv., validis, angustis, rotundatis; interstitialis multo laetioribus, subplanatis; tota superficie minutissime concentrice striata; auriculis latis, haud æqualibus, lirulis circ. vi. ornatis; sinus paucidentato: intus pallidiore, linea cardiaci costata, ad suturas auricularem tuberculosa; fossa ligamentali curta, transversim lata. Long. 1° 7', lat. 1° 84', alt. 56'.

Hab. Sta. Barbara (Jewett); Sta. Barbara Island (Cooper).

Pecten (? var.) squarrosus. (Page 536.)

P. testa orbiculari, æquilaterali, rubida, albido maculata; valva dextra convexa; costis xviii., æqualibus, testa jun. approximatis, testa adulta interstitiali æqualibus; costis et interstitiali regulariter undatis; striis crebris squamosis radiantis ubique ornatis; auriculis magnis, latissimis, subæqualibus; antica anguste fissata, serrata, postica sinuata; auriculis ambabus et regione contigua sebrose striatis: intus alba, linea cardiaci alte sulcata. Long. 1° 82', lat. 1° 79', alt. 9'.


Resembles a shell in Mus. Cuming., marked "exasperatus, var.," but does not agree with the diagnosis of that species. All Col. Jewett's valves were dextral. The locality needs confirmation.

183. Volvula cylindrica.

V. testa cylindracea, alba, nitente, striis spiralibus distantibus cineta; medio planato, marginibus fere parallelis; antice satis effusa, postice subito angustata; canali brevissimo; labro acuto; labio indistincto; plica columnaria parva, valde declivi. Long. 17', lat. 07'.

Hab. Sta. Barbara (Jewett).

265. Phasianella (? compta, var.) punctulata.

P. testa P. compta simili, sed elatiore; suturis impressis; anfractibus tumentibus; omnino minutissime fusco punctata; columella lancrata. Long. 24', long. spir. 12', lat. 14', div. 50°.

Hab. S. Diego (Jewett).
265 b. Phasianella (? compta, var.) pulloides.

P. testa P. pullo simillima; solida, compacta, spira breviore; suturis distinctis. Long. 2, long. spir. 1, lat. 13, div. 55°.

Hab. Sta. Barbara (Jewett); Monterey, 20 fathoms (State Coll. no. 353). Smaller var., 8–10 fathoms, Catalina Island (Cooper).

265 c. Phasianella (? compta, var.) elatior.

P. testa perparva; spira elongata, ut in P. pullo picta; anfractibus subplanatis; suturis haud impressis; columnella haud lacunata. Long. 19, long. spir. 12, lat. 11, div. 40°.

Hab. Sta. Barbara (Jewett).

P. compta, with a large proportion of the small shells of the genus, is included under P. pullus in Mr. Reeve’s monograph. In so difficult a tribe, it is judged better to name the distinct forms, and those from separated localities, until more is known.

276. Trochiscus convexus.

T. testa parva, subelevata, purpureo-fusca, tenuiter sculpta; anfr. nucl. ? sinistralibus, vertice quasi decollato; norm. iv., convexis, suturis impressis; obtusissime bicornatis, striolis confluentissimis, minutis, subobsoletis cinetis; umbilicu majore, costis duabus cinetis, quarnum interior acuta, exterior rotundata, crenata; apertura circulare. Long. 15, long. spir. 06, lat. 15, div. 90°.

Hab. Monterey (Jewett).

The nuclear whorls in this unique little shell and in the typical species appear sinistral, as in Phoridse and Solariaedse. The operculum also resembles that of Solarium rather than of Trochus. The genus may prove to belong to the Proboscidifera, notwithstanding its nacreous texture.

317. Hipponyx tumens.

H. testa normaliter fornicata, rotundata, albida; epidermide ruguloso, interstitii pilulosa; vertice nucleoso nautiloideo, lave, parum tumente, apice celato, interdum persistente; dein rapidissime augente, expansa, undique regulariter arcuata; liris acutis, subelevatis, distantibus, spiralis, alis intercalantibus; lineis incipienti minoribus decussantibus; margine acuto; apertura pleurique rotundata; cicatrice musculare a margine parum remota, regione capitis valde interrupta. Long. 7, lat. 46, alt. 33, div. 90°.

Hab. Sta. Barbara (Jewett); S. Pedro (Cooper).

from the West Coast of North America.

329 b. Bittium (? var.) esuriens.

*B.* testa *B. filoso* simili, sed multo minore, graciliore, interdum valde attenuata; sculptura testae jun. ut in *B. filoso*, testae adultae sub obsoleta; interstitiis haud inculpitis. Long. ·3, long. spir. ·21 lat. ·11, div. 25°.

*Hab.* Sta. Barbara (Jewett); Neeah Bay (Swàn); Monterey (Cooper).

334. Bittium fastigiatum.

*B.* testa parva, graciil, pallide rufo-cinerea, marginibus spirae vix excurvatis; anfr. nucl. iii., laevibus, tumidis, spice acuto; norm. ixi., planatis, suturis alte impressis; anfr. primis iii. carinatis, postea costis radiantis circ. xiii., obtusis, satis extantibus, ad suturas interruptis, interstitiis undatis, liris spiralibus iv. in spira se monstrantibus, costas undatim superantibus, quarum antica in testa jun. plerumque extat; anfr. nucl. uno et dimidio, quoad magnitudinem pernagiosis, minutissime et confertissime spiraliter et radiatim striolatis; anfr. norm. iii., laevibus, subplanatis, suturis impressis; basi subangulata; costa peripherica rotundata, haud extante, interdum in spira se monstrante; costa altera circa regionem pseudo-umbilicarem; labro acuto, haud contracto; labro testae adolescentae normali, dein a parieta separata, sinum posticum sururam versus formante, t. adulta valde separata, regionem quasi umbilicarem magnam formante; ad labrum subito fere perpendiculariter, subpostice juncto; operculum tenuissimo. Long. ·25, long. spir. ·19, lat. ·09, div. 20°.

*Hab.* Sta. Barbara (Jewett).

Genus Amphithalamus*.

Testa Rissoidea, nucleo magno; apertura labio producto, labro subpostice juncto, subito in adulta contracto.

355. Amphithalamus inclusus.

*A.* testa minuta, lata, solidiore, pallide rufo-fusca; vertice mamillato; anfr. nucl. uno et dimidio, quoad magnitudinem pernagiosis, minutissime et confertissime spiraliter et radiatim striolatis; anfr. norm. iii., laevibus, subplanatis, suturis impressis; basi subangulata; costa peripherica rotundata, haud extante, interdum in spira se monstrante; costa altera circa regionem pseudo-umbilicarem; labro acuto, haud contracto; labio testae adolescentae normali, dein a parieta separata, sinum posticum sururam versus formante, t. adulta valde separata, regionem quasi umbilicarem magnam formante; ad labrum subito fere perpendiculariter, subpostice juncto; operculum tenuissimo. Long. ·04, long. spir. ·02, lat. ·03, div. 60°.

*Hab.* Sta. Barbara (Jewett); S. Diego (Cooper).

This very remarkable little shell bears the same relation to Rissoa that Stoastoma does to Helicina. The peritreme resembles a figure 6 inverted, as on the face of the type. In the disproportionate size of the nuclear whorls it resembles Vitrinella.

373. Drillia maesta.

*D.* testa acuminata, laevi, dense olivaceo-fusca, epidermide laevi adhærente induta; anfr. nucleosis?... (decollatis); norm. viii., parum

* * * Th. ἀμφι, ἐδαλμος, having a chamber on both sides.

283
Dr. P. P. Carpenter on new Forms of Mollusca

excurvatis, suturis parum distinctis; testa adolescente costis radiantis circ. x., subbossiletis, elongatis, arcuatis, sinum versus interruptis, postice nodosis; anfr. ult. sculptura nulla; aperture elongata; canali brevi, aperto; columella recta; labio tenui; labro acuto, suturam versus sinuato, sinu parvo, expanso; operculo normali. Long. 1'-1, long. spir. 1'-63, lat. 3'-36, div. 27°.

Hab. Sta. Barbara (Jewett); S. Pedro (Cooper).

386. Mitromorpha filosa.

M. testa parva, solidiore, atro-purpurea, subconiformi, antice et pos-
tice subæqualiter tereti; anfr. nucl. ii., albis, laevibus, apice mamillato; norm. iv., planatis, suturis haud distinctis; omnino æqualiter spiraliter lirulata; lirulis acutioribus, in spira iv., anfr. ult. circ. xx., interstititis majoribus; aperture lineata; labro parum inflexo, rotundato, postice vix sinuato, intus circ. xii.-dentato; labio inconspicuo; columella arcuatim truncata. Long. 1'-26, long. spir. 1'-1, lat. 1'-12, div. 45°.

Hab. Sta. Barbara (Jewett); Lower California (teste Trick, in Mus. Cuming).


Mr. A. Adams obtained two similar species from Japan; and as the shells do not rank satisfactorily under any established group, he proposes the above genus for their reception. M. Crosse suggests that Columbella dormitor, Sby., may be congeneric.

Mangelia variegata.

M. testa valde attenuata, tenni, parva, pallide carnea, rufo-fusco normaliter bizonata, interdum unizona; seu zonis interruptis; vertice nucleo conspicio, anfr. uno et dimidio, apice mamillato; anfr. norm. vi., subrotundatis, suturis valde impressis; costis radiantis ix., angustis; costulis spiralibus erebris, validioribus, in spira circ. x., costas superantibus; aperture valde elongata; canali brevi, aperto; labro tenui, juxta suturam conspreue arcuatæ; labio tenui. Long. 3'-1, long. spir. 1'-17, lat. 1'-1 poll., div. 22°.

Variat costis erebrioribus, sculptura minus expressa.

Hhab. Sta. Barbara (Jewett).

Mangelia (? variegata, var.) nitens.

M. testa M. variegatae similis, sed nitentiore, fascia alba et altera rufo-fusca atingente spiram ascendentibus. Long. 2'-25, long. spir. 1'-15, lat. 1'-08, div. 20°.

Hhab. Sta. Barbara (Jewett), rare.

Mangelia angulata.

M. testa parva, rufo-purpurea, vix gracili, epidermide tenui fugaci; anfr. nucl. iii., helicoideis, primum laevibus, dein cancellatis, apice
from the West Coast of North America.

mamillato; anfr. norm. iv., convexis, suturis impressis, in medio spirae obtusangulatis; costis radiantis circ. xii., acutiobibus; costula spirali circa angulum, inter costas subobsoletae; tota superficie tenuiter spiraler crebrisulcata, sulcus sub lente sepius bifidis; aperture pyriformi, canali longiore, recto, aperto; labro acuto, postice conspice sinuato; columella hauad contorta; labro obsoletae. Long. 35, long. spir. 18, lat. 13, div. 30°.

_Hab._ Sta. Barbara (Jewett).

**Myurella simplex.**

_M._ testa rufo-cinerea, minore, minus tereti, epidermide tenui; anfr. xii., planatis; fascia suturali valida, nodosa, tuberculis ovalibus crebrisulcatis; costis radiantis circ. xii., acutiobibus; costula spirali circa angulum, inter costas subobsoletae; tota superficie tenuiter spiraliter crebrisulcata, sulcus sub lente sepius bifidis; aperture pyriformi, canali longiore, recto, aperto; labro acuto, postice conspicue sinuato; columella hauad contorta; labro obsoletae. Long. 1-03, long. spir. 0-76, lat. 0-27, div. 20°.

Variat tuberculis subobsoletis.

_Hab._ Sta. Barbara (Jewett); S. Pedro (Cooper).

**Odostomia inflata.**

_O._ testa majore, tenui, pallide cinerea, epidermide cinerea induta; vert. nucl. subito immerso; anfr. norm. iv., rapidissime augmentibus, subplanatis, suturis impressis; tota superficie minutissime et confertissime spiraler striolata; umbilico nullo; basi et apertura valde elongatissimae; labro acuto; labio tenuissimo; plica acuta, transversa, parietem attingente; columella valde arcuata, antice effusa. Long. 0-26, long. spir. 0-09, lat. 0-14, div. 60°.

Variat spira elatiore. Long. 0-24, long. spir. 0-11, lat. 0-13, div. 45°.

Variat quoque striolis subobsoletis.

_Hab._ Sta. Barbara (Jewett); Farralcone Islands, in cavities, on _Haliotis_ (teste R. D. Darbishire); near San Francisco (Rowell); Neeah Bay (Swan).

**Chemnitzia crebrifilata.**

_C._ testa satis tereti, subalbida, haud regulari; anfr. nucl. ii., helicoideis, decliviter sitis, margines spirae parum excurvatos paulum superantibus; norm. vii., quorum primi subrotundati, ultimi vii planati; suturis valde distinctis; cost. rad. circ. xxiv., subrectis, acutioribus, angustis, interdum attingentibus, anfr. ultimo crebrisulcatis minus expressis, circa basim prolongatam haud subito evanescentibus; lirulis spiralibus, in spira circ. viii., rotundatis, expressis, anfr. ult. supra costas subnodulosis, circa basim crebrisulcatis; peritremate continuo; columella vix torta, haud plicata; labio distincto. Long. 0-22, long. spir. 0-17, lat. 0-07, div. 18°.

_Hab._ Sta. Barbara, 1 specimen (Jewett).
Dr. P. P. Carpenter on new Forms of Mollusca

403 b. Chemnitzia (?torquata, var.) stylina.

C. testa C. torquatae simili, sed valde teretiore, gracillima, interdum subdiaphana; anfr. nucl. ii., decliviter sitis, margines spirae fere parallelos vix superantibus; norm. xii., angustis, subplanatis, suturis distinctis; costis radiantibus circ. xxiii., latis, declivibus, testa junioire continuis, adulta fascia haud sculpta supersurali separatius; interstitiis parvis, haud sculptis; basi rotundata, haud sculpta; columnella parum torta. Long. ’32, long. spir. ’27, lat. ’8, div. 10°.

Hab. Sta. Barbara (Jewett); Monterey (Cooper).

Chemnitzia Virgo.

C. testa parva, alba, gracili, stylina; anfr. nucl. ii., decliviter sitis, margines spirae subparallelos haud superantibus; norm. viii., subrotundatis, suturis distinctis; costulis radiantibus circ. xviii., angustis, acutioribus, sese attingentibus, circa peripheriam haud subito evanidius, interstitiis subequalibus alte spiraliter sulcatis, sulcis circ. viii., latera costarum crenulatibus, costas haud superantibus; basi valide rotundata, curta, haud sculpta; axi lacinato; peritremate vix continuo; columnella recta. Long. ’18, long. spir. ’14, lat. ’05, div. 12°.


Dunkeria laminata.


Hab. Sta. Barbara (Jewett); San Diego (Cooper).

This beautiful Fenelloid species may be regarded as the type of the group Dunkeria.

Eulima Thersites.

E. testa parva, curtissima, albida, arcuata, valde distorta; marginibus spirae dextro subrecto, sinistro valde excurvato; anfr. nucl. ?..(decollatis); norm. vi., laevibus, subplanatis, suturis distinctis; basi valde arcuada; apertura subovali, dextrosum producta; peritremate continuo, valde callosio; labro sinuato. Long. ’21, long. spir. ’13, lat. ’09, div. 40°.

Hab. Sta. Barbara, 1 specimen (Jewett).

Preeminent for aberration among the distorted Eulimidae. A second specimen occurred from an uncertain source.

286
Opalia bullata.

O. testa minore, alba, subdiaphana, turrita, gracili; marginibus spirae subrectis; tota superficie minutissime et creberrime spiraliter striolata; vertice nucleoso declivi, celato; dein anfr. ii., globosis, radiatim haud sculptis; dein v. normalibus, planatis, suturis vix impressis; lirulis radiantis circ. xxvi., haud nisi in anfr. primis expressis, circa basim irregulariter rotundatam ad axim continuis; serie bullularum suturalium anfr. primis e lirulis baud convenientibus, anfr. penult., planatis, super suturas pari eti appressis, interstitiiis haud infossis; basi angulata, costata; apertura subovali, sinistrorsum subplanata; peritremate continue, calloso; labro baud sinuato. Long. '3, long. spir. '21, lat. '09, div. '20°.

Hab. Sta. Barbara, one specimen (Jewett).

422. Cerithiopsis purpurea.

C. testa compacta, haud gracili, marginibus spirae parum excurvatis; purpurea seu fusco-purpurea, circa peripheriam pallidiore; anfr. nucle. ?ii., leevibus; norm. vii., planatis, suturis impressis; seriebus iii. nodularum minorum supra costulas spirales minores, ad intersectiones costularum radiantium circ. xiii., lineis fere rectis, ad suturas interruptis, spiram ascendentium sitis; interstitiiis impressis, quadratis; costulis suturalibus ii. haud nodulosis; basi rotundata, antice lirulis paucis expressis inter eas et costulas suturales vix sculpta; apertura subquadra tata; columna torta, emarginata. Long. '29, long. spir. '19, lat. '1, div. '20°.

Hab. Sta. Barbara (Jewett); Monterey, San Diego (Cooper).

423. Cerithiopsis forti or.

C. testa C. purpureae similis, sed sculptura multo fortior, basi pallida; seriebus nodularum spiralibus testa adolescenti ii., postea iii.; costis radiantis circ. xiii., interstitiiis magnis; costis suturalibus validis, subnodosis; costa basali valida. Long. '3, long. spir. '2, lat. '11, div. '26°.

Hab. Sta. Barbara, 1 specimen (Jewett).

439. Marginella subtrigona.

M. testa M. Jewettii similis, sed multo curtiore, latiore; antice valde angustata, postice valde tumene; labio postice minus prolongato; pleis iv., validioribus, parietali una. Long. '14, long. spir. '01, lat. '11, div. '130°.

Hab. Sta. Barbara (Jewett).

440. Marginella regularis.

M. testa M. Jewettii similis, sed multo minore, paullum angustiore; tenui, nitidissima, crystallina, omnino diaphana; labio magis calloso. Long. '13, long. spir. '01, lat. '09, div. '120°.

Hab. Sta. Barbara (Jewett); coast of California south from
Monterey, beach to 20 fathoms; Catalina Island, 10–20 fathoms, State Coll. no. 398 a (Cooper).

453. *Amycla tuberosa.*

*A. testa A. minori* simillima, sed vertice nucleoso tuberoso; anfr. iv., tumidis, rapide augentibus; apice minimo, margines spira rectos parum superante, interdum subdehiviter sito; testa adulta interdum unicolor, livida seu aurantiaca; plerumque albida, rufo-fusco varie picta, seu maculata, seu nebulosa, seu strigata stregis radiantis seu flexuosus, seu varie penicillata, saepe fascia tessellata subsuturali; anfract. norm. v., planatis, suturis distinctis; basi subangulata; apertura pyriformis, canali satis prolongato, arcuato; labro intus acuto, deorsum quasi tumidiore, postice sinuato, intus circ. octodentato; labio parum conspicuo, vix rugulato; columella torta, axi antice striato; superficie laevi, seu interdum minutissime sub lente radiatim striolata; epidermide cornea, tenui, subdianphana, spiraliter sub lente minutissime striolata: operculo Nassæformi, parvo, marginibus irregulariter serratis, cicatrice bilobata. Long. '32, long. spir. '18, lat. '14, div. 30°.

*Hab. Sta. Barbara, recent and fossil (Jewett); coast of California north to Monterey; Catalina Island, 8–10 fathoms (Cooper).*

As this belongs to a group of closely allied species of Nassoid Columbellæ, a minute diagnosis is given. The fossil specimens are larger, and have the remarkable nucleus more perfect, than any of the recent shells yet seen. In appearance it scarcely differs from the small variety of the Mediterranean *A. minor, Scac.*; but that (with *A. corniculata*) has a Chrysodomoid nucleus, the Californian an Alaboid.

? *Anachis penicillata.*

*1A. testa parva, Metuloida, turrita, albida, rufo-fusco plus minusve penicillata; anfr. nucleosis ii., tumidis, helicoideas, apice mammato; norm. vi., tumidis, suturis valde impressis; costis radiantisibus c. xii., angustis, expressis; lirulis spiralibus extantibus, in spira plerumque vi. supra costas transeuntibus; apertura pyriformi, antice effusa; labro postice sinuato. Long. '21, long. spir. '13, lat. '08, div. 25°.*

*Hab. Sta. Barbara (Jewett); S. Diego, Catalina Island, shore to 10 fathoms (Cooper).*

Neither of the specimens sent is quite mature. The mouth is that of an adolescent *Anachis,* but the sculpture is Metuloid.

*Siphonalia fuscotincta.*

*S. testa minima, turrita, albida, apicem versus fusco tineta; anfr. nucl. ii., compactis, subplanatis, apice mammato; norm. iv., convexis, suturis impressis; costis radiantisibus rotundatis, tumentibus, basim versus evanidis, interstitii us undulatis, subœquantibus; lirulis 288
crebris spiralibus, costas superantibus; apertura pyriformi, in canalem brevem apertum contortum producta; labro acuto; labio haud conspicuo; columella canalem versus valde contorta. Long. 17, long. spir. 1, lat. 08, div. 32°.

Hab. Sta. Barbara (Jewett).

The unique specimen is like a minute edition of Siphonalia Kellettii, but does not accord with the young of that or of any other species known in the region. It is probably not mature.
L.

DIAGNOSES

OF

NEW FORMS OF MOLLUSCA,

COLLECTED BY COL. E. JEWETT

ON THE

WEST TROPICAL SHORES OF NORTH AMERICA.

BY

PHILIP P. CARPENTER, B.A., Ph.D.


( 291 )
DIAGNOSES

NEW FORMS OF MOLLUSCA

COLLECTED BY CAPT. M. PREWITT

OF THE

WEST TRIBAL SHORES OF NORTH AMERICA

BY

THOMAS HUMPHREYS, M.D., F.R.S.

From the Archive and Pension of the Royal Society, Third Series, Vol. LIV.

XCV. 1839-1869, May 1870.

(201)
DIAGNOSES

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Rissoina expansa.

R. testa magna, lata, tenuisculpta, alba, nitente, subdiaphana; marginibus spiræ parum excurvatis; anfr. nucl. lævibus, vertice mamillato; norm. v., planatis, suturis distinctis; costulis radiantibus circ. xxiv., obtusis, hau longis, interstitiæ equantibus, peripheriam versus evanidis; circa basim productam strîs spiralis expressis; medio lævi; apertura valde expansa, semilunata; labro substantie producto, varicoso, antice et postice alte sinuato; labio caloso. Long. '35, long. spir. '18, lat. '17 poll., div. 30°.

Hab. Mazatlan (teste Jewett).

This fine species is the largest known in the fauna. It most resembles R. infrequens, C. B. Ad., which was described from a dead shell.

Mangelia hamata.

M. testa carneo-aurentiaca, satis turrita, marginibus spiræ excurvatis; anfr. nucl. ii. globosis, tenuissime cancellatis, apice mamillato; norm. vi., subelongatis, in spirâ tumentibus, subangulatis, suturis impressis; costis radiantis x.–xii., acutioribus, validis, circa basim prolongatam continuos; interstitialites concavis; lirulis spiralibus filosis, distantibus, supra costas transeuntibus, in spirâ iii.–iv.; apertura subelongata, quasi hamata, intus lævi, intense colorata; labro
Dr. P. P. Carpenter on new Forms of Mollusca.

acuto, dorsaliter varicoso, postice valde sinuato. Long. '24, long. spir. '13, lat. '1, div. 25°.

Hab. Panama (teste Jewett).

This very beautiful species is easily recognized by the varieose lip, sloping off to a sharp edge; by the deeply cut posterior notch, giving the smooth mouth a hooked appearance; by the sharp ridges, traversed by distant spiral threads; and by the flesh-tinted orange colour.

Mangelia cerea.

M. testa M. hamata simili, sed textura cerea, aurantiaca, gracilior, anfractibus tumidioribus, hauud angulatis; anfr. nucl. levibus; normalibus v., costis radiantiibus hauud acutis, interstitiis sequantibus; liris spiralibus validioribus, hauud filosis, supra costas nodulosis, in interstitiis subbolesitis; apertura, testa adulta, ? . . . .

Long. '25, long. spir. '14, lat. '1, div. 28°.

Variat testa rufo-fusca.

Hab. Panama (teste Jewett).

Col. Jewett’s unique specimen is not mature. It is distinguished from M. hamata by the smooth nucleus, waxen texture, rounder whorls, more equal distribution of the contour between ribs and interstices, and especially by the spiral sculpture, which is faint in the hollows, but nodulose on the ribs. Mr. Cuming has a specimen with the same texture, but of a rich brown colour.

Chemnitzia calata.

C. testa satis magna, cinerea, elongata; anfr. nucl. ? . . . ; norm. xiii., planatis, suturis vix impressis; costis radiantiibus xx.—xxviii., rectis, hauud semper convenientibus, subacutis, ad peripheriam subito truncatis; sulcis spiralibus in spira iv.—v., valde impressis, interstitiis et costarum latera transeuntibus, juga hauud superanti- bus; basi subito angustata, angulata, lirulis spiralibus circ. vi. ornata; apertura subquadrata; columella satis torta. Long. '35, long. spir. '3, lat. '09, div. 13°.

Hab. West coast of North America (Jewett).

This beautiful and unique shell was probably from Panama; but there was no locality-mark. It is remarkable for its deep furrows and the suddenly shortened and spirally sculptured base. It is much larger and broader than the northern C. Virgo, and differs in details of sculpture.

294
M.

DIAGNOSES

des

MOLLUSQUES NOUVEAUX

PROVENANT DE CALIFORNIE,

ET FAISANT PARTIE DU MUSÉE DE L'INSTITUTION SMITHSONIENNE.

BY

PHILIP P. CARPENTER, B.A., Ph.D.

Diagnoses de *Mollusques nouveaux* provenant de *Californie* et faisant partie du *musée de l'institution Smithsonienne*,

PAR PHILIP P. CARPENTER, B. A., PH. D.

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I.

D'après les lois des États-Unis, tous les objets d'histoire naturelle recueillis dans le cours des expéditions faites par 297
les États deviennent la propriété de l'institution Smithsonienne, qui est autorisée, de plus, à échanger les doubles. Cette institution, si bien dirigée par le professeur Henry, qui en est le secrétaire, n'a pas pour objet principal son seul agrandissement; elle est établie pour « l'accroissement et la propagation de la science parmi les hommes, » c'est-à-dire qu'elle embrasse toutes les nations. Dans l'échange des doubles, on n'a pas pour but d'obtenir un *quad pro quo*, mais plutôt d'envoyer les échantillons à quelque endroit où ils seront plus utiles pour l'avancement de la science. Le revenu de l'institution ne suffisant pas pour avoir à poste fixe des naturalistes chargés de classer et de décrire au besoin les objets d'histoire naturelle de ce musée, on envoie ces objets en communication à des naturalistes des États-Unis ou d'autres pays, selon leur spécialité, en vue d'arriver à déterminer les espèces et de faire choix des échantillons pour leur collection permanente et pour les échanges. En conformité de ce principe, les directeurs de l'institution m'ont transmis en Angleterre toutes les coquilles recueillies sur la côte ouest d'Amérique. Je les ai soigneusement comparées avec les types de la collection Cuming et du musée britannique; et, par suite de cet examen comparatif joint à celui de mes propres matériaux, je me suis trouvé dans la nécessité de décrire à peu près trois cents espèces ou variétés locales, en dehors de celles que j'ai publiées antérieurement dans mon catalogue des coquilles de Mazatlan.

On trouvera des renseignements sur ces espèces et sur toutes les sources originales d'information concernant le même sujet, dans mon *Supplementary Report on the present state of our knowledge of the Mollusca of the West coast of N. America*, écrit à la demande de l'Association britannique pour l'avancement de la science, et
publié dans ses Transactions pour l’année 1863 (p. 517-686). Aux pages 656-664, on peut consulter une table disposée de manière à faire voir d’un coup d’œil toutes les espèces de la région de Vancouver et de Californie, jusqu’ici très-peu connues, avec tous les endroits où on les a recueillies, d’après les renseignements fournis par les principaux collecteurs. Dans les mêmes pages on trouvera une description très-succincte des espèces qui sont nouvelles ou peu connues : quant aux diagnoses latines, elles ont été publiées dans divers journaux scientifiques, selon la source de provenance des espèces qu’elles concernent. Ainsi, par exemple, on doit en chercher le plus grand nombre, qui ont été draguées par le docteur Cooper, lors du Geological Survey de l’État de Californie, dans les Proceedings of the California Academy, 1864-5. Les espèces draguées par le docteur Kennerley au Puget-Sound se trouvent décrites dans le Journal of the Philadelphia Academy, 1865. Les espèces trouvées par le colonel Je- wett, en Californie, ont été publiées dans les Annals of natural History, 1864-5 ; celles qui ont été recueillies par M. Swan et les jeunes Indiens, de l’instruction desquels il est chargé, à la baie de Neeah (vis-à-vis l’île de Vancou- ver), et par M. Xantus, au cap St.-Lucas, se trouvent décrites dans le même recueil périodique (1864). Dans les Proceedings of the zoological Society (1863, p. 559-569), on trouvera un examen critique du Panama cata- logue du professeur C. B. Adams, fait d’après ses échan- tillons typiques ; et, pendant le cours de la présente an- née, le même journal doit publier les espèces nouvelles de la région tropicale, recueillies par MM. Reigen, C. B. Adams, etc.

Profitant de la bienveillance avec laquelle l’éditeur du Journal de Conchyliologie a bien voulu m’ouvrir les co-
lonnes de son recueil scientifique, je me propose de don-
ner, dans cet article, les diagnoses des espèces nouvelles de Californie, qui ne se trouvent pas décrites dans les mé-
moires cités plus haut. Je me trouve dans l'impossibilité d'en donner en même temps les figures, attendu que j'ai déjà restitué les échantillons typiques à l'institution Smith-
sonienne; mais cette absence de figures est moins regrett-
able, si l'on considère qu'elle n'est que momentanée, et que les espèces en question doivent être prochainement

dessinées et gravées sur bois par le savant artiste, M. le

II. W. Stimpson, pour le Manuel des Mollusques de la côte

ouest d'Amérique, que je prépare en ce moment, à la de-

mande de l'institution Smithsonienne (1). Lorsqu'il existe
des doubles de ces diverses espèces, on les trouvera ou
dans le Musée britannique ou dans la collection Cuming.

Warrington (Angleterre), 15 février 1865.

II.

1. Angulus Gouldii.

A. t. parva, alba, tenui, tumida, subdiaphana, subqua-
drata; epidermide pallida, tenuissima, induta; lævi, li-
nes incremenl haud exstantibus; antice et ventraliter in-
flata, marginibus regulariter excurvatis; parte postica
minima, haud angulata; umbonibus prominentibus; in-
tus, dentibus cardinalibus utraque valva uno simplici
unoque bifido, validis, obtusis; laterali antico valva dex-

(1) Je prie les naturalistes qui trouveraient des erreurs dans
mes ouvrages déjà publiés, ou qui posséderaient de nouveaux
matériaux relatifs aux Mollusques de la côte ouest d'Amérique,
de vouloir bien me communiquer leurs renseignements, en me
les adressant chez M. le professeur Henry, Smithsonian institu-
tion, Washington, D. C., États-Unis, afin que je puisse rendre ce
Manuel aussi complet et aussi exact que possible. P. C.
tra curto, valido, exstante; postico obsolete; valva sinistrali nullis; nymphis rectis, inconspicuis; sinu pallii maximo, subtriangulari, fere cicatricem alteram tenus porrecto; cicatricibus adductoribus postica subquadrata, antica elongata. — Long. *48, lat. *4, alt. *1 poll. (1).

Hab. San Diego, Cassidy. L’île de Cerros, dans la basse Californie, Ayres.


(1) Les dimensions des espèces sont données en pouces anglais, dont chacun = 2.53 centimètres.
(2) Pour cette section de Scrobicularia, MM. Adams proposent le vocable Capsa; ce qui fait grandement confusion, Capsa étant un nom de Lamarck, synonyme, il est vrai, d’Iphigenia, Schumacher, mais néanmoins très-usité. Je propose de reconstituer le genre ancien Lutricola, de Blainville, pris dans un sens restreint, pour ce groupe, intermédiaire entre les vrais Scrobicularia et les Macoma, ainsi qu’il suit :

Sous-genre Lutricola,

= Lutricola, Blainv. pars.
= Capsa, H. et A. Ad., non Lam.
= Scrobicularia, seu Macoma, seu Tellina, pars, auct.

Testa tumida, sape inaequivalvis, irregularis, subquadrata seu antice producta; pars postica undata seu truncata; cartilago fossa subinterna sita, ligamento curtiore contigua : dentes cardinales utraque valva duo, laterales nulli.

Ex. Lutricola ephippium, Solander, L. alta, Conrad; L. Dombeyi, Lamarck, etc.
Oëdalia, n. g.

Étym. Oëdalia (une coquille) renflée.

Testa inflata, tenuis, aequalvis, aequalateralis, cyclo-

2. Oëdalia subdiaphana.

Oë. t. albida, tenuissima, subdiaphana, submargaritacea, tumente; lavi, striulis incrementi exillimis; epidermide pallide straminea, tenuissima, induta; suborbiculari, umbonibus tumentibus, prominentibus; marginibus omnino satis excurvatis, antico rotundato, postico paululum porrecto, lunula nulla: intus, valva sinistrali dentibus cardinalibus 3 bifidis, radiantis, quorum centralis major, valva dextra 2 bifidis, intercalantibus; nymphis parvis, curtis, tenuibus; ligamento circa umbones excurrente; lamina cardinali dorsaliter parum claviculara; cicatricibus adductoribus parvis, marginem dorsalem versus sitis, antica ovali, postica subrotundata; sinu pallii regulariter ovali, per duas trientes interstitii incurrante, longitudinaliter tenuissime corrugato; linea pallii antice a marginem remota, diagonaliter reflexa. — Long. 452, lat. 44, alt. 26, poll.

Hab. San Diego, Cassidy.

Je n'ai vu qu'un seul échantillon de cette coquille fort remarquable. Après l'avoir examinée pour la seconde fois et avec beaucoup de soin au microscope, pour caractériser l'espèce et pour comparer ses caractères avec ceux du Cooperella scintillaformis, j'ai eu le malheur de le laisser tomber à terre et de le briser; mais je puis attester l'exactitude de la description. Cette espèce a l'aspect externe 302
d'un *Kellia suborbicularis*; l'inflexion palléale d'un *Semelae*; le ligament circumumbonal des *Circe* et des *Psephis*; et une charnière très-complexe, contenant cinq dents, toutes bifides. Avec le sous-genre *Cooperella*, qui en diffère comme les *Lutricola* et les *Macoma* (le cartilage étant semi-interne) et peut-être avec les *Cycladella*, elle constitue un groupe particulier des *Tellinidae*.

3. *Psephis tellimyalis*.

*Ps. t. valde transversa, subquadrate, tumidiore, valde inaequilaterali; umbonibus obtusis, vix prominentibus; pallide carneo-lutescente, purpureo (maxime circa marginem dentesque) tincta; epidermide tenuissima induta; tota superficie creberrime concentrice striata; marginibus, dorsali et ventrali subparallelis, antico rectiore, postico rotundato; lunula inconspicua: intus, dentibus centralibus minimis, anticis elongatis, posticis valde elongatis; sinu pallii vix sinuato.—Long. *09, lat. *07, altit. *04, poll.*

Hab. Californie (sur la partie dorsale d'une *Haliotide, Rowell*).

Le sous-genre *Psephis* se compose de très-petites coquilles vénériiformes, dont l'animal est ovipare, comme celui des *Cyclas*, etc., des eaux douces, et des *Bryophila* parmi les *Lamellibranches* marins. La charnière porte trois dents; quelquefois elles ressemblent à celles des *Chione*; mais ordinairement les dents antérieures et postérieures se prolongent. Le *Psephis tellimyalis* se trouve sur les limites extrêmes du groupe. II a l'aspect extérieur d'un *Tellimya bidentalis* et quelque chose aussi de sa charnière, à cause du très-grand développement des deux dents terminales aux dépens de la dent centrale. Je n'en ai
vu qu'un seul échantillon, qui appartient au révérend J. Rowell, pasteur à San Francisco.

4. TAPES LACINIATA.

T. t. • T. stamineae • simili, sed majore, fragili, mutto tenuiore; satis tumida, subovali, regulariter excurvata, cinerea; lunula linea impressa, parum definita; marginibus, postico vix subquadrate, antico producto; ligamento haud prominent; costis radiantis acutis, distantibus, ventraliter dimidium interstitiorum aquantibus, postice parvis, crebris, antice latis; laminis concentricis creberrimis, vix erectis, costas transeuntibus, a costis et interstittis eleganter undatis, haud nodosis: pagina interna albida; dentibus cicatricibus ut in •T. staminea• forma-tis; sinu pallii paulum longiore, acutioire. — Long. 2' 4, lat. 2'4, alt. 1'4, poll.

Hab. San Diego, Rich, Blake, Cooper.


5. KELLIA (LAPEROUSSII, var.) CHIRONI.

K. t. • K. Laperoussii • simili; sed tenuiore, minus transversa, ventraliter excurvata; epidermide pallidiore; um-
Hab. Neeah Bay, Swan; San Pedro, Cooper.
Cette variété est assez distincte de la forme typique du K. Laperousii; mais la suite d'individus que j'ai eu occasion d'examiner comparativement m'a permis de me convaincre que l'espèce variait beaucoup.

6. KELLIA ROTUNDATA.

Hab. Monterey, Taylor.
Cette espèce est beaucoup plus grande, mais moins renflée que le K. suborbicularis, et se distingue facilement par sa forme presque complètement arrondie.

7. OSTREA LURIDA.

O. t. irregulare, suborbiculari, ellipsoidea, seu producta; superficie interdum laminata, purpurea seu squamis griseae, haud costata: intus olivacea, interdum purpurea tinctoria, seu omnino purpurea, submargaritacea; cardine recto; umbonibus haud conspicuis, haud excavatis; margine interno, cardinem versus sape crenulato.
Animal flavore cupreo tinctum.
Var. laticaudata, Nutt, ms.: t. omnino purpurea, margine producto, undato; cardinem versus, denticulis conspicuis instructo.
Hab. Vancouver Is., à 2-5 toises sur fond de vase, Lord;
Shoalwater Bay, Cooper; Neeah Bay et Tatooché Is., Swan (Var.) Monterey, Nuttall.

?Var. expansa : t. omnino planata, per totam superficiem affixa; extus, marginem versus laminata, purpureo radiata; intus, olivaceo-rufa, ligamento parvo, in medio undato, solidiore.

Hab. S. Pedro, Cooper.

?Var. rufoides : t. « O. Virginicae » jun. simili; sed tenuissima, luteo-rufa, intus rufo tincta; umbonibus concavis.

Hab. S. Diego, Cassidy, Cooper. Fossile à San Pablo, 20 pieds au-dessus de la haute marée, Newberry.

Les Huitres de Californie, dans leur état ordinaire, comme on les trouve au Shoalwater Bay (Orégon), ont à peu près la couleur et l'aspect de petites Ethéries. Les individus des mers plus chaudes ont l'air d'être très-distincts; mais, d'après le docteur Cooper, qui a une grande expérience de la matière, ce ne sont que des variétés. Je ne pouvais pas prendre pour nom spécifique celui que le professeur Nuttall avait donné en manuscrit à une forme accidentelle. Quant aux autres formes, assez constantes dans leurs diverses localités, je leur ai donné des noms qui pourront servir à les désigner soit comme espèces, soit comme variétés, lorsque, plus tard, la connaissance d'un plus grand nombre d'individus permettra d'avoir une opinion définitive en ce qui les concerne. La variété rufoides a beaucoup de l'aspect de l'O. Virginica (Maz. Cat., n°. 212). Elle était désignée sous le nom « O. ?rufa » par le docteur Gould; mais je suis porté à croire que l'espèce de Lamarck est une variété des Huitres atlantiques, attendu que les coquilles de la haute Californie n'étaient pas connues à l'époque où il a écrit.
8. **Tornatella punctocælata.**

* T. t. tenui, satis elongata, ovoidea; cinerea, fasciis duabus latis fuscis ornata; vertice nucleoso decliviter caelato; anfractibus normalibus 4 vix convexit, suturis distinctis; tota superficie sulcis subdistantibus cælata, punctis impressis seriæm dispositis, quarum 7-9. in spira monstrantur; basi ovali; apertura latiore; labro acuto, antice sinuato; labio indistincto; plica acuta declivi juxta parietem, haud exstante; columna antice torta. Long. 2, long. spir. 06, lat. 09, poll.: div. 50°.

Hab. Santa-Crux, Rowell. — San Diego, Cooper.

Cette espèce est un peu aberrante, à cause de son ouverture large, de son pli reporté près du bord pariétal et de sa columelle tordue comme celle des *Bullina*. La ciselure des tours ressemble aux impressions que laisserait une série de petits colliers.

9. **Cylichna planata.**

* C. t. parva, cylindracea, subelongata, alba, lævi, epi-dermide straminea induta; marginibus fere parallelis; spira planata, haud umbilicata, haud mamillata; anfractibus 4 convolutis, suturis parum impressis; basi modice effusa; labro tenui, in medio satiis producto, antice late arcuato, postice parum sinuato, haud canaliculato, suturam versus satiis rotundato; labio distincto, postice sub-calloso; columna plica satiis exstante, axi basim circum-gyrante. Long. 14, lat. 055, poll.: div. 180°.

Hab. San Diego, Cassidy.

On n’a trouvé qu’un seul échantillon de cette petite espèce, qui est intermédiaire entre les *Cylichna* et les *Tornatina.*
Genus LOTTIA.

Genus LOTTIA.

= Lottia, Gray, pars.

= Acmaea. seu Tectura, seu Patella, pars, auct.


Testa Patellis quibusdam seu Helcioni similis; ple- rumque planata, solida, apice anteriori.

Animal margine pallii intus papillis lamellosis circa dorsum lateraque instructo, regione capitis interruptis; pede elongato, ovali, planato; branchia minima.

Ce genre est intermédiaire entre les Acmaea et les Scurria. Dans les Acmaea, le manteau est simple ; dans les Scurria, il est garni, sur toute sa circonférence, de papilles qui, à première vue, offrent l'apparence des branchies des vraies Patelles ; chez les Lottia, on trouve ces papilles sur le corps, mais non sur la tête de l'animal. De plus, la branchie, qui est ordinairement allongée et en forme de plume chez les Acmaea, et triangulaire chez les Scurria, est très-petite dans le genre qui nous occupe. Il serait prématuré de vouloir fixer définitivement les caractères conchylologiques du genre Lottia, quoique le type soit très différent des Patelles ordinaires ; car il est possible que quelques-unes des espèces que l'on considère actuellement comme des Patelles se trouvent être des Lottia, lorsqu'on aura eu l'occasion d'observer leurs animaux.

On sait qu'il y a quatre noms employés pour désigner les Patelles à branchie de petite dimension. Acmaea est le premier en date, ayant été publié dans l'appendice du voyage de Kotzebue. J'aurais voulu conserver pour ce groupe le vocable générique Tectura, employé (après Milne Edwards) par Gray et MM. Adams : mais je trouve 308
que Sowerby sen., dans son Genra, a figuré l'espèce originale comme type de son « Lottia, Gray. »

C'est le docteur Cooper qui, le premier, a observé et signalé les particularités de l'animal; mais la diagnose que je viens de donner est le résultat des études du docteur Alcock, qui a succédé au capitaine Brown comme curateur du Musée de Manchester. Il a fait l'anatomie de presque toutes les Patelles de la côte ouest d'Amérique; mais je ne veux pas anticiper sur ses découvertes. Voici la diagnose de l'espèce typique.

10. Lottia gigantea, Gray.

L. t. magna, crassiore, planata, expansa, textura sūpius extus spongiosa; nucleo minore, corneo, nigro-fusco, an-
cylinformi, vertice mamillato, subelevato; dein elongata, postice grisea, undulata; t. adolescente verrucosa, radiis obscuris, antice haud verrucosis; t. adulta plus minusve lata, plus minusve radiata seu verrucosa; apice plus minusve a margine remoto; parte antica seu haud exstante, seu circiter per quintam totius longitudinis projiciante, parte postica plus minusve elevata, convexa; extus ut in « Acmea pelta » pīcta, albido-grisea, fusco-olivaceo copiosē irregulariter strigata : intus, plerumque testudinaria, margine lato, nigro; spectro definito, seu rarius albido, cicatrice muscularī fortīore, interdum purpurōe seu vi-
locēo tincta.

Long. (sp. normalis) 2:6, lat. 2:05, alt. ·7, poll. A.
Long. (sp. variantis) 2:95, lat. 2 33, alt. ·8, poll. B.
On mesure de l'apex jusqu'au bord antérieur, dans le sp. A, ·45.
On mesure de l'apex jusqu'au bord antérieur, dans le sp. B, ·05.
L'altitude de l'apex en sp. A est de 6.
L'altitude de l'apex en sp. B n'est que de 55.

