

ART. XXXVIII.—*Brief Contributions to Zoölogy from the Museum of Yale College. No. XX.—Recent Additions to the Molluscan Fauna of New England and the adjacent waters, with notes on other species ;* by A. E. VERRILL.

[Continued from page 209.]

Spiralis balea (Möll. sp.) = *Heterofusus balea* Mörch ; Binney, = *Spiralis Gouldii* Stimpson.

Heterofusus Alexandri V. = *H. Flemingii* Binney (non auth.).

Taonus pavo Stp. = *Loligopsis pavo* Fer. and D'Orb. ; Binney (description) = *Loligo pavo* Les. ; but not the figure (pl. xxvi), which is an *Ommastrephes* (? *O. illecebrosa*).

Ommastrephes illecebrosa (Les. sp.) = *O. squittatus* Binney (description), but not the figure (pl. xxv, fig. 340), which is a *Loligo* (? *L. Pealii*, female).

Loligo = *Ommastrephes Bartramii* Binney (non Les. sp.). The figure (pl. xxv, fig. 339), represents a *Loligo*, but does not show the long tentacular arms.

Descriptions of Genera and Species.

Scalaria angulata Say, Amer. Conch., 1831, = *S. Humphreysii* Kiener, 1838.

Say described this species as a doubtful variety of *S. clutheus*, under the above name, which should, therefore, be adopted instead of Kiener's.

Acirsa borealis Mörch (Beck sp.).

Shell white or pale flesh-color, elongated, turreted, acute. Whorls ten, convex, with numerous revolving striæ ; the upper

* This Journal, I, vol. xxxii, page 217.

whorls with slight transverse undulations or faint costæ, which are wanting on the lower ones: last whorl slightly carinated. Aperture roundish, effuse and slightly angulated in front.

Length about .75 of an inch; diameter .28.

Eastport, Me., shelly bottoms, 10 to 40 fathoms, dead shells frequent, rarely living,—A. E. V. and S. I. Smith.

Lunatia heros, var. *triseriata*.

Since there are no positive characters by which the *Natica triseriata* Say can be distinguished from *heros*, except the color,—a character well known to be very unreliable in this family,—I have for several years suspected that the two forms were but varieties of one species. The size and outlines are generally described as different, but the shape varies in both, passing through the same series of forms, while specimens of the *triseriata* type, although usually smaller, are sometimes found as large as the full-grown *heros*.

This view was fully confirmed two years ago at Eastport, by breaking up large and characteristic specimens of *L. heros*, when in one such specimen the inner whorls were found to have the distinct color markings of the *triseriata*. This specimen was a well-marked *triseriata* until half-grown, when it changed to *heros*!

The two varieties are associated and have the same range, being common everywhere on sandy shores from the Gulf of St. Lawrence to Cape Hatteras, and probably farther south.

Aclis polita V., sp. nov. Plate VI, figure 5.

Shell white, elongated, regularly tapering, slender, acute. Whorls thirteen or more, convex, rounded, scarcely flattened; surface smooth, polished, shining, with faint or scarcely distinct striæ of growth. Aperture broad oval; outer lip sharp, slightly effuse; columella slightly curved, without a fold. Length .33 of an inch; breadth .08.

Eastport Harbor, 20 fathoms, shelly bottom. Only one perfect specimen was obtained.—Exp. 1864, A. E. Verrill and S. I. Smith.

Turbonilla elegans V., sp. nov. Plate VI, fig. 4.

Shell light yellowish, elongated, moderately slender, acute. Whorls ten or more, well rounded, not distinctly flattened; suture rather deeply impressed; surface somewhat lustrous, with numerous rounded vertical costæ, narrower than the concave interspaces, fading out below the middle of the last whorl; and with numerous fine revolving grooves, which are interrupted on the costæ, but distinct in the intervals; on the upper whorls there are about five; and on the lower half of the last whorl usually five or six distinct and continuous ones.

Aperture broad oval, anteriorly rounded and slightly effuse; outer lip thin, sharp; columella nearly straight at base within, slightly revolute outwardly, regularly curved anteriorly where it joins the outer lip, and not forming an angle with it. The epidermis is thin, light yellow, sometimes with a darker, yellowish revolving band on the middle of the last whorls, and also with the revolving striæ darker.

