SYNOPSIS OF THE FAMILY CARDIIDÆ AND OF THE NORTH AMERICAN SPECIES.

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In pursuance of the plan already carried out for the Mactracea, Diplodontidæ, Leptonacea, Psammobiidæ, Solenidæ, and Tellinidæ, I have prepared the following synopsis of the *Cardiidæ*, to include the species found on both coasts of North America, as well as the subdivisions of the family considered as a whole. I should perhaps explain, for the benefit of students who have not followed recent systematic changes, that this family is here regarded as not including the curious brackish-water forms associated with *Adacna* in the waters of the Caspian and the Tertiary horizons of southeastern Europe. These forms were separated as a distinct family, *Limnocardiidæ*, by Stoliczka in 1870.

The forms included in the present paper have the hinge teeth arched (Cyclodont), springing from below the hinge margin, with the hinge plate obscure or undeveloped, and in many cases the two cardinal teeth in one of the valves rotated so that one stands above the other, while in the opposite valve one precedes the other horizontally, so that the axes of the two pairs when the shell is closed cross each other nearly at right angles. There is a small and a large cardinal in each valve; when the shell is closed the two small cardinals are external to the large ones. The laterals are present in all except *Lophocardium*. The sculpture of the shell is chiefly radial, the lobes of the mantle free below the siphons, the foot geniculate, elongated, and rounded, except in *Serripes*, which has it compressed and serrate below. The gills have a very simple type of reticulation, strongly plicate; the anal chamber in some cases is separated from the pedal by a siphonal septum. The ligament and resilium are parivincular, external and posterior. The valves have serrate margins and frequently gape behind.

BIBLIOGRAPHY.

1758. LINNÆUS, *Systema Naturæ*, 10th ed.
1778. PENNANT, *British Zoology*.
1780. BORN, *Testacea Mus. Caes. Vindobonensis*.
1780. O. FABRICIUS, *Fauna Grönlandica*.
1782. CHEMNITZ, *Conchylien Cabinet*, VI.
1786. MOHR, *Islands Naturhistorie*.
1786. SOLANDER, in the *Portland Catalogue*.
1787. MEUSCHEN, *Museum Geversianum*.
1789. BRUGUIÈRE, *Encyclopédie Méthodique*, Vers, I.
1792. GMELIN, *Systema Naturæ*, pt. 6.
1795. POLI, *Testacea Utriusque Siciliae*, III.
1798. BOLTEN, *Museum Bøltenianum*.
1799. LAMARCK, *Prodrome d'un Nouveau Classification des Coquilles*.
1799. DONOVAN, *British Shells*, V.
1808. MONTAGU, *Testacea Britannica*, supplement.
1811. MEGERLE VON MUHLFELDT, *Entwurf einer Neues System der Schälthiere*.
1815. OKEN, *Lehrbuch der Naturgeschichte*.
1815. WOOD, *General Conchology*.
1817. CUVIER, *Régne Animale*, II.
1819. LAMARCK, *Animaux sans Vertèbres*, VI, pt. 1.
1822. FERUSSAC, *Tableau Systematique*.
1825. GRAY, *Annals of Philosophy*, IX.
1829. BRODERIP AND SOWERBY, *Zoological Journal*, IV.
1830. CONRAD, *Journal of the Academy of Natural Sciences of Philadelphia*, VI.
1831. SOWERBY, *Genera of Shells*.
1831. CONRAD, *American Marine Conchology*.
1833. SOWERBY, *Proceedings Zoological Society of London*.
1834. LEA, *Transactions of American Philosophical Society*, new ser., V.
1837. CONRAD, *Journal of the Academy of Natural Sciences of Philadelphia*, VII.
1838. COUTHOUY, *Boston Journal of Natural History*, II.
1839. DESHAYES, *Revue Zoologique Société Cuvierienne*.
1840. SWAINSON, *Malacology*.
1840. SOWERBY, *Proceedings Zoological Society of London*.
1841. GOULD, *Invertebrata of Massachusetts*.
1842. WHEATLEY, *Catalogue of his collection*.
1842. BECK, in Möller, *Index Molluscorum Grönlandiæ*.
1843. DE KAY, *Zoology of New York*, Mollusca.
1844-45. REEVE, *Conchologia Iconica*, II, Cardium.
1845. BEYRICH, *Zeitschrift für Malacozoologie*.
1845. D'ORBIGNY, *Sagra*, Mollusca Cubana.
1846. REDFIELD, *Annals of the Lyceum of Natural History of New York*, IV.
1846. VALENCIENNES, *Voyage of the Venus*; plates only.
1847. D'ORBIGNY, *Voyage en Amérique Méridionale*.
1850. GREWINGK, *Verh. Min. Gesell. St. Peterbourg für 1848-49*.
1850. ADAMS AND REEVE, *Voyage of the Samarang*; Zoology.
1850. GOULD, *Proceedings of the Boston Society of Natural History*.
1851. GRAY, *List of British Animals*, British Museum.
1851. GOULD, *Boston Journal of Natural History*.
1853. MÖRCH, *Catalogue Yoldi*, pt. 2.
1853. GRAY, *Annals and Magazine of Natural History*.
1854. DESHAYES, *Proceedings Zoological Society of London*.
1854. WOODWARD, *Manual of Recent and Fossil Shells*.