11. BITTIUM (?VAR.) ESURIENS.

B. t. * B. filoso * simili, sed multo minore, graciliore, interdum valde attenuata; sculptura t. junioe ut in * B. filoso; * sed t. adulta subobsoleta, interstitiiis haud insculptis. Long. •27, long. spir. •19, lat. •085, poll. : div. 25º.


Bien que j'aie vu beaucoup d'individus de cette forme, et un plus grand nombre encore du B. filosum, Gld. (= Turritella Eschrichti, Midd. = Acirsa Eschrichti, Adams, Genera), je ne puis pas décider avec une certitude complète si c'est une véritable espèce, ou seulement une variété dégradée et, pour ainsi dire, affamée (esuriens) du B. filosum, qui, d'ailleurs, ne varie pas. Comme le B. filosum ne s'étend pas aussi loin au sud, il est probable que les échantillons californiens doivent être considérés comme distincts, tandis que les individus de la région Vancouvé-rienne peuvent être réunis au B. filosum. Tous les individus qu'on a envoyés étaient très-roulés.

12. BITTIUM ATTENUATUM.

B. t. valde gracili, attenuatu; anfr. nucl... (detritis); normalibus 10 planatis, suturis haud impressis; t. junioe lirulis spiralibus 2 anticus conspicuis, aliis posticus parum conspicuis, supra costulas circiter 14. radiantes transeun-
tibus; t. adulta costulis et lirulis anticiis obsoletis; lirulis 2. suturalibus; basi prolongata, striis circiter 6 ornata; apertura ovali; columella intorta, parum emarginata. Long. '4, long. spir. '31, lat. '11, poll. : div. 48°.

Jen ai vu qu’un seul échantillon en bon état de cette espèce. Elle a la taille du B. plicatum, A. Ad., mais la sculpture de la base est différente.

15. ?Bittium quadrifilatum.

?B. t. satis tereti, pallide cinerea, tenuisculpta; anfr. nucleosis, primo omnino caelato, ?sinistrali, dein 2 levibus, rotundatis, apice quasi mamillato; anfr. normalibus 7 subplanatis; suturis valde impressis, haud sculptis; costulis radiantis circ. 16-22, angustis, subrectis, anfr. ult. crebrioribus, suturam versus evanidis; filis spiralibus semper æqualibus, supra spiram 4 angustis, expressis, costulas transenuntibus, haud nodulosis; filis duabus alteris, inter quas sutura sita est; basi tenue striata; columella intorta, parum effusa; apertura ovata; labio parvo, labro tenui, parum arcuato. Long. '26, long. spir. '48, lat. '09, poll.: div. 25°.

Hab. S. Pedro, Cooper. — S. Diego, Cassidy.

Dans cette espèce et dans quelques autres très voisines, les B. asperum et B. armillatum, par exemple, le nucléus est très-différent de celui des Bittium typiques. Il est probable qu’elles n’appartiennent pas au même genre.


B. t. parva, tenui, interdum subdiaphana, rufo-cornea, anfr. nucleosis normalibus, apice submamillato; normalibus 4, planatis, suturis distinctis; basi rotundata; aper-
tura subovata, peritremate continuo; labro acuto; labio distincto, lacunam umbilicalem formante; columella sub-anangulata operculo semilunato, dense rufo-vinoso, subhomogeneo, haud spirali, rudi; apophysi prælonga antice columellam versus extant. Long. .11, long. spir. .07, lat. .06, poll. : div. 40°.

Hab. S. Diego, Cassidy; sur l’herbe, Cooper. — Cape St.-Lucas, Xantus. — Mazatlan, Reigen.


15. BARLEEIA (?SUBTENUIS, VAR.) RIMATA.

B. t. • B. subtenui » simili; sed paulum tumidiore; anfractibus minus planatis; rima umbilicali conspicua.

Hab. S. Diego, Cassidy, Cooper.

Peut-être cette forme se trouvera-t-elle constituer une espèce distincte, lorsqu’elle sera mieux connue.

16. BARLEEIA HALIOTIPHILA.

B. t. parva, turrita, lævi, angusta, tenui, rufo-fusca; marginibus spiræ subrectis; anfr. nucleosis normalibus, vertice submamillato; norm. 5 subplanatis, suturis distinctis; basi subplanata, obsolete angulata; apertura ovata, peritremati haud continuo; labro tenui; labio parum calloso; columella vix arcuata; operculo ut in • B. subtenui •

Long. .4, long. spir. .06, lat. .05, div. 30°.

Hab. Basse Californie, sur la partie dorsale d’une Halioîtide, Rowell.

312
Cette espèce est voisine du *B. subtenuis*; elle s'en distingue par sa taille beaucoup plus petite, et sa forme plus élancée.

17. **Drillia torosa.**

*D. t. acuminata, lœvi, aurantio-fusca, epidermide aurantio-olivacea induta; anfr. nucleosis ?... (detritis); normalibus 7 tumidioribus, suturis planatis; serie una tuberculorum validorum, subrotundatorum, anfractu penultimo 8, anfr. ultimo haud obsoletis; regione sinus parvi, rotundati paulum excavata; regione suturali haud sculpta; canali longiore; columnella recta; labio tenui; labro acuto, postice sinuato. Long. *95, long. spir. *55, lat. *3, poll. : div. 30°.*

*Hab. Monterey, Taylor, Cooper.*

Cette espèce, ainsi que d'autres *Pleurotomidae* californiens, appartient à un groupe particulier, dont le *D. inermis*, Hinds, peut être considéré comme le type. Peut-être ces formes seraient-elles mieux placées dans le sous-genre *Clionella*, qui est vraiment marin, d'après les observations du docteur Stimpson sur les espèces du cap de Bonne-Espérance, et non pas Mélanien, comme l'a supposé le docteur Gray, et comme l'ont dit, après lui, MM. Adams et Chenu.

18. **Drillia (?)torosa, var.) aurantia.**


*Hab. San Diego, Cassidy. — San Pedro, Cooper.*

Les individus des localités méridionales étaient tous en mauvais état, et je ne suis pas encore convaincu qu'ils appartiennent à la même espèce.

313
19. DRILLIA PENICILLATA.

D. t. • D. inermi • forma et indole simili; sed cinerea, rufos-fusca dense penicillata; lineolis creberrimis, inter-
dum diagonalibus, seu zig-zag formibus, seu varie inter-
ruptus; anfractibus planatis, plicato-costatis, costulis circi-
citer 4, regione sinus minimi, lati, expansi interruptis, postice nodosis; canali effusa.—Long. 1·35, long. spir. 75, lat. 42, poll. : div. 25°.

Hab. Cerros Is., basse Californie, Veatch.

Tous les individus que j'ai vus de cette espèce étaient excessivement roulés, mais on peut la reconnaître très-facilement à sa coloration élégante.

20. ? DAPHNELLA ASPERA.

? D. t. parva, tenui, rufos-fusca, gracili, angusta, fusi-
formi, epidermide tenui induta; anfr. nucleosis 2 lavivibas, 
vertice contorto; normalibus (t. adolescente) 4 elongatis, 
fenestratis, suturis distinctis; costulis radiantis circi-
citer 13 angustis, acutis, et costulis spiralibus, in spira 
3, anfractu ultimo circiter 40, angustis, acutis, radiant
superantibus, eleganter decussata; intersectionibus subno-
dulosis, interstitii quadratis; apertura elongata, an-
gusta, antice effusa; labro postice vix sinuato.—Long. 
41, long. spir. 09, lat. 08, poll. : div. 35°.

Hab. Monterey, Taylor.

Je n'ai vu de cette charmante petite coquille qu'un seul échantillon très-frais, mais incomplètement adulte. Peut-être se trouvera-t-elle mieux placée dans le genre Mitromorpha, A. Adams?

21. ODOSTOMIA STRAMINEA.

O. t. • O. inflatae, var. eltiore • simili, sed multo ela-

Hab. basse Californie (sur la partie dorsale d'une Haliotide), Rowell. — Cap St.-Lucas, Xantus.

On peut facilement distinguer cette espèce de celles du Nord par sa spire allongée et son épiderme d'un jaune de paille.

22. CHEMNITZIA TRIDENTATA.

Ch. t. (quoad genus) magna, compacta, latiore; castanea, interdum fasciis pallidoribus; anfr. nucleosis 3 helicoideis, apice conspicuo, marginibus spira rectis parum superantibus; normalibus 11 subplanatis, suturis distinctis; costis rectis acutis, interdum 19, interdum 24 tenus, haud attingentibus, circa peripheriam haud subito evanidis; interstitiiis undatis, eleganter spiraliter sulcatis; sulculis circiter 8-10, costis haud superantibus; apertura subquadrata; labro intus tridentato; columella tortuosa; basi rotundata. — Long. *45, long. spir. *35, lat. *12, poll.: div. 16°.


Les trois dents de cette belle espèce, cachées tout à fait à l'intérieur de l'ouverture, comme dans plusieurs espèces du genre Obeliscus, ont été, pour la première fois, observées sur un individu cassé et roulé de Santa Barbara. Celui-ci a 22 côtes ; celui de Monterey, 20 ; celui du nord, 19 ; et ceux de San Diego, 24.

23. CHEMNITZIA (? var.) AURANTIA.

Ch. t. « Ch. chocolate » simili, sed multo minore, latiore, haud tereti, aurantia; anfr. nucleosis ?... (detritis); normalibus 7 planatis, suturis impressis; costulis radiantis...
bus circiter 26, haud expressis, ad peripheriam evanidis, interstitiiis late undatis; lineolis spiralibus castaneis creberrimis tota superficie ornata; basi subrotundata; columna parum torta; apertura ovata; labro tenui, acuto; labio haud conspicuo.—Long. '23, long. spir. '16, lat. '07, poll.: div. 20°.

Hab. Santa Bárbara, Jewett.—Puget Sound, Kennerley.

Il est possible qu'on reconnaîsse plus tard que cette espèce est le jeune âge du Ch. tridentata: elle est intermédiaire entre elle et le Ch. chocolata.

24. Volutella pyriformis.

V. t. parva, * V. margaritula * simili, sed aurantiaco pallide tincta; antice angustiore, magis elongata; labio conspicuo; labro postice parum sinuato, intus denticulis minus expressis ornato; plicis columellaribus normalibus, acutioribus.—Long. '1, lat. '065, poll.

Hab San Diego, Cooper.—California, * Pacific Railway exploring Expedition. »

Cette espèce ressemble au V. margaritula (Maz. Cat., n° 589), mais elle est plus allongée en avant. Le genre Volutella, Swainson (non d'Orbigny), correspond au genre Closia de Gray.

25. Ocinebra Poulsomi (Nutt. ms.).

O. t. turrita, solida, luteo-albida, rufo-sanguineo spiraliter lineata; vertice nucleoso parvo, lavi, parum tumente: t. juniore rhomboidea, haud varicosa, spira planata, peripheria subangulata, canali recta, longiore, labro intus dentato, labio distincto, subcallosa: t. adulta, anfr. 7 primis planatis, posticis tumidis; suturis planatis, sedarea postica concava; costis subvaricosis crebris,
tumentibus, irregularibus, anfractu ultimo 7, circiter quinquies subnodosis; tota superficie spiraliter crebre in-
sculpta; sulcis punctatis, rufo-sanguineis; apertura ovali;
labro acutiore, dorsoliter tumido, varicoso, intus dentibus
validis circiter 6 munito; labio solido, sub suturam dente
valido parietali munito, super columnellam calloso; canali
breviore, aperto. — Long. 1.85, long. spir. *96, lat. *93,
poll. : div. 38».

Hab. San Diego, Nuttall. — Cerros Is., Veatch. —
Santa Barbara, Jewett.

Je n'ai vu que trois individus de cette belle espèce :
l'un d'eux, qui est typique, porte le nom de « Buccinum
Poulsoni » dans la collection Nuttall qui fait partie du
Musée britannique : un second, très-jeune, et d'un as-
pect fort particulier, bien qu'il appartienne évidemment
tà la même espèce, a été recueilli par le colonel Jewett,
probablement à Santa Barbara (mais, d'après son étiquette,
at Panama) : enfin celui du docteur Veatch provient de la
basse Californie, et il est en très-mauvais état. Le premier
a été dessiné sur bois pour l'institution Smithsonienne
par M. Sowerby. Comme cette espèce intéressante est
presque inconnue en France, j'ai cru devoir en donner
une description suffisamment précise. P. P. C.

317
ON

THE PLEISTOCENE FOSSILS

COLLECTED BY

COL. E. JEWETT, AT STA. BARBARA, CALIFORNIA;

WITH

DESCRIPTIONS OF NEW SPECIES.

BY

PHILIP P. CARPENTER, B.A., Ph.D.

On

THE PLEISTOCENE TOSSINA

FOR PEPIENT \\ 1837.

IN

DESCRIPTION OF NEW SPERM

DENTAL CHARACTERS IN...
ON

THE PLEISTOCENE FOSSILS

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DESCRIPTIONS OF NEW SPECIES.

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The study of the recent and tertiary mollusks of the west coast of America is peculiarly interesting and instructive, for the following reasons. It is the largest unbroken line of coast in the world, extending from 60° N. to 55° S., without any material saliency except the promontory of Lower California. Being flanked by an almost continuous series of mountain-ranges, the highest in the New World, it might reasonably be supposed that the coast-line had been separated from the Atlantic from remote ages. The almost entire dissimilarity of its faunas from those of the Pacific Islands, from which it is separated by an immense breadth of deep ocean from north to south, marks it out as containing the most isolated of all existing groups of species, both in its tropical and its temperate regions. When we go back in time, we are struck by the entire absence of anything like the boreal drift, which has left its ice-scratchings and arctic shells over so large a portion of the remaining temperate regions of the northern hemisphere, and also by the very limited remains of what can fairly be assigned to the Eocene age. The great bulk of the land on the Pacific slope of North America (so far as it is not of volcanic origin) appears to have been deposited during the Miocene epoch. Here and there only are found beds whose fossils agree in the main with those now living in the neighbouring seas. To trace the correspondences and differences
Dr. P. P. Carpenter on Pleistocene Fossils

between these and their existing representatives may be expected to present results analogous to those now being worked out with such discerning accuracy from the various newer beds of modern Europe.

The first collection of Californian fossils seen in the east was made near Sta. Barbara by Col. E. Jewett in 1849; but no account was published of them before the list in the British Association Report (1863), p. 539. They consist of forty-six species, of which twenty-nine are known to be now living in the Cali- fornian seas, and others may yet be found there. The following ten are Vancouver species, some of which may travel down to the northern part of California:—

Margarita pupilla,  
Galerus fastigiatus,  
Bittium filosum,  
Lacuna solidula,  
Natica clausa,  

Priene Oregonensis,  
Trophon Orpheus,  
Chrysodomus carinatus,  
C. tabulatus, and  
C. dirus.

Some of these are distinctly boreal shells, as are also Crepidula grandis (of which Col. Jewett obtained a giant, 3½ inches long, and which now lives on a smaller scale in Kamtschatka) and Trophon tenuisculptus (whose relations will be presently pointed out). So far, then, we have a condition of things differing from that of the present seas, somewhat as the Red Crag differs from the Coralline. But in the very same bed (and the shells are in such beautiful condition that they all appear to have lived on the spot, which was perhaps suddenly caused to emerge by volcanic agency) are found not only tropical species which even yet struggle northwards into the same latitudes (as Chione succineta), but also species now found only in southern regions, as Cardium graniferum and Pecten floridus. Besides these, the following, unknown except in this bed, are of a distinctly tropical type, viz.:

Opalia, var. insculpta.  
Chrysallida, sp.  
Pisania fortis.

From a single collection made only at one spot, in a few weeks, and from the very fragmentary information to be derived from the collections of the Pacific Railway surveys (described by Mr. Conrad, and tabulated in the Brit. Assoc. Report, 1863, pp. 589–596), it would be premature to draw inferences. We shall await with great interest the more complete account to be given by Mr. Gabb in the Report of the California Geological Survey. With the greatest urbanity, that gentleman has sent his doubtful Pleistocene fossils to the writer, to be compared with the living fauna; but it would be unfair here to give any
account of them, except that they confirm the foregoing statements in their general character.

The following are diagnoses of the new species in Col. Jewett's collection.

**Turritella Jewettii.**

*T. testa satis tereti, hand tenui, cinerea rufo-fusco tineta; anfr. subplanatis, suturis distinctis; lirulis distantibus (quarum t. jun. duæ extantiores) et striolis subobsoletis spiralibus cincta; basi parum angulata; apertura subquadrata; labro tenui, modice simuato.

Hab. Sta. Barbara, Pleistocene formation (Jewett). San Diego, on beach (Cassidy).

This species comes nearest to *T. sanguinea*, Re., from the Gulf, but differs in the faintness of the sculpture. Mr. Cassidy's specimens may be washed fossils, or very poor recent shells.

**Bittium asperum.**

*B. testa B. quadrifilato forma, magnitudine, et indole simili, sed sculptura intensione; codem vertice nucleoso abnormali; sed, vice flororum, costulis spiralibus costas spirales superantibus, subnodulosis; t. jun. costulis ii. anticis majoribus, alteris minus; postea plerumque iv. subaequalibus, interdum iii. interdum aliis intercalantibus; sculpture basali intensione; costis radiantiibus subarcuatis.


Hab. Sta. Barbara, fossil in Pleistocene beds; abundant (Jewett). S. Pedro, S. Diego, Catalina Is. 30-40 fms. (Cooper), State Col. no. 591 c.

Mr. Gabb informs me that his *Turbonilla aspera* is a *Bittium*. Unfortunately the type is not accessible; and as the diagnosis would fit several closely allied species, it cannot be said with precision to which it rightfully applies. As this is the commonest of the group, it is presumed that it is the "*Turbonilla*" intended. Should the type, however, be recovered, and prove distinct, this shell should take the name of *B. rugatum*, under which I wrote the diagnosis, and which was unfortunately printed in the Brit. Assoc. Report, p. 539. The fossil specimens are in much better condition than the recent shells as yet discovered.

**Bittium armillatum.**

*B. testa B. aspero simili; anfr. nucl. ii. levibus, tumentibus, vertice declivi, celato; dein anfr. ix. normalibus planatis, suturis impressis; t. adolescense serieibus nodolorum tribus spiralibus extantibus, supra costas instructis; costis radiantiibus cire. xiii. fere parallelis,
Dr. P. P. Carpenter on Pleistocene Fossils

seriebus, a suturis separatis, spiram ascendentibus; t. adulta, costulis spiralisbus, interdum iv., intercalantibus; costulis radiantisbus ereberrimis; costis suturalibus ii. validis, hand nodosis; basi effusa, liris circ. vi. ornata; apertura subquadrata; labro labioque tenuibus; columella vix torsa, effusa, vix emarginata.

_Hab._ Sta. Barbara, Pleistocene, 1 sp. (Jewett). S. Pedro, S. Diego (Cooper).

The sculpture resembles _Cerithiopsis_; but the columella is pinched, not notched.

**Opalia (?crenatoides, var.) insculpta.**

_O._ testa _O. crenatoidei_ similis; sed costis radiantisbus pluribus, xiii.-xvi., in spira validis; anfr. ult. obsoletis; sculptura spirali nulla; punctis suturalibus minus impressis, circa fasciam basalem laevem postice, non antice continuis.

_Hab._ Sta. Barbara, Pleistocene, 1 sp. (Jewett).

Very closely related to _O. crenatoides_, now living at Cape St. Lucas, and, with it, to the Portuguese _O. crenata_. It is quite possible that the three forms had a common origin.

**Trophon tenuisculptus.**

_T._ testa _T. Barricensi_ similis, sed sculptura minus extante; vertice nucleoos minimis; anfractibus uno et dimidio laevibus, apice acuto; normalibus v., tumidis, postice subangulatis, suturis impressis; costis radiantisbus x.-xiv., plerumque xii., haud varicosis, angustis, obtusis; liris spiralibus majoribus, distantibus, quorum ii.-iii. in spira monstrantur, alius intercalantibus, supra costas radiantes undatim transeuntibus; tota superficie liris increamenti, supra liras spirales squamosis, eleganter ornata; canali longiore, subrecta, vix clausa; labro acutior, postice et intus incrassato, dentibus circ. v. munito; labio conspicuo, laevi; columella torsa.

_Hab._ Sta. Barbara, Pleistocene formation (Jewett).

This very elegant shell is like the least-sculptured forms of _T. Barricensis_, from which it appears to differ in its extremely small nucleus. It is very closely related to _T. fimbriatulus_, A. Ad., from Japan, but differs in texture, and is regarded by Mr. Adams as distinct. It stands on the confines of the genus, there being a slight columellar twist, as in _Peristernia._

**Pisania fortis.**

_P._ testa _P. insigni_ similis, sed solidiore; crassissima, sculptura valde impressa; anfr. norm. v., parum rotundatis, suturis distinctis; costis radiantisbus t. jumoni circ. xii., obtusus, parum expressis, postea obsoletis; liris spiralibus validis, crebris (quorum t. jumoni v., postea x., in spira monstrantur), subaequalibus, anticis majori-
from Sta. Barbara, California.

bus; canali recurvata; lacuna umbilicali magna; labro intus crebrilirato; labio conspicuo, spiraliter rugose lirato.

_Hab._ Sta Barbara, Pleistocene formation (Jewett).

Col. Jewett’s single specimen is in very fine condition, and is confirmed by a fragment obtained by Mr. Gabb, the palæontologist to the California State Survey. Although resembling _Purpura aperta_ and congeners in the irregular rugose folds of the labium, and _Siphonalia_ in the strongly bent canal, Mr. H. Adams considers that its affinities are closest with the _Cantharus_ group of _Pisania_. That genus is extremely abundant in the tropical fauna, but does not now live in California. It is the only distinctly tropical shell in the whole collection; and its presence, along with so many boreal species and types, appears somewhat anomalous, like the appearance of _Voluta_ and _Cassidaria_ in the Crag fauna. It is distinguished from the extreme forms of _P. insignis_ by having the spiral lirae pretty equally distributed over the early whorls, by the close internal ribbing of the labrum, by the absence of the stout posterior parietal tooth, and by the great development of the columellar folds.

**Note.**—Unfortunately, during the long interval which has elapsed between the transmission of the MS. and receipt of the proof, the types have been returned to the owner, and (with the remainder of Col. Jewett’s invaluable collection of fossils) have become the property of a college in New York State. As they are packed in boxes, and at present inaccessible, I am unable to give the measurements; but the unique specimens were drawn on wood by Mr. Sowerby for the Smithsonian Institution.—_P. P. C._, Montreal, Feb. 22, 1866.

325
INDEX OF SPECIES.

N. B. The numbers without capitals refer to the foot-paging in this volume: those with capitals to the original works quoted in the list, O-X.

Acanthochites

Acanthochiton

Acanthopleura

Acar

Achatina

Acicula

Acila

Acirsa

Aclis

Acmaea

Acirsa

Acirsa

Aclis

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea

Acmaea
INDEX OF SPECIES.

Acmaea
(floccata, var.) subrotunda, 37, 268.
gigantea, O 229, O 233, O 297.
grandis, O 282, O 283, O 297, O 319, O 351.
instabilis, O 212.
Kochii, O 229, O 233.
var. limulata, 26, 136, 151.
livescens, O 319.
mamillata, 7, 173, 199, O 215, V 222.
marmorea, 173, 199, O 215, V 222.
Mazatlandica, 319.
mitra, O 173, O 177, O 199, O 212, O 213, O 215, V 222.
var. monticola, 72.
mutabilis, O 239, O 252, P 203, P 205, P 206, P 546.
Oregona, 170, O 229, O 233, O 240.
paleacea, O 227, O 229, U 204.
pelta, 16, 19, 23, 26, 48, 49, 84, 92, 136, 214, 309, O 162, O 173, O 199, O 223, O 291, O 319, V 221.
persooni, 16, 19, 23, 26, 84, 136, 151, 170, O 174, O 175, O 199, O 229, O 233, O 252, O 291, 37.
vernicosa, 24, 268.
verniculata, O 229, O 233.
vespertina, 268, O 319.
(var. umbonata, var.) vernicosa, 37.
virginea, 136.

Acroloxus
Nuttalli, 161.

Acrybia
aperta, 71.

Actinia
candida, Q 235.
INDEX OF SPECIES.

Actinocyclus
Sandiegensis, 94.

Actinobolus
borealis, 70.
ventricosus, 17.

Acus
luctuosus, P 387.

Adamsiella
Osberti, 44.

Adeorbis
aljectus, 188, 190, O 273.
scaber, O 295, O 322, P 354.
Verrauxii, 62.

Admete
arctica, 71, O 329.
crispa, O 217.
viridula, 71, O 329.

Adrana
lanceolata, 131.

Adula
cinnamomea, 38, 237.
falcata, 21, 26, 130, 237.
parasitica, 237.
soleniformis, 236.
stylinia, 85, 113, 130, 155, 237.

Ægopsis
cultellata, 159.

Æneta
harpa, 110.

Æolis
iodinea, 94, 95.
Barbarensis, 95.
opalescens, 94, 95.
pinnata, O 313.

Agaronia
hiatula, O 177, O 366, P 472,
P 473.
Steeriæ, O 366.
testacea, 24, 28, 153, 155, 178,
O 340, O 282, O 366, P 272,
P 473.

Aglala
fidelis, 157.
infumata, 157.

Alaba
alabastrites, O 257, O 327, P 368.
conica, O 257, O 327, P vi.,
P 368.
laguncula, O 257, O 328, P 369.
mutans, O 257, O 328, P 367,
P 369, P 370.
sealata, O 257, O 327, P 368.
suprarirata, 109, 259, O 257,
O 327, O 364, P 366, P 367,
P 369, P 530.
terebralis, 109, O 257, O 327,
P 367.
terrvaricosa, O 364.
vioaceæ, O 257, O 327, P 367.

Alasmodon

Alasmodonta

Aletes
centiquadrus, 24, 27, 37, 42, 43,
108, 194, O 324, O 255, O 275,
P 301, P 306.
tcentiquadrus, var. imbricatus,
42, O 255, P 303.
margaritarum, 42, O 255, O 324,
P 303.
Peronii, O 282, O 324.
squamigerus, 43, O 200, O 233,
O 324, O 349, P 303, P 304,
V 226.

Alora
Gouldii, 24, 40.

Alvania
effusa, O 257, O 327, P 359.
excurvata, O 257, O 327, P 359,
P 360.
filosa, 114, 142, 241.
Inconspicua, O 327.
reticulata, 114, 142, 241.
terebellum, O 327.
INDEX OF SPECIES.

Alvania
tumida, 36, 109, 189, O 327, O 357, P 359, P 360.
turrita, O 327.

Amalia
columbiana, 159.

Amalthea
effodiens, R 5.
Grayana, P 299, R 4.
Panamensis, P 297, R 3.

Amiantis
callosa, 22, 26, 39, 106, 126, 151, 279.

Amicula
vestita, 71.

Amnicola
Hindsii, 90.
longinqua, 79, 162, O 283, 325.
Nuttalliana, 84, 162.
protea, 79, 162, O 283, O 325.
seminalis 84.

Amphidesma (=Semele)
bicolor, 203, O 279.
Californicum, O 289.
corbuloides, O 222.
corrugatum, 62.
decisum, O 195, O 228, V 213.
elipticum, 39, 203, O 279.
flavescentis, O 226, U 199.
nucleolus, P 108.
physoides, P 105.
pulchrum, 203, O 188, O 280.
punctatum, O 182.
roseum, O 195, O 228, V 213.
rubrolineatum, O 195, V 212.
rupium, O 182.
striosum, 39, 203, O 280.
tortuosum, 203, O 280.
venustum, P 28.
ventricosum, 39, 203, O 280.

Amphichaena
Kindermannii, O 297.

Amphithalamus
inclusus, 23, 100, 142, 283.
lacunatus, 99, 143.

Ampullaria
cerasum, O 291.
Columbensis, 155, O 291.
Cumingii, O 179, O 291, O 326.
malleata, O 295, O 325.

Amusium
caurinum, 22, 70, 73, 74, 81, 131, 165, 169.

Amyclca
Californiana, 23, 148.
chrysalloidea, 99, 148.
corniculata, 288.
gausapata, 23, 25, 76, 114, 145, 149.
Goeldiana, 53.
minor, 288.
undata, 99, 148.

Anachis
albonodosa, O 263, O 343, P 512.
atramentaria, 180, O 361, O 344.
auriflora, 112.
azorla, O 225.
Californica, 25.
conspera, 180, O 269, O 344.
coronata, 25, 112, 151, 155, O 263, O 171, O 343, P 508, P 513.
costellata, 25, 180, O 210, O 225, O 263, O 343, O 364 P 506, P 507.
?costellata, var. O 263.
(?costellata, var.) pachyderma, O 263, P 507.
costulata, O 363.
duminuta, 25, 180, O 269, O 344.
sulva, 180, O 263, O 283, O 343, P 509.
fuscutata, 25, 59, 61, 180, O 344.
fuscostrigata, 105, 221.
Gaskoinei, 20, 53, 112, 260, O 263.
O 343, P 511.
gracilis, 180, O 344.
INDEX OF SPECIES.

Anachis
Guatemalensis, 35, 181.
lentiginosa, 344.
lyrata, 25, 53, 180, O 344.
maculosa, O 263.
mesta, 181, O 270, O 344, P 509.
nigrigans, 25, 181, O 344, O 361, P 509.
nigrofusca, 263, 343.
nucleolus, 343.
pallida, 112, O 343.
parva, O 344.
peupleuillata, 23, 150, 288.
pseudana, var. O 284, P 510.
pulchrior, 112.
rufotincta, 34, 263, 343.

Anella
floridanum, X 442.
gracile, X 443.
gurgulio, X 442.

Angulus
amphitrite, 155, 272.
decumbens, 271.
Gouldii, 125, 151, 300.
modestus, 88, 125, 167.
obtusus, 125, 235.
tener, 88, 125, 167.
variegatus, 97, 113, 125, 235.

Anodonta (=Anodonta)
angulata, 17, 18, 86, 92, 120, 164, O 206, O 210, O 212, O 297, O 309.
anatina, O 222.
anserina, P 117.
atrorvens, O 295, O 309.
Californiensis, 77.
cellensis, O 222.
cognata, 17, 91, O 210, O 212, O 310.
cornea, O 295, O 309.
feminalis, 17, 86, 120, O 210, O 212, O 213, O 309.

Anellum
clothratum, O 256, O 324, X 442.
elegantissimum, X 443.
flegantissimum, var. Searles-Woodii, X 443.
elongatum, O 256, O 324, X 442.
—— var. semilave, X 442.
firmatum, O 256, O 324, X 442.
Florida num, X 442.
gracile, X 443.
gurgulio, X 442.
pupulatum, O 324.
pulchelum, X 442.
quadratum, O 256, O 324, X 442.
p ——— var. compactum, X 442.
regulare, X 443.
subimpressum, O 256, O 324, X 442.

Anatina
alta, 39, 204, O 280.
arginata, O 231.

Anculus
Nuttalli, 162.

Ancylus
caurinus, 85, 161.
erasus, 161.
fragilis, 161.
Kootaniensis, 90, 161.
Newberryi, 161.
Nuttalli, 85.
patelloides, 120, 161.

Anellum
annulatum, X 442.
INDEX OF SPECIES.

Anodonta
hercula, O 222.
implicata, P 117.
Montezuma, O 265.
Nicaragua, O 295, O 309.
Nuttalliana, 91, 164, O 197, O 211, O 309, V 218.
Oregonensis, 17, 86, 91, 164, O 197, O 213, O 309, V 218.
Randalli, 117, 120.
rotundovata, 117, 120.
sinuata, P 117.
siuosa, P 117.
triangularis, 117.
triangulata, 120.
Wahlamatusis, 86, 91, 92, 120, 164, O 197, O 309, V 218.

Anomala
cumingii, O 287.
inflata, O 287.
ingnis, O 287.

Anomalocardia
flexuosa, O 364, P 79.

Anomia
cumingii, O 287.
inflata, O 287.
ingnis, O 287.

Anomalocardia
flexuosa, O 364, P 79.

Anomala
cumingii, O 287.
inflata, O 287.
ingnis, O 287.

Anomalocardia
flexuosa, O 364, P 79.

Anosia
tenuis, 38, 198, O 277, O 312.

Aplexan
aurantia, P 179, P 180.
elata, P 180.
hyphorum, P 179.
Maugere, P 180.
Peruviana, P 180.

Aphrodite
columba, 47.

Aplysia
Californica, 95.

Arca
aequilatera, O 1.
alternata, 200, O 229, O 277.
Americana, O 249, P 139.
ara, 75.
auriculata, O 277.
aviculooides, 38, 200, O 277.
barbata, var. P 140.
bicolorata, P 140.
bifrons, O 249, O 310, P 134.
Brazilliana, O 289.
brevifrons, 136, O 249, O 310.
canalis, 80.
cardiformis, O 285, O 289, O 310.
c flattata, O 249, P 142, P 143.
coucinna, O 183, O 229, O 310.
congesta, 80.
devincta, O 367.
Domingensis, O 249, P 142.
donaeformis, O 249, P 142.
emarginata, 200, O 183, O 249, O 277, O 310, P 137.
formosa, O 183, O 234, O 310.
fusea, O 243, P 140.
gradata, 200, O 175, O 229, O 278, P 141.
grandis, 23, 85, 153, 200, 260, O 1, O 160, O 175, O 183, O 208, O 226, O 229, O 234, O 249, O 278, O 366, P 132, P 134.
hemicardium, O 234, O 249.
O 278, P 136.
Helbingii, 62, O 278.
INDEX OF SPECIES.

Arca
- illota, var. O 278.
- imbricata, O 249, P 139.
- incongruva, O 249, P 134, P 135.
- labiata, O 183, O 249, O 310,
  O 363, P 134.
- labiosa, O 249, P 134.
- lurida, O 226.
- microdonta, 75.
- multicostata, 27, 85, 102, 107,
  130, 260, O 183, 234, O 249,
  O 310, P 134, P 136.
- mutabilis, 200, P 139.
- nux, O 229, O 310.
- Obispoana, 81.
- ovata, O 236, P 538.
- Pacifica, O 229, O 282.
- pectiniformis, 10, O 178, O 289.
- pernoides, O 283, O 351.
- pholadiformis, 38, 200, O 278.
- pusilla, P 142.
- quadrilatera, O 183.
- Reeviana, 62, 200, O 278, O 310.
- reversa, 200, O 234, O 278,
  O 249, O 310, P 136.
- senilis, 31, O 366, P 132.
- setigera, P 140.
- similis, 38, 200, O 229, O 249,
  O 278, P 135.
- solidia, O 226, O 278.
- squamosa, P 142.
- squamosa, 62, O 249.
- Tabogensis, 200, O 249, O 278,
  P 141.
- trilineata, 80.
- trapezia, 14, O 202, O 249, P 550.
- tuberculosa, 14, 23, 38, 200,
  O 183, O 202, O 229, O 234,
  O 249, O 278, O 310, P 135.
- umbonata, P 142.
- vespertilio, O 226.

Arcopagia
- biplicata, 80, 81.
- lamellata, 97, 125.
- medialis, 80.
- unda, 81.

Arcturus
- rudis, 9.

Argina
- brevifrons, 31, 154.

Argobuccinum
- cancellatum, 33, O 338.
- Chemnitzii, O 338.
- nodosum, 182, O 261, O 270,
  O 367, O 338, P 545, V 209.
- Oregonense, O 338.
- scabrum, O 338.

Argonata
- argo, 99, 112, 150.
- hians, 153.
- var. papyracea, 112.

Arianta
- arrosa, 157.
- Ayrosiana, 158.
- Bridgesii, 158.
- Californiensis, 158.
- Carpenteri, 158.
- Dupetithouarsi, 158.
- exarata, 158.
- intercisa, 158.
- levis, 158.
- Mormonum, 158.
- ramentosa, 158.
- redimita, 157.
- reticulata, 158.
- Townsendiana, 157.
- Traskei, 158.
- tudiculata, 157.

Aricia
- Arabica, 11, P 374.
- arabicula, 27, 109, 176, O 258,
  O 328, P 373, P 374.
- caput-serpentis, P 374.
- obvelata, P 374.
- punctulata, 24, 109, 155, 176,
  O 328.

Arion
- foliatus, 159, O 313.
- foliolatus, O 210.

Artemis
- Dunkeri, 201, O 224, O 278, P 61.
INDEX OF SPECIES.

**Artemisia**
- gigantea, 60, O 352.
- Pacifica, O 278.
- ponderosa, 60, O 289, P 60.
- saccata, 201, O 227, O 246, O 278, P 62, S 161, U 201.
- simplex, O 186, O 246, O 278, O 287, P 61.
- subquadrate, O 186, P 62.
- tenuis, O 281.

**?Assiminea**
- dubiosa, O 275.
- subrotundata, 114, 142, 241.

**Astarte**
- Banksii, O 178.
- borealis, O 219.
- compacta, 88, 128, 168.
- compressa, 88, 128, O 223, P 162.
- corbis, 236.
- corrugata, O 219, O 223, O 306, O 347.
- crassidens, O 175, O 347.
- Danmoniensis, O 223.
- Esquimalti, 128.
- fluctuata, 97, 128.
- Garensis, O 221.
- lactea, 20, 71, 72, O 175, O 219, O 221, O 347.
- Omallii, 128.
- omarla, 97.
- orbicularis, 128, 236.
- Scotica, 20, O 219, O 221, O 223.
- semisulcata, O 219, O 221, O 347.
- fstrata, O 178.
- triangularis, O 336.

**Asteronotus**
- alabastrina, 94.
- sanguinea, 94.

**Asthenothœrus**
- villosior, 104, 209.

**?Atys**
- casta, 104, 212.

**Aulus**
- grandis, 12.

**Auricula**
- acuta, O 275.

**Auricula**
- coneinna, O 275.
- infrequens, O 275.
- Panamensis, O 275.
- papillifera, O 275.
- stagnalis, O 275.
- Tabogensis, O 275.
- trilineata, O 275.

**Autonoe**
- rubra, P 108.

**Avicula**
- Atlantica, O 227, O 236, O 249, O 364, P 148, P 538.
- barbata, 50.
- Cumingii, 50.
- fimbriata, O 296, P 550.
- heteroptera, 50.
- libela, 31, 199.
- margaritifera, O 277, O 295.
- Peruvianna, 107, 153.
- sterns, 24, 50, 199, O 1, O 227, O 229, O 233, O 249, O 277, O 364, P 148, P 151, U 203.

**Axinia**
- Barbarensis, 80, 82, 97, 130, 170.
- inequalis, 154.
- intermedia, 82, 97, 130, 170.
- gigantea, 107.
- multicostra, 154, 155.
- parcipicta, 154.
- pectenoides, 154.
- septontrionalis, var. subobsoleta, 113, 130, 237.

**Bankivia**
- varians, O 253, O 320, O 365, P 226.

**Barbatia**
- alternata, 24, 31, 200, 256.
- aviculoidea, 24.
- gradata, 24, 69, 97, 107, 130, 152.
- illota, 24, 107, 200.
- mutabilis, 155.
- pernoides, 102.
- Reeviana, 27, 107, 200.
INDEX OF SPECIES.

Barbatia
solida, 24, 27, 107.
Tabogensis, 31.
vespertilio, 107.

Barleeia
haliotiphiia, 142, 312.
lirata, 109, 257, O 327, P 552.
rubra, 32, P 552.
subtenuis, 32, 109, 142, 155, 313.
(?subtenuis, var.) rimata, 142, 312.

Barnea
candida, 205.

Bela
decussata, 71.
excurvata, 89, 144, 169.
fidicula, 17, 144, 169, O 331.
harpularia, 71.
rufa, 71.
turgida, 73.
turrucula, 70, 144, O 348.

Bereneicia
trispinosa, P 3.

Bezoardica
abbreviata, 24, 27, 110, 151, 151, 181.
inha, 35.

Binneya
notabils, 95, 157.

Bithinia
nuclea, 162, O 326.
simillis, 144, O 326.

Bittium
armillatum, 25, 99, 141, 311, 323.
asperum, 99, 141, 311, 323.
attenuatum, 141, 310.
Eserichtii, 141.
(?var.) esuriens, 23, 114, 141, 283, 310.
fastigiatum, 23, 141, 283.
filosum, 19, 25, 84, 141, 310, 322.
nitens, 104, 218.
plicatum, 141, 311.
quadriatlatum, 141, 311, 323.
rugatum, 25, 323.

Bivonia
albida, 24, 43, P 307, O 255, O 324.
compacta, 114, 149, 239.
feonorta var. indentata, P 307, O 255.
glomerata, 194, P 309, W 316.
indentata, 43, O 233.
Panamensis, O 324.
Quoyi, 43.
subeancellata, W 315.
sutilis, 43.
triquetra, 43.
var. typica, 43.
var. variegata, 43.

Bornia
inha, P 105.
luticola, 15, O 203.
semlunum, P 108.

Brochus
annulatus, X 414, X 423.
areatus, X 436, X 437.
glaber, X 436.
lavis, X 436.
reticulatus, X 423.
striatus, X 425.
trechiformis, X 416, X 425.

Bryophila (= Philobrya)
setosa, 24, 98, 104, 131, 212.

Buccinum
aciculatum, P 389.
angulosum, 71, O 177, O 347.
Antoni, O 225.
aplustre, 4.
aratum, 10, O 177, O 294.
bilatatum, O 188, O 361, P 515.
boreale, O 176, O 218.
Boysii, 35.
INDEX OF SPECIES.

**Buccinum**
- brevidentatum, 10, O 177, O 178.
- cancellatum, 20, O 218.
- cinis, O 188.
- crassum, 179, O 268.
- decussatum, 18, 49.
- distortum, 10, 179, O 268.
- elongatum, 10, 41.
- fusiforme, O 218.
- gemmatum, O 238, P 515, P 542.
- gemmulatum, O 236, O 238, O 263, P 515, P 536.
- Glaciale, 70, 71, O 218.
- Greenlandicum, O 218.
- hæmastoma, P 477, P 517.
- hydrophanum, O 218.
- insigne, 179, O 268, P 514.
- interstriatum, 77.
- Janelli, O 204, O 263, O 269, P 517.
- lamellosum, 5.
- lima, 4.
- liratum, 4, 5, 83.
- lugubre, 179, O 268.
- interostoma, O 238, P 495, P 542.
- mutabile, O 261, O 263, O 268, P 516.
- nigrocostatum, O 188.
- nodatum, 10.
- Northæ, O 293.
- nucleolus, O 225, P 535.
- Ochotense, 19, 71, O 218, O 221.
- ooides, 19, O 218.
- ovoides, O 221.
- ovum, O 218, O 223, O 342.
- pagodus, 179, O 268, O 293, P 515.
- Panamense, O 296.
- parvulum, O 262, O 269, P 487.
- pastinaca, O 188.
- patulum, P 474.
- var. pelagica, 71.
- planaxis, 10, O 178, O 268.
- plicatum, 4, 5.
- plumbum, 6.
- polaris, O 177, O 218, O 347.
- prismaticum, O 225.
- pristis, 179, O 238, O 268, O 293, P 542.
- pseudodon, O 188.
- pulcharum, O 188, O 270, O 361.
- pusio, O 293.
- ringens, 179, O 171, O 178, O 238, O 269, P 518.
- roseum, O 179.
- Rudolphii, O 178.
- Sabini, O 217.
- sanguinolentum, 179, O 236, O 269, P 517, P 536.
- saturnum, 4.
- scabrum, O 218.
- scalariforme + vars. 70.
- serratum, 48, O 238, O 268, O 293, O 294.
- sericatum, O 218.
- simplex, 19, O 218, O 221.
- Stimpsonii, 73.
INDEX OF SPECIES.

**Buccinum**
- Stimpsonianum, 73, 179, O 269.
- striatum, 28.
- strombiforme, O 178, P 491.
- subrostratum, 9, O 176, O 293.
- tectum, 10, O 178.
- tenebrosum, 0 223.
- tenue, 10, 71, O 177, O 347.
- tiairula, 0 262, P 496.
- tortuosum, 70.
- undatum, 10, 71, 73, O 217, O 221, 0 223.
- undosum, O 263, P 515, P 516.
- undulatum, O 217.
- ventricosum, O 218.
- zebra, P 176.

**Bulimulus**
- artemisia, 158.
- Californicus, 158.
- elatus, 158.
- excelsus, 158.
- inscendens, 158.
- Mexicanus, 158.
- pallidior, 158.
- pilula, 158.
- sufflatus, 158.
- undulatus, 0 288.
- vegetus, 158.
- vesicalis, 158.
- Xantusi, 158.
- Ziegleri, 158.

