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ARTICLE I.

NOTICE OF SOME NEW OR INTERESTING SPECIES OF SHELLS FROM BRITISH COLUMBIA AND THE ADJACENT REGION,

BY

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ARTICLE I.

Notice of some New or Interesting Species of Shells from British Columbia, and the Adjacent Region.

(BY WILLIAM HEALEY DALL.)

For many years I have been gathering material toward a monograph of the Mollusk fauna of the North-West Coast, from the Arctic regions to Monterey. In pursuance of this object I have done what I could to interest and encourage those who were investigating any of the local faunas embraced in the above general limits, and many puzzling specimens have been submitted to me for examination and opinion. Some of these have proved new and manuscript names have been applied to them, for convenience in correspondence, pending the receipt of fuller information.

In the energetic researches into the fauna of British Columbia made by Dr. C. F. Newcombe, Rev. Geo. W. Taylor, Mr. Whiteaves, Dr. Geo. M. Dawson, James Richardson, and others, several species were obtained which appeared to be new. It was thought best that they should be suitably described and figured for the use of students, and in order that the names applied to them, already printed in sundry lists, should not remain with the standing of *nomina nuda*. To these I have joined notes on several allied species, and have added a few figures of hitherto unfigured species, some of which, though properly described, have remained unfigured for many years.

In this connection I wish to thank my various correspondents above named, as well as Mr. P. B. Randolph, and the Young Naturalists' Association of Seattle; Mr. and Mrs. Drake, and Mrs. W. B. Hare, of Tacoma; Prof. O. B. Johnson, of the University of Washington, and many others, for various courtesies and assistance on numerous occasions.

Genus CRENELLA, Brown.

The Arctic and boreal species of *Crenella* are not numerous, though quite a number of rather deep water species from Japan and vicinity have been named and very imperfectly described by A. Adams, in the Annals and Magazine of Natural History for 1862. On the European shores of the North Atlantic *Crenella decussata*, Mtg., is the only representative. On the American side of that ocean, beside *C. decussata*, we have *C. glandula*, Totten, with which the rare and beautiful *Crenella pectinula*, of Gould, has sometimes been mistakenly identified; and, further north, confined to truly Arctic water, is found *Crenella faba*, of Fabricius.

On the Pacific side, from Northern Japan to the Santa Barbara Islands, the widely distributed *C. decussata* ranges. The place in the fauna, occupied in the east by *C. glandula*, on the Pacific Coast is taken by a new species, the *C. columbiana*. We have no Arctic Pacific species corresponding to *C. faba*, but in the sub-Arctic province, from the Okhotsk Sea to Queen Charlotte Islands, and north to the limit of floating ice in Bering Sea, ranges the elegant *Modiolaria vernicosa*, of Middendorff, which much resembles *C. faba* in colour and form, but is almost devoid of sculpture. As the faint radial striæ are not absent from the middle of the valves, one is puzzled whether

to refer the creature to *Crenella* or *Modiolaria*, until an examination of the soft parts shows a balance of evidence in favour of the latter genus. Still another species of *Crenella* is known from this region, the *C. Leana*, Dall, which will doubtless be eventually found in British Columbia, though the specimens heretofore collected are Alaskan. A splendid species of *Crenella*, the largest known, and which appears to be distinct from any of those named by Adams, was collected by Capt. St. John, R. N., in Northern Japan, and confounded with *C. faba* by Jeffreys, in whose collection I found the types so named. Lastly, a species, having the form and aspect of *Crenella*, but the interrupted sculpture of *Modiolaria*, was dredged by the U. S. Fish Commission in Southern Alaska, at three localities. Further researches can hardly fail to add it to the British Columbian fauna.

CRENELLA COLUMBIANA, Dall, n. sp.

Plate 1, figs. 3, 5.

Shell large for the genus, inflated, elongate oval, thin, of a delicate greenish gray tint, usually somewhat stained by blackish blotches; umbones conspicuous, prosogyrous, terminal; surface of the shell entirely covered with fine radiating threads, like those of *C. decussata*, but proportionately more delicate; concentric sculpture, only of delicate incremental lines; margin of the valves extremely thin and minutely denticulate; a small portion immediately under the beaks thickened; ligament rather long, deep-seated, hardly visible externally; interior pearly, the muscular and pallial impressions hardly visible, close to the margin. Extreme length, 16; height, 12; diameter, 9.5 mm.

Port Orchard, Puget Sound, Randolph; Deep Bay, Vancouver Island, 40 fms., C. F. Newcombe; Sitka Harbour, Alaska, Dall; Chernoffski Harbour, Unalaska, Alaska, in 109 fms., U. S. Fish Commission; Kyska Harbour, Aleutian Islands, in 10 to 16 fms., sand, W. H. Dall.

This species differs from *C. glandula*, Totten, in its more oval, elongate, and inflated form, and when full grown is rather larger. The sculpture in *C. glandula* is coarser and the margin of the valves much more strongly denticulated.

CRENELLA LEANA, Dall, n. sp.

Plate 1, Figs 6, 7.

Shell small, plump, ovate, nearly smooth, with a brilliantly polished olivaceous epidermis; beaks prominent, terminal; sculpture of delicate concentric incremental lines, which at irregular intervals are sharply impressed, crossed by obsolete radial striæ which are hardly perceptible except on the beaks, near the margin of the valves, and at the impressed lines; margin of the valves microscopically dentate; ligament subinternal, inconspicuous; hinge line thickened below the beaks and perceptibly minutely dentate; muscular impressions ovate, rather large; interior of the shell obscurely pearly. Extreme length, 5; height, 3.5; diameter, 3 mm.

Near Middleton Island, Alaska; in Yukon Harbour, Shumagins; Nazan Bay, Atka Island, and Kyska Harbour, Kyska Island, Aleutians, in 10-12 fms., sand or gravel, W. H. Dall.