1856. GOULD, Proceedings of the Zoological Society of London.
 1856. SHUTTLEWORTH, Journal de Conchyliologie, V.
 1856. CARPENTER, Report to the British Association.
 1857. MEEK AND HAYDEN, Proceedings of the Academy of Natural Sciences of Philadelphia, VIII.
 1857. CARPENTER, Mazatlan Catalogue.
 1857. H. AND A. ADAMS, Genera Recent Mollusca, II.
 1858. DESHAYES, Animaux sans Vertèbres, bassin de Paris.
 1860. MEEK AND HAYDEN, Proceedings of the Academy of Natural Sciences of Philadelphia, IV.
 1861. DUNKER, Malacozoologischer Blätter, VIII.
 1861. RAVENEL, Proceedings of the Academy of Natural Sciences, Philadelphia, for 1861.
 1862. CONRAD, Proceedings of the Academy of Natural Sciences, Philadelphia, for 1862.
 1862. STIMPSON, Proceedings of the Academy of Natural Sciences, Philadelphia, for 1862.
 1863. STIMPSON, Proceedings of the Academy of Natural Sciences, Philadelphia, for 1863.
 1864. KREBS, Catalogue of West India Shells.
 1864. CARPENTER, Supplementary Report to the British Association for 1863.
 1868. GABB, Paleontology of California, II.
 1869. ROEMER, Conchylien Cabinet, Neue Ausgabe, Cardium.
 1870. CONRAD, American Journal of Conchology, VI.
 1872. TRYON, Catalogue Cardiacea, American Journal of Conchology, VII.
 1873. GABB, Geology of Santo Domingo.
 1875. CONRAD, Appendix to Kerr, Geological Report, North Carolina.
 1875. GUPPY, Annals and Magazine of Natural History, 4th series, XV.
 1876. VEST, Jahrbuch der Malakozoologische Gesellschaft, II.
 1876. VON MARTENS, Zoological Record, Mollusca.
 1877. GUPPY, Proceedings of the Scientific Association of Trinidad.
 1878. WHITEAVES, Canadian Naturalist, new series, VIII.
 1879. BAYLE, Journal de Conchyliologie, XXVII.
 1880. WHITE, Proceedings of the U. S. National Museum, II.
 1880. VASSEUR, Journal de Conchyliologie, XXVIII.
 1884. MONTEROSATO, Nomenclatura Conchiglie Mediterranee.
 1885. WHITFIELD, Brach. and Lamellibr. of the Raritan Clays of New Jersey.
 1886. DOLLFUS AND DAUTZENBERG, Feuille des Jeunes Naturalistes.
 1886. DALL, Bulletin of the Museum Comparative Zoology, XII, no. 6.
 1887. COSSMANN, Catalogue Illustré des fos. de l'éocène des environs de Paris.
 1887. FISCHER, Manuel de Conchyliologie.
 1889. DALL, Proceedings of the U. S. National Museum, XII, No. 773.

