

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

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In reviewing the family Tellinidæ, as restricted by me,¹ for the purpose of revising the American Tertiary species, so much work was necessitated on the recent forms of our coast as to make it desirable to record it for the benefit of students of the existing fauna.

The present synopsis aims to include in the list of North American species those which have been actually found on our coasts, exclusive of Central America and the West Indies, excepting a few which it seemed, for one reason or another, were likely to occur there, and do occur in adjacent waters, and have therefore been inserted. No attempt has been made to include a complete enumeration of the West Indian or Panamic Tellinidæ, though it is probable that a much larger number of them than is now known to do so will eventually be found to reach our waters. The energetic researches of Mrs. Oldroyd and other Californian collectors have already added a large number of molluscan species to the fauna of San Diego and San Pedro, which were previously recorded only from Mexico or Middle America, and it is to be anticipated that thorough dredging will add largely to the number. The northern limit of the Panamic fauna is Point Conception, California; its southern limit is probably in the vicinity of Payta, Peru, where the Peruvian current strikes westward across the Pacific.

Each coast boasts of over fifty species of Tellinidæ, the Pacific coast being slightly the richer, especially in the genus *Macoma*.

Pelecypods, being creatures living usually in moderate depths, are well suited to give indications of faunal relations as modified by geological changes. A table of the species common to both coasts, or represented by closely related analogues, will not be without interest.

¹Transactions of the Wagner Free Institute of Science, III, Pt. 3, 1895.

1. SUBTROPICAL SPECIES.

PACIFIC COAST.

Tellina cuningi.
Merisca reclusa.
Merisca crystallina.
Elliptotellina pacifica.
Eurytellina rubescens.
Mocrella meropsis.
Angulus macneilii.
Angulus carpenteri.
Angulus modestus.
Scissula virgo.
Strigilla fucata.
Strigilla cicercula.
Strigilla lenticula.
Tellidora burneti.
Metis alta.
Macoma leptonoidea.
Cymatoica undulata.
Psammacoma panamensis.

ATLANTIC COAST.

Tellina interrupta.
Merisca lintea.
Merisca crystallina.
Elliptotellina americana.
Eurytellina angulosa.
Angulus promerus.
Angulus sybariticus.
Angulus consobrinus.
Angulus tener.
Scissula exilis.
Strigilla carnaria.
Strigilla pisiformis.
Strigilla flexuosa.
Tellidora cristata.
Metis intastriata.
Macoma leptonoidea.
Cymatoica orientalis.
Psammacoma extenuata.

2. BOREAL SPECIES.

PACIFIC COAST.

Macoma krausei.
Macoma calcarea.
Macoma balthica.

ATLANTIC COAST.

Macoma krausei var.?
Macoma calcarea.
Macoma balthica.

Table 1 shows that of the subtropical species eighteen are represented to some extent on both sides of the Isthmus of Panama and Middle America. Of these two, or perhaps three, are unchanged by their long separation, or about 17 per cent. If we adopt the geological percentages by which faunas are referred to subdivisions of the Tertiary, this proportion would indicate for our Tellinas a separation dating from some time in the Miocene, which is exactly what we learn from the geology of the Middle American region, where the last marine beds of any general extent, indicating a connection of the two oceans, belong to the Oligocene epoch, while the absence of marine Miocene from the whole of this region leads to the belief that the land surface was during that epoch above the sea.

I do not regard the evidence of the Tellinas alone as more than a trifle, but such as it is it coincides with other evidence of more weight. While some portions of Middle America may have been low enough to permit the passage of water between the two oceans since the Upper Oligocene, yet it is quite certain that this connection, if it existed, did not lead to any important interchange of animal life, nor prevent the northward migration of South and Middle American vertebrates and fresh-water mollusks into the continent of North America.

The boreal types tell another story, as they are practically common

to the two oceans, as, indeed, is an overwhelming proportion of the whole Arctic and boreal fauna, though largely mixed toward the south with the fauna of the temperate regions, which is distinct.

As the Tellinas are mostly inhabitants of moderate depths, their distribution in latitude rarely affords anything remarkable. A few species, like *Macoma inflatula*, manage to extend their range over the northern border of the Panamic province by descending to considerable depths, where they find their normal temperature; and one species, found in shallow water on the Texas coast, by some remarkable chance still survives in deep water off the coast of California, though not known near shore. It may perhaps be a relic of the time when the cold northern current, passing through the Suwanee Strait (now the neck of the Floridian peninsula), carried a number of cold-water types to the northern shores of the Gulf of Mexico, where several of them have accommodated themselves to circumstances and still survive.

The full synonymy of the genera and of such species as were represented in the Tertiary or Pleistocene beds of North America will be found in the Transactions of the Wagner Institute, III, Pt. 5, now in press. For the convenience of students I add a list of references which will enable them to look up any of the species cited.

I may add that for want of time and material, in the synopsis of the group-names of the family, no attempt has been made to include the more or less problematical groups of the Mesozoic which are the precursors of *Tellina* and its allies.

WORKS REFERRED TO BY DATES IN THE TEXT.

1758. LINNÆUS, Systema Nature, 10th Edition.
 1778. DA COSTA, British Conchology.
 1780. FABRICIUS, Fauna Grönlandica.
 1780. BORN, Mus. Test. Viudobonensis.
 1792. GMELIN, Systema Nature, I, Pt. 6.
 1797. HUMPHREY, Museum Calomnianum.
 1798. SPENGLER, Skrifter Naturistoriske Selskabet, IV.
 1799. LAMARCK, Prodrome d'un Nouveau Classification des Coquilles.
 1802. BOSC, Histoire Naturelle des Coquilles, III.
 1803-4. MONTAGU, Testacea Britannica.
 1806. SOWERBY, British Miscellany.
 1811. MEGERLE, Magazin der Gesellschaft Naturforschender Freunde zu Berlin.
 1812. LAMARCK, Système des Animaux sans Vertébrés.
 1815. WOOD, General Conchology.
 1817. SCHUMACHER, Essai d'un Nouveau Système des habitations des Vers testacés.
 1817. DILLWYN, Catalogue of Recent Shells, I.
 1818. LAMARCK, Animaux sans Vertébrés, V.
 1819. LEACH, Journal de Physique, LXXXVIII.
 1819. TURTON, Conchological Dictionary of the British Islands.
 1822. TURTON, Dithyra Britannica, or Bivalve Shells of the British Islands.
 1822. SAY, Journal of the Academy of Natural Sciences of Philadelphia, II.
 1824. SAY, Journal of the Academy of Natural Sciences of Philadelphia, III.

1825. GRAY, *Annals of Philosophy*, XXV.
 1827. SAY, *Journal of the Academy of Natural Sciences of Philadelphia*, V.
 1827. (LEACH in) BROWN, *Illustrations of the recent Conchology of Great Britain and Ireland*.
 1828. GRAY, in *Wood's Index Testaceologicus*, supplement.
 1829. BRODERIP AND SOWERBY, *Zoological Journal*, IV.
 1831. CONRAD, *American Marine Conchology*.
 1834. SAY, *American Conchology*.
 1834. CONRAD, *American Conchology* (Say), Pt. 7.
 1834. GRAY, in *Griffith's Cuvier*, XII.
 1837. CONRAD, *Journal of the Academy of Natural Sciences, Philadelphia*, VII.
 1838. COUTHOUY, *Boston Journal of Natural History*, II.
 1839. LYELL, *Geological Transactions*, 2d ser., VI.
 1839. SOWERBY, *Zoology of the voyage of the Blossom, Captain Beechey*.
 1841. PETIT, *Révue de Zoologie*, Paris.
 1842. MOLLER, *Index Molluscorum Gröulandiae*.
 1843. (COZZENS in) DE KAY, *Natural History of New York*, V.
 1844. HANLEY, *Proceedings of the Zoological Society of London*.
 1844. MICHELIS, *Proceedings of the Boston Society of Natural History*, I.
 1844. PHILIPPI, *Zeitschrift für Malacozoologie*, I.
 1844. HINDS, *Zoology (Mollusca) of the voyage of the Sulphur*.
 1845. PHILIPPI, *Abbildungen und Beschreibungen neue oder wenig-gekannter Conchylien*, II.
 1845. C. B. ADAMS, *Proceedings of the Boston Society of Natural History*, II.
 1846. DESHAYES, *Exploration de l'Algérie; histoire naturelle des mollusques acéphales*, Pt. 6.
 1846. (ORBIGNY in) SAGRA, *Mollusca Cubana*, II.
 1846-47. HANLEY, *Monograph of Tellina*, in *Sowerby, Thesaurus Conchyliorum*.
 1847. MENKE, *Zeitschrift für Malacozoologie*.
 1848. DESHAYES, *Exploration de l'Algérie*, Pt. 22.
 1848. AGASSIZ, *Nomenclator Zoologicus; Index*.
 1851. GRAY, *List British Animals*, B. M.
 1851. MIDDENDORFF, *Sibirische Reise*, II, Pt. 1.
 1851-52. GOULD, *Journal of the Boston Society of Natural History*, VI.
 1852. LEACH, *Mollusca of Great Britain*, edited by Gray.
 1852. RÉCLUZ, *Journal de Conchyliologie*, III.
 1852. C. B. ADAMS, *Panama Shells*.
 1853. MÖRCH, *Yoldi Catalogue*, Pt. 2.
 1853. (ORBIGNY in) SAGRA, *Mollusca Cubana*, II.
 1853. RÉCLUZ, *Journal de Conchyliologie*, IV.
 1854. DESHAYES, *Proceedings of the Zoological Society of London*.
 1856. CARPENTER, *Proceedings of the Zoological Society of London*.
 1856. (MÖRCH in) H. and A. ADAMS' *Genera of Recent Mollusca*, II.
 1856-58. H. and A. ADAMS' *Genera of Recent Mollusca*, II.
 1857. CARPENTER, *Catalogue of Mazatlan Shells in the British Museum*.
 1857. STIMPSON, *Shells of New England*.
 1860. H. ADAMS, *Proceedings of the Zoological Society of London*.
 1860. CONRAD, *Journal Academy of Natural Sciences of Philadelphia*, 2d ser., IV.
 1861. MÖRCH, *Malacozoologische Blätter*, VII; also PFEIFFER, in *Index*.
 1862. DUNKER, *Malacozoologische Blätter*, VIII.
 1864. CARPENTER, *Supplementary Report to the British Association for 1863, on Mollusks of Western North America*.
 1864. KREBS, *The West Indian Marine Shells*.
 1865. CARPENTER, *Proceedings of the Zoological Society of London*.

1865. CARPENTER, Proceedings of the California Academy of Natural Sciences, III.
 1866. CONRAD, American Journal of Conchology, II.
 1867-68. SOWERBY, Monograph of Tellina, in Reeve, Conchologia Iconica, XVII.
 1869. TRYON, Catalogue of Tellinidæ, in American Journal of Conchology, IV.
 1869. CONRAD, in Tryon, 1869.
 1870. TRYON, American Journal of Conchology, VI.
 1871. STOLICZKA, Cretaceous Pelecypoda of India.
 1871. MEEK, Annual Report, Hayden's Survey of the Territories of Wyoming, etc.
 1872. VERRILL, Report on the Invertebrate Animals of Vineyard Sound, U. S. Fish Commission.
 1872. ROEMER, Monograph of Tellina, in Martini and Chemnitz, Conchylien Cabinet, 2d edition.
 1875. (CONRAD in) KERR, Geological Report of North Carolina, Appendix 9. (Separates in 1873?)
 1878. BERTIN, Nouvelles Archives du Museum, Paris, 2d ser., I. Monograph of Tellinidæ.
 1880. ARANGO, Malacologia Cubana.
 1880. WHITEAVES, Report of Progress, Canadian Geological Survey.
 1881. DALL, Report on the Blake Mollusks, Bulletin Museum of Comparative Zoology, IX.
 1884. MONTEROSATO, Nomenclatura Conchiglie Mediterranee.
 1885. KRAUSE, Archiv. für Naturgeschichte.
 1886. COSSMANN, Catalogue Illustré des Coquilles fossiles de l'Eocene des environs de Paris, Pt. 2.
 1887. FISCHER, Manual de Conchyliologie.
 1889. DALL, Bulletin No. 37, U. S. National Museum.
 1889. DALL, Proceedings of the U. S. National Museum.
 1891. DALL, Proceedings of the U. S. National Museum.
 1892. COSSMANN, Catalogue Illustré des Coquilles fossiles de l'Eocene des environs de Paris, Pt. 5.
 1895. DALL, The Nautilus, IX, No. 3.
 1897. DALL, Natural History Society British Columbia, Bulletin No. 2.