Length .22; breadth .07 of an inch.

Several living specimens were dredged in Vineyard Sound, in 8 to 10 fathoms, shelly bottom,—A. E. Verrill and S. I. Smith (on U. S. Fish Commission).

This species is allied to *T. interrupta*,* but is less slender and has the whorls more rounded. The sculpture is nearly the same.

Stylifer Stimpsonii V., sp. nov.

Shell white, short, swollen, broad oval; spire short, rapidly enlarging. Whorls four or five, the last one forming a large part of the shell; convex, rounded, with the suture impressed, surface smooth, or with very faint striæ of growth; a slightly impressed revolving line just below the suture. Aperture large and broad. Length about .15 of an inch; breadth .12. I have seen no specimens with the aperture perfect.

Off the coast of New Jersey, on a bank in 32 fathoms, parasitic on *Euryechinus Dröbachiensis* V.,—Capt. Gedney.

Cœcum costatum V. Plate VI, fig. 6.

Cœcum Cooperi Smith, Annals Lyceum Nat. History, vol. ix, p. 394, fig. 3, 1870, (non Carpenter).

Mr. Sanderson Smith has described and figured this shell in a later stage of growth than the one here figured. In my figure the longitudinal costæ are, by an error, not so distinctly brought out as they should be, and the annular grooves in the depressions are too distinct.

In the adolescent stage of growth this species enlarges rather rapidly, and has 12 or 13, distinct, elevated, rounded costæ, narrower than the intervals between; the circular grooves are numerous, unequal, interrupted over the costæ, and broader toward the aperture. The aperture is rounded within; its margin is externally stellated by the costæ.

Vineyard Sound, 8 to 10 fathoms,—A. E. V.; Gardiner's Bay, L. I., 4 to 5 fathoms, sand,—Smith.

ELYSIELLA, gen. nov.

Allied to *Elysia* and *Placobranchus*. Head rounded, with two short, obtuse tentacles; eyes sessile behind the bases of the tentacles, on the neck. Lateral lobes united behind, rounded

* The figure in Gould's Invertebrata (copied in the new edition) is very poor.

and separate in front, and raised from the back, leaving a cavity beneath for respiration. Blood vessels, commencing in the anterior part of the back, extend backward, forking and diverging, in the area enclosed by the lateral lobes.

This genus differs from *Placobranchus* and *Elysia* in having the lateral lobes united together posteriorly over the back, so that the respiratory cavity partially enclosed by them is closed behind.

Elysiella catulus V. Plate VII, figures 5, 5^a.

Placobranchus catulus Agassiz, MSS.; Gould, Invert. of Mass., 2nd ed., p. 256, pl. xvii, figs. 249, 250, 1870.

This species is well described by Dr. Gould, but the figure is incorrect in representing the lateral lobes as separate posteriorly,—perhaps a theoretical mistake on the part of the artist.

It is common adhering to eel-grass in harbors and estuaries from Boston to New Jersey; Great Egg Harbor,—A. E. V. and S. I. Smith; New Haven, Conn., and Wood's Hole, Mass.,—S. I. Smith.

It often floats with the bottom of the foot at the surface of the water.

Styliola vitrea V., sp. nov. Plate VI, figure 7.

Shell smooth, polished, diaphanous, almost glassy, long conical, rather slender, slightly curved toward the acute apex. Animal white; swimming organs obovate, with the end broadly rounded, and bearing the slender tapering tentacles near the middle of the anterior edge; intermediate lobe short, rounded in front.

Length of shell .46; diameter .08 of an inch.

This species was taken among *Salpæ*, off Gay Head, Martha's Vineyard, in the afternoon, Sept. 9th, 1871,—Dr. A. S. Packard and A. E. Verrill.

Ensatella Americana (Gould sp.)

Solen ensis of American authors, not of Linnæus.

In addition to the differences in the shells of the American and European species, noticed by Gould and others, there are, apparently, still more marked differences in the soft parts, to judge from the figures and descriptions of the *ensis* of Europe.