SYNOPSIS OF THE FAMILY CARDIIDÆ.

Genus CARDIUM (Linnæus) Lamarck.

(Syn. *Cardium* Linnæus, 1758, part; + *Cerastes* and *Cerastoderma* Poli, 1795; + *Acanthocardia* Gray, 1851; + *Acanthocardium* Roemer, 1869; + *Eucardium* Fischer, 1887; + *Criocardium* Conrad, 1870; + *Cardea* [Conrad, MS.] Whitfield, 1885; + *Plagiocardium* Cossmann, 1887; + *Papillicardium*, Sacco, 1899.)

Subgenus **Cardium** s. s. Type *Cardium aculeatum* Linnæus.

Subgenus **Trachycardium** Mörch. (Syn. *Trachycardium* Mörch, 1853; + *Granocardium* Gabb, 1868.) Type, *Cardium isocardia* Linnæus.

Section *Acrosterigma* Dall, 1900. Shell with an elevated mesial rib internally, radiating from the umbonal cavity. Type, *Cardium dalli* Heilprin; Pliocene of Florida.

Subgenus **Ringicardium** Fischer. (Syn. *Ringicardium* Fischer, 1887; + *Bucardium* Gray, 1853, *ex parte*, not of Megerle, 1811; *Pectunculus* (Adanson) Mörch, 1853; not of Lamarck, 1799.) Type, *Cardium ringens* Gmelin.

Subgenus **Cerastoderma** Mörch. (Syn. *Cerastoderma* Mörch, 1853; + *Cardium* s. s. Gray, 1851, not of Lamarck, 1799; + *Parvicardium* Monterosato, 1884.) Type, *Cardium edule* Linnæus.

Section *Dinocardium* Dall, 1900. Type, *Cardium magnum* Born.

Subgenus **Ethmocardium** White, 1880. Type, *Cardium whitei* Dall, = *Cardium speciosum* Meek and Hayden, 1857, not *Cardium speciosum* Adams and Reeve, 1850; Cretaceous.

Subgenus **Tropidocardium** Roemer. (Syn. *Tropidocardium* Roemer, 1868; + *Cardium* s. s. of many authors, not of Lamarck, 1799.) Type, *Cardium costatum* Linnæus.

Subgenus **Fragum** Bolten. (Syn. *Fragum* Bolten, 1798; + *Isocardia* Oken, 1815, not of Lamarck, 1799; + *Hemicardium* Swainson, 1840; + *Bucardium* Gray, 1853; + *Loxocardium* Cossmann, 1887.)

Section *Fragum* s. s. Type, *Cardium unedo* Linnæus.

Section *Hemicardium* (Cuvier) Dall, 1900. Type, *Cardium hemicardium* Linnæus.

Section *Trigoniocardia* Dall, 1900. Type, *Cardium graniferum* Sowerby.

Section *Otenocardia* H. and A. Adams, 1857. Type, *Cardium hystrix* Reeve.

Subgenus **Papyridea** Swainson (Syn. *Papyridea* Swainson, 1840.) Type, *Cardium spinosum* Meuschen.

Section *Fulvia* Gray. (Syn. *Fulvia* Gray, 1853, not *Fulvia* H. and A. Adams, 1858; Fischer, 1887, etc.) Type, *Cardium apertum* Bruguière.

Subgenus **Lævicardium** Swainson. (Syn. *Lævicardium* Swainson, 1840; + *Liocardium* Mörch, 1853.) Type, *Cardium norvegicum* Spengler.

