SYNOPSIS OF THE RECENT AND TERTIARY LEPTONACEA OF NORTH AMERICA AND THE WEST INDIES.

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Having been engaged in reviewing the Tertiary species of this group it was found necessary to investigate the standing of the genera and higher groups, both recent and fossil, as the synonymy was found in great confusion. The full details of this work will appear in Transactions[1] of the Wagner Institute of Science, Philadelphia, but it seemed desirable to give a synopsis of the American species, with the revised synonymy, for the use of students who might not have access to the larger paleontological work. No doubt more thorough exploration of our Southern coasts and the Antilles will add largely to the present list, which nevertheless adds several genera and some 20 recent species to those heretofore known from our fauna.

The *Leptonacea* form a very interesting and puzzling group. Their characters combine features, characteristic in other Teleodonts of immaturity, with such as are more probably due to environmental modifications. Without being in themselves prototypes they exhibit features which we may readily suppose might have been characteristic of prototypic Teleodonts. Groups which are really starting points for numerous subsequently developed genera, are usually notable for their tendency to vary and interchange characters. In the present case perhaps the very general habit of commensalism, or parasitism, has produced degeneration accompanied by a revival of atavistic primary characters. The fact that authors, struck by similarity of dental features to those of immature specimens of genera of widely different origin, have too hastily referred species of *Leptonacea* to such families as the Mactridæ or Cyrenidæ is significant in this connection.

It must be confessed at the outset that our knowledge of the anatomy of recent *Leptonacea* is lamentably deficient. We have to assume (which is never safe) that forms with similar dentition are generally

[1] Volume III, Pt. 5.

similar in other points of structure, except where we know to the contrary. We find, moreover, that the dentition is frequently indistinctly developed, or somewhat amorphous, rendering it difficult to make out the homologies of the different parts of the hinge. It is certainly unsafe to assume, as Bernard has sometimes done, that the position of a dental lamina is sufficient to settle its homology. The dynamic reactions of the teeth upon each other are, I am confident, of the utmost importance in the development of the hinge. As in the vertebrate skeleton, pressure and friction in localized areas will produce directly a response in facets and buttresses. In fact, to the eye trained to take such matters into account, every hinge shows more or less evidence of the mutability of hinge structure and its responses to stress, as well as to inherited tendencies of form. In no group are these more obvious than in the *Leptonacea*.

The prototypic hinge of the group, or that which with slight modifications will exhibit any of the various types of hinge-structure found in the group, is very simple and has been figured by Bernard in his illustrations of a minute form which he has named *Pachykellya*. His invaluable researches upon the early features of the hinge have shown that among the *Teleodesmacea* the so-called laterals and cardinals are dissevered parts of originally single laminæ sharply bent at the proximal, or umbonal, end and having somewhat the form of a figure seven (7). In *Pachykellya* the hinge is composed of an internal resilium not obviously separated from the ligament and inclined obliquely backward as in many nepionic Teleodonts. On each side of this in each valve is a pair of the ⋋-shaped lamellæ, of which most have developed more or less distinctly the proximal or cardinal "hook." The lower ones are less engaged in the various stresses to which the laminæ are subjected in use, and hence, as might be expected, the hook is less evident or even undeveloped.

From this type of hinge all the others can be developed by trifling modifications. The laminæ may be long or short; when the outer limb is short we have a ⋀-shaped tooth; if the angle proceeds to that stage of development when its continuity is lost we may have a hinge like that of *Cyamiomactra;* the severed hook may be modified by pressure to a petaloid shape, which again by degeneration may be reduced to two obscure minute conical projections, as in some species of *Galeomma*. Any part or the whole of the hinge may become obsolete; the resilium and ligament may separate or continue in connection; the latter frequently becomes external and often obsolete, though traces of it almost always exist.

The arrangement of the groups must, in our present state of knowledge, be provisional.

No linear arrangement will show the exact interrelations of the different genera, and yet we are confined to a linear arrangement.

The present tentative scheme is based on our present insufficient

information, and, where only shell characters are known, chiefly on those of the hinge. It is difficult at present to say what should be done with *Montacuta*. According to the literature it has Lucinoid gills and Thyasiroid hepatic digitations, while the shell is obviously Leptonoid. The anatomical combinations that the other groups would exhibit are at present unknown in many cases. It may be for the present most convenient to place the Montacutas and Aligenas at the end of the list with an unassigned value, as they certainly seem to lead up to the *Thyasiridæ* in spite of the differences of the gills.

It does not seem practicable to associate *Sportella*, *Anisodonta*, and other genera, in which the soft parts are permanently retained within the shell, with forms like *Galeomma*, in which they are exserted, covering a large part of the valves. The only data we have on *Anisodonta* (*quadrata*) would indicate that the mantle edges are largely united, the gills as in *Thyasira* (*Cryptodon*), but united behind the foot, and, contrary to the rule in the *Leptonacea*, the incurrent orifice, though not developed into a siphon, is complete and posterior. Yet the shell characters merge so gradually into those of typical *Anisodonta*, and these into those of *Sportella*, that one feels that they can hardly be widely separated without more definite information. The interchanges of characters and the multiplicity of forms separated by apparently trifling details of structure make this group one of the most perplexing I have ever tried to review.

The following scheme is provisionally adopted.

The name of the typical species follows the date of the genus. The series begins with the most specialized forms.

Family CHLAMYDOCONCHIDÆ.

Chlamydoconcha Dall, 1884. *C. orcutti* Dall.

Family GALEOMMATIDÆ.

Ephippodonta Tate, 1889. *E. macdougalli* Tate.

Galeomma Turton, 1825. *G. turtoni* Sowerby.

Sections: *Amphilepida* Dall, 1899. *G. polita* Deshayes.

Paralepida Dall, 1899. *G. formosa* Deshayes.

Libratula Pease, 1865. *L. plana* Pease.

Solecardia Conrad, 1849. *S. eburnea* Conrad.

Subgenera: *Scintilla* Deshayes, 1855. *S. philippinensis* Deshayes.

Spaniorinus Dall, 1899. *S. cossmanni* Dall.

Scintillorbis Dall, 1899. *S. crispata* Fischer.

Vasconiella Dall, 1899. *Vasconia jeffreysiana* Fischer.

Family SPORTELLIDÆ.

Sportella Deshayes, 1858. *Psammobia dubia* Deshayes.

? Section: *Fabella* Conrad, 1863. *F. constricta* Conrad.

Anisodonta Deshayes, 1858. *A. complanata* Deshayes.
Sections: *Fulcrella* Cossmann, 1886. *Poromya paradoxa* Deshayes.
? *Basterotia* Mayer, 1870. *Corbula quadrata* Hinds.
Hindsiella Stoliczka, 1871. *Modiola arcuata* Defrance.

Family LEPTONIDÆ.

Entovalva Voeltzkow, 1890. *E. mirabilis* Voeltzkow.
Lepton Turton, 1822. *Solen squamosus* Montagu.
Subgenera: *Neolepton* Monterosato, 1875. *L. sulcatulum* Jeffreys.
Lutetina Vélain, 1876. *L. antarctica* Vélain.
Epilepton Dall, 1899. *Lepton clarkiæ* Clark.
Planikellia Cossmann, 1887. *Erycina radiolata* Lamarck.
Erycina (Lamarck, 1806) Récluz. *Erycina pellucida* Lamarck.
Subgenera: *Scacchia* Philippi, 1844. *Tellina elliptica* Scacchi.
Anomalokellia Cossmann, 1887. *A. catalaunensis* Cossmann
Pseudopythina Fischer, 1884. *P. macandrewi* Fischer.
Turquetia Vélain, 1876. *T. fragilis* Vélain.
Bornia Philippi, 1836. *Erycina corbuloides* Bivona.
Sections: *Ceratobornia* Dall, 1899. *Lepton longipes* Stimpson.
Pythina Hinds, 1844. *P. deshayesiana* Hinds.
Kellia Turton, 1822. *Mya suborbicularis* Montagu.
Sections: *Mancikellia* Dall, 1899. *Zoë pumila* Monterosato.
Kelliola Dall, 1899. *Kellia symmetros* Jeffreys.
Divarikellia Cossmann, 1887. *K. nitida* Caillat.
Thecodonta A. Adams, 1864. *T. sieboldii* Adams.
? Subgenera: *Serridens* Dall, 1899. *Pristiphora oblonga* Carpenter.
Dicranodesma Dall, 1899. *Mysella calvertensis* Glenn.
Mysella Angas, 1877. *M. anomala* Angas.
Subgenera: *Pythinella* Dall, 1899. *Montacuta cuneata* Verrill.
Sphenalia S. Wood, 1874. *Montacuta donacina* S. Wood.
Rochfortia Vélain, 1876. *R. australis* Vélain.
Pachykellya Bernard, 1897. *P. edwardsi* Bernard.