SYNOPSIS OF THE FAMILY TELLINIDÆ.

Genus TELLINA (Linnæus) Lamarek, 1799.

a. Hinge with two lateral laminae in each valve.

Subgenus *Tellina* Lamarek, 1799. Type, *Tellina virgata* Linnaeus. *Angulus* Megerle, 1811; *Tellinella* Gray, Mörch, 1853, and *Eutellina* Fischer, 1887, are synonymous.

Section *Liotellina* Fischer, 1887. Type, *Tellina radiata* Linnaeus. *Muscibus* Mörch, 1853, not Rafinesque, 1818, is synonymous.

Section *Mucaliopsis* Cossmann, 1886. Type, *Tellina barrandei* Deshayes. (Eocene.) *Arcopagiopsis* Cossmann, 1886, is closely allied.

Section *Herouvalia* Cossmann, 1892. Type, *Herouvalia semitecta* Cossmann.

Section *Arcopagella* Meek, 1871. Type, *Arcopagella mactroides* Meek. (Cretaceous.)

Shell with the form and sculpture of *Moerella*, the sinus of *Arcopagia*, and the hinge of *Tellina*.

Subgenus *Linearia* Conrad, 1860. Type, *Linearia metastriata* Conrad. (Cretaceous.)

b. Hinge with two lateral laminae in the right valve, the laminae of the left valve more or less obsolete, or absent.

Subgenus *Elliptotellina* Cossmann, 1866. Type, *Tellina tellinella* Lamarek. (Eocene.)

Subgenus *Pseudarcopagia* Bertin, 1878. Type, *Tellina decussata* Lamarek.

Subgenus *Arcopagia* (Leach), 1827. Type, *Tellina crassa* Pennant. *Cydippe* (Leach), 1852, not Eschscholtz, 1829; not *Arcopagia* Orbigny, 1853.

Section *Cyclotellina* Cossmann, 1886. Type, *Tellina lunulata* Deshayes. (Eocene.)

Section *Phyllodina* Dall, 1900. Type, *Tellina squamifera* Deshayes.

This has the form of *Phylloda* and the sinus of *Arcopagia*.

Section *Merisca* Dall, 1900. Type, *Tellina crystallina* Wood.

This group comprises more or less trigonal, usually rather convex shells of small or moderate size, with lamellose concentric sculpture and often fine radial lines in the interspaces. There is a narrow but sharp posterior flexure; the laterals of the right valve are strongly developed, but the left valve is without lateral teeth, its margin fitting above the laterals of the opposite valve. The pallial sinus is ample, frequently wholly confluent below and always largely confluent, the dorsal portion often represented only by a line connecting the adductors.

These shells are related to *Macaliopsis*, from which they differ in the absence of lateral teeth in the left valve; to *Moerella*, from which the sculpture and posterior fold separate them; and to *Pseudarcopagia*, which is not rostrate nor folded, while its radial sculpture is more conspicuous. The recent species are usually pale, without color markings, or white, and inhabit the warmer seas.

Section *Eurytellina* Fischer, 1887. Type, *Tellina punicea* Born. *Peronoderma* Mörch, 1853, not Poli, 1795.

Section *Scrobiculina* Dall, 1900. Type, *Scrobicularia viridotincta* Carpenter.

Shell tellinoid, thin; resilium short, strong, internal: hinge with feeble laterals; sinus confluent below.

Section *Quadrans* Bertin, 1878. Type, *Tellina gargadia* Linnaeus.

Section *Tellinides* Lamarek, 1818. Type, *Tellina timorensis* Lamarek.

Subgenus *Phylloda* Schumacher, 1817. Type, *Tellina foliacea* Linnaeus.

Subgenus *Moerella* Fischer, 1887. Type, *Tellina donacina* Linnaeus.

Moera H. and A. Adams, 1856, not Leach, 1815; *Macra* H. and A. Adams, 1858, not Leach, 1813; *Donacilla* Gray, 1851, not Lamarek, 1812.

c. Hinge with a single strong right anterior lateral, closely adjacent to the cardinals, the other laterals absent.

Subgenus *Angulus* (Megerle em.), 1811. Type, *Tellina lanceolata* Linnaeus.

Fabulina Gray, 1851, and *Tellinula* (sp.) auct., as of Chemnitz, are synonymous.

Section *Angulus* s. s.

Surface smooth or finely concentrically sculptured.

Section *Scissula* Dall, 1900. Type, *Tellina decorata* Say.

Surface obliquely grooved.

Section *Oudardia* Monterosato, 1884. Type, *Tellina compressa* Brocchi.

With a thick internal anterior rib.

Section *Peronidia* Dall, 1900. Type, *Tellina albicans* Gmelin (*nitida* auct.).

Peronæa Mörch, 1853, not *Peronea* Curtis, 1824.

Subgenus *Omala* Schumacher, 1817. Type, *Tellina hyalina* Gmelin. *Homala* Agassiz, 1848, not Mörch, 1853.

? Section *Homalina* Stoliczka, 1871. Type, *Tellina triangularis* Dillwyn.

Homala Mörch, 1853, not Agassiz, 1848?

Genus STRIGILLA Turton, 1822.

Type, *Tellina carnaria* Linnaeus.

Strigella Gray, 1842; *Strigillina* Stoliczka, 1871, not Dunker, 1862; *Limicola* Fischer, 1887, not Koch, 1816, nor Leach, 1852; *Strigula* Pfeiffer, 1861.

Genus TELLIDORA (Mörch), 1856.

Type, *Tellina burneti* Broderip and Sowerby.

Genus METIS H. and A. Adams, 1856.

Type, *Tellina meyeri* Dunker.

Capsa Lamarek, 1799, not Humphrey, 1797; *Caspa* Bose, 1802; *Lutricola* Carpenter, 1863, not Blainville, 1825.

Genus GASTRANA Schumacher, 1817.

Type, *Tellina fragilis* Linnaeus.

Fragilia Deshayes, 1848; *Diodonta* Deshayes, 1846, not Schumacher, 1817.

Genus MACOMA Leach.

Subgenus **Macoma** Leach, 1819. Type, *Macoma tenera* Leach (= *Tellina calcarea* Gmelin).

Valves subtrigonal, rarely inflated, subequilateral, with a well-marked posterior flexure; sinus usually confluent below with the pallial line. Tertiary to recent in the cooler seas. *Macroma* Gray, 1825, and *Limicola* Leach, 1852, not Koch, 1816, are synonymous.

Section *Macalia* H. Adams, 1860. Type, *Tellina bruguïerei* Hanley.

Tellinungula Roemer, 1872, and *Capsa* Tryon, 1869, not Humphrey, 1797, are synonyms.

?Section *Rerithærus* Conrad, 1869. Type, *Macoma secta* Conrad.

Subgenus **Cymatoica** Dall, 1889. Type, *Tellina undulata* Hanley (+ *occidentalis* Dall).

Subgenus **Psammacoma** Dall, 1900. Type, *Psammotwa candida* (Lamarek), Bertin.

Valves elongate, convex, thin, the posterior end markedly shorter; posterior flexure obsolete; sinus (in the type) free, or only partly coalescent with the pallial line. Tertiary to recent; warmer seas.

Section *Psammacoma* s. s. Sinus free, gibbous, short. Type, *Macoma candida* (Lamarek¹), Bertin.

Section *Cydippina* Dall, 1900. Sinus partly coalescent below, elongated. Type, *Macoma brevifrons* Say.

Section *Psammotreta* Dall, 1900. Type, *Tellina aurora* Hanley.

Like *Psammacoma*, but shorter, with the resilium internal, shorter than and partly separated from the ligament. This section bears to *Psammacoma* a relation similar to that which *Scrobiculina* does to *Angulus* in the genus *Tellina*.

¹This is the *Tellina galathea* Hanley, not Lamarek, according to Bertin, and the *Tellina sericina* Jonas, 1844.

SPECIES OF THE EASTERN COAST OF NORTH AMERICA.

Genus TELLINA (Linnæus).

TELLINA INTERRUPTA Wood, 1815.

Cape Lookont, North Carolina, south to Brazil; Bermuda.

Tellina maculosa Lamarck, 1818; *Tellina antoni* Philippi, 1844, and *Tellina mexicana* Petit, 1841, are synonyms. The latter name has been retained in a varietal sense, for the more slender aspects of the species.

TELLINA LÆVIGATA Linnæus, 1758.

Tampa, on the west coast of Florida, Bermuda, and southward.

This species is not cited from Cuba by Arango, hence its range seems in need of elucidation. *Tellina lewis* Krebs, not of Rumphius, seems to be the only synonym.

TELLINA LINEATA Turton, 1819.

St. Augustine, Florida, south to Brazil.

Tellina brasiliensis Lamarck, 1818, not Spengler, 1798, *Tellina striata* Montagu, 1803, not Chemnitz, *Tellina tenuis* Conrad, 1834, and *Tellina decussatula* C. B. Adams, 1845 are synonyms. The hinge is that of *Eurytellina*, but the other characters are more like the typical section of the genus.

TELLINA (LIOTELLINA) RADIATA Linnæus, 1758.

Charleston, South Carolina, south to the West Indies; Bermuda.

This is variable in color markings, *Tellina nivea* Wood, 1815, and *Tellina unimaculata* Lamarck, 1818, are color varieties.

TELLINA (MERISCA) CRYSTALLINA Wood, 1815.

Sullivans Island, South Carolina, Mazyck, 1892; St. Thomas, West Indies. Swift; Carthagen, Krebs. Also on the Pacific coast.

Tellina schrammi Récluz, 1853, is synonymous.

TELLINA (MERISCA) LINTEA Conrad, 1837.

Miocene to recent. Coast of North Carolina southward; Mobile Point, Gulf coast (Conrad).

TELLINA (MERISCA) ÆQUISTRIATA Say, 1824.

Miocene (Maryland) to recent. North Carolina coast southward to northern Brazil.

Closely resembling the preceding, but more densely sculptured and more elongated. The sinus nearly reaches the anterior adductor, and is wholly confluent below in both species.

TELLINA (ELLIPTOTELLINA) AMERICANA Dall, 1900.

Off Cape Lookout, North Carolina, in 52 fathoms sand.

TELLINA (CYCLOTELLINA) FAUSTA Donovan, 1804.

Off shore in about the latitude of Cape Hatteras, North Carolina, southward to the West Indies.

Commonly referred to *Arcopagia*, but has the sinus partly confluent below and linked by a linear scar to the anterior adductor scar.

Tellina lewis Wood, 1815, and *Tellina remies* Born, 1780, not of Linnæus, 1758, are synonyms.

TELLINA (EURYTELLINA) ALTERNATA Say, 1822.

Cape Hatteras, North Carolina, south to Belize and Samana Bay.

There are sometimes traces of the left laterals, but they are usually obsolete. The pink variety may be discriminated from the closely allied *Tellina angulosa* by the fact that in the former the pallial sinus does not touch the anterior adductor scar. This species is the *Tellina punicea* of Orbigny in part, but not of Born; and the *Tellina tayloriana* Sowerby, 1867, was founded on the pink variety.

TELLINA (EURYTELLINA) ANGULOSA Gmelin, 1792.

Florida Keys and southward to Brazil.

Tellina striata (Chemnitz) auct., *Tellina lacta* Montagu, 1804; *Tellina punicea* Orbigny, 1853, in part, but not of Born, 1780; *Donax martinicensis* Lamarek, 1818; *Tellina rosacea* King, 1830; *Tellina hanleyi* Deshayes in B. M. but not of Dunker, 1853; *Tellina* "subradiata Schumacher," of Arango, 1880, are synonymous. Traces of the left laterals are sometimes present.

TELLINA (EURYTELLINA) GEORGIANA Dall, 1900.

Cape Hatteras, North Carolina, southward to St. Thomas, West Indies.