In our species, when full grown, the siphonal tubes protrude an inch or more and are united for about half their length, beyond which they are round and divergent, subequal. Both orifices are surrounded by a similar circle of numerous papillæ, of three sizes; the larger ones are enlarged in the middle, acute at tips, with a large black spot on each side of the base; alternate with these are somewhat smaller ones of the same form and with similar basal spots; alternating with the primary and sec-

ondary ones are small tapering papillæ, less than half the length of the longest; numerous slender tapering papillæ are also scattered irregularly over the sides of the free portions of both tubes, in some cases in irregular rows of four to six, while on the ventral side of the branchial tube two rows of alternating papillæ extend along the whole length of the siphon. The mantle is open ventrally for more than half its length; the posterior portion of the opening has small conical papillæ along its margin. Foot long; the end bulbous, obliquely truncated and beveled laterally.

Periploma papyracea V. Plate VII, figs. 1, 1^a, 1^b; pl. VIII, fig. 1.

Anatina papyracea Say; Gould, Invert. Mass., 2nd ed., p. 67, fig. 382.

An examination of the soft parts of this species (pl. viii, fig. 1) shows that it is very different from *Anatina*, and agrees closely with *Periploma*, with which the shell also agrees well.

The siphonal tubes are separate from the base, slender, subequal; the orifices are both surrounded by a simple row of small papillæ. One pair of gills, with a well-marked longitudinal fold on the dorsal side posteriorly. Palpi with the anterior and ventral margin thickened, revolute, and strongly striated transversely, the ends prolonged and rolled into a point posteriorly. Mantle with thickened margins, united except at the small antero-ventral opening for the foot.

In young shells (pl. vii, fig. 1^a) the spoon-shaped tooth is supported beneath by two slender brace-like laminæ, in both valves; in larger shells one of these usually becomes obsolete.

This species occurs from New Jersey to Labrador.

Angulus modestus V., sp. nov. Plate VI, figures 2, 2^a.

Shell smooth, shining, more or less iridescent, with very fine concentric striæ. Form similar to that of *A. tener*, but more oblong and with the anterior dorsal margin nearly straight or even slightly concave; the beaks are at about the posterior third, and scarcely prominent; the posterior end slopes rapidly, and is subtruncate at the end; the ventral margin is but slightly convex in the middle, and sub-parallel with the dorsal margin. The shell is often a little thickened and firmer than in *A. tener*, but is sometimes as thin. Color pink, light straw-color, or white; often banded concentrically with these colors. The hinge margin is stouter and the teeth stronger than in *A. tener*, and different in relative size and proportions, as may be seen by comparing the figure (pl. vii, fig. 1) with that of *A. tener* (fig. 2) magnified to the same extent. The ligament plate is also longer.

This species occurred sparingly in Vineyard Sound and Buzzard's Bay, in 6-10 fathoms, sand,—A. E. V. and S. I. Smith; it has also been found in Long Island Sound, off New Haven, 4-5 fath., mud,—A. E. V.

GASTRANELLA V., gen. nov.

Shell oblong, more or less irregular, and sometimes with the ventral margin inflexed; pallial sinus large; ligament external, elongated. Right valve with two small cardinal teeth; the posterior one thin, directed obliquely backward. Left valve with two cardinal teeth; the posterior one stout, bilobed; the anterior one smaller. No distinct lateral teeth. Animal with long, slender, separate siphonal tubes, with a simple circle of papillæ at the ends; mantle well open anteriorly; foot ligulate. The curious little shell for which this genus is constituted apparently resembles *Gastrana* more than any other described genus.

Gastranella tumida V., sp. nov. Plate VI, figures 3, 3^a.

Shell small, variable in form, swollen above, more or less elongated oval, or oblong, with rounded ends, compressed posteriorly. The beaks are rounded, somewhat prominent, incurved but not approximate, and directed somewhat forward; the anterior dorsal margin is deeply concave in front of the beaks, but without a distinct lunule, at the anterior end regularly rounded or a little prolonged, compressed; ventral margin slightly convex, or nearly straight and sub-parallel with the dorsal margin, or incurved, in the different specimens; posterior end broadly rounded in some, decidedly prolonged in others; dorsal posterior margin usually nearly straight for at least half its length, sometimes a little convex and gradually sloping throughout. Surface with fine, somewhat irregular, concentric striæ, slightly iridescent. Color white, with the umboes purple. Long Island Sound, near New Haven, 4-6 fathoms, shelly and gravelly bottom, among hydroids and sponges,—A. E. Verrill.