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Lasæa Leach, 1827. *Cardium rubrum* Montagu.
Myllita Orbigny, 1850. *M. deshayesii* Récluz.
Perrierina Bernard, 1897. *P. taxodonta* Bernard.

Family KELLIELLIDÆ.

Kelliella Sars, 1870. *K. abyssicola* Sars.
Lutetia Deshayes, 1860. *L. parisiensis* Deshayes.
Alvenus Conrad, 1865. *A. parvus* Conrad.
Cyamiomactra Bernard, 1897. *C. problematica* Bernard.
Turtonia Alder, 1848. *Venus minuta* Fabricius.

INCERTÆ SEDIS.

Cyamium Philippi, 1845. *C. antarcticum* Philippi.
Scioberetia Bernard, 1896. *S. australis* Bernard.
Montacuta Turton, 1822. *Ligula substriata* Montagu.
Aligena H. C. Lea, 1845. *Abra æquata* Conrad.
? Section: *Spaniodon* Reuss, 1867. *S. nitidus* Reuss.
Cycladella Carpenter, 1865. *C. papyracea* Carpenter.
Asbiornsenia Friele, 1886. *A. striata* Friele.[1]

A.—SPECIES OF THE EAST COAST OF NORTH AMERICA.

Genus SOLECARDIA Conrad.

1. *Solecardia* (*Scintilla*) *mörchii* Dall, 1899; St. Thomas, West Indies.
Scintilla eburnea Mörch, 1876; not Conrad, 1849.

Genus SPORTELLA Deshayes.

2. *Sportella* (*Fabella*) *pilsbryi* Dall, 1899; 17 miles off Cape Hatteras, North Carolina, in 49 fathoms sand; U. S. Fish Commission.
3. *Sportella* (*Fabella*) *protexta* (Conrad) 1841; 17 miles off Cape Lookout, North Carolina, in 22 fathoms sand; U. S. Fish Commission.

This is *Amphidesma protexta* Conrad, 1841, + *Hiatella lancea* H. C. Lea, 1845, and *Saxicava fragilis* Holmes, 1859. It ranges from the Miocene to the present fauna.

Genus ANISODONTA Deshayes.

4. *Anisodonta* (*Basterotia*) *quadrata* (Hinds) 1844; coast of North Carolina to the West Indies.

Type of the genus *Eucharis* Récluz, 1850; not Latreille, 1804.

5. *Anisodonta* (*Fulcrella*) *elliptica* Récluz, 1850; North Carolina to Guadelupe Island, West Indies; Miocene ?
6. *Anisodonta* (*Fulcrella*) *corbuloidea* Dall, 1899; North Carolina.

Genus LEPTON Turton.

7. *Lepton lepidum* (Say) 1826; Charleston Harbor, South Carolina.
Amphidesma lepidum of Say.
8. *Lepton placunoideum* Carpenter, 1857; "West Indies."

Genus ERYCINA Lamarck.

9. *Erycina linella* Dall, 1899; off Cape Lookout, North Carolina.
10. *Erycina emmonsi* Dall, 1899; coast of North Carolina.

[1] Referred by Friele to *Tellinidæ*, following Jeffreys's advice, but possibly related to *Montacuta*. I may add that the genus *Erycinella* Conrad, 1845, which from its name might be supposed to belong among the *Leptonacea*, probably should be classed among those *Carditidæ*, like *Carditella* Smith, which have an internal resilium.

11. *Erycina periscopiana* Dall, 1899; off Cape Lookout, North Carolina.
12. *Erycina fernandina* Dall, 1899; off Fernandina, Florida.

The shortness and strength of the laterals in this species recall those features in *Mysella*.

Genus BORNIA Philippi.

13. *Bornia barbadensis* Dall, 1899; Barbados; 100 fathoms.
14. *Bornia* (*Ceratobornia*) *longipes* Stimpson, 1855; coast of the Carolinas.

Genus KELLIA Turton.

15. *Kellia suborbicularis* (Montagu, 1804) Turton, 1822, var. *gouldii* Thomson, 1867; Salem, Massachusetts, to Long Island Sound.
16. *Kellia* (*Kelliola*) *symmetros* Jeffreys, 1876; Baffin Bay, in 1,750 fathoms; North Atlantic, 488 fathoms.

Genus MYSELLA Angas.

17. *Mysella planulata* Stimpson, 1851; Nova Scotia south to Corpus Christi, Texas.

= *Kellia rubra* Gould, 1841, ex parte, not Montagu; *Montacuta bidentata* Verrill and Bush, 1898, not Montagu, *nec* Gould; var. *fragilis* Verrill and Bush, 1898.

18. *Mysella planulata* var. *tenuis* Verrill and Bush, 1898; Massachusetts Bay south to North Carolina.

This variety is connected by numerous gradations with the type, in which the laminæ are less stout.

19. *Mysella striatula* Verrill and Bush, 1898; coast of North Carolina in 5 to 50 fathoms.
20. *Mysella casta* Verrill and Bush, 1898; coast of North Carolina in 14 to 17 fathoms.
21. *Mysella ovata* Jeffreys (?); Vineyard Sound, Massachusetts, in 100 to 157 fathoms.
22. *Mysella triquetra* Verrill and Bush, 1898; off Cape Hatteras, North Carolina, in 43, and off Fernandina, Florida, in 294 fathoms.
23. *Mysella tumidula* Jeffreys var. *verrilli* Dall, 1899; off Delaware Bay in 843 to 1,091 fathoms.
24. *Mysella mölleri* Mörch, 1899; Novaia Zemlia, Spitsbergen, Norway, and Greenland.

Montacuta elevata Mörch, 1875, after Torell, not of Stimpson, 1851.

25. *Mysella barbadensis* Dall, 1899; Barbados, in 100 fathoms.
26. *Mysella* (*Pythinella*) *cuneata* Verrill and Bush, 1898; coast of North Carolina.

Genus MONTACUTA Turton.

27. *Montacuta dawsoni* Jeffreys, 1863; Europe from Norway to the Mediterranean; Spitsbergen; America from Disco, Greenland, to St. Johns, Newfoundland.

Perhaps Möller's *species indet.* No. 8, 1842.

28. *Montacuta floridana* Dall, 1899; Miocene, Pliocene; Recent, West Florida.
29. *Montacuta minuscula* Dall, 1899; off Cape Hatteras, North Carolina, in 124 fathoms.
30. *Montacuta limpida* Dall, 1899; Florida coast from Fernandina to Cape Florida, in 85 to 294 fathoms.
31. *Montacuta percompressa* Dall, 1899; Vineyard Sound, Massachusetts.

Montacuta ferruginosa Verrill, 1884, not of British authorities following Montagu.

Genus LASÆA Leach.

32. *Lasæa rubra* Montagu, 1804; Bermuda; European seas; California.

Genus TURTONIA Alder.

33. *Turtonia minuta* Fabricius, 1780; Greenland, Nova Scotia, New England coast (and south to South Carolina?).

Genus KELLIELLA Sars.

34. *Kelliella nitida* Verrill, 1885; off the coast between Delaware and Marthas Vineyard, in 1,525 to 2,033 fathoms.

Genus ALIGENA H. C. Lea.

35. *Aligena elevata* Stimpson, 1851; coast of southern New England from Chelsea beach, Massachusetts, to New Haven, Connecticut.

= *Montacuta bidentata* Gould, ex parte, 1841, not of Turton; *Montacuta elevata* Stimpson, 1851; *Kelliopsis elevata* Verrill and Bush, 1898.