Section *Pachycardium* Conrad, 1870. Type, *Cardium spillmani* Conrad; Cretaceous.

Subgenus **Discors** Deshayes. (Syn. *Discors* Deshayes, 1858; + *Lyrocardium* Meek, 1876; + *Amphicardium* von Martens, 1880; + *Divaricardium* Dollfus and Dautzenberg, 1886.) Type, *Cardium subdiscors* d'Orbigny.

Genus SERRIPES Beck.

(Syn. *Serripes* (Beck) Gould, 1841; + *Aphrodite* Lea, 1834, not Hübner, 1816; + *Acardo* Swainson, 1840, not of Lamarck, 1799.) Type, *Cardium grønlandicum* Gmelin.

Genus CORCULUM Bolten.

(Syn. *Corculum* Bolten, 1798; + *Cardissa* Megerle, 1811; + *Isocardia* Oken, 1815, not of Lamarek, 1799; + *Les Hemicardes* Cuvier, 1817, *ex parte*; + *Hemicardium* Ferussac, 1822; + *Hemicardia* Mörch, 1853.) Type, *Cardium cardissa* Linnæus.

Genus LUNULICARDIA Gray.

(Syn. *Lunulicardia* Gray, 1853; + *Opisocardium* Bayle, 1879.) Type, *Cardium retusum* Linnæus.

Genus AVICULARIUM Gray.

(Syn. *Avicularium* Gray, 1853; + *Lithocardium* Woodward, 1854.)

Section *Avicularium* s. s. Type, *Cardium aviculare* Lamarek.

Section *Byssocardium* Munier Chalmas, 1882. Type, *Cardium emarginatum* Deshayes.

(*Pterocardia* Bayan, 1874, and *Goniocardium* Vasseur, 1880, are suspiciously close to *Avicularium*.)

Genus PROTOCARDIA Beyrich.

(Syn. *Protocardia* Beyrich, 1845; + *Protocardium* Meek and Hayden, 1860; + *Nemocardium* Meek, 1876.)

Section *Protocardia* s. s. Type, *Cardium hillanum* Sowerby.

Section *Nemocardium* Meek. Type, *Cardium semiasperum* Deshayes.

Section *Leptocardia* Meek, 1876. Type, *Cardium subquadratum*.

Evans and Shumard; Cretaceous.

Subgenus *Lophocardium* Fischer, 1887. Type, *Cardium cumingi* Broderip.

? Genus HEMIDONAX Mörch.

(Syn. *Hemidonax* Mörch, 1870; + *Donacocardium* Vest, 1876; + *Donaciocardium* von Martens, 1876.) Type, *Cardium donaciforme* Schroeter.

This group probably belongs with the Donacidæ.

EAST AMERICAN SPECIES.

Cardium (Trachycardium) *isocardia* Linnæus, 1758.

Range: Cape Hatteras, North Carolina, to Trinidad Island, West Indies. Pliocene to Recent.

This includes *Cardium egmontianum* Shuttleworth, 1856, and *Cardium eburniferum* Guppy, 1875.

Cardium (Trachycardium) *muricatum* Linnæus, 1758.

Range: North Carolina to Santa Caterina, Brazil. Pleistocene.

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This is *Cardium muricatum* Linnæus, No. 69, not No. 62, 1758; + *Cardium campechiense* Bolten, 1798; + *Cardium gossei* Deshayes, 1854.

Cardium (Trachycardium) leucostoma Born, 1780.

Range: West Indies.

This includes *Cardium marmoreum* Lamarck, 1819; + *Cardium elongatum* Wood, 1815, and Sowerby, 1831, not Bruguière, 1789; + *Cardium magnum* Wood, 1825. I am inclined to think this shell may be the original *Cardium magnum* Linnæus.

Cardium (Trachycardium) subelongatum Sowerby, 1840.

Range: Southern West Indies.

This is not the *Cardium angulatum* Lamarck as assumed by some authors.