**Bulimus**
- achatinellinus, O 240, O 315, 0 359.
- alternans, O 181.
- alternatus, O 240, O 315.
- artemisia, 116.
- Bovinus, 59.
- Californicus, 59.
- calvus, O 183, O 240, O 315, 0 359.
- Chemnitzoides, O 240, O 315, 0 359.
- ekordatus, 59.
- cornus, O 183, 315, O 359.
- Darwinii, O 286, O 315, O 359.
- discrepans, 44, O 183, O 315.
- Dysoni, 44.
- eschariferus, O 188, O 240, O 315, 0 359.
- excelsus, 27, 116, O 227, O 234, 0 203.
- fenestratus, O 286, O 290.
- fimbriatus, O 240, O 315.
- Gallapaganus, O 315, O 359.
- Gruneri, O 286, O 290.
- Honduratinus, 44.
- Humboldti, 59, 162.
- inscendens, 116.
- incrassatus, O 315, 359.
- Jacobi, O 315, O 359, O 183, O 188.
- Laurentii, 162.
- Liebmanni, O 295.
- longus, 59.
- Manini, O 315, O 359.
- melania, 59.
- melanochelius, 59, O 251, P 176.
- Mexicanus, 6, 59, O 170, O 314, P 177.
- Moricandi, 44, O 286.
- nuclula, O 287, O 315, O 359.
- nux, O 181, O 240, O 315, O 359.
- obscurus, O 222.
- Panamensis, O 181, O 315.
- Prazianus, 44.
- pilula, 116.
- princeps, O 188, 59, O 251, O 314, P 176.
- proteus, 116.
- punctalissimus, O 265.
- rudis, O 290.
- rugiferus, O 183, O 315.
- rugulosus, O 188, O 240, O 315, O 359.
- Schiedeanus, O 265.
- sculpturatus, O 286, O 315, O 359.
INDEX OF SPECIES.

**Bulimus**
- semipellucidus, 44.
- striatus, 162.
- sufflatus, 21, 27, 116.
- translucens, O 181, O 315.
- undatus, 7, 59, 119, O 170, O 251, P 176.
- unicolor, O 183, O 315.
- unifasciatus, 45, O 183, O 240, O 288, O 315, O 359.
- ustulatus, O 183, O 188, O 315, O 359.
- vegetus, 116, O 227, O 233, U 203.
- verrucosus, O 287, O 359.
- vesicallis, 21, 116, O 227, O 234, U 203.
- vexillum, O 181, O 315.
- xanthostoma, O 265.
- Xantusi, 116.
- zebra, 59, O 251, O 314, P 176, P 540.
- Ziegleri, 59, O 314, P 177.
- zigzag, O 251, P 176.

**Bulla**
- aurantius, 161.
- elatus, 161.
- hypnorum, 161.

**Bulla**
- australis, P 172.
- Californica, 35.
- calyculata, O 175.
- cerealis, O 227, O 229, U 203.
- constricta, U 203.
- crassula, 160.
- culcitella, O 227, O 229, U 203.
- decussata, O 179, O 261, O 271, P 454.
- exarata, O 250, P 173, O 313.
- fontinalis, 160.
- fluviatilis, 161.
- var. fulminosa, 132.
- fusiformis. U 203.

**Bullia**
- gracilis, O 237, O 250, P 171, P 540.
- inculta, 79, O 227, U 203.
- infrequens, O 237, O 250, O 275, P 171.
- Jugularis, 77.
- longinqua, O 284, O 313.
- laticola, 194, O 274, P 170.
- major, P 172.
- media, P 172.
- Panamensis, O 295, O 313, P 172.
- petrosa, 165, O 367.
- punctata, 194, O 189, O 274.
- puncticulata, 194, O 274.
- punctulata, 31, 37, 194, O 229, O 313.
- Quoyii, 5, 24, 100, 107, 132 O 189, O 250, O 313, O 359, P 173.
- rotundata, U 204.
- rufolabris, O 189, O 313, O 359.
- striata, 5, O 364.
- tenella, 85.
- velutina, O 216.
- vesicula, 79, O 227, O 284, U 204.
- virescens, 48, 79, O 284, O 313.
- zebra, P 176.

**Bullia**
- ampullacea, 19, 79, O 218, O 221, O 223, O 342, O 348.
- Perryi, 74.

**Bullina**
- eximia, 90.

**Bursa**
- bituberenlaris, 41.
- fuseo-costata, 41.

?Busycon
- Blakei, 75.
Byssarca

alternata, O 310, P 137.

Americana, O 364.
avienoides, O 310.
divariata, O 249, P 142.

Domingensis, O 364.

fuscata, O 310, O 249, O 364, P 140.

gradata, O 249, O 310, O 364, O 366, P 141, U 203.

illota, O 183, O 249, O 310, P 141, P 142.

lactea, P 141, P 143, O 366.

mutabilis, 24, 107, 200, O 249, O 310, P 139.

Pacifica, 24, 107, 153, O 249, O 310, P 138, P 139, P 296.

pernoides, O 227, O 310, U 202.

pholadiformis, 200, O 278, O 310.

solida, O 249, O 310, O 364, O 366, P 142, P 143, U 203.

Tabogensis, 200, O 278, O 310, P 141.

tetragona, O 366, P 139.

truncata, O 183, O 310, O 359.

vespertilio, O 249, O 310, P 140.

Cadium
dentatum, O 238.

ingens, O 238.

Cæcum

eburnum, 186, O 4, O 166, O 272, X 427.
elegantissimum, X 429, X 430.

(elegantissimum, var.) Searles-Woodii, X 430.
elongatum, P 320, X 424.
elongatum, var. semilaeve, X 429.

farcimen, X 431.

firmatum, 186, O 4, O 166, O 256, O 272, O 357, P 319, P 320, P 321, P 324, P 326, X 427.

firmatum, var., O 272, 273.

Florianum, X 428, X 429.

glabriforme, O 366, P 327, P 328.

glabrum, O 366, P 313, P 314, P 327, X 413, X 426, X 432, X 436.
gracile, X 429.]
gurgulio, X 426.

heptagonum, P 319, X 422.
imbricatum, X 422.
imperforatum, P 321, X 413, X 425.

incurvatum, X 434, X 436.

insculptum, P 315, X 420.

laeve, 155, 186, O 272, P 314, P 325, P 326, X 431.

liratocinctum, 155, P 315, P 316, P 317, P 319, X 421.
liratum, X 421.

mamillatum, X 427, X 434, X 436.
mamillatum, var. subulatum, X 434.
mamillatum, X 434.

monstrosum, O 4, O 166, O 256, O 272, P 313, P 321, X 427.
nitidum, X 439.
obtusum, P 317, X 421.

parvum, 186, O 256, O 273, P 323.

plicatum, X 421.
INDEX OF SPECIES.

Caecum
pollicare, X 429, X 432.
pulchellum, P 312, P 313, X 415, X 424.
pygmeum, 186, O 4, O 166, O 256, O 273, P 321, X 427

quadratum, X 428.

regulare, X 417, X 423, X 428.

reversum, P 329, X 434.
Searles-Woodii, X 430.

var. semilsecve, 39, 0 256, P 319.

var. subconicum, 256.


subspirale, P 315, P 316, X 419.

subquadratum, 39, X 433.

var. tenuiliratum, 256.

teres, P 329, X 434, X 440.

trachea, P 313, X 413, X 414, X 415, X 416, X 417, X 418,
P 424, X 425, X 426, X 427, X 429.

(?trachea, var.) obsoletum, X 426.
tumidum, X 426.

undatum, 36, 186, O 4, O 272, O 357, P 314, P 321, P 323,
P 325, P 326, X 429, X 430, X 431.
vitreum, X 429, X 432.

(?vitreum, var.) Clarkii, X 433.

Calcar
erithrophthalmus, O 296, P 227.

olivaceus, O 238, P 541.

Melchersi, O 238, P 227, P 541.

stellaris, O 238, P 541.

Callochiton
Elenensis, 198.

interstinctus, O 317, O 348.
pulchellus, 198, 267, O 317.

Calliostoma

filosum, 3, 13, 138.
gemmulatum, 98, 139.
imbricatum, 196.

Leanum, 24, 32, 40, 154, 191.

ligatum, 3.

lima, 24, 53, 154, 272.

M'Andreae, 32, 36, 40.

modestum, 3.
splendens, 98, 139.

supragranosum, 98, 139.

variegatum, 89, 138.

versicolor, 152, 272.

virgineum, 138.

Callista
affinis, 30.

alternata, 30, 106.
aurantia, 23, 106, 201.
callosa, 39, 57.

chionnea, 23, 27, 57, 106, 151, 201.
cireinata, 23, 30, 154.

concinnia, 27, 30, 201.

consanguinea, 201.

Dione, 57.

lupinaria, 6, 23, 57.
pannosa, 91, 170.

(?pannosa, var.) puella, 23, 58, 104, 170, 211.
petechialis, 30.

prora, var. 104.

rosea, 23, 57, 58.

semilamellosa, 153, 154.

spinosissima, 154.
tortuosa, 23, 30.
vulnerata, 151.

Callochiton

Calliostoma

(Pilima, var.) æquisculpta, 154, 272.

annulatum, 13, 27, 138.

Antoni, 36, 191.

canaliculatum, 6, 13, 23, 27, 113, 138.
castaneum, 3.
costatum, 13, 19, 23, 25, 27, 138.
dolarium, 13, 138.

Callopoma
fluctuatun, 153, O 253, O 348, P 223, Q 234.

(?fluctuatun, var.) depressum, 41, O 253, O 288, P 223, Q 234.
INDEX OF SPECIES.

**Callopoma**
- fluctuosum, 27, 192, O 224, O 253, O 320, P 223, P 224.
- phasianella, O 320 [vide 550].
- saxosum, 24, 192, O 282, O 288, O 320.
- tessellatum, 31, 151, 192.

**Calypeopsis**
- auriculata, 3, P 290.
- Byronensis, 3.
- hispida, 3, 275, P 290.
- imbricata, P 287.
- lignaria, 3, O 184, P 290.
- quinquina, 3, O 190, P 291.
- serrata, O 184.
- tubifera, 61.

**Calyptraea**
- aberrans, 37, 195.
- Adolphi, O 172.
- alveolata, 51.
- amygdalus, O 204, O 254, P 278.
- Araucana, P 265.
- arenata, O 184.
- aspersa, 37, 195.
- auricularis, P 287, P 289.
- auriculata, O 190, P 287, P 290, P 292.
- Byronensis, O 255, P 291.
- cepacea, 37, 195, O 235, O 239, O 255, O 275, O 323, P 295, P 546.
- cinerea, 48.
- conica, 37, 195, O 239, O 275, P 265, P 266, P 545.
- cornea, P 295.
- corrugata, 52, O 184, O 323.
- dentata, 195, O 236, O 255, O 275, P 287, P 538.
- dilatata, P 265.
- dorsata, P 273.
- echinus, O 2, P 268.
- equestris, P 295.

**Calyptraea**
- excavata, O 184, P 274.
- ?extinctorum, 47, O 3, O 174, O 236, P 267, P 287.
- fastigata, O 209.
- foliacea, P 272.
- gemmacea, O 204, P 288.
- hystrix, O 2, P 268.
- incurva, P 276.
- intermedia, P 292.
- lavigata, P 267.
- Lamarckii, O 236, O 239, O 254, P 266, P 538, P 545.
- Lessonii, O 2, P 280.
- lichen, O 254, P 265.
- lignaria, O 184, O 190, O 255, P 290, P 291, P 292.
- loricata, P 292.
- mamillaris, O 230, P 266, P 267, P 292.
- marginalis, O 184.
- perforans, O 204, O 255, P 281.
- peziza, O 255.
- pileiformis, O 212.
- pileolus, P 292.
- planulata, 37, 195, O 275, O 318.
- quiriquina, O 190, O 255, P 291, P 292.
- radians, P 264, P 265.
- radiata, 195, P 275, P 291.
- regularis, 195, O 230, O 233, O 254, O 276, P 266.
- rudis, O 184, P 292, P 295.
INDEX OF SPECIES.

Calyptreae

rugosa, 48, O 3, O 190, O 204, O 236, O 255, O 275, P 287, P 290, P 291, P 292.
serrata, O 184.
sordida, P 267.
squama, O 2, O 184, P 280.
striata, U 205.
strigata, P 272.
tenuis, O 184, O 255, P 290, P 291, P 292.
tortilis, 51.
trigonalis, 224.
tubifera, 3, O 204, O 255, P 290, P 291, P 292.

Czancellaria

corrugata, O 206.
costata, P 380.
costellifera, O 217.
Couthouyi, O 217.
crenata, O 206, O 329.
decussata, 24, O 181, O 271, O 329.
elata, O 206, O 329.
funiculoata, 51, O 206, O 329.
gemmulata, O 181, O 329.
haemastoma, O 181, O 329, O 360.
indentata, O 181, O 206, O 329.
lyrata, 51.
mitriformis, 24, O 271, O 329.
modesta, 114, 146, 245.
obesa, 27, O 181, O 235, O 352, O 329, P 380.
oblonga, O 265.
ovata, P 380, P 543.
pulchra, O 271.
pygmaea, 36, 183, O 271, O 329.
reticulata, 61, O 192.
rigida, P 381.
solida, 27, O 181, O 235, O 271, O 329, O 352.
teressellata, 24, O 271, O 329.
uniplicate, O 182, O 271, O 329.
vendricosa, O 206, O 329.
viridula, O 217.

Cantharus

gemmatus, P 516.
ingens, 518.
sanguinolentus, P 517.

Capsa

altior, 202, O 182, O 279.
Braziliensis, O 364.
deflorata, 63.
lavrigata, O 364, P 42.
INDEX OF SPECIES.

Capulus
  militaris, P 300.
  mitrula, P 297, R 3.
  subrufus, R 4.

Cardita
  arecella, 14.
  borealis, 9, 70, O 210, O 219, O 221, O 223.
  Californica, O 232, O 234, O 287, O 352, P 84.
  corbis, 128.
  crassa, 178, O 306.
  Cuvieri, 10, 181, 208, O 306.
  laticostata, 201, O 182, O 278, O 306.
  incrassata, O 287, O 306, O 359.
  Michelini, 10, 14.
  modulosa, 14, O 278.
  monilicosta, 118.
  nodulosa, O 278.
  occidentalis, 17, 80.
  planicosta, 75.
  radiata, 201, O 182, O 278, O 306.
  spurca, O 221.
  subtenta, 17, 165, O 367.
  turgida, 14.
  varia, O 181, O 306, O 359.
  variegata, 128, 280.
  ventricosa, 17, 80, 91, O 209, O 210, O 213, O 306.
  volucris, O 229.

Cardium
  blaudum, 14, 17, 49, 70, 91, 128, O 210, O 212, O 213, O 307, O 348.
  boreale, O 175.
  bullatum, O 364.
  Californianum, 13, 14, 17, 49, 119, O 197, O 203, O 212, 0 213, O 219, V 217.
  Californiense, 14, 17, 70, 91, 128, O 197, O 203, O 219, O 221, O 223, O 232, O 234, O 283, O 307, O 347.
  carneosum, P 40.
  centifilosum, 97, 128.
  corbis, 5, 13, 17, 91, 128.
  costatum, 45, P 95.
  erucentatum, 21, 78, O 227, O 284, O 307, O 352, U 201.
  Cumingii, O 183, O 307.
  Dionaeum, O 175.
  discors, 60.
  Elenense, P 91, U 201.
  Gabbii, 119.
  gemmatum, O 229.
  graniferum, 25, 30, 154, 201, 322, O 175, O 187, O 229, O 248, O 278, O 307, P 85, P 95.
  Groenlandicum, 47, 70.
  Icelandicum, O 210.
  Indicum, 45, O 288.
  Laperousii, 14, O 203, O 307.
  laticostatum, O 247, P 92.
  linteum, 75.
  lucinoides, O 248, P 96.
  luteolabrum, 13, 21, 128, O 197, O 227, O 307, O 351, U 201.
  maculatum, 45, O 282, O 285.
  maculosum; 45, O 229, O 285, O 307.
  magnificum, O 187.
Cardium
modestum, 75, 97, 128.
Mortoni, U 201, V 218.
muricatum, O 175, O 236, O 247, O 364, P 93, P 539.
Niccolleti, 75.
Nuttallianum, O 192.
obovale, 23, 201, O 229, O 278, O 307.
Panamense, O 178, O 183, O 232, O 234, O 307, P 92
planioostatum, 38, 201, O 183, O 278, O 307.
procerum, 14, 23, 106, 152 153, 201, O 178, O 183, O 236, O 247, O 278, O 307, P 91, P 92, P 539.
pseudofossile, 14, 17, 49, 70, 128, O 247, P 94.
punctulatum, O 247, P 93.
quadragenarium, 13, 21, 86, 128, O 197, O 307, V 217.
radula, O 175, O 236.
rastrum, O 247, O 278, P 93.
rotundatum, O 247, O 307, P 531.
senticosum, 23, 106, 201, O 247, O 278, O 307, P 93.
serratum, O 364.
subelongatum, 14.
substriatum, 78, O 197, O 232, O 307, O 351, U 201, V 218.
triangulatum, O 247, P 94.
xanthocheilum, 128, O 197, O 227, O 232, U 201.
Carinea
emarginata, 24, 176.
gibbosa, 176.

Carinifex
Newberryi, 161.

Carocolla
Ilhaydiana, O 265.
labyrinthus, O 165.

Carocolla
quadridentata, O 180.
unifera, O 290.

Cassidaria
setosa, O 261 O 367, P 455.

Cassidulus
patulus, P 501.

Cassis
centiquadrata, O 171, O 292.
corrugata, 7.
doliata, O 171, O 292.
granosa, O 238.
inflata, 181, O 238, O 364, P 543.
lactea, O 270, O 292.
Massene, 10, O 188.
ringens, 7, O 174, O 238.
tenus, O 188, O 337, O 360.
testiculus, O 171, O 364.

Castra
Tureica, 48.

Cavolina
crassicornis, O 173.
subrosacea, O 173.
telemus, 98, 107, 132.

Cellepora
areolata, 34, 256.
cyclostoma, O 244, O 298, P 5.
papilliformis, O 244, O 298, P 5.

Cerithium
adustum, O 189, O 256, O 272, O 293, O 325, O 366, P 333, P 334.
alboliratum, 24, O 256, O 325, P 336.
asimillatum, O 272, O 289, P 445.
bimarginatum, 185, O 272.
Californianum, O 212.
INDEX OF SPECIES.

Cerithium

corallium, O 170.
familicium, 36, 185, O 256,
  O 272, O 282, P 334, P 335.
filosum, 17, 185, O 209, O 212,
  O 295.
fragaria, 7, O 170.
Gallapaginis, 32, 63, 185, O 189,
  O 256, O 272, O 325, P 338.
gemmatum, O 272, P 339.
granosum, 7, O 170.
Guiiiaicum, P 333.
Hegewischii, 295, P 345.
interruptum, 24, 32, 36, 45, 63,
  108, 155, 185, O 189, O 226,
  O 238, O 256, O 272, O 325,
  O 360, P 337, P 338, P 542.
lostoma, P 345.
irroratum, 17, 32, 36, 45, 185,
  O 189, O 209, O 256, O 272,
  O 283, O 325, P 337.
Largillierti, P 343.
luna, O 170, O 222.
literatum, O 170.
maculosum, 7, 24, 27, 108, 185,
  O 189, O 230, O 238, O 256,
  O 272, O 282, O 293, O 325,
  O 360, O 366, P 333, P 339,
  P 340, P 542.
mediale, O 367.
var. mediolæve, 24, 35, 108, 185,
  O 256, P 334.
Menkel, P 338.
Montagnei, O 190, O 239, P 342,
  P 343, R 345, P 542.
musicum, 7, O 170, O 171,
  O 256, O 325, P 335.
nebulosum, O 189, O 256, O 325,
  P 333.
neglectum, 185, O 272.
obesum, 17, 32, 185.
oellatum, 45, O 189, O 236,
  O 238, O 256, O 296, O 325,
  O 366, P 337, P 536, P 542.
Pacificum, 48, 185, O 170, O 272,
  O 325.

Cerithium

pauperclum, 186, O 272.
Peruvianum, P 442.
pulchrum, 186, O 256, O 272,
  P 343.
Reeviousanum, 186, O 256, O 272,
  P 343.
reticulatum, 6.
sacratum, O 209, U 206, V 226.
stercusmuscuarum, 17, 27, 32,
  36, 108, 152, O 170, O 209,
  O 233, O 236, O 238, O 256,
  O 272, O 282, O 325, O 360,
  O 366, P 337, P 339.
terebellum, O 289.
trillineatum, O 289.
umbonatum, O 256, P 335.
uneinatum, 24, 63, 108, 151,
  185, O 256, O 272, O 285,
  O 325, O 364, P 334, P 335.
validum, 186, O 163, O 257,
  O 272, P 344.
varicosum, 7, 48, O 170, O 189,
  O 190, P 343, P 344.
vulgatum, O 170.

Cerithidea

albonodosa, 153, 186, O 228,
  O 253, O 325, O 351, U 205.
Californica, 141.
fusca, 79, O 228, O 233, P
  345.
Lavalleana, O 364.
Mazatlanica, 108, 141, 186,
  O 233.
Montagnei, 24, 27, 151, 186,
  O 230, O 256, O 272, O 325,
  P 342, P 343.
pulchra, O 325.
pullata, 141, 151, O 325, O 351.
Reeviousana, O 325.
sacrate, 23, 79, 141, O 200, O 228,
  O 230, O 233, O 325, O 351,
  P 345, U 206, V 226.
(sacrate, var.), fusca, U 206.
solida, O 230.
valida, O 230, O 325.
Cerithidea
varicosa, 7, 24, 186, 208, O 170,
O 190, O 230, O 233, O 272,
O 295, O 325, O 364.
vvaricosa, var. Mazatlanica,
O 257, P 344, U 206.

Cerithiopsis
assimilata, 99, 110, 146, 155,
274, O 260, O 335, O 364,
P 445.
bimarginata, 274, O 335.
cerea, O 260, O 335, P 443,
P 445.
columna, 99, 114, 146, 245.
convexa, O 260, O 335, P 44.
decussata, O 260, O 335, P 445.
flosa, O 335, O 348.
fortior, 23, 146, 287.
terebralis, 274.
munita, 114, 146, 245.
neglecta, 185, O 336.
paupeirea, O 336.
pupiformis, O 260, O 335, P 443.
purpurea, 23, 146, 287.
sorex, O 260, P 335, P 444.
terebella, O 364, P 445.
terlineata, P 445.
tuberenlaris, 169, 186, O 366.
?tuberculata, 23, 114, 146, P 442.
tuberculoide, 32, 36, 110, O 260,
O 335, O 366, P 442, P 443.
?tuberculoide, var. albonodosa,
O 260, P 443.

Cereus
conglomeratus, 4.

Cerostoma
var. Burnettii; 72.
foliatum, 13, 48, 72, 149, 169,
O 345.
moniceros, 13, 149, 151, 152.
moneol, 83, 149, O 345.
Nuttallii, 13, 27, 149, O 201,
O 345, O 349, V 229.

Chama
Broderipii, P 89.

Chama
Buddiana, 26, 30, 38, 106, 200,
247, O 277, O 307, P 89.
chionae, 178.
corrugata, 27, 38, 154, O 184,
O 277, O 307.
crassiocestata, 10.
Delessertii, P 549.
echinate, 9, 30, 38, 106, 200,
O 178, O 184, O 234, O 247,
O 277, O 307, P 87, P 549.
exogra, 11, 71, 106, 127, O 232,
O 247, O 307, O 349, O 351,
O 352, O 353, P 90, V 217.
frondosa, 9, 23, 106, 152, O 178,
O 197, O 232, O 282, O 306,
P 87, P 549.
?frondosa, var. fornicatea, 38,
200, O 247, O 277, P 89.
frondosa, var. Mexicana, 200,
O 178, O 197, O 247, O 307,
O 352, O 353, O 364, P 87,
P 89, P 548, V 217.
imbricata, 63, O 184, O 307.
Janus, O 186, O 307, O 359.
lobata, 11, 71.
Mexicana, 30, 38, O 232.
Panamensis, O 186, O 307, P 90.
pellucida, 22, 127, 170, O 197,
O 232, O 307, O 351, V 217.
producta, 27, O 184, O 307.
rugosa, O 234.
spinosa, 23, 27, 97, 106, 128,
O 208, O 247, O 307, O 359,
P 89, P 90.
squalida, O 178.
venosa, O 232.

Chelyconus
punctiulatus, P 404.
purpurascens, P 402.
regalitatis, P 403.

Chelysoma
MacLeayanum, O 176

Chemnitzia
Adamsii, 36, 110.
Chenmitzia

INDEX OF SPECIES.

Chemnitzia

aculeus, 187, 188, O 260, O 273, O 335, P 427, P 428.
acuminata, 36, 187, O 273.
affinis, 33, 36, 187, O 260, O 273, O 335, P 429.
?var. aurantia, 23, 89, 145, 315.
bicarinata, T 171.
bittiformis, T 171.
caelata, 24, 294.
cancellata, O 260.
C.-B.-Adamsii, O 260, O 335, P 427.
chocolata, 99, 145, 316.
clatliratula, 36, 187, 273, P 424.
comnmnis, 36, 187, 190, O 260, O 335, P 427.
crebrifilata, 23, 285.
curaingii, T 170.
flavescens, 110, O 260, O 334, P 432.
gibbosa, O 260, O 334, P 430.
gracillima, 36, 188, O 260, O 334, P 431.
gracillior, 187, O 273, O 335, P 431, P 432.
intermedia, O 260.
major, 30, 187, O 273, O 335.
marginita, 187, O 273.
muricata, O 260, O 334, P 428.
paucliratula, O 260.
polyzonata, T 170.
prorlongata, 110, O 260, O 334, P 429.
reticulata, P 433.
rubrofusca, T 171.
sclaris, P 414.
similis, 33, 36, 188, O 260, O 273, O 335, P 428.
striosa, 188, O 273, O 335.
?var. stylina, 23, 145.

Chenmitzia

subangulata, O 260.
tennicula, 23, 145, O 228, O 230, O 334, O 349, U 207.
(?tenunicula, var.) subcuspidata, 99, 145.
tenuilirata, 154, O 260, O 334, P 433.
terebralis, O 260, O 334, P 432.
toruata, 23, 89, 90, 145, 286, O 228, O 230, O 334, O 349, U 207.
(?toruata, var.) stylina, 286.
tridentata, 23, 89, 145, 315, 316.
turrita, 36, 188, 190, O 273, O 335, P 429, T 171.
undata, 33, 36, 187, O 260, O 334, P 431, P 432.
unifasciata, O 260, O 335, P 433.
Vancouverensis, 90, 145.
virgo, 23, 145, 286, 294.

Chione

amathusia, 23, 27, 152, 154, 201, O 236, O 247, P 71, P 72, P 80.
astartoides, 39.
badia, 58.
var. bilineata, 106.
Californiensis, 7, 127, 152, O 197, V 216.
callosa, 13, 39, 127, 152, O 197, O 281, V 216.
cancellata, 13, 127.
Columbiensis, O 247, P 75.
crenifera, 201, O 247, P 74.
discors, P 77.
distans, O 247, P 74.
eexcavata, 13, 127, O 197, V 216.
fluctifraga, 22, 39, 127, 152, 153.
gnidia, 27, 151, 152, O 247, P 71, P 72, V 215.
gnidia, var. P 72.
grata, P 77.
histrionica, O 247, P 77.
var. lilacina, 106.
Lordi, 91.
<table>
<thead>
<tr>
<th>Chione</th>
<th>Chiton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lupanaria, P 67.</td>
<td>Dispar, 37, 198, 261, 266, O 181, 0 276.</td>
</tr>
<tr>
<td>Negleeta, 23, 106, 151, O 192, 0 203.</td>
<td>Elenensis, O 180, O 318.</td>
</tr>
<tr>
<td>Squalida, P 64.</td>
<td>Goodallii, O 180.</td>
</tr>
<tr>
<td>Straminea, V 215.</td>
<td>Hartwegii, 40, O 287, O 318, O 349, Q 231, Q 232.</td>
</tr>
<tr>
<td>Succincta, 13, 22, 25, 26, 27, 40, 127, 151, 152, 154, 322.</td>
<td>Hindsii, 92, O 229.</td>
</tr>
<tr>
<td>Undatella, 106, P 75.</td>
<td>Incarnatus, 35.</td>
</tr>
<tr>
<td>Chiorasra</td>
<td>Insignis, O 208, O 214.</td>
</tr>
<tr>
<td>Leonina, 95, O 210, O 213, O 313.</td>
<td>Interstinctus, 16, O 210.</td>
</tr>
<tr>
<td>Chironia</td>
<td>Lavivatus, 92, O 285, P 191.</td>
</tr>
<tr>
<td>Laperoussii, O 202, O 203.</td>
<td>Lignarius, O 209.</td>
</tr>
<tr>
<td>Chiton</td>
<td>Lignosus, 16, 19, 84, O 209, O 318, O 348.</td>
</tr>
<tr>
<td>Achates, 72.</td>
<td>Limaeformis, O 180, O 252, P 104.</td>
</tr>
<tr>
<td>Acutus, 13, O 198, O 318, Q 232, V 221.</td>
<td>Lineatus, 9, O 208, O 214, O 223, O 229, O 318.</td>
</tr>
<tr>
<td>Albolineatus, O 175, O 290, P 191.</td>
<td>Lividus, 19, O 215, O 223.</td>
</tr>
<tr>
<td>Albus, 71, 72.</td>
<td>Loeschhoanus, O 175.</td>
</tr>
<tr>
<td>Amiculatus, 19, O 214, O 223.</td>
<td>Luridus, 198, 276, O 318.</td>
</tr>
<tr>
<td>Armatus, O 198.</td>
<td>Magdalensis, O 206, O 233... Marginatus, 92.</td>
</tr>
<tr>
<td>Articulatus, O 178, O 233, O 290, P 190, Q 232.</td>
<td>Mercckii, 19, 40, O 215, O 223.</td>
</tr>
<tr>
<td>Blainvillei, 72, O 233.</td>
<td>Mertensii, 19, O 215, O 224.</td>
</tr>
<tr>
<td>Brandtii, 19, O 215, O 219, O 223.</td>
<td>Montereyensis, 16, 40, O 287, O 318, O 349, Q 231.</td>
</tr>
<tr>
<td>Californicus, 13, O 198, O 229, O 318.</td>
<td>Muricatus, 18, O 215.</td>
</tr>
<tr>
<td>Chlamys, O 214.</td>
<td>Muscosus, 16, 72, 84, O 198, O 209, O 229, O 317, O 348, V 221.</td>
</tr>
<tr>
<td>Clathratus, 267, O 276, O 318.</td>
<td>Nuttallii, 13, O 198, O 318, O 349, Q 231, V 221.</td>
</tr>
<tr>
<td>Collei, O 229.</td>
<td>Ornatus, 16, O 198, O 229, O 318, O 349, Q 232, V 221.</td>
</tr>
<tr>
<td>Concinus, 72.</td>
<td>Proprius, O 290.</td>
</tr>
</tbody>
</table>
### Chiton

- regularis, 40, O 287, O 318, Q 232.
- retusus, O 180.
- sanguineus, 63, O 364, P 194.
- scaber, O 229, O 290, O 317.
- seabriculus, O 180, O 318.
- serobiculatus, 19, O 215, O 224.
- setiger, O 214.
- setosus, 18, O 178, O 180, O 214, O 215, O 318.
- Simpsonii, O 208.
- Sitchensis, 19, O 192, O 214, O 229, O 290.
- Stelleri, 19, O 194, O 214, O 223, O 229.
- Stimpsonii, 72.
- Stokesii, 38, 153, 198, 266, O 180, O 229, O 277.
- submarmoreus, 84, 214, O 219, O 223.
- sulcatus, 9, O 187.
- textilis, 35.
- tunicatus, 9, 84, O 178, O 192, O 214, O 223, O 288.
- vespertinus, 16, O 210.
- vestitus, O 175, O 223, O 296.
- Wosnessenskii, 19, 92, O 214, O 318.

### Chlorostoma

- aureotinctum, 28, 138, 152.
- brunneum, 27, 138.
- gallina, 138, 152.
- maculosum, 21, O 227.
- marginatum, 79.
- moestum, 49, 170.
- nigerrimum, 28, 138.
- Pfeifferi, 23, 27, 138.
- var. pyriforme, 138.
- rugosum, P 233.
- var. subapertum, 113, 138.

### Choristodon

- typicum, 29, O 244, O 364, P 447, P 529.

### Choruss

- Belcheri, 60, 149, 151.

### Chaetopleura

- muscosa, 16.
- dentiens, 16.

### Chrysallida

- acuminata, O 273, O 334.
- angusta, 104, 219.
- cancellata, O 364.
- cincta, 99, 145.
- clathratula, 36, 187, O 259, O 273, O 334, P 424.
- convexa, O 260, O 334, P 422.
- crebristriata, T 170.
- effusa, 36, 39, 187, O 259, O 334, P 422.
- fasciata, 39, O 259, O 334, P 417, P 423.
- indentata, O 260, O 334, P 425.
- marginata, O 273, O 334, P 423.
- nodosa, O 259, O 334, P 369, P 417.
- oblonga, O 259, O 334, P 418.
- ovata, O 259, O 334, P 417, P 418.
- paupercula, 36.
- Photis, O 260, O 334, P 425.
- pumila, 99, 145.
- Reigeni, O 259, O 334, P 422.
- rotundata, O 259, O 334, P 418, P 419.
- telescopilum, 36, 39, 187, O 259, O 334, P 418, P 421, P 422.

### Chrysodomus

- antiquus, 69, 70, 83, 166, 183, O 343.
- Baeri, O 343.
- Behringii, O 343.
INDEX OF SPECIES.

Chrysodomus

var. Behringianus, 83.
carinatus, 25, 322.
cassidariiformis, 70.
dececostatus, 83, 149.
dirus, 19, 25, 77, 83, 150, 322.
despectus, var. 25.
forncatus, O 347.
incisus, 83, 150.
Islandicus, 71, O 343.
liratus, 4, 20, 149, 169.
luridus, O 343.
Middendorfii, 20, 83, 149.
rectirostris, 89, 150.
Schuantaricus, 71.
Sitchensis, 49, 83, 150, O 343.
tabulatus, 25, 83, 89, 90, 102, 114, 149, 322.
Cingula

inconspecua, 33, 36, 190.
? —— O 274.
lavis, O 220.
minuta, 20, O 220.
paperecula, 33, 36, 190, 259, O 274, O 327.
saxieola, O 274, O 327.
striata, O 220.
terebellum, 33, 36, 190, O 274.
tervariaosa, O 257, P 366.
?turrita, 33, 36, 190, O 274.
Clirce

margarita, O 247, O 306, P 81, P 82.
minima, 30, P 82.
nummulina, 58.
subtrigona, O 247, O 306, P 82.
Circestrema

diademata, O 336, O 360, P 448.
funiculata, 192, O 284, O 336, O 360, P 447.
Clirrus

nodosus, P 354.
Cistula

trochlearis, 45.
Cithara

concina, 183.
fusconotata, 104, 218.
sinnata, O 234, O 332, S 162.
stromboides, 23, 39, 109, O 332.
Clathrus

hexagonus, P 446.
Clathurella

aurea, O 259, O 331, P 400.
bella, O 332.
bicanalifera, 183, O 332, P 400.
candida, O 332.
cornuta, O 332.
corrugata, O 332.
ericea, O 332.
exigua, O 332.
terecalaris, O 284, O 332.
gemmulosa, O 332.
merita, O 332.
micans, O 332.
neglecta, O 332.
occata, O 332.
quiscalis, O 332.
rava, O 259, P 399, P 400.
rigida, 184, O 332.
sculpta, O 332.
serrata, O 284, O 332.
variculosa, O 332.
Clavella

distorta, 25, 179, O 344.
Clavatula

aspera, O 205.
bella, O 205.
calata, O 205.
Californica, 75.
candida, O 205.
ericea, O 205.
Griffithii, 61.
Impressa, O 205.
luctuosa, O 205, P 397.
merita, O 205.
micans, O 205.
militaris, O 205.
INDEX OF SPECIES.

Clavatula
neglecta, O 205.
ocata, O 205.
pardalis, O 205.
plumbea, O 205.
pudica, O 205.
proruta, 75.
quiscalis, O 205.
raa, O 205, P 399.
riga, O 205.
sulpta, O 205.

Clementia
gracillima, O 246, O 305, P 54.
subdiaphana, 88, 93, 126.

Clidiophora
acutedentata, 227.
aruata, 228.
claviulata, 225, 226, 228, 229.
cristata, 226.
depressa, 227.
discors, 228.
nasuta, 167, 226.
tabacea, 226.
trilineata, 12, 124, 167, 226, 227.

Closia. See Volutella.

Cochlea
neritoides, 160.

Cochlodesma
Leana, Q 229.

Cochlogena
melania, 59.
vittata, 59

Cochlostyla
princeps, P 177.
undata, P 176.

Codakia
exasperata, 30.
punctata, 30, 106.
tigerrina, 23, 27, 106, O 248, P 96.

Coelodon
Cumingii, 229.
delicutalus, 229.
elongatus, 229.
flexuosus, 228, 230.
ungeniculus, 230.

Collonia
marginata, 49.
phasianella, 192.

Columbella
aciula, 53.
albuginosa, 221.
angularis, O 181.
atramentaria, O 186, O 269.
baccata, 111.
bicanalifera, O 181, O 231.
bicolor, 59, O 270.
Boivinii, 52, O 265, O 269.
O 341.
Bridgesii, 52.
Californiana, O 286, O 341.
Californica, 53, O 351.
carinata, 23, 148, 151, O 206.
O 231, O 341, O 349, O 351.
castanea, O 181, O 192, O 341.
cervinetta, O 262, O 341, P 493.
—— var. obsoleta, O 262, P 493.
sitharula, O 238, O 269.
conformis, O 235.
conspicua, O 269.
coronata, O 181, P 507, P 508.
costata, 59, O 171, O 263, P 508.
costellata, 35, 180, O 176, O 181.
O 269, P 506.
costulata, O 263, O 284.
eribraria, 53, O 171, O 189, O 231, P 487.
diminuta, 34, 180, O 269.
dormitor, 284.
dorsata, 180, O 269.
electroidees, 53.
elegans, O 181.
encastica, 53.
festiva, 25, 111, O 180, O 231.
O 288, O 341.
fluctuata, O 180, O 181, O 269.
fulgurans, P 505.
fulva, 180, O 181, O 238, O 269.
P 509, P 543.
INDEX OF SPECIES.

Columbella

fuscata, 25, 111, 151, 180, O 171, O 181, O 210, O 235, O 238, O 262, O 269, O 283, O 294, O 341, P 489, P 492, P 543.

fuscata, var. 28.

fusiformis, O 206.

gausapata, 17, 84, 148, O 210, O 341, O 348.

gibberula, 180, O 231, O 269.

gibbosa, O 171, O 234, O 262, O 269, P 489, P 491.

Gouldiana, 21.

Gouldii, 53, O 231.

gracilis, 180, O 269.

guttata, 53, 180, O 181, O 231, O 262, O 269, P 487.

Hemastoma, 111, O 181, O 192, O 231, O 269, O 294, O 341, O 361.

Haneti, 62.

harpiformis, 61, 181, O 181, O 230, O 231, O 236, O 238, O 269, O 341, P 537, P 543.

Hindsii, 23, 114, 148.

humerosa, 155, 274.

labiosa, 25, 48, O 269, O 283, O 341.

lactea, 53.

lanceolata, O 181, O 190.

lentiginosa, O 206.

ligata, O 341.

livida, O 181, O 341.

lyrata, 180, O 181, O 269.

maculosa, O 181, O 231, P 513.

major, 25, 52, 111, 180, O 171, O 181, O 210, O 231, O 236, O 262, O 269, O 341, P 489, P 491, P 492, P 507, P 537.

maura, O 181.

meleagris, O 262, O 269, O 294, P 492.

mercatoria, O 222.

filillepunctata, var. 25.

mitriformis, O 177, O 262, P 487.

modesta, 180, O 270.

Columbella

moesta, 181, O 270.

nasuta, O 238, O 341, P 543.

nigricans, 181, O 186, O 231, O 270.

Pracifica, 53.

pullida, O 235, P 535.

pardinis, O 341.

parva, 35, 181, O 231, O 270.

pavonia, O 206.

pytalida, O 262, O 294, P 489.

procera, O 181, O 341.

pulcherrima, O 181, O 341.

pulchrior, O 270.

punctata, P 487.

pusilla, 53.

pygmea, 181, O 181, O 192, O 226, O 270, P 510.

pyrostoma, O 181.

Reevei, 53, 111.

rorida, 53.

rugulosa, O 186.

rugosa, 181, O 181, O 231, O 270.

rustica, O 269, O 294, P 489, P 492.

sativa, 59, 61, O 269.

sclaranina, O 181, P 505.

solidula, 111.

Sowerbyi, O 270.

spadicea, 53, O 225, P 535.

Sta.-Barbarensis, 21, 53, 111, O 228, O 231, O 341, O 349.

strombiformis, 48, 181, O 171, O 174, O 178, O 192, O 210, O 234, O 236, O 262, O 270, O 341, P 490, P 537.

strombiformis, var. O 262, O 269, P 489.

salicina, 53, 185, O 272.

Terpsichore, O 226, O 238, O 263, P 508, P 543.

tessellata, 35, 181, O 270.

teniata, 20, 53, 260, O 225, P 535.

triumphans, 10, O 268.

turrita, 181, O 181, O 270.
INDEX OF SPECIES.

Columbella
quincinata, 25, 53, 155.
unicolor, O 181, O 342, O 361.
vaiga, 84.
varia, 181, O 181, O 270, P 507.
varians, 155, O 270, O 341, 0 361.
venusta, 53.
veixillum, 53.

Colus
aretatus, 77.

Concholepas
antiquata, P 297, R 3.
Peruviana, O 231.
sunrufa, R 4.

Conella
cedo-nulli, 28, III.
coniformis, 25.

Conovulus
myosotis, P 112.

Conus
abbreviatus, 11.
achatinus, O 228, O 236, O 259,
P 403, P 537, U 206.
archon, O 182, O 208, O 333.
areatus, 9, 27, 46, O 176, O 259, O 333, P 402.
arenatus, O 243, O 259, P 404.
brunneus, 110, O 184, O 270,
O 292, O 333, O 360.
Californiaus, 21, 23, 27, 144,
O 205, O 332.
cinclus, O 170, O 333.
colebs, O 205.
comptus, O 228, O 230, O 259,
O 332, P 402, U 206.
concinnus, O 285, O 292, O 297,
O 332.
Cumingii, 46.
deperditus, O 170.
diadema, O 184, O 333, O 360.
ebraeus, 7.
emarginatus, 152.
ferrugatus, O 285, O 332, O 352.

Conus
gladiator, 24, 27, 110, O 182,
O 259, O 270, O 282, O 332,
O 405.
gradatus, 7, 10, 46, O 178.
hieroglyphus, 11.
hyana, O 170.
incavus, 46.
interruptus, 9, 45, 46, 154, 154,
O 176, O 187, O 235, O 360,
P 402.

--- var. O 292.