The species is named in honour of the late Dr. Isaac Lea, well known as a student of the Naiades.

This small species is somewhat more elongate than *C. decussata*, from which it is easily distinguished by its polished surface and absence of the

strong radial threading. In worn specimens the impressed concentric lines are often conspicuous.

CRENELLA JAPONICA, Dall, n. sp.

Plate 1, fig 2.

Shell large, strong, of rich silky chestnut brown, the beaks prominent, not terminal, the whole surface sculptured with flattish radial riblets, strongest anteriorly and near the margin, crossed by delicate lines of growth; valves moderately full, not inflated, internally with a yellowish nacre, the epidermis infolded over the margins which are slightly crenulated by the sculpture; ligament strong, almost wholly internal; margin below the beaks strongly crenulated, forming a conspicuous provinculum.

Lon., 20.7; height, 16; diam., 8.5 mm.

North Japan, in 48 fms., Captain St. John, in Jeffrey's collection, U. S. Nat. Museum, No. 107,635.

This is nearest *C. faba*, from which it differs by its larger size, more flabelliform shape and less inflated valves.

Genus MODIOLARIA, Beck.

MODIOLARIA VERNICOSA, Middendorff.

Plate 1, fig. 4.

Off Masset, Queen Charlotte Islands; Sitka Harbour, Alaska; northward to Cook Inlet at Fort Kenai; westward through the Aleutian chain to the Kurile Islands and Okhotsk Sea; northward in Bering Sea to the Pribiloff Islands; living from low water to 20 fms., usually in mud or sand. W. H. Dall.

This species may easily be recognised by its smooth surface and reddish brown, brilliantly polished epidermis.

MODIOLARIA TAYLORI, Dall, n. sp.

Plate 1, figs. 17, 18.

Shell small, rather solid, modioliform, with a greenish epidermis, and dark purple nacre shining through; inflated, with the middle area of the exterior of the valves impressed; beaks low, not quite terminal; surface smooth, except for lines of growth; the anterior area very small, with some obscure radial striæ; the middle area smooth, its basal margin pouting a little; posterior area, covering more than half the shell, swollen; ligament obscure, almost internal; margins of the valves smooth, except for some small denticulations on a thickened area below the beaks, and a few beyond the distal end of the ligament. Length, 5.5; height, 3; diam. 2.5 mm.

In tidepools at Victoria, Vancouver Island, by Rev. G. W. Taylor, in whose honour it is named.

Though very much the shape of a *Modiola*, the impression of the central area as in typical *Modiolaria*, leads me to refer it to that group.

MODIOLARIA SEMINUDA, Dall, n. sp.

Plate 1, fig. 1.

Shell short, thin, inflated, with a polished greenish epidermis; beaks turgid but not prominent; surface divided by the sculpture into three areas;

the anterior small, with coarser radiating riblets; the middle, smooth and larger; the posterior, covering about two-thirds of the shell, finely radially striate; the only concentric sculpture is that of the delicate lines of growth. Interior of the valves with a pale whiteish nacre, the sculpture showing through and denticulating the margin; thickening below the beaks inconspicuous, finely denticulate; ligament thin, short, not prominent; extreme length of shell 12, height 9, diameter 7.5 mm.

Markoffski Bay, Unalaska, in 54 fms., sand; off Sannakh Islands, Alaska, in 38 and 41 fathoms; U. S. Fish Commission.

This curious and delicate shell has the aspect of a *Crenella*, but the sculpture is that of a *Modiolaria*.

Genus NUCULA, Lamarck.

The genus *Nucula* is rather sparsely represented in shallow water on the North-west Coast, though doubtless numerous abyssal species remain as yet unknown. The ordinary *Nucula* of this region appears to be one which has been referred to *N. tenuis*, as a variety *lucida* Gld. by Carpenter, but seems identical with *Nucula Belloti*, A. Adams, subsequently described by Reeve under the better known name of *N. expansa*. This is found at moderate depths in the Arctic Ocean and Alaska, and in deeper water further south. It has been dredged off the Queen Charlotte Islands in 876 fathoms by the U. S. Fish Commission steamer Albatross.

Nucula (Acila) castrensis, Hinds (*N. Lyalli*, Baird), appears to be rather abundant on the North-west Coast, and ranges from the Aleutian Islands to the coast of Oregon in 8 to 483 fathoms.

The following species appears to be undescribed.

NUCULA CARLOTTENSIS, Dall, n. sp.

Plate 1, figs 15, 16.

Shell small, solid, yellowish olive colour, moderately convex with conspicuous beaks; in perfect specimens the prodissoconch is rather large, smooth and white, but it is commonly eroded; the nepionic shell outside the limits of the prodissoconch is distinguished from the rest by having only delicate concentric sculpture, which abruptly changes to a stronger sculpture of somewhat irregularly concentric ridges with narrower interspaces crossed by numerous fine uniform radial striæ; there is no well defined lunule or escutcheon; the margin in front of the beaks is marked by a radial impressed space, the margin enclosed by which is a little pouting; the interior of the shell is pearly, radially striate near the finely crenulate margin; the chondrophore is narrow and projects backward obliquely into the cavity of the valves; there are about 8 anterior and 12 posterior teeth. Height of the shell 5.2; length, 6; diameter, 3.5 mm.

Dredged off the Queen Charlotte Islands in 876 fathoms by the U. S. Fish Commission steamer Albatross.

This species recalls *N. crenulata*, Adams, of the West Indies, and *N. exigua*, Sby., of the Panama region. From the former it differs in being smaller, more compressed and delicate. *N. exigua* is of a different colour, smaller and much more inflated, while its radial sculpture is less conspicuous.

Genus LEDA, Schumacher.

This genus is more generously represented than *Nucula* in the North Pacific, even when we omit the strictly Arctic species.