Cardium (Cerastoderma) ciliatum O. Fabricius, 1780.

Range: Arctic and boreal seas south to Cape Cod on the Atlantic and to Puget Sound on the Pacific side.

This is *Cardium islandicum* Chemnitz, 1782; + *Cardium edule* Mohr, 1786, not of Linnæus; + *Cardium pubescens* Couthouy, 1838; + *Cardium arcticum* Sowerby, 1840; + *Cardium dawsoni* Stimpson, 1862; + *Cardium hayesii* Stimpson, 1863; + *Cardium boreale* Broderip and Sowerby, 1829, not of Reeve, 1844. The small compact specimens which have lost their pubescence form Stimpson's *Cardium hayesii*.

Cardium (Cerastoderma) elegantulum Beck, 1842.

Range: Greenland, 90 fathoms.

This is described from Beck's manuscript in Möller's Index Moll. Grönl., 1842.

Cardium (Cerastoderma) pinnulatum Conrad, 1831.

Range: Labrador to Cape Lookout, North Carolina, in 1 to 266 fathoms. Also Pleistocene of New Brunswick.

Cardium (Dinocardium) robustum Solander, 1786.

Range: Cape May, New Jersey, south to Belize and Jamaica, West Indies. Upper Miocene to Recent.

This is best known under the name of *Cardium magnum* Born, 1780, but it is not the *Cardium magnum* of Linnæus, 1758; it is *Cardium ventricosum* Bruguière, 1789; *Cardium maculatum* Gmelin, 1792; + *Cardium carolinense* Conrad, 1862, not of Conrad, 1875.

Cardium (Fragum) medium Linnæus, 1758.

Range: Cape Lookout, North Carolina, south to Santa Marta, Brazil. Upper Miocene to Recent.

This includes *Cardium venustum* Dunker, 1861, and *Cardium columba* Heilprin, 1886; but not *Cardium magnificum* Deshayes, as stated by Carpenter.

Cardium (Trigoniocardia) antillarum Orbigny, 1845.

Range: Straits of Florida to Guadeloupe Island, West Indies, in 2 to 182 fathoms.

This includes *Cardium ceramidum* Dall, 1886.

Cardium (Papyridea) spinosum Meuschen, 1787.

Range: Cape Hatteras, North Carolina, south to Santa Marta, Brazil. Pleistocene.

This includes *Cardium hiatus* Meuschen, 1787; + *Cardium bullatum* Chemnitz (Solen), 1782, not of Linnæus, 1758; + *Cardium bullatum* of many authors but not of Linnæus; + *Cardium soleniforme* Bruguière, 1789; ? + *Cardium latum* Born, 1780, not *Cardium latum* "Born" Reeve, 1844; + *Cardium hiuleum* Reeve (monstr.), 1844.

Curiously the Pliocene form of Florida is identical, not with the existing type of the Antilles, but with that of the southeast Atlantic, St. Helena, and the Cape Verde Islands, a variety with the angle of the ribs minutely crenulate, which I have named *Cardium spinosum* var. *turtoni*. The Pacific species is hardly more than varietally different from the West Indian form, and will retain Sowerby's name of *aspersum* in a varietal sense.

Cardium (Papyridea) semisulcatum Gray, 1825.

Range: Southern Florida, south through the West Indies to Trinidad and the Cape of Good Hope, in 3 to 300 fathoms. Pliocene to Recent.

This is *Cardium ringiculum* Sowerby, 1840; + *Cardium petitianum* Orbigny, 1845.

Cardium (Lævicardium) serratum Linnæus, 1758.

Range: Cape Hatteras, North Carolina, south to Guadeloupe, West Indies, in 1 to 75 fathoms. Oligocene to Recent.