Largillierti, 58.
lineolatus, O 170, O 270, O 333.
Lorenzianus, 46, O 294, O 333.
Luzonicus, var. O 184, O 333,
O 360.
Mahogany, 9, 24, 154, O 270,
O 282, O 292, O 333.
Mauritianus, 46.
Mediterraneus, O 222.
minimus, O 291, O 360.
minimus, var. O 333.
nex, 21, 24, 27, 110, O 182, O
259, O 270, O 332, O 360, P
405.

omaria, O 238, P 544.
Orion, O 182, O 333.
var. papillosus, 46.
patriicus, O 205, O 333.
perplexus, 46.
Philippii, 59.
princeps, 7, 58, 110, O 170, O
183, O 233, O 238, O 333,
O 352, P 544.
pulchellus, O 187.
punctieatus, 9, 27, 46, 154,
O 238, O 259, O 332, P 404,
P 544.
purpurascens, 24, 27, 32, 110,
181, O 176, O 182, O 228,
O 230, O 259, O 270, O 332,
O 364, P 402, P 403, U 206.
purpurascens, var. O 259, P
403.
purpureus, O 236.
<table>
<thead>
<tr>
<th>Conus</th>
<th>Corbula</th>
</tr>
</thead>
<tbody>
<tr>
<td>pusillus, 9, 21, O 228, O 230, O 332, U 206.</td>
<td>fragilis, O 207, O 300.</td>
</tr>
<tr>
<td>var. pusillus, 110.</td>
<td>gibbosa, O 175, O 347.</td>
</tr>
<tr>
<td>pustulosus, 46.</td>
<td>luteola, 97, 123.</td>
</tr>
<tr>
<td>pyriformis, O 292, O 333.</td>
<td>marmorata, O 207, O 300.</td>
</tr>
<tr>
<td>ravus, 21, 144, O 228, O 230, O 332, O 333, O 349, U 206.</td>
<td>nasuta, 23, O 228, O 300.</td>
</tr>
<tr>
<td>regalitatis, 32, 110, 181, O 184, O 236, O 259, O 270, O 282, O 333, P 403.</td>
<td>nuelliformis, 23, 154, O 183, O 300.</td>
</tr>
<tr>
<td>regius, 7, 58, O 170, O 270.</td>
<td>obesa, 204, O 207, O 300.</td>
</tr>
<tr>
<td>regularis, 24, 27, O 238, O 259, O 270, O 292, O 333, O 352, P 401, P 544.</td>
<td>ovulata, 33, 154, 204, O 183, O 228, O 244, O 280, O 300, P 23.</td>
</tr>
<tr>
<td>regularis, var. 46, O 176.</td>
<td>polychroma, 20, 39, 205, O 226, O 228, O 300, U 198.</td>
</tr>
<tr>
<td>reticulatus, 152.</td>
<td>pustulosa, 30, 204, O 244, O 300, P 22.</td>
</tr>
<tr>
<td>scalaris, 7, 10, 46, 110, O 170, O 259, P 406.</td>
<td>radiata, O 207.</td>
</tr>
<tr>
<td>terebellum, O 205.</td>
<td>rostrata, O 175.</td>
</tr>
<tr>
<td>tiaratus, 46, O 182, O 292, O 360.</td>
<td>rubra, 39, 204, O 280, O 300.</td>
</tr>
<tr>
<td>tornatus, 9, 110, O 188, O 333.</td>
<td>scaphoides, P 547.</td>
</tr>
<tr>
<td>trochulus, O 235.</td>
<td>speciosa, O 207, O 300.</td>
</tr>
<tr>
<td>varius, O 187, O 360.</td>
<td>Taheitensis, O 280.</td>
</tr>
<tr>
<td>virgatus, var. 46.</td>
<td>tenuis, 23, 204, O 183, O 228, O 244, O 280, O 300.</td>
</tr>
<tr>
<td>vittatus, O 270, O 292, O 333.</td>
<td>testulata, O 236, P 539.</td>
</tr>
<tr>
<td>Ximenes, 9, 46, O 177, O 333.</td>
<td>ventricosa, O 584, O 300.</td>
</tr>
<tr>
<td>Zebra, 46.</td>
<td>venusta, 73.</td>
</tr>
<tr>
<td>Cooperella</td>
<td></td>
</tr>
<tr>
<td>scintillarseformis, 97, 125.</td>
<td></td>
</tr>
<tr>
<td>Corbicula</td>
<td></td>
</tr>
<tr>
<td>convexa, 154, 164, O 287.</td>
<td></td>
</tr>
<tr>
<td>ventricosa, 164.</td>
<td></td>
</tr>
<tr>
<td>Corbula</td>
<td></td>
</tr>
<tr>
<td>alba, O 224, O 228, O 244, P 534, P 547.</td>
<td></td>
</tr>
<tr>
<td>bicarinata, 23, O 183, O 224, O 228, O 244, O 280, O 281, O 300, O 364, P 21, U 199.</td>
<td></td>
</tr>
<tr>
<td>biradiata, 20, 23, 39, 123, 204, 205, O 183, O 244, O 280, O 300, P 22.</td>
<td></td>
</tr>
<tr>
<td>Bolivinei, O 300.</td>
<td></td>
</tr>
<tr>
<td>carinata, O 224.</td>
<td></td>
</tr>
<tr>
<td>Cubananina, O 364.</td>
<td></td>
</tr>
<tr>
<td>Diegoana, 75.</td>
<td></td>
</tr>
<tr>
<td>Coralliophila</td>
<td></td>
</tr>
<tr>
<td>Californica, O 287.</td>
<td></td>
</tr>
<tr>
<td>madreporarum, 63.</td>
<td></td>
</tr>
<tr>
<td>Corniculina</td>
<td></td>
</tr>
<tr>
<td>Ehrenbergii, X 419.</td>
<td></td>
</tr>
<tr>
<td>Cornuoides</td>
<td></td>
</tr>
<tr>
<td>major, X 416, X 425, X 426.</td>
<td></td>
</tr>
<tr>
<td>minor, X 426, X 436.</td>
<td></td>
</tr>
<tr>
<td>Coronaxis</td>
<td></td>
</tr>
<tr>
<td>nux, P 405.</td>
<td></td>
</tr>
<tr>
<td>Crania</td>
<td></td>
</tr>
<tr>
<td>radiosa, 55.</td>
<td></td>
</tr>
<tr>
<td>Crassatella</td>
<td></td>
</tr>
<tr>
<td>alta, 75.</td>
<td></td>
</tr>
<tr>
<td>collina, 81.</td>
<td></td>
</tr>
<tr>
<td>Esquimalti, 91.</td>
<td></td>
</tr>
<tr>
<td>Guadalupensis, P 549.</td>
<td></td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Crassatella
Martiniucensia, O 364, P 549.
Pacificae, 101.
undulata, O 297.
Uvasana, 75.
variaus, 106.

Crassispira
aterrima, P 393.
inerasata, P 392.
luctuosa, P 397.
rudis, P 393.
zonulata, P 395.

Cremides
Barbadensis, P 215.
Peruviana, P 219.
rugosa, P 216.

Crenella
coarctata, 50, 107, O 226, O 234,
O 248, O 309, O 359, P 123.
decussata, 97, 130, 169, 170,
212.
discrepans, O 309.
inflata, 39, 104, 211.

Crepídula
aculeata, 24, 27, 47, 51, 69, 92,
108, 140, 196, O 2, O 190, O 200,
O 235, O 236, O 254, O 282,
O 323, O 353, O 363, O 365,
P 268, P 269, P 283, P 292.
aculeata, var. O 276, V 225.
Adolphei, O 254, P 272.
adunca, 23, 25, 27, 31, 37, 51,
79, 98, 108, 140, 197, O 174,
O 206, O 209, O 212, O 230,
O 236, O 254, O 276, O 323,
P 263, P 275, P 277.
arenata, O 254, P 272.
arenata, 27, 51, 151, O 184,
O 282, O 323, P 275.
arenata, var. 151.
auriculata, P 289.
var. bilobata, 17, 52, 140, O 3,
O 254.
calceolina, O 276.
Californica, 52, O 2, O 200, O
254, P 268, V 225.

calyptreformis, P 270.
eapensis, O 209, P 268.
cerithicola, O 254, O 276, P 278.
contorta, O 239, O 254, P 278,
P 545.
costata, O 2, O 236, O 239, O 254,
P 268, P 537, P 545.
depressa, O 254, P 272.
dilatata, 51, O 172, O 190, O
254, O 323, O 366, P 272,
P 285, P 292.
dilatata, var. O 190.
dorsata, 13, 17, 23, 52, 92, 140,
O 254, P 273, P 274, P 288.
echinus, 52, O 254, O 276, O 363,
P 268.
excurvata, 20, 24, 51, 98, 108,
140, 152, 196, O 230, O 235,
O 254, O 276, O 364, P 274.
----- var. 108.
explanata, 27, 52, 140, O 200,
O 204, O 228, O 233, O 255,
O 323, P 281, P 282, U 205,
V 225.
exuvia, 140, O 200, O 228,
O 233, O 255, P 281, U 205,
V 225.
fimbriata, 17, 51, 140.
foliacea, O 190, O 254, P 272, P
292.
formicata, 20, P 282, P 286.
Goreensis, O 239, O 369, O 365,
P 280, P 284, P 286, P 545.
grandis, 20, 25, 70, 76, 169, 322,
O 216, O 223, O 323.
hepatica, 196, O 236, O 254, O
276, P 276, P 278, P 537, V 225.
hystrix, 52, O 363, P 269, P 293.
----- var. 69.
incurva, 24, 37, 52, 79, 154, 196,
O 190, O 230, O 236, O 254,
O 276, O 284, O 323, O 352,
P 276, P 277, P 279, P 292.
incurva, var. P 275.
incurvata, O 175.
Crepidula

Italicca, O 255, O 276, P 284.
Lessonii, 51, 140, 196, 197, O 190, O 276, O 358, P 269, P 282, P 293.
lineolata, P 272.
lingulata, 17, 52, 92, 140, O 209, O 323.
lirata, 52.
marginalis, O 184, O 324, P 292.
minor, 17, 20, O 200, O 216, O 223, O 323, V 225.
nautiloides, 51, O 254, P 272.
aviceelloides, 17, 20, 25, 52, 140, O 200, P 281, V 225.
aviceelloides, var. O 200.
nivea, var. O 190, O 239, O 276.
ummaria, 17, 52, 140, O 200, O 209, O 212, O 323, V 225.
osculans, 31, 37, 197, O 276, O 323.
pallida, O 254, P 272.
Patagonica, O 190, O 254, O 255, P 272, P 281, P 292.
patula, O 254, P 272.
perforans, 52, 140, O 200, O 228, O 233, U 205, V 225.
Peruviana, O 24, O 254, O 366, P 272.
plana, O 255, O 276, P 284.
porellana, O 364, P 275.
princeps, 20, 25, 76, 166.
prorupta, 166, O 369.
protea, O 255, P 272, P 281, P 292.
rostriformis, 32, 37, 51, 140, 197,
Crepidula

O 209, O 239, O 254, O 276, O 323, P 275.
rostrata, 32, 37, 52, 140, 197, O 254, O 276, O 323, P 275.
rudis, O 263, P 289.
Sitchana, 20, O 216, O 223, O 323.
solida, 31, 37, 51, 140, 197, O 206, O 216, O 224, O 254, O 276, O 323, P 275.
sordida, O 324.
squama, 32, 51, 140, 196, O 184, O 235, O 255, O 276, O 286, P 269, P 280, P 281, V 225.
squamosa, 35.
strigata, O 254, P 272.
striolata, 37, O 2, O 239, O 255, O 276, P 280, P 281, P 282, P 545.
umbrella, O 263, P 289.
uncata, 32, 37, 52, 140, 197, O 254, O 276, P 275, P 538.
unguiculus, P 281.
—— var. O 255, P 281.
guiformis, 27, 37, 140, 196, 197, O 2, O 184, O 222, O 255, O 276, O 282, O 365, O 369, O 368, O 272, P 282, P 284, P 285, P 286, V 225.
guiformis, var. O 275.

Crepipatella

aculeata, P 268.
Adolphei, P 272.
dilatata, P 272.
dorsata, O 3.
echinus, P 268.
explanata, O 2.
foliacea, P 272.
hepatica, P 278.
ystrix, P 268.
pallida, P 272.
strigata, P 272.
INDEX OF SPECIES.

Crescis
  caligula, O 173.
  cornucopie, O 173.
  rugulosa, X 425.

Crucibulum
  auriculatum, T 168.
  auritum, 52.
  Byronense, 52.
  cinereum, 52.
  corrugatum, 24, 52, U 204.
  dentatum, O 235, T 167.
  extinctoruin, 364, P 287.
  ferrugineuin, 52.
  geuimaceum, 52.
  hispidam, 52.
  imbricatum, var. O 275.
  imbricatum, var. Broderipii, O 190, O 288, P 287, T 168, U 205.
  imbricatum, var. Carribbense, T 167.
  Jewettii, 21, O 228, O 230, O 323.
  lignarium, 52, O 224, O 323.
  maculatum, 52.
  — var. 195.
  etinatum, 24, 27, 52, P 292, T 168.
  peziza, 52.
  quiriquinum, 52.
  radiatum, 24, O 323.
  rude, 195, O 235, O 276, O 282, T 168.
  rugosum, 52, O 255.
  scutellatum, 52, O 255, P 287.
  serratum, 52, O 323, P 292.
  sordidum, 52.

Crucibulum
  O 3, O 179, O 190, O 200, O 204, O 230, O 233, O 235, O 255, O 280, O 283, O 323, O 353, P 290, P 292, P 293.
  spinosum, var. 10.
  spinosum, var. compresso-conicum, O 288, T 167.
  striatum, 52.
  tenue, O 235.
  tubiferum, 52.
  unguis, 52.
  violaseens, T 166, U 205.

Crypta
  Goreensis, P 285.
  nivea, O 2, P 281.
  Peruviana, P 272.
  rostrata, P 275.
  rugosa, P 278.

Cryptobranchia
  candida, O 219.
  caca, O 219.

Cryptochiton

Cryptodon
  flexuosus, 97, 129, 168.
  myoides, 11.
  Nuttalli, 11, 61, 72, O 194, O 300, O 349, V 210.
  serricatus, 88, 129.

Cryptomya
  ovalis, 79.

Cultellus
  lucidus, O 349.
  subteres, O 195.

Cuma
  calcar, P 482.
  costatum, 7, 35, 155, 180, O 262, O 340, P 482, P 484, P 485.
  diadema, P 482.
INDEX OF SPECIES.

Cuma
kiosquiforme, 24, 180, O 262, O 340, P 481.
kiosquiforme, var. O 190.
sulcatum, O 269.
tectum, 24, 48, 180, O 182, O 191, O 340, P 355, P 475, P 481.

Cumingia
Adamsii, 38, 203.
California, 26, 126, O 195, O 231, O 234, O 245, O 304, O 351, O 353, P 30, V 213.
var. coarctata, 38, 47, 203, O 245, O 279.
lamellosa, 38, 47, 203, O 183, O 245, O 304, P 29, P 30.
similis, 40.
striata, O 245.
trigonularis, 38, 47, 105, 203, O 245, O 279, O 304, P 30.

Cyathodonta
plecta, 27.
undulata, 119.

Cycladella
papyracea, 29, 257.

Cycladina
Adansonii, P 108.

Cyclas
acuminata, 164.
australis, P 108.
calyculata, O 222, P 106.
cornea, 164, O 210, O 222, P 106.
edentula, 164.
egregia, O 213, O 308.
Estrellana, 81.
inornata, 164.
minor, 165.
modesta, 164.
nobilis, 165.
ovalis, 165.
panduta, 81.
patella, 165, O 210, O 308.
permaea, 81.
simplex, 164.
Spokani, 91.

Cyclas
striatina, 164.
tenuistriata, 164.
triangularis, 164.
tumida, 91.

Cyclina
producta, O 284, O 305, S 161.
saccata, O 305.
subquadra. 77, 201, O 227, O 246, O 278, O 305, O 364, P 62, S 161, U 201.

Cyclophorus
ponderosus, 45.
transluceus, 45.

Cyclostoma
acutum, O 220.
anatimum, O 220.
giganteum, O 185.
Mexicanum, O 265.

Cyclostremat excava. T 169.
octoliratum, T 169.
pentegoniostoma, T 169.

Cyclostoma
acutum, O 220.
anatimum, O 220.
giganteum, O 185.
Mexicanum, O 265.

Cyclotus
giganteus, O 326.

Cylichna
Carpenteri, 34.
(=cylindracea, var.) attonsa, 23, 89, 133, 169.
inculta, 133.
luticola, 34, 194, O 250, O 275, O 313, P 170.
mamillata, 133, O 366.
planata, 133, 307.
tritacea, 71.

Cylinder
porphyreticus, 48.

Cylindrella
Ghiesbrechtii, 44.
Liebmanni, O 295.
Pfeifferi, O 295.
salpinx, 44.
teres, O 295.

Cymbium
patulum, 48.
tuberosum, 48.
INDEX OF SPECIES.

Cypræa

adusta, 9, O 291.
acicularis, P 373.
albuginosa, 8, 45, O 291.
approximans, O 285.
Arabica, O 239, O 265, P 545.
arabicula, 35, 176, O 164, O 170,
O 178, O 235, O 236, O 239,
O 282, P 373, P 537, P 545.
arabicula, var., O 267.
armadina, O 188, O 292.
California, O 230, O 291.
candidula, 285, O 294.
cervina, O 258, P 371.
cervinetta, 176, O 258, O 267,
O 282, O 328, O 363, P 371,
P 372.
cervus, O 258, P 372.
—— var. P 371.
coastata, 8.
eglandina, 11, O 265.
exanthema, 27, 153, 154, 166,
176, O 258, O 328, O 362, O
363, P 371, P 372.
—— var. O 267.
flaveola, P 373.
fusca, O 187, O 239, P 378, P
545.
irina, O 187.
Lamarekii, O 170, O 293.
lathyrus, O 258, O 293.
Maugerie, O 182, O 291.
nigropunctata, O 187, O 190.
nymphæ, O 291.
obesa, O 235.
olorina, O 285.
onisens, 8, O 267, P 376.
onyx, 9, 49, O 291.
Pacifica, O 182, O 230.
pediculus, 8, O 230.
poraria, 8.
pulla, O 186, O 286, O 291,
P 379.
punctulata, 35, 176, O 230, O
267, O 291, P 374.
Cypræa

pustulata, 6, 8, 48, 176, O 174,
O 230, O 236, O 239, O 267,
P 375, P 537, P 545.
radians, 8, 177, O 179, O 174,
O 230, O 233, O 267.
rubescent, 35, 177, O 182, O
267, O 291, P 378.
sanguinea, 177, O 239, O 236,
O 239, O 258, O 267, O 288,
O 293, P 537, P 545.
Solandri, O 230, O 236, O 291,
P 377, P 537.
Sowerbyi, O 235, O 236, O 293,
P 537.
spadicea, 7, 8, 49, O 230, O 235.
spurea, P 373.
terecoraria, P 373.
subrostrata, 8, O 239, O 292,
O 294, P 379, P 545.
suffusa, O 188, O 230, O 292.
tigris, 109.
zebra, P 371.
zonata, O 235, O 236, O 293.
Cypræcassis

tenuis, 153.
testiculus, 152.
Cyrena

acuta, 164.
aequisetis, 164.
altilis, 164, O 1, O 227, O 232,
angulata, 164.
California, 164.
cordiformis, 164.
Cumingii, 164, O 287.
Floridana, O 1, O 281, P 115,
P 116.
Fontainei, 164, O 248, O 281,
P 114.
fragilis, 164, P 115.
inflata, 164, O 287, O 296, O
309.
inignis, 164, O 287, O 308.
maritima, 38, 164, 201, O 278,
O 309, S 161.
<table>
<thead>
<tr>
<th>Cyrena</th>
<th>Cytherea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexicana, 27, 164, O 1, O 175, O 248, O 281, O 308, P 115.</td>
<td>consangurna, 58, 201, O 278.</td>
</tr>
<tr>
<td>Mexicana, var. 227, O 232.</td>
<td>corbicula, O 246, P 54, P 55, P 539.</td>
</tr>
<tr>
<td>altilis, U 202.</td>
<td>crassatelloides, 58, O 196, O 207, P 58, V 216.</td>
</tr>
<tr>
<td>Panamensis, 164.</td>
<td>decisa, 77.</td>
</tr>
<tr>
<td>placens, P 114.</td>
<td>Dione, var. 61, O 185, O 246, O 285, P 67.</td>
</tr>
<tr>
<td>pullastra, 164.</td>
<td>Dunkeri, 60.</td>
</tr>
<tr>
<td>radiata, 164.</td>
<td>elegans, O 246, P 64.</td>
</tr>
<tr>
<td>Recluzii, 164.</td>
<td>erycinoides, V 216.</td>
</tr>
<tr>
<td>solida, 60, O 281, O 309.</td>
<td>formosa, P 70.</td>
</tr>
<tr>
<td>sordida, 164.</td>
<td>fusca, P 70.</td>
</tr>
<tr>
<td>subquadrata, 164, O 287, O 309.</td>
<td>gigantea, 39, 60, O 246, O 289, P 60.</td>
</tr>
<tr>
<td>triangula, 164.</td>
<td>graelior, 58, O 246, P 55.</td>
</tr>
<tr>
<td>tumida, 164.</td>
<td>graphica, P 70.</td>
</tr>
<tr>
<td>varians, 164, P 115.</td>
<td>Guineensis, P 69.</td>
</tr>
<tr>
<td>Cyrenoida serricata, P 104.</td>
<td>Hindsii, O 246, P 55.</td>
</tr>
<tr>
<td>Cyrtopleura truncata, 121.</td>
<td>impudica, P 70.</td>
</tr>
<tr>
<td>Cyrtulus distortus, O 231.</td>
<td>intermedia, O 246, O 289, P 55.</td>
</tr>
<tr>
<td>patulus, P 501.</td>
<td>lacta, 58.</td>
</tr>
<tr>
<td>Cytherea equilatera, O 203, O 246, P 549.</td>
<td>lepida, O 246.</td>
</tr>
<tr>
<td>affinis, 201, O 185, O 191, O 229, O 247, O 278, P 69.</td>
<td>ligula, 58.</td>
</tr>
<tr>
<td>alternata, O 247, O 289, P 69.</td>
<td>lupinaria, 6, O 185, O 229, O 284, P 67.</td>
</tr>
<tr>
<td>argentina, O 185, O 236, P 539.</td>
<td>lusoria, P 70.</td>
</tr>
<tr>
<td>arguta, 60.</td>
<td>lutea, 58.</td>
</tr>
<tr>
<td>aurantia, O 174, O 229, O 278.</td>
<td>mactroides, 60, O 246, P 55, P 59.</td>
</tr>
<tr>
<td>aurantiaca, 47, 201, O 246, O 278, P 63.</td>
<td>meretrix, 58, P 70.</td>
</tr>
<tr>
<td>biradiata, 9, O 211, O 236, O 246, O 366, P 64.</td>
<td>morphina, P 70.</td>
</tr>
<tr>
<td>brevispina, O 281.</td>
<td>nitidula, 58.</td>
</tr>
<tr>
<td>brevispinosa, O 289, P 69.</td>
<td>nobilis, 12, 106, 280.</td>
</tr>
<tr>
<td>callosa, 12, 279, O 197, V 216.</td>
<td>ovum, P 70.</td>
</tr>
<tr>
<td>casta, P 70.</td>
<td>Pacifica, 60, O 246, P 55.</td>
</tr>
<tr>
<td>castanea, P 70.</td>
<td>petechialis, 69, O 202, O 247, O 305, O 366, P 70.</td>
</tr>
<tr>
<td>chione, O 211, O 289, P 64.</td>
<td>lanulata, 47, O 176, O 189, P 59.</td>
</tr>
<tr>
<td>chionaea, O 236, P 64, P 539.</td>
<td>punctata, P 97.</td>
</tr>
<tr>
<td>cireinata, O 289, P 69.</td>
<td>radiata, 58, 201, O 191, O 278.</td>
</tr>
<tr>
<td>concinna, O 185, P 69.</td>
<td>rosea, O 175.</td>
</tr>
<tr>
<td>semifulva, O 236, O 246, P 55, P 539.</td>
<td></td>
</tr>
</tbody>
</table>
INDEX OF SPECIES

Cytherea
   semilamellosa, 6, 61, O 246, P 67, P 68.
   solidissima, O 196, O 296.
   squalida, 201, O 246, O 278, O 366, P 64.
   subsulcata, O 247, P 79.
   tigerina, P 96.
   tortuosa, O 185, O 229, O 247.
   undulata, O 189, O 246, P 59.
   unicolor, O 185.
   vulnerata, O 185, P 68.
   zonaria, P 70.

Cythna
   albida, 99, 143.
   asteriapila, 104, 218.
   tumea, 143, 218.

Dactylidea
   mutica, P 470.

Dactylina
   Campechensis, 121.
   Chiloensis, 121.
   dactylus, 39.
   laqueata, 23.

Dactylus
   incrassatus, P 464.

Decalochila
   implicata, O 294.

Daphnella
   aspera, 144, 314.
   effusa, 114, 144, 243.
   casta, 24, 109, O 205, O 332.
   crebriformata, 109.
   filosa, 23, 144, 284.

Darina
   declivis, 93, 123, 251.

Defrancia
   bella, O 239, O 349.
   intercalaris, S 163.
   intricata, 97, 122, P 6, O 244, O 298.
   rana, P 399.
   rava, O 259, O 331, S 163, S 164.
   serrata, S 163.

Dendronotus
   arborescens, O 218, O 313.
   iris, 95.

Dendropoma
   lituella, 42.
   megastum, 42.

Dentalium
   corrugatum, O 251, O 317, P 189.
   dentalis, O 222.
   eburneum, 134.
   elephantinum, P 314, X 419.
   euntalis, 46, 98, 134, O 296.
   glabrum, X 414, X 435, X 436.
   var. X 414.
   hexagonum, 46, 98, 134, 154.
   hyalinum, 31, 134, O 225, O 251, O 317, P 188, P 536.
   imperforatum, X 414, X 425, X 436.
   incurvum, X 425.
   var. Indianorum, 98, 134, 169.
   lacteum, 31, 152.
   liratum, 46, O 251, O 317, P 188.
   minutum, X 413, X 435.
   nebulosum, O 175.
   politum, O 223, O 317.
   pretiosum, 31, 46, 98, 134, O 251, O 296, P 189.
   pseudosexagonum, 46.
   quadrangulare, 46.
   rectius, 89, 134.
   semipolitum, 31, 98, 134, 152, O 175.
   splendidum, 46.
   striatulum, 46.
   substratum, O 367.
   tessaragonum, O 180, O 317.
   tetragonum, 46, 152.
   trachea, X 414, X 423, X 425.
   var. X 414.

Diadora
   crucibuliformis, 80.

Diala
   acuta, 99, 143.
   electrina, 104, 217.
INDEX OF SPECIES.

Diala
mamillata, 33, P 412.
marunorea, 99, 143.
apaupercula, 259.

Dione
affinis, O 305.
alternata, O 363.
aurantia, O 246, O 305, P 56
P 63.
aurantiaca, O 282.
biradiata, O 232, O 305, P VI.
brevispina, 57.
brevispinata, 57, O 281, P 69.
brevispinosa, O 247, O 305, O 358, P 69.
chione, O 366, P VI., P 63, P 65.
chionæa, O 226, O 232, O 234, O 246, O 282, O 305, O 352, O 366, P VI., P 63, P 64, P 65, P 70.
chionæa, var. O 364.
circinata, 58, O 232, O 247, O 305, O 363, P 69.
concinnæa, O 247, O 305, P 69.
consanguinea, O 305.
dione, O 232, O 364.
elegans, P VI.
expinata, 58.
lepidæa, O 234.
lupinaria, 57, O 232, O 246, O 265, O 297, O 305, O 358, O 364, P 67.
maculata, 57, O 364, P 65.
multispinosa, 57.
nobilis, 57.
pannonia, 58, 211.
prora, 58.
pucilla, 21.
roseæa, O 232, O 234, O 246, O 305, P 66.
semilamæosa, 57, 58.
spalæa, O 305, P VI., P 64.
tortuosa, O 305.
unicolor, 58, O 305.

Dione
Veneris, 57, P 67.
vulnerata, O 246, O 305, P 68.

Diplodonta
calculus, 106, O 308.
circularis, O 366.
obliquæa, O 224, O 248, O 308, P 103, P 534.
orbella, 12, 22, 26, 113, 129, O 197, O 232, O 308, O 349, O 351, O 352, U 202, V 218.
semiasperæa, 30, 154, O 197, O 224, O 229, O 248, O 297, O 308, O 393, O 366, P 102.
semiasperæa, var. discrepans, O 248, P 103.
serricata, O 248, P 104.
subquadrata, 106, O 287, O 308, Q 230.
trigonæa, P 103.
undata, P 103.

Discina
Cumingii, 37, 105, 155, 194, 205, 266, O 244, O 298, O 366, P 7.
Evansii, 55, 102, O 298, O 349.
striata, O 366.
strigata, 54.

Discopora
tripsinosa, P 3.

Discus
Vancouverensis, 157.

Dispotea
Byronensis, 10.
dentata, O 3, P 287.
spinosa, O 239, P 546.
striata, Q 234.

Distortio
anus, O 171.
constrictus, 182.

Ditrupa
gadus, X 413.

Dollum
crassilabre, O 238, P 543.
dentatum, 8, O 238, P 543.
latilabre, O 238.
INDEX OF SPECIES.

*Donium*

personatum, O 238.
petrosum, 166, O 367.
plicosum, O 238.
pomum, O 174.
ingens, 8, 179, O 231, O 238, O 269, O 292.

*Donax*

abruptus, O 232.
assimilis, 23, 202, O 186, O 236, O 245, O 279, O 297, O 304, P 44.
bellus, O 226, O 287, O 304.
var. caelatus, 23, 106.

carinatus, 23, 38, 154, 202, O 208, O 232, O 285, O 304, P 43, P 44.
carinatus, var. 202, O 245, P 43.

Carpenteri, O 287, O 304.
compressus, O 236, P 539.


Conradi, var. O 196.
contusus, O 241, O 246, O 287, O 289, P 47, P 548.
culminatus, 38, 202, O 229, O 245, P 43, P 548, U 200.
--- var. P 48, P 548.

elongatus, 9.
flexuosus, 21, 22, 126, O 227, O 229, O 304, O 349, P 44, P 548, U 200.
gracilis, 23, 202, O 186, O 229, O 279, O 304.
levigatus, O 227, O 232.

Lamarecki, 21.
Lessoni, O 246, P 59.

*Donax*

Martineicensis, O 245.
navicula, 23, 27, 106, 126, 202, O 186, O 229, O 246, O 279, O 304, P 50, P 548.
obesus, 126, O 195, O 196, O 227, O 296, O 304, U 200, V 213.
obesus, O 287.

ovalinus, O 287, O 304.

Panamensis, O 295, O 304.
pretexitus, O 367.
pulchellus, Q 230.
punctatostriatus, var. caelatus, O 246, P 46.

radiatus, 7, O 170, O 191, O 246, O 287, P 44.

rostratus, 23, 27, 38, 154, 202, O 229, O 245, O 279, O 304, O 364, P 548, U 200.
rugosus, O 364.

scalpellum, 9, O 178, P 44.

scortum, O 296.

semistriatus, O 287, Q 230.
serrula, P 548.

stultorum, 10.
sulcatus, O 226.
transversus, 23, 154, O 174, O 245, O 304, P 44, P 548.

*Dosinia*

alabasterina, 94.
albopunctata, 95.

Sandiegensis, 94, 95.
sanguinea, 94, 95.

Montereyensis, 94, 95.

alta, 80, 81.

Anna, 154, O 246, O 305, P 61.
callosa, 279, O 281, O 305, O 349, V 216.

concentrica, P 60.
### Dosinia

distans, P 60.
Dunkeri, 23, 106, O 163, O 186, O 229, O 232, O 246, O 282, O 287, O 305.
gigantea, O 232, O 234.
longula, 80, 81.
Montana, 81.
ponderosa, 27, 39, 106, 151, O 246, O 395, P 60, P 61.
saccata, O 232.
simplex, O 232, O 287, O 305, O 61.
subobliqua, 81.
turgida, O 287.

### Drilliia

alabastra, O 364.
albicostata, O 331, O 360.
albolaqueata, 155.
albonodosa, O 331, P 397.
albovallosa, 109, O 226, O 230, O 258, O 331, P 296.
appressa, 104, 218.
arquata, O 331.
aspera, P 395.
aterrima, O 331.
atrior, O 331.
aterrima, var. Melchersi, 36, 109, O 258, P 393.
aterrima, var. Melchersi, 36, 109, O 258, P 393.
aterrima, var. Melchersi, 36, 109, O 258, P 393.
attrior, O 331.
astronomos, O 258.
bicolor, O 331, O 360.
cancellata, 89, 144.
cepithoidea, O 258, O 330, P 394.
cincta, O 331.
ceolata, O 331.
colebs, O 331.
collaris, 183, O 331.
corrugata, 183, O 331.
discors, 183, O 331.
duplicita, 184, O 331.
edrubnea, 154, 273.
exarata, 24.
exeeuntrics, 184, O 331, O 360.

### Dunkeria

cancellata, O 260, O 335, P 435.
INDEX OF SPECIES.

**Dunkerla**
- intermedia, O 260, O 335, P 435.
- laminata, 23, 145, 286.
- paucilirata, O 260, O 335, P 434.
- subangulata, 36, 187, O 260, O 335, P 434.
- **var.** 36.

**Elephantulum**
- abnormale, O 255, O 324, X 442.
- heptagonum, O 256, O 324, X 442.
- imbricatum, X 442.
- insculptum, O 255, O 324, X 442.
- laqueatum, O 324, X 442.
- liratoocinctum, O 256, O 324, X 442.
- **var.** subconicium, X 442.
- **var.** subobsoletum, X 442.
- var. tenuiliratum, X 442.
- liratum, X 442.
- obtusum, O 255, O 324, X 442.
- plicatum, X 442.
- subspirale, O 255, O 324, X 442.

**Emarginula**
- crenulata, O 175.
- rosea, 136, P 276, P 296.

**Engina**
- alveolata, O 341.
- carbonaria, 181, O 341, O 361.
- crocostoma, 25, 112, O 231, O 341, O 361.
- ferruginosa, O 231.
- heptagonalis, O 341.
- jugosa, O 270, O 341.
- maura, O 341, O 361.
- pulchra, 181, O 341, O 361.
- pyrostoma, O 341, O 361.
- Reeviana, 25, 112, O 341, O 361.
- zonata, O 341, O 361.

**Ensella**
- ambigua, 39.
- rudis, 205.

**Entodesma**
- cuneata, 124.
- diaphana, 97, 124.
- inflata, 97, 124.
- picta, 124.
- saxicola, 124.
- saxicola, **var.** cylindracea, 124.

**Bolidia**
- pinnata, O 173.

**Erato**
- columbella, 23, 143, 147, 169, O 228, O 230, O 236, O 328, P 537, U 206.
- Jewettii, O 230.
- leucophae, 143, O 228, O 230, O 328, U 206.
- Maugeria, 24, 109, 112, O 328, O 364.
- Maugeria, **var.** Panamensis, O 284, S 162.
- scabriuscula, 24, 45, 109, 177, O 230, O 267, O 328.
- vitellina, 23, 143, O 206, O 328.

**Erycina**
- dubia, O 186.
- Geoffroyii, P 105.
- papyracea, O 287.
- suborbicularis, P 105.
- violacea, P 108.

**Ethalia**
- amplectans, O 254, O 322, P 253.
- carinata, O 254, O 322, P 252.
- lirulata, O 253, O 322, P 251.
- pallidula, O 253, O 322, P 252.
- pyricallosa, O 253, O 322, P 251.
- supravallata, 98, 138.
- **supravallata,** **var.** invallata, 98, 138.

**Eucosmia**
- cyclostoma, 104, 215.
- punctata, 104, 215.
INDEX OF SPECIES.

**Eucosmia**
variegata, 214, 215.
(\*variegata, var.) striata, 104, 215.

**Eulima**
acuta, O 183, O 335, P 438.
compacta, 99, 145.
distorta, O 296, P 408, P 441.
falcata, 273.
fuscostrigata, 105, 219.
hastata, 154, O 260, O 335, P 438.
interrupta, O 183, O 335.
iota, 37, 192, O 274, P 440.
micans, 89, 99, 145, 169.
recta, 193, O 274, P 439.
rutila, 99, 145.
solitaria, 37, 193, O 274, P 439.
Thersites, 23, 145, 286.
yod, 39.

**Eulimella**
obsoleta, O 260, O 335, P 436.

**Euomphalus**
radiatus, O 238, O 259, P 407, P 541.

**Euparypha**
areolata, 158.

**Euryta**
aciculata, 24, 109, O 258, O 329, O 366, P 389.
Cosentini, O 366.
fulgurans (=fulgurata), O 366.
fulgurata, 24, 27, 109, 177, O 258, O 329, P 388, U 206.

**Euthria**
errea, 70.
plumea, 70.

**Evalea**
sequisculpta, 219.
delicatula, 219.
sublirulata, 33, P 410.

**Fartulum**
bimarginatum, X 443.
corrugulatum, O 256, O 324, X 443.

**Fasciolaria**
aurantiaca, 48, O 261, P 459.
bistriata, O 228, O 231, O 338, U 207.
canalliculata, O 171.
granosa, 10, 24, 183, O 181, O 271, O 338.
rugosa, O 171.
salmo, O 188, O 338.
sulcata, 60.
tulipa, 24, O 171.
Valenciennesii, O 188.

**Felania**
cornea, O 308.
serricata, 30, 201, O 308, O 364.
tellinoides, 23, 154, 201, O 308.
usta, 73.

**Fenella**
crystallina, 104, 217.
excavata, 32.
pupoidea, 99, 142.

**Ficula**
decussata, 7, 153, O 231, O 234, O 236, O 238, O 242, O 282, O 337, O 364, P 454, P 537, P 544.
flexoides, 7, O 171.
gracilis, O 364.
Ocoyana, 77.
INDEX OF SPECIES.

Ficula
reticulata, O 171.
.ventricosa, 24, 110, O 234, O 261, O 271, O 337, P 453, P 454.

Fissurella
æqualis, 197, O 276.
affinis, P 219.
alba, 46, 154, 256, O 236, O 252, O 319, P 217, P 218, Q 234.
alta, 46, 197, O 276, O 221.
aspera, 8, 84, O 174, O 209, O 215, O 224, V 223.
Barbadensis, O 162, O 184, O 243, O 252, O 364, P 215.
cancellatus, 46, 49.
catillus, P 220.
ehlorotrema, 2, 236, O 236, P 216, P 538.
coarctata, P 213.
crattitia, 84, O 199, O 209, O 212.
crenifera, O 184.
crenulata, 76, O 234, O 283, V 223.
densiclathrata, 49, 84, O 174, O 199, O 291, V 223.
exarata, O 199, V 223.
excelsa, 46.
gemmata, O 236, O 252, P 218, P 538.
gibberula, O 188, O 319.
Gunneri, 49.
hians, O 175.
humilis, O 2, O 236, O 252, P 216, P 538.
inæqualis, O 1, O 184, P 220.
Lincolni, 45, 84, O 178.
macrotrema, 24, 154, 197, O 184, O 276, O 319, O 360.
microtrema, 37, 108, 197, O 184, O 276, O 319.
Mexicana, 46, O 188, O 319.
mus, 37, 197, O 1, O 252, O 276, O 319, P 551.
muntabilis, O 296, O 320, O 360.

Fissurella
nigropunctata, 24, 37, 84, 154, 197, O 184, O 276, O 282, O 319, O 360, P 214, P 218, Q 234.
Novæ-Hollandiae, 49.
obscurea, 46, O 184, O 320, O 360.
ornta, 13, 26, 137, O 241, O 319, O 349, P 214, V 222.
ostrina, O 276, O 319.
Panamensis, 46, O 184, O 320.
Peruviana, O 252, O 319, P 219.
var. pica, 35, 37, O 1, O 184, O 236, O 252, P 220, P 538.
rugosa, var. O 239, O 276.
spongiosa, O 252, P 219.
tenebrosa, 46.
turbinelloides, 49.
viminea, O 2, O 239, O 252, P 216, P 546.
vioacæa, 100, O 215, O 224, O 319.
vioascens, O 348.
virescens, 27, 37, 197, O 3, O 162, O 233, O 234, O 239, O 252, O 276, O 319, P 213, P 216, P 218, P 546, V 223.
virescens, var. O 364.
vulcano, 13, 23, 100, 114, 137, 151, O 208, O 233, O 319, O 349.

Fissurellidaæ
æqualis, 197, O 320.

Flabellina
crackicornis, O 313.
opalescens, 94, 95.
sbrusacea, O 313.
INDEX OF SPECIES.

**Fluminicola**
- fusca, 163.
- semialalis, 90.
- virens, 162.

**Fossarus**
- abjectus, O 273.
- angiostoma, O 273.
- angulatus, 216, O 257, O 326.
- excavatus, 188, O 273, O 326.
- foveatus, O 273, O 326.
- maculosus, O 273.
- megasoma, O 273, O 326.
- ovoides, U 205.
- parcipictus, 104, 216.
- purus, 104, 216.
- reticulatus, U 205.
- tuberosus, 216, O 257, O 326, P 354

**Fulvia**
- modesta, 170.

**Fusus**
- ambustus, 21, 25, 150, O 228, O 234, U 208.
- angulatus, O 177.
- antiquus, 19, O 217, O 223.
- apertus, Q 263, P 504.
- Baerii, 19, O 217.
- Bamfins, O 209.
- Behringii, 19, O 217.
- bellus, 183, O 271.
- Berniciensis, O 217.
- cancellatus, O 171, O 210.
- cancellinus, 18, O 211.
- carinatus, O 192.
- clavatus, 21, 150.
- contrarius, O 217, O 223.
- corrugatus, O 367.
- decemcostatus, 4, 20, 179, O 217, O 223.
- deformeis, O 217.
- Dupetithouarsii, 7, 28, 49, 112, O 192, O 204, O 208, O 293.
- O 294, O 296, O 361.
- ficiculus, 17, O 209, O 211.
- fornaticus, O 177, O 217.

**Fusus**
- fragosus, 21.
- geniculatus, 166, O 367.
- glacialis, O 177.
- Holboelli, O 217.
- horridus, O 293.
- incus, 18.
- Islandicus, O 217, O 223.
- Kelletitii, 28, O 240.
- lamellosus, 34, O 177, O 217.
- lapillus, 9, O 176, O 293.
- lignarius, O 352, P 503.
- luridus, 19, O 217.
- Magelanicus, 7, O 171.
- Mexicanus, O 293.
- multicosatus, O 177.
- muricatus, O 222.
- nodulosus, 179.
- Norvegicus, O 223.
- Novan-Hollandiae, 112.
- Oregonensis, O 210 O 240, O 293.
- Orpheus, 17, 92, O 209, O 213.
- pygmaeus, O 217.
- rheuma, O 238, P 544.
- Sabini, O 177, O 217, O 223.
- salebrosus, P 485.
- scalariformis, O 217.
- Sitchenis, 18, 19, O 217.
- tenebrosus, O 217.
- Thouarsii, 112.
- torheuma, O 238.
- tumens, O 263, P 503, P 504.
- turbilinelloides, P 503.
- turricula, O 209, O 211.
- turris, 7, O 171.
- ventricosus, O 177.
- Wiegmanni, O 261, P 455.