B.—SPECIES OF THE WEST COAST OF NORTH AMERICA

Genus CHLAMYDOCONCHA Dall.

1. *Chlamydoconcha orcutti* Dall, 1884; San Diego, California.

Genus SOLECARDIA Conrad.

2. *Solecardia eburnea* Conrad, 1849; Cape St. Lucas to Panama.

This is *Scintilla cumingi* Deshayes, 1855.

Genus SPORTELLA Deshayes.

3. *Sportella californica* Dall, 1899; Monterey, California.
4. *Sportella stearnsii* Dall, 1899; Gulf of California.

Genus LEPTON Turton.

5. *Lepton meröeum* Carpenter, 1864; San Diego, California.
6. *Lepton umbonatum* Carpenter, 1857; Mazatlan, Mexico.

Genus ERYCINA Lamarck.

7. *? Erycina subquadrata* Carpenter, 1857; Mazatlan.

   Described as a *Montacuta*, but, according to a camera lucida drawing of the type by Carpenter, has the hinge of *Erycina*.

8. *Erycina* (*Pseudopythina*) *rugifera* Carpenter, 1864; Puget Sound.

   Described as *Pythina*. Lives attached to the abdomen of *Gebia pugetensis* Dana, a burrowing crustacean. *Lepton rude* Whiteaves, is synonymous.

9. *Erycina* (*Pseudopythina*) *compressa* Dall, 1899; Nunivak Island, Bering Sea, and throughout the Aleutian region.

Genus BORNIA Philippi.

10. *Bornia pulchra* Philippi, 1848; "West America."

    Described as *Kellia*. Probably a *Pythina*, but unfigured.

11. *Bornia* species indet. Carpenter, Maz. Cat. No. 688, 1857; Mazatlan.

    Listed as *Lasæa* species, but appears from a camera lucida sketch of the type to have the hinge of *Bornia*.

12. *Bornia retifera* Dall, 1899; off Santa Rosa Island, California, in 13 fathoms.

    Dredged by the U. S. Fish Commission.

13. *? Bornia dubia* Deshayes, 1855; Muerte Island, Guayaquil.

    Described as *Erycina*, but perhaps a *Bornia*.

Genus KELLIA Turton.

14. *Kellia suborbicularis* (Montagu as *Mya*), 1804; Straits of Juan de Fuca south to Mazatlan; North Atlantic.

    Has many synonyms: *Tellimya lactea* and *tenuis* Brown, 1827; *Bornia inflata* Philippi, 1844, and others have been cited in connection with it. The West American specimens seem identical with those of Europe.

15. *Kellia laperousii* Deshayes, 1839; from Bering Island and the Aleutians south along the coast to San Diego, California, and Panama.

    The largest and finest of the genus and a typical *Kellia*; very variable; *Bornia luticola* Valenciennes, 1846; *Chironia laperousii* Deshayes; *Kellia rotundata* Carpenter, 1865 and *Kellia* var. *chironii* Carpenter, are synonymous.

16. *? Kellia papyracea* Deshayes, 1855; West Colombia.

    Described as *Erycina* and unfigured, but perhaps a *Kellia*.[1]

? Genus SERRIDENS Dall.

Pristiphora Carpenter, 1865, not Blanchard, 1835.

17. *Serridens oblonga* Carpenter, 1865; San Pedro, California.

[1] *Kellia ventricosa* (C. B. Adams as *Amphidesma*) Carpenter, 1857, is a *Semele*.

Genus MYSELLA Angas.

Tellimya Carpenter, 1864, not Brown, 1827; *Montacuta* Verrill and Bush, 1898, not Turton, 1822.

18. *Mysella tumida* Carpenter, 1864; Alaska Peninsula and south to San Diego, California.

Described as *Tellimya*.

19. *Mysella planata* Dall, 1885; Bering Strait south to the Aleutians and east to the Shumagin Islands, Alaska.

20. *Mysella aleutica* Dall, 1899; Bering Sea, the Aleutians, and east to Sitka Bay, Alaska.

21. *Mysella pedroana* Dall, 1899; San Pedro, California.

22. *Mysella clementina* Carpenter, 1857; Mazatlan.

Described as *Lepton*.

23. *Mysella dionœa* Carpenter, 1857; Mazatlan.

Described as *Lepton*.

24. *Mysella obtusa* Carpenter, 1865; Mazatlan.

Described as *Montacuta*.

25. *Mysella chalcedonica* Carpenter, 1857; Mazatlan.

Described as *Montacuta*.

26. *Mysella elliptica* Carpenter, 1857; Mazatlan.

Described as *Montacuta*.

26*a*. ?*Mysella subquadrata* Carpenter, 1857; Mazatlan.

Described as *Montacuta*, said by Carpenter to be congeneric with the two preceding species, but his drawing of the hinge looks like *Erycina*.

27. *Mysella* (*Pythinella*) *sublævis* Carpenter, 1857; Mazatlan.

Described as *Pythina*.

Genus LASÆA Leach.

28. *Lasœa rubra* (Montagu), 1804; Puget Sound south to San Diego, California; North Atlantic, etc.

The West American specimens can not be distinguished from those of Europe. A variety, *subviridis* Carpenter, is pale greenish yellow. It is reported from Lower California.

29. *Lasœa oblonga* Carpenter, 1857; Mazatlan.

30. *Lasœa trigonalis* Carpenter, 1857; Mazatlan.

This and the preceding species need more thorough study.

Genus TURTONIA Alder.

31. *Turtonia minuta* Fabricius; Bering Sea to the Shumagins.

Precisely similar to European and New England specimens.

32. *Turtonia occidentalis* Dall, 1871; Plover Bay, Bering Strait, and northward, in 20 to 40 fathoms.

Larger, stouter, and shorter than the preceding.

Genus CYCLADELLA Carpenter.

33. *Cycladella papyracea* Carpenter, 1865; Mazatlan.

The only known perfect specimen is inaccessible in the Hanley collection. The shell is possibly the nepionic young of *Cooperella* or *Clementia*.

C.—TERTIARY SPECIES OF THE UNITED STATES.

Genus SOLECARDIA Conrad.

Subgenus SPANIORINUS Dall.

1. *Solecardia clarkeana* Aldrich; Chickasawan.
2. *Solecardia alabamiensis* Cossmann; Claibornian.
3. *Solecardia oblonga* Conrad; Vicksburgian.
4. *Solecardia cossmanni* Dall; Miocene, Virginia.

Genus SPORTELLA Deshayes.

5. *Sportella oblonga* Aldrich, 1897; Chickasawan.
6. *Sportella gregorioi* Cossmann, 1894; Claibornian.
7. *Sportella alabamensis* Aldrich, 1897; Claibornian.
8. *Sportella obolus* Dall; Oligocene, Florida.
9. *Sportella unicarinata* Dall; Oligocene, Florida.
10. *Sportella lubrica* Dall; Oligocene, Florida.
11. *Sportella lioconcha* Dall; Oligocene, Florida.
12. *Sportella whitfieldi* Dall; Miocene, New Jersey and Maryland.
13. *Sportella constricta* Conrad, 1863; Miocene and Pliocene.
14. *Sportella protexta* Conrad, 1841; Miocene and Recent.
15. *Sportella petropolitana* Dall; Miocene, Virginia.
16. *Sportella compressa* H. C. Lea; Miocene, Pliocene.
17. *Sportella yorkensis* Dall; Miocene, Virginia.
18. *Sportella recessa* Glenn; Miocene, Maryland.
19. *Sportella pelex* Dall; Miocene, Virginia and Maryland.

Genus ANISODONTA Deshayes.

Section BASTEROTIA Mayer.

20. *Anisodonta bowdeniana* Dall; Oligocene, Jamaica.

Section FULCRELLA Cossmann.

21. *Anisodonta elliptica* Récluz ?; Miocene to Recent.

Section ANISODONTA s. s.

22. *Anisodonta americana* Dall; Pliocene, Florida.

Genus HINDSIELLA Stoliczka.