This is not *Cardium serratum* Pennant, 1778; but is the *Cardium lævigatum* of Born, 1780; and of Lamarck, 1819; the *Cardium citrinum* of Wood, 1815; the *Cardium pictum* Ravenel, 1861 (*testa juv.*), but not of Dunker, 1861; the *Cardium lineatum* of Krebs, 1864, but not of Gmelin, 1792; the *Cardium pristis* Valenciennes, 1846; probably the *Cardium oviputamen* Reeve, 1844; the *Cardium venustum* of Gabb, 1873, but not of Dunker, 1861; the *Cardium lævigatum* Reeve, 1844, but not of Linnæus, 1758; and the *Cardium glabratum* of Roemer, 1869.

Cardium serratum var. **brasilianum** Lamarck, 1819.

Range: Southern West Indies south along the coast of Brazil.

This is the *Cardium lamarekii* Orbigny, 1847, but not the *Cardium brasiliense* of Gmelin, 1792, which was founded on the figure of an *Arca*.

Cardium serratum var. **sybariticum** Dall, 1886.

Range: West Indies (Barbados, etc.), in 100 fathoms or more. Oligocene to Recent.

This is a deep-water dwarf form of *serratum*. It may include *Cardium pictum* Ravenel, but certainty can not be attained on account of the loss of Ravenel's types.

Cardium (Lævicardium) mortoni Conrad, 1830.

Range: Nova Scotia to Santa Marta, Brazil, in 1 to 5 fathoms. Miocene to Recent.

Serripes gronlandicus Gmelin, 1792.

Range: Arctic and boreal seas, south to Cape Cod on the Atlantic and Puget Sound on the Pacific side, in 2 to 60 fathoms. Pleistocene.

This is the *Macra radiata* of Donovan, 1799; the *Cardium edentulum* of Montagu, 1808; *Aphrodite columba* Lea, 1834; *Cardium boreale* Reeve, 1844, not of Broderip and Sowerby, 1829; and *Cardium fabricii* Deshayes, 1854.

Protocardia peramabilis Dall, 1886.

Range: Rhode Island southward in deep water to Grenada, West Indies, 18 to 164 fathoms.

Protocardia tineta Dall, 1886.

Range: Key West, Barbados, Santa Cruz, and Porto Rico, in 7 to 100 fathoms.

This was described as a variety of the preceding, which is a white or yellowish shell, but the receipt of more specimens shows them to be quite distinct.

NOTES.

Cardium haitense Guppy, as of Sowerby, 1877, said to be dredged alive in the Gulf of Paria, is probably *Cardium antillarum* Orbigny or a related species.

Cardium pictum Dunker, 1861 (April, not *Cardium pictum* Ravenel, February, 1861), is probably a variety of *Cardium papillosum* Poli, from south Europe, with a wrong locality label. It was a dealer's shell.

Cardium pectinatum (Linnæus) Menke, cited from St. Vincent, is from the island of that name in the Cape Verde group, not the Antillean St. Vincent.

Cardium cygnorum Deshayes, cited by J. Matthew Jones from Bermuda, is probably a misidentification, as Deshayes's species came from Swan River, Australia, and if found on Bermuda must have been adventitious.

Cardium echinatum O. Fabricius, 1780, from Greenland was doubtless derived from European ballast.

Cardium fasciatum Montagu, of Wheatley, 1842, from South Carolina, and De Kay, 1843, has not been authenticated as occurring on the American coast, though it occurs in Iceland.

WEST AMERICAN SPECIES.

Cardium (Trachycardium) quadragenarium Conrad, 1837.

Range: Santa Barbara, California, to Todos Santos Bay, Lower California, in 24 to 60 fathoms.

This is *Cardium luteolabrum* Gould, 1851; + *Cardium xanthocheilum* (Gould MS.) Carpenter, 1856; + *Cardium arenatum* Carpenter (*testa juv.*), 1857; + *Cardium setosum* Tryon, 1872, not Redfield, 1846.

Shells from deep water are remarkably fine and among the largest of the genus. The number of ribs ranges from 42 to 44 and in a remarkable oval variety, much more oblique than the typical form, to 46. It may be noted that nearly all *Cardia* have an oval and a more rotund variety, possibly to be correlated with sex.