This species appears to be a "nestler," and quite variable in form. About 20 specimens were obtained, of different sizes; one of the largest, which may not be mature, is .18 of an inch long, .09 high and about the same in thickness.

Turtonia nitida V. Plate VII, figures 4, 4^a.

Turtonia minuta Gould, 2d ed., p. 85, fig. 395 (not of European authors).

The American specimens of this shell differ so widely in form and especially in the structure of the hinge, from all the European specimens with which I have compared them, as well as from the descriptions and figures, that I cannot regard them as identical. Dr. Gould has well defined the form and external characters of our shell. The much enlarged figure of the interior, which is now given, illustrates the structure of the hinge better than any description could. I have seen no European specimens so elongated in form as the American examples seen by me invariably are, but depend less on the external form than on the structure of the hinge for distinguishing them.

Astarte undata Gould, Inv. Mass., 1st ed., p. 79, 1840 (provisional name).

Astarte sulcata (pars) Gould, op. cit., and most American writers.

Crassina latisulca Hanley, Recent Bivalve Shells, p. 87, pl. 14, fig. 35, 1843.

This is by far the most abundant species on the northern coast of New England. It ranges from Cape Cod to Labrador. In the Bay of Fundy it is very abundant at all depths, from 3 to 125 fathoms, on muddy bottoms. It varies greatly in form and sculpture, but can easily be recognized in all its varieties, by any one familiar with the species of this genus. The beaks are less prominent and the lunule less deeply excavated than in *A. sulcata*, and other differences exist in the hinge, etc.

The figure in the new edition of Gould (fig. 432) is not characteristic, having been made from an old eroded specimen, of unusual, if not abnormal, form.

Astarte lens Stimpson, MSS.

Astarte crebricostata Gould, 2d ed., p. 126, fig. 440 (non Forbes).

This species is very well described and figured in the work referred to. It is unquestionably distinct from the *A. crebricostata* of Europe. It occurs associated with the preceding species in Eastport Harbor and the Bay of Fundy on soft muddy bottoms in 20 to 130 fathoms. This, however, is much more common at 100 fathoms and below, being by no means abundant at 20-30 fathoms, where the former occurs in the greatest profusion.

The two species, although somewhat similar, are easily recognized. This is more compressed, more rounded, lighter and brighter yellowish in color, and generally has much more numerous and regular undulations. The hinge is also quite different.

Astarte quadrans Gould, 1st ed., p. 81; 2d ed., p. 123, fig. 434.

Astarte Portlandica Mighels, Boston Jour. Nat. Hist., iv, 320, 345, Pl. 16, fig. 2.

Among the specimens dredged in Eastport Harbor are some that agree with the original *Portlandica*, in color, form, and size, while other specimens are intermediate between these and the typical *quadrans*, so that a complete series can be formed connecting the two varieties together. Differences of the same kind and equally great occur in other species of *Astarte*.

Cryptodon obesus V., sp. nov. Pl. VII, fig. 2.

Shell white, irregularly and rather coarsely concentrically striated, much swollen in the middle; the transverse diameter nearly equal to the length; the height considerably exceeding the length. The beaks are prolonged and turned strongly to the anterior side. The lunular area is rather large and sunken, somewhat flat, in some cases separated by a slight ridge into an inner and an outer portion. Anterior border with a prominent rounded angle; ventral margin prolonged and rounded in the middle; posterior side with two strongly developed flexures,

separated by deep grooves. Interior of shell with radiating grooves, most conspicuous toward the ventral edge.

Length of the largest specimen .60 of an inch; height .72; thickness .52. The smaller specimens have about the same proportions.

Off No-man's Land, in 19 fathoms, muddy bottom,—A. E. V. and Dr. A. S. Packard; Labrador,—Dr. Packard.

Six single valves, some of them quite fresh, were obtained off No-man's Land at several different localities. They were all right valves, and the smallest was .50 of an inch in height. The specimen from Labrador agrees nearly in form and structure, and is only .23 in height and .20 in length.

This species appears to be more nearly related to *C. flexuosus* of Europe than to *C. Gouldii*. The European species is nearly intermediate between the two American shells in form; but judging from the specimens which I have had opportunities to examine, the three forms ought to be kept distinct. *C. Gouldii* is common in Eastport Harbor, and occurs sparingly in Buz-zard's Bay and Vineyard Sound. It is a thinner and more delicate shell, more rounded, relatively much longer, and is seldom more than .25 to .30 of an inch in breadth.