**Gadinia**
- Afra, O 366.
- pentegoniiostoma, 195, O 1, O 185, O 252, O 319, O 366, P 212.
<table>
<thead>
<tr>
<th>Index of Species</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gadinia</strong></td>
<td></td>
</tr>
<tr>
<td>reticulata, 152.</td>
<td></td>
</tr>
<tr>
<td>steltata, 31, 195, O 319.</td>
<td></td>
</tr>
<tr>
<td><strong>Galeomma</strong></td>
<td></td>
</tr>
<tr>
<td>macroschisma, 46.</td>
<td></td>
</tr>
<tr>
<td>Turtoni, 46.</td>
<td></td>
</tr>
<tr>
<td><strong>Galerus</strong></td>
<td></td>
</tr>
<tr>
<td>asperus, O 275.</td>
<td></td>
</tr>
<tr>
<td>asperus, O 323.</td>
<td></td>
</tr>
<tr>
<td>conicus, 24, 27, 37, 152, 154, 195, O 235, O 254, O 282, O 323, P 265, P 266, P 267, contortus, 76, 98, 140.</td>
<td></td>
</tr>
<tr>
<td>fastigiatus, 25, 140, 322, O 323. lichen, P 266, P 267.</td>
<td></td>
</tr>
<tr>
<td>mamillaris, 24, 27, 37, 52, 140, 154, 195, O 190, O 230, O 233, O 235, O 254, O 276, O 282, O 323, O 366, P 266, P 267, Q 233.</td>
<td></td>
</tr>
<tr>
<td>regularis, 37, 195, O 323, P 266, Q 233.</td>
<td></td>
</tr>
<tr>
<td>Sinensis, Q 366, P 266, P 267, Q 233.</td>
<td></td>
</tr>
<tr>
<td><strong>Garnotia</strong></td>
<td></td>
</tr>
<tr>
<td>solida, 197, O 254, O 297, P 275.</td>
<td></td>
</tr>
<tr>
<td><strong>Gastrochaena</strong></td>
<td></td>
</tr>
<tr>
<td>brevis, O 184, O 299, O 359. euneiformis, P 547.</td>
<td></td>
</tr>
<tr>
<td>hyalina, O 184, O 299, O 359.</td>
<td></td>
</tr>
<tr>
<td>ovata, 105, 121, O 184, O 244, O 299, O 363, P 15.</td>
<td></td>
</tr>
<tr>
<td>rugulosa, O 184, O 299, O 359.</td>
<td></td>
</tr>
<tr>
<td>truncata, O 184, O 244, O 299, O 363, P 14, P 15.</td>
<td></td>
</tr>
<tr>
<td><strong>Gena</strong></td>
<td></td>
</tr>
<tr>
<td>varia, 40.</td>
<td></td>
</tr>
<tr>
<td><strong>Gibbula</strong></td>
<td></td>
</tr>
<tr>
<td>coronulata, O 321.</td>
<td></td>
</tr>
<tr>
<td>funiculata, 114, 139, 239.</td>
<td></td>
</tr>
<tr>
<td><strong>Gibbula</strong></td>
<td></td>
</tr>
<tr>
<td>lacunata, 113, 139, 239.</td>
<td></td>
</tr>
<tr>
<td>minor, P 461.</td>
<td></td>
</tr>
<tr>
<td>nivosa, 73.</td>
<td></td>
</tr>
<tr>
<td>optabilis, 98, 139.</td>
<td></td>
</tr>
<tr>
<td>pareipicta, 113, 139, 238.</td>
<td></td>
</tr>
<tr>
<td>redimita, 73.</td>
<td></td>
</tr>
<tr>
<td>succincta, 113, 139, 238.</td>
<td></td>
</tr>
<tr>
<td><strong>Gitocentrum</strong></td>
<td></td>
</tr>
<tr>
<td>Chiloënsis, 121.</td>
<td></td>
</tr>
<tr>
<td><strong>Glandina</strong></td>
<td></td>
</tr>
<tr>
<td>Albersi, 156, O 251, O 287, O 313, P 175.</td>
<td></td>
</tr>
<tr>
<td>—— var. turrita, 156, P 175.</td>
<td></td>
</tr>
<tr>
<td>Carminensis, 44.</td>
<td></td>
</tr>
<tr>
<td>conularis, O 287.</td>
<td></td>
</tr>
<tr>
<td>fusciformis, O 285.</td>
<td></td>
</tr>
<tr>
<td>Ghiesbrechtii, 44.</td>
<td></td>
</tr>
<tr>
<td>Isabellina, O 286. monilifera, O 286.</td>
<td></td>
</tr>
<tr>
<td>nigricans, O 286. obtusa, O 186, O 314.</td>
<td></td>
</tr>
<tr>
<td>Sowerbyana, O 286, O 314. tortiliana, O 286.</td>
<td></td>
</tr>
<tr>
<td>turris, 156, O 251, O 313, P 175.</td>
<td></td>
</tr>
<tr>
<td><strong>Glaucus</strong></td>
<td></td>
</tr>
<tr>
<td>draco, O 173.</td>
<td></td>
</tr>
<tr>
<td>Pacificus, O 173.</td>
<td></td>
</tr>
<tr>
<td><strong>Globulus</strong></td>
<td></td>
</tr>
<tr>
<td>tumens, O 253, O 322, P 250.</td>
<td></td>
</tr>
<tr>
<td><strong>Glycimeris</strong></td>
<td></td>
</tr>
<tr>
<td>Estrallina, 82.</td>
<td></td>
</tr>
<tr>
<td>generosa, 123, 165, 168, 169.</td>
<td></td>
</tr>
<tr>
<td><strong>Glyphis</strong></td>
<td></td>
</tr>
<tr>
<td>alta, 24, 27, 197, O 252, O 320, P 221, P 222.</td>
<td></td>
</tr>
<tr>
<td>aspera, 45, 49, 137, O 199, O 291, O 320, V 223.</td>
<td></td>
</tr>
<tr>
<td>arratifia, 8, 137, O 320.</td>
<td></td>
</tr>
<tr>
<td>crenifera, O 320.</td>
<td></td>
</tr>
<tr>
<td>densiellathrata, 8, 13, 23, 27, 137, O 320.</td>
<td></td>
</tr>
<tr>
<td>inaequalis, 24, 27, 37, 108, 153, 197, 214, O 1, O 252, O 360, P 220, P 222.</td>
<td></td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Glyphis
  Lincolni, 8, 137, O 320.
  microtreina, O 364.
  pica, O 320.
  saturnalis, 104, 214.

Gnathodon
  Lecontii, 78, 119.
  mendicus, 21, 29, 78, O 232,
    O 246, O 304, P 549, U 200.
  trigonus, 21, 62, 78, 119, O 227,
    P 52, U 200.

Gonidea
  feminalis, 120.
  Randallii, 120.

Gouldia
  Pacifica, 30, 38, 201, O 247,
    O 278, O 306, O 364, P 82, P 83,
    P 84, P 549.
  varians, 30, O 247, O 306, O 364,
    O 366, P 83, P 530, P 549.

Gratelupia
  Hydanea, 77.
  mactropsis, 77.

Grypea
  angulata, P 160.

Gundlachia
  Californica, 119, 161.

Haliotis
  aquatillis, O 216, O 286, O 320,
    O 350.
  Californiana, 7, O 170.
  Californiensis, 6, 7, 13, 84, 100,
    137, O 174, O 199, O 291,
    O 320, O 350, O 351, V 223.
  corrugata, 10, 84, 137, O 291,
    O 320, O 350.
  Cracherodii, 6, 7, 9, 13, 23, 27,
    84, 100, 108, 137, 151, O 174,
    O 199, O 229, O 241, O 291,
    O 320, O 350, O 351, V 223.
  discus, 69, 350.
  fulgens, 60.
  glabra, 6, 9, O 199, O 291, V
    223.
  interrupta, 7.

Halectis
  Japonica, O 350.
  Kamtschatkana, 27, 69, 72, 84,
    100, 113, 137, O 216, O 226,
    O 283, O 295, O 320, O 350.
  nodosa, 10.
  pulcherrima, 4.
  rufescens, 7, 13, 23, 27, 84, 100,
    114, 137, 144, O 192, O 229,
    O 320, O 350.
  splendens, 23, 27, 42, 60, 72,
    84, 108, 137, 151, O 199, O
    286, O 320, O 350, O 351, V
    223.
  tuberculatus, 43.

Haminea
  cymbiformis, 31, 132, O 250,
    O 313, P 174.
  hydatalis, 85, 89, 132, 169.
  luticola, P 170.
  vesicula, 79, 132, O 227, O 313,
    O 351, U 203, U 204.
  virens, 31, 79, 132.

Hapllocochlias
  cyclophoreus, 104, 215.

Harpa
  crenata, 7, 8, 46, 111, 153, O 177,
    O 238, O 292, O 340, O 366,
    P 543.
  gracilis, O 176.
  Mexicana, O 292.
  minor, O 179.
  Rivoliana, 46, O 238, O 292.
  rosea, O 177, O 179, O 292,
    O 366.
  rosea, var. O 292.
  scriba, O 171, O 340.
  testudinalis, O 292.

Harvella
  elegans, 21, 23, 100, 204.

Hastula
  luctuosa, P 387.

Hauztator
  Banksii, P 330.
  gonistoma, P 330.
  tigrina, P 332.
INDEX OF SPECIES.

Haustrum
  dentex, 6.
  pictum, 6.
  tuberculatum, 6.

Hecuba
  culminata, 548.

Helicina
  amena,
  chryseis, 45.
  Lindeni, 45.
  merdigera, 45.
  Oweniana, 45.
  Salvini, 45.
  tuberculatum, 6.

Helisoma
  corpulentum, 161.
  trivolve, 161.

Helix
  acutedentata, 157.
  anachoreta, 157.
  annulifera, 286, 314.
  Antoni, 295, 314.
  arborotum, 59, 157.
  arbusorum, 162.
  areolata, 116, 152, 158, 208.
  O 265, 294, 295, 314.
  aspera, 162, 239.
  Ayresiana, 118, 158.
  Baskervillei, 85, 157, O 226.
  O 286, 290, 297, 314.
  bicincta, 294.
  Bridgesii, 118, 158.
  Breweri, 95, 96.
  Buffoniana, 265, 294, 295.
  caduca, 295.
  Californica, 226.
  O 286, 290, 297, 314.
  intercisa, 95, 120, 158.
  Carpenteri, 118, 158.
  Carpenteriana, 118.
  earthusiana, O 222.
  chersina, 95, 96.
  eicercula, 265.

Helix
  coactiliata, 44.
  Columbiana, 85, 92, 96, 115.
  157, O 198, O 239, O 294,
  O 314, V 220.
  concava, 115, O 211.
  crebristriata, 95.
  cultellata, 59.
  Damascenus, 59, 120, 158.
  devia, 85, 157, O 209, O 213,
  O 226.
  Dupetithouarsii, 59, 87, 92, 96,
  118, 119, 158, O 203, O 294,
  O 314.
  Duranti, 96.
  euryomphala, 44, O 295.
  exarata, 59, 96, 158.
  eximia, 44.
  facta, 95.
  fidelis, 59, 84, 92, 96, 120, 157.
  158, O 198, O 212, O 234,
  O 294, O 314, V 220.
  fraterna, O 211.
  fulva, O 222.
  Gabbii, 95.
  Gauieriana, P 247.
  germana, 157, O 210, O 211,
  O 314.
  Ghiesbreghti, 44, O 295.
  griseola, 265, O 294, O 295.
  Hildebrandt, 119.
  Hindsi, O 286, O 294.
  hispida, O 222.
  Humboldtiana, O 294.
  imperator, O 265.
  infirmata, O 283.
  infumata, 79, 87, 96, 157, O
  314.
  inflecta, O 211.
  intercisa, 95, 120, 158.
  Kellettii, 95, 96, 158, O 233,
  O 239, O 314, O 351.
  labiata, 92.
  labiosa, 85, 115, 157, O 209,
  O 212, O 213, O 314.
INDEX OF SPECIES.

**Helix**

labyrinthus, 0 239, O 265, 0 295.

—— var. sipunculata, 0 286.

Lalliana, 44.
laxata, 44.
Leconti, 157.
levis, 158, O 208, O 294, O 295, O 314.
loisa, 157.
loricata, 96, 157, 158, 127, 209-211.
lucubrata, 265, O 294.

Mexicana, 0 294.
mormonum, 59, 96, 158.
nemorivaga, 157.
Newberryana, 96.
Niekliniana, 59, 96, 120, 157, 158, O 198, 0 212, 0 226, O 314, V 220.
Nuttalliana, 59, 84, 87, 157, O 210, 0 226, 0 239, V 220.
Nystiana, O 186, O 295, O 314.
Ojacensis, O 294.
orn sinus, 13, 59, 87, 157, O 226, O 283, O 314.
Oregonensis, 59, 79, 87, 120, 158, 0 198, O 314, V 220.
Pandora, 59, 116, 158, 0 239, O 314.
pedestris, 59, 157.
peregrina, 01, 162.
plicata, 0 265, 0 295, O 314.
polygyrata, 115.
princeps, P 177.
pulchella, 0 222.
pura, 0 222.
Pytonesica, 95.
quadridentata, 0 295, 0 314.
quinquestrigata, 0 295.
ramentosa, 120, 158.
redimita, 157.
reticulata, 59, 118, 158.
Rothi, 95.

**Helix**

rotundata, 36, 92, 191.
ruderata, O 222.
rufescens, 92.
rufocincta, 95.
Sagraiana, 59, 162, O 294, O 314.
Sandiegoneensis, 162.
Schrenkii, O 222.
var. sipunculata, O 239.
solitaria, 115.
spendidula, O 265.
sportella, 85, 92, 96, 115, 157, O 209, O 226, O 314.
spirulata, 0 186, O 265, O 295, O 314.
stagnalis, P 361.
striatella, 95, 116.
strigosa, 115, 157, O 209, O 212, O 213, O 314.
Thouarsii, 92, 96, 118, 119.
—— var. 96.
tenuecostata, O 294.
Townsendiana, 13, 59, 84, 92, 115, 0 198, 0 210, 0 213, 0 226, 0 239, 0 294, O 314, V 220.
Traskii, 96, 118, 158.
Tryoni, 95.
tudicuhta, 72, 85, 96, 157, O 211, 0 233, 0 294, O 314, O 351.
undigera, O 187, O 290, O 295, O 314.
undata, P 176.
Vancouverensis, 79, 85, 92, 96, 115, 157, O 198, O 210, O 211, 0 212, 0 213, O 294, O 314, V 220.
vecillata, O 314: [misprint for] vellicata, 92, 115, 157, O 239.
ventrosula, 0 286, O 294.
vincta, 158, O 203, 0 226, O 297, O 314.
vivata, 6, 59, P 177.
INDEX OF SPECIES. 59

Hemicardium
biangulatum, 23, 38, 75, 97, 106, 128, 201.
graniferum, 23.
medium, 38, 201.
obovale, 155.

Hemifusus
Belcheri, 60.

Heterodonax
bimaculatus, 12, 27, 38, 105, 112, 126, 151.
— vars. 23.
Pacificus, 78.

Hiatella
oblonga, 0 221.

Hiatula
compacta, 151.
Nuttallii, 74.

Hima
decussata, P 497.

Hinnites
Californiensi sis, 13.
erassus, 81.
giganteus, 8, 13, 14, 20, 22, 25, 26, 81, 131, 151, 169, O 164, O 193, O 233, O 290, O 312, O 350, O 351.
Nickleinianus, 13.
Nuttallii, O 193.
Poulsoni, 8, 13, 131, O 193, O 233, O 290.

Hipponyx
australis, O 236, O 255, P 299, P 538, R 3.
barbatus, var. costellatus, R 4.
ecranoides, 114, 239.
crispus, P 299, R 4.
effodiens, R 5.
foliaceus, O 239, O 255, P 296, P 540, R 3.

Hipporyx
imtralis, P 297.
imtrula, O 226, O 324, O 363, P 297, R 3.
Panamensis, O 255, O 275, O 324, O 363, P 297, R 3.
planatus, 140, O 255, O 284, O 324, P 298.
radiatus, 194, O 184, O 200, O 230, O 255, O 275, P 299, R 4.
serratus, 27, 98, 140, 195, 256, O 226, O 236, O 239, O 255, O 324, O 364, P 296, P 297, P 300, P 549, R 3, R 5.
subrufus, 37, 194, 282, O 239, O 275, O 363, R 4.
tessellatus, P 90, P 549.
tuberculatus, R 4.
tumens, 23, 27, 140, 282.

Homalopoma
sanguineum, 23, 74, 113.

Hyala
rotundata, 104, 217.

Hyalæa
trigentata, 132.

Hydrobia
compacta, 104, 217.
stagnalis, P 361.
ulvae, 20, 142, O 257, O 327, O 366, P 361.

Ianacus
Lessonii, O 2, P 280.
squama, O 2, P 280.
unigueulis, P 281.
uniguiformis, P 284.

Ianthis
bifida, P 185.
communis, 74, O 366, P 186.
decollata, 52, 107, O 251, O 316, O 364, P 187.
INDEX OF SPECIES.

**Ianthina**
- fragilis, 52, 186, O 364, P 185.
- globosa, 52, O 251, P 187.
- pallida, O 366.
- prolongata, 74, O 251, O 364, O 366, P 185, P 187.
- striolata, 52.
- striulata, 31, 52, O 251, O 316, O 364, O 366, P 185.
- **var. contorta**, O 251, P 186.

**Iberus**
- Gaulterianus, P 247.
- sportella, 157.

**Imperator**
- olivaceus, P 227.
- serratus, 98, 138.
- unguis, 29.

**Infundibulum**
- Californicum, 40, O 286, P 265.
- chloromphalus, 40.
- Gabiotsense, 82.
- radians, P 264.

**Iopas**
- sertum, P 489.

**Iphigenia**
- altior, 23, 27, 202, O 245, O 304, P 42.
- laevigata, O 245, O 304, O 366, P 42, P 548.

**Iphinoe**
- coronata, 72.

**Isapis**
- maculosa, O 257, O 327, P 247, P 355.
- obtusa, 99, 142.

**Ischnochiton**
- Beanii, 108.
- Elenensis, 38, 39, 104, 266.
- **var. expressus**, 38, 266.
- flectens, 89, 92.
- Gothicus, 98.
- limaciformis, 63, 108.
- Magdalensis, 18, 107, 135, 151, 266.
- Mertensii, 89.
- Nuttalii, 113.
- paralellus, 104, 212, 213.
- pectinatus, 98.
- **var.** prasinatus, 104, 213.
- pseudodentiens, 16, 92, 98.
- retiporus, 89.
- sanguineus, 266.
- seabrocostatus, 98.
- serratus, 104, 213.
- trifidus, 89.
- vereodentiens, 98, 135.

**Isognomon**
- Chemnitizianus, 24, 27, 107, 199, O 249, O 297, O 311, O 352, O 363, O 365, P 150.
- **var.** 199.
- Chemnitzii, P 151: [==anus.]
- costellatus, 107, O 349, V 219.
- flexuosus, O 311, O 363.
- incisus, 107.
- Janus, 107, O 250, O 311, P 151.
- perna, P 150.

**Janira**
- bella, 80.
- deutata, 14, 27, 81, 98, 107, 131, 153.
- Estrellana, 81.
- excavata, 131, 153.

**Jeffreysia**
- Alderi, 109, 143, O 257, O 327, P 362.
- bifasciata, 109, O 257, O 327, O 366, P 362, P 363.
- opalina, O 366.
- translucens, 99, 143.
- tumens, O 257, O 327, P 366.

**Jouanettia**
- Darwinii, 251.
- pectinata, 121.
Katharina
Douglasiae, 9, 134, O 192, O 288, O 318, O 348.
submarmorea, O 318.
tunicata, 26, 134, O 318.

Kellia
(var.) Chironii, 99, 113, 129.
Laperousii, 15, 26, 88, 129, 304, 305, O 308, O 349.
(— var.) Chironii, 304.

tuuicata, 26, 134, O 318.
pulchra, 295.
rotundata, 129, 305.
rubra, P 108.
ventricosa, O 280.

Kennerlia
bicarinata, 80, 97, 124, 232.
filosa, 88, 124, 231.
glacialis, 231, 232.

Lacuna
var. aurantia, 142.
carinata, 17, 118, 142, 240, O 209, O 211, O 213, O 327, O 348.
decorata, 114, 142, 240.
var. effusa, 114, 142, 240.
var. exequata, 114, 142, 240.
glacialis, O 220, O 223.
pallidula, P 252.
porrecta, 114, 142, 240.
puteolus, O 240.
solidula, 17, 25, 142, 240, 322.
(solidula, var.) compacta, 114, 240.
unifasciata, 23, 142, O 228, O 230, O 327.
variegata, 114, 142, 240.
vincta, 89, 142, 169.

Lævicardium. See Liocardium.

Lagena
Californica, O 286.

Lagena
Wiegmanni, P 455.

Laminaria
digitata, Q 236, Q 237.

Lanistes
discors, 70.
lævigata, 70.

Lasæa
oblouga, O 248, O 308, P 109.
trigonalis, O 248, O 308, P 109.

Lasæa. See Lasæa.

Lathirus
armatus, O 287, O 297, O 338.
Californicus, O 338.
castaneus, 24, 48, 154, 183, O 282, O 338.
ceratus, 24, 110, 183, O 261, O 338, O 361, P 457.
concentricus, O 282, O 338.
gracilis, S 166.
Knorrii, O 364.
nodatus, O 338.
rudis, 24, 183, O 338.
spadiceus, 183, O 338.
tuberculatus, 24, 61, O 282, O 338, O 361, O 364, P 457.
tumens, O 284, O 338, S 166.
varicosus, O 338, O 361.

Lathyris. See Lathirus.

Latirus. See Lathirus.

Latyrus. See Lathirus.

Lavignon
lamellosa, P 29.

Lazaría
affinis, 14, 23.
Californica, 27, 30, 106.
pectunculus, 153.
subquadrata, 22, 113, 128, 280.

Leda
arctica, 70.
cætata, 22, 130.
costellata, O 311.
commutata, 130.
cuneata, 98, 130.
Leda
eburnea, 46.
Elenensis, 24, 200, O 249, O 311, P 145, P 530.
fossa, 88, 91, 130.
goebosa, O 311.
hamata, 98, 130.
Hindsi, 41.
impressa, O 367.
inornata, 130.
lyrata, 46.
minuta, 71, 89, 130, 169.
inornata, var. 71.
pernula, 130.
perita, 24, 200, 311.
Sowerbiana, 46.
Taylori, 41, 46.

Leiosolenus
spatiosus, O 249, O 310, P 130, P 550.

Leiostraca. See Liostraca.

Leiostracus
Mexicanus, P 177.
Ziegleri, P 177.

Lepas
alba, P 297.

Lepeta
candida, 71.
cecoides, 89, 137, 169.

Lepidopleurus
Adamsii, 37, 265, 266.
Beani, O 252, O 317, P 197.
bullatus, O 252, O 317, P 195.
—— var. calciferus, O 252, P 196.
clayratus, O 252, O 317, P 195.
lmaciformis, O 317.
MacAndrew, O 252, O 317, P 196, P 197.
Magdalensis, O 317.
Mertensi, 89, 135.
pectinatus, 89, 135.
regularis, 135.
sanguineus, O 252, O 317, P 194, P 195, P 196.

Lepidopleurus
scabriocostatus, 98, 135.
tenuisculptus, 37, 39, 266.

Lepralia
adpressa, 256, O 244, O 298, P 5.
atrofuscus, O 243, O 298, P 3.
cucullata, P 3.
hipporepis, O 244, O 298, P 4.
humilis, O 244, O 298, P 5.
marginata, O 244, O 298, P 4.
Mazatlanica, O 243, O 298, P 3.
rostrata, O 243, O 298, P 4.
trispinosa, O 243, O 298, P 3.

Leptinaria
Ellisae, 44.
Emmelinea, 44.

Leptochiton
cinereus, 92.
interstinctus, 16.
lividus, O 317.
Mertensi, O 317, O 349.
nexus, 98, 136.
proprius, O 317.
sco鸆iculatus, O 317, O 349.

Leptoconchus
monodonta, 63.

Leptoconus
gladiator, P 405.
puncticulatus, P 404.
purpurascens, P 402.
regularis, P 402.
regalitalis, P 403.

Lepton
clementinum, O 248, O 308, P 110, P 111.
dioneum, O 248, O 308, P 111.
mero euth, 97, 129.
placノideum, P 111.
umbonatum, O 248, O 308, P 111.

Leptonyx
bacula, 98, 138.
sanguineus, 113, 138.

Leptoxis
fusca, 163.
**INDEX OF SPECIES.**

**Leptoxis**
- Nuttallii, 162.
- vireus, 162.

**Lesoea.** See Lasaea.

**Leuchochila**
chordata, 158.

**Leucozonia**
- Californica, O 297.
- cingulata, 24, 28, 151, 180, 0 171, 0 231, 0 235, 0 261, 0 338, P 457.

**Levenia**
coarctata, 24, 27, 110.

**Levicardium.** See Liocardium.

**Lima**
- angulata, 24, 154, 199, O 185, O 189, O 229, O 277, O 284, O 311.
- arcuata, 107, 199, O 189, O 277, O 311, O 359.
- dehiscaens, 98, 131.
- fragilis, 107.
- gigantea, 8.
- lians, 131.
- orientalis, 98, 131.
- Pacifica, 199, O 277 O 311, O 359.
- squamosa, 21, 47, 69, 107, O 222.
- var. tenera, 131.
- tetrica, 21, 27, 69, 107, O 227, O 234, O 311, O 352, V 203.

**Limacina**
- artica, O 218, O 221, O 223.
- helicella, O 221.

**Limatula**
subauriculata, 98, 131.

**Limax**
- Columbianus, 85, 159, O 210, O 213, O 313.
- foliatus, O 213.

**Limnophysa**
- Adelinæ, 160.
- bulimosides, 160.
- cataracta, 93.
- cataractum, 160.
- cornea, 160.
- desidiosa, 93, 116.
- elongata, 159.
- emarginata, 85, 160.
- exigua, 120.
- exilis, 159.
- expansa, 160.
- ferruginea, 160, O 265, O 316.
- fragilis, 116, 159, 160.
- Gebleri, O 222.
- Haydeni, 159.
- humilis, 116.
- jugularis, 85, 159.
- leptis, 159.
- leucostoma, O 222.
- megasoma, 93.
- Nuttalliana, 160, O 198, O 316,
  V 220.
- Ontariensis, 160.
- pallida, 120, 160.
- pinguis, 160.
- plebeia, 160.
- proxima, 120, 160.
- reflexa, 159.
- sericata, 160.
- serrata, 160.
- solida, 160.
- speciosa, 159.
INDEX OF SPECIES.

Limnea
stagnalis, 93, 159, O 222.
Sumassii, 90, 159.
Traskei, 160.
truncatula, O 222.
umbrosa, 85, 159, O 210, O 316.
ventricosa, O 213.
Virginiana, 160.

Limnea. See Limnea.

Limnaeus. See Limnea.

Limaea
subauriculata, 169.

Lingula
albida, 122, O 207, O 298.

Liocardium
apicinum, 23, 104, 211, 261.
cruentatum, 128.
etatum, 27, 97, 128, 152, O 248.
Elenense, 170.
Mortoni, 168.
substriatum, 21, 128, 168, 170.

Lioconcha
hieroglypica, 101.

Liostraca
distorta, O 335, O 363, O 366, P 441.
— var. yod, O 260, P 441.
fulvocincta, P 440.
involuta, 193.
loa, 33, 37, O 335, P 441.
? — var. retexta, O 260, P 440.
linearis, 193, O 260, P 440.
producta, 33, 193, 260.
recta, 33, 193, 260, O 260, O 335, P 439.
retexta, 33, 37, 39, 192.
solitaria, 33, 193, 260, O 260, O 335, P 439.

Liota
acuticostata, 98, 138.
carinata, O 253, O 322, P 248.
C-B-Adamsii, O 253, O 322, P 249.
fenestrata, 98, 138.
striulata, O 253, O 322, P 248.

Lithodomus
aristatus, 38, 47, 50, P 126.
attenuatus, 38, 47.
calyculatus, 50.
caudigerus, 47, 50, P 127.
— var. P 124.
cinnamomens, 50, P 129.
cinnamominus, 50.
coaretata, 50.
Cumingianus, 50.
Gruneri, 50.
lithophagus, P 127.
pestulatus, 50.
plumula, 38, 50.
— var. 50.
subula, 50.
teres, 50.

Lithophagus
aristatus, 23, 107, 199, O 249, O 297, O 310, O 363, O 365, P 126, P 128.
aristatus, var. gracilior, P 129.
aristatus, var. tumidior, P 125, P 129, O 249.
attenuatus, 26, 130, 152, 199, O 233, O 248, O 309, O 351, P 124, P 127.
calyculatus, O 249, O 309, P 124.
caudigerus, O 363, O 365.
cinnamomens, 72, 200, O 174, O 234, O 249, O 309, O 363, P 127, P 129.
daetylus, O 174.
lavigatus, P 125.
plumula, 107, 130, 199, 256, O 249, O 310, P 125, P 128.
ruigferus, P 125.

Litiopa
divisa, O 288, O 350, Q 234.
saxicola, 190, O 273, P 369, Q 234.
<table>
<thead>
<tr>
<th>Species</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litorina aberrans</td>
<td>60, 186, 326</td>
</tr>
<tr>
<td>Litorina angiostoma</td>
<td>188, 273</td>
</tr>
<tr>
<td>Litorina angulifera</td>
<td>U 205</td>
</tr>
<tr>
<td>Litorina aspera</td>
<td>24, 152, 188, 162, 216, 224, 230, 235, 237, 257, 273, 286, 326, 348, 349, P 349, P 350, P 530, P 540</td>
</tr>
<tr>
<td>Litorina atrata</td>
<td>36, 188, 190, 273, 326</td>
</tr>
<tr>
<td>Litorina castanea</td>
<td>20</td>
</tr>
<tr>
<td>Litorina conspersa</td>
<td>24, 27, 60, 108, 188, 189, 208, 237, 257, 326, P 346, P 347, P 348, P 349</td>
</tr>
<tr>
<td>Litorina coronata</td>
<td>297, 326</td>
</tr>
<tr>
<td>Litorina dubiosa</td>
<td>188, 273</td>
</tr>
<tr>
<td>Litorina excavata</td>
<td>188, 273</td>
</tr>
<tr>
<td>Litorina fasciata</td>
<td>27, 152, 188, 189, 177, 208, 237, 257, 273, 296, 326, 352, P 351, P 540</td>
</tr>
<tr>
<td>Litorina foveata</td>
<td>188, 273</td>
</tr>
<tr>
<td>Litorina grandis</td>
<td>19, O 215, 220, O 223</td>
</tr>
<tr>
<td>Litorina Groenlandica</td>
<td>70</td>
</tr>
<tr>
<td>Litorina iostoma</td>
<td>35</td>
</tr>
<tr>
<td>Litorina irrata</td>
<td>51</td>
</tr>
<tr>
<td>Litorina Kurila</td>
<td>19, O 215, 220, 223, O 326</td>
</tr>
<tr>
<td>Litorina lepida</td>
<td>17, 142, 209, 326, O 348</td>
</tr>
<tr>
<td>Litorina litoren</td>
<td>19, O 176</td>
</tr>
<tr>
<td>Litorina maculata</td>
<td>35</td>
</tr>
<tr>
<td>Litorina megasoma</td>
<td>188, 273</td>
</tr>
<tr>
<td>Litorina modesta</td>
<td>51, 84, 216, 224, 237, 257, 286, 326, P 340, P 347</td>
</tr>
<tr>
<td>Litorina var. modesta</td>
<td>141</td>
</tr>
<tr>
<td>Litorina nuritoides</td>
<td>222</td>
</tr>
<tr>
<td>Litorina parvula</td>
<td>32, 36, 188, 273, O 295, O 326</td>
</tr>
<tr>
<td>Litorina patula</td>
<td>17, 84, 141, O 209, O 212, O 213</td>
</tr>
<tr>
<td>Litorina Pedroana</td>
<td>76, 118</td>
</tr>
<tr>
<td>Litorina phasianella</td>
<td>273, O 295</td>
</tr>
<tr>
<td>Litorina philippii</td>
<td>24, 32, 36, 108, 188, O 257, O 273, O 326, O 364, P 349</td>
</tr>
<tr>
<td>Litorina philippii var. dubiosa</td>
<td>O 273</td>
</tr>
<tr>
<td>Litorina planaxis</td>
<td>17, 23, 27, 84, 141, 151, O 200, O 209, O 212, O 224, O 230, O 235, O 326, O 349, P 348, P 349, V 226</td>
</tr>
<tr>
<td>Litorina pleuna</td>
<td>17, 71, 76, 79, 142, O 209, O 213, O 326</td>
</tr>
<tr>
<td>Litorina pulchra</td>
<td>48, 61, 189, O 160, O 273, O 326, P 351</td>
</tr>
<tr>
<td>Litorina pullata</td>
<td>32, 104, 216</td>
</tr>
<tr>
<td>Litorina punctata</td>
<td>P 346</td>
</tr>
<tr>
<td>Litorina puncticulata</td>
<td>189, O 230, O 257, O 273, P 346, P 347</td>
</tr>
<tr>
<td>Litorina porcata</td>
<td>O 186, O 326, O 360</td>
</tr>
<tr>
<td>Litorina pusilla</td>
<td>O 230</td>
</tr>
<tr>
<td>Litorina rudis</td>
<td>84, 141, O 222</td>
</tr>
<tr>
<td>Litorina scabra</td>
<td>P 351</td>
</tr>
<tr>
<td>Litorina scutellata</td>
<td>O 213, O 326, O 348</td>
</tr>
<tr>
<td>Litorina scutulata</td>
<td>17, 23, 84, 142, O 209</td>
</tr>
<tr>
<td>Litorina Sitchana</td>
<td>17, 19, 20, 84, 141, O 216, O 223, O 286, O 326</td>
</tr>
<tr>
<td>Litorina Squalida</td>
<td>O 176</td>
</tr>
<tr>
<td>Litorina sulcata</td>
<td>84, 141</td>
</tr>
<tr>
<td>Litorina subtenebrosa</td>
<td>19, 84, 141, O 215, O 220, O 223</td>
</tr>
<tr>
<td>Litorina tenebrata</td>
<td>13, O 200, O 230, V 226</td>
</tr>
<tr>
<td>Litorina varia</td>
<td>48, 188, 189, O 273, O 326</td>
</tr>
<tr>
<td>Litorina zebrata</td>
<td>P 348</td>
</tr>
<tr>
<td>Livona ziczac</td>
<td>O 364, P 348</td>
</tr>
<tr>
<td>Livona (ziczac, t-ar.) lineata</td>
<td>104, 216</td>
</tr>
<tr>
<td>Livona pica</td>
<td>O 225, O 228, O 321, O 350</td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Livona
  picoides, 21, 23, 100, 138.

Lophyrus
  Adamsii, 198, 265.
  albolineatus, O 252, O 317, O 352, P 191, P 193.
  articulatus, O 3, O 251, O 317, P 190, P 192, P 193, P 199.
  dispar, O 317.
  Goodallii, O 317, O 360.
  laevigatus, O 317, O 352, P 191.
  striato-squamosus, O 252, O 317, P 192, P 196.
  Stokesii, 153, 198, 266, O 317.
  sulcatus, O 317, O 360.
  tenuisculptus, 198.

Lottia
  conica, 79.
  gigantea, 26, 47, 136, 151, 309, P 199.
  mitra, 79.
  pallida, O 177, O 199, O 215, V 222.
  patina, 37, 79, 197, 268, O 252, O 276, O 284, P 203.
  pindadina, 31, O 173, O 209, O 211, P 203, P 208, V 221.
  punctata, O 174, O 215, P 209, V 222.
  scabra, 79, O 199, O 284, P 209, V 222.
  spectrum, 79, O 284.
  testudinalis, O 211.
  textilis, O 209.
  viridula, O 210.

Lucapina
  alta, P 221.
  crenulata, 27, 45, 76, 137, 151, O 1, O 174, O 199, O 320, O 349, V 223.
  inaequalis, P 220.
  pica, P 220.

Lucina
  acutelirata, 97.
  acutilineata, 129, 165, O 367.
  annulata, O 248, O 289, O 307, P 96, P 97.
  Artemidis, 128, O 227, O 308, U 201.
  bella, 102, 128, 151, O 197, O 234, O 307, O 351, V 218.
  borealis, 97, 129, 168, O 167, P 96.
  caelata, O 248, P 102, P 103.
  calcarius, O 187, P 96, P 100.
  Californica, 22, 25, 26, 86, 128, 151, O 197, O 234, O 307, O 351, V 218.
  Candeana, O 364, P 103.
  capax, 39.
  carnaria, O 245, P 40.
  Childreni, 8.
  commutata, P 99.
  compressa, 8.
  cornea, O 187, P 103.
  corrugata, O 203.
  cristata, 14, O 203, O 245, P 39.
  excavata, 23, 106, O 248, O 308, P 98.
  fenestrata, O 207, O 297, O 308.
  fibula, O 187, P 96, P 99.
  glacialis, O 327.
  lentcula, 165.
  lentilaria, 47.
  lingualis, 104, 211.
  Mazatlanica, 97, O 248, O 307, P 99, P 530.
  muricata, O 249, O 307, P 98.
  Nuttalii, 78, 128, O 197, O 307, O 351, V 218.
  obliqua, 60.
  occidentalis, P 96.
  orbella, 30, 78, O 227, O 229, O 284, U 202, V 218.
  pecten, O 197, O 304, P 99.
  pecten, var. V 218.
INDEX OF SPECIES.

**Lucina**
- pectinata, 23, 102, 128, 154, O 248, O 308, O 364, P 98.
- pisum, 60.
- prolongata, O 248, O 308, P 100.
- reticulata, P 99.
- semireticulata, O 308, P 102.
- serricata, P 104.
- squamosa, P 99.
- tellinoides, 201, O 279.
- tenuissculpta, 88, 97, 128.
- tigerina, 63, 153, O 243, O 248, O 282, O 308, O 350, O 363, P 96, P 97.
- undata, 272.
- unifasciata, U 205.

**Lucinopsis**
- subquadrata, P 62.
- undata, Q 231.

**Lucatia**
- algida, 17, O 336, O 348.
- aperta, 71.
- Bonplandi, O 337.
- caurina, 9, 147, O 336, O 348.
- flava, O 336.
- Gallapagosa, O 337, O 360.
- herculea, 17, 147, O 336, O 348.
- heros, 168.
- impervia, O 336.
- lurida, O 337.
- otis, O 337, O 360.
- pallida, 71, 147, 169.
- pallidoides, 71.
- ravid, 60.
- septentrionalis, 71.
- soluta, 9, 147.

**Luponia**
- fimbriolata, 154.
- nigropunctata, O 328, O 360.
- semipollita, 154.
- Sowerbyi, 27, 109.
- spadicea, 9, 23, 143.
- spurea, 32, O 328.

**Lutraria**
- canalculata, O 211.
- carinata, O 211.
- elegans, 204, O 280.
- inflata, O 296.
- lineata, 61.
- maxima, 11, 17, 86, O 192, O 209, O 219, O 224, O 300.
- nasuta, O 232.
- Nuttallii, 61, 69.
- papyria, 81.
- transmontana, 81.
- Traskei, 76.
- undulata, O 211, O 227, O 232, O 280, U 200.
- ventricosa, 29, O 211, O 227, O 232, O 246, P 51, P 548, U 200.

**Lutricola**
- alta, 22, 80, 81, 125, 301.
- Dombeyi, 40, 301.
- ephippium, 301.
- viridotincta, 105.

**Lymneea.** See **Limnea.**

**Lyonsia**
- arenosa, 73.
- bracteata, 124, O 300.
- California, 22, 26, 124, 167, O 194, O 226, O 300, O 349, O 354, U 199, V 211.
- cuneata, Q 229.
- diaphana, 40, O 284, O 287, O 301, Q 228.
- flabellata, 73.
- Floridana, 119, 124, 169.
- gibbosa, O 222.
Lyonsia
hyalina, 20, 167, O 194.
inflata, 40, 105, O 193.
navicula, 73, 91.
nitida, 124, O 194, O 297, O 300, U 199, V 211.
Norvegica, 20, 71, 73, O 219, O 222, O 223.
picta, 105, O 184, O 245, O 301, O 358, O 364, P 26.
placata, O 364.
saxicola, 91.
striata, O 222.
ventricosa, 73.

Lyria
Cumingii, 40.
harpa, 24, 40.

Machaera
costata, 20, 73, 87, O 219, O 222, O 223, O 301.
lucida, 72, 124, O 195, O 301, V 211.
maxima, O 195.
Nuttalli, 5, O 349.
patula, 12, 20, 22, 26, 72, 87, 124, 154, 251.
sodalis, 73.

Macoma
calcarea, 70, 125.
concinna, 202.
crasulata, 235.
Dombeyi, 202.
edentula, 12, 70, 113, 125.
edulis, 12, 86, 125.
(Pear.) expansa, 88, 125.
Fabricii, 125.
fragilis, 125.
fusca, 167.
inconspicua, 12, 18, 20, 86, 125, 167.
indentata, 97, 125.
inquinata, 11, 80, 97, 125, 168.
lata, 70, 88, 125.
nasuta, 20, 22, 26, 71, 125.
proxima, 70, 88.

Macron
Kellettii, 40, 102, 150, 151.
lividus, 100, 150, 151.

Mactra
alata, P 50.
albaria, 76.
angulata, 0 229, 0 246, 0 282, 0 289, O 297, O 304, P 52, S 161.
angusta, O 287, O 289, O 304.
Brasiliiana, 0 211, 0 246, P 51.
Californica, 26, O 196, O 229, O 232, 0 287, O 289, O 304, O 349, V 214.
cauliculata, O 364.
carinata, O 364, P 50.
carinulata, O 289, P 52.
Diegoana, 76.
donaciformis, O 289.
exoleta, O 208, O 211, O 227, O 232, 0 246, O 280, O 364, P 50, P 51, P 52, U 200, V 214.
falcata, O 209, O 232, O 304.
fragilis, O 243, O 246, O 304, O 363, P 51.
Gabiotensis, 82.
goniata, O 287, O 304, P 52.
laciniata, O 284, O 304, S 161.
### INDEX OF SPECIES.

<table>
<thead>
<tr>
<th>Mactra</th>
<th></th>
<th>Mangelia</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxima, O 192.</td>
<td></td>
<td>attenuata, 144.</td>
</tr>
<tr>
<td>mendica, O 227, P 549, U 200.</td>
<td></td>
<td>cerea, 24, 294.</td>
</tr>
<tr>
<td>modesta, 152.</td>
<td></td>
<td>concinna, O 332.</td>
</tr>
<tr>
<td>nasuta, O 211, O 232, O 304, O 352.</td>
<td></td>
<td>crebricostata, 114, 144, 242.</td>
</tr>
<tr>
<td>Nuttallii, O 194.</td>
<td></td>
<td>exigua, 184.</td>
</tr>
<tr>
<td>oblonga, O 246, P 51.</td>
<td></td>
<td>gemmuloosa, 184.</td>
</tr>
<tr>
<td>ovalina, O 246, P 51.</td>
<td></td>
<td>hamata, 24, 293, 294.</td>
</tr>
<tr>
<td>ovalis, O 219, O 221, O 223, O 304.</td>
<td></td>
<td>interfossa, 114, 144, 242.</td>
</tr>
<tr>
<td>pallida, O 175, O 304.</td>
<td></td>
<td>levidensius, 59, 144.</td>
</tr>
<tr>
<td>planulata, 25, O 196, O 304, O 349, V 214.</td>
<td></td>
<td>neglecta, 36, 184, O 272, O 332, P 401, S 163.</td>
</tr>
<tr>
<td>ponderosa, O 221.</td>
<td></td>
<td>plumbea, O 332.</td>
</tr>
<tr>
<td>similis, O 178, O 192, O 221.</td>
<td></td>
<td>pulchella, 24.</td>
</tr>
<tr>
<td>stultorum, P 531.</td>
<td></td>
<td>rigida, S 163.</td>
</tr>
<tr>
<td>subglobosa, O 175.</td>
<td></td>
<td>— var. fuscoligata, O 284, S 163, S 164.</td>
</tr>
<tr>
<td>undulata, U 200.</td>
<td></td>
<td>septangularis, 144.</td>
</tr>
<tr>
<td>velata, 204, O 280, O 295, O 304.</td>
<td></td>
<td>striosa, O 284, S 163.</td>
</tr>
<tr>
<td>Mactrella</td>
<td></td>
<td>subdiaphana, 24, 104, 154, 218.</td>
</tr>
<tr>
<td>alata, 154.</td>
<td></td>
<td>sulcata, 34, 259.</td>
</tr>
<tr>
<td>exoleta, 29, 126, 204.</td>
<td></td>
<td>sulcosa, 185, O 272, O 332.</td>
</tr>
<tr>
<td>carinata, 154.</td>
<td></td>
<td>tabulata, 114, 144, 242.</td>
</tr>
<tr>
<td>lacinata, O 284, S 161.</td>
<td></td>
<td>variegata, 23, 144, 284.</td>
</tr>
<tr>
<td>Mæra</td>
<td></td>
<td>(?variegata, var.) nitens, 144, 284.</td>
</tr>
<tr>
<td>Gouldii, 301.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>salmonea, 113, 125, 235.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malea</td>
<td></td>
<td>Margarita</td>
</tr>
<tr>
<td>crassilabris, O 171, O 178, O 238, O 269.</td>
<td></td>
<td>acuminata, 47.</td>
</tr>
<tr>
<td>latilabris, O 171, O 238, O 269, O 292, O 337.</td>
<td></td>
<td>acuticostata, 98, 139.</td>
</tr>
<tr>
<td>ringens, 24, 34, 80, 110, 152, 153, 166, 179, O 171, O 238, O 282, O 288, O 337.</td>
<td></td>
<td>albula, 73.</td>
</tr>
<tr>
<td>ringens, var. O 238.</td>
<td></td>
<td>aretica, 19, 73, 322, O 216, O 220, O 223, O 321.</td>
</tr>
<tr>
<td>Mamma</td>
<td></td>
<td>argentata, 71.</td>
</tr>
<tr>
<td>umberina, P 452.</td>
<td></td>
<td>calostoma, 18, 40, 139, O 286, O 321.</td>
</tr>
<tr>
<td>Mangelia</td>
<td></td>
<td>cidaris, 113, 139, 238.</td>
</tr>
<tr>
<td>acuticostata, 36, 184, O 284, O 332, P 401, S 162.</td>
<td></td>
<td>var. conica, 139.</td>
</tr>
<tr>
<td>acuticostata, var. subangulata, O 259, P 400.</td>
<td></td>
<td>costellata, 18, 40, 47, 92.</td>
</tr>
<tr>
<td>angulata, 23, 89, 144, 284.</td>
<td></td>
<td>helicina, 71, 113, 139, 169, O 216.</td>
</tr>
<tr>
<td>Mangelia</td>
<td></td>
<td>Hillii, 28, O 240.</td>
</tr>
<tr>
<td>acuticostata, 36, 184, O 284, O 332, P 401, S 162.</td>
<td></td>
<td>ianthina, 73.</td>
</tr>
<tr>
<td>crebricostata, 114, 144, 242.</td>
<td></td>
<td>inflata, 89, 139.</td>
</tr>
<tr>
<td>crebricostata, var. subangulata, O 259, P 400.</td>
<td></td>
<td>lirulata, 82, 139.</td>
</tr>
<tr>
<td>albolaqueata, 273.</td>
<td></td>
<td>mustelina, 73.</td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Margarita
obscura, 70.
var. obsoleta, 139.
pupilla, 25, 40, 47, 92, 98, 139.
purpurata, 28, O 240.
puessa, 89.
(var.) salmonea, 98, 139.
Schantarica, 73.
sordida, O 223.
striata, 47, 71, O 176, O 216, O 223, O 321.
sulcata, O 216, O 223, O 321.
var. subelevata, 139.
sulcata, 216, O 223, O 321.
var. tenuisculpta, 89, 139.
sulcata, 216, O 223, O 321.
undulata, 47, 98, 139.
Vahlia, 89, 139, 169.