Cardium (Trachycardium) consors Sowerby, 1833.

Range: Gulf of California south to the Galapagos Islands.

A fine and well-known shell. A variety *laxum* Dall has the imbrications twice as distant as usual and more elongated. The specimens seen were from the Gulf of California and were all of a color decidedly lighter than the type. The ribs vary from 31 to 34.

Cardium (Trachycardium) maculosum Wood, 1815.

Range: Panamic region; St. Elena, Colombia.

This is *Cardium multistriatum* Sowerby, 1833, and perhaps also *Cardium arenicolum* Reeve, 1845.

Cardium (Trachycardium) pristipleura Dall, 1900.

Range: Gulf of California (La Paz) and west coast of Middle America.

This is *Cardium maculosum* Sowerby, 1833, not Wood, 1815; + *Cardium maculatum* Reeve, 1844, not Gmelin, 1792. The shell has 34 to 39 ribs, laterally imbricate. *Cardium lacunosum* Reeve, 1845, should be compared with it.

Cardium (Trachycardium) senticosum Sowerby, 1833.

Range: Gulf of California to Payta, Peru.

This is *Cardium muricatum* Menke, not Linnæus; + *Cardium ras-trum* Reeve, 1844; + (?) *Cardium lima* Reeve, 1845; + *Cardium lucinoides* Carpenter (*testa juv.*), 1857. It is the Pacific coast analogue of *Cardium muricatum* Linnæus.

Cardium (Trachycardium) belcheri Sowerby, 1829.

Range: Gulf of California, in 6 to 24 fathoms.

Cardium (Ringicardium) procerum Sowerby, 1833.

Range: Lower California, from the vicinity of Cerros Island south to Ecuador, and Payta, Peru. Pleistocene of upper California.

This is *Cardium laticostatum* Sowerby, 1833, and *Cardium panamense* Sowerby, 1833; + *Cardium subelongatum* Valenciennes, 1846, not of Sowerby, 1840; + *Cardium rotundatum* Carpenter (*testa juv.*), 1857.

There are 7 ribs on the posterior area while the rest of the shell has from 13 to 18.

Cardium (Cerastoderma) corbis Martyn, 1784.

Range: Pribilof Islands, Bering Sea, and the Aleutian chain, and southward to San Diego, California, and Hakodadi, Japan.

This is *Cardium nuttallii* Conrad, 1838; + *Cardium californianum* Conrad (*testa juv.*), 1838; + *Cardium nuttallianum* Carpenter, 1864.

This fine shell normally has thickened loops thrown upward over the backs of the ribs as its proper sculpture, but in some young shells the bight of the loops becomes obsolete, giving an ornament nearly of the type of some species of *Trachycardium*.

Cardium (Cerastoderma) californiense Deshayes, 1839.

Range: Bering Strait southward to Oregon, and Monterey, California, and to Hakodadi, Japan.

This is *Cardium pseudofossile* Reeve, 1844, and *Cardium blandum* Gould (*testa juv.*), 1850.

A variety *comoxense* Dall occurs in the boulder clay of Vancouver Island with the ribs depressed and flattened to such an extent as to be defined only by the interstitial lines.

Cardium (Cerastoderma) ciliatum O. Fabricius, 1780.

Range: Arctic and boreal seas, southward to Puget Sound and Japan.

For synonymy see under the head of this species in the East American list. The same varieties occur on both coasts.

Cardium (Cerastoderma) decoratum Grewingk, 1850.

Range: Boulder clays of Alaska and British Columbia.

This species may very likely be found alive hereafter.

Cardium (Fragum) magnificum (Deshayes MS.) in Carpenter, 1857.

Range: Lower California south to Payta, Peru, in 10 to 13 fathoms.