Leda minuta Fabricius, and a broad variety of it, are common in the Vancouver waters. It ranges through the Arctic region, east and west, part of the North Atlantic, and on the Pacific south as far as Catalina Island, California, where it has been dredged in 60 fathoms.

Leda acuta, Conrad, (*L. cuneata*, Sby.,) extends from the Aleutian Islands to the Gulf of California, and is also abundant in the temperate and subtropical region of the Atlantic coast of America. The small *Leda hamata*, Cpr., is as yet only known from the Santa Barbara region of California.

LEDA FOSSA, Baird.

Plate 2, figs. 3, 13.

This species was described from a young Vancouver shell, in which condition the anterior slope is often marked by obsolete concentric ripples. But the adult often exceeds 26 mm. in length, and is a smooth brown solid shell, the most common species of the genus in Southern Alaska. It has not yet been figured, and I have therefore included figures of an adult Alaskan specimen. The range of the species is from the Aleutian Islands to Puget Sound, in 10–60 fathoms.

LEDA CELLULITA, Dall.

Plate 2, figs 5, 7.

L. cellulita, DALL, Nautilus, May, 1896, Vol. I, p. 1.

This species so far is only known from Fuca Strait and Puget Sound, where it appears to replace *Leda taphria*, Dall, (*L. caelata*, Hinds, *non* Conrad) with which it has been confounded. The latter (of which figures are also given for comparison*) ranges from Bodega Bay, Cala., to San Diego.

Leda cellulita, when fully grown, reaches a length of 15.5, a height of 10.5, and a diameter of 7.2 mm., and is of a dull olive-gray colour.

LEDA CONCEPTIONIS, Dall.

Plate 2, fig. 1.

L. conceptionis, DALL, Nautilus, May, 1896, p. 2.

This fine species ranges from the Sannakh Islands, Alaska, where it was dredged in 483 fathoms, to the Santa Barbara Channel, California; and has been dredged by the U. S. Fish Commission in 205–278 fathoms at various localities. It is of a polished olive green and reaches a length of 28.0 mm.

LEDA LEONINA, Dall.

Plate 2, fig. 12.

L. leonina, DALL, op. cit., p. 2.

This species has been dredged by the U. S. Fish Commission in the Straits of Fuca and off Sea Lion Rock on the coast of Washington, in 477-559 fathoms. The epidermis is dull and papery and the shell reaches a length of 25 mm.

*Cf., Plate 2, figs. 6, 8.

LEDA EXTENUATA, Dall, n. sp.

Plate 2, fig. 2.

Shell elongated, arcuate, slender, compressed, of a pale olive colour, with a smooth but not brilliant periostracum; surface sculptured with delicate concentric hardly elevated ridges; beaks acute, small, a flat ridge, medially depressed, extends from them to the end of the elongated, obliquely truncate, rostrum; there is no lunule, but between the rostral ridges a depressed smooth space might be regarded as an escutcheon; valves very inequilateral, the beaks $\frac{9}{34}$ of the distance from the anterior to the posterior end; interior white, smooth with an elevated ridge unequally dividing the rostral channel; chondrophore small, directed backward; hingeplate very narrow, bearing extremely oblique, long, thin, narrow, laminar teeth, of which nine are anterior and twelve posterior. Length of shell, 17; height, 6; diameter, 3 mm.

Dredged by the U. S. Fish Commission in 1,569 fathoms, ooze, off Dixon Entrance, British Columbia. Bottom temperature 34°9 Fahr.

This shell is quite remarkable for its elongated compressed teeth, and slender arcuate form. It is sufficiently distinct not to need comparison with the other species of the coast.

Genus YOLDIA, Morch.

This group is more numerous in species than either of the preceding genera, and a larger proportion are not confined to the Pacific.

The great *Yoldia thraciæformis*, Storer, of the North Atlantic is found in the Pacific from the Aleutian Islands to Puget Sound, and has been dredged at various depths between 8 and 238 fathoms in this ocean.

Yoldia limatula, Say, dredged about Vancouver Island by Hepburn and Taylor, ranges northward to the Arctic Ocean and eastward to the North Atlantic.

Yoldia arctica, Gray, (Parry's voyage), the *Y. amygdalea*, of Hanley, is a circumboreal species, which extends its range southward to Puget Sound. After an examination of several hundred specimens from many localities, I am inclined to think that the form named *Y. vancouverensis*, by Smith, is merely a phase of this species. The curious shagreening of the periostracum which occurs in some specimens, is not constant, and may be pathologic.

Yoldia truncata, Brown, and its variety *intermedia*, Sars, are also circumboreal, but I have not seen specimens from points south of Bering Sea.

YOLDIA SEMINUDA, Dall.

Y. seminuda, DALL, Am. Journ. Conch. VII, p. 153, 1871.

St. Paul Harbour, Kodiak, in 17 fathoms; Liturya Bay and Sitka, Alaska, 8-15 fathoms, W. H. Dall; Victoria and Comox, B. C., C. F. Newcombe and G. W. Taylor.

Yoldia scissurata, Dall, has been dredged by me in the Arctic Ocean, and thence southward to the vicinity of Sitka, in 10 to 50 fathoms. South of Sitka it appears to be replaced by the following species, which has been generally confounded with the true *scissurata*.*

**Yoldia arctica*, Brod. and Sby., not of Gray; *Y. lanceolata*, of authors, not of Sowerby; the latter is a British fossil.

YOLDIA ENSIFERA, Dall, n. sp.

Plate 2, fig. 4.