23. *Hindsiella faba* O. Meyer, 1886; Claibornian.
24. *Hindsiella donacia* Dall; Claibornian.
25. *Hindsiella nephritica* Dall; Oligocene, Florida.
26. *Hindsiella carolinensis* Dall; Miocene, North Carolina.
27. *Hindsiella acuta* Dall; Miocene, North Carolina and Maryland.

Genus ERYCINA Lamarck.

28. *Erycina whitfieldi* O. Meyer, 1886; Claibornian.
29. *Erycina* (*whitfieldi* var.) *meyeri* Cossmann, 1894; Claibornian.
30. *Erycina plicatula* Dall; Claibornian.
31. *Erycina zitteli* O. Meyer, 1887; Jacksonian.
32. *Erycina undosa* Dall; Oligocene, Florida.
33. *Erycina chipolana* Dall; Oligocene, Florida.
34. *Erycina quadrata* Gabb, 1873; Oligocene, West Indies.
35. *Erycina fabulina* Dall; Oligocene, Florida.
36. *Erycina curtidens* Dall; Oligocene, Florida.
37. *Erycina carolinensis* Dall; Miocene and Pliocene.
38. *Erycina americana* Dall; Miocene, Maryland.
39. *Erycina marylandica* Glenn; Miocene, Maryland.
40. *Erycina protracta* Dall; Pliocene, North Carolina.
41. *Erycina kurtzii* Dall, 1898; Pliocene, Florida.

Genus BORNIA Philippi.

42. *Bornia prima* Aldrich, 1897; Chickasawan.
43. *Bornia dalli* Cossmann, 1894; Claibornian.
44. *Bornia dodona* Dall; Oligocene, Florida.
45. *Bornia floridana* Dall; Oligocene, Florida.
46. *Bornia mactroides* Conrad, 1834; Miocene, Maryland.
47. *Bornia triangula* H. C. Lea (MS.); Miocene, Pliocene.
48. *Bornia rota* Dall; Miocene, North Carolina.
49. *Bornia lioica* Dall, 1898; Pliocene, Florida.
50. *Bornia mazyckii* Dall, 1898; Pliocene, Florida.

Genus KELLIA Turton.

51. *Kellia* species indet.; Miocene, Maryland.
52. *Kellia laperousei* Deshayes, 1839; Pleistocene, California.
53. *Kellia suborbicularis* Montagu, 1804; Pleistocene, California.

Genus THECODONTA A. Adams.

? Subgenus DICRANODESMA Dall.

54. *Thecodonta* (*Dicranodesma*) *calvertensis* Glenn; Miocene, Maryland.

Genus MYSELLA Angas.

55. *Mysella stantoni* Dall; Miocene, North Carolina.
56. *Mysella stimpsoni* Dall; Miocene, North Carolina.
57. *Mysella planulata* Stimpson, 1851; Pliocene and Recent.
58. *Mysella bowmani* Holmes; Pleistocene.

Genus ALVEINUS Conrad.

59. *Alveinus minutus* Conrad; Eocene.
60. *Alveinus rotundus* Dall; Chipola Oligocene, Florida.

Genus TURTONIA Alder.

61. *Turtonia minuta* (Fabricius), 1780; Pleistocene; Recent.

Genus MONTACUTA Turton.

62. *Montacuta claiborniana* Dall; Claibornian.
63. *Montacuta chipolana* Dall; Oligocene, Florida.
64. *Montacuta actinophora* Dall; Oligocene, Florida.
65. *Montacuta petropolitana* Dall; Miocene, Virginia.
66. *Montacuta sagrinata* Dall; Miocene, Virginia.
67. *Montacuta floridana* Dall; Pliocene; Recent.

Genus ALIGENA H. C. Lea.

68. *Aligena æquata* Conrad, 1843; Miocene, Pliocene.
69. *Aligena pustulosa* Dall, 1898; Oligocene, Florida.
70. *Aligena lineata* Dall; Oligocene, Florida.
71. *Aligena sharpei* O. Meyer, 1888; ? Miocene, Maryland.
72. *Aligena minor* Dall; Miocene, North Carolina.
73. *Aligena elevata* Stimpson, 1851; Pleistocene and Recent.

DESCRIPTIONS OF NEW SPECIES AND REMARKS ON OTHERS IMPERFECTLY KNOWN.

[The letter and number before the remarks refer to the preceding lists.]

SOLECARDIA MÖRCHII Dall.

Scintilla eburnea MÖRCH, Journ. de Conchyl., XXIV, 1876, p. 373.

A. 1. Though described from the Swift collection, now the property of the Academy of Natural Sciences, Philadelphia, it seems not to exist there at present. It is unfigured. Mörch says that it is nearest to "*S. lactea* Deshayes," but the only *S. lactea* in the literature is of Sowerby, and this is probably what is meant.

SOLECARDIA EBURNEA Conrad.

Solecardia eburnea CONRAD, Proc. Acad. Nat. Sci., Phila., IV, 1849, p. 155; Journ. Acad. Nat. Sci., 2d ser., I, 1850, p. 278, pl. XXXIX, fig. 1.

B. 2. Specimens of this species were compared by Carpenter with the type of *Scintilla cumingi* in the British Museum and proved conspecific.

SPORTELLA PILSBRYI Dall.

Sportella (Fabella) pilsbryi, new species.

(Plate LXXXVIII, fig. 9.)

A. 2. Shell small, compressed, elongate-ovate, inequilateral, the anterior part much the longest; anterior dorsal margin nearly straight, base evenly arcuate, ends rounded; external ligament on a well-marked nymph, pit for the resilium rather small; teeth in the left valve normal,

small, and delicate; adductor scars high up, the anterior narrow and longer, the posterior larger and rounded; exterior with a very thin, pale straw-colored epidermis, and faint incremental sculpture, the surface apparently smooth but under the microscope minutely sagrinate. Lon. 8, alt. 5, diam. 2.5 mm.

A single left valve was dredged as stated.

SPORTELLA CALIFORNICA Dall.

Sportella californica, new species.

(Plate LXXXVIII, fig. 5.)

B. 3. Shell small, compressed, rude, with a yellowish epidermis; slightly arcuate, dorsal margin evenly arched, base concavely arcuate; inequilateral, the anterior part longer, rounded, the posterior end more blunt; teeth normal, the larger right cardinal nearly parallel with the dorsal margin, the ligamentary nymph obscure, the attachment for the resilium thickened and projecting; scar of the mantle wide and somewhat irregular, the anterior adductor scar not well distinguished from it. Lon. 6, alt. 4.2, diam. 1.5 mm.

A single rather worn right valve was collected on the beach at Monterey, California, by Dall in 1866.

SPORTELLA STEARNSII Dall.

Sportella stearnsii, new species.

(Plate LXXXVII, figs. 9, 12.)

B. 4. Shell of moderate size for the genus, inequilateral, not very convex, white, with an almost imperceptible yellowish epidermis; anterior dorsal margin nearly straight, the base parallel with it, the ends bluntly rounded; surface nearly smooth, with faint incremental lines and microscopic sagrination; teeth normal, strong, the posterior cardinal prominent, vertical; ligament strong, external, on a nymph; resilium well developed, its area of attachment thickened; posterior adductor scar rounded, unusually large. Lon. 13.5, alt. 10, diam. 5 mm.

One well-preserved specimen from the Gulf of California, exact locality unknown, is contained in the Stearns collection.

ANISODONTA CORBULOIDEA Dall.

Anisodonta corbuloidea, new species.

(Plate LXXXVIII, fig. 2.)

A. 6. Shell small, glassy white, rather compressed, very inequilateral, anterior side short, comprising about the anterior fourth of the shell, bluntly rounded; beaks distinct, dorsal margin nearly parallel with the base; posterior end obliquely rounded-truncate to a point near the base from which an obscure ridge extends to the beaks; nymph for the

ligament distinct, small; anterior tooth prominent, arcuate, posterior low, small, oblique; surface microscopically sagrinate and with faint incremental lines. Lon. 6.5, alt. 3.75, diam. 2.5 mm.

Fresh valves were dredged in 18 to 22 fathoms, sand, off Cape Fear and Cape Lookout, North Carolina, bottom temperature 78° F., by the U. S. Fish Commission.