This is *Cardium planicostatum* Sowerby, 1833, not of Sedgwick and Murchison, 1829. Carpenter wrongly refers Deshayes's name to *Cardium medium* as a synonym, but the species is amply distinct from *Cardium medium* and represents it on the Pacific coast.

Cardium (Fragum) biangulatum Sowerby, 1829.

Range: Catalina Island, California, south to Panama.

Cardium (Trigoniocardia) graniferum Broderip and Sowerby, 1829.

Range: Gulf of California to Panama.

Cardium (Trigoniocardia) alabastrum Carpenter, 1857.

Range: Gulf of California, 8 to 24 fathoms; Mazatlan.

Cardium (Trigoniocardia) ovuloide Reeve, 1845.

Range: West coast of middle America?

Cardium (Trigoniocardia) obovale Sowerby, 1833.

Range: Margarita Bay, Lower California, to Ecuador.

Cardium (Papyridea) spinosum Meuschen, 1787, variety **aspersum** Sowerby, 1833.

Range: Margarita Bay, Lower California, and the Gulf of California, south to Panama.

This is cited as *Cardium "asperum"* Sowerby by Roemer, 1869. For the synonymy of the species see the East American list.

Cardium (Lævicardium) elatum Sowerby, 1833.

Range: San Pedro, California, and south to Panama. Pleistocene of California.

This is the largest species of the genus. One valve in the United States National Museum measures 170 mm. in height and 143 mm. in length.

Cardium (Lævicardium) substriatum Conrad, 1838.

Range: From Catalina Island and San Pedro, California, south to San Ignacio lagoon, Lower California. Pleistocene of California.

This is *Cardium cruentatum* Gould, 1856.

Cardium (Lævicardium) elenense Sowerby, 1840.

Range: Gulf of California, south to Panama; Clarion Island.

This is *Cardium apicinum* Carpenter, 1864, as Carpenter himself suspected.

Serripes grönlandicus Gmelin, 1792.

Range: Arctic seas, south to Puget Sound and Hakodadi. Pleistocene.

The synonymy is cited in the East American list.

Serripes laperousei Deshayes, 1839.

Range: Bering Strait, at Plover Bay, south to Avatcha Bay, Kamchatka, and Sitka, Alaska.

This is a well-defined species and the specific characters can be recognized in shells less than an inch long.

Protocardia centiflosa Carpenter, 1864.

Range: Queen Charlotte Islands, British Columbia, south to San Diego, California.

Protocardia centiflosa var. **richardsonii**, Whiteaves, 1878.

Range: Queen Charlotte Islands, British Columbia, south to the coast of Oregon.

This is *Fulvia modesta* Adams and Reeve, var. *centiflosa* Carpenter. The *Protocardia modesta* appears to me distinct from the American shell and is a native of Japan. The northern specimens forming the variety are a little stronger and coarser than those from California, with which they seem to be united by intermediate gradations, though the extremes have apparently good distinctions.

Protocardia (Lophocardium) cumingii Sowerby, 1833.

Range: Gulf of Dulce, Central America, 12 fathoms.

Protocardia (Lophocardium) annettæ Dall, 1889.

Range: Gulf of California, 6 to 24 fathoms.

This is distinguished from the preceding species by its greater altitude and lower radial keel.

NOTES.

Cardium aculeatum Linnæus was found, a single worn valve, by Dr. John S. Newberry at Acapulco. It was doubtless a ballast specimen.

Cardium triangulatum "Sowerby" Carpenter, 1857, I have not been able to discover in the literature. It is perhaps a manuscript name taken from a museum tablet.

Cardium gemmatum Gould, in Carpenter, Rep. British Association, 1857, p. 229, appears to be merely a "list name" and does not appear in Gould's works.

Cardium orbita Sowerby, 1833, appears to be an Indo-Pacific and not an American species.

Dall, William Healey. 1901. "Synopsis of the family Cardiidae and of the North American species." *Proceedings of the United States National Museum* 23(1214), 381–392. <https://doi.org/10.5479/si.00963801.23-1214.381>.

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