Shell large, thin, compressed, with a brilliant olivaceous periostracum, usually showing darker and lighter zones; valves nearly equilateral, moderately convex, rostrate, subarcuate; sculpture of fine lines of growth more or less evident, and on the anterior two-thirds of the shell numerous irregularly fluctuating, distant, incised grooves (like those of *Y. scissurata*) which are absent on the posterior third; base arcuate, anterior dorsal profile rounded evenly from the beaks; a slight inward wave of the margin is visible anteriorly near the pedal gape; lunule absent; the escutcheon impressed, and the posterior dorsal margins of the valves, projecting vertically, blade-like, and slightly pouting; rostrum pointed, slightly recurved, beaks low inconspicuous; valves internally whitish; pallial sinus deep, rounded; chondrophore wide, hardly projecting; teeth narrow A-shaped, slender, about 30 in front of and 24 behind the chondrophore. Length 35, height 16, diameter 6 mm.

This species ranges from Vancouver Island and Puget Sound, southward to Monterey, California, in from 30 to 135 fathoms.

All the specimens from the region indicated, which hitherto had been referred to *Y. scissurata*, Dall, prove on examination to belong to this species. It differs from *scissurata* in being more equilateral, in having the grooved sculpture sparser and less extended, in being more compressed and more pointed but less recurved behind, and in the greater length, height and prominence of the blade-like extension of the posterior dorsal margin. The colour of *scissurata* is also generally notably darker than in the present species. *Y. seminuda* is larger, darker, with the rostrum shorter, less pointed, more recurved and with the grooves differently distributed; the posterior teeth are also more adjacent and fewer. In form *Y. ensifera* agrees better with *Y. limatula* which has no grooving.

YOLDIA MONTEREYENSIS, Dall.

Plate 2, fig. 16.

Yoldia montereyensis, DALL, Nautilus, July, 1893; Vol. VII., No. 3, p. 29.

This species ranges from the Aleutian Islands to Monterey, California, in 30 to 695 fathoms. It has been dredged in Puget Sound by the U. S. Fish Commission in 30 fms., and on the coast of British Columbia in 238 fms., off Vancouver Island.

This shell at first sight recalls *Y. thraciæformis*, but may readily be distinguished from that species by its closefitting valves, which do not gape perceptibly, and its less rectangular shape. The largest specimen seen is 37 mm. in length, a size which is much exceeded by well grown specimens of *Y. thraciæformis*.

YOLDIA MARTYRIA, Dall, n. sp.

Plate 2, fig. 15.

Shell olive greenish, polished, smooth, nearly equilateral; surface sculptured only by obsolete incremental lines; two or three rays extend obliquely backward from the beaks, due to some variation of colour in the periostracum, but these do not interrupt the smoothness of the surface; beaks full, but not prominent; base arcuate, posterior end roundly pointed, subrostrate,

compressed, slightly recurved; there is a long narrow, slightly impressed lunule and escutcheon, both of which are delicately striate, longitudinally, and the dorsal margins included within them are not quite closed; the rostrum gapes slightly, but there is no obvious pedal gape; within the shell is white, with a deep rounded pallial sinus; chondrophore rounded, one-half of it projecting below the hingeplate; there are 21 anterior and 17 posterior teeth, narrow, high, and rather strong. Length of shell, 26; height, 15; diameter, 11 mm.

Puget Sound, 35-135 fms.; Gulf of California off the Island of San Pedro Martir, in 65 fms.; U. S. Fish Commission steamer Albatross.

This species is closely related to *Y. montereyensis*, from which it differs especially by its more compressed and acute posterior end.

Genus MALLETIA, Desmoulins.

This genus is now for the first time recorded from the north-west coast of America. Other species will probably turn up as the deep water is more thoroughly explored.

MALLETIA FABA, Dall, n. sp.

Plate 2, fig. 10.

Shell ovate, smooth, slightly inequilateral, inflated, thin, covered with yellowish olive, brilliantly polished periostracum; beaks full, but not elevated, nearer the posterior end; anterior end rounded, dorsal and ventral margins nearly parallel, posterior end shorter, slightly more pointed; surface smooth or marked only by feeble lines of growth; a feebly impressed line may be regarded as the boundary of a lanceolate escutcheon, which is not impressed; internally bluish white, a small high pallial sinus reaches nearly to the vertical of the beaks; hingeplate very narrow, the ligament very small and black, is wholly external and posterior; there are about nine small posterior teeth, the anterior teeth are still smaller and shorter and number about 32. Length of shell, 22.5; height, 13; diameter, 9 mm.

Off Sea Lion Rock, coast of Washington, in 477 fms.; off Queen Charlotte Islands, British Columbia, in 876 fms.; off Tillamook in 786 fms.; off San Diego, Cal., in 822 fms., U. S. Fish Commission.

This elegant little shell is remarkable for its plump rounded-oval shape, so different from the flattened type to which most species of the genus conform. A very similar but smaller species is found on the Atlantic coast of North Carolina.

MALLETIA GIBBSII, Dall, n. sp.

Plate 2, fig. 14.

Shell small, thin, sub-equilateral, inflated, with a polished pale olive periostracum and smooth surface; anterior end shorter, rounded; posterior end very slightly recurved; beaks full, not acute, base arcuate; ligament wholly external, amphidetic, discontinuous below the beaks; interior bluish white, with a large rounded pallial sinus; anterior teeth 17, posterior 19, the line separated by a vacant triangular space on the hinge plate below the beaks.

Length, 10; height, 6.5; diameter, 3.5 mm.

Off Queen Charlotte Islands, British Columbia, in 876 fms., U. S. Fish Commission.

This small shell has much the aspect of some of the small Ledas, but the ligament is wholly external. The species is dedicated to the memory of the

late Dr. Geo. Gibbs, naturalist and ethnologist of the International Northwest Boundary Commission, whose work in the Puget Sound region is well known.

MALLETIA PACIFICA, Dall, n. sp.

Plate 2, fig. 11.