ERYCINA LINELLA Dall.

Erycina linella, new species.

(Plate LXXXVIII, fig. 7.)

A. 9. Shell transparent, glassy, small, extremely thin, compressed; beak very low, anterior end somewhat shorter, rounded, posterior dorsal margin and end continuously arched, base evenly convexly arcuate; surface polished, microscopically sagrinate, but otherwise smooth; anterior right dental lamella long, narrow, with a short hook nearly parallel; pit for the resilium shallow, posterior lamella longer than the anterior, but only raised distally; adductor scars long and narrow, hardly differentiated from the rather wide pallial line. Lon. 4.6, alt. 3.6, diam. 1.5 mm.

One right valve was dredged in 31 fathoms, sand, bottom temperature 74° F., by the U. S. Fish Commission.

ERYCINA EMMONSI Dall.

Erycina emmonsi, new species.

(Plate LXXXVIII, fig. 1.)

A. 10. Shell small, compressed, elongate, white or translucent, nearly equilateral, the anterior side slightly longer; dorsal and ventral margins nearly parallel, the anterior end bluntly rounded, the posterior end narrower and more oblique above, rounded near the base; surface concentrically and somewhat irregularly sculptured by the incremental lines, more or less polished; beak inconspicuous, dental lamellæ low, elongate, the "hook" small but distinct; adductor scars high up and rather narrow; pallial scar linear, rather distant from the margin. Lon. 9, alt. 5, diam. 3 mm.

Off Frying Pan Shoals in 12 fathoms, Dr. Rush; off Cape Lookout, North Carolina, in 22–31 fathoms, sand, U. S. Fish Commission.

This species appears to be the recent representative of the Miocene *E. kurtzii* Dall, but is a more delicate shell and without the sharp radial sculpture of that species.

ERYCINA PERISCOPIANA Dall.

Erycina periscopiana, new species.

(Plate LXXXVIII, fig. 3.)

A. 11. Shell small, pellucid, subquadrate, with the ends bluntly rounded and the dorsal and ventral margins nearly parallel; beaks

low, valves compressed, very inequilateral, the beaks being nearly at the posterior fifth of the shell; left anterior lamina very long, rather elevated, with a very small hook, posterior lamina short, nearly obsolete, with an elongated resiliary pit below it; adductor scars small, high up, the anterior narrower, the posterior rounder;[1] pallial scar linear; surface polished, smooth, or marked only by incremental lines and very obscure occasional radial striulations. Lon. 5, alt. 2.8, diam. 1 mm.

A single left valve was dredged in 22 fathoms off Cape Lookout, North Carolina, on sandy bottom, with a temperature of 78.2° F., by the U. S. Fish Commission.

ERYCINA FERNANDINA Dall.

Erycina ? fernandina, new species.

(Plate LXXXVIII, fig. 6.)

A. 12. Shell small, ovate, pellucid white, sometimes with irregular radial opaque white narrow streaks; moderately convex, with a very thin, pale straw-colored epidermis; very inequilateral, the posterior side short; beaks distinct, the prodissoconch often conspicuous; surface polished, sculptured only with faint incremental lines and obscure, irregular microscopic radial striæ; right valve with the anterior and posterior lamellæ short and strong, with a marked sulcus above each of them, the anterior with a conspicuous hook; resilium well developed, but short; adductor scars small, narrow, pallial scar linear. Lon. 3.75, alt. 2.8, diam. 1.5 mm.

Dredged off Fernandina, Florida, in 294 fathoms, coral sand, by the U. S. Fish Commission, bottom temperature 46° F. The strong laminæ and the deep sulci above them give this species, when casually observed, the look of a *Mysella*.

ERYCINA (PSEUDOPYTHINA) RUGIFERA Carpenter.

Pythina rugifera CARPENTER, Suppl. Rept. Brit. Assoc., 1863 (1864), pp. 602, 643; Proc. Acad. Nat. Sci., Phila., 1865, p. 57.

Lepton rude (DALL manuscript) WHITEAVES, Rept. Progr. Geol. Surv. Canada, 1878-79 (1880), p. 198 B, fig. 2.

B. 8. This differs from the type of *Pseudopythina* in having an obscurer remnant of the cardinal hook in the shape of a small subumbonal conical tooth, and less obvious radial striation, but is otherwise very similar. In both there is a well-marked calcareous coating to the ventral surface of the resilium. The arcuate form is undoubtedly correlated with its peculiar *situs*. (See Plate LXXXVII, fig. 4.)

[1] In all these forms, whether the shorter end be anterior or posterior, its adductor scar will be more rounded and often larger than the scar at the longer end of the shell, a result brought about in all probability by the dynamics of the situation.

ERYCINA (PSEUDOPYTHINA) COMPRESSA Dall.

Erycina (Pseudopythina) compressa, new species.

(Plate LXXXVII, figs. 1, 8.)

B. 9. Shell large, subquadrate, thin, moderately compressed, white, covered with a conspicuous, thin, wrinkled, partly glossy periostracum; nearly equilateral, the posterior end slightly broader, both ends rounded, the basal margin nearly straight; beaks inconspicuous, surface with strong, irregular incremental lines, but no radial sculpture; pallial scar rather wide and irregular, merging into the subequal, rather narrow adductor scars; resilium large, wide, and long, more or less calcareous ventrally, left valve with one obscure cardinal tooth, right valve with the tooth better developed; the right dorsal valve margins overlap those of the left valve a little, but there are no distinct lamellæ. Lon. 18, alt. 13, diam. 6 mm.

Dredged on muddy bottom in from 4 to 28 fathoms in the eastern part of Bering Sea, south of Nunivak Island, the eastern Aleutians, and southward to Sitka, Alaska, by Mr. W. H. Dall.

This is easily discriminated from the other species by its flattened and normal form. As it has always been found free in the dredge it is probably not a commensal species.

BORNIA BARBADENSIS Dall.

Bornia barbadensis, new species.

A. 13. Shell rather large for the group, evenly ovate, moderately convex, polished, white, covered with a brilliant yellowish periostracum, inequilateral, the anterior end shorter; dorsal margins convexly arcuate; ends rounded, the posterior end obliquely, and produced near the base which is evenly convexly arcuate; beaks low, distinct; teeth normal, adductor scars small and high up, margins entire. Lon. 15, alt. 12, diam. 5 mm.

A dead and somewhat dilapidated valve was dredged in 100 fathoms at Barbados, but is clearly distinct from any of the other East American species.

BORNIA (CERATOBORNIA) LONGIPES Stimpson.

A. 14. This was described as *Lepton* but the shell is a typical *Bornia*.[1] The soft parts resemble those of *Montacuta percompressa* Dall, as figured by Verrill under the name of *ferruginosa* Montagu,[2] except that there are one posterior and two anterior cirrhi arising from the

[1] Proc. Boston Soc. Nat. Hist., V, February, 1855, p. 111.

[2] Trans. Conn. Acad. Sci., VI, 1884, p. 225, pl. xxx, fig. 13.

dorsal side of the animal and as long as its shell, while the foot is pointed in front and produced into a cylindrical, extremely extensile "heel" behind. The byssal gland is situated at the extreme conical end of this organ, which can be moved about like a finger and emits when needed a single byssal thread. When fully extended it may reach twice the length of the shell. It will be seen at once on comparing Stimpson's figures (here first published) with Deshayes's figure of the type species of *Bornia*[1] that the two are quite different animals. For this reason I have separated Stimpson's species under the name of *Ceratobornia*. The produced hood of *Bornia* is apparently lacking. (See Plate LXXXVIII, figs. 10, 11, 13.)

BORNIA PULCHRA Philippi.

B. 10. *Kellia pulchra* PHILIPPI, Zeitschr. für Mal., V, 1848, p. 149

BORNIA RETIFERA Dall.

Bornia retifera, new species.

(Plate LXXXVII, fig. 2.)

B. 12. Shell thin, white, moderately convex, rounded, trigonal, nearly equilateral; beaks distinct, not high; surface polished, with faint incremental lines and minute close punctations whose interspaces give the effect of a fine netting; hinge normal, delicate; adductor scars rounded, high up; posterior basal margin very slightly crenulate. Lon. 12, alt. 9, diam. 4 mm.