Margaritana
margaritifera, 85, 116, 120, 164.

Margaritiphora
albina, P 149.
barbata, 199.
finibrata, 27, 50, 107, 153, 199, O 161, O 249, O 277, O 282, O 311, P 550.
margaritifera, P 149.
Mazatlanica, 199, O 249, O 296, O 311, P 149, P 196.
radiata, P 149.

Marginella
cerulea, O 363: [should be—] ceruleascens, 15, 24, 35, 177, O 189, O 339, O 365.
curta, O 296, O 339.
eypricola, 45, O 267, O 285, O 339.
glans, 15, 177.
granum, O 267
imbricata, O 226, O 285, O 297, 339.
Jewettii, 23, 147, 287, O 228, O 339, O 349, U 207.
Lavalleana, P 461.
margaritula, O 261, O 339, O 364, P 462.
mimina, O 364, P 461.

Marginella
minor, 110, 147, 177, O 261, O 267, O 339, O 364, P 461.
ovuliformis, O 261, O 364, P 462.
polita, 23, 24, O 261, O 339, P 462.
prunum, 7, 15, 177, O 189, O 206, O 282, O 339, O 363, O 365.
regularis, 23, 147, 287.
sapotilla, 15, 35, 177, O 189, O 206, O 231, O 267, O 282, O 339, O 363.
subtrigona, 23, 147, 287.

Marinula
Recluziana, O 275.

Marmorostoma
planospira, 35.
undulata, 10.

Martesia
intercalata, 114, 123, 151, O 244, O 299, P 13.

Megalomastoma
simulacrum, 45.

Meloceras. See Mioceras.

Melampus
acutus, O 315.
Adamsianus, S 161.
bidentatus, P 178.
Bridgesii, O 284, O 315, S 161.
concinuus, O 315.
fasciatus, 44.
infrequens, O 315.
olivaceus, 107, 133, 151, 159, O 233, O 251, O 284, O 315, O 351, P 178.
Panamensis, O 315.
stagnalis, O 315.
Tabogensis, O 315.
trilineatus, O 315.

Melania
bulbosa, 163, O 209, O 325.
Busbiana, 51.
exigua, 163, O 283.
fusca, 163.
Gouldii, O 325.
INDEX OF SPECIES.

Melania

Largillierti, O 265.
maxima, O 286.
Menkeana, 163.
Newberryi, 120, 163.
nigrius, 51, 120, 163.
occata, 120, O 206, O 211, O 325.
plerata, O 211, O 325.
plicifera, 18, 84, 92, 116, 163.
O 210, O 213, O 325.
polygonata, O 286.
rudens, 92.
semitalis, 120.
Scipio, 51.
Shastaensis, 120, 163.
Shortaensis, 84.
silicula, 84, 92, 163, O 209, O 325.
siliqua, O 209.
strata, 6, 162.
subnodosa, O 265.
Wahlamatensis, 163, O 211, O 325.
Warderiana, 163.

Melaraphe

fasciata, P 351.
phasianella, 31, 37, 192.

Meleagrina

fimbriata, O 296, P 550.
Mazathanica, P 149, P 151.

Melongena

occidentalis, 35.

Membranipora

calpensis, P 2.
denticulata, O 243, O 298, P 1.
Flemingii, 34, 256.
gothica, O 243, O 298, P 2.
Lacroixii, P 2.
Rozieri, P 2.
Savartii, P 2.

Menetus

opercularis, 161.

Mercenaria

Ducatellii, 77.
orientalis, 69.
perlaminosa, 77.

Mercenaria

Stimpsoni, 69, 73.

Meretrix

Californiana, 75.
Dariena, 77.
impudica, P 70.
petichialis, P 70.
Poulsoni, 75.
Tularena, 75.
uuniomeris, 75.
Uvasana, 75.

Mesalia

lactea, 89, 141.
lacteola, 89, 93, 141, 166, 169.
subplanata, 89, 141.
tenuisculpta, 98, 141.

Mesembrinus

excelsus, 158.
inscendens, 158.
pallidior, 158.

Mesodesma

rubrotinctum, 78.

Mesodon

Columbianus, 157.
devius, 157.

Meta

cedonulli, 53.
coniformis, 53.
Dupontia, 53.
ovnoides, 53.

Metula

Hindsii, O 342.

Miltha

Childreni, 106.

Mioceras

cornubovis, X 439, X 443.
cornucopiae, X 429, X 439, X 440, X 443.
nitidum, X 438, X 443.

Miodon

orbicularis, 236.
prolongatus, 97, 113, 128, 168, 236.

Miralda

laennata, 33, P 414.
quinquecincta, 33, P 414.
INDEX OF SPECIES.

Miralda

scalariformis, 33, P 413.

Mitra

amphorella, P 461.
atenuata, O 188, O 339.
auriculoides, O 231.
babea, O 171, O 339.
Belcheri, O 206, O 339.
Chilensis, 13, 147.
crenata, 110.

Dupontii, O 231, O 239, O 261, P 466.
effusa, O 185, O 338.
foraminata, O 231.
funiculata, 24, 177, O 267, O 339.
gausapata, O 186, O 339, O 361.
granulosa, 177, O 364.
gratiosa, O 186, O 339, O 361
Haneti, 62.
Hindsii, O 207, O 208, O 339.
lens, 24, 28, 177, O 231, O 239, O 261, O 267, O 338, P 460, P 545.
maura, 13, 147, 170, O 201, O 338, O 349, V 227.
murieta, O 339, O 361.
nucleola, 24, 110, 177, O 267, O 338, O 364.
orientalis, 13, 147.
pica, O 231.

solitaria, 110, 177, O 267, O 284, O 339.
sulcata, O 188.

tristis, 177, O 185, O 267, P 461.

Mitrella

cibbraria, P 487.

Mitromorpha

aspera, 144.
filosa, 144, 284.
effusa, 144.

Modelia

striata, 118, 240.

Modiola

Adamsiana, 38.
INDEX OF SPECIES.

Modiola

subpurpurea, 21, 50.
'sulcata, P 119.
verniosa, O 223.
vulgaris, O 211.

Modiolaria
corrugata, 71.
discors, O 218.
lavigata, 88, 130, 169, O 218.
lavis, O 218.
marmorata, 88, 130, 169.
nigra, 71, O 218, O 221.
verniosa, O 218, O 221.

Modulus
carchedonicus, O 286, O 364, P 352.
catenulatus, 27, 109, 191, O 230, O 233, O 257, O 274, O 326, O 364, P 353.
cerodes, 152.
disculus, 27, 36, 192, O 202, O 225, O 226, O 230, O 233, O 257, O 326, O 364, P 353, U 205.
dorsuosus, 21, O 226, O 228, O 230, O 257, O 326, P 353, U 205.
duplicatus, O 226.
—— var. O 257, P 253.
lenticularis, 21, O 226.
lividus, O 274.
trochiformis, O 202, O 257, P 352.
unidens, P 352.

?Mormula
unifasciata, 33, P 433.

Monoceros
crassilabrum, O 171, O 235.
cymatum, 48, O 174, O 177, O 235, O 285, O 294.
engonatum, 83, 102, 149, O 201, O 340, O 349, V 228.
globulus, O 235.
grande, O 177, O 188, O 204, O 294, O 341, O 361.
lapilloides, 13, 83, 149, O 201, O 231, O 340, O 349, V 229.
lugubre, 10, 14, 48, 76, 151, 153, O 177, O 178, O 285, O 294, O 341.
—— var. 152.
maeulatum, O 177, O 201, O 341, V 229.
muriecatum, O 191, O 234, O 238, P 458, P 476, P 542.
plumbeum, 35.
punctatum, 83, 149, O 177, O 201, O 231, O 235, O 293, V 229.
punctulatum, O 201, V 229.
?var. spiratum, 149.
tuberculatum, O 234, O 341, O 352.
unicarinatum, 83, 149, O 201, O 231, O 235, O 285, O 293, V 229.

Monodonta
carchedonica, P 352.
catenulata, O 238.
fusca, 35.
modulus, P 353.
pyriformis, O 228, U 204.
Sayii, O 286.

Montacuta
calcedonica, 34, O 354, P 531.
dionaea, 257.
divariecta, 73.
elliptica, O 248, O 308, P 113.
obtusa, 34, 257.
subquadrata, O 248, O 308, P 113, P 114.
INDEX OF SPECIES.

Mopalia
acuta, 134.
Blainvillei, O 318, O 351.
Grayii, 89, 134.
Hindsi, 13, 26, 89, 92, O 318.
imporcata, 89, 134.
lignosa, 40, 134.
Merckii, 134.
Montereyeneis, 19, 134.
muscosa, 23, 26, 92, 134.
Simpsonii, 134, O 318, O 349.
sinuata, 89, 134.
Stimpsoni, 72.
(Sar.) Swauii, 113, 134, 238.
vespertina, 134, O 318, 348.
Wosnesseuskii, 134.

Morrisia
Hornii, 118.

Morbus
pilula, 158.
sulfatus, 158.

Morum
xanthostoma, O 287.

Morvilia
zonata, 71.

Mouretea
Peruviana, 9.
stellata, O 185.

Mucronalia
involuta, 33, 259, P 439.

Mulinia
angulata, 23, 27, 76, 106, 204.
0 246, O 280, P 52.
carinulata, 152.
densata, 80.
donaciformis, 204, O 246, O 280.
P 52, P 549.
exalbida, O 295.
ventricosa, 204, O 246, O 280.
P 51.

Mumila
nodosa, 33, P 417.
oblonga, 33, P 418.
urnata, 33, 39, P 417.
rotundata, 33, P 418.

Murex
acanthopterus, O 177.
aculeatus, O 179, O 188, O 238.
O 271, P 527.
alatus, O 173, O 177.
aveatus, O 188, P 527.
ambiguus, O 177, O 237, O 238.
O 264, O 271, P 521, P 543.
amalus, 4.
anceps, O 182.
argus, 4, O 177.
argus, var. P 455.
armatus, O 226, O 287, O 344.
Belcheri, 15, 60, 182, O 205, O 351.
bicolor, O 172, O 234, O 235.
O 238, O 264, O 352, P 524.
P 525, P 543.
— var. 45.
Boivinii, O 182, O 293.
brassica, O 174, O 176, O 177.
O 234, O 235, O 238, O 264.
P 523, P 537, P 543.
California, O 205.
centrifuga, 99, O 205.
ceratostoma, O 179, P 457.
clethratus, O 217.
cornex, O 217.
corrugatus, O 294.

Mumila
nodosa, 33, P 417.
oblonga, 33, P 418.
urnata, 33, 39, P 417.
rotundata, 33, P 418.
INDEX OF SPECIES.

Murex

foveolatus, O 205.
fungiculatus, P 519, P 520.
glomer, 4, 5.
hamatus, O 208.
hippocastanum, O 264, P 524.
horridus, O 182, O 293, O 345.
humilis, O 208.
imperialis, 45, O 178, P 524.
imisius, O 208.
lactuca, 7, O 173, O 217, O 223.
—— var. O 173.
lappa, O 182, O 238, O 264, P 526, P 543.
lima, 61.
lividus, O 345.
lyratus, 5.
macropterus, O 203.
melanoleucus, 42.
melanomathos, 6, O 271.
messorius, O 238, O 264, O 294, O 364, P 519, P 520, P 543.
—— var. P 519.
miliaris, P 485.
monoceros, O 201, O 293.
monodon, 83, O 173, O 174, O 177, O 217, O 223.
monacilla, O 294.
multicosatus, 7, O 173, O 217.
nigrescens, 25, O 264, O 294, P 519, P 520.
nigritus, 60, O 177, O 237, O 238, O 264, O 354, P 521, P 523, P 530, P 543.
—— var. O 238.
nitidus, O 182, O 264, P 523.
nodatus, 10.
nucleus, O 182, O 345, O 361.
Nuttalli, O 201, O 231, O 293.
nux, O 191, O 287, P 484.
oxyacantha, O 182, O 208, O 294.
pauxillus, O 264, O 287, P 528.
peritus, O 205.
Peruviana, 7.
phyllopterus, 48, O 177.

Murex

pinniger, O 235.
placatus, 28, 112, O 185, O 234, O 263, O 345, O 352, P 518.
pomum, var. 45.
ponderosus, 119.
princeps, O 264, P 124, P 523, P 525.
pumilus, O 182, O 345, O 361.
purpura, 4, 5, O 177, P 485.
radix, 6, O 182, O 174, O 177, O 271, O 283, P 521, P 522.
radicatus, O 205, O 264, P 526.
rectirostris, 182, O 271, O 294, O 345, P 519, P 520.
recurvoirostris, 25, 28, 112, 182, O 182, O 271, O 345, O 364, P 519, P 520.
—— var. lividus, O 264, P 519.
regius, 182, O 172, O 174, O 177, O 179, O 264, O 271, O 283, P 524.
rigidus, 10, O 179, O 188.
salebrosus, 182, O 179, O 238, O 271, O 293, P 485, P 543.
salmo, 10.
sanguineus, 10.
sinuositus, 35.
ternispina, O 238, P 518, P 543.
tortuus, 14.
trialatus, 5, O 192.
tricolor, 119, O 172, O 264, O 271, P 525.
trigonularis, O 177.
tripterus, 5, 6, O 173.
uninatus, P 335.
unidentatus, O 238, P 519, P 543.
vibex, 183, O 182, O 271.
vittatus, 183, O 271.
vitulinus, O 177, O 262, P 485, P 486.

Muricidea

alveata, 155, O 345.
California, 149.
INDEX OF SPECIES.

Muricidea

erinaceoides, O 345.

—— var. indentata, O 264, O 345, P 527.
erosa, 182.
lacteua, O 345.
lappa, O 264, O 345, P 526.
pauillus, O 264, O 345, P 528.
erita, O 345.
pinnigera, 25.
radicata, O 345.
var. squamulata, 274.
vibex, 25, O 345.
vittata, 183, O 345.

Musculus-polypteo-ginglymus

Area-Nose, 33.

Mya

abrupta, 165, O 367.
arenaria, 69, 70, 74, O 219.
O 222, O 223, O 300.
byssifera, O 221.
cancellata, 87.
hyalina, O 222.
Japonica, 74.
Montereyana, 80.
pracisa, 17, 123, O 209, O 210, O 219, O 300.
suborbicularis, P 105.
susiniata, 80.
truncata, 17, 70, 123, 168, O 209, O 210, O 219, O 222, O 223.

Uddevalensis, O 222.

Myrtæa

lenticula, 165.

Mysia

tumida, 12, 78, 129, O 196, V 215.
usta, 73.

Mytilimeria

Nuttallii, 26, 87, 124, O 194, O 301, O 349, V 211.

Mytilus

abbreviatus, O 219.

Adamsianus, 41.
bicolor, P 122.
bifurcatus, 12, 49, 129, O 198, O 226, O 309, O 349, V 219.
borealis, O 219.
Brasiliensis, U 202.

Californianus, 5, 22, 26, 72, 85, 129, O 192, O 197, O 212, O 234, O 284, O 309, O 349, O 351, V 219.
cinnamomeus, P 129.
coruscus, 73.
Cumingianus, 49.
edulis, 18, 22, 26, 70, 72, 76, 78, 85, 129, 151, 169, O 192, O 197, O 212, O 219, O 223, O 284, O 309.

—— var. 102.

—— var. latissimus, V 219.

flabellatus, 18.
frons, 6.
Guiaënsis, O 277.
Guyanensis, P 122.
humerus, 75.
incurvatus, O 219.
Inezensis, 81.
latissimus, O 197.
lithophagus striatus, P 126.
normalis, O 197.
notatus, O 219.
Pedroanus, 76.
pellucidus, O 197, O 219.
retusus, O 219.
ropan, O 249, P 129.
rugosus, O 221.
Sallei, 49.

splendens, 72, 73.
INDEX OF SPECIES.

Mytilus

spatula, O 236, P 121, P 538.
subsaaxatilis, O 219.
tenuiaratus, P 118.
trossulus, 18, 78, 129, O 212.

Myurella

albocincta, 109, O 258, P VI., P 384, P 386.
elata, 177.
frigata, O 360.
Hindsii, O 258, P 385, P 386.
larvæformis, 177.
rufocinerea, 32, O 258, P 386.
simplex, 23, 100, 143, 285.
subnodosa, 109, O 258, P 386.
tuberculosa, 177.
variegata, 109, 153.

Nacella

Asmi, O 318.
depicta, 21, 136, O 227, O 229, O 318, O 349, U 204.
incessa, 23, 26, 136, O 229, O 318, O 349.
instabilis, 84, 136, O 318.
paleacea, 21, 23, 136.
peltoides, 31, 104, 213.
subspiralis, 68, 136.
var. triangularis, 98, 136.

Naranio (Narinio)

(Narinio)

scobina, O 244, O 300, P 529.

Narica

anomala, P 355.
aperta, 104, 215.
cyryptophila, O 254, O 323.
Diegoana, 76.
insculpta, 273.
ovoidea, O 228, O 230, P 355, U 205.

Narineo. See Naranio.

Nassa

acuta, 35, O 263, O 342, O 366, P 497, P 498.
ambigua, 155, O 364.
angulifera, O 186, O 342, O 361.

californica, 155.
canescens, 35, 178, O 268, O 342.
collaria, 25, 155, O 231, O 268, O 342.
complanata, 25, 35, 151, 179, O 231.
Cooperi, 28, 100, 148.
corpulenta, 25, 28, 111, O 231, O 268, O 342.
costallata, O 167.
crebristriata, 25, 34, 35, 179, O 263, O 342, O 351, O 366, P 499.
crenulata, O 222.
decussata, 35, 178, P 497.
elegans, 17, 100, 148.
exilis, 35.
festiva, O 185, O 268, O 342.
fossata, 25, 27, 100, 148, O 209, O 342.
gemmulata, 69.
gemmulosa, 178, O 263, O 268, O 342, P 498.
Gibbesii, 17, 83, 148.
glauea, O 268, O 342.
incrassata, O 167, P 499.
insculpta, 99, 102, 148.
interstriata, 76, 100.
lunata, 76.
luteostoma, 28, 178, O 176 O 231, O 225, O 262, O 268 O 283, O 342, O 351, P 494, P 496, P 542.
moea, O 206.
nodicineta, 25, 153, O 186, O 342.
nodicincta, 25, 153, O 186, O 342.
nodifer, 178, O 185, O 268 O 342, O 361, P 496.
nodicincta, O 297, O 361.
nodulifera, 256, P 496.
Northiae, 48, 61.
INDEX OF SPECIES.

**Nassa**

obsoleta, 179.

pagodus, 25, 35, 178, O 268, O 342, P 552.

(—— var.) acuta, 178, O 263, P 498.

pallida, O 185, O 342.

Panamensis, 35, 179, O 268, O 342.

paapera, 35, 100, 179.

Pedroana, 76.

perpinguis, 23, 27, 100, 147, O 206, O 231, O 342, O 349.

polygonata, P 497.

proxima, 34, 35, 179, O 268.

scabriuscula, 25, 28, 35, 179, O 185, O 268, O 342.

Stimpsoniana, 25, 179.

striata, 35, 100, 179, O 268, O 342.

tegula, 25, 111, 148, 151, 152, O 192, O 262, O 283, O 342, O 351, P 496, P 497.

—— var. nodulifera, O 263, P 496.

tiarula, O 192, P 497.

trivittata, 76, 83, 148, 168, O 209.

versicolor, 25, 34, 35, 111, 179, O 231, O 268, O 342, O 364, P 499.

—— var. O 268.

Wilsoni, 35, 179, O 268, O 342.

Woodwardi, 17, 28, 148.

xanthostoma, O 176, O 262, P 495.

**Natica**

borealis, O 177, O 216, O 220.

var. Californica, 193, O 201, O 336.

carena, 110, O 235.

catenata, 24, 110, 155.

caurina, O 209, O 213, O 348.


clausa, 9, 25, 71, 72, 147, 169, 322, O 176, O 216, O 220, O 223, O 335.

consolidata, O 216, O 220.

Elene, 40.

excavata, 40, O 282, O 336, S 165.

flava, 19, O 216, O 223.

Gallapagosa, O 176, O 185, O 274.

geniculata, 77.

gibbosa, 75.

glanca, O 172, O 190, O 202, O 237, P 540.

Gouldii, O 216, O 220.

Grenlandica, O 216.

Haneti, 40, 194, O 230, O 274, O 336.

helicoides, 8, O 223.

herculia, 84, O 216, O 224.

heros, O 211.

ianthostoma, O 203, O 216.

impervia, O 348.

Inezana, 82.

intemerata, O 286.

intermedia, P 448.

iostoma, O 235, O 261, P 449, R 450, P 536.

laetea, O 216.

Lewisii, 84, O 209, O 211, O 213, O 216, O 284.

lineata, 40, S 165.

lurida, 37, 193, O 260, O 274, P 448.

Moquiniana, 62.

maroccana, 13, 27, 37, 63, 69.
INDEX OF SPECIES.

Natica

110, 193, O 201, O 202, O 211, O 230, O 234, O 236, O 237, O 261, O 274, O 296, O 336, O 352, O 353, O 360, O 365, O 366, P 448, P 450, P 536, P 540.

—— var. 24, O 230, O 235, O 240, O 282.

—— var. Californica, V 227.

marochiensis, 63, 69, O 261, P 448.

Ocotypa, 77.

cotites, 75.

otis, 9, 37, 193, O 176, O 185, O 274, O 296.

ovum, O 237, O 261, P 452, P 540.

danilla, 9, O 176, O 216, O 220, O 223, O 347.

Panamensis, O 185.

patula, 8, O 170, O 172, O 190, O 202, O 234, O 237.

perspicua, O 292.

plecatula, O 201.


pusilla, O 216.

rapulum, O 261, P 452.

Recluziana, O 203, O 208, O 234, O 237, P 540.

rugosa, 61.

russa, 72.

Salangonensis, O 274.

sanguinolenta, O 203.

saxaelis, O 177, O 216.

saxea, O 367.

septentrionalis, O 216, O 220.

severa, 72.

Souleyetiana, 24, 37, 193, O 230, O 274, O 336.

Taslet, 62.

tessellata, O 261, P 449.

uber, 7, O 231, O 274, O 283, O 292, O 351, P 452.

Natica

uber, var. O 292.

uberina, O 185.

unifasciata, 37, 72, 193, O 230, O 261, P 448.

unimaculata, O 292.

variolaris, 35.

vitrinelloides, P 246.

virginea, 37, 193, O 274.

zonaria, 24, 27, 110, O 231, O 336.

Naticina

scopulosa, O 367.

Nautilus

angustatus, O 367.

zigzag, O 367.

Navarchus

inermis, 95, 133.

Navea

subglobosa, 121.

Neaplysia

California, 133.

Neaera

costata, O 207, O 301.

didyma, O 207, O 301.

pectinata, 87, 88, 123.

Neptunia

(Neptunaea)

badia, 60.

castanea, 60.

harpa, 60.

Icelandica, 73.

incisa, 18.

terebralis, 73.

Nerita


costata, O 274.

Deshayesi, 194, O 254, O 274, O 322, P 255, P 256.

elegans, O 230.

fulgurans, 61.

funiculata, O 237, O 254, O 322, P 257, P 540.
INDEX OF SPECIES.

Nerita

- *Nerita glauca*, P 448.
- *Nerita maroccana*, P 448.
- *Nerita marochiensis*, O 261, P 448.
- *Nerita papilionacea*, O 170.
- *Nerita patula*, O 179.
- *Nerita praecognita*, 283.
- *Nerita tessellata*, O 364, P 257.
- *Nerita textilis*, O 170.

Neritina

- *Neritina alata*, O 176.
- *Neritina Californica*, O 291, P 258.
- *Neritina faba*, P 258.
- *Neritina Fontaineana*, P 259.
- *Neritina globosa*, 24, O 182, O 322.
- *Neritina harpaiformis*, O 230.
- *Neritina intermedia*, 24, 194, O 182, O 274, O 322.
- *Neritina latissina*, O 182, O 322.
- *Neritina liasina*, P 551.
- *Neritina Listeri*, O 289, O 291, O 322.
- *Neritina Michandii*, O 189, O 291, O 322.
- *Neritina pulmonary*, O 188, O 322.
- *Neritina pusilla*, P 237.
- *Neritina tritonensis*, O 182.
- *Neritina virginea*, O 364, P 258.

Netastoma (Netastomella)

- *Netastoma* Darwini, 15, 26, 91, 121, 123, 179, 250.

Neverita

- *Neverita Chemnitzii*, P 449.
- *Neverita glauca*, 110, O 337.
- *Neverita helicoides*, O 208.
- *Neverita patula*, 24, 27, O 208, O 337.
- *Neverita Reclusiana*, 147, 151, 152, 153, O 337, O 349.

Niothia

- *Niothia gemmulosa*, P 498.

Nitidella

- *Nitidella densilineata*, 105, 221.
- *Nitidella gausapata*, 92.
- *Nitidella Gouldii*, 21, 23, 53, 89, 149, O 228, O 341, O 349, U 208.
- *Nitidella millepunctata*, 105, 155, 220, 221.
- *Nitidella pulchrior*, O 270, O 341.

Noetia


Northia

- *Northia pristis*, 25, 48, 155, O 294, O 344.
- *Northia serrata*, 61, 179, O 344.

Novaculina

- *Novaculina Caribbana*, 205.

Nucula

- *Nucula arctica*, O 175, O 219, O 223.
- *Nucula castrensis*, 14, 75, 91, O 207, O 219, O 223, O 310.
- *Nucula castrensis*, O 207, O 311, O 349.
- *Nucula Cobboldiae*, 91, O 207.
- *Nucula costellata*, O 182.
- *Nucula crispa*, O 207, O 311.
- *Nucula decisa*, 75.
- *Nucula Elenensis*, 200, O 277.
- *Nucula excavata*, O 207, O 311.
INDEX OF SPECIES.

Nucula

exigua, 100, O 249, O 277, O 311, P 145.
gibbosa, O 182.
—— var. O 182.
impressa, O 367.
insignis, 73.
Lyallii, 91.
lyrata, O 207, O 311.
mirabilis, 73, 91.
polita, 200, O 182, O 229, O 277.
pygmaea, O 223.

Obeliscus

achates, 21, 24, O 333, U 206.
Adamsii, 33, 37.
bicolor, O 296.
clavulus, 21, O 289, O 333, U 206.
conicus, 193, O 259, O 333, P 409.

Odostomia

gemmulosa, P 415.
var. Gouldii, 144.
gravida, 23, 144, O 228, O 230, O 296, O 333, O 349, P 413, U 207.
inflecta, 23, 114, 144, 145, 285.
lamelilata, O 259, O 333, P 411.
mamillata, 36, 259, O 259, O 334, P 411, P 412.
nuciformis, 114, 144, 243.
obliscus, O 230.
satura, 114, 144, 243.
straminea, 110, 145, 314.
sublirilata, 145, O 259, O 333, P 410.
subulatula, O 259, O 333, P 411.
tennis, O 259, O 334, P 412.
tenuisculpta, 114, 145, 243.
vallata, O 259, O 334, O 364, P 411, P 412.

Odonotidium

levissimum, X 436.
rugulosum, X 415, X 425, X 426.

Cibalalia

scintillaeformis, 97.
subdiaphana, 125, 302.

Oliva

aldinia, 63.
anazora, O 239, O 292, P 545.
araneosa, 35, 63, 178, O 261, O 268, O 292, O 364, P 466.
aureocineta, 35.
auricularia, 63.
azemula, 62, O 292.
bulica, var. 63.
biplicata, 8, 10, 25, 79, O 208, O 231, O 235, O 284, O 292, O 352.
brasiliensis, 63.
Oliva
caldania, 62, 63.
candida, 63.
columellaris, 8.
erenta, 0 282.
Cumingii, 11, 28, 34, 63, 153, 0 191, 0 292, 0 339, P 404.
dama, 63, 0 292.
Cumingii, n, 28, 34, 63, 102, 191, 0 292, 0 339, P 464.
Deshayesiana, 63.
Duclosi, 0 261, 0 339, 0 366, P 467.
eburnea, 0 231, 0 234, 339.
erythrostoma, 62.
fimbriata, 63.
fusiformis, 63, 178.
gracilis, 0 226, P 461.
hiatula, 0 262, P 472.
inconspicua, 178, 0 268, 0 364, P 470.
intercincta, 34, 0 261, 0 339, P 465.
intorta, 0 234.
Julietta, 62, 154, 178, 0 188, 0 238, 0 339, P 466, P 544.
kaleontina, 154, 0 188.
Levariana, 6.
lineolata, 63, 178, 0 177, 0 178, 0 292, P 471.
literata, 178.
mantichora, 62.
Maria, 62.
Melchersii, 28, 35, 111, 178, 0 238, 0 261, 0 339, 0 364, P 464, P 465, P 466, P 544.
memnonia, 63.
mutica, 63.
nedulina, 63, 0 292.
nivea, 0 268.
obesina, 63, 0 292.
onisca, 63.
oriola, 63.
oryza, 0 364.
ozodona, 63, 0 292.
pantherina, 0 238.
pellucida, 34, 35, 178, 0 268.
petiolita, 0 231, P 470.
Oliva
pindarina, 62, 63, 0 292.
plumbea, 0 231.
polpaster, 11, 0 188, 0 191, 0 339, P 464.
ponderosa, 62.
porphyrja, 6, 24, 28, 48, 111, 152, 178, 0 168, 0 174, 0 234, 0 238, 0 268, 0 282, 0 339, 0 350, 0 352, P 463, P 544.
propatula, 0 265, V 209.
purpurata, 63, 0 262, P 471.
razomola, 62, 63.
reticularis, 62, 178, 0 292, P 464, P 465, P 466, P 467.
— var. O 261, 0 268, P 466.
ruffasciata, 63, 0 231.
Schumacheriana, P 467.
seasia, 62, 63.
semistrata, 9, 178, 0 268.
splendidula, 8, 0 188, 0 234, 0 235, 0 283, 0 297, 0 339, 0 351, 0 352.
Steerise, 63.
subangulata, 28, 34, 111, 152, P 464.
tergina, 0 234, 0 236, 0 239, 0 292, P 469, P 537, P 544.
testacea, 178, 0 171, 0 177, 0 231, 0 235, 0 239, 0 265, 0 268, 0 292, P 472, P 545, V 209.
testacea, var. 63.
tigrina, 0 235.
timoria, 63, 0 292.
tisiphona, 63.
todosina, 62.
undatella, 10, 63, 178, 0 177, 0 239, 0 268, 0 292, P 467, P 545.
ustulata, 63.
venulata, 35, 63, 178, 0 192, 0 238, 0 261, 0 268, 0 292, 0 339, P 464, P 465, P 466, P 467, P 544.
— var. O 268.
INDEX OF SPECIES.

**Oliva**

volutella, 63, 178, O 171, O 177, O 178, O 231, O 235, O 268.
zonalis, O 171, O 177, O 236, P 468, P 471, P 537.

**Olivella**
anazora, 23, 24, 111, 147, O 262, O 339, P 469.
aureocineta, 34, 111.
batica, 23, 27, 76, 100, 147.
biplicata, 13, 23, 27, 114, 147, 151, O 339.
bullata, U 207.
columnellaris, 178.
conoidalis, O 364.
dama, 34, 111, 178, O 262, O 339, P 471.
eburnea, O 352.
fulgida, 152.
glandinaria, 13, 147, O 201, O 339, V 227.
gracilis, 24, 28, 34, 155, 178.
inconspicua, 24, 34, 111, 178, O 262, O 340, P 470.
intorta, O 228, O 339, O 352, U 207.
kaleontina, O 340, O 364.
lineolata, O 192, O 262, P 471.
mutica, P 470, P 472.
oryza, 178, P 470.
pellucida, 178, O 340.
petiolata, 23, 147, O 364, P 469, P 470.
--- var. aureocincta, O 262, O 339, O 364, P 470.
russica, 23, 147, O 339.
semistriata, 24, 100, 178, O 340.
tergina, 24, 28, 147, 178, O 262, O 340, O 352, O 364, P 469.
undatella, 111, 178, O 262, O 350, P 468.
volutella, 24, 28, 178, O 282, O 340, P 469.
Zanoëti, 24.
zonalis, 24, 111, O 262, O 339, O 363, P 472.

**Ommastrephes**

Ayresii, 99, 150.
giganteus, 99, 150.

**Omphalitus**

ater, 13, O 200, V 224.
aureotinctus, 25, 151, O 200, O 321, O 349, O 351, V 224.
Brazilianus, P 234.
brunneus, O 321, O 351.
Byronensis, P 234.
Californicus, O 163, O 233, O 297, P 235.
cruciatus, P 234.
dentatus, O 229.
euryomphalus, O 321.
funebralis, 13.
fuscescens, 27, 138, 151, O 200, O 233, O 321, V 224.
globulus, O 253, O 321, P 236.
maculosus, O 321.
marginatus, 13, O 200, O 321, V 224.
mœstus, O 321, O 348.
Panamensis, 24, 192.
Pfeifferi, 21, O 277, O 321, U 204.
reticulatus, O 321.
rugosus, 27, O 321, O 352.
--- var. rufotinctus, O 253, P 233.
viridulus, 24, 36, 155, 192, O 229, O 253, O 321, P 234, P 235, P 236.

**Onchidium**

Carpenteri, 107, 159.

**Oniscia**

onicus, O 364.
tuberulata, O 282.
--- var. O 287.
tuberculosa, 27, 110, O 188, O 234, O 270, O 292, O 337, O 350, O 352, O 360, O 364.
xanthostoma, O 337, O 360.
INDEX OF SPECIES.

Onychoteuthis
Bergii, O 218, O 223, O 345.
fusiformis, 99, 118, 119, 150.
Kamtschatica, O 218, O 223.

Opalia
attenuata, 244.
australis, 244, 245.
bicarinata, 244.
borealis, 18, 99, 114, 146.
bullata, 23, 146, 287.
ecostata, 244, 245.
ecilabrum, 244.
crenata, 105, 220, 244, 324.
crenatoides, 105, 220, 244, 324.
(var.) insculpta, 25, 105, 146, 214, 322, 324.
diadema, 244.
funiculata, 37, 244.
M. Andreas, 244.
Ochotensis, 114, 245.
repisporosa, 99, 146, 244.
spongiosa, 99, 146, 244.

Orbicula
Cumingii, 54, 205, O 280.
Evansi, 55, O 287.
Norvegica, 55.
ostreoides, 55.
striata, 55.
strigata, 54.

Orthalicus
livens, 59, O 251, P 176.
Mexicanus, O 250, P 177.
princeps, P 177.
undatus, 158, O 363, P 176.
zebra, 93, 158, O 170, O 363, P 176.
Ziegleri, O 251, P 177.

Orthocera
glabra, X 436.
meperforata, X 425.
trachea, X 414, X 423.

Oscilla
exarata, 33, 110, P 415.
terebellum, 110.
ziziphina, 33, P 416.

Osilinus
ater, O 321, O 348, O 351.
gallinus, O 321.
(var.) U 204.

Ostbestos
bracteatium, 17, O 209, O 210.
Californicum, O 231.
corbuloides, O 222.
diaphanum, O 287, Q 228.
hyalinum, 119, O 209, O 210, O 222.
nitidum, 17, O 226, O 228, U 199, Q 229.

Ostrea
æquatorialis, O 191, O 250, P 157.
amara, 27, 38, 107, 152, 199.
bicolor, P 161.
borealis, 74.
Bourgeoisi, 119.
Canadensis, P 160, P 550.
Columbiensis, 107, 132, O 186, O 226, O 250, O 277, O 312, P 161.
conchaphila, 38, 78, 132, 151, 152, 199, O 233, O 250, O 277, O 282, O 312, O 351, O 353, O 365, P 159, P 161, P 163, P 352, P 482, V 220.
Cumingiana, O 250, O 312, O 352, P 163.
edulis, 85, 132, 198, P 159, P 161.
(var. expansa, 101, 132, 306.
fons, 6.
gallus, 14.
Heermannii, 76.
iridescens, 107, 117, 198, 273, 274, O 162, O 226, O 250, O 312, O 365, P 157, P 162, P 164.
(var. laticaudata, 101, 132, 305.
longiro-tris, P 160.
lurida, 85, 92, 101, 132, 305.
(var.) 76.
margaritacea, O 250.
INDEX OF SPECIES.

Ostrea
megodon, 14, 154.
palmula, 24, 132, 199, O 233,
O 250, O 282, O 312, P 163,
O 550.
Panamensis, 198.
Panza, 81.
perna, P 150.
plumula, O 351, O 353.
prismatica, P 157.
Puelchana, P 157.
rufa, 38, 132, 198, 306, O 226,
O 250, P 157, P 159.
var. rufoides, 78, 101, 132, 306.
spathulata, O 365, P 157.
subfalcata, 76.
subjecta, 81.
Titan, 80.
Virginiaca, 38, 78, 107, 132, 152,
306, O 226, O 250, O 277,
O 312, O 363, P 159, P 160.

Ovulum { (Ovula) }
aciculare, P 370.
aequare, O 182, O 188.
avena, 35, 176, O 182, O 267.
Californiaum, O 230, O 233,
O 355, P 370.
deflexum, O 239, P 545.
emarginatum, 176, O 239, O 267,
P 545.
gibbosum, O 297, O 328, O 363.
inxflexum, O 182.
neglectum, 35, O 267.
patulum, P 375.
secile, O 226.
simile, O 226.
subrostratum, O 364, P 370.
uniplicatum, P 370.
variabile, 176, O 226, O 230,
O 233, O 267, O 364, P 370.
——— var. O 267.
Pachychilus
corvinus, 45.
Pachydesma
crassatelloides, 25, 26, 81, 114,
126, 151.
Inezana, 81.
Pachypoma
gibberosum, 113, 137, 239.
aequare, 137.
Pallium
Estrellanum, 80, 81.
Paludina
baltica, O 220.
carinata, O 170.
Hindsii, 162.
Kikxii, O 222.
murlicata, O 220.
nuclea, 162, O 207, O 297.
Nuttalliana, 162.
octona, O 220.
puilla, O 220.
seminalis, 90, 120, 162, 211,
O 206.
stagnalis, O 220.
——— var. O 220.
tentaculata, O 222.
thermalis, O 220.
ulva, O 220.
virens, 162.
Paludinella
aculeus, O 215, O 220, O 223.
castanea, 241, O 215.
eingulata, O 215, O 220, O 223.
stagnalis, O 215, O 220, O 223,
O 257, P 361.
Pandora
arcuata, 228.
bilirata, 80, 124, 232.
brevifrons, 231, O 185, O 301.
Ceylanica, 229.
cistula, 231.
claudeculata, 124, 204, 225, O
287, O 301, Q 228.
cornuta, 39, 204, 227, O 280,
301.
Cumingii, 229.
delicatula, 229, 230.
depressa, 227.
INDEX OF SPECIES.

Pandora
   discors, 228-
   flexuosa, 230.
   inaequalis, 230.
   Indica, 229.
   nasuta, 226.
   oblonga, 231.
   obtusa, 229, 230, 231.
   punctata, 12, 226, 0.94, 0.301,
      O 349, Q 228, V 211.
   radiata, 231.
   rostrata, 230, 231.
   striata, 232.
   trilineata, 226.
   unguenius, 230.
   Wardiana, 230, 231.

Pandorina
   arenosa, O 222.
   flabellata, 73.

Panopœa
   abrupta, O 367.
   Aldrovandi, O 209.
   Faujasii, 123.
   fragilis, 73.
   generosa, 73, 82, O 209, O 213,
      O 300, O 348.
   Norvegica, O 222, O 223.
   reflexa, 82.
   var. sagrinata, 73.

Parapholas
   acuminatata, 29, O 194, O 244,
      O 265, O 299, O 366, P 12,
      V 209.
   bisulcata, 61, 121, O 265, V
      209.
   branchiata, O 366.
   Californica, 26, 119, 121, 123,
      O 194, O 299, O 349, O 351,
   calva, 26, 29, 61, O 244, O 299,
      P 9.
   Janelli, 123.

Parthenia
   armata, O 259, O 334, O 364,
      P 415.
   exarata, 33, 36, 190, O 259,
      O 334, P 415, P 416.
   gemmulosa, O 364.
   lacunata, O 334, P 414.
   quinquecostata, 33, 36, 189, 190,
      O 259, O 334, P 414.
   scalariformis, O 259, O 334,
      O 368, P 413, P 414, P 434.
   ziziphina, O 259, O 334, P 416.

Patella
   aculeata, P 268.
   æruginosa, 19, O 215, O 224,
      P 203.
   ancyloides, 19.
   antiquata, P 297, R 3.
   Asmi, 19, O 215, O 223.
   Araneaana, P 200.
   auriculata, P 287, P 290, T 168.
   australis, P 299, R 3.
   Barbadensis, P 215.
   cerea, 19, O 215, O 219, O 223.
   var. concentrica, 19.
   calyptra, 3, 98.
   candida, 71, O 219.
   cassis, O 215.
   cerea, O 219.
   eunis, 48, O 173, O 290, P 207,
      V 221.
   eypeaster, 48, O 172, O 290,
      P 208.
   conica, O 209.
   corrugata, O 252, O 291, P 200.
   creplula, O 255, P 284.
   Cumingii, O 173, O 290, P 203,
      P 208, V 221.
   deaurata, O 173, O 215, O 348.
   diaphana, O 173, O 187, O 199,
      O 208, O 239, O 252, P 203,
      V 221.
   digitalis, O 223.
   discors, 60, 108, O 233, O 252,
      O 282, O 291, P 200, P 201,
      P 206, P 210.
   exarata, 9, O 173, O 290.
   fenestrata, O 173, O 198, O 291,
      P 207, V 221.
INDEX OF SPECIES.

**Patella**

- fimbriata, O 209.
- floccata, P 203.
- fornicata, P 268.
- *var.* P 268.
- Goreensis, O 255, O 363, P 284.
- grata, 72.
- instabilis, O 209.
- laevigata, O 199.
- livescens, 48, 291.
- leucophsea, 173, 199, 291.
- Magellanica, 91.
- mamillata, 13, 49, O 173, O 198, O 291, P 207, V 221.
- maxima, O 192, O 252, P 199.
- Mazatlandica, 9, O 173, O 178.
- Mexicana, 24, 27, O 175, O 190, O 233, O 239, O 241, O 252, O 318, P 199, P 200, P 201, P 210, P 546.
- militaris, P 300.
- mitrula, P 297.
- monticola, O 173, O 198, V 221.
- monticolor, O 173, O 198, V 221.
- nivea, P 297, R 3.
- Nuttalliana, 49, O 173, O 291, P 208.
- opea, P 206.
- Oregona, O 174, O 199, O 291, P 209, Q 223, V 222.
- pallida, 72.
- patina, O 215, O 219, O 223.
-pecten, 3.
-pelta, O 219, O 223.
-perforata, P 215.
-persona, O 215, O 223.
-personoides, O 215, O 223, P 203.

**Patella**

- peziza, 10, O 3, O 179, P 287, P 290.
- pileata, O 174, O 199, P 209, V 222.
- pileolus, 19, O 215, O 223.
- plicata, 35.
- plumbea, 29.
- poculum, O 179.
- porphyrozonias, P 215.
- rosea, P 215.
- scabra, 16, 49, O 199, O 209, O 252, O 291, P 203, V 222.
- scurra, O 172, O 173, O 215, O 224, V 222.
- scutellata, O 3, P 287.
- spectrum, 16, O 199, O 209, O 291, P 209, V 222.
- stipulata, 48, O 187, O 318.
- striata, O 187, O 252, P 203, P 208.
- strigillata, O 173, O 198, V 221.
- talcosa, 9.
- tessellata, O 173, O 199, P 207, V 221.
- textilis, 16, O 209.
- toreuma, 48, O 288, O 290, O 291, Q 233.
- *var.* tenuillirata, O 288, Q 233.
- transoserica, 3.
- trochiformis, P 264.
- trochoides, P 265.
- umbonata, O 174, O 199, O 291, P 209, V 222.
- venosa, O 163, O 290.
- verriculata, O 173, O 291, P 203, P 207, V 221.
- vespertina, 48, O 290, P 203.
- vulgata, 37, 198.