Shell thin, inequilateral, gaping, elongate-ovate, with a brilliant olive-yellow periostracum, showing zones of lighter and darker colour, and smooth inflated valves; beaks low, anterior, nearly reaching the anterior third; surface marked by obsolete incremental lines, and behind, with obscure radial depressions; base arcuate, anterior end acutely rounded, anterior dorsal margins vertical, pouting, somewhat gaping; anterior part of the shell more inflated, posterior more compressed, posterior ventral margin waved, posterior end obscurely obliquely truncate, posterior dorsal margin straight, with a long very narrow black ligament, which is continuous between and for a short distance in front of the beaks; pedal and siphonal gape conspicuous; interior bluish white, pallial sinus extremely shallow; hinge plate very narrow, the anterior teeth larger, much crowded, about 12 in number; posterior teeth very small, about 45 in all; length of adult 30, height 17, diameter 10 mm.

Clarence Strait, Alaska, in 322 fms.; off Straits of Fuca 877 fms.; off San Luis Obispo Bay, Cala., in 252 fms.; off Point Conception, Cala., in 278 fms., U. S. Fish Commission.

This species is more nearly the shape of the Antarctic types, upon which the genus was founded.

MALLETIA (TINDARIA) KENNERLYI, Dall, n. sp.

Plate 2, fig. 9.

Shell small, cythereiform, plump, with a yellowish periostracum; beaks full, rather prominent; valves nearly equilateral, rounded before and behind, base regularly arcuate; surface uniformly sculptured with rounded narrow, equal close-set, small concentric riblets; lunule and escutcheon obscure or none; interior white, the pallial line hardly sinuate; ligament short, external, opisthodetic; hinge plate and teeth rather strong, anterior teeth about 12, posterior 14, the series hardly interrupted; length of shell 6.5; height 5; diameter 4 mm.

Off the coast of Washington in 559 fms., U. S. Fish Commission.

This small species is dedicated to the memory of Dr. C. B. R. Kennerly, of the North-west Boundary Commission, the first naturalist to systematically dredge in Puget Sound, and who, had his life been spared, would doubtless have added still more largely to our knowledge of the marine fauna of this region.

Malletia Kennerlyi is closely related to *M. cytherea*, Dall, of the Antillean region, the latter species being more inequilateral, more triangular, and more pointed at the posterior end.

Genus MACOMA.

MACOMA INFLATULA, Dall, n. sp.

Plate 1, figs. 19, 20.

Shell small, thin, rather inflated; full and rounded in front; shorter, compressed and pointed behind, the rostrum strongly bent to the right; surface smooth except for lines of growth, often polished cream colour or whitish,

sometimes pale brown with darker umbones, covered with a papery, dehiscent epidermis, which is either gray or greenish; ligament short; interior whitish, the palleal sinus reaching before the vertical of the beaks, rounded, subequal in the two valves; left valve with a strong slightly bifid anterior, and a simple, smaller posterior cardinal tooth; right valve with two nearly equal grooved cardinals. Length 24.5; height, 17.5; diameter 8.5 mm.

Aleutian Islands to Puget Sound.

This species is quite abundant in the Aleutians, and might be mistaken for the young of *M. nasuta*, Conr., but is proportionately more inflated, thinner, and more twisted. What appeared to be the young of it were collected at Comox, by Dr. Newcombe.

The small *Macoma* from Clayquot, which was supposed to be new* when first examined, proves on further study to be identical with Carpenter's *M. yoldiformis*, described from Neeah Bay, and ranging south to San Diego. The *M. carlottensis* of Whiteaves may prove identical with *M. frigida*, Gray, wrongly referred by Middendorff to *M. proxima* as a synonym. It ranges north to the Bering Sea, and the Arctic from Queen Charlotte Islands, and somewhere I have seen it identified as *M. iridescens*, Sby., *non* Benson, but have not been able to find any printed description of *iridescens*, Sby.

MACOMA LIOTRICHA, Dall, n. sp.

Plate 1, fig. 21.

Shell large, thin, somewhat inflated, with a polished straw-yellow periostracum, and rather coarse concentric lines of growth; valves nearly equilateral, the ligament strong, external; base rounded evenly into the rounded anterior end, posterior end bluntly pointed with two faint radial plications hardly indenting the margin; valves gaping a little dorsally, in front of the beaks; left valve slightly smaller than the right, beaks small and low; internally chalky white, the pallial sinus deep, roughly triangular, slightly large in the left valve, cardinal teeth thin, feeble, often obsolete or eroded, two in each valve. Length 45; height 34; diameter 16 mm.

Arctic Ocean to Queen Charlotte Islands.

The young of this species would be a good deal like *M. carlottensis*, but are not flattened. The adult is easily distinguished from any of the other species of the coast by its yellow periostracum, and thin rather inflated rounded valves.

Genus CADULUS, Philippi.

CADULUS HEPBURNI, Dall, n. sp.

Plate 1, fig. 13.

Shell small, polished, smooth, white, nearly straight; apertures circular, their margins simple; length of shell, 11; diameter at anterior end, 1.25; at posterior end, 0.75 mm.

Near Victoria, Vancouver Island, in 60 fms., Nat. Hist. Soc. of British Columbia.

This shell in some lights appears to have longitudinal streaks of more or less opaque white, but there is no development of longitudinal sculpture.

The only other species described from this region is *Cadulus aberrans*, Whiteaves, which is larger and more arcuate. An apparently undescribed species from the east coast of North America, near Cape Hatteras, North

*Bull, Nat. Hist. Soc. Brit. Col., 1893, p. 45.

Carolina, is very close to *C. Hepburni*, though the slight differences observable may be thought sufficient, taking the habitat into consideration, to separate it specifically. I have named the Columbian species in honour of the late James Hepburn, Esq., one of the earliest collectors of British Columbian mollusks, and who is well known for his contributions to the herbaria of European botanists.

CADULUS TOLMIEI, Dall, n. sp.

Plate 1, fig. 8.

