

UNITED STATES COMMISSION OF FISH AND FISHERIES.

Rare BK  
SH  
11  
A15  
1871/72

PART I.

U. S. Bureau of Commercial Fisheries.  
REPORT

"

ON THE

CONDITION OF THE SEA FISHERIES

OF THE

SOUTH COAST OF NEW ENGLAND

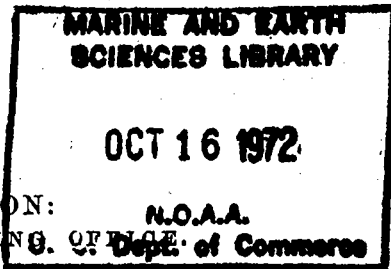
IN

1871 AND 1872.

BY

SPENCER F. BAIRD,  
COMMISSIONER.

WITH SUPPLEMENTARY PAPERS.



WASHINGTON:  
GOVERNMENT PRINTING OFFICE  
1873.

CRUSTACEA.

The following catalogue of the Crustacea has been prepared by Mr. S. I. Smith, excepting the portion relating to the Isopoda, which has been written by Mr. O. Harger.\* The list is by no means complete, even for the higher groups which are treated, and no attempt has been made to enumerate the Ostracoids and free-swimming Copepods. Among the Amphipods, the difficult group of Lysianassinæ has not been studied, as the species require careful comparison with those of our northern coast and of Europe. The same is true of the species of *Ampelisca*, and partially of some other genera. In several cases species are omitted which are as yet only represented in our collections by imperfect, young, or too few specimens. The catalogue is intended, however, to include every species which has been mentioned, on good authority, in any published work as inhabiting the southern coast of New England.

BRACHYURA.

GELASIMUS MINAX Leconte. (p. 467.)

Proceedings Acad. Nat. Sci., Philadelphia, vol. vii, 1855, p. 403; Smith, Trans. Conn. Acad., vol. ii, p. 128, Pl. 2, fig. 4, Pl. 4, fig. 1, 1870.

Southern coast of New England to Florida. This species, the largest of our "fiddler-crabs," lives upon salt marshes, usually farther from the sea than the others, and frequently where the water is most of the time nearly fresh.

GELASIMUS PUGNAX Smith. (p. 468.)

Trans. Conn. Acad., vol. ii, p. 131, Pl. 2, fig. 1, Pl. 4, fig. 2. *G. vocans*, var. *λ*, De Kay, Nat. Hist. of New York, p. 14, Pl. 6, fig. 10, 1844, (not *Cancer vocans* Linné.) *G. pugilator* Leconte, loc. cit., p. 403, (not of Bosc.)

From Cape Cod to Florida, the Gulf of Mexico, and the West Indies. It makes its burrows only upon salt marshes, but is often seen in great companies wandering out upon muddy or sandy flats, or even upon the beaches of the bays and sounds.

GELASIMUS PUGILATOR Latreille. (p. 336.)

Nouveau Dictionnaire d'Hist. nat., 2<sup>e</sup> édit., tome xii, p. 520, 1817; Smith, Trans. Conn. Acad., vol. ii, p. 136, Pl. 4, fig. 7, 1870. *Ocylope pugilator* Bosc, Hist. nat. des Crust., tome i, p. 167, 1820. *Gelasimus vocans* DeKay, op. cit., p. 14, Pl. 6, fig. 9.

Cape Cod to Florida, upon muddy and sandy flats and beaches.

OCYPODA ARENARIA Say. (pp. 337, 534.)

Journal Acad. Nat. Sci., Philadelphia, vol. i, p. 69, 1817; Edwards, Hist. nat. des Crust., tome ii, p. 44, Pl. 19, figs. 13, 14.

This species, which is common upon the sandy beaches from New Jersey southward, and which I have found upon Fire Island Beach, Long

\* The description of *Scyphacella arenicola* and the reference of *Idotea triloba* to *Epelys* are taken from Mr. Smith's unpublished manuscript, and his name, therefore, appears as authority in these cases.

Island, will very likely be found rarely upon the beaches at Nantucket, and on the southern part of Cape Cod. It lives in deep burrows, above the reach of tides, upon sandy beaches. It is readily distinguished from the "fiddlers" by the nearly equal claws or hands, which are alike in both sexes, and by its color, which is almost exactly like the sand upon which it lives. It is carnivorous and very active, running with great rapidity when pursued.