This is *Tellina* var. *carolinensis* Dall, 1889, not *Tellina carolinensis* Conrad, 1875.

TELLINA (PHYLLODINA) SQUAMIFERA Deshayes, 1854.

Cape Hatteras, North Carolina, south to Sombrero, in 22 to 85 fathoms. Erroneously indicated as Chinese by Sowerby and Bertin.

TELLINA (MOERELLA) GOULDII Hanley, 1846.

Cape Hatteras, North Carolina, southward to Yucatan, in 2 to 50 fathoms. Erroneously referred to the Pacific coast by authors. The sinus touches the anterior adductor scar, and is wholly confluent below. *Tellina cuneata* Orbigny, 1846, is synonymous.

TELLINA (MOERELLA) MARTINICENSIS Orbigny, 1846.

Tampa, Florida, and Antillean fauna.

Very similar to the preceding but more strongly sculptured and with the sinus only partly confluent below, and free from the adductor scar. *Tellina obtusa* Sowerby, 1868, and *tumida* Sowerby, 1867, are synonymous.

TELLINA (ANGULUS) MAGNA Spengler, 1798.

Cape Hatteras, North Carolina, south to St. Thomas, the Virgin Islands, and Bermuda.

Though so much larger than most of the species, this is a typical *Angulus* in every particular. *Tellina acuta* Wood, 1815, and *Tellina elliptica* Lamareck, 1818, are synonyms.

TELLINA (ANGULUS) TENERA Say, 1822.

Prince Edward Island, south to the Gulf of Mexico. This shell has been called *Angulus tener*, but *Angulus* is hardly of generic value. *Tellina elucens* Mighels, 1844, was probably founded on the young of this species. *Tellina omoia* Ravenel, 1875, and *Tellina agilis* Simpson, 1857, are identical. Another species is figured under this name¹ by Sowerby.

TELLINA (ANGULUS) TENELLA Verrill, 1872.

Cape Cod, Massachusetts, southward to New York.

Angulus modestus Verrill, 1872, not Carpenter, 1864, is synonymous. The shell referred to this species from Tampa, Florida, by me² appears on further study to be distinct. The name *tenella* has been used earlier in *Tellina*, but I have lost the reference.

TELLINA (ANGULUS) TEXANA Dall, 1900.

Corpus Christi Bay, Texas, and Charlotte Harbor, west Florida.

TELLINA (ANGULUS) VERSICOLOR (Cozzens) De Kay, 1843.

Stratford, Connecticut, west and south to the Antilles and to Santa Caterina, Brazil, in 15 to 50 fathoms.

This small shell, with much similarity to *Tellina tenera*, unites radial color markings which recall those of *Tellina variegata* Carpenter. *Tellina consobrina* Orbigny, 1846, is closely allied.

TELLINA (ANGULUS) SYBARITICA Dall, 1881.

Cape Hatteras, North Carolina, south through the Antilles to Brazil.

Variable in color, but recognizable by its solid shell and sharp, fine concentric grooving.

¹ Conch. Icon., p. xxxiv, fig. 195, 1867.

² U. S. Nat. Mus. Bull. No. 37, 1889.

TELLINA (ANGULUS) POLITA Say, 1822.

North Carolina southward to Progreso, Mexico.

The internal anterior ray in this species is quite heavy, but not as distinctly differentiated as in *Oudardia*.

TELLINA (ANGULUS) PAUPERATA Orbigny, 1846.

Tampa Bay, Florida, south to Martinique.

Polished and apparently smooth, but showing fine concentric sculpture when magnified.

TELLINA (ANGULUS) TAMPAËNSIS Conrad, 1866.

Gulf coasts of the Southeastern United States, from Florida to Texas.

The sinus is wholly coalescent below and the internal radii are obsolete. The lateral tooth separates it from the rather similar *Macoma cerina*.

TELLINA (ANGULUS) MERA Say, 1834.

South Carolina, southward to the Bahamas.

This has been wrongly referred by Tryon to the genus *Strigilla*. It is smooth or slightly concentrically striated.

TELLINA (ANGULUS) PROMERA Dall, 1900.

West Florida, from Tampa Bay south to Curaçao, Bermuda.

Larger than *mera*, with fine, sharp distant concentric lamellæ (easily worn off) and the sinus approaching the anterior adductor scar more closely.

TELLINA (ANGULUS) SIMPLEX Orbigny, 1846.

Gulf of Mexico, southward through the Antilles.

Dredged in 60 fathoms between the Mississippi Delta and Cedar Keys, Florida.

TELLINA (ANGULUS) FLAGELLUM Dall, 1900.

Florida? (Petit). Coast of Brazil near Cape San Roque. Dredged by the U. S. Fish Commission, in 20 fathoms.

This closely resembles externally *Tellina unifasciata* Sowerby, of Port Jackson, Australia, which, however, is a thinner shell without the strong approximate lateral tooth, according to Sowerby.

TELLINA (SCISSULA) SIMILIS Sowerby, 1806.

Bermuda, Florida, and south to Venezuela.

This beautiful shell is better known to American authors by the name of *T. decora* Say (1827), but, unfortunately, there seems to be no doubt that Sowerby's species was founded on a white specimen of

this species. Philippi¹ has figured a specimen under the name of *Tellina iris* Say, and for *similis* Sowerby has figured *Tellina exilis* Lamarck. Hanley² figures *decora* Say, but his other figures called *decora* represent some other species. His figure of *similis* represents *Tellina decorata*.

TELLINA (SCISSULA) IRIS Say, 1822.

North Carolina, south to the Florida Keys.

This is not *Tellina iris* Philippi above referred to. Shells labeled *Tellina exilis* Lamarck, from the West Indies, are very close to this species, being generally larger, higher proportionally, and more brightly colored. I should not be surprised if a fuller series than I have access to might unite the two. *Tellina caribæa* Orbigny, 1846, is synonymous.

TELLINA (SCISSULA) EXILIS Lamarck, 1818.

Antillean fauna (north to Florida Keys?).

Very closely related to the preceding species, but has a longer sinus, which touches, or nearly touches, the anterior adductor scar.

TELLINA (SCISSULA) CANDEANA Orbigny, 1846.

Florida Keys, Bermuda, and the Antilles.

More wedge shaped and solid than either of the other species of this group.

Genus STRIGILLA Turton.

STRIGILLA CARNARIA Linnæus, 1758.

Beaufort, North Carolina, south to Brazil.

Cardium carnosum Da Costa, 1778, and *Strigilla arcolata* Menke, 1847, are synonymous. This species is recognizable by the fact that the upper part of the pallial sinus connects the adductor scars. The sculpture is often obsolete on the umbonal angle.

STRIGILLA ROMBERGII Mörch, 1853.

Florida Keys to Brazil.

In this species, almost identical externally with the preceding, the pallial sinus does not reach the anterior adductor scars.

STRIGILLA FLEXUOSA Say, 1822.

Cape Hatteras, North Carolina, south to Haiti and Guadeloupe.

Strigilla mirabilis Philippi, 1841, is synonymous, and the species has been confused with the *Strigilla pisiiformis* Linnæus.

¹Abbild., II, 1845.

²Thesaurus, 1846, pl. lvi, fig. 27.

STRIGILLA PISIFORMIS (Linnæus), 1758.

Florida Keys and Antillean fauna.

Cardium discors Montagu, 1806, is probably synonymous. This species is darker, less arcuate ventrally, and with less rude zigzag sculpture than *Strigilla flexuosa* Say. *Strigilla producta* Tryon, 1870, is markedly wider and more triangular. *S. pisiformis* was named *Lucina pulchella* by C. B. Adams in 1846.

Genus TELLIDORA Mörch.

TELLIDORA CRISTATA Recluz, 1843.

North Carolina south to Trinidad. Also Pliocene.

Tellidora lunulata Holmes, 1858, is synonymous. The left valve is the flatter; in *Tellidora burneti* Sowerby the reverse is the case.

Genus METIS H. and A. Adams.

METIS INTASTRIATA (Say), 1827.

Florida southward through the Antilles.

The name was probably a misprint for *interstriata*. *Tellina gruneri* Philippi, 1845, *Tellina inornata* (Adams fide) Krebs, 1864, not of Hanley, 1844, and *Tellina lacunosa* Bertin (ex parte), 1878, non Chemnitz, are synonymous. The species has been confounded with *Macoma constricta* Bruguière by several authors, and with *Metis ephippium* Spengler, a Chinese species.

Genus MACOMA Leach.

MACOMA CONSTRICTA (Bruguière), 1792.

New Jersey coast (Wheatley) south to Santa Caterina, Brazil.

The sinus usually, but not always, touches the anterior adductor scar; when shorter the right valve usually has it free. *Tellina cayennensis* Lamarek (as *Psammobia*), 1818, *Tellina lateralis* Say, 1827, and *Tellina inornata* Adams are synonymous, and probably *Tellina suezensi* (Mörch manuscript) Deshayes, 1854.

MACOMA KRAUSEI Dall, 1900.

Spitsbergen, Greenland, and Bering Sea.

MACOMA BALTHICA (Linnæus), 1758.

Arctic and boreal seas generally, and in cool water southward to Georgia and the Mediterranean. In the north it is chiefly littoral, and affects localities where the water is slightly brackish.

Venus fragilis O. Fabricius, 1780, not of Linnæus; *Tellina gronlandica* (Beck) Lyell, 1839; *Psammobia fusca* Say, 1827; *Sanguino-*

laria fusca Conrad, 1831; *Tellina inconspicua* Broderip and Sowerby, 1829; *Tellina tenera* Mörch, 1857, not of Say, 1822; *Tellina fabricii* Hanley, 1847; *Tellina fragilis* Moller, 1842, not of Linnaeus; *Tellina molleri* Deshayes, and *Tellina dubia* Deshayes, 1854, and probably *Tellina plena* Sowerby, 1868; are synonymous.

The original *Tellina balthica* was the thin form from the Baltic, not the solid *Tellina solidula* Pulteney, which is better known to collectors. The former is identical with our common American type.

MACOMA CALCAREA (Gmelin), 1792.

Arctic and boreal seas generally, south to Boston Bay and Long Island Sound, on the east coast of America.

Tellina lata Gmelin, 1792; *Macoma tenera* Leach, 1819; *Tellina sabulosa* Spengler, 1798; *Tellina proxima* (Brown manuscript) Sowerby, 1839; *Tellina sordida* Couthouy, 1838, and probably *Tellina belcheri* Sowerby, 1868, are among the synonyms. The species prefers deep water, or, at least, is not littoral or estuarine.

MACOMA INFLATA (Stimpson), 1893.

Spitsbergen, Greenland, Gulf of St. Lawrence, and south to latitude 40°, in 57 to 206 fathoms.

This species was named by Stimpson in manuscript, and the name published by Dawson, but the first real definition of that name is by Verrill and Bush.¹ *Macoma moesta* Deshayes, 1854, is suspiciously similar.

MACOMA CERINA C. B. Adams, 1845.

Southern Florida and the Antilles. The pallial sinus is about half confluent below. *Tellina cerena* Krebs, 1864, is identical.

MACOMA LEPTONOIDEA Dall, 1895.

Texas coast at Matagorda Bay (Lloyd), also California. The sinus is short, high, and half confluent.

MACOMA MITCHELLI Dall, 1895.

Texas coast and north to Charleston, South Carolina. Sinus wholly confluent below; form approaching *Angulus*.

MACOMA PHENAX Dall, 1900.

Jerome Creek, Chesapeake Bay, Virginia, and Tampa Bay, Florida. Closely resembles *Tellina (Angulus) tenera* Say externally.

MACOMA TENTA Say, 1834.

Cape Cod southward to Rio la Plata.

In the warmer waters from Florida southward this species takes on a yellowish flush of color, in which state it is the *Tellina souleyetiana*

¹ Proc. U. S. Nat. Mus., p. 778, pl. 77, fig. 1, and pl. 88, fig. 6, 1898.

Recluz, 1852 (*Tellina lacrymabunda* Deshayes), but after long study I think the two aspects can not be specifically separated. The sinus is about half confluent below. It has been named *Tellina recluziana* by Tryon in 1869, on account of the existence of *Tellina souleyeti* Hanley, 1844. I have no doubt that the original *Psammobia lusoria* Say, 1822, was based on a large specimen of this species, but it can not be recognized from Say's description and Conrad's figure.