**Patelloida**

- depicta, O 206, U 204.
- punctata, O 215.
- striata, P 203.
### INDEX OF SPECIES.

<table>
<thead>
<tr>
<th>Patula</th>
<th>Pecten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mazatlanica, 157.</td>
<td>mesotimeris, 45.</td>
</tr>
<tr>
<td>sportella, 157.</td>
<td>monutimeris, 26, 78</td>
</tr>
<tr>
<td>strigosa, 157.</td>
<td>131, 151, O 198, O</td>
</tr>
<tr>
<td></td>
<td>229, O 233, O 234,</td>
</tr>
<tr>
<td></td>
<td>V 219.</td>
</tr>
<tr>
<td></td>
<td>Nevadanaus, 77.</td>
</tr>
<tr>
<td></td>
<td>nodosus, O 233, O 234, O 311, O 352.</td>
</tr>
<tr>
<td></td>
<td>nucleus, var. O 290.</td>
</tr>
<tr>
<td></td>
<td>Pablosensis, 80.</td>
</tr>
<tr>
<td></td>
<td>pancoecstatus, 22, 100, 131, 281.</td>
</tr>
<tr>
<td></td>
<td>Pealii, O 218.</td>
</tr>
<tr>
<td></td>
<td>pomatia, 14.</td>
</tr>
<tr>
<td></td>
<td>propatulus, 165, O 367.</td>
</tr>
<tr>
<td></td>
<td>purpuratus, 102, O 233, O 284, O 351.</td>
</tr>
<tr>
<td></td>
<td>pyxidatus, 153.</td>
</tr>
<tr>
<td></td>
<td>rastellinus, 14.</td>
</tr>
<tr>
<td></td>
<td>rubidus, 4, 20, 92, 131, O 207, O 218, O 223, O 311.</td>
</tr>
<tr>
<td></td>
<td>senatorius, 40, 73, O 282.</td>
</tr>
<tr>
<td></td>
<td>sericeus, O 207, O 311.</td>
</tr>
<tr>
<td></td>
<td>(var.) squarrosus, 22, 281.</td>
</tr>
<tr>
<td></td>
<td>subnodosus, 24, 27, 107, 151, O 185, O 311.</td>
</tr>
<tr>
<td></td>
<td>Townsendii, 18, O 213, O 311, O 348.</td>
</tr>
<tr>
<td></td>
<td>Tumbezensis, 199, O 277, O 311.</td>
</tr>
<tr>
<td></td>
<td>timidus, 35, 78, 85, O 185, O 187, O 277, O 290.</td>
</tr>
<tr>
<td></td>
<td>tunica, 60, 131.</td>
</tr>
<tr>
<td></td>
<td>varius, O 222, P 532.</td>
</tr>
<tr>
<td></td>
<td>ventricosus, 14, 24, 27, 40, 45, 54, 78, 85, 107, 131, 151, 152, 170, 199, 280, 281, O 187, O 233, O 234, O 277, O 282, O 290, O 311.</td>
</tr>
<tr>
<td></td>
<td>var. 22.</td>
</tr>
<tr>
<td></td>
<td>Yessoonsis, 70, 74.</td>
</tr>
<tr>
<td>Pectunculus</td>
<td></td>
</tr>
<tr>
<td>assimilis, 200, O 182, O 229, O 233, O 249, O 277, P 144.</td>
<td></td>
</tr>
<tr>
<td>bicolor, O 285, O 290, O 310.</td>
<td></td>
</tr>
<tr>
<td>Californicus, O 192.</td>
<td></td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Pectunculus
corbis, 4.
giganteus, 27, O 208, O 233, O 285, O 289, O 310, O 352.
inæqualis, 10, 24, 200, O 178, O 182, O 249, O 285, O 289, O 290, O 310, O 366, P 144.
maculatus, 24, 200, O 208, O 277, O 310.
multicostatus, O 249, O 310, O 366, P 144.
nitens, 165, O 367.
pæcine'oides, 24, O 208, O 265, O 310.
pæctiniformis, O 249, P 144.
septentrionalis, O 219, O 223.
tessellatus, O 229.

Pedicularia
California, 119, 149.
decussata, 119.
elegantissima, 119.
Sicula, 119.

Pedipes
angulatus, O 275, O 316.
liratus, 98, 116, 133, 159.

Penitella
Conradi, 14, 121, O 203.
ovoidea, 76.
pælina, 70, 121.
spæsea, 76.
tubigera, 15, O 203.
Wilsonii, 121, O 194, O 265, V 209.
xylophaga, 15, O 203.

Perdicca
nodosa, 48.

Periploma
papyracea, O 287, O 301, Q 229.
planuscula, O 194, O 231, O 301, O 352, V 211.

Perna
anomioides, 52.
Californica, 52, O 193, O 198, O 234, V 219.
Chemnitziana, O 233, O 277, P 150.
costellata, 52, O 198, P 152, V 219.
flexuosa, O 208, O 233, O 249, P 150.
icissa, V 219.
maxillata, 82.
montana, 82.
quadra'ata, 60.
radiata, P 150.

Peronæoderma
punicea, 202.

Peronæus
artemisia, 158.

Persicula
clandestina, P 462.
frumentum, III.
imbricata, 24, III, 112.
interrupta, III.
phrygia, 111, 112.
minor, P 461.
sagittata, 111.

Persona
constricta, 24, O 231.
ridens, 24, O 338.

Petalonchus
co'ereus, W 316, W 317.
flavescens, W 314, W 317.
INDEX OF SPECIES.

Petaloconchus
"octosectus, W 317.
renisectus, W 315, W 317.

Petricola
amygdalina, O 184, O 299, O 359.
"arcuata, 12, 14, 45, 120, 127, O 196, O 203, O 229, V 214.
"var. O 203.
"bulbosa, O 226, O 232, O 244, P 547, U 198.
Californica, 12, 45, 120, 127, O 196, O 229, O 299, O 349, O 351, V 214.
"carditoides, 12, 14, 20, 22, 26, 76, 78, 88, 120, 127, O 196, O 229, O 284, V 214.
"cognata, 38, 203, O 279, O 299, O 363.
"CORDIERI, O 196, O 203, O 229, V 214.
"cylindracea, 12, 14, 20, 78, 120, 127, O 196, O 203, O 219, O 224, O 229, O 284, V 214.
"dactylus, O 232, O 299, O 352.
"denticulata, O 244, O 297.
"gibba, 20, 127, O 196, O 219, O 223, O 299.
"lamellifera, var. O 229.
"mirabilis, O 281.
"pholadiformis, O 279.
"var. 23, 38, 203, O 299, O 363.
"rubra, P 108.

Phasianella
compta, 54, 79, 97, 137, 228, 282, O 230, O 253, O 283, O 284, O 320, O 351, P 225, U 204.
"var. elaitor, 23, 137, 282.
"var. pulloides, 23, 137, 282.
"var. punctulata, 23, 137, 281.
"fasciata, P 226.
"fulminata, P 226.
"minuta, P 224.
"perforata, 24, 54, 155, O 253, O 295, O 320, O 364, U 204.
"var. striatula, O 253, P 225.
"pullus, 282, P 226.
"striatula, 214.
"tessellata, P 224.
"undatella, P 226.
"zebrina, P 225.

Phidiana
iodinea, 94, 95.

Pholadidea
clausa, O 366.
concamerata, 123.
cornea, 121.
curta, O 244, O 299, P 9.
melanura, 121, O 194, O 244, O 265, O 299, O 366, V 209.
ovoidea, 14, 22, 26, 123, O 226, O 299, O 351, U 198.
penita, 22, 50, 87, 123, 251, O 299, O 349, O 351.
tubifera, 205, O 299.
Pholadopsis
pectinata, 121, O 265, V 209.

Pholas
acuminata, O 184.
California, 121, 0 194, O 202,
231, O 234, V 209.
Californiensis, O 174.
calva, O 184.
Candeana, 121.
concamerata, 87, 121, O 194,
O 202, O 211, O 228, V 210.
cornea, O 184, O 229.
crucigera, 87, 205, O 184, O 280,
O 299.
corta, O 184, O 191.
dactylus, 205.
Darwinii, 251.
Janelli, 121, O 194, O 202, V 209.
lanceolata, 23, O 280.
laqueata, 39, O 280.
var. nana, O 184.
oblongata, 121.
ovoidea, O 226, O 231, O 234,
U 198.
penita, 87, 121, O 194, O 202,
O 211, O 231, V 210.
retifera, 121.
rostratra, 15, O 203.
truncata, 121.
tubifera, 205, O 280.
xylophaga, 205, O 280, O 299.

Phorcas
California, O 253, O 286, P 235.
euryomphalus, 139.
liratus, P 235.
maeolusus, 139.
marcidus, 139.
Panamensis, O 295.
pulligo, 19, 21, 139.
umbilicaris, P 235.
variegatus, O 253, P 234.

Phos
articulatus, O 206, O 343.
biplicatus, O 284, O 343, S 166.
erassus, O 206, O 268, O 343.

Phos
raudens, 25, O 206, O 342.
senticosus, O 206.
turritus, O 186, O 343.
Veraguensis, O 206, O 342.

Phrontis
xanthonstoma, P 495.

Phylliroe
Lichtensteinii, O 173.

Phyllonotus
bicolor, 28, 112, 153, O 264,
O 345, P 524.
brasica, 28, 155, O 264, O 345,
P 523.
imperialis, O 345.
nigrutus, 28, 152, 153, 182, O 264,
O 345, P 521.
nitidus, O 264, O 345, P 523.
oxyacanthus, O 345.
princeps, 28, 112, O 264, O 345,
P 525.
radix, 182, O 345.
regina, 182, O 264, O 345, P 524,
P 525.

Physa
ampullacea, 160.
aurea, 27, O 237, O 251, O 316,
O 364.
bullata, 85, 160, O 283, O 316.
Charpentieri, 160.
concolor, 161.
costata, 118, 160.
cylindrica, 160.
elata, 27, O 227, O 296, O 316,
O 364, P 180, U 203, V 220.
elliptica, 160.
elongata, 85, 161.
elongatina, 161.
fontinalis, 222.
fontana, 160.
Gabbii, 160.
gabra, 160.
gyrina, 160.
heterostropha, 85, 93, 116, 120,
160.
INDEX OF SPECIES.

Physa
Hildrethiana, 160.
humerosa, 79, 90, 160, O 283, O 316.
hypnorum, 116, O 222.
infata, 160.
Lordi, 90, 93, 160.
Maugerae, 61, 162, O 364.
osculans 160, O 265.
Peruviana, O 237, O 251, P 179, P 180, P 540.
Phillipii, 160.
plauorbula, 161.
plicata, 104, 316.
purpurostoma, 44.
Sowerbyana, 44.
striata, 160.
subarata, 160.
triticea, 120, 161.
virgata, 160, 283, 316.
virginea, 160, O 209, O 213, O 316.

Pila
multijugis, P 255.
ornata, P 255.
sabricia, P 255.
Pileopsis
antiquata, P 297.
mitrula, O 255, P 297, R 3.
pilos, O 275.
subrufa, R 4.
Pilidium
commodum, O 216, O 220, O 233.

Pinna
lanceolata, 107, O 208, O 249, O 311, P 147.
maura, 24, 38, 107, 199, O 185, O 249, O 277, O 311, P 146.
nigra, 43.
rudis O 241, O 282, O 296.
rugosa, 27, 107, O 185, O 249, O 311, P 147.
tuberolosa, 24, 38, 199, O 185, O 277.

Pirena
Californica, O 200, O 209, O 230, U 206, V 226.
Pisania
æquiliirata, O 263, O 344.
articulata, O 226.
einis, O 344, O 361.
D’Orbignyi, 180.
elata, 105, 221.
elegans, O 288.
fortis, 25, 322, 324.
gemmata, 25, 29, 196, O 204, O 236, O 263, O 344, O 364, P 515.
hamastoma, O 231.
insignis, 25, 28, 179, 324, 325, O 204, O 263, P 514, P 515, P 516.
lugubris, 112, O 344.
mutilabilis, P 514.
nigrocostata, O 344.
pagodus, 25, 179, O 344, P 552.
Panamensis, O 344.
pastinaca, O 344.
pusio, O 226.
ringens, 25, 179, O 263, O 283, O 296, O 344, O 363, P 518.
sanguinolenta, 25, 28, 112, 155, 179, O 177, O 204, O 263, O 344, P 517, P 518.
Stimpsonianiana, O 344.
tincta, 363.
Pisidium
abditum, 165.
ampulum, 165.
Kurtzii, 165.
notatum, 165.
obliquum, O 222.
obscurum, 165.
occidentale, 118, 165.
plenum, 165.
regulare, 165.
resartum, 165.
retusum, 165.
INDEX OF SPECIES.

Pisidium
zonatum, 165.

Placiphora, *vide* Plazophora.
Placiphorella, *vide* Mopalia.

Placunanomia *)
Placunomia *)

alope, 11, 132, O 192, O 286,
O 312, O 348.
Broderipii, O 286.
cepio, 11, 92, 132, O 192, O 286,
O 312, O 348.
claviculata, O 250, O 312, P 166.
Cumingii, 47, O 180, O 312.
echinata, 50, O 250, P 166.
foliacea, O 363.
foliata, 50, O 250, O 282, O 312,
O 363.

Planaxis

acutus, O 237, O 240, O 257,
P 364, P 541.
canalliculatus, O 268.
laticostatus, O 178.
nigriflora, 24, 100, 109, O 164,
O 237, O 240, O 257, O 328,
P 364.

------ vari., O 237.

obsoletus, O 237, O 240, O 257,
P 364, P 541.
planicostatus, 10, 24, 109, 178,
328, O 174, O 230, O 235,
O 268, O 360.
sulcatus, O 230.

Planorbis

affinis, O 364, P 181.
albus, O 222.
ammon, 40, 79, 120, 161, O 283,
O 316.
carinatus, P 252.
complanatus, O 222.
cortorta, O 222.
corneus, O 222.
corpulentus, 18, 44, 85, 93, 161,
O 210, O 316.
deflectus, O 211.
Duenasianus, 44.
exacutus, O 211.

--- vari. fallax, 161.
gracilentus, 40, O 283, O 316.
Haldemanni, 40.
--- lentus, 161.
leucostoma, O 222.
Liebmanni, 40.
megastoma, 161.
Newberryi, 120.
opercularis, 85, 161, O 209,
O 211, O 316.
Panamensis, O 186, O 316.
parrus, 116.
--- planulatus, 85, 161.
--- regularis, 161.
--- subcrenatus, 93, 161, O 198,
--- O 316, V 220.
tenagophilus, 161, O 237, O 251,
P 181, P 540.
Traskei, 40, 120, 161.
trivolvis, 85, 116, 120, 161,
V 221.
tumens, 44, 161, O 237, O 251,
O 316, O 364, P 181.
tumidus, 44.
vermicularis, 161, O 209, O 211,
O 316.
--- vermiculatus, O 213.
--- vortex, O 222.
--- Wyldi, 44.

Platyodon
cancellatus, 11, 26, 87, 123,
O 494, O 231, O 234, O 300,
O 349, O 351, V 210.

Platysemus
Wossnessenskii, 92.
INDEX OF SPECIES.

Plaxiphora

Placiphora

retusa, O 318.

Plectodon

scaber, 97, 124.

Pleuropus

pellucidus, O 173.

Pleurophyllidia

Californica, 94, 133.

Pleurotoma

arauata, O 207, O 208.

aterrirma, 183, O 183, O 271,

P 393.

--- var. Melchersi, O 271.

atrior, 36, 183, O 258, O 271,

P 393, P 394.

bicanalifera, 183, O 183, O 271.

bicolor, 183.

bituberculifera, O 330.

Bottse, 191, O 238, O 258,

O 330, P 294.

cedo-nulii, O 185, O 330.

cincta, O 187, O 258, O 272,

P 295.

clavulus, O 183, O 330.

collaris, 183, O 271.

concinna, 183, O 271, S 162.

cornuta, O 271.

corrugata, 183, O 183, O 271.

discors, 36, 183, O 258, O 271,

P 393, P 394.

duplicata, 184, O 183, O 271.

excentrica, 184, O 183, O 271,

P 393.

exigua, 184, O 271.

funiculata, 24, 27, 109, 184,

O 208, O 226, O 238, O 258,

O 271, O 282, O 294, O 330,

P 390, P 391, P 544.

gemnata, O 205, O 330.

gemmulosa, 184, O 271.

gracillima, O 284, O 330, S 163,

S 164.

grandimaculata, 184, O 271.

granulosa, O 183.

--- var. Melchersi, O 271.

Gracillima

heterocera, O 183.

incassata, 184, O 183, O 238,

O 271, O 294, P 392, P 544.

inermis, O 205.

luctuosa, P 397.

maculata, P 391.

maculosa, 27, O 235, O 238,

O 258, O 330, P 391.

maura, O 191, O 258, O 294, P 293.

militaris, O 208.

Melchersi, O 238, O 294, P 393,

P 544.

modesta, O 187.

nigririma, 184, O 183, O 271.

nittida, O 183.

nobilis, O 205.

obeliscus, 184, O 271.

Ocoyana, 77.

olivacea, 184, O 208, O 271,

O 330, P 390.

--- var., O 258, P 390.

oxytropis, O 183, O 330.

pallida, 184, O 271.

picta, O 207, O 208, O 330.

pudica, O 330.

rava, P 399.

rigida, 184, O 271.

rudis, 184, O 272, P 393.

ragilera, O 183.

rustica, 36, 184, O 272, P 393.

Schantarica, O 217, O 220, O 223.

simplex, O 217, O 220, O 223.

splendidula, O 183.

striosa, 184, O 272.

stromboledes, O 208.

thiarella, O 272.

transmontana, 77.

tritiope, 59.

tuberculeifera, 6, O 176, O 330.

turricula, O 271.

unicolor, O 183.

unimaculata, 183, O 330.

variculosa, O 183.

Plicatula

dubia, var., O 250, P 155.
INDEX OF SPECIES.

Plicatula
penicillata, 38, 107, 199, O 250, O 312, P 155.

Polinices
bifasciata, 27, 110, 152, 153.
var. fusca, 9, 110.
Gallapagosa, O 282, O 284.
temperata, O 337.
lactea, O 364.
ottis, 24, 27, 110, O 282.
ovum, O 284.
Panamensis, O 337.
perspicua, 102, O 337.
Recluziana, 27, 153.
Salangonensis, 27, 193, O 337.
uber, 24, 37, 110, 193, O 261.
O 282, O 337, O 364, P 452.
unimaculata, O 337.
virginea, O 337.

Pollia
distorta, O 268.
hæmastoma, O 177, O 191, O 236.
O 263, O 269, P 517.
insignis, 29.
scabra, 20.

Polydonta
dentata, O 321.

Polygyra
.acutedentata, 157.
contortuplicata, O 294.
polygyrella, 157.
ventrosula, 157.

Polyplex
gracilis, 6.

Polytropa
nux, P 484.

Pomatiopsis
Binneyi, 163.

Pomaulax

Pompholyx
effusa, 120, 160.

Porania
Petitiana, 30, P 549.
rubra, 69, P 108.

Potamis

Potamides
Californianus, O 213.
ebeninus, 48.
fusaceus, U 206.
Hegewischii, O 233, O 295, P 345.
Montagnei, O 238, P 542.
pullatus, 79, 84, O 283, O 284.
sacraus, O 259, U 206, V 226.

Potamomya
æqualis, 204, O 280, O 300.
inflata, 204, O 280, O 300.
trigonalis, 204, O 280, O 300.

Priene
cancellata, 20, 170.
nodosa, 24, 27, 152, 166.
Oregonensis, 20, 25, 69, 92, 99, 147, 169, 170, 322.

Pristes
oblongus, 97, 127.

Propilidium
aneyloide, 19.

Psammobia
Californica, 119.
casta, 23, 38, 202.
decora, 124, O 195, O 207, O 231, V 212.
fusca, O 221.
Kindermanni, O 301.
maxima, 49.
olivacea, 74.
Pacific, 12, 38, 78, 126, O 195, O 301, O 351, V 212.
rubroradiata, 26, 49, 88, 124.

Psephis
Lordi, 88, 97, 127.
salmonae, 25, 97, 127.
tantilla, 22, 25, 118, 126, 165.
tellimyalis, 127, 303.

Pseudobuccinum
billiratum, O 342.
INDEX OF SPECIES.

**Pseudobuccinum**
- liochilus, O 342.
- Panamense, O 342.
- pulchrum, O 342.

**Pseudoliva**
- Kellettii, 40, O 272, O 340, O 350.
- Kellettii, 41, 350.

**Pteroceras**
- lambis, 109.
- centrifugus, 102, O 345.
- festivus, 23, 149, O 345.

**Pullastra**
- gigantea, O 196.

**Puncturella**
- Cooperi, 98, 137.
- cucullata, 88, 98, 137, O 209, 320, O 348.
- galeata, 137, 320, O 348.
- noachina, 72.

**Pupa**
- Californica, 118, 158.
- chordata, 158.
- ovata, 117.
- Rowelli, 117, 158.

**Pupilla**
- Californica, 158.
- Rowelli, 158.

**Purpura**
- alveolata, O 187, O 293, O 340.
- analoga, 20, 28, 148, O 240.
- anguilfera, 10, O 191, O 269.
- aperta, 13, 325, O 201, V 227.
- atromarginata, O 236, P 537.
- attenuata, 20, 148, O 220.
- bezoa, O 294.
- bicostalis, O 174, O 190, O 191, 236, O 238, 262, O 292, P 477, P 478, P 537, P 543.
- biserialis, 14, 24, 28, 111, 151, 152, 180, O 171, O 187, O 190, O 191, O 202, O 204, O 231, 234, O 235, O 236, O 238, O 262, O 269, O 283, O 340, O 352, O 364, O 366, P 477, P 482.

**Purpura biserialis var., O 283.**
- bizonalis, O 217.
- brevidens, V 229.
- bufonides, 14.
- callosa, 10, 48, O 269, O 294.
- canaliculata, 10, 20, 28, 92, 148, O 171.
- cancellata, O 236.
- cassidiformis, P 476.
- centiquadra, 10, O 171, O 191, 262, P 480.
- chocolata, O 191, O 294.
- columellaris, 6, O 174, O 178, O 187, O 191, O 228, O 231, O 235, O 240, O 262, O 294, O 340, O 361, P 355, P 475, O 481.
- Conradi, 83, O 184, O 192, O 201, O 203, O 231, V 228.
- consul, O 238, O 262, P 477, P 478, P 542.
- cornigera, 10, O 177, O 191, O 201, O 269, V 229.
- coronata, O 297.
- costata, O 191, P 482.
- costularis, O 191.
- crassilabrum, O 171, O 235.
- crispata, 7, 13, 23, 26, 74, 92, 148, O 192.
- decemcostata, 4, 10, 20, 28, 83, 92, 149, O 217, O 223, O 240, O 340.
- deltoidea, O 364, P 478.
- diadema, O 262, P 482.
- dumosa, O 201.
- engonata, O 293, V 228, V 229.
- fasciata, O 183.
- ferruginea, 83.
INDEX OF SPECIES.

Purpura

Floridana, O 190, O 262, O 364, P 477.

foliata, 4, 5.

foveolata, 35, 180, O 269.

Freycinetii, 14, 20, 28, 72, 83.
  O 203, O 204, O 217, O 220,
  O 223, O 240, O 340.

fuscata, 13, 28, 114, 148.

fusciformis, O 191.

Grayi, O 188, O 204, O 294.

hæmastoma, O 190, O 202, O
  231, O 236, O 262, O 366,
  P 477, P 478, P 537.

hæmatura, O 204, O 262, P 477.

harpa, 13, O 201, O 340, O 349,
  V 228.

imbricata, 102, O 217.

kiosquiformis, 180, O 191, O 231,
  O 234, O 235, O 269, O 352,
  P 481.

  var., O 269.

lacteua, 4, 83, 148.

lagna, 18, O 212, O 340, O 348.

lamellosa, 5, O 340.

lapillus, 13, 18, 23, 83, 148,
  O 203, O 204, O 217, O 220,
  O 223, O 231, O 340.

lapilloides, O 293.

macrostoma, O 201, O 340, O
  349, V 227.

maculata, O 269.

madreporarum, 63.

melo, 24, 180, O 269, O 340.

melones, 10, O 231, O 269, O 282,
  O 340.

muricata, 28, 108, 111, O 235,
  O 262, O 340, O 352, P 476.

nux, P 484.

nympha, O 191.

oeclata, O 269.

ochrostoma, 63.

osculans, 35, 180, O 269.

ostrina, 13, 14, 18, 26, 27, 83,
  148, 151, 152, O 210, O 340,
  O 348.

7

Purpura

pallidus, 191.

pansa, O 228, O 262, O 340, O
  362, O 363, O 365, P 474, P
  475, U 208.

patula, 6, 8, 24, 28, 48, 63, 111,
  152, 166, O 171, O 228, O 234,
  O 238, O 262, O 283, O 292,
  O 340, O 352, O 361, O 363,
  O 365, P 474, P 475, P 476,
  P 479, P 542, U 208.

planospira, 6, 8, 28, 103, 104,
  108, 111, O 187, O 240, O 340,
  O 361.

planospirata, 48.

plicata, 148.

purpuroides, 180.

rupestris, 14.

sanguinolenta, O 191, O 231,
  P 517.

saxicola, 13, 18, 23, 83, 148,
  O 204, O 220, O 231, O 340.

  var., 83.

scalariformis, O 190, O 262, O
  269, P 481.

semi-imbricata, 7, O 171.

septentionalis, 74, 83, 148, O
  211, O 212, O 217, O 231,
  O 340.

speciosa, O 171, O 191, O 262,
  O 340, P 480.

sphæridia, 10.

spieata, O 293, V 228.

spirata, O 191, O 201, V 228.

succineta, 10.

tecta, 180, O 269.

triangulis, 24, 28, 111, 180,
  O 187, O 191, O 262, O 269,
  O 340, O 361, P 480.

triserialis, 24, 111, O 171, O
  191, O 262, O 283, O 294, O
  340, P 479, P 480.

truncata, O 191, O 262, P 476.

undata, 180, O 171, O 187, O
  190, O 202, O 262, O 269,
  O 340, O 364, P 477, P 478.
INDEX OF SPECIES.

Pustularia
  pustulata, P 375.

Pyramidella
  bicolor, O 296.
  conica, 193, O 274, P 409.

Pyrazus
  ——— var., 152.

Pyrgula
  quadricostata, O 284, O 326, S 162.

Pyrgulina
  elathratula, 33, P 424.
  convexa, 33, P 424.
  Photis, 33, P 425.

Pyrula
  anomala, O 238, O 263, P 503, P 544.
  Belcheri, O 205.
  bezoar, O 191.
  carinaria, O 171.
  lactea, O 263, P 503.
  lignaria, O 234, O 263, P 502.
  melongena, O 294, O 364, P 501.
  ——— var., O 263, P 501.
  rapa, 7.
  reticulata, O 171.
  spirata, 7, O 171.
  subrostrata, O 176, O 238, O 293, P 544.
  turbinelloides, O 263.
  ventricosa, O 174, O 236, O 294, P 453.
  vespertilio, O 171.

Pythina
  rugifera, 88, 129.
  sublaevis, O 248, O 308, P 112.

Radius
  œqualis, O 328.
  avena, 24, 154, O 328.
  Californicus, O 328.
  emarginatus, O 328.
  inflexus, O 328.
  similis, 24.

Raeta
  canaliculata, 100, 126, 167, 204.
  undulata, 21, 100, 126, 167.

Ranella
  albofasciata, O 163, O 185 O 338.
  aniceps, O 238, O 294, O 338, P 544.
  argus, O 294.
  bufonia, O 294.
  celata, 24, 110, 182, O 231, O 270, O 294, O 338.
  Californica, 15, 27, 110, 147, 170, O 205, O 338, O 351.
  convoluta, O 231, O 338.
  crumenata, O 171.
  crumenoides, O 171.
  granifera, O 172.
  murriformis, O 182, O 201, O 238, O 283, O 338, O 351, P 544.
  nana, O 163, O 176, O 185, O 208, O 238, O 271, O 338, P 544.
  nitida, 24, 182, O 231, O 271, O 338.
  pectinata, O 338.
  plicata, O 271, O 338.
  pyramidalis, 24, O 182, O 238, O 294.
  scabra, O 294.
  semigranosa, O 270, O 294.
  tuberculata, O 338.
  ——— var., O 297.
  ventricosa, 15, 147, 170, O 235.
  vexillum, O 294, O 297.

Rangia
  trigona, O 232, O 246, P 52.

Rapana
  nux, O 262.
INDEX OF SPECIES.

Recluzia
Rollandiana, 62, O 297, O 316.

Rhinoclavis
gemmata, 7, 24, 108, 152, 185.

Rhizochilus
asper, O 287, O 297, O 340.
Californicus, 35, 111, 180, O 262, O 287, P 484.
distans, 34, 35, 180, P 484.
foveolatus, O 340.
gibbosus, P 485.
madreporarum, 155.
niveus, P 484.
nux, 25, 34, 35, 111, 180, O 262, O 269, O 340, P 484.

Rhodea
Californica, 158.

Rhynchohella
lucida, 72.
psittacea, 71, 93, 122, 168.

Ricinula
alveolata, O 187, O 293.
aracnoidea, O 176.
carbonaria, 181, O 231, O 270.
contracta, O 187.
elegans, O 176.
heptagonalis, O 187.
jugosa, 181, O 270.
Reeviana, 181, O 270.
zonata, O 187.

Rimula
eucullata, O 209, O 213.
galeata, O 209.
Mazatlanica, 108, O 252, O 320, P 222.

Rissoa
glabra, O 220.
incouspicua, 32, 33, 36, 189, 190, O 273.
infrequens, 189, O 273, O 327.
Janus, 189, O 273, O 327.
lirata, P 358.
notabilis, 33, 36, 189, 190, O 273, O 327.
proxima, P 437.
saxatilis, O 220.
sclariformis, 36, 189, O 273, O 327.
striata, O 238, P 356, P 542.

Rissoina
ambigua, 230.
Catesbyana, O 364.
Clandestina, 109, O 327.
expansa, 24, 293.
infrequens, 109, 293.
terfossa, 99, 142.
firmata, 24, 32, 109, 189, O 327.
fortis, 24, 109, O 327.
Janus, 24.
pyramidata, P 356.
sclariformis, 32.
striata, 24, 109, O 257, O 327, P 356.
Woodwardii, 24, 189, O 257, O 327, O 364, P 356, P 357.

Rocellaria
ovata, 121.

Rostellaria
indurata, O 367.

Rotella
lineata, O 222.

Rupallaria
Cordieri, 127.
exarata, O 244, O 299, P 20.
foliaeae, 154, O 299.
lamellifera, 22, 25, 26, 127, O 299, O 349, V 214.
lingua-felis, 106, O 244, O 299, P 20.
paupercula, O 299.
<table>
<thead>
<tr>
<th>Species</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sanguinolaria</strong></td>
<td></td>
</tr>
<tr>
<td>Californica</td>
<td>O 221</td>
</tr>
<tr>
<td>Californiana</td>
<td>12, 62, 86, 125, O 301, V 212</td>
</tr>
<tr>
<td>decora</td>
<td>70, O 226</td>
</tr>
<tr>
<td>fusca</td>
<td>O 221</td>
</tr>
<tr>
<td>grandis</td>
<td>O 228, O 349</td>
</tr>
<tr>
<td>miniata</td>
<td>23, 27, 29, 35, 49, 154, O 231, O 245, O 301, P 548, U 199</td>
</tr>
<tr>
<td>Nuttallii</td>
<td>26, 70, 124, 151, 169, O 195, O 207, O 226, O 234, O 301, O 351, O 352</td>
</tr>
<tr>
<td>ovalis</td>
<td>49</td>
</tr>
<tr>
<td>Pacifica</td>
<td>V 212</td>
</tr>
<tr>
<td>purpurea</td>
<td>49, O 226, O 231, O 245, O 301, O 352, P 31, P 548, U 199</td>
</tr>
<tr>
<td>rubroradiata</td>
<td>O 301, V 212</td>
</tr>
<tr>
<td>tellinoides</td>
<td>49, O 286, O 301, P 31</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Saxicava</strong></td>
<td></td>
</tr>
<tr>
<td>abrupta</td>
<td>76</td>
</tr>
<tr>
<td>arctica</td>
<td>118, 123, O 244, O 296, O 299, O 365, O 366, P 16, P 24</td>
</tr>
<tr>
<td>Californica</td>
<td>120, O 196, V 214</td>
</tr>
<tr>
<td>carditoides</td>
<td>120, O 196, O 232, O 234, V 214</td>
</tr>
<tr>
<td>clava</td>
<td>15, O 203</td>
</tr>
<tr>
<td>Cordieri</td>
<td>O 232, P 16</td>
</tr>
<tr>
<td>distorta</td>
<td>70, O 221</td>
</tr>
<tr>
<td>fragilis</td>
<td>256</td>
</tr>
<tr>
<td>Gallicana</td>
<td>O 221</td>
</tr>
<tr>
<td>Groenlandica</td>
<td>O 221</td>
</tr>
<tr>
<td>Iamellifera</td>
<td>O 234</td>
</tr>
<tr>
<td>legumen</td>
<td>14, 15, 123, O 202, O 203</td>
</tr>
<tr>
<td>pholadis</td>
<td>14, 15, 22, 26, 70, 88, 91, 105, 123, 124, 151, 166, 168, O 202, O 219, O 221, O 223, O 232, O 279, O 299, O 351</td>
</tr>
<tr>
<td>rugosa</td>
<td>70, 91, O 221, P 15, P 16</td>
</tr>
<tr>
<td>solida</td>
<td>P 16</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Saxidomus</strong></td>
<td></td>
</tr>
<tr>
<td>aratus</td>
<td>12, 73, 86, 127</td>
</tr>
<tr>
<td>brevisiphonatus</td>
<td>93, 127, 251</td>
</tr>
<tr>
<td>giganteus</td>
<td>12, O 196, O 299, V 215</td>
</tr>
<tr>
<td>Nuttallii</td>
<td>12, 74, 76, 86, 127, O 192, O 196, O 203, O 210, O 232, O 234, O 299, O 349, O 351, V 215</td>
</tr>
<tr>
<td>Petiti</td>
<td>12, 17, O 196, O 299, O 349</td>
</tr>
<tr>
<td>squalidus</td>
<td>12, 14, 20, 22, 86, 91, 127, O 192</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>** Scalaria**</td>
<td></td>
</tr>
<tr>
<td>aeculina</td>
<td>O 207, O 336</td>
</tr>
<tr>
<td>australis</td>
<td>18, 114, O 210, O 336</td>
</tr>
<tr>
<td>bellastrata</td>
<td>99, 146</td>
</tr>
<tr>
<td>borealis</td>
<td>O 212</td>
</tr>
<tr>
<td>crassilabris</td>
<td>O 238, P 542</td>
</tr>
<tr>
<td>crebicioestata</td>
<td>99, 146</td>
</tr>
<tr>
<td>Cumingii</td>
<td>99, 146, O 284, O 336, S 165</td>
</tr>
<tr>
<td>diadema</td>
<td>33, O 181, P 448</td>
</tr>
<tr>
<td>Diane</td>
<td>O 206, O 336</td>
</tr>
<tr>
<td>Elenensis</td>
<td>33</td>
</tr>
<tr>
<td>funiculata</td>
<td>33, O 260</td>
</tr>
<tr>
<td>gracilis</td>
<td>146</td>
</tr>
<tr>
<td>Groenlandica</td>
<td>71, O 216, O 223, O 336</td>
</tr>
<tr>
<td>hexagona</td>
<td>192, O 260, O 274, O 285, O 336, P 446</td>
</tr>
<tr>
<td>Hindsi</td>
<td>24, O 284, O 336, S 165</td>
</tr>
<tr>
<td>Indianorum</td>
<td>114, 146, 169, 244</td>
</tr>
<tr>
<td></td>
<td>var. 99</td>
</tr>
<tr>
<td>indistincta</td>
<td>O 285, O 288, O 336</td>
</tr>
<tr>
<td>Mindorensis</td>
<td>S 164</td>
</tr>
<tr>
<td>mitraformis</td>
<td>O 186, O 336, P 446, Q 235, S 165</td>
</tr>
<tr>
<td>obesa</td>
<td>S 164</td>
</tr>
<tr>
<td>obtusa</td>
<td>192, O 274, O 336</td>
</tr>
<tr>
<td>Ochotensis</td>
<td>20, O 216, O 220, O 223</td>
</tr>
<tr>
<td>planicosta</td>
<td>O 216</td>
</tr>
<tr>
<td>Species</td>
<td>Page Numbers</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
</tr>
<tr>
<td>Scalaria raricostata</td>
<td>33, 260, 336, P 447</td>
</tr>
<tr>
<td>Scalaria regularis</td>
<td>244, 284, 336, S 164</td>
</tr>
<tr>
<td>Scalaria reflexa</td>
<td>288, 336, Q 235</td>
</tr>
<tr>
<td>Scalaria statuminata</td>
<td>230, O 336</td>
</tr>
<tr>
<td>Scalaria subcorouata</td>
<td>99, 146</td>
</tr>
<tr>
<td>Scalaria subnodosa</td>
<td>284, 336, S 165</td>
</tr>
<tr>
<td>Scalaria subulata</td>
<td>216</td>
</tr>
<tr>
<td>Scalaria suprastriata</td>
<td>260, 336, P 446, P 447</td>
</tr>
<tr>
<td>Scalaria tiara</td>
<td>no, 284, 336, S 164</td>
</tr>
<tr>
<td>Scalaria var. ticta</td>
<td>146, 151, 244</td>
</tr>
<tr>
<td>Scalaria Turtonis</td>
<td>244</td>
</tr>
<tr>
<td>Scalaria venosa</td>
<td>230</td>
</tr>
<tr>
<td>Scalaria vulpiua</td>
<td>206, 336</td>
</tr>
<tr>
<td>Scapharca bifrons</td>
<td>24, 154</td>
</tr>
<tr>
<td>Scapharca emarginata</td>
<td>24</td>
</tr>
<tr>
<td>Scapharca labiata</td>
<td>24</td>
</tr>
<tr>
<td>Scapharca nux</td>
<td>24, 195, 123, 126, 169</td>
</tr>
<tr>
<td>Scapharca Dombeyi</td>
<td>var. 272</td>
</tr>
<tr>
<td>Scapharca producta</td>
<td>284, 336, S 160</td>
</tr>
<tr>
<td>Scapharca viridotincta</td>
<td>284, 303, S 160</td>
</tr>
<tr>
<td>Scapharca Xantusi</td>
<td>158</td>
</tr>
<tr>
<td>Scapharca Scutellina navicelloides</td>
<td>31, 37, 197, O 252, O 319, P 211</td>
</tr>
<tr>
<td>Scapharca Scurria (?var.) funiculata</td>
<td>98, 136</td>
</tr>
<tr>
<td>Scapharca Turtonis</td>
<td>22, 26, 79, 54, 136, 170, O 173, O 174, O 190, O 199, O 202, O 209, O 234, O 297, O 319, O 348, P 292, V 222</td>
</tr>
<tr>
<td>Scapharca pallida</td>
<td>79, O 284</td>
</tr>
<tr>
<td>Scapharca scurra</td>
<td>170, V 222</td>
</tr>
<tr>
<td>Scapharca Segmentina Donbilli</td>
<td>44</td>
</tr>
<tr>
<td>Scapharca Seila assimilata</td>
<td>33, P 445</td>
</tr>
<tr>
<td>Scapharca Semele bicolor</td>
<td>29, 105, O 303</td>
</tr>
<tr>
<td>Scapharca California</td>
<td>O 287</td>
</tr>
<tr>
<td>Scapharca var. 105, 151, O 303</td>
<td></td>
</tr>
<tr>
<td>Scapharca corrugata</td>
<td>126</td>
</tr>
<tr>
<td>Scapharca decisa</td>
<td>22, 26, 126, O 231, O 303, O 351, V 213</td>
</tr>
<tr>
<td>Scapharca elliptica</td>
<td>0 303, P 28</td>
</tr>
<tr>
<td>Scapharca flavicans</td>
<td>29, 39, 48, 105, 203, O 245, O 303, O 351, P 28, P 548, U 199</td>
</tr>
<tr>
<td>Scapharca flavicans</td>
<td>48, O 231, O 279</td>
</tr>
<tr>
<td>Scapharca ineongrana</td>
<td>97, 126</td>
</tr>
<tr>
<td>Scapharca obliqua</td>
<td>O 284, O 303</td>
</tr>
<tr>
<td>Scapharca planata</td>
<td>O 284, O 303, S 160</td>
</tr>
<tr>
<td>Scapharca proxima</td>
<td>39, 154, 203, O 226, O 231, O 245, O 279, O 303, P 548, U 199</td>
</tr>
<tr>
<td>Scapharca pulchra</td>
<td>23, 39, 78, 97, 126, 154, 203, O 303</td>
</tr>
<tr>
<td>Scapharca punctata</td>
<td>O 304, S 160</td>
</tr>
<tr>
<td>Scapharca rubrolinea</td>
<td>22, 113, 126, O 163, O 232, O 303, O 351, V 212</td>
</tr>
<tr>
<td>Scapharca rubrotincta</td>
<td>O 284, O 352</td>
</tr>
<tr>
<td>Scapharca rubrium</td>
<td>97, 126, 170, O 304, O 359</td>
</tr>
<tr>
<td>Scapharca simplex</td>
<td>163, O 195, O 232, V 212</td>
</tr>
<tr>
<td>Scapharca striosa</td>
<td>203, O 303</td>
</tr>
<tr>
<td>Scapharca tortuosa</td>
<td>O 303</td>
</tr>
</tbody>
</table>

- **INDEX OF SPECIES.**

- **Scutellina**
  - navicelloides, 31, 37, 197, O 252, O 319, P 211

- **Scurria**
  - (?var.) funiculata, 98, 136

- **Seila** assimilata, 33, P 445

- **Semele**
  - bicolor, 29, 105, O 303
  - California, O 287
  - var. 105, 151, O 303
  - corrugata, 126
  - decisa, 22, 26, 126, O 231, O 303, O 351, V 213
  - elliptica, O 303, P 28
  - flavicans, 29, 39, 48, 105, 203, O 245, O 303, O 351, P 28, P 548, U 199
  - flavicans, 48, O 231, O 279
  - ineongrana, 97, 126
  - obliqua, O 284, O 303
  - planata, O 284, O 303, S 160
  - proxima, 39, 154, 203, O 226, O 231, O 245, O 279, O 303, P 548, U 199
  - pulchra, 23, 39, 78, 97, 126, 154, 203, O 303
  - punctata, O 304, S 160
  - rubrolinea, 22, 113, 126, O 163, O 232, O 303, O 351, V 212
  - rubrotincta, O 284, O 352
  - rubrium, 97, 126, 170, O 304, O 359
  - simplex, O 163, O 195, O 232, V 212
  - striosa, 203, O 303
  - tortuosa, O 303
INDEX OF SPECIES.

Semele
ventricosa, 203, 0 303.
venusta, 23, 29, 154, 203, 0 245, 0 303, P 28.

Senectus
funiculatus, 4.
squamigerus, 24, 154.

Septifer
bifurcatus, 26, 129, 151.
Cumingianus, 106, 0 309.

Serpula
incurvata, X 436.
recta, X 425, X 436.
regularis, 42.

Serpulorbis
Panamensis, 42.
squamigerus, 23, 27, 100, 140.

Serripes
Grønlandicus, 70, 88, 128, 168.
Laperousii, 128.

Serrula
Carpenteri, O 287.

Sigaretus
coraeus, O 176, O 216.
debilis, 27, O 228, O 233, O 337, O 352, U 207.
fenestratus, O 259, P 408.
inflatus, O 275.
millegranus, O 170, P 408.
scopulosus, O 367.
tessellatus, O 294, P 407.

Silliqua
lucida, 120, O 195, V 211.
Nuttallii, 120, 124, O 195, V 211.

Silliquaria
gibba, 39.

Simnia
patula, P 375.

Sipho
terebalis, 73.

Siphonalia
anomala, 152.
fascotincta, 23, 149, 288.
Kellettii, 74, 149, 169, 289.
modiifecata, 152.
palida, 28, 49, 112.