Anomia glabra V.

Anomia ephippium (pars) Linn.; Gould and most American authors.

A. electrica Binney, in Gould, 2d ed., p. 205, fig. 499 (*non* Linn.).

A. ephippium Binney, op. cit., p. 204, fig. 497 (*non* Linn.).

One of the localities given by Linné for *A. ephippium* was "Pennsylvania." He, therefore, doubtless included our common southern *Anomia* under that name, but it appears to be quite distinct from the common European species. Its range is quite southern. It is very abundant everywhere from Cape Cod to Florida, but north of Cape Cod it is rare. Although occasionally found as far north as Nova Scotia, I have never met with it at Eastport or in the Bay of Fundy, where it is replaced by the typical *A. aculeata* and its squamose variety.

Glandula arenicola V., sp. nov.

Body sub-globular, rather higher than broad, the whole surface covered with grains of sand forming a continuous layer. When the sand is removed the surface of the test is reticulately wrinkled and pitted, not furnished with fibres, except at base, where there are a few long, slender, thread-like, white ones. Tubes terminal, near together, in the alcoholic specimen short, forming low verrucæ, swollen at base, the ends a little prominent and naked. Apertures square, with four small lobes. The test is tough and opaque. Height .45; breadth .35 of an inch.

Murray Bay, Gulf of St. Lawrence,—Dr. J. W. Dawson.

Molgula pellucida V. Plate VIII, figure 2.

Body sub-globular with a smooth, thin, pellucid test. Tubes terminal, contiguous, much swollen at base, long, divergent, tapering, reticulated within by longitudinal and circular white lines (muscular fibers). Branchial aperture with six small papillæ. Intestine conspicuously visible through the test; stomach covered by deep orange-colored hepatic glands. Ovaries large, whitish. Color of test, pale hyaline bluish; tubes toward the ends, dull neutral tint.

Diameter of the largest specimens about 1 inch.

Mass. Bay,—L. Agassiz; Long Island,—Coll. Peabody Academy of Science; Bird Shoal near Beaufort, N. C.,—Dr. H. C. Yarrow.

Mr. Binney has published characteristic colored figures of this species under the name of *M. producta* Stimp., which is a very different, sand-covered species, (plate viii, fig. 6).

Eugyra glutinans V.

Cynthia glutinans Möll., Naturh. Tidsskrift, iv, p. 94, 1842.

Several specimens from Greenland, which I have had opportunity to examine, were sent by Dr. Chr. Lütken to Dr. A. S. Packard as Möller's species, and agree well with his description.

These are subglobular, .20 to .35 of an inch in diameter, with a thin translucent test, covered with fine sand, which adheres to very slender and delicate fibers which thickly cover the whole surface, but are longer and more numerous below, those of the base being as long as the diameter of the body and bearing grains of sand along their whole length. The tubes are naked and entirely retractile, connected by a thickened ridge surrounding their bases. The branchial aperture is six-lobed; the anal is square. It is more nearly allied to *E. pilularis* V. than to any other American species.

Ascidopsis complanata V., gen. nov. Plate VIII, fig. 8.

Ascidia complanata Fabr.; Verrill, this Journal, i, p. 98, fig. 11, 1871.

Ascidia callosa Stimp., Proc. Boston Soc. Nat. Hist., vol. iv, p. 228, 1852.

The remarkable and complex structure of the gill in this species seems to require its separation as a distinct genus. A small portion of the gill is represented in the figure, much enlarged.

Alcyonidium ramosum Verrill, sp. nov. Plate VIII, fig. 10.

Much branched, when full grown; the branches irregularly dichotomous, usually crooked. Surface glabrous, smooth, or nearly so, the cells rather small and crowded; zooids with sixteen slender tentacles. Color ashy brown, or dull rusty brown.

Diameter of branches mostly .20 to .25 of an inch. Height 10 to 15 inches.

Off South-end, near New Haven, 1-4 fathoms, common,
—A. E. V.; Vineyard Sound, Mass. and Great Egg Harbor,
N. J.,—A. E. V., and S. I. Smith.

Errata.—p. 210, for *Mangelia cerinum*, read *Mangelia cerina*.