MACOMA (CYMATOICA) ORIENTALIS Dall, 1889.

Florida Straits, south to Santo Domingo.

This appears to be distinct from, though allied to, the West Indian *Macoma (Cymatoica) arcuata* Sowerby, 1867.

Subgenus *Psammacoma* Dall.

MACOMA (PSAMMACOMA) TAGELIFORMIS Dall, 1900.

Texas.

Two closely allied species appear to have been generally confounded under the name of *brevifrons*. That to which the name *tageliformis* is assigned here reaches a length of 45 mm., and has the pallial sinus gibbous, short, high, and only slightly confluent below.

MACOMA (CYDIPPINA) BREVIFRONS Say, 1834.

New Jersey south to Rio Janeiro.

This differs from *M. tageliformis* in its pale orange flush over the central portion, in its usually much smaller size, and in its elongate-oval pallial sinus, extending nearly to the anterior adductor and largely confluent below. The Miocene *Tellina virginiana* Conrad, 1866, is closely allied. Say's figure does not agree with his diagnosis and, as it was published after his death, may represent another species.

MACOMA (CYDIPPINA) LIMULA Dall, 1895.

Cape Lookout, North Carolina, south to Barbados.

Always identifiable by its finely granular surface. The sinus is long and partly confluent.

Bertin cites a manuscript name, *Tellina limula* of Valenciennes, in his monograph of 1878, but as this referred to a true *Tellina*, while the present species is a *Macoma*, the name of the latter need not be changed.

MACOMA (CYDIPPINA) EXTENUATA Dall, 1900.

Between the Mississippi delta and Cedar Keys, Florida, in 32 fathoms, sand.

Elongated and with a dull surface, the sinus long and partly con-

fluent below. If it were not for the hinge this might be referred to *Liotellina*.

Tellina eupareia and *Tellina athroa*, of Ravenel are list-names of species found by him on Sullivans Island, Charleston Harbor, South Carolina, and printed without figure or description in the catalogue of his collection, 1875. They have no standing and are unidentifiable, but have been cited in the literature. Another Ravenelian name, *Tellina omoia*, is cited by him as a synonym of *Tellina tenuis* Say, by which *Tellina tenera* Say was probably meant.

SPECIES OF THE PACIFIC COAST OF NORTH AMERICA.

Genus TELLINA Linnæus.

TELLINA CUMINGII Hanley, 1844.

Lower California to Panama (Red Sea?). This is the Pacific coast analogue of *Tellina interrupta* Wood, and the synonyms of the latter are sometimes confused with the former.

TELLINA IDÆ Dall, 1891.

(Plate IV, figs. 10, 11.)

San Pedro, California, and vicinity.

Figures of a young specimen from Catalina Island are given.

The adult has already been well figured in the Proceedings of the U. S. National Museum.¹

TELLINA (MACALIOPSIS) LYRA Hanley, 1844.

Lower California to Tumbez, Peru.

TELLINA (MERISCA) LAMELLATA Carpenter, 1857.

San Diego, California, to Mazatlan.

This is referred to the section with doubt, as the unique specimen is so polished internally as to obscure the pallial line.

TELLINA (MERISCA) RECLUSA Dall, 1900.

San Ignacio Lagoon, Lower California, and Gulf of California.

This is the Pacific coast analogue of *Tellina lintea* Conrad of the Atlantic coast from which it differs in minor details, especially in being shorter and more triangular. *Tellina aquistriata* Say is more sharply sculptured, and has the anterior end of the pallial sinus free from the adductor scar.

TELLINA (MERISCA) DECLIVIS Sowerby, 1868.

Cerros Island, Lower California, to the Gulf of California.

¹ XIV, pl. VI, fig. 3; pl. VII, figs. 1, 4; 1891.

TELLINA (MERISCA) CRYSTALLINA Wood, 1815.

Lower California to Panama; also Atlantic coast. The specimens from the two oceans are absolutely similar, and differ no more than individuals from either sea among themselves.

TELLINA (ELLIPTOTELLINA) PACIFICA Dall, 1900.

Panama Bay, and probably northward. This is the Pacific analogue of *Tellina (E.) americana* Dall, which is differently sculptured. From the figures *Tellina clathrata* Bertin, 1878, is a third recent species of *Elliptotellina*, but appears to be smoother and to have a much longer and more confluent sinus than either of the American species.

TELLINA (PHYLLODINA) PRISTIPHORA Dall, 1900.

Lower California, near La Paz, in 26 fathoms.

TELLINA (EURYTELLINA) RUBESCENS Hanley, 1844.

Margarita Bay, Lower California, to Panama. This is the Pacific coast analogue of *Tellina angulosa* Gmelin, which is very similar, but distinguishable. *Tellina simulans* C. B. Adams, 1852, and *Tellina punicea* Carpenter, 1857, not Born, 1778, are synonymous.

TELLINA (SCROBICULINA) VIRIDOTINCTA Carpenter, 1855.

Lower California to Panama.

TELLINA (SCROBICULINA) OCHRACEA Carpenter, 1864.

Cape St. Lucas to the Gulf of California.

Extremely similar, except in color, to the preceding species.

TELLINA (QUADRANS) COGNATA C. B. Adams, 1852.

Panamic fauna; Guatemala.

This is *Macoma cognata* of Adams and *Psammobia casta* (Deshayes) Reeve, 1857, but not *Tellina casta* Hanley, 1844.

TELLINA (TELLINIDES) BRODERIPII Deshayes, 1857.

Cape St. Lucas to Panama; Gulf of California.

This is *Tellina purpurea* Broderip and Sowerby, 1829, but not of Dillwyn, 1817; *Tellina purpurascens* Hanley, 1846, but not of Gmelin, 1792.

TELLINA (MOERELLA) SALMONEA Carpenter, 1864.

Aleutian Islands and southern part of Bering Sea, southward to the Santa Barbara Islands, California.

This is a widely distributed species, variable in color, but very con-

stant in form. *Tellina crassula* Deshayes, 1854, if correctly described and figured, differs by the absence of lateral teeth and smaller pallial sinus.

TELLINA (MOERELLA) MEROPSIS Dall, 1900.

San Diego, California, to the Gulf of California.

This is the *Tellina gouldii* of Carpenter, 1865, but not of Hanley, 1846; it is the Pacific analogue of *Tellina promera* Dall, from which it differs by its more solid and, on the whole, smaller shell, with the sinus rising higher than the posterior adductor scar, just behind the latter, and reaching nearer to the anterior scar. There is a feeble posterior right lateral in the present species which is wanting in *Tellina promera*.

TELLINA (MOERELLA) PAZIANA Dall, 1900.

Lower California, and near La Paz. Like a miniature *Macoma liotricha* Dall, with the *Angulus* hinge and a very large, nearly free, pallial sinus.

TELLINA (MOERELLA) AMIANTA Dall, 1900.

Gulf of California.

Slender, small, white, anteriorly much produced, and externally finely concentrically striated.

TELLINA (ANGULUS) MACNEILII Dall, 1900.

Gulf of California, Guaymas.

The Pacific representative of the Atlantic *Tellina sybaritica* Dall.

TELLINA (ANGULUS) SUFFUSUS Dall, 1900.

Lower California, San Ignacio, Guaymas. Analogous to the Atlantic *Tellina colorata* Dall.

TELLINA (ANGULUS) CARPENTERI Dall, 1900.

Strait of Juan de Fuca to Lower California.

The Pacific analogue of *Tellina versicolor* Cozzens, of the Atlantic fauna, or *Tellina consobrina* Orbigny.

This is the *Angulus variegatus* Carpenter, 1864, not *Tellina (Angulus) variegata* Gmelin, 1792.

TELLINA (ANGULUS) CERROSIANA Dall, 1900.

Cerros Island, Lower California and the Gulf of California, in 8 to 26 fathoms.

Small, white, sharply concentrically striate, with the form of *Tellina sybaritica* Dall.

TELLINA (ANGULUS) RECURVA Dall, 1900.

Gulf of California.

White or pinkish, blunt and oval, with the shape of *Macoma krausei* Dall.

TELLINA (ANGULUS) MODESTA Carpenter, 1864.

Puget Sound.

Shell small, white, rather short, with a thick but obscurely defined ray behind the anterior adductor scar.

TELLINA (SCISSULA) VIRGO Hanley, 1844.

Gulf of California, La Paz, to Chiriqui.

Pink or white, compressed. The Pacific analogue of *Tellina (Scissula) exilis* Lamarck, but more compressed, more arcuate, and less pointed behind.

TELLINA (OUDARDIA) BUTTONI Dall, 1900.

Lituya Bay, Alaska. to Gulf of California.

This is the Pacific analogue of *Tellina compressa* Brocchi of the Mediterranean. The radial rib is well defined, and the shell is longer and more inequilateral than *Tellina modesta* Carpenter. The shell is white, often with a conspicuous olive green periostracum, which, however, is not unfrequently absent, or rather pale yellow or colorless. The species is the *Tellina (Angulus) var. obtusus* Carpenter, 1864, but not *Tellina obtusa* Sowerby, 1818.

TELLINA (PERONIDIA) LUTEA Gray, 1828.

Cape Espenberg, north of Bering Strait, south to Kamchatka and north Japan on the west, through Bering Sea, the Aleutians, and east to Cooks Inlet.

This fine shell is the *Tellina guildfordiae* Gray, 1834, the *Tellina alternidentata* Broderip and Sowerby, 1829, but not the *Tellina lutea* of Krause, 1885 (which from author's specimens proves to be a *Macoma*). The *Tellina venulosa* Schrenck, 1861, from north Japan, is probably identical, or at most a variety.

TELLINA (PERONIDIA) BODEGENSIS Hinds, 1844.

Queen Charlotte Islands and Vancouver to San Diego, California: (Japan?).

The name is misspelled *bodejensis* by Bertin, 1878, who proposes to unite with it the Miocene *Tellina emacerata* Conrad, 1849, from Oregon, a course which I regard as unwarranted, though suggested by Carpenter. The *Tellina sulcatina* Deshayes, 1854, is closely related to

Tellina bodegensis, and may be identical. It is said to be found in Japan and China, but I have seen no specimens from that region. Dunker also does not cite the species from Japan, and it may be that Deshayes's name was founded on a Californian specimen wrongly labeled as Asiatic.

TELLINA (PERONIDIA) SANTAROSÆ Dall, 1900.

Santa Rosa, San Miguel, and Santa Barbara Islands, of the Santa Barbara group, California.

This form, which may prove a special race of *Tellina bodegensis*, is thinner, flatter, less flexuous behind, with the part of the disk in front of the umbonal ridge of the left valve with the concentric sculpture suddenly obsolete; the color whiter, with translucent venulations of a radial tendency. Adult specimens look very different from *Tellina bodegensis* of the same size.

Genus STRIGILLA Turton.

STRIGILLA FUCATA Gould, 1851.

Lower California, south to Panama.

Strigilla costulifera Mörch, 1861; *Strigilla carnaria* Carpenter, 1856, not Linnaeus, 1758; *Strigilla miniata* Carpenter, 1856, not of Gould, are synonymous. In color, in minuter details of sculpture, and in the presence or absence of a smooth radial streak on one or both valves, these shells are notably inconstant. Nuttall (erroneously?) reported this species from Santa Barbara, California. A posterior thickened ray or two, internally, are often developed.

STRIGILLA SINCERA Hanley, 1844.

Cape St. Lucas to Panama.

Strigilla disjuncta Carpenter, 1856, is said by Carpenter (1864) to be identical. The species is posteriorly produced, white, and grows to a large size.

STRIGILLA CICERCULA Philippi, 1846.

Gulf of California to Panama.

Strigilla maga Mörch, 1861. *Strigilla interrupta* Mörch, 1861. *Strigilla ercilia* Philippi, 1846. *Strigilla dichotoma* Philippi, 1846, and *Strigilla pisiformis* Philippi, 1846, *ex parte*, not of Linnaeus, 1758, are synonymous. This form is the analogue on the Pacific coast of the West Indian *Strigilla pisiformis*.

STRIGILLA LENTICULA Philippi, 1846.