The synonymy of this species is in much confusion, and I have not attempted to rectify it here, although there are apparently several names which antedate that of Say. The Brazilian species, usually called *rhombæa* appears to be identical with ours, and if it is really the *rhombæa* of Fabricius, his name should undoubtedly be retained.

**SESARMA RETICULATA** Say. (p. 467.)

Journal Acad. Nat. Sci., Philadelphia, vol. i, pp. 73, 76, Pl. 4, fig. 6, 1817; p. 442, 1818; Smith, Trans. Conn. Acad., vol. ii, p. 156.

From Long Island Sound to Florida, usually upon salt marshes and associated with *Gelasimus pugnax*.

**PINNIXA CYLINDRICA** Say. Plate I, fig. 1. (p. 367.)

Journal Acad. Nat. Sci., Philadelphia, vol. i, p. 452, 1818.

Vineyard Sound and Long Island Sound to South Carolina.

**PINNOTHERES OSTREUM** Say. Plate I, fig. 2, male. (p. 367.)

Loc. cit., p. 67, Pl. 4, fig. 5, 1817; DeKay, op. cit., p. 12, Pl. 7, fig. 16.

Massachusetts to South Carolina.

**PINNOTHERES MACULATUS** Say. (p. 434.)

Loc. cit. p. 450, 1818.

It lives in *Mytilus edulis* on the New England coast, and is found from Cape Cod to South Carolina.

**CANCER IRRORATUS** Say. (pp. 312, 530.)

Loc. cit., p. 59, Pl. 4, fig. 2, 1817; Stimpson, Annals Lyceum Nat. Hist., New York, vol. vii, p. 50, 1859. *Platycarcinus irroratus* Edwards, Hist. nat. des Crust., tome i, p. 414, 1834; DeKay, op. cit., Pl. 2, fig. 2. *Cancer Sayi* Gould, Report on the Invertebrata of Massachusetts, 1st edit., p. 323, 1841. *Platycarcinus Sayi* DeKay, op. cit., p. 7. *Cancer borealis* Packard, Memoirs Boston Nat. Hist. Soc., vol. i, p. 303, 1867.

Labrador to South Carolina.

**CANCER BOREALIS** Stimpson. (pp. 486, 493.)

Loc. cit., p. 50, 1859. *Cancer irroratus* Gould, op. cit., p. 322.

Nova Scotia to Vineyard Sound and No Man's Land. It very likely occurs both north and south of these limits, as it seems to be rare or local, and is often, perhaps, confounded with the far more common *C. irroratus*, although it is a perfectly distinct species.

PANOPEUS HERBSTII Edwards. (p. 472.)

Op. cit., vol. i, 403, 1834; Smith, Proceedings Boston Soc. Nat. Hist., vol. xii, p. 276, 1859.

Long Island Sound to Brazil,\*but not common north of New Jersey. It is readily distinguished from the following species, by the tubercle on the subhepatic region, just below the first lobe of the antero-lateral border of the carapax; by the postorbital tooth being separated from the second tooth of the antero-lateral margin by a rounded sinus; and by the dactylus of the larger cheliped having a stout tooth near the base within.

PANOPEUS DEPRESSUS Smith. Plate I, fig. 3. (p. 312.)

Loc. cit., p. 283, 1859.

From Cape Cod to Florida, and often carried with oysters much farther north. It is, perhaps, native in Massachusetts Bay.

PANOPIUS SAYI Smith. (p. 312.)

• Loc. cit., p. 284, 1859.

Associated with the last, and having the same range. It is easily distinguished from the last species by its narrower, more convex, and swollen carapax, and by the more projecting and arcuate front. The terminal segment of the abdomen of the male is also quite different in the two species; in *P. Sayi* it is broader than the preceding segment, about two-thirds as long as broad, the edges slightly concave, and the tip abruptly triangular, while in *P. depressus* it is narrower than the preceding segment, about three-fourths as long as broad, the edges convex, and the tip broadly rounded.

PANOPEUS HARRISII Stimpson. (p. 313.)

Loc. cit., p. 55, 1859. *Pilumnus Harrisii* Gould, op. cit., p. 326, 1841.

Massachusetts Bay to Florida.

CARCINUS GRANULATUS (Say, sp.) (p. 312.)

*Cancer granulatus* Say, loc. cit., p. 61, 1817. *Carcinus manas* Gould, op. cit., p. 321; DeKay, op. cit., p. 8, Pl. 5, figs. 5, 6. (?) *Carcinus manas* Leach, Edwards, &c.