Shell small, thin, polished, translucent bluish white, rather arcuate and rapidly tapering behind, the anterior orifice oblique, nearly circular, the posterior orifice circular, simple; sculpture none, or only of obscure, incremental lines. Length of shell, 12.0; max. diam., 2.0; min. diam., 0.7 mm.

Near Victoria, Vancouver Island, in 60 fms., with the last species.

This species is markedly different, both in its arcuation and the inflation of the anterior part, from either *C. aberrans* or *C. Hepburni*. I have named it in honour of the late Dr. William Tolmie, of Victoria, sometime officer of the Hudson Bay Co., who for many years contributed valuable material to students of the ethnology and natural history of British Columbia, both in America and England.

Genus CYTHARA, Schumacher.

CYTHARA VICTORIANA, Dall, n. sp.

Plate 1, fig. 9.

Shell small, solid, brownish or livid purple, with six whorls; spire rather acute, nucleus worn, but apparently smooth, the succeeding whorls sculptured with strong flexuous, discontinuous ribs, which cross from suture to suture; the interspaces are wider than the ribs, of which there are nine on the last whorl; suture distinct, somewhat appressed and undulated by the ends of the ribs; aperture long, narrow, with a wide strong anal notch, the outer lip strong and heavy; pillar smooth, canal short, not recurved. Length of shell 7; max. diameter 3 mm.

Near Victoria, Vancouver Island, dredged in 10–20 fms. C. F. Newcombe.

The surface of this small shell is rather rude and somewhat worn, but there may be in perfect specimens some fine spiral striation. It is not very closely related to any of the other species of the region, but recalls *Cythara stellata*, Stearns, of Florida, and *C. crassicosta*, C. B. Adams, from the Antilles, though sufficiently different from either.

Genus TURBONILLA, Risso.

Subgenus MUMIOLA, A. Adams.

? MUMIOLA TENUIS, Dall, n. sp.

Plate 1, fig. 10.

Shell small, thin, strawcoloured, with four and a half whorls; nucleus sinistral, smooth, polished, large; subsequent whorls moderately inflated, evenly spirally groved, with flattish wider interspaces; transverse sculpture obsolete or none; suture distinct; base ovately rounded, not umbilicate; aperture higher than wide, peristome thin, sharp, continuous, joined across the body

by a thin callus; pillar smooth, a single plait, invisible from the front, nearly reaching the aperture; throat smooth. Alt. of shell 2.25; diam. 0.8 mm.

Cumshewa Inlet, Queen Charlotte Islands, 10–15 fms. C. F. Newcombe.

This form belongs to a group referred to *Mumiola*, by Adams and Carpenter, but these shells require a thorough revision before their systematic position can be regarded as fixed. It is, in brief, a *Turbonilla*, with exclusively spiral sculpture and few whorls.

Genus ODONTOSTOMIA, Jeffreys.

ODONTOSTOMIA (MIRALDA) INFLECTA (Cpr. MSS.) Dall.

Shell small, yellowish white, acute, with rounded whorls, nucleus smooth, sinistral, immersed, of one and a half whorls; the subsequent (five) whorls neatly rounded, with a distinct suture; sculpture of (on the upper whorls four) rather strong subequal revolving ribs crossing little-elevated, transverse riblets; the reticulation is caused by a nodulation of the spiral sculpture over the supposed riblet, rather than by the rise and fall of the spirals over and between the riblets; the nodules when well developed lie in the same axial line, and are sometimes apparently connected by the subjacent riblet, in other less nodulous specimens the connection is hardly evident; in some specimens all four spirals are nodulous, in others only the upper two or three; on the latter part of the last whorl the sculpture is apt to be feeble; the base has one large peripheral and 5–6 smaller spirals and is slightly puckered, but not nodulous near a very narrow umbilical chink; aperture ovate, simple, slightly angular at the base of the rather straight pillar, which has about midway, well inside the aperture, a single rather stout plait. Lon. 3.6; max. diam.; 1.4 mm.

Cumshewa, Queen Charlotte Islands, in 10 fms., C. F. Newcombe; Monterey, California, Canfield; Point Abreojos, Lower California, Hemphill.

This interesting little form was named from Canfield's specimens, in manuscript, by Dr. P. P. Carpenter, *Mumiola inflecta*, but I am unable to state that the name has been published, and so have thought it best to supply a description.

The species is closely paralleled by *O. seminuda*, C. B. Ads., of the eastern coast of North America, which is a somewhat larger and coarser shell, with less conspicuous nodulation.

Genus RISSOINA, d'Orbigny.

RISSOINA NEWCOMBEI, Dall, n. sp.

Plate 1, fig. 12.

Shell small, thin, white, with six and a half whorls; nucleus transparent, polished, smooth; subsequent whorls with closeset, low, fine, slightly flexuous, transverse (or axial) riblets; suture distinct, somewhat appressed; aperture large, patulous, with the lips rather thickened. Lon. of shell 3; diam. 1 mm.

Cumshewa Inlet, 20 fms. C. F. Newcombe.

This quite distinct little species cannot be confounded with any of the other Rissoinas of the coast.

It is named in honour of Dr. C. F. Newcombe, whose energetic researches have added much to our knowledge of the fauna of British Columbia.

Genus MOLLERIA, Jeffreys.

MOLLERIA QUADRÆ, Dall, n. sp.

Plate 1, figs. 14, 14a.

Shell small, solid, straw-colored or brownish, with three rapidly enlarging well rounded whorls; spire depressed, suture very distinct, umbilicus narrow and deep; surface microscopically spirally striate, the sculpture coarser on the base, but visible with a lens on the upper surface also; aperture circular, peritreme continuous, simple; operculum multispiral, calcareous, centrally slightly concave on the outer side. Diam. of shell 1.8; alt. 1.0 mm.

Cumshewa Inlet, 10–15 fms. C. F. Newcombe.

This little species is smaller than *M. costulata*, the type of the genus, and is not cancellated like that species.