Cape St. Lucas to Central America.

Strigilla serrata Mörch, 1861, seems identical. This species is the Proc. N. M. vol. xxiii—20

Pacific coast analogue of *Strigilla flexuosa* Say. All the Pacific coast species so far reported have the sinus produced to the anterior adductor scar, and confluent with the pallial line below.

Genus TELLIDORA Mörch.

TELLIDORA BURNETI Broderip and Sowerby, 1839.

Lower California, south to West Colombia.
The Pacific analogue of *Tellidora cristata* Récluz.

Genus METIS H. and A. Adams.

METIS ALTA Conrad, 1837.

Santa Barbara, California, south to San Diego.

This species is identical with *Scrobicularia biangulata* Carpenter, 1856, and is also the *Lutricola alta* of the same author. It differs from the *Metis excavata* Sowerby, 1867, which extends from the Gulf of California south to Peru and the Galapagos Islands, by its bright yellow suffusion internally, its broader hinge plate, strong and deeply immersed resilium, and usually by more or less brownish coloration externally. The only other species of the genus belonging to western North America is the *Metis dombeyi* Hanley, 1846 (not of Carpenter), distinguished by its smooth, white exterior, reddish internal flush in many specimens, and evenly oblong form. This species has been confused by Carpenter with *Macoma (Psanmacoma) aurora* Hanley, of the same region, under the name of *Scrobicularia producta* (1855); but this is not the *Tellina producta* Sowerby (1868). Bertin has wrongly referred some Chinese shells to *Metis excavata*, all the species being externally very similar.

Genus MACOMA Leach.

MACOMA MIDDENDORFFII Dall, 1886.

Bering Strait to the Aleutians and eastward to Chirikoff Island, Alaska; Okhotsk Sea.

This is *Macoma edentula* Middendorff, 1851, not of Broderip and Sowerby, 1839. Recognizable by its high triangular form, solid shell, with broad hinge plate and flattened left valve.

MACOMA INCONGRUA von Martens, 1865.

Bering Strait to Japan and Puget Sound.

This is *Tellina rotundata* Sowerby, 1867. *Tellina nasuta* var. *truncata* Middendorff, 1851, not *Tellina truncata* Jonas, 1844; *Macoma californiensis* Bertin, 1878, etc.

MACOMA KRAUSEI Dall, 1900.

Icy Cape south to the Aleutians and east to the Shumagin. Greenland?

This is *Tellina lutea* A. Krause, 1885, not of Gray, 1828. I have received a very similar form from Greenland and Spitsbergen. The species is characterized by its oval compressed form, low posterior beaks, and short, hardly flexed posterior end.

MACOMA EDENTULA Broderip and Sowerby, 1839.

From Bering Strait southward to the Aleutians and Japan and eastward to Port Etches, Alaska.

This splendid species is rare, and has been much confused by authors. It is the *Tellina lata* of Middendorff, 1851, in part, but not of Gmelin. It is notable for its large size, blunt transverse form, and rather smooth surface, often with a ferruginous flush. The pallial sinus is unusually short and free for the genus. *Tellina edentula* Spengler, 1798, is a *Metis*.

MACOMA CALCAREA Gmelin, 1792.

Arctic Ocean generally and on the Pacific south to the Okhotsk and Japan seas on the west and to the Aleutians and Oregon on the east.

The synonymy of this species has been indicated in the Atlantic coast list.

MACOMA SITKANA Dall, 1900.

Kadiak, Alaska, south to Sitka (15 fathoms).

Shell like *Macoma calcarea*, but more slender, more equilateral, less flexuous, with the pallial sinus more regular, oval, and confluent below, and with the posterior end somewhat recurved dorsally.

MACOMA INQUINATA Deshayes, 1854.

Bering Strait to Monterey, California, on the east and to Japan on the west.

This variable, but on the whole very recognizable, species has been confused with *Macoma incongrua* Martens, *calcarea* Gmelin, and *nasuta* Conrad.

MACOMA INFLATULA Dall, 1897.

Aleutian Islands and southward in constantly deeper water to Balenas Bay, Lower California.

Characterized by its strong flexure, pointed posterior end, thin inflated shell, and greenish periostracum.

MACOMA NASUTA Conrad, 1837.

Kadiak Island, Alaska, to Lower California.

This well-known species has not been seen by me from west of

Kadiak, though *Macoma inquinata* Deshayes has frequently been reported under the name of *nasuta*. It seems to occur in Japan, where it was named *Tellina dissimilis* by von Martens, 1865, but is not the *Tellina dissimilis* of Deshayes, 1854. The young was described by Gould as *Tellina tersa*, 1852.

MACOMA LEPTONOIDEA Dall, 1895.

Santa Barbara Channel, California, in 314 to 322 fathoms. Also at Matagorda Bay, Texas.

This very distinct species occurs in shallow water on the Texas coast and in very deep water on the coast of California. It probably antedates the separation of the two oceans.

MACOMA CARLOTTENSIS Whiteaves, 1880.

Arctic Ocean south to Avatcha Bay, Kamchatka on the west, and to the Aleutians and eastward to Chilkat Inlet, Alaska.

One of the handsomest species when in perfection, and characterized especially by its brilliant periostracum and subtriangular form. *Macoma frigida* Hanley, 1844, should be compared, though very likely only a variety of *calcareo* Gmelin. *Tellina frigida* Krause, 1885, from author's specimens, proves to be the young of *Macoma balthica* Linnæus.

MACOMA LIOTRICA Dall, 1897.

Aleutian and Shumagin islands to Puget Sound.

A thin oval shell, with glossy yellow periostracum.

MACOMA EXPANSA Carpenter, 1865.

Puget Sound to Baulinas Bay, California.

This must be regarded as a doubtful species. The two specimens upon which it was founded belong to different species and neither agrees with Carpenter's diagnosis. A large broken valve with the teeth wanting probably belongs to the preceding species. The originally more perfect pair has also met with accidents, and is really too young for satisfactory determination. Specimens from Baulinas Bay, California, collected by Stearns, which have been associated with the specimens named by Carpenter, may belong to a valid species which will carry the name.

MACOMA BALTHICA Linnæus, 1758.

Arctic and boreal seas generally. On the Pacific it has been collected in northern Japan, and as far south on the northwest coast as Monterey, California.

This widely dispersed form is abundant about Bering Sea, but the

Macoma solidula Pulteney, usually regarded as a variety of *balthica*, has not been found in that region. In addition to the synonyms mentioned in the Atlantic list, it may be mentioned that the *Tellina frigida* of Krause, 1885, is based on young *balthica*, and it is possible that the original *Tellina frigida* of Hanley, 1844, was of the same character.

MACOMA YOLDIFORMIS Carpenter, 1864.

Neah Bay, Juan de Fuca Strait, to San Diego, California.
A very uniform, brilliantly polished species.

MACOMA ALASKANA Dall, 1900.

Lituya Bay and Sitka Harbor, Alaska, in 8 to 12 fathoms.

A small species having the form of *Moerella* but the hinge of *Macoma*, with a polished greenish periostracum and the pallial sinus strikingly discrepant in the two valves.

MACOMA (CYMATOICA) UNDULATA Hanley, 1844.

Gulf of California, south to St. Elena, West Colombia.

Macoma occidentalis Dall, 1889, not *Tellina occidentalis* Mörch, 1861, is synonymous. This curious little shell is the Pacific analogue of the Antillean *Macoma orientalis* Dall.

MACOMA (REXITHAERUS) SECTA Conrad, 1837.

Victoria, British Columbia, to the Gulf of California at Guaymas, Mexico.

This is perhaps the finest shell of the genus. *Tellina ligamentina*, Deshayes, 1843, *Tellina japonica* Deshayes, 1854, and *Tellina denticulata* Sowerby, 1867, not of Deshayes, 1854, are synonymous. To the somewhat ruder northern specimens Carpenter applied in a varietal sense the manuscript Nuttallian name of *edulis*, in 1864.

MACOMA (REXITHAERUS) INDENTATA Carpenter, 1866.

Santa Barbara to San Diego, California.

MACOMA (REXITHAERUS) INDENTATA var. TENUIROSTRIS Dall, 1900.

San Pedro and Santa Barbara Islands.

This form differs from the typical *indentata* in being more elongated, with a shorter and more pointed posterior end and deeper flexure. *Tellina columbiensis* Hanley, 1844, also belongs to this section of the genus.

MACOMA (PSAMMACOMA) ELONGATA Hanley, 1844.

Lower California (lat. 30°-36°) south to Panama in 14 to 30 fathoms.

This species was confused by Carpenter in his labeling with *Tellina candida* auct., not Lamarck.

MACOMA (PSAMMACOMA) EXTENUATA var? PANAMENSIS Dall, 1900.

Panama.

This form is hardly distinguishable from the Atlantic *Macoma extenuata* Dall, but appears to have a less polished surface and to be a larger and somewhat higher shell.

MACOMA (PSAMMOTRETA) AURORA Hanley, 1844.

Gulf of California to Panama.

This species was cited and labeled by Carpenter with the name of *Tellina dombeyi* Hanley, which is a *Metis*.

It may be noted here that *Macoma (Macalia) Bruguieri* Hanley, a Chinese species, and *Macoma inornata* Hanley, a Chilean species, are erroneously referred to California in Bertin's Monograph of 1878. *Tellina pura* Gould, 1852, from Lower California, is the young of *Tellina mazatlanica* Deshayes, according to Carpenter, but the figures of Gould and Sowerby hardly sustain this view. The species is erroneously referred to Vancouver by Sowerby and Bertin. *Tellina brevirostris* Deshayes, 1854, is another species which has had a Californian habitat wrongly assigned to it.

DESCRIPTIONS OF NEW SPECIES.

ATLANTIC COAST.

TELLINA (EURYTELLINA?) GEORGIANA new species.

(Plate II, fig. 3.)

Shell of moderate size, rosaceous, more or less suffused with a yellowish tinge, and frequently with obscure paler narrow rays near the posterior slope; surface polished; valves compressed, subequilateral, the anterior somewhat longer, rounded in front, descending more rapidly and somewhat pointed behind, base arcuate; surface sculpture of fine, even, concentric grooves with wider interspaces, these, on approaching the umbonal ridge, in large part cease, those which persist continue over the umbonal angle and to the dorsal margin as rather distant sharp little elevated lamellae, the interspaces of which are very finely obscurely radially striate; umbones not prominent, their apices usually pale; lunule and esutcheon narrow and inconspicuous; hinge normal, the right laterals well developed, the anterior subapproximate, the left laterals obsolete; pallial sinus similar in both valves, touching the anterior adductor scar, wholly confluent below. Lon., 32; alt., 17; diam., 6 mm.

Figured type.—No. 93777, U. S. N. M.; dredged by the U. S. Fish Commission in the Gulf of Mexico, at station 2387, in 32 fathoms,

sand. Specimens from St. Thomas, West Indies, which appear otherwise similar, are translucent whitish instead of rosaceous. The species has a distant resemblance to the European *Tellina nitida*.

TELLINA (LIOTELLINA) IHERINGI new species.

(Plate II, fig. 2.)

Shell polished, white, with a pale olivaceous periostracum, showing darker concentric zones; moderately convex, elongated, the anterior end longer, evenly rounded, the shorter posterior end wedge-shaped, hardly flexuous, with the umbonal ridge obscure; umbones white, small, little elevated; lunule and escutcheon linear or nearly so, ligament short, deeply inset; interior white with a slight yellowish flush anteriorly; hinge normal, the teeth all present but small; pallial sinus low, reaching in front to the posterior vertical of the anterior adductor scar, confluent below. Lon., 27; alt., 13; diam., 5.5 mm.

Type.—No. 108531, U.S.N.M.; dredged by the U. S. Fish Commission off the Rio La Plata, in 10½ fathoms sand, at station 2765.

This species is not nearly related to any other American *Tellina*, and the surface shows only faint incremental lines a little stronger on the rostrum.

TELLINA (ELLIPTOTELLINA) AMERICANA new species.

(Plate II, fig. 8.)