One left valve dredged by the U. S. Fish Commission at station 2900, in 13 fathoms, off Santa Rosa Island, California.

The microscopic sculpture distinctly separates this from any other American species.

KELLIA (SUBORBICULARIS var.) GOULDII Thomson.

Montacuta gouldii THOMSON, Am. Journ. Conch., III, 1867, p. 33, pl. 1, fig. 15.

A. 15. An examination of Thomson's types shows that his species is identical with the shell hitherto identified as *Kellia suborbicularis*, from southern New England. It is also probably *Lepton fabagella* Conrad,[2] but Conrad's unique type is lost, and his description and figures insufficient for positive identification. All the specimens of this form hitherto found on the New England coast are notably smaller and more delicate than adult British examples, and it may prove distinct. On the other hand Pacific coast specimens (B. 14), in size and all other features, agree well with the European shells.

[1] Fischer, Manual, p. 1026, fig. 772, where it is called *B. complanata* erroneously.

[2] Am. Mar. Conch., 1831.

KELLIA (KELLIOLA) SYMMETROS Jeffreys.

Kellia symmetros JEFFREYS, Ann. Mag. Nat. Hist., December, 1876, p. 491.

A. 16. From a careful microscopic examination of the type of this very minute species, I find the hinge was imperfectly observed, and hence incorrectly described by Dr. Jeffreys, a fact perhaps due to imperfection of his microscope. There is in each valve a single strong, short tooth in front of the beaks, that in the left valve is thinner, flatter, and fits over the more conical tooth of the right valve. Behind the beaks is a strong resilium without a lithodesma. The hinge plate is narrow and flat; in some lights the edge is so illuminated as to give the appearance of a lamina, which does not exist. This hinge recalls that of *Aligena*, and is quite different from that of the true Kellias, for which reason I have separated it as *Kelliola*.

MYSELLA PLANULATA Stimpson.

Kellia planulata STIMPSON, Shells of New England, 1851, p. 17.

A. 17. The shell figured by Gould[1] was named *planulata* by Stimpson. Gould's description included not only this species, but *Turtonia minuta*, which, as Gould afterwards recognized, he took to be the young of the larger shell which he figured. Subsequently the *planulata* was incorrectly identified with the British *Tellimya bidentata* of authors. The two shells are quite distinct, as the examination of a very large number of *Mysella bidentata* has convinced me. The European shell is constantly smaller, more convex, more inequilateral, more quadrate, and more elongate. It also has smaller dental lamellæ than the average American specimens. I have not found any adult specimens which could be called intermediate, and I have therefore restored Stimpson's name. The variety *fragilis* Verrill and Bush has feebler teeth than the form which they call variety *tenuis*, but differences of this kind are frequent among these little shells, and too much value should not be ascribed to them. Exactly parallel differences occur in all those species of *Mysella* of which I have been able to examine a large series of specimens.

MYSELLA OVATA Jeffreys.

Montacuta ovata (? Jeffreys's species) VERRILL and BUSH, Proc. U. S. Nat. Mus., XX, 1898, p. 781, pl. XCII, figs. 9, 10.

A. 21. The specimens so identified are incrusted with such a heavy coat of iron oxide as to have become pathologically modified. They resemble many of Jeffreys's specimens in this, and may really be identical, but it would be more satisfactory to be able to prove it by normal individuals.

MYSELLA (TUMIDULA var.) VERRILLI Dall.

Montacuta tumidula VERRILL and BUSH, Proc. U. S. Nat. Mus., XX, 1898, p. 781, pl. XCIII, fig. 6; pl. XCIV, figs. 1, 2.

[1] Inv. Mass., 1841, pl. II, fig. 33.

A. 23. This, upon careful comparison, proves not to be quite the same as *Montacuta tumidula* Jeffreys.[1] An examination of types of both authors shows that the American shell is more produced and patulous in front and more attenuated and abruptly truncate behind, as well as somewhat more inflated. A European series from nine localities shows some individual variation, but all in a direction away from rather than toward the American type.

MYSELLA MÖLLERI (Hölboll) Mörch.

(Plate LXXXVIII, fig. 14.)

Unnamed biralve No. 7, Möller, Index Moll. Grönl., p. 24, 1842.

Montacuta elevata MÖRCH, Arctic Man , p. 131, 1875, not of Stimpson, 1851.

Montacuta mölleri "Hölboll," MÖRCH, Arctic Man., p. 131, 1875; Rink's Greenland, p. 441, 1877; (name only).

Montacuta ferruginosa var. *grönlandica* MÖRCH, Forteg. Grönl., Blodd., p. 19, No. 164, 1857; fide Posselt, Consp. Faunæ Grönl., Moll., p. 75, 1898.

Montacuta mölleri POSSELT, Conspectus Faunæ Grönl., Moll., p. 74, 1898; in Meddel. om Grönl., XXXIII, 1898.

A. 24. Shell rather large for the group, ovate, white, covered by a profuse wrinkled yellow-brown papery periostracum; valves only moderately convex, inequilateral, the anterior part longer and more fully rounded, base convexly arcuate; beaks low, often eroded; teeth of moderate size, the anterior about three times as long as the other in the right valve; pallial scar rather wide and uneven, not sharply distinguished from the adductor scars; resilium short, stout, ventrally calcareous. Lon. 6.4, alt. 4.8, diam. 3 mm.

From specimens kindly sent by Jensen, who edited Posselt's posthumous Conspectus, I am able to identify this species with the shell called *Montacuta mölleri* after Hölboll's manuscript by Mörch. The identification can only take date from 1898, as all the previous references were absolutely without any means of identification. Posselt furnishes the link which connects the name with Möller's unnamed diagnosis. It seems curious that Mörch should have listed this species under two distinct specific names, but specimens sent by him to Jeffreys show this to have been the case.

Specimens from Greenland were identified as *Montacuta elevata* Stimpson, by Torell and Mörch, and are now in the Jeffreys collection. There is also one unnamed from the collection made by Möller and Hölboll in Greenland. It is perhaps the shell to which Hölboll's manuscript name of *impura* applies, but I was not able to find any type so-named in the Copenhagen collection. It somewhat resembles the fresh, brown specimens of *M. planulata* Stimpson, but is much larger, with more unequal laminæ and a coarse, dirty-looking epidermis over a smooth surface.

[1] Brit. Conch., V, 1869, p. 177, pl. 100, fig. 5.

MYSELLA BARBADENSIS Dall.

Mysella barbadensis, new species.

(Plate LXXXVII, fig. 3.)

A. 25. Shell small, white, thin, inflated, inequilateral, ovate, with distinct beaks, rounded at both ends, with a convexly arcuate basal margin, the short posterior end somewhat attenuated; surface apparently smooth, but not polished, magnification shows a fine, even concentric striation; pallial scar linear, adductor scars small, obscure. Lon. 4, alt. 2.9, diam. 1.8 mm.

This species recalls *M. tumidula*, but is rather longer, less inflated, more equilateral, and has a different surface. A single left valve was obtained.

MYSELLA (PYTHINELLA) CUNEATA Verrill and Bush.

Montacuta cuneata VERRILL and BUSH, Proc. U. S. Nat. Mus, XX, 1898, p. 782, pl. XCI, fig. 4; pl. XCIII, fig. 5.

A. 26. This species presents the concavely arcuate form which I believe to be correlated with commensalism, and the group of species thus distinguished in *Mysella*, for which I have proposed the name *Pythinella*, has the same relations to the typical *Mysella* as *Pythina* has to *Bornia*, *Pseudopythina* to *Erycina*, and *Hindsiella* to its associated genera.

MYSELLA TUMIDA Carpenter.

Tellimya tumida CARPENTER, Suppl. Rept. Brit. Assoc. for 1863 (1864), pp. 88, 97, 129; Proc. Acad. Nat. Sci., Phila., 1865, p. 58.

B. 18. It has not hitherto been figured and I have given (Plate LXXXVII, fig. 7) a camera lucida outline from the type specimen for comparison with the other west coast species. It is especially characterized by its solid and tumid valves, rounded triangular form, and strong hinge. Lon. 3.8, alt. 3.2, diam. 2 mm.