EXPLANATION OF PLATES.

PLATE VI.

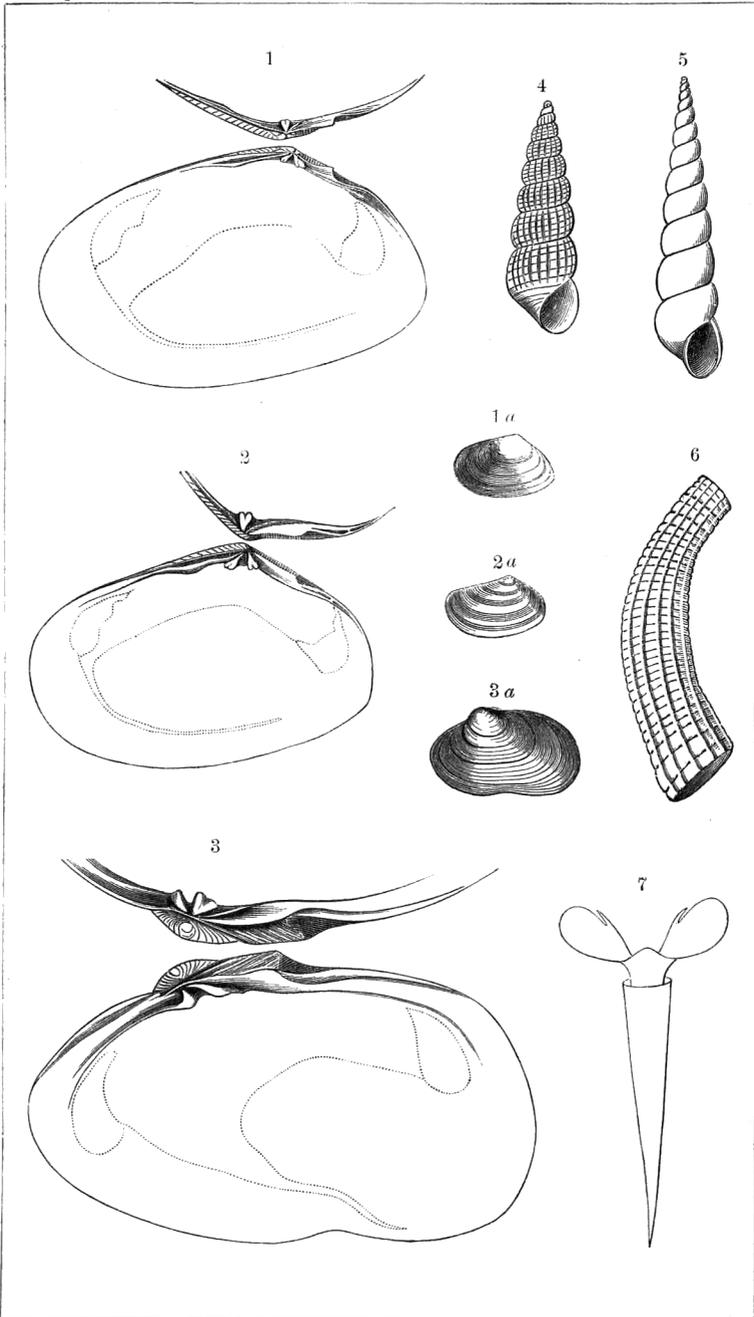
- Figure 1. *Angulus tener*, enlarged 5 diameters; 1 *a*, the same, natural size (from Binney's Gould, by E. S. Morse).
 “ 2. *Angulus modestus* V., enlarged 5 diameters; 2 *a*, the same, natural size.
 “ 3. *Gastranella tumida* V., enlarged 16 diameters; 3 *a*, another specimen, enlarged 6 diameters.
 “ 4. *Turbonilla elegans* V., enlarged 5 diameters.
 “ 5. *Actis polita* V., enlarged 5 diameters.
 “ 6. *Cecum costatum* V., immature, enlarged 24 diameters.
 “ 7. *Styliola vitrea* V., enlarged 3 diameters.

PLATE VII.