Shell small, convex, having much the form of an *Ercilia*, white or pale straw color, with a crimson spot or streak on the dorsal margin near each end; sculpture of well-marked narrow, close, concentric ripples over the whole surface, crossed near the posterior end by feeble, close set, radial grooves; anterior end longer and slightly more pointed; beaks low, ligament short; hinge with the teeth well developed, pallial sinus short, rounded, obliquely ascending and free from the pallial line below. Lon. 8.5, alt. 5.5, diam. 3.2 mm.

Type.—No. 92154, U.S.N.M.; dredged by the U. S. Fish Commission in 52 fathoms sand, 31 miles S.E. by S. from Cape Lookout, North Carolina, at station 2612; bottom temperature 67° F.

This little shell is very interesting as being the first species of the subgenus recognized in the recent state. Another of unknown habitat had been described by Bertin, in 1878, but no one had recognized its proper systematic place. A third species has been dredged by the U. S. Fish Commission on the Pacific coast, which is also described in this paper.

TELLINA (MERISCA) CRYSTALLINA Wood.

(Plate II, fig. 10.)

This species has not been reported before from the coast of the United States, so we have figured a valve collected some years ago by

Mr. W. G. Mazyck, of Charleston, South Carolina, on Sullivans Island, Charleston Harbor. The species occurs in the Antilles, where it has received the name of *Tellina schrummi* from Récluz, but a comparison with specimens from the Gulf of California does not show any distinctive characters.

TELLINA (ANGULUS) PROMERA new species.

(Plate II, fig. 11.)

Shell solid, white, rounded, triangular; the anterior end a little longer, rounded in front, the posterior shorter, slightly flexuous, bluntly pointed; surface sculptured with rather distant, very thin, sharp, little elevated lamellæ, the interspatial surface finely radially striate, the umbonal ridge fairly well marked on the right valve, corresponding to a feeble radial sulcus on the left valve; beaks elevated, rather pointed and polished; traces of a papery, straw-colored periostracum visible near the margin; lunule and escutcheon hardly discernible; hinge normal, well developed; pallial sinus rising in a peak before the posterior adductor, then depressed, rounded in front, not reaching the anterior adductor scar, less than half confluent below, in the right valve, in the left valve similar but larger. Lon. 18, alt. 14.5, diam. 7 mm.

Type.—No. 94465, U.S.N.M.; collected at Bermuda by the late Dr. G. Brown Goode.

The nearest ally of this species, and which has probably often been confounded with it, is the shell we have identified with the *Tellina mera* of Say, from which it differs as we have stated in a previous note in this paper (p. 296).

TELLINA (ANGULUS) FLAGELLUM new species.

(Plate II, fig. 6.)

Shell small, polished, white, yellowish or rosaceous, with a single dark red ray extending backward from the umbo parallel with the umbonal ridge; valves moderately convex, elongated, pointed, and slightly flexuous behind, sculptured with fine regular concentric grooves with slightly wider interspaces; hinge of *Angulus*, the approximate lateral broad and strong; pallial sinus long, rounded behind, not reaching the anterior adductor scar, and wholly confluent below. Lon. 9, alt. 5, diam. 3 mm.

Type.—No. 108534, U.S.N.M.; dredged by the U. S. Fish Commission, SE. of Cape San Roque, Brazil, in 20 fathoms; bottom temperature 79° F., at station 2758.

A species, externally very similar, from Port Jackson, Australia, was described by Sowerby in 1868, under the name of *Tellina unifasciata*, but he states that it has no lateral teeth. The present species is

probably that alluded to by Bertin in 1878, as received from Florida by Petit, under the name of *Tellina unifasciata*, and which he refers to *Angulus*.

TELLINA (ANGULUS) COLORATA new species.

(Plate II, fig. 9.)

Shell small, compressed, subtriangular, suffused with rose color or pale yellow, sometimes showing minute, subtranslucent, subradial vermiculations, sculpture of faint incremental lines, the posterior end shorter, rather blunt, slightly flexuous; hinge with the lateral very short and close to the cardinals; pallial sinus subtriangular, the apex rising considerably above the level of the posterior adductor, the anterior end not reaching the anterior adductor scar, the lower portion wholly confluent; there is an obscure posterior ray. Lon. 13.5, alt. 9.5, diam. 4 mm.

Types.—No. 42865, U.S.N.M., from the island of Guadeloupe, West Indies.

TELLINA (ANGULUS) TEXANA new species.

Shell small, thin, sharply flexed, varying from ivory white, through yellowish, to pale pinkish brown; subequivalve, inequilateral, the anterior end longer, moderately convex; epidermis very thin, silky, with an iridescent play of colors upon it when fresh; beaks rather high and pointed, anterior dorsal margin subarcuate, declining into the evenly rounded anterior end; posterior end short, rapidly declining, subtruncate or obtusely pointed, markedly flexed to the right; surface near the beaks nearly smooth, toward the margin finely concentrically grooved, the grooves becoming more crowded, until in some cases the interspaces resemble minute close-set threads; there are also fine, almost microscopic, radial striæ and the usual obtuse ridge at the posterior angle; hinge normal, adjacent lateral strong; pallial sinus long, not precisely similar in both valves, but reaching the anterior adductor scar in neither; the valves, if the epidermis is lost, do not appear polished; lon. 14, alt. 8.2, diam. 4.6 mm.

Habitat.—Various localities in Corpus Christi Bay, Texas, Singley, and Charlotte Harbor, Florida, in 3 or 4 feet of water, over a sandy bottom, Dall.

From *T. (Angulus) tenella* Verrill, which is perhaps its nearest ally, it differs in outline, has more arcuate dorsal margins, a straighter base, and more attenuated posterior end. That species is grooved over the whole disk and has the grooving more sharp and regular.

Type.—No. 125539, U.S.N.M.

MACOMA (MACOMA) PHENAX new species.

Shell small, thin and fragile, polished, bluish white, subequilateral, very feebly flexed behind; beaks very low; dorsal margins declining about equally before and behind the umbo; anterior end evenly rounded, posterior end obtusely pointed, base nearly straight; hinge normal, very delicate, the teeth minute; pallial sinus long and low, subequal in the two valves, not reaching the anterior adductor scar. Lon. 14, alt. 8, diam. 3.5 mm.

Types from an artificial pond screened from the sea so that only embryos could enter, occupied for researches on the development of *Ostrea virginica* by the late Prof. John A. Ryder, at Jerome Creek, Chesapeake Bay, Virginia. The pond was made in February, 1884, and these shells were found in the mud cleaned out of it in May, 1885, so that they were, though fully adult, only 15 months old, or less. Young shells of the same species were collected by Stearns at the mouth of the Hillsboro River, Tampa Bay, Florida.

These specimens externally bear such a close resemblance to a somewhat stunted and obtuse *Tellina (Angulus) tenera* Say, that, without special scrutiny, they were identified as that species, and so remained more than fourteen years in the collection. Desiring to examine the hinge of *Tellina tenera* one day, a specimen of this lot was selected, when, to my surprise I found the hinge to be that of *Macoma*. A careful examination of all the specimens labeled *Tellina tenera* was then made and another lot of half-grown shells from Florida were found to be conspecific. There is no sculpture except inconspicuous and somewhat irregular lines of growth, and the exterior differs from *Tellina tenera* chiefly in the more obtuse beaks and posterior end and less marked flexure of the valves.

Type.—No. 61719, U.S.N.M.

MACOMA (MACOMA) MITCHELLI Dall.

(Plate II, figs. 4, 5.)

Macoma mitchelli DALL, Nautilus, IX, July, 1895, p. 33.

An illustration is now provided of this hitherto unfigured species.

MACOMA (PSAMMACOMA) EXTENUATA new species.

(Plate II, fig. 7.)

Shell small, thin, white, with a yellowish flush on the disk near the umbones; elongated, the anterior end slightly longer, rounded, posterior end more attenuated, flexuous, bluntly pointed; surface nearly smooth, not polished, sculptured only with more or less obvious incremental lines; hinge delicate, interior whitish, the pallial sinus long, but not reaching the anterior adductor scar, largely confluent below. Lon. 14, alt. 6.75, diam. 2.5 mm.

Type.—No. 94012, U.S.N.M.; dredged by the U. S. Fish Commission between the delta of the Mississippi and Cedar Keys, Florida, in 32 fathoms, sand, at station 2387.

Quite distinct from any species of our coasts so far known, but closely resembling the young of a larger valve hereafter described from Panama Bay.

MACOMA (CYDIPPINA) LIMULA Dall.

(Plate II, fig. 1.)

Macoma limula DALL, Bull. U. S. Nat. Mus. No. 37, p. 60, 1889 (name only); Nautilus, IX, July, 1895, p. 32.

This species, which has not been figured, is now illustrated. It can always be recognized by its curiously sagriate surface.

MACOMA (PSAMMACOMA) TAGELIFORMIS new species.

Shell thin, white, elongate, longer and rounded in front, shorter and rounded-truncate behind, moderately convex; surface sculptured only with rather rude incremental lines and faint radial striations; valves unequal, the left valve more convex, but the rostrum is not perceptibly flexed; teeth small, hinge normal, pallial sinus gibbous, about half confluent below, not quite similar in both valves, extending in front of the middle of the shell. Lon. 45, alt. 26, diam. 11 mm.

Type.—No. 6086, U.S.N.M., from Corpus Christi Bay, Texas. This species and *Macoma brevifrons* will be fully illustrated in a Report on the Mollusca of Porto Rico, now in preparation.

PACIFIC COAST.

TELLINA (MERISCA) RECLUSA new species.

(Plate III, fig. 2.)

Shell white, solid, moderately convex, subtrigonal, strongly flexuous; anterior end slightly longer, rounded; posterior end keeled dorsally, wedge-shaped, twisted to the right with a very short terminal truncation; beaks small, pointed; surface sculptured, with rather close-set, little elevated, concentric sharp lamellæ, with wider, faintly radially striate interspaces; escutcheon deep, narrow, long, bordered by a minutely serrate keel on each valve, lunule small, inconspicuous; hinge strong; pallial sinus high behind, descending to the base of the adductor scar in front, wholly confluent below. Lon. 18, alt. 13, diam. 6 mm.

Types.—No. 105513, U.S.N.M., from San Ignacio Lagoon, Lower California, Hemphill. Also off Lower California, in lat. 30° 28', by the U. S. Fish Commission, at station 3019, in 14 fathoms, Gulf of California.

This species is notable for the rasp-like quality of its surface to the touch.

TELLINA (ELLIPTOTELLINA) PACIFICA new species.

(Plate III, fig. 9.)

Shell small, oval, yellowish white, or more or less painted with rose-color, especially a spot near each end on the hinge margin; anterior end longer, both ends rounded, and the valves rather convex; sculpture of fine concentric regular grooves with wider interspaces, crossed on the posterior end by deep angular radial grooves which serrate the valve margin and are separated by rib-like interspaces; these grooves become less pronounced anteriorly, some of them attaining the anterior third of the disk; interior polished, hinge well developed, pallial sinus longer and less oblique than in *Tellina (Elliptotellina) americana*. Lon. 8, alt. 5, diam. 3 mm.

Type.—No. 96260, U.S.N.M.; dredged in Panama Bay, in 18 fathoms, sand, at station 2798, by the U. S. Fish Commission.

This species differs from the Atlantic species by its much stronger and more extended radial sculpture, and apparently also by its brighter colors and longer pallial sinus.

TELLINA (PHYLLODINA) PRISTIPHORA new species.

(Plate IV, fig. 14.)

Shell compressed, small, the right valve flatter, nearly equilateral; the beaks compressed, acute, low, with the minute prodissoconch and the nepionic shell polished and conspicuous; surface greenish white, chalky, sculptured with evenly spaced elevated concentric lamellæ over the posterior third of the shell, with much wider faintly striated interspaces; in the right valve over the anterior two-thirds of the disk the lamellæ are obsolete except on the dorsal margin, over the umbonal fold they are conspicuous, interrupted by the sulcus above it, and rise into small squarish foliations on the posterior dorsal margin; on the anterior dorsal margin the prominences are more like serrations; on the left valve there are no lamellæ on the disk, but the foliations persist though less prominent; lunule and escutcheon developed between the foliated keels, but very narrow and rather shallow; over all the disk translucent subradial venulations are frequent; interior with the hinge strongly developed, the pallial sinus narrow, obliquely ascending and entirely free from the pallial line below. Lon. 16.5, alt. 9.5, diam. 3 mm. Another specimen, the valve figured, reaches a length of 20 mm.