It is named in honour of Don Juan de la Bodega y Quadra, the Spanish explorer, who is associated with Vancouver in the mapping of part of the British Columbian Coast, at the suggestion of Dr. C. F. Newcombe.

Genus EUCOSMIA, Carpenter.

EUCOSMIA LURIDA, Dall, n. sp.

Plate 1, fig. 11.

Shell small, solid, turbinate, of four whorls, of a lurid purple colour, slightly paler on the base and apex; whorls rounded, sculptured only by feeble lines of growth, polished; suture distinct; base rounded with feeble spiral striation, aperture rounded, peritreme sharp edged, smooth within, the lips united over the body by a wash of callus; umbilical region imperforate. Height of shell 3.75; diam. 3 mm.

Skidegate Channel, Queen Charlotte Islands, in 20 fms. C. F. Newcombe.

This small shell resembles some of the more southern species in form, but is heavier and ruder in appearance. Most of the specimens are marked with whitish dots, which I believe to be due to sessile *Polyzoa*, which are apt to leave such marks when removed.

EXPLANATION OF THE PLATES.

NOTE :—As the figures are of different degrees of magnification, the longest dimension, in millimeters, follows the reference in each case.

PLATE 1.

Fig. 1. *Modiolaria seminuda*, DALL ; long. 12 mm., p. 5.
Fig. 2. *Crenella japonica*, DALL ; lon. 20.7 mm., p. 5.
Fig. 3. *Crenella columbiana*, DALL ; lon. 15 mm. p. 4.
Fig. 4. *Modiolaria vernicosa*, MIDDENDORFF ; lon. 15 mm., p. 5.
Fig. 5. *Crenella columbiana*, DALL ; from above, p. 4.
Fig. 6. *Crenella Leana*, DALL ; profile, lon. 5 mm., p. 4.
Fig. 7. *Crenella Leana*, DALL ; side view, lon. 5 m., p. 4.
Fig. 8. *Cadulus Tolmiei*, DALL ; lon. 12 mm., p. 13.
Fig. 9. *Cythara victoriana*, DALL ; alt. 7 mm., p. 13.
Fig. 10. *Mumiola tenuis*, DALL ; alt. 2.25 mm., p. 13.
Fig. 11. *Eucosmia lurida*, DALL ; alt. 3.7 mm., p. 15.
Fig. 12. *Rissoina Newcombei*, DALL ; alt. 3 mm., p. 14.
Fig. 13. *Cadulus Hepburni*, DALL ; lon. 11 mm., p. 12.
Fig. 14, 14A. *Molleria Quadræ*, DALL ; diam. 1.8 mm., p. 15.
Fig. 15, 16. *Nucula carlottensis*. DALL ; lon. 6 mm., p. 6.
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Fig. 19, 20. *Macoma inflatula*, DALL ; lon. 24.5 mm., p. 11.
Fig. 21. *Macoma liotricha*, DALL ; lon. 45 mm., p. 12.

PLATE 2.

Fig. 1. *Leda conceptionis*, DALL ; lon. 28 mm., p. 7.
Fig. 2. *Leda extenuata*, DALL ; lon. 17.5 mm., p. 8.
Fig. 3, 13. *Leda fossa*, BAIRD ; lon. 26 mm., p. 7.
Fig. 4. *Yoldia ensifera*, DALL ; lon. 35 mm., p. 9.
Fig. 5, 7. *Leda cellulita*, DALL ; lon. 15 mm., p. 7.
Fig. 6, 8. *Leda taphria*, DALL ; (*caelata* HINDS, *non* CONRAD) ; lon. 17 mm., p. 7.
Fig. 9. *Malletia Kennerlyi*, DALL ; lon. 6.5 mm., p. 11.
Fig. 10. *Malletia faba*, DALL ; lon. 22.5 mm., p. 10.
Fig. 11. *Malletia pacifica*, DALL ; lon. 20.5 mm., p. 11.
Fig. 12. *Leda leonina*, DALL ; lon. 17 mm., p. 7.
Fig. 14. *Malletia Gibbsii*, DALL ; lon. 10 mm., p. 10.
Fig. 15. *Yoldia martyria*, DALL ; lon. 26 mm., p. 9.
Fig. 16. *Yoldia montereyensis*, DALL ; lon. 34 mm., p. 9.