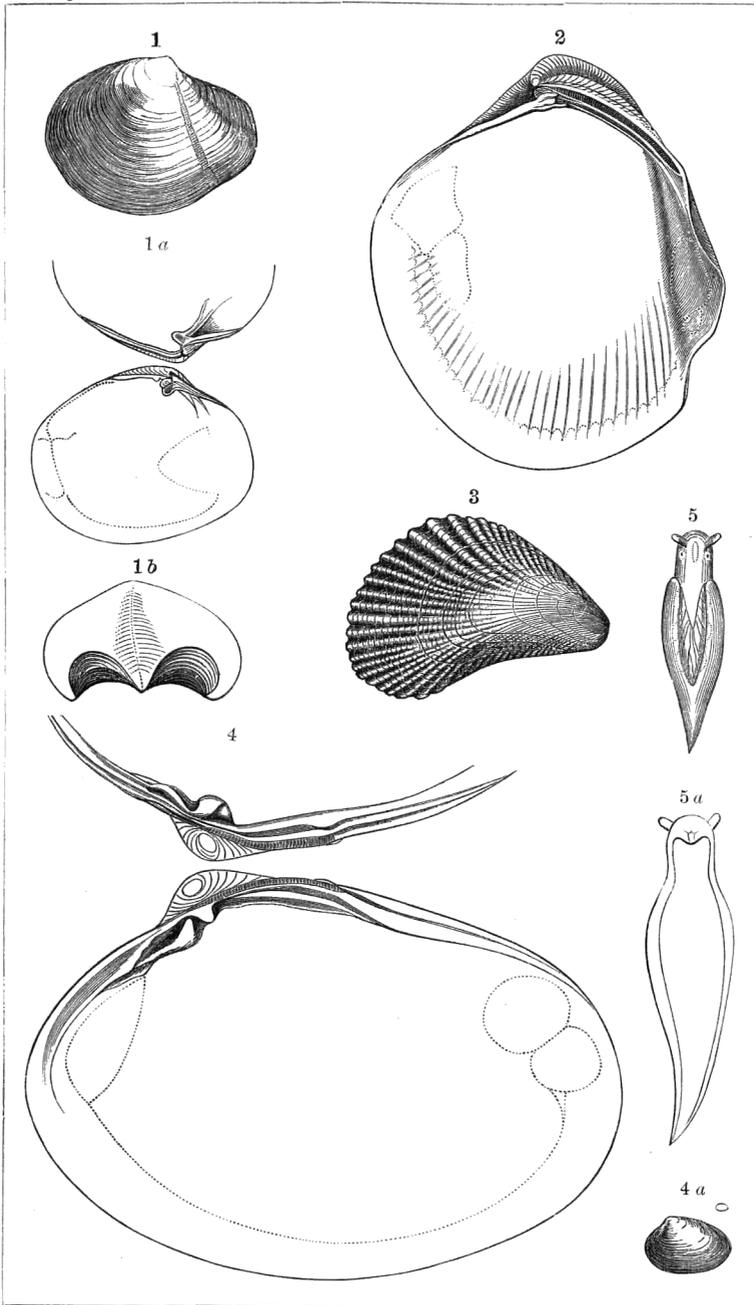
- Figure 1. *Periploma papyracea*, left side, exterior view (from Binney's Gould, by E. S. Morse); 1 *a*, the same, view of the interior of a young specimen, with the ossicle in place, enlarged 3 diameters; 1 *b*, ossicle of the same, enlarged 30 diameters.
 “ 2. *Cryptodon obesus* V., enlarged 3 diameters.
 “ 3. *Modiola hamatus* (young), from New Haven, enlarged nearly 2 diameters.
 “ 4. *Turtonia nitida* V., view of the interior, enlarged 40 diameters; 4 *a*, the same, external view, natural size and enlarged, (from Binney's Gould, by E. S. Morse).
 “ 5. *Elysiella catulus* V., dorsal view, enlarged nearly 3 diameters; 5 *a*, the same, ventral view, more enlarged.

PLATE VIII.