Type.—No. 108575, U.S.N.M.; dredged near La Paz, Lower California, in 26½ fathoms, by the U. S. Fish Commission at Station 2823.

This is an elegantly sculptured shell, with rather remarkable characters, entirely different from any other species on the coast now known.

TELLINA (EURYTELLINA) LEUCOGONIA new species.

(Plate IV, fig. 5.)

Shell brilliantly polished, rosy in darker or lighter concentric zones, suffused with light yellowish brown, the dorsal margin and umbones white; valves subequilateral, compressed, the anterior end slightly longer; surface smooth near the beaks, but in the adult nearer the margin, especially in front, with a series of fine, concentric, rather distant, evenly spaced grooves, which near the basal middle of the disk are slightly out of harmony with the incremental lines; and on the posterior half of the shell are obsolete; a faint ridge extends from the umbo to the posterior angle of the valves; the space between this ridge is sculptured with concentric striæ, the surface slightly rippled at equal distances, the ripples stronger on the right valve; hinge normal; pallial sinus large, touching the anterior adductor scar and wholly confluent below, the elevated internal ray strong. Lon. 24, alt. 19, diam. 6 mm.

Type.—No. 102182, U.S.N.M., from the Gulf of California, Stearns collection.

This handsome shell, under a magnifier in a good light, shows extremely fine radial striæ somewhat irregularly distributed.

TELLINA (MOERELLA) MEROPSIS new species.

(Plate III, fig. 1.)

Shell small, white, solid, subequilateral, rather swollen, slightly flexed behind, with a rather bluntly pointed posterior end; surface finely concentrically closely striate, with obscure radial striulations and a papery periostracum, which sometimes has an iridescent effect and is often deliquescent; beaks low and pointed; interior white, sometimes with a pale yellow suffusion; hinge normal, the left anterior lateral small but distinct; pallial sinus large, separated from the anterior adductor scar only by the feeble slightly elevated ray. Lon. 15, alt. 11.5, diam. 6.4 mm.

Types.—No. 123410, U.S.N.M., San Diego, California: Miss Shepard.

This quite abundant little shell was confounded with *Tellina gouldii* Hanley, a West Indian species, by Carpenter, and has been called by that name by most Californian collectors.

It recalls the *Tellina mera* and *promera* rather than the genuine *Tellina gouldii*, which is compressed and polished.

TELLINA (MOERELLA) AMIANTA new species.

(Plate III, fig. 12.)

Shell elongated, rather solid, white, the anterior end produced, rounded, the posterior shorter, obliquely truncate, rather pointed;

beaks low, surface sculptured with close concentric ridges, thread-like in front and over most of the disk, but behind and on the posterior dorsal area becoming sharper and more lamellose; hinge normal, the anterior right lateral conspicuously large, a faint trace of a posterior lateral in the same valve; pallial sinus nearly touching the anterior adductor scar and wholly confluent below; there is no trace of an elevated internal ray. Lon. 12.5, alt. 6.2, diam. 3.5 mm.

Type.—No. 108560, U.S.N.M.; dredged in 14 fathoms, sand, off Cape Tepoca, Lower California, near the head of the Gulf, by the U. S. Fish Commission at station 3019.

TELLINA (MOERELLA) PAZIANA new species.

(Plate III, fig. 8.)

Shell small, thin, white, convex, the anterior end slightly longer, rounded, the posterior end bluntly pointed; surface finely concentrically sculptured by the incremental lines, covered with a very delicate dehiscent pale straw-colored epidermis; hinge well developed, a minute but distinct anterior left lateral present; interior polished, only about half the lower portion of the pallial sinus confluent, the anterior part not reaching the adductor. Lon. 10.2, alt. 7, diam. 3.5 mm.

Type.—No. 108580, U.S.N.M.; dredged in 26½ fathoms, near La Paz, Lower California, by the U. S. Fish Commission, at station 2823.

This differs from the young of *Scrobiculina viridotincta* Carpenter, which in outline it resembles, by being less polished, more inflated, and without the deep-set resilium.

TELLINA (ANGULUS) MACNEILII new species.

(Plate III, fig. 7.)

Shell small, solid, inequilateral, the anterior end longer, rounded, the posterior end quite short, depressed, bluntly pointed; color deep rosy, slightly zoned, and paler toward the basal margin; surface closely, sharply concentrically striated, the posterior dorsal area feebly imbricate, with a little obscure radial striulation; valves moderately full, flattish toward the middle of the disk; hinge strong, normal; internal ray obscure; pallial sinus long, nearly reaching the anterior adductor scar, wholly confluent below. Lon. 12.5, alt. 7.6, diam. 3.5 mm.

Types.—No. 120660, U.S.N.M., obtained at Guaymas, Mexico, by W. H. Dall.

The species is named in honor of a good collector, to whose efforts we are indebted for a number of additions to the mollusk fauna of Central America and West Mexico.

TELLINA (ANGULUS) SUFFUSA new species.

(Plate III, fig. 10.)

Shell eumcate, very thin, convex, blunt in front, pointed behind, the posterior end slightly longer, pinkish, yellowish, or translucent white in color; surface rather strongly, closely, and irregularly concentrically striate, with an unusually large and wide lunular impression, but no escutcheon to speak of; hinge normal, delicate; interior polished; the pallial sinus high, well separated from the anterior adductor, though there seems to be no trace of a ray in the specimens examined. Lon. 13.5, alt. 9.2, diam. 4.7 mm.

Type.—No. 105512, U.S.N.M., collected at San Ignacio Lagoon, Lower California, by Henry Hemphill.

This little species is quite characteristic; the unusually large lunule and shorter anterior end are especially notable.

TELLINA (ANGULUS) CERROSIANA new species.

(Plate III, fig. 11.)

Shell minute, compressed, greenish white, the anterior end longer, the surface sharply concentrically sculptured with low, thread-like lamellæ less close over the posterior dorsal area; left valve with a rather marked sulcus extending from the beak to the posterior angle; hinge normal, strong for the size of the shell; pallial sinus elongated, confluent below, nearly reaching the adductor. Lon. 5.2, alt. 3.2, diam. 1.5 mm.

Types.—No. 151957, U.S.N.M., dredged off Cerros Island, Lower California, in 9–10 fathoms, by the U. S. Fish Commission.

These little shells may not be adult, but if so they nevertheless do not agree with the young of any of the other species from this vicinity so far obtained

TELLINA (ANGULUS) PANAMENSIS new species.

(Plate III, fig. 3.)

Shell small, thin, ivory-white, polished, rather compressed, flexuous behind, the anterior end much the longer, produced and rounded, posterior end with the ligament rather deeply inset, margin obliquely descending to a rather blunt point; surface smooth or marked only by incremental lines, except near the basal margin, where there are a few incised lines with wider interspaces, not quite in harmony with the lines of growth; posterior dorsal area minutely concentrically rippled; hinge normal, delicate; pallial sinus large, not reaching the adductor, mostly confluent below; the elevated ray absent or obsolete. Lon. 9, alt. 5.25, diam. 2.5 mm.

Types.—No. 108557, U.S.N.M., dredged in 30 fathoms in Panama Bay by the U. S. Fish Commission, at station 2799.

A simple little species, but one which can hardly be united with any other known from the vicinity. Fresh specimens exhibit on the surface a lovely iridescent glow.

TELLINA (ANGULUS) RECURVA new species.

(Plate III, fig. 4.)

Shell translucent white, brilliantly polished, rather compressed, with very low beaks, the anterior side longer, produced and evenly rounded, the posterior side with the site of the ligament excavated, the posterior end rounded and slightly recurved; surface with faint, concentric, chiefly incremental sculpture, anterior end with a marked gape; hinge feeble, lateral tooth very small; pallial sinus short, subtriangular, confluent below. Lon. 12, alt. 7.5, diam. 2.75 mm.

Types.—No. 108559, U. S. N. M., dredged near the head of the Gulf of California in 24 fathoms mud, off Point San Fermin, by the U. S. Fish Commission, at station 3034.

The peculiar form of this shell distinguishes it from any other on the coast. It is most like a young *Macoma goldiformis*, but more blunt behind, and with a different hinge. The delicate anterior right lateral is frequently broken off in separated valves.

TELLINA (ANGULUS) CARPENTERI, new name.

Angulus variegatus CARPENTER, Ann. Mag. Nat. Hist., 3d Ser., XIV, Dec. 1864, p. 5; not *Tellina variegata* Gmelin, Syst. Naturæ, 1792, p. 3237.

Gmelin's species is also an *Angulus*, and therefore the Californian form requires a new name. The elevated internal ray is absent or obsolete.

TELLINA (OUDARDIA) BUTTONI new name.

(Plate IV, figs. 12, 13.)

Angulus modestus? var. *obtusus* CARPENTER, Suppl. Report Brit. Assoc. for 1863, p. 639, 1864; Smithsonian Miscell. Coll. No. 252, 1872, p. 125; Proc. Acad. Nat. Sci. Phila., 1865, p. 56, not *Tellina obtusa* J. SOWERBY, Min. Conch., II. pl. 179, 1818, nor *T. obtusa* G. B. SOWERBY, Conch. Iconica, 1868.

Angulus modestus of the majority of Californian collectors.

Shell elongated, subequilateral, compressed, polished, white, rounded before, slightly shorter and pointed behind, with a slight flexuosity; surface finely concentrically grooved, with wider interspaces, the sculpture stronger on the right valve and anteriorly; beaks low, inconspicuous; interior polished, white, with a well-marked thickened ray behind the anterior adductor scar; pallial sinus reaching the ray, confluent below. Lon. 16, alt. 9.5, diam. 3.5 mm.

Types.—No. 42865a, U.S.N.M., from the island of Guadalupe, off Lower California.

This species is much more acute behind than *Tellina* (*Oudardia*) *compressa* Brocchi, of the Mediterranean, and has not the oblique sculpture on the disk of that species.

The species named *Angulus modestus* by Carpenter, as represented by the type specimen from Puget Sound, is quite distinct from the form subsequently named by him variety *obtusus*, from southern California. The name *obtusus* being preoccupied for a species of *Tellina*, I propose the above specific name in honor of Mr. Fred. L. Button, of Oakland, California, an enthusiastic student of Californian shells. It belongs to the section *Oudardia* of Monterosato, characterized by having the elevated ray sharply defined, but is almost exactly intermediate between the more common forms of *Angulus* like *A. tener* Say and the typical species of *Oudardia*, which approaches *Scissula* by its oblique external grooving.

TELLINA (PERONIDIA) SANTAROSÆ new species.

(Plate III, fig. 6; plate IV, figs. 1, 2.)

Shell white, frequently with pale brownish concentric zonation, and subtranslucent radial venulations; valves rather thin, compressed, hardly flexuous behind, beaks low, and nearly central; surface polished, concentrically evenly grooved with wider flat interspaces especially on the anterior half of the disk; on the posterior fourth of the right valve the interspaces are narrowed and elevated showing a tendency to become lamellose; if an imaginary line be drawn from the beak to the basal margin, in front of that line in the adult the concentric sculpture seems to fail suddenly, leaving an obscurely triangular area almost without sculpture; on the left valve the sculpture is not interrupted but appears feebler over the whole disk than in the right valve; hinge with the laterals obsolete, posterior radial callus not differentiated into a ray, pallial sinus low, short, mostly coalescent below. Lon. 51.5, alt. 24.5, diam. 6 mm. The dimensions of a similar valve of *Tellina bodegensis* Hinds are: Lon. 52, alt. 24, diam. 9.5 mm.; the beaks in the former are 20 mm. in front of the posterior end of the shell, while in the latter the distance is 23 mm.

Type.—No. 60212, U.S.N.M., collected at Santa Rosa Island, of the Santa Barbara group, California, by Stephen Bowers.

This shell is perhaps a southern race of *Tellina bodegensis*, or may prove to be a distinct species with more material. It is confined to the region about the islands and San Pedro; the northernmost specimen is from Santa Barbara, on the mainland. But we have typical specimens of *Tellina bodegensis* from as far south as San Diego. *Tellina santarosæ* seems to differ by its thinner, flatter, and more compressed shell, by details of sculpture, the form of the pallial sinus, and by being more equilateral.