MYSELLA PLANATA Dall.

Tellimya planata DALL, in Krause, Beitr. Moll. fauna des Beringsmeers, Arch. f. Naturg., LI, 1885, Pt. 1, p. 34, pl. III, figs. 6 *a-d*.

B. 19. Dr. Krause's figures are not all equally characteristic, and I give, therefore, a magnified camera lucida sketch (Plate LXXXVIII, fig. 12) from one of his specimens which shows the hinge and outline rather better. Lon. 5.3, alt. 4, diam. 2 mm.

MYSELLA ALEUTICA Dall.

Mysella aleutica, new species.

(Plate LXXXVII, fig. 6.)

B. 20. Shell small, solid, ovate, white, smooth, covered with a polished straw-colored epidermis with usually three or four concentric darker

colored zones; beaks distinct, often eroded, ends and base rounded, valves moderately convex, teeth strong in the right valve, anterior adductor scar narrow and rather irregular, elongated, posterior rounded, pallial scar linear. Lon. 4.3, alt. 3.3, diam. 2 mm.

Resembles *M. tumida* Carpenter, but is more ovate and with less prominent beaks and smaller resilium.

MYSELLA PEDROANA Dall.

Mysella pedroana, new species.

(Plate LXXXVIII, fig. 4.)

B. 21. Shell large, thin, rounded, rather compressed, white, with a concentrically rugose pale-brownish epidermis (to which, in the type, adheres a good deal of blackish oxide of iron); beaks inconspicuous; surface with coarse, concentric, incremental lines; inequilateral; the posterior side short, dorsal margins merging roundly into the distal and they into the basal margin, which last is nearly straight; hinge feeble, the right anterior lamella elongated and very slender, the posterior one shorter and stouter, the resilium subumbonal and very small; adductor scars small, the pallial scar linear. Lon. 9, alt. 7.3, diam. 3 mm.

This is an unusually large and fragile species, of which a single shell was found on the beach at San Pedro.

MONTACUTA FLORIDANA Dall.

Montacuta floridana, new species.

(Plate LXXXVII, fig. 10.)

A. 28. Shell subovate, inequilateral, posterior end much the shorter, white, inflated; beaks low, polished; sculpture of concentric lines growing gradually stronger downward and forward until on the lower anterior third they form low, stout, evenly distributed, concentrically striated lamellæ, remaining feebler on the rest of the shell; base nearly straight, dorsal margin convexly arcuated, ends evenly rounded; hinge with a prominent slender cardinal in each valve, the lamellæ obsolete; sockets of the resilium thickened and raised above the inner surface of the valve. Lon. 16, alt. 10, diam. 9.5 mm.

This is probably the largest species of the genus, if, indeed, it should not prove eventually distinct from the typical forms upon which the genus rests. The anterior lamellæ are entirely absent and there is no radial sculpture visible without a lens. A few faint striations on the anterior slope are feebly reflected on the inner surface of the anterior margin.

The recent specimens of this species were first collected on the beaches of west Florida, near the Manatee River, by Charles T. Simpson.

MONTACUTA MINUSCULA Dall.

Montacuta minuscula, new species.

(Plate LXXXVIII, fig. 8.)

A. 29. Shell small, very thin, white, brilliantly polished; inequilateral, with the posterior end shorter, rounded, the anterior wider and obtusely pointed; the dorsal margin before the beaks convexly arcuate; lamellæ obsolete in the left valve; valves with the beaks low, the surface with faint incremental sculpture; adductor scars elongate, narrow, the anterior not well distinguishable from the pallial line. Lon. 2.7, alt. 1.7, diam. 1.1 mm.

A single left valve was dredged by the U. S. Fish Commission, 36 miles south ½ west from Cape Hatteras in 124 fathoms, sand, bottom temperature 61°.

MONTACUTA LIMPIDA Dall.

Montacuta limpida, new species.

(Plate LXXXVII, figs. 5, 11.)

A. 30. Shell small, thin, white, inflated, uniformly ovate; beaks small, low, but very distinct; surface concentrically minutely striate, the striæ stronger at regular intervals, no radial sculpture; the margin forms an uninterrupted oval; the right anterior lamella is present but feeble and its hook or cardinal though visible is somewhat obsolete; the adductor scars are narrow, the pallial scar linear. Lon. 3, alt. 2.5, diam. 1.8 mm.

An apparently young right valve was obtained in 294 fathoms, coral sand, off Fernandina, Florida, bottom temperature 46.3° F.; an adult valve supposed to be conspecific and which has been selected as the type came from a depth of 85 fathoms, 5 miles off Cape Florida, in the Gulf of Mexico. The younger valve has a length of 1.6 mm.; is slightly more pointed behind; has the dental hook proportionately more prominent, and the pallial line wider and less distinguished from the adductor scars.

MONTACUTA PERCOMPRESSA Dall.

Montacuta percompressa, new species.

A. 31. Shell small, thin, compressed, oblong-ovate, white, tinged with reddish brown near the umbones; inequilateral; the posterior side shorter, bluntly rounded; anterior side produced, narrower; beaks depressed; surface rather irregularly concentrically striated and sometimes feebly waved; lamellæ feeble, almost obsolete; adductor scars narrow, rather irregularly merging in the somewhat ragged pallial line. Lon. 3.7, alt. 2.9, diam. 1.4 mm.

This is *Montacuta ferruginosa* Verrill.[1]

On comparison with authentic specimens of *M. ferruginosa* Montagu, they appeared to be discrepant. Subsequently a comparison was made with several hundred specimens from thirty-eight different European localities, from Norway to the Mediterranean. None was found to have the characteristics of the American shell. The true *M. ferruginosa* grows to a much larger size than any of the Woods Hole specimens, and a comparison of the latter with European shells of as nearly the same size as could be found, developed the following differences: The *M. ferruginosa* Montagu is longer and more slender, more inflated, its posterior end is proportionately longer and more pointed, the beaks more elevated and convex, the dental lamellæ more conspicuous, the adductor scars larger and more clean-cut.

I conclude, therefore, that the two forms are distinct and propose the name of *percompressa* for the flattish form from Woods Hole.

LASÆA RUBRA Montagu.

A. 32. It is remarkable that this little shell should be abundant at Bermuda, and even in southern California, and unknown on our Atlantic coast.

TURTONIA MINUTA Fabricius.

A. 33. In examining the muscular and pallial scars of a large number of American and European specimens I found that there was a certain amount of variation among them. However, none of them showed the extreme discrepancy in size of the pedal scar as figured by Professor Verrill,[2] and it would seem as if his specimen must have been abnormal and exceptional. I found the pedal scar large, but never attaining the size of the adductor near it. I also found the range of variation in Alaskan and British specimens quite sufficient to cover the differences which led Professor Verrill to suggest that the British and American shells might belong to distinct species.

ALIGENA ELEVATA Stimpson.

A. 35. The genus *Aligena* H. C. Lea, 1845, from an examination of his types, proves to have been based upon a species of which *Montacuta elevata* Stimpson is a recent representative. It occurs in the Tertiaries of both Europe and America. *Spaniodon* Reuss is probably, and *Laubrièreia* Cossmann certainly, congeneric, as is *Kelliopsis* Verrill and Bush.[3]

The species is *Montacuta bidentata* Gould, 1841, not of Montagu, 1804; *Montacuta elevata* Stimpson, 1851, not of Mörch, 1875; *Cyamium elevatum*

[1] Trans. Conn. Acad., VI, 1884, p. 225, pl. XXX, fig. 13; Proc. U. S. Nat. Mus., XX, 1898, p. 783, pl. XC, figs. 7, 8.

[2] Am. Journ. Sci., 3d ser., III, 1872, pl. VII, figs. 4, 4*a*.

[3] Proc. U. S. Nat. Mus., XX, 1898, p. 784, pl. XCIII, figs. 2–4; pl. XCIV, figs. 7, 8.

H. and A. Adams, 1858, *Tellimya elevata*[1] Dall, 1889, and *Kelliopsis elevata* of Verrill and Bush, 1898.

FOSSIL LEPTONACEA.