Siphonaria
æquilarata, 107, 112, 151, 152, 162, O 251, O 290, O 316, P 184.
æquilarata, O 290, P 550.
amara, 48, O 290.
characteristica, 197, O 185, O 276, O 282, O 290.
costata, O 185, O 276, O 316.
denticulata, O 239, P 546.
ferruginea, 31.
gigantea, O 229.
gigas, 24, 152, 197, O 174, O 276, O 282, O 290, O 316, O 359, T 168, U 205.
—— var. O 276.
lateralis, 133, 170, 238.
—— var. O 239.
—— var. palmata, O 251, P 183.
leviuscula, 152.
maura, 24, 31, 162, O 185, O 276, O 316.
palmata, 24, 31, 107, 162.
pentegoniostoma, P 212.
pica, 37, 197, O 276, O 285, O 316.
sentellum, O 203, O 316, O 359.
thersites, 47, 113, 133, 162, 170, 237.
Tristensis, 47, 113.

Siphonium
var. centiquadra, 42.
effusum, 42.
lituela, 42.
margaritarum, 42.
megamastum, 42.
var. spinosum, 44.
suberenatum, 44.

Sistrum
carbonarium, 25, 111.
(fochrostoma, var.) rufonotatum, 105, 220.
INDEX OF SPECIES.

Skenea
rotan, X 415, X 426.
Verranxii, 62.

Smaragdinella
thecephora, O 250, O 313, P 533.

Solariea
aspecta, 98.
peramabilis, 98, 139.

Solarium
æthiops, O 294.
bicanaliculatum, 7, O 170.
cyclostoma, O 294.
granulosum, O 170, P 408.
granulatum, 15, 24, 27, 36, 58. 110, 153, 191, O 170, O 236, O 237, O 274, O 333, P 536. P 541.
granulatum, var. 58.
granulosum, 15.
placentale, 58, O 206, O 333.
placentula, 58.
quadriceps, 15, 27, 58, 110, 153, 191, O 206, O 234, O 235, O 274, O 333.
variegatum, 63, O 294, P 407.
verrucosum, 58.

Solecardia
eburnea, O 265, V 209.

Solecurtus
affinis, 39, 205, O 245, O 280, O 301, P 27.
ambiguus, 48.
Californiaanus, 12, 22, 26, 124, 170, O 195, O 231, O 284, O 301, O 351, V 212.
Californiaen, O 349.
Californiaensis, 78.
Caribbeus, 39, 205.
Carpenteri, 29.
Dombeyi, 12, 48, 124, 170.
Lucidus, 12, 120, O 195, O 211, V 211.

maximus, 120, 124, V 211.
Nuttallii, 12, 87, 120, O 195, O 222, V 211.

politana, 29, O 245, O 301, P 27.

Solecurtus
radiatus, 120, O 195, O 211, V 211.

splendens, V 211.
subteres, 22, 124, O 195, O 231, O 234, O 301, O 349, O 351.
violesens, 151, O 282, O 301, P 27.

Solemmya
pusilla, 73.
velum, 73.
ventricosa, 164, O 367.

Solen
altus, O 175, O 222.
acutidens, O 175.
ambiguus, 6, 7, 8, 20.

Americanus, O 222.

Californiaanus, O 61.
corneus, 73.
Dombel, 61.
ensis, O 222.

gaxilia, 73.

maximus, 9, 87, O 211, O 212, O 213, O 222, O 231.

medius, 7, 20, O 222.

minutus, O 221.

Nuttalli, O 231.
patulus, 5, 9.

rudis, 6, 39, 205, O 280, O 301.
sicarius, 26, 74, 87, 124, 169, O 209, O 212, O 213, O 301.

(?)var. rosaceus, 22, 124, 279.

splendens, 120, O 195, O 222.
strictus, 73.

subteres, 61.
tenuis, O 175, O 222.

Solenæ
ambigua, 39.
media, 39.
obligua, 39, 205.

Soletellina
oblurata, 70.

Sphænia
bilirata, 118.
INDEX OF SPECIES.

**Sphaenia**
Binghami, P 16, P 24.
Californica, 78, 87, O 194, O 211, O 284, O 301, O 349, O 351, V 210.
fragilis, 29, 39, 105, O 244, O 300, P 24, P 530.
luticola, 29.
ovalis, 168.
ovoidea, 88, 123.

**Sphaerella**
tumida, 30, 129.

**Sphaerium**
dentatum, 164.
lenticula, 165.
meridionale, 165.
nobile, 165.
occidentale, 116, 165.
ovale, 165.
patella, 165.
Spokani, 91, 165.
striatinnm, 116, 164.
subertransversum, 165.
tumidum, 91, 165.

**Spiraxis**
Cobanensis, 44.
Latrei, 44.
Shuttleworthii, 44.

**Spirogylypus**
albidus, 43.
lituella, 27, 108, 140.

**Spisula**
fragilis, P 51.

**Spondylius**
calceifer, 24, 107, 199, 256, 258, O 241, O 250, O 277, O 312, P 547, P 548, P 550.
erassiquama, O 233.
dubius, O 182, O 312, P 153.
ducalis, P 153.
Estrellanus, 81.
Lamorekii, 199, O 250, O 277, P 153, P 547.
limbatus, 43, O 290, O 312.
pictorum, O 233, O 234, O 265.
----- var. P 153.

**Spondylius**
princeps, O 312.
----- var. O 182.
radula, O 290, O 312.
varius, O 233.
Victoriae, 41.

**Standella**
Californica, 22, 99, 113, 126, 151.
falcata, 126.
fragilis, 27, 106.
nasuta, 12, 99, 126.
planulata, 99, 126.
velata, 204.

**Stenotrema**
germana, 157.

**Stephopoma**
var. bispinosa, 42.
pennatum, 42.

**Stoa**
ammonitiformis, 42.
suberenata, 44.

**Stomatella**
inflecta, 37, 194, O 275, O 320.

**Stramona**
petrosa, 76.

**Strategus**
imermis, 94, 95.

**Strebelloceras**
anellum, 43.
cornuoides, X 441, X 443.
solutum, X 441, X 443.

**Strephona**
incrassata, P 464.
Pedroana, 76.

**Strigatella**
effusa, O 339.
tristis, 24, 110, 151, 177, O 261, O 339, P 461.

**Strigilla**
dischotoma, O 224, O 303.
disjuncta, 40, O 284, O 303, S. 160.
INDEX OF SPECIES.

**Strigilla**
- effusa, O 361.
- ervilia, O 224, O 303.
- fucata, 29, 38, O 227, O 228, O 245, O 279, O 363, U 200.
- lenticula, 105, O 224, O 245, O 303, P 41.
- miniata, O 245, P 40, U 200.
- pisiformis, 23, O 224, O 303, O 363.
- sincera, 23, 40, 105, 203, O 303, S 160.
- tristis, O 361.

**Strombina**
- angularis, O 344.
- bicanalifera, 25, 180, O 344, O 361.
- dorsata, 180, O 344.
- elegans, O 344.
- fusiformis, O 344.
- gibberula, 25, 112, 151, 180, O 344.
- lanceolata, O 344, O 361.
- maculosa, 112, O 263, O 344, P, 513.
- recurva, 25.
- turrita, 181, O 344.

**Strombus**
- bituberculatus, 10.
- cancellatus, 7.
- galea, 43, O 179, O 241, O 258, O 270, O 282, P 302, P 381.
- galeatus, 24, 109, O 187, O 238, O 270, O 329, P 544.
- gracilis, O 364, P 382.
- lentiginosus, O 238, P 544.

**Styrilfer**
- astericola, O 281, O 335, O 360.

**Styrilferina**
- turrita, 99, 143.

**Stylopygma**
- clausiliformis, 33, P 126.

**Subula**
- luctuosa, 109, O 258, O 329, P 387.
- strigata, 109, O 329.
- varicosa, 177, O 329.

**Succinea**
- aperta, 162.
- aurea, 159.
- brevis, 0 296.
- cingulata, 159, O 240, O 315.
- Hawkinsii, 90, 159.
- lineata, 120.
- Nuttaliana, 85, 159.
- Oregonensis, 159, O 198, O 315, V 220.
- ovalis, 159.
- putris, 44, 93, O 222.
- rotundata, 162.
- rusticana, 93, 116, 159, O 209, O 315.

**Surcula**
- funiculata, P 390.

**Syctotypus**
- Ocoyanus, 77.

**Syphopatella**
- aspersa, O 275.
- conica, P 265.
- lichen, P 266.
- mamillaris, P 266.
- regularis, 195.
- sordida, O 184.

**Syrmola**
- lamellata, 33, 110, P 411.
**INDEX OF SPECIES.**

**Tapes**
- Adamsii, 74, 304.
- decussata, 74, 127.
- Deshayesii, 58.
- discors, 23, 78, 0 306, P 77.
- diversa, 12, 56, 72, 76, 86, 127, 304, O 203, O 284, O 289, O 306.
- florida, U 200.
- fluctuosa, 39.
- fuscolinata, 23, 211.
- geographica, U 200.
- gracilis, 75, 78, O 227, O 284, O 306, O 352, U 200.
- granulata, 55, O 364, P 76, P 78.
- grata, 23, 27, 38, 55, 58, 78, 151, 201, O 247, O 278, O 282, O 306, O 352, P 77.
- var. 56, 151.
- Inezensis, 81.
- laciniata, 26, 57, 127, 304.
- linteata, 80.
- maxima, O 232.
- montana, 81.
- mundulius, 127.
- var. orbella, 127.
- Petitii, 127.
- var. 70, 74, 76, 91.
- pectunculoides, O 306.
- regularis, 119.
- rigida, 127.
- var. ruderata, 127.
- squamosa, 106, O 247, O 306, P 78.
- staminea, 12, 17, 22, 26, 56.
- tenerrima, 17, 22, 100, 127, 304, O 227, O 229, O 306, U 200.

**Tapes**

**Tectarius**
- coronatus, O 170.

**Tectura**
- persona, 16.
- textilis, 16.

**Tecturella**
- grandis, 31, 47, 136, 310.

**Tedinia**
- pernoides, O 250, O 286, P 165.

**Tegula**
- elegans, 10.
- flammee, 61.
- pellis-serpentis, 24, 61, O 170, O 282, O 288, O 321.
- strigilata, O 282.

**Teinostoma**
- amplexans, O 254, O 322, P 253, P 254.
- minutum, O 273, O 322.
- substratium, O 254, O 322, P 254.

**Tellidora**
- Burneti, 14, 29, 226, O 234, O 245, O 297, O 303, O 364, P 548.
- crystallina, 202.
- lunulata, 14.

**Tellina**
- albaria, O 367.
- alta, 12, 125, O 195, O 302, O 349, V 213.
- alternata, 29, O 245, P 35.
- alternidentata, 9, O 175, O 221, O 347.
- amplexans, 155.
- angulosa, O 245, P 35.
- aretata, 165, O 367.
- atra, O 219.
- aurora, 202, O 186, O 279, O 303.
- balthica, 20, O 221.
- bimaclulata, O 363.
- bitruncata, O 367.
<table>
<thead>
<tr>
<th>Tellina</th>
<th>Tellina</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodegensis, 69, 86, 125, 169, O 207, O 211, O 219, O 224, O 234, O 302, O 349.</td>
<td>Fabrici, O 221.</td>
</tr>
<tr>
<td>brevirostris, O 245, O 287, O 302, P 38.</td>
<td>fausta, O 284, O 303.</td>
</tr>
<tr>
<td>Broderipi, O 245, O 302, P 32.</td>
<td>felix, 23, 38, 73, 202, 203, O 186, O 228, O 245, O 279, O 302, P 34.</td>
</tr>
<tr>
<td>Burneti, O 175, O 203, P 39, P 83.</td>
<td>frigida, O 221.</td>
</tr>
<tr>
<td>calcearea, O 221, O 232.</td>
<td>fucata, O 227, U 200.</td>
</tr>
<tr>
<td>Californica, 18, O 211, O 302.</td>
<td>fusca, 20, O 221.</td>
</tr>
<tr>
<td>cierecula, O 224, O 236, P 534, P 539.</td>
<td>Gronlandica, O 175.</td>
</tr>
<tr>
<td>cognata, 38, 202, O 279, O 303, O 364.</td>
<td>guibernaenum, O 186, O 302.</td>
</tr>
<tr>
<td>Columbusiensis, 202, O 279, O 303.</td>
<td>Guilfordiae, 9, O 221.</td>
</tr>
<tr>
<td>concinna, O 279.</td>
<td>Hanleyi, 105.</td>
</tr>
<tr>
<td>congest, 75.</td>
<td>hiberna, O 186, O 303.</td>
</tr>
<tr>
<td>crystallina, 202, O 279, O 303.</td>
<td>inaequalis, 230.</td>
</tr>
<tr>
<td>Cumingii, 27, 105, 202, O 186, O 234, O 245, O 279, O 302, P 36.</td>
<td>inespica, 62, O 175, O 221, O 347.</td>
</tr>
<tr>
<td>Diegoana, 75.</td>
<td>inquinata, O 192, O 302.</td>
</tr>
<tr>
<td>decumbens, 271.</td>
<td>inesculpta, O 186, O 302.</td>
</tr>
<tr>
<td>denticulata, O 245, O 302, P 38.</td>
<td>laceridens, 202, O 186, O 279, O 302.</td>
</tr>
<tr>
<td>Deshayesii, O 284, O 303, S 160.</td>
<td>lamellata, O 245, O 302, P 37.</td>
</tr>
<tr>
<td>dichotoma, O 224, P 534.</td>
<td>laminata, 39.</td>
</tr>
<tr>
<td>Diegoana, 75.</td>
<td>lata, O 219, O 221, O 223, O 301.</td>
</tr>
<tr>
<td>divaricata, P 99.</td>
<td>lenticulata, O 224, P 41, P 534.</td>
</tr>
<tr>
<td>Dombeyi, 202, 272, O 186, O 245, O 279, O 302, P 33.</td>
<td>ligamentina, 14, O 195, V 213.</td>
</tr>
<tr>
<td>donaciformis, P 34.</td>
<td>lingua-felis, P 20.</td>
</tr>
<tr>
<td>donacilla, O 245, O 302, O 366, P 34, P 531.</td>
<td>lutea, O 193.</td>
</tr>
<tr>
<td>donacina, O 366, P 34.</td>
<td>lubrica, 73.</td>
</tr>
<tr>
<td>eburnea, 29, O 245, O 302.</td>
<td>lutea, 9, O 219, O 221, O 223, O 301.</td>
</tr>
<tr>
<td>edentula, 86, O 175, O 195, O 219, O 223, O 301, V 213.</td>
<td>Mazatlanica, 40, O 302, P 33.</td>
</tr>
<tr>
<td>elongata, O 186, O 279, O 302.</td>
<td>miniata, O 226, P 31, P 548, U 199.</td>
</tr>
<tr>
<td>emaceraeta, 165, O 367.</td>
<td>muriac, 9, P 98.</td>
</tr>
<tr>
<td>ervilia, O 224, P 534.</td>
<td>nasuta, 86, 302, O 192, O 211, O 219, O 221, O 223, O 232, O 234, O 283, O 296, O 347, O 351, O 367, V 213.</td>
</tr>
<tr>
<td>fabagella, 73.</td>
<td>ochracea, 104, 210.</td>
</tr>
<tr>
<td></td>
<td>opercularis, 47, 154.</td>
</tr>
<tr>
<td></td>
<td>operculata, 8, 47, O 245, O 363, P 32.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Tellina
- Panamensis, O 295, O 303.
- Pedroana, 75.
- perna, O 366.
- petalum, O 170, O 302.
- pisiformis, 60, O 224, P 102.
- plebeia, O 186, O 302.
- princeps, 154, O 186, O 282, O 302.
- prora, 202, O 279, O 303.
- proxima, O 178, O 221.
- puella, 23, 38, 202, O 245, O 279, O 302, P 37.
- purpurea, 29, P 33.
- regia, O 186, O 232, O 302.
- regularis, O 245, O 302, P 36.
- rosea, 35.
- rubella, 23.
- rubescens, 105, 202, O 186, O 282, O 302, P 32.
- siliqua, 202, O 279, O 303.
- similis, O 364.
- solidula, 20, O 170, O 219, O 221, O 223, O 301.
- sordida, O 221.
- straminea, O 245, O 287, O 302, P 34.
- striata, 155, P 35.
- suborbicularis, P 105.
- tersa, 20, 272, O 226, O 228, O 303, U 199.
- triangularis, 221.
- virgina, 12, 38, 78, 126, 203, O 232, O 279, O 284, O 302, O 351, O 363, U 201.
- virgo, O 189, O 302.

### Tellina
- bidentalis, 303.

### Tellimya
- lactea, P 105.
- suborbicularis, P 105.
- tenuis, P 105.
- tumida, 88, 97, 129.

### Tellinidae
- purpureus, O 175, P 32.

### Terebra
- aeculata, O 185, O 285, P 388, P 389.
- albocincta, 51, O 226, O 258, P vi., P 384, P 386.
- arguta, O 228, O 233, O 258, P 388, U 206.
- armillata, 51, O 206, O 239, O 258, O 366, P 384, P 545.
- aspera, 51, O 185.
- Belcheri, O 296.
- castanea, 51.
- cenerea, 51, O 364.
- dislocata, 51.
- elongata, 51.
- flammea, 41, 51, 61, O 207.
- formosa, 41.
- frigata, O 189.
- fulgurata, O 225, O 228, O 233, O 236, O 352, P 353, P 537, P 552.
- Hindsii, 51, O 258.
- Hupei, 51.
- incomparabilis, 41.
- insignis, 41.
- interstincta, O 366.
- intertincta, 51, P 384.
- Jamaicensis, 51.
- larviformis, 41, 177, O 267.
- larvina, 51.
- lingualis, 109, O 206, O 330.
- Loroisi, 51.
- lucuta, 51, 63, O 206, O 239, O 364, P 387, P 545.
- marginata, 51.
- ornata, O 185, O 207, O 330, O 360.
INDEX OF SPECIES.

Terebra

Petiveriana, 41, 51.
robusta, 24, 0 206, 0 230, 0 267, 0 282, 0 330, 0 350.
rudis, 51.
rufocinerea, 51, 0 258.
Salleana, 41.
specillata, 41, 101, 0 206, 0 267, 0 268, 0 330.
strigata, 10, 46, 51, 155, 0 174, 0 207.
strigosa, 61.
stylata, 51.
subnodosa, 51, 0 258.
textilis, 0 206.
tuberculosa, 154, 177, 0 206, 0 268.
uva, 0 330.
varicosa, 177, 0 206, 0 268.
variegata, 51, 61, 0 235, 0 239, 0 285, 0 288, 0 352, P 384, P 463, P 545.
zebra, 10, 41, 51, 0 207.

Terebratella

angustata, 250.
caput-serpentis, 93, 122.
caurina, 18, 97, 122.
Coreanica, 122, 169.
dorsata, 122.
frontalis, 122.
globosa, 122.
miniata, 20, 72, 122.
vitrea, 122.

Terebratulina

Japonica, 54.
nitens, 166, 0 367.
physea, 54.
psittacea, 0 218, 0 223.
pulvinata, 18, 72, 0 210, 0 213, 0 298, 0 348.
radiata, 54.
transversa, 72.
unnglicius, 93, 97, 122, 249, 250.
uea, 54, 0 265.
vitrea, 54, 72.

Terebratulina

Japonica, 54.
radiata, 54.

Teredo

finbriata, 91.
substriata, 0 367.

Thaumastus

Californicus, 158.

Theeliostyla

Bernhardi, P 257.

Theora

lubricula, 73.

Thracia

alta, 0 280.
curta, 26, 88, 124, 0 194, 0 300, 0 349, V 210.
granulosa, 0 231.
mactropsis, 79.
phaseolina, 202.
plicata, 27, 50, 0 231, 0 297, 0 352.
squamosa, 105, 0 287, 0 300, 0 366, Q 229.
trapezoides, 165, 0 367.
villoisuscula, 0 366.

Thylacodes

contortus, 43, 44.
contortula, 43, 44.
cruciformis, 43.
electina, 43.
var. indentata, 43.
savosa, 43.
oryzata, 44.
Thylacodes
repeus, 43.
Rüsei, 43.
squamigera, 43.

Tiara
foraminata, O 185, O 261, P 460.
muricata, O 185.

Tivela
arguta, 60.

Tonicia
Brandti, O 317.
crenulata, O 317.
Eschscholtzii, O 317.
Forbesii, O 252, O 317, P 193.
ingsignis, O 317.
lineata, 134, 170, O 317.
——— var. 134.
lineolata, 134, 170.
Merkiii, O 317.
Sitcheniis, O 317.

Torinia
areola, O 192, P 407.
bicanaliculata, O 333.
granosa, O 259, O 333, P 408.
rotundata, 36.
variegata, 24, 32, 63, 69, O 192, O 238, O 259, O 274, O 297, O 333, O 363, P 407.

Tornatella

Tornatellina
Cumingiana, O 186, O 315.

Tornatina
carina, 37, 97, 133, 194, O 250, O 313, P 171.
cerealis, 23, 133, O 227, O 313, O 349, P 171, U 203.
culcitella, 23, 133, O 313, O 349, U 203.
exinia, 89, 90, 133, 166.
inculta, 79, O 227, O 313, O 351, U 203.
infrequens, 154, 194, O 250, O 275, O 313, O 366, P 171.
gracilia, P 171.

Trachydermon
dentiens, 135.
flecteus, 135.
Gothieius, 98, 135.
Hartwegii, 135.
interstinctus, 135.
Nuttallii, 113, 135, pseudodentiens, 98, 135.
reteporsus, 135.
trifidus, 135.

Trapezium
Californicum, 102, O 306, O 349.

Tresus
capax, 76.
maximum, 11, 123, O 192.

Tribulus
Caroleusis, P 480.

Trichotropis
Atlantica, O 217.
bicarinata, 48, 61, 70, 71, O 176, O 220, O 223, O 328.
borealis, 20, 146, 176, O 211, O 217, O 223, O 328, O 347, O 348.
cancellata, 20, 114, 147, O 206, O 210, O 211, O 213, O 217, O 328.
ciliata, 72.
coronata, 70, 72.
costellata, O 217.
Gouldii, 40, O 288.
inermis, 114, 146, O 207, O 217, O 328.
ingsignis, 70, 71, O 217, O 223, O 328.
Sowerbiensis, 61, O 220.

Trigona
sequilatera, P 549.
argentina, 27, O 202, O 234, O 246, O 305, P 58.
bicolor, O 366, P 59.
Byronensis, O 246, P 54.
corbicula, O 232, O 234.
INDEX OF SPECIES.

**Trigona**
- crassatelloides, 10, 22, O 196, O 229, O 232, O 234, O 246, O 305, O 349, O 351, P 58, V 216.
- Dillwyni, P 55.
- gracilior, P 55.
- Hindsii, 23, 154, 155, O 241, P 55.
- huinilis, 229, 366.
- intermedia, P 55.
- mactroides, 60, O 192, O 229, O 364, P 55.
- nitidula, 106.
- planulata, 23, 27, O 229, O 234, O 246, O 305, O 366, P 59.
- semifulva, P 56.
- stiltorum, 10, 12.
- tantilla, O 229, O 305, U 201.
- tripla, O 366, P 55.
- undulata, P 59.
- ventricosa, P 55.

**Triodopsis**
- loricata, 157.

**omphalia**
- pulcherrima, 121.

**Triforis**

**Triphoris**
- adversa, 99, 114, 146, 169.
- alternata, 36, 110, 155, 186, O 256, O 272, O 325, P 341.
- inconspicua, 32, 186, O 256, O 272, O 325, P 341, P 342.
- infrequens, 32, 186, O 256, O 272, O 325, P 342.

**Triopa**
- Catalinæ, 95.

**Triton**
- anomalus, O 205, O 337.
- cancellatus, 83, O 218.
- Chemnitizii, 182, O 188, O 235, O 238, O 261, O 265, O 270, P 455, V 209.
- eiliatus, O 218.
- cingulatus, 182.
- clandestinus, O 292, O 338, O 360.
- constrictus, O 231, O 270, O 337.
- crebristriatus, O 284, O 337, S 165.
- decussatus, O 270.
- elegans, 61.
- eximius, O 284, O 337.
- fusoides, 182, O 270, O 337.
- gibbosus, O 182, O 270, O 337.
- lignarius, 24, O 182, O 205, O 271, O 337.
- lineatus, O 182, O 188, O 360.
- nodosus, O 261, P 455.
- pagodus, 178, O 186, O 268, O 292, P 497, P 552.
- parvus, O 284.
- perforatus, O 261, O 265, P 455, V 209.
- pilearis, 24, O 364.
- pictus, O 185, O 292, O 337, O 360, S 166.
- reticulatus, O 183, O 188, O 337, O 360.
- scaber, 10, O 179, O 347.
- scalariformis, O 182, O 337.
- siphonatus, O 235.
- Sowerbyi, O 188, O 337, O 360.
- tigrinus, 18, 24, O 182, O 211, O 212, O 337.
- turriculatus, O 188, O 360.
- vestitus, 110, O 205, O 270, O 337, O 364.
- var. senior, O 270.

**Tritonia**
- arborescens, O 218.
Tritonia
Palmeri, 94.
Reynoldsii, O 218.
Tritonidea
gemmata, P 516.
pagodus, O 231, O 235.
ringsens, P 518.
sanguinolenta, P 517.
Tritonium
angulosum, 60.
antiquum, 19, 69, O 217, O 220, O 223.
Baerii, 19, O 217, O 223.
Behringianum, O 220.
Behringii, 19, O 217, O 223.
cancellatum, 20, O 218, O 223.
carinatum, 60.
cassidariforme, 70.
Chemnitzii, O 177.
clathratum, 20, O 217, O 223.
commune, O 220.
contrarium, O 217, O 220, O 223.
decemcostatum, 20, 83, O 217, O 223.
decussatum, O 171.
deforme, O 217.
fornicatum, O 220.
gracile, O 217.
hæmastoma, O 171.
Islandicum, O 217.
intertextum, O 188.
lignarium, O 238, P 544.
lirudum, 19, O 217, O 223.
macrodon, O 171.
Mediterraneum, O 188.
Mörchianum, 60.
nodosum, O 238, P 544.
Norvegicum, O 217, O 220, O 223.
Ochotense, 19, O 218, O 221, O 223.
ooides, 19, O 218, O 223.
Oregonense, 69.
ovoides, O 221.
ovum, O 223.

Tritonium
reticulatum, O 188.
Rombergi, 60.
rutilum, 60.
Sabinii, O 217.
seabrum, 20, O 218, O 224.
sealariforme, O 238, P 544.
Schantariicum, O 217, O 220, O 221, O 223.
simplex, 19, O 218, O 221, O 223.
Sitchense, 18, 19, O 217, O 223.
tenebrosum, O 217, O 218, O 221, O 223.
undatum, 19, O 217, O 221, O 223.
verrucosum, O 263, P 517.

Triumphis
distorta, O 288.

Trivria
Californica, 23, 27, 143, 151, O 328, O 349.
var. fusca, O 258, O 328, O 360, P 378, P 545.
Maugeriae, O 328, O 360.
Pacifica, 24, 27, 101, 109, O 328, O 360.
pediculus, O 364.
pulla, 24, O 258, O 328, O 360, P 379.
pastulata, 24, 27, 109, O 258, O 282, O 328, P 376, P 377.
radians, 27, 109, O 258, O 282, O 328, P 376, P 377.
rubescens, O 328, O 360, P 378.
sanguinea, 27, 101, 109, O 258, O 328, P 379, P 545.
subrostrata, O 258, O 328, O 364, P 379, P 545.
suffusa, O 192, O 328, O 360, O 364, P 379.

Trochatella
conica, O 239, P 545.
INDEX OF SPECIES.

Trochatella
Lamarckii, O 239, P 266, P 545.
mamillaris, O 190.
trochiformis, O 190, P 265.

Trochiscus
convexus, 23, 138, 282.

Trochita
aspera, 52.
corrugata, 52.
costellata, 82.
diegoana, 76.
diegensis, 28, 179, P 264, P 265.
solida, 52.
spirata, 28, 52, O 240, O 323.

———, var. 28.
subreflexa, 52.
ventricosa, 76, O 254, O 323, P 264.

Trochus
angulatus, P 352.
annulatus, 3, 4, 5.
amictus, O 203, O 253, P 229.
Antonii, P 233.
——— var. O 230.
ater, 19, O 216, O 224, O 230, O 235.
aureotinctus, O 233, O 240, V 224.
anripigmentum, 54.
balanarum, 10, O 204, P 230.
Belcheri, O 296.
Brazilianus, O 253, P 234.
brevispinosus, O 204, O 253, P 227.
brunneus, O 233.
Buschii, O 229, P 227.
Byronianus, O 179, O 229, O 253, P 234.
calculus, 4, 5.
Californiaus, O 190.
Californiaus, 35, O 233.
callichrous, O 296.

calliopeus, O 296.
calyptroformis, P 552.
canaliculatus, 3, 4, 5.
castaneus, O 200, O 240, O 286, V 224.
catenifers, O 200, O 233, O 240, V 224.
catenulatus, 191, O 238, O 274, P 352, P 542.
conulus, O 163.
coronulatus, 191, O 274.
costatus, 3, 84.
decarnatus, 6.
diadematus, 14.
digitatus, 53.
discusculus, O 225, O 274, P 535.
dollarus, 4, 5, 8, O 200, O 230, O 233, O 234, V 224.
dorsosusus, O 274.
erythrophthalmus, O 253, O 296, P 227.
euryomphalus, 19, O 216, O 224.
eximius, O 253, P 232.
filosus, 19, 84, O 179, O 200, O 209, O 230, O 234, O 349, O 351, V 224.
Fokkesii, 19, O 224, P 223.
gallinus, O 200, O 230, O 235, O 240, V 224.
gibberosus, 53.
gigas, 53.
glomus, O 238, O 253, P 236, P 542.
Hillii, O 240.
iequalis, 3, 4.
inermis, O 229, O 293, O 296.
in-fauce-nigerrimus, 28.
Japonicus, 53.
Leanus, 36, 191, O 274.
ligatus, 84, O 200, O 209, O 230, O 286, V 224.
ligulatus, O 238, P 235, P 542.
luck, 14, 36, 191, 272, O 274.
lividus, 36, 192, O 274.
luridus, O 200, V 224.
<table>
<thead>
<tr>
<th>Trochus</th>
<th>Trochus</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacAndrew, O 253, O 284, P 232.</td>
<td>Schantaricus, 84, O 216, O 220, O 223.</td>
</tr>
<tr>
<td>magus, P 235.</td>
<td>solaris, 61.</td>
</tr>
<tr>
<td>maroidus, 21, O 227, U 204.</td>
<td>stellaris, O 238, O 253, P 230, P 541.</td>
</tr>
<tr>
<td>melanostoma, 28.</td>
<td>striatulus, O 233.</td>
</tr>
<tr>
<td>Melechersi, O 238, O 253, P 227, P 541.</td>
<td>strigilatns, 10, 60, O 274.</td>
</tr>
<tr>
<td>metaformis, O 296.</td>
<td>suavis, O 296.</td>
</tr>
<tr>
<td>minatus, O 238, O 253, P 233, P 541.</td>
<td>undatus, 10</td>
</tr>
<tr>
<td>modestus, 18, 19, 84, O 223.</td>
<td>undosus, 10, 53, O 179, P 230, V 224.</td>
</tr>
<tr>
<td>moeatus, 19, 79, O 212, O 216, O 224, O 230, O 234, O 265, O 284, O 352.</td>
<td>unguis, 53, O 179, P 229.</td>
</tr>
<tr>
<td>Monterey, O 227, O 233, U 204.</td>
<td>unidens, P 352.</td>
</tr>
<tr>
<td>neritoides, O 296.</td>
<td>variegatus, O 238, P 407.</td>
</tr>
<tr>
<td>Norrisii, O 230.</td>
<td>versicolor, O 238, O 253, O 286, P 231, P 541.</td>
</tr>
<tr>
<td>nucleus, O 296.</td>
<td>viridulus, O 274, O 283.</td>
</tr>
<tr>
<td>olivaceus, 29, O 179, O 233, O 238, O 253, O 296, P 227, P 541.</td>
<td>vittatus, 119.</td>
</tr>
<tr>
<td>pallidus, O 200, V 224.</td>
<td>Trophon</td>
</tr>
<tr>
<td>pelis-serpentis, 10, 60, 192, O 179, O 274.</td>
<td>Barvicenis, 324.</td>
</tr>
<tr>
<td>pellucidus, 14.</td>
<td>canaliculatus, O 217.</td>
</tr>
<tr>
<td>perlatus, P 352.</td>
<td>cancellinus, O 343.</td>
</tr>
<tr>
<td>perspectivinunculus, O 238, P 407.</td>
<td>elathatus, 20, 71, O 173, O 217, O 223, O 343.</td>
</tr>
<tr>
<td>Pfeifferi, O 233, U 204.</td>
<td>corrugatus, O 343, O 348.</td>
</tr>
<tr>
<td>pica, U 204.</td>
<td>crassilabrum, O 226.</td>
</tr>
<tr>
<td>picoides, O 228, O 229, O 362, U 204.</td>
<td>erassus, 73.</td>
</tr>
<tr>
<td>pulligo, 4.</td>
<td>Fabrici, 17.</td>
</tr>
<tr>
<td>pupillus, 18.</td>
<td>fimbriatus, 25, 324.</td>
</tr>
<tr>
<td>purpuratus, O 240.</td>
<td>Gunneri, 149, O 217.</td>
</tr>
<tr>
<td>pyriformis, O 228, O 233, U 204.</td>
<td>Hindii, O 205, O 343.</td>
</tr>
<tr>
<td>radiatus, 61.</td>
<td>incomptus, 73.</td>
</tr>
<tr>
<td>reticulatus, 36, 192, O 229, O 253, O 270, P 234.</td>
<td>labiosus, O 296.</td>
</tr>
<tr>
<td>rubiginosus, 14.</td>
<td>lamellatus, O 347.</td>
</tr>
<tr>
<td></td>
<td>Magellanicus, 93, 170.</td>
</tr>
<tr>
<td></td>
<td>multicostatus, 6, 49, 89, 149, 169, 170.</td>
</tr>
<tr>
<td></td>
<td>muricatus, O 205.</td>
</tr>
<tr>
<td></td>
<td>muriciformis, O 293.</td>
</tr>
<tr>
<td></td>
<td>Orpheus, 17, 92, 149, 322, O 343, O 348.</td>
</tr>
<tr>
<td></td>
<td>tenuisculptus, 25, 322, 324.</td>
</tr>
</tbody>
</table>
INDEX OF SPECIES.

Trophon
- triangulatus, 99, 149.

Truncaria
- corrugata, 25, 148.
- eurytoides, 104, 220.
- modesta, 25, 180, O 231, O 270, O 342.

Truncatella
- assiminea, O 275.
- Bairdiana, 154, 194, O 275, O 326.
- Californica, 60, 100, 143, 156.
- dubiosa, 37, 194, O 275, O 326.
- gracilenta, 156.
- Montagu, P 363, P 364.

Turbinella
- acuminata, 48, O 271, O 292.
- ardeola, O 171, O 261, O 338, P 456.
- armata, O 182.
- castus, 27, 183, O 171, O 238.
- cingulata, O 294, P 457.
- mucicata, P 456.
- nodata, O 188.
- rigida, 10, O 177.
- rudis, 183, O 271.
- spadicea, 183, O 271.
- tectum, O 292.
- tubercularis, 61, O 294.
- tuberculata, O 182.
- varicosa, 10, O 188.

Turbo
- bicarinatus, 61, O 174.
- Buschii, 36, 192, O 274.
- carneus, O 216.
- cinereus, O 216.
- coccinus, 3.
- digitatus, O 203, O 253, P 229.
- eximius, 31.

Turbonilla
- aspera, 118, 323.

Turris
- funiculata, P 390.

Turritella
- altiiira, 80.
- Banksii, 36, 154, 186, O 256.
- O 272, O 291, O 325, P 330.
- biseriata, 77.
- Broderipiana, O 190, O 256, P 330.
- Californica, P 330.
- Cooperi, 98, 141.
- Cumingii, O 256, O 291, P 332.
Turritella
Cumingii, var. 108.
erosa, 71.
Eschrichtii, 17, 19, 84, 310, O 223, O 325.
fascialis, O 187, O 325.
Gatunensis, 8o.
goniostoma, 24, 27, 36, 153, 186, O 170, O 190, O 192, O 230, O 237, O 256, O 291, O 325, O 364, P 330, P 359, P 540.

Typhis
grandis, O 287, O 297, O 345.
quadratus, O 205, O 345.

Umbrella
eovalis, 52, O 284, O 313, S 161.

Ungulina
lucicola, 15.

Unio
Aztecorum, 0 295.
batavus, O 222.
cyrenoides, 0 295, O 309.
Dahuricus, O 222.
famelieus, 163, O 210, O 213, O 309.
Liebmanni, O 295.
luceolus, 116.
margaritifera, O 222.
Mexicanus, O 295.
Mongolicus, O 222.
nuculius, O 295, O 309.
Oregonensis, 164.
pictorum, O 222.

Uvanilla
Buschii, 36, O 320.
inermis, 24, 36, 102, O 253, O 274, O 320, P 229.
unguis, 148, 256, O 293, O 253, O 282, O 320, P 229, P 309.
variegatus, O 253.

Uzita
nodulifera, P 496.
versicolor, P 499.

Valvata
obtusa, 215.
piscinalis, O 222.
sincera, 162.
tricarinata, 163.
virens, 162.

Vanicoro (see Narica)
cryptophila, O 254, P 262.
INDEX OF SPECIES.

**Vasum**
castus, P 456.

**Véluína**

**Velecíaria**
borealis, 17, 97, 128, 165, 168, 170. crassa, 106. crassicostata, 10. laticostata, 23. radiata, 23. ventricosa, 25, 97, 118, 128.

**Veneripis**

**Venus**
Adamsii, 57, 70. amathusia, 38, 201, O 229, O 232, O 234, O 247, O 278, O 282, O 289, O 306, O 358, P 72, V 217. ampliata, 18, O 213, O 305, O 348. angustifrons, O 367. asperrina, 55, 56. astartoides, 70, 88, O 219, O 221, O 223, O 305.
INDEX OF SPECIES.

**Venus**

excavata, 56, O 305, O 351, V 216.

exlimia, 55.

fluctifraga, 56, 57, 78, O 232, 0 O 284, O 351, O 352.

fluctuosa, 70.

fuscolineata, 30, O 185, O 306.

gibbosula, 56, 57.


granulata, 55.

grate, 55, O 229, O 284, P 77.

Guineensis, P 69.

hisrtionicia, 86, O 185, P 76.

intersecta, 56.

Kellettii, O 207, O 306.

Kennerleyi, 39, 55, 86, 88, 127.

Lamarckii, 56.


laticostata, 14.

leucodon, 40, 55, O 285, V 216.

var. lilacina, 56.

Listeri, var. 55.

lupinaria, P 67.

maxima, 86.

mercenaria, 18, O 210.

multicostata, 14, 55, 201, O 185, O 278.

mundulus, 12, 56, 304.

muscaria, 57.

neglecta, 55, 56, 57, O 161, O 170, O 178, O 191, O 208, O 247, O 306, O 364, P 77.

Nuttallii, 12, 56, 57, 78, O 232, O 284, O 305, O 349, O 351, O 352, V 216.

ornatissima, 57, O 185, O 306.

Pajaroana, 81.

paphia, 57, 61.

pectora, 55.

pectunculoides, 14, 201, O 203, O 278.

**Venus**

perdix, O 203.

Pinacatensis, 55.

planulata, O 191, P 59.

Portesiana, 55, O 247, P 74.

pulicaria, 55, 56, O 185, O 305.

punctata, P 97.

radiata, 6, 14, P 74.

reticulata, O 232, O 305, O 352.

rhyosma, 118.

rigida, 12, 17, 18, 57, 70, 86, O 210, O 284, O 305.

ruderata, 12, 17, 56, 304.

simillima, 55, 56, O 232, O 289, O 305, V 216.

Solangensis, O 191, O 246, P 54.

stamina, \} 57, 86, O 196, O 305.

straminea, O 232, O 234, O 284, O 352, V 215.

var. O 232.

Stimpsoni, 73.

Stutchburyi, 56.

subimbricata, 57, O 185.

subrostrata, 56.

subrugosa, 47, 201, O 178, O 278.

subsulcata, O 278.

succincta, 7, 12, 55, 56, 78, O 170, P 72, P 549.

sugillata, 55, 201.

sulcata, O 221.

tantilla, O 227, U 201.

Thouarsii, 14, O 278.

tigerina, P 96.

toreuma, 101.

tricolor, 55, O 247, P 77.

tumida, 304.

undatella, 57, O 247, O 285, O 305, P 75.

**Vermetus**

anellum, 43.

centiquadrus, 43, O 204, P 302, P 303.

contortus, 43.

corrodens, 43.

eburneus, 24, 32, 37, 42, 194, O
INDEX OF SPECIES.

Vermetus
175, O 185, O 255, O 324, O 367, P 304.
effusus, 42.
Hindsii, 42, P 304.
lumbricalis, 42, P 301, P 306.
margaritarum, O 204.
margaritifera, 43.
Panamensis, 37, 43, 194, O 237, O 255, O 275, P 306, P 540.
Péronii, 43, O 204, O 255, O 324, P 302.
tulipa, 43.
varians, 43, W 315.

Vermiculus
centiquadrus, 42.
eburneus, 42.
effusus, 42.
incurvatus, X 436.
pellucidus, 42.

Vertagus (see Rhinoclavis)
fragaria, O 325.
gemmatus, O 170, O 230, O 256, O 325, P 339.

Verticordia
novemoostata, 131, 168, 170.
oruntata, 98, 131, 170.

Vexilla
fuscocincta, 102.

Vitrina
diaphana, 118.
pellucidia, O 222.
Pfeifferi, 118, 157.

Vitrinella
anunulata, O 253, P 245.
biflata, O 253, O 321, P 241.
bifrontia, O 253, O 321, P 242, P 245.
carinnulata, 191, O 253, O 321, P 246.
cincta, O 253, O 321, P 245, P 246.
clathrata, O 357, P 238.
concinna, 190, O 273, O 322.
coronata, O 253, O 321, P 244.
decussata, O 253, O 321, P 239, P 240.
exigua, 190, O 253, O 273, O 322.
interrupta, P 237.
Janus, 190, O 273, O 322.
irulata, O 253, O 321, P 241.
megastoma, P 237.
minuta, 36, 190, O 273, P 237.
modesta, 190, O 273, O 322.
moneile, O 253, O 321, P 240.
moneilifera, O 253, O 321, P 240, P 241.

Vitta
picta, O 4, P 259.
INDEX OF SPECIES

Vitularia
aspera, 90.
Belcheri, O 340.
lactuca, 92.
vitulina, O 366.

Volsella
splendida, 41.

Voluta
Barnesi, 40.
carrilae, O 178, O 268.
coffea, P 178.
Cumingii, O 181, O 292, O 339.
dama, O 177, 178, P 471.
harpa, 10, 40, O 178, O 188, O 231, O 339.
incassata, 9, O 261, O 292, P 464.
lens, 10, O 185.
nucleus, 10.
nux, 10.
ocellata, O 262, P 487.
plumbea, 7.
tenebrosa, 10, O 262, O 268, P 468.

Volutella
margaritula, 39, 110, 147, 316.
pyriformis, 147, 316.

Volutharpa
ampullacea, 70.

Volutilithes
California, 75.
Sayana, 75.

Volvarina
fusca, 24, 154.
serrata, 23, 24.
varia, 23, 24, 100, 111, 112, 147.

Volvula
cylindrica, 23, 133, 281.

Vulsella
Nuttallii, O 193.

Waldheimia
Californica, 99, 122, 169, 250, O 298.
Coreanica, O 20, 72, 113, 122.
Koreanica, O 169.
dilatata, 54.
globosa, 54, 99, 122, 250.
Grayi, 70, 97, 122, 169.
pulvinata, 18, 122, 166.
transversa, 72.

Xylotrya
fimbriata, 122, 168.
palmulata, 122.
pennatifer, 113, 122, 168.

Yoldia
amygdala, 89, 131.
arctica, 131.
hyperborea, 71.
lanceolata, 89, 131, 169.
linatula, 71.
myallis, 71.
traciæformis, 70.

Zaphon
elegans, 17.

Zebra
Mulleri, 59.

Zemira
Keletii, 40.

Zierliana
solitaria, 177.

Zirphæa
crispata, 88, 97, 123, 168.

Ziziphinus (see Calliostoma)
anmulatus, 5, O 200, O 286, V 224.
Antonii, 53, 272, O 320.
California, 40, 53, O 253, O 286, P 231.
canalculus, 5.
eximius, 53.
filosus, O 192, O 286, O 320.
Leanus, O 321.
lima, O 321.
INDEX OF SPECIES.

Ziziphinus
Juridus, 53.
M'Audrex, 0 284, 0 321.
Panamensis, 0 321.
Versicolor, 0 320.

Zonites
Cultellata, 159.
Electrina, 92.
Excavata, 92.
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