TELLINA (PERONIDIA) LUTEA Gray.

(Plate IV, figs. 15, 16.)

Tellina lutea GRAY, in Wood's Index Testaceologicus, Supplement, pl. 1, fig. 3c, 1828; not of Krause.

Tellina guildfordia GRAY, in Griffith's Cuvier, XII, pl. 19, fig. 2, 1834.

Tellina alternidentata BRODERIP and SOWERBY, Zool. Journ., IV, p. 363; SOWERBY, Zoology of the voyage of the Blossom, Capt. Beechey, 1839, p. 153, pl. 44, fig. 5.

? *Tellina venilosa* SCHRENCK, Bull. de l'Acad. Imp. des Sci., 1861, p. 411; Annuir. Moll., 1867, p. 556, pl. xxii, figs. 2-5.

It seemed desirable that a good figure of this fine shell should be available, so one has been included. The specimen figured is No. 122562, U.S.N.M., collected at Bering Island by Governor Grebnitzki.

MACOMA KRAUSEI new species.

(Plate IV, fig. 8.)

Tellina lutea A. KRAUSE, Archiv für Naturgeschichte, 1885, p. 37; not of Gray.

Specimens obtained by Dr. Krause in the vicinity of Bering Strait, and donated by him to the U. S. National Museum, were supposed to be young specimens of *Tellina lutea* Gray. They prove, however, on careful examination, to belong to an undescribed species of *Macoma*, which is represented in the U. S. National Museum from many localities in Bering Sea and the Arctic Ocean, including specimens from both Greenland and Spitsbergen as well as the Alaskan waters.

Shell of a nearly egg-oval outline, with very low beaks, situated at the posterior third; valves not flattened but only slightly convex, marked with faint incremental sculpture and covered with an olive green, usually polished periostracum; there is hardly any posterior flexure and no rostration; hinge normal, very delicate; pallial sinus small rather low and reaching only about three-fifths of the distance from the posterior end of the shell forward: mostly confluent below. Lon. 23.5, alt. 14.5, diam. 5.7 mm.

Types.—No. 108606, U.S.N.M., collected in the Arctic Ocean north of Bering Strait by Capt. E. E. Smith, off Icy Cape in 7 to 15 fathoms.

The species has much the general appearance of *Yoldia myalis*, though nearly of the color of *Yoldia limatula*. It differs from *Macoma carlottensis* Whiteaves in not being flattened, in its rounded posterior end, and different color. When once recognized it is easily picked out from the related species. The Greenland and Spitsbergen specimens were referred to *Macoma inflata* by Jeffreys, but that species is proportionately much more inflated, more arcuate and flexuous, and never reaches so large a size. It is named in honor of Dr. Arthur Krause, who worked up the mollusks of his expedition to Alaska.

MACOMA SITKANA new species.

(Plate IV, figs. 6, 7.)

Shell thin, calcareous, elongate, nearly equilateral, white, with a dull papyraceous, grayish-olive periostracum: surface marked only by lines of growth, which are stronger posteriorly; anterior end larger and pretty evenly rounded, posterior end attenuated, rather squarely truncate, flexuous, and moderately gaping; hinge delicate, normal; pallial sinus discrepant in the two valves, in the right valve shorter and higher and about half confluent below, in the left longer, nearly reaching the adductor scars and almost entirely confluent with the pallial line below. Lon. 41, alt. 26, diam. 10 mm.

Type.—No. 108656, U.S.N.M., dredged at Sitka Harbor, Alaska, in 15 fathoms, by W. H. Dall.

This species is nearest *Macoma calcarea* Gmelin, which is less slender, larger, heavier, and more inequilateral, the outline of the pallial sinus in the left valve is more gibbous and less confluent below, and the beaks much more conspicuous.

MACOMA LEPTONOIDEA Dall.

(Plate IV, figs. 4, 9.)

Macoma leptonoidea DALL, Nautilus, IX, July, 1895, p. 33.

Type specimen.—No. 125532, U.S.N.M., from Matagorda Bay, Texas; Lloyd. Figured specimen No. 108579, U.S.N.M., dredged in 332 fathoms green mud, Santa Barbara Channel, California, by the U. S. Fish Commission, at station 2903; and also found at station 2904, near by, in 314 fathoms, the bottom temperature being 44° F.

The occurrence of this species in two such different localities is difficult to explain; the facts, however, seem beyond question, and the specimens show no differences whatever. Several years intervened between the receipt of the Texas specimen and that of the bottle of dredgings from California, so that there seems no opportunity for a confusion of labels. As the species has not hitherto been figured, illustrations of it are now furnished.

MACOMA ALASKANA new species.

(Plate III, fig. 5.)

Shell small, very inequilateral, moderately inflated, white, with a polished pale-greenish periostracum; beaks low but acute, two-fifths of the whole length of the shell from the posterior end; anterior end produced, evenly rounded, posterior end descending rapidly to a rather

blunt point; surface sculptured only with faint incremental lines; hinge normal, strong for the size of the shell; pallial sinus discrepant, in the right valve small, gibbous, short, about two-thirds confluent below; in the left valve large, reaching nearly to the anterior adductor scar, and three-fourths confluent below. Lon. 14, alt. 9, diam. 4 mm.

Types.—No. 108652, U.S.N.M., dredged at Lituya Bay, Alaska, in 8 fathoms, sand, by W. H. Dall, at station 1126. The species was also obtained in 12 fathoms, mud, in Sitka Harbor, at station 1109.

This little shell looks externally like an *Angulus*, but internally has the characters of *Macoma*. It is not closely related to any of the other *Macomas* of the coast.

MACOMA (INDENTATA Carpenter, var.?) TENUIROSTRIS Dall.

Macoma indentata CARPENTER, Proc. Cal. Acad. Nat. Sci., III, 1866, p. 119 (*ex parte*).

The species cited was founded upon two lots of specimens, both from San Pedro, California, one young (Palmer) and fresh, the other (Cooper) dead, more or less worn valves. Dr. Carpenter remarks that it "differs from *M. umbonella* Lamarck in its *sceta*-like post-ligamental wing. This being rubbed off in the large dead valves, the shell [in them] has the aspect of a very distinct species." An examination of the material in the collection of the U. S. National Museum shows that the difference above alluded to by Dr. Carpenter does not rest alone on the absence of the post-ligamental wing. The typical *indentata* is a shorter, smaller, flatter, and much less rostrate shell, besides being more inequivalve. For the rostrate form, pending the acquisition of more and fresh material, I would propose the varietal name of *tenuirostris*. It measures: lon. 55, alt. 33, and diam. 16 mm. The nearest specimen of the typical form measures respectively 44, 31, and 12 mm. The beaks are 25 mm. behind the anterior end and in *tenuirostris* 33 mm. behind it. The left valve is notably flatter than the other in the type, while in the only pair we have of the variety the valves, though flexuous, hardly differ in degree of convexity.

MACOMA (PSAMMACOMA) PANAMENSIS new species?

(Plate IV, fig. 3.)

Shell elongated, slender, thin, inequilateral, moderately convex, whitish; surface finely concentrically striated with (especially toward the basal margin) numerous obscure radial striulations; beaks rather low, anterior end longer, evenly rounded, posterior end produced, attenuated, and subrostrate; periostracum delicate, yellowish, dehiscent; hinge normal; pallial sinus long, but rather distant (in the left valve) from the adductor scar, about half confluent below, the interior of the

valve near the margins with obscure striations. Lon. 32, alt. 14, diam. 6.5 mm.

Type.—No. 96252, U.S.N.M., dredged in 33 fathoms, sand, in Panama Bay, at station 2795, by the U. S. Fish Commission.

Only a left valve of this species was obtained, which bears a notable resemblance to *Macoma catenuata* Dall, from the Gulf of Mexico. In that species, besides the difference of size the pallial sinus seems to approach proportionally nearer the adductor and to be more extensively confluent below. More material is necessary to determine the relations of the Atlantic and Pacific shells.

Supplementary note.—The details of many matters which are briefly summarized in this paper may be found in full in Trans. Wagner Institute of Science, Volume III, No. 5.

EXPLANATION OF THE PLATES.

PLATE II.

- FIG. 1. *Macoma limula* Dall, North Carolina; lon. 13 mm.; see p. 315.
 2. *Tellina iheringi* Dall, La Plata; lon. 27.5 mm.; see p. 311.
 3. *Tellina georgiana* Dall, Georgia; lon. 32 mm.; see p. 310.
 4. *Macoma mitchelli* Dall, Texas; lon. 15 mm.; see p. 314.
 5. The same Dall; dorsal view.
 6. *Tellina (Angulus) flagellum* Dall, West Indies; lon. 9.5 mm.; see p. 312.
 7. *Macoma (Psammacoma) extenuata* Dall, Gulf of Mexico; lon. 14.5 mm.; see p. 314.
 8. *Tellina (Elliptotellina) americana* Dall, North Carolina; lon. 6.5 mm.; see p. 311.
 9. *Tellina (Angulus) colorata* Dall, West Indies; lon. 13.5 mm.; see p. 313.
 10. *Tellina (Merisca) crystallina* Wood, South Carolina; lon. 23 mm.; see p. 311.
 11. *Tellina (Angulus) promera* Dall, Bermuda; lon. 18.5 mm.; see p. 312.

PLATE III.

- FIG. 1. *Tellina (Moerella) meropsis* Dall, California; lon. 16 mm.; see p. 317.
 2. *Tellina (Merisca) reclusa* Dall, Gulf of California; lon. 20 mm.; see p. 315.
 3. *Tellina (Angulus) panamensis* Dall, Panama; lon. 9.5 mm.; see p. 319.
 4. *Tellina (Angulus) recurra* Dall, Gulf of California; lon. 12 mm.; see p. 320.
 5. *Macoma alaskana* Dall, Lituya Bay, Alaska; lon. 15 mm.; see p. 323.
 6. *Tellina (Peronidia) santarosae* Dall, young shell; lon. 15 mm.; see p. 321.
 7. *Tellina (Angulus) macnilli* Dall, Guaymas; lon. 13 mm.; see p. 318.
 8. *Tellina (Moerella) paziana* Dall, La Paz; lon. 9 mm.; see p. 318.
 9. *Tellina (Elliptotellina) pacifica* Dall, Panama; lon. 8 mm.; see p. 316.
 10. *Tellina (Angulus) suffusa* Dall, Lower California; lon. 13.5 mm.; see p. 319.
 11. *Tellina (Angulus) cerrosiana* Dall, Cerros Island, Lower California; lon. 7 mm.; see p. 319.
 12. *Tellina (Moerella) amianta* Dall, Gulf of California; lon. 13.5 mm.; see p. 317.

PLATE IV.

- FIG. 1. *Tellina (Peronidia) santarosae* Dall, Santa Barbara, California; lon. 52 mm.; see p. 321.
 2. The same, interior view.
 3. *Macoma (Psammacoma) panamensis* Dall, Panama; lon. 31.5 mm.; see p. 324.
 4. *Macoma leptonoidea* Dall, Santa Barbara Channel, California; lon. 21 mm.; see p. 323.

5. *Tellina (Eurytellina) leucogonia* Dall, Gulf of California; lon. 34 mm.; see p. 317.
6. *Macoma sitkana* Dall, interior view, Sitka, Alaska; lon. 42 mm.; see p. 323.
7. The same, external view.
8. *Macoma krausei* Dall, Icy Cape, Arctic Ocean; lon. 23 mm.; see p. 322.
9. *Macoma leptonoidea* Dall, dorsal view; lon. 21 mm.; see p. 323.
10. *Tellina idæ* Dall, young shell, Catalina Island, California; lon. 20 mm.; see p. 301.
11. The same, interior view.
12. *Tellina (Oulardia) buttoni* Dall, interior, showing rib; California; lon. 16 mm.; see p. 320.
13. The same, external view.
14. *Tellina (Phyllodina) pristiphora* Dall, Lower California; lon. 20 mm.; see p. 316.
15. *Tellina (Peronidia) lutea* Gray, Bering Sea; lon. 60 mm.; see p. 322.
16. The same, view of the interior of the left valve.