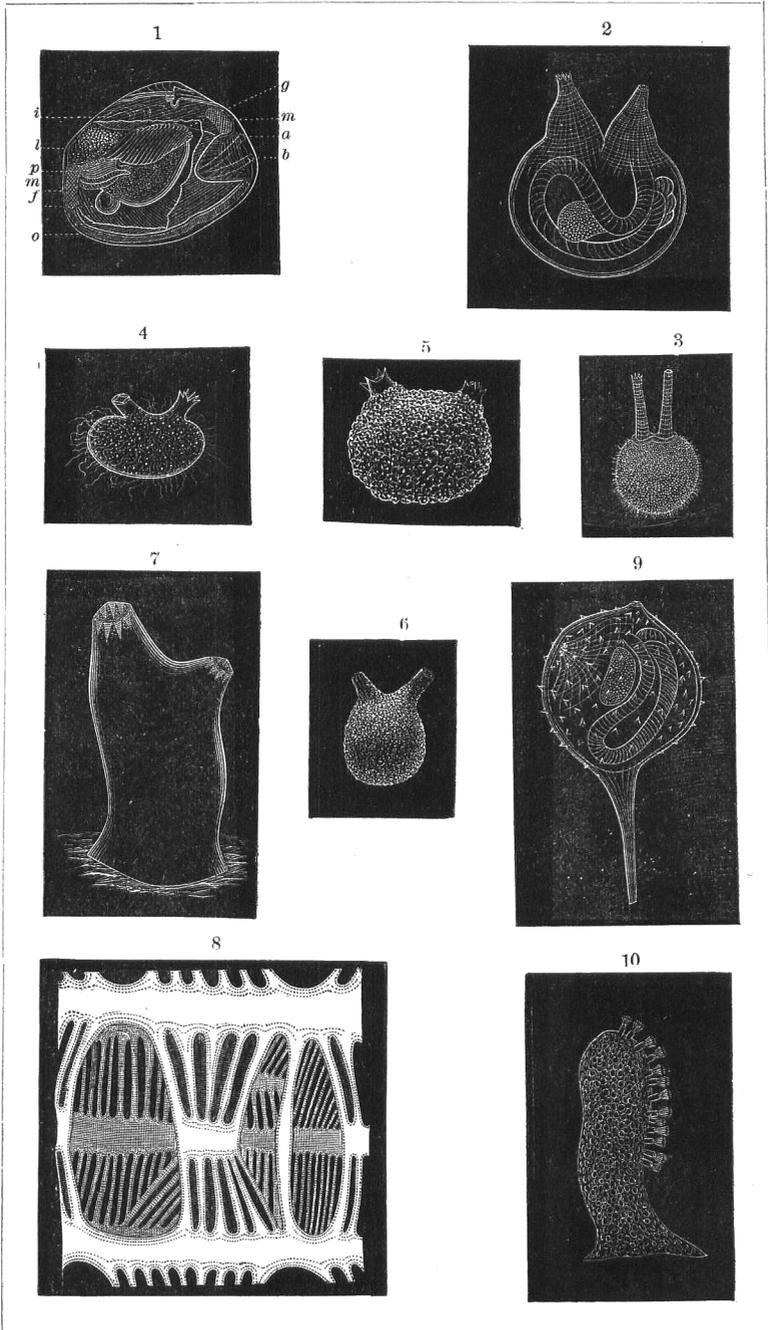
- Figure 1. *Periploma papyracea*, animal, resting in right valve, with part of the mantle removed from the upper side; *a*, retracted anal tube; *b*, branchial tube; *g*, left gill; *m, m*, anterior and posterior adductor muscles; *i*, intestine; *l*, liver; *p*, palpi of left side; *f*, retracted foot; *o*, opening in mantle for protrusion of foot.
 “ 2. *Molgula pellucida* V., rather more than natural size.
 “ 3. *Eugyra pitularis* V., enlarged about 2 diameters, with the adhering mud partly removed.
 “ 4. *Molgula papillosa* V., from off Martha's Vineyard, enlarged 2 diameters, with the adhering sand mostly removed.
 “ 5. *Molgula arenata* Stimp., natural size, and with its coating of sand.
 “ 6. *Molgula producta* Stimp., natural size, with its coat of fine sand.
 “ 7. *Cynthia partita* Stimp., erect variety, showing the outline and the character of the apertures; but the surface of the body appears smoother than is natural.
 “ 8. *Ascidioopsis complanata* V., small portion of the gill, much enlarged.
 “ 9. *Pera crystallina* V., from Murray Bay, enlarged 3 diameters.
 “ 10. *Aleyonidium ramosum* V., a young specimen enlarged 2 diameters, with part of the zooids expanded.



A. E. V. from nature.



A. E. V. from nature.



A. E. V., from nature.