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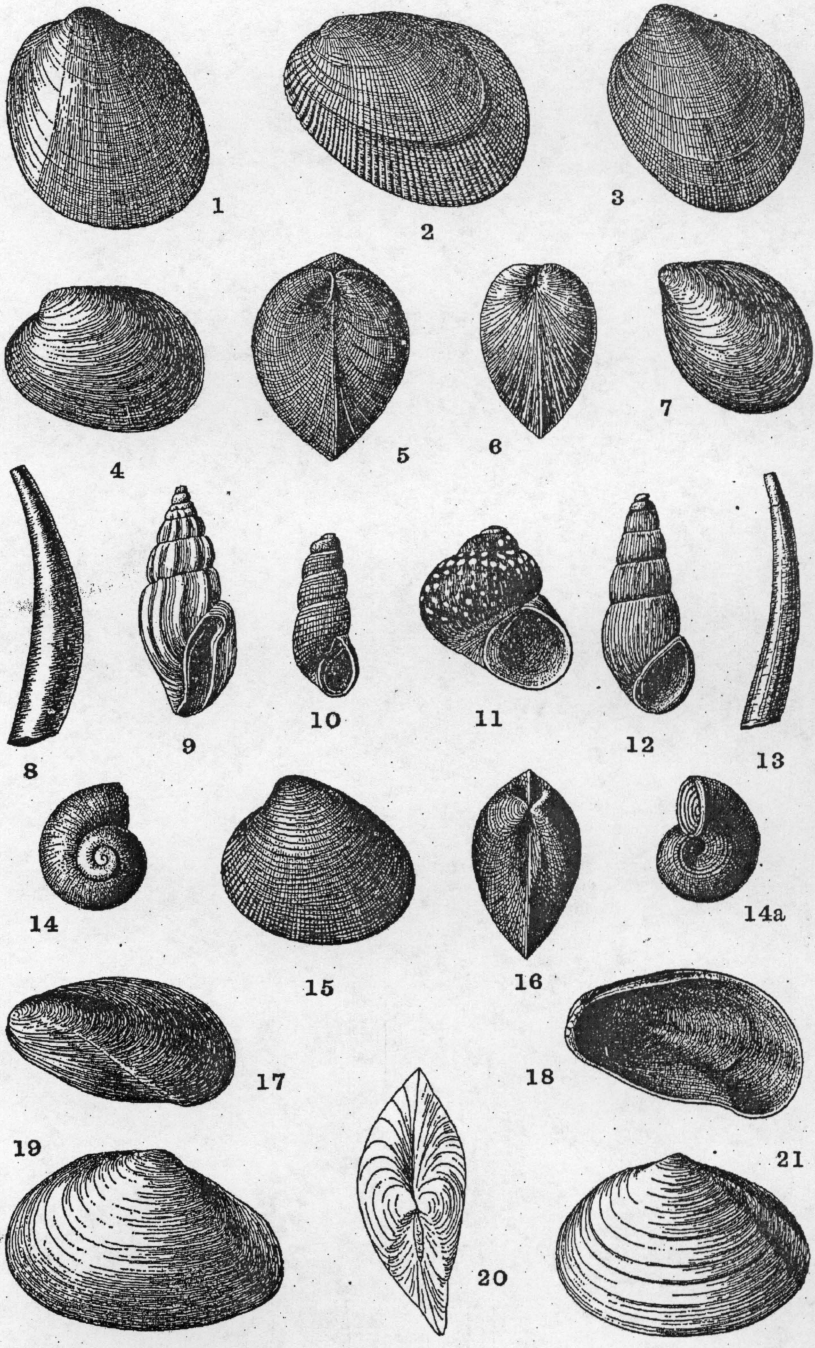

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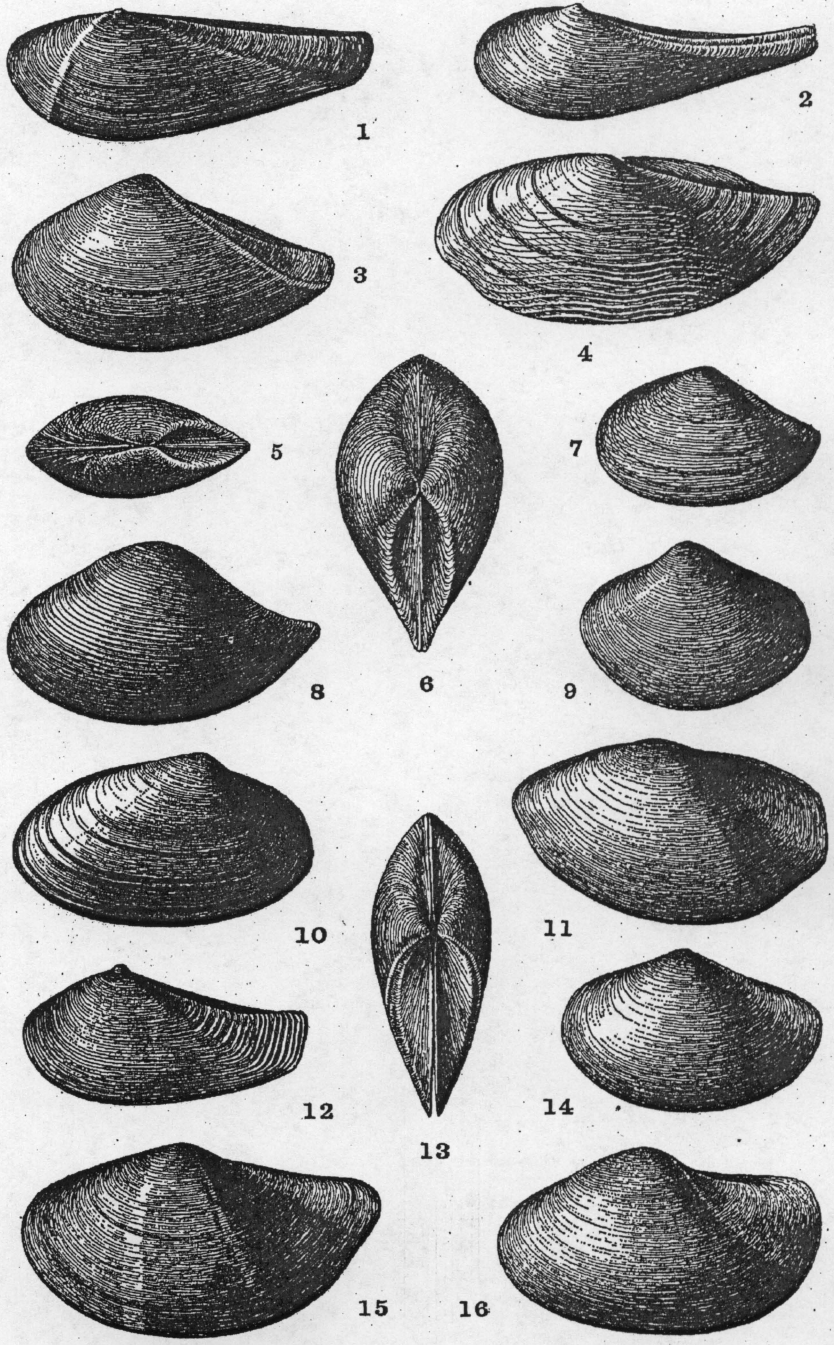

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