C. 1—73. The descriptions and figures of the fossil species will appear in the Transactions of the Wagner Free Institute of Science, Philadelphia.[2] The full elucidation of the generic synonymy is also reserved for that work. The types of the fossil and recent new species are in the collection of the U. S. National Museum. Most of the fossils were collected by the parties of the U. S. Geological Survey.

EXPLANATION OF PLATES.

When not otherwise stated, the figures are from magnified camera lucida drawings, by Mr. W. H. Dall, from the types in the U. S. National Museum. The extreme length in millimeters of the specimen figured follows each name, together with the number of the specimen in the Museum Register.

PLATE LXXXVII.

Fig. 1. *Erycina (Pseudopythina) compressa* Dall; 18.0 mm. No. 107855, U.S.N.M. Bering Sea.

2. *Bornia retifera* Dall; 12.0 mm. No. 107856, U.S.N.M. The microscopic reticulation is too fine to be represented on the scale of the figure.
3. *Mysella barbadensis* Dall; 4.0 mm. No. 95703, U.S.N.M. Barbados.
4. *Gebia pugetensis* Dana, with *Erycina (Pseudopythina) rugifera* Carpenter, attached by its byssus to the abdomen of the crab behind the limbs. Natural size. Drawn from nature by Dr. J. C. McConnell. No. 15789, U.S.N.M. Puget Sound.
5. *Montacuta limpida* Dall; adult type; 3.0 mm. No. 97155, U.S.N.M. Florida.
6. *Mysella aleutica* Dall; 4.3 mm. No. 108233, U.S.N.M. Kiska Harbor, Aleutian Islands.
7. *Mysella tumida* Carpenter; type specimen; 3.8 mm. No. 5242, U.S.N.M. California.
8. Hinge of *Erycina (Pseudopythina) compressa* Dall; right valve, considerably enlarged; *c*, cardinal tooth; *p*, prodissoconch; *rl*, resilium covered by the large calcareous lithodesma; *l*, raised edge of the valve carrying the linear external ligament.
9. *Sportella stearnsii* Dall; enlarged view of hinge, right valve, *c*, *c'*, cardinals; *l*, nymph for the ligament; *p*, prodissoconch; *r*, excavation and ridge which carry the resilium.
10. *Montacuta floridana* Dall; interior of right valve; 16.0 mm. No. 64456, U.S.N.M. West Florida.
11. *Montacuta limpida* Dall; young shell; 1.6 mm. No. 107867, U.S.N.M. Florida.
12. *Sportella stearnsii* Dall; 13.5 mm. No. 73071, U.S.N.M. Gulf of California.

PLATE LXXXVIII.

Fig. 1. *Erycina emmonsi* Dall; 7.0 mm. No. 92638, U.S.N.M. North Carolina.

2. *Anisodonta (Fulcrella) corbuloidea* Dall; 6.5 mm. No. 92303, U.S.N.M. North Carolina.

[1] Bull. No. 37, U. S. Nat. Mus., 1889, p. 50.

[2] Volume III, Pt. 5.

Fig. 3. *Erycina periscopiana* Dall; left valve; 5.0 mm. No. 92227, U.S.N.M. North Carolina.

4. *Mysella pedroana* Dall; 9.0 mm. No. 127565, U.S.N.M. California. The subumbonal projection between the laminæ is the resilium.

5. *Sportella californica* Dall; 6.0 mm. No. 108231, U.S.N.M. The drawing represents the right valve and the posterior projection of the hinge plate carries the resilium.

6. *Erycina fernandina* Dall; 3.75 mm. No. 108230, U.S.N.M. Deep water off Florida. The dark spot to the right of the cardinal tooth is the resilium.

7. *Erycina linella* Dall; 4.6 mm. No. 107863, U.S.N.M. North Carolina.

8. *Montacuta minuscula* Dall; 2.7 mm. No. 92628, U.S.N.M. North Carolina.

9. *Sportella pilsbryi* Dall; 8.0 mm. No. 107864, U.S.N.M. Left valve. North Carolina.

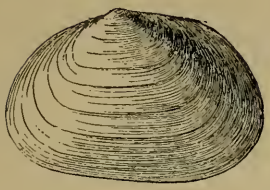
10. *Bornia* (*Ceratobornia*) *longipes* Stimpson; about one and a half times natural size. From an unpublished drawing by Stimpson, representing the animal crawling, the right side facing the observer. South Carolina. Shell is No. 107812 U.S.N.M.

11. The same, representing the animal suspended by its byssal thread, the heel of the foot elongated. Drawn by Stimpson.

12. *Mysella planata* Dall; 5.3 mm. No. 108234, U.S.N.M. Aleutian Islands. The dark spot between the laminæ is the resilium.

13. *Bornia* (*Ceratobornia*) *longipes* Stimpson; the posterior extremity, or heel, of the foot emitting the byssal thread. Much enlarged. From a drawing by Stimpson.

14. *Mysella mölleri* Mörch; 6.4 mm. No. 108232, U.S.N.M. From a specimen in the Jeffreys collection, named *Montacuta elevata* by Mörch, and collected by Torell in Greenland.



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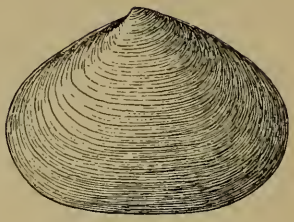

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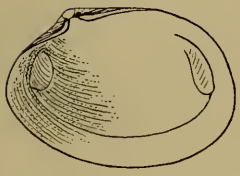

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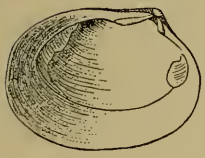

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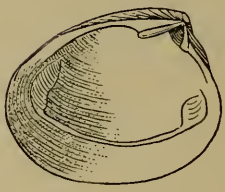

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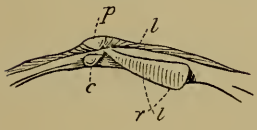

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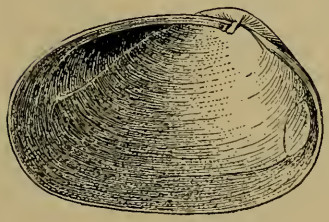

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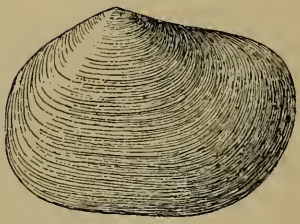

LEPTONACEA OF NORTH AMERICA.

FOR EXPLANATION OF PLATE SEE PAGE 896.

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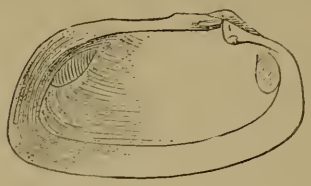

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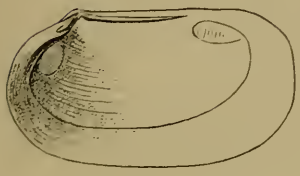

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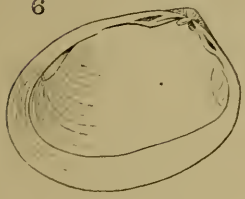

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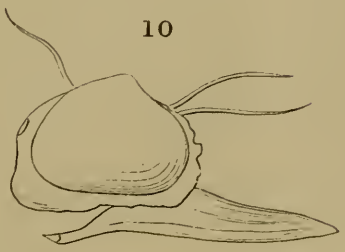

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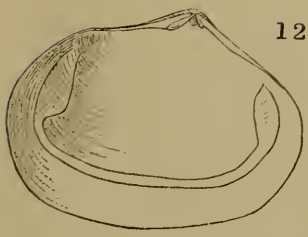

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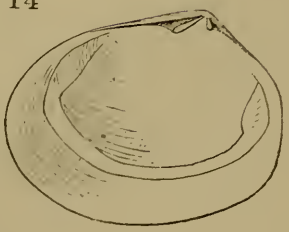

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LEPTONACEA OF NORTH AMERICA.

FOR EXPLANATION OF PLATE SEE PAGES 896, 897.