Cape Cod to New Jersey, and perhaps much farther south. Our species may, very likely, be the same as the *Carcinus manas* of Europe, but its not extending north on our own coast throws some doubt upon this until there has been a careful comparison of specimens from the two sides of the Atlantic.

PLATYONICHUS OCELLATUS Latreille. Plate I, fig. 4. (pp. 338, 533.)

Encyclopédie méthodique, tome xvi, p. 152; DeKay, op. cit., p. 9, Pl. 1, fig. 1, Pl. 5, fig. 7. *Cancer ocellatus* Herbst, Krabben und Krebse, Band iii, erstes Heft, p. 61, Pl. 49, fig. 4, 1799. *Portunus pictus* Say, loc. cit., p. 62, Pl. 4, fig. 4, 1817.

Cape Cod to Florida.

**CALLINECTES HASTATUS** Ordway. (pp. 367, 468.)

Boston Journal Nat. Hist., vol. vii, p. 568, 1863. *Lupa hastata* Say, loc. cit., p. 65, 1817. *Lupa diacantha* DeKay, op. cit., p. 10, Pl. 3, fig. 3.

Cape Cod to Florida, and occasionally in Massachusetts Bay.

**LIBINIA CANALICULATA** Say. (p. 368.)

Loc. cit., p. 77, Pl. 4, fig. 1, 1817; DeKay, op. cit., p. 2, Pl. 4, fig. 4; Streets, Proceedings Acad. Nat. Sci., Philadelphia, 1870, p. 105, 1871.

Found as far north as Casco Bay, on the coast of Maine, and common from Massachusetts Bay southward, at least as far as Florida.

**LIBINIA DUBIA** Edwards. (p. 368.)

Op. cit., tome i, p. 300, Pl. 14 bis, fig. 2, 1834; Streets, loc. cit., p. 104.

Cape Cod to Florida.

**PELIA MUTICA** Stimpson. (p. 415)

Annals Lyceum Nat. Hist., New York, vol. vii, p. 177, 1860. *Pisa mutica* Gibbos, Proceedings Amer. Association Adv. Sci., 3d meeting, p. 171, 1850.

Vineyard Sound to Florida.

**HYAS COARCTATUS** Leach. (p. 504.)

Trans. Linn. Soc., London, vol. xi, p. 329, 1815. Règne animal de Cuvier, 3<sup>me</sup> édit., Pl. 32, fig. 3. *Lissa fissirostra* Say, loc. cit., p. 79, 1817.

Leidy mentions this species as having been found on the coast of New Jersey, and Say mentions it from the coast of Long Island, but it seems to be rare south of Cape Cod. It lives in deep water from Cape Cod northward, and on the European coast, and is frequently found in the stomachs of the cod-fish.

**HETEROCRYPTA GRANULATA** Stimpson. (p. 315.)

Annals Lyceum Nat. Hist., New York, vol. x, p. 102, 1871. *Cryptopodia granulata* Gibbes, loc. cit., p. 173; and Proceedings Elliott Soc., Charleston, vol. i, p. 35, wood cut.

This species, dredged several times in Vineyard Sound, was before known only from North Carolina to Florida and the West Indies.

ANOMOURA.

**HIPPA TALPOIDA** Say. Plate II, fig. 5. (pp. 338, 530.)

Loc. cit., p. 160, 1817.

Cape Cod to Florida.

**EUPAGURUS POLLICARS** Stimpson. (p. 313.)

Annals Lyceum Nat. Hist., New York, vol. vii, p. 92, 1859. *Pagurus pollicaris* Say, loc. cit., p. 162, 1817; Gould, op. cit., p. 329; DeKay, op. cit., p. 19, Pl. 8, fig. 21.

Massachusetts to Florida.

**EUPAGURUS BERNHARDUS** Stimpson. (p. 501.)

Loc. cit., p. 89, 1859. *Pagurus Bernhardus* (Linné sp.,) Fabricius, Entomologia systematica, vol. ii, p. 463, 1793; Gould, op. cit., p. 329; DeKay, op. cit., p. 20.

Vineyard Sound, &c., in deep water, more abundant north of Cape Cod, and extending to Northern Europe on one side, and to Puget Sound on the other.

**EUPAGURUS PUBESCENS** Stimpson.

Loc. cit., p. 89, 1859; and Proceedings Acad. Nat. Sci., Philadelphia, 1858, p. 237, 1859. *Pagurus pubescens* Kroyer, Naturh. Tidsskrift, Bind ii, p. 251, 1838.

This species has been taken in deep water off the coast of New Jersey, and will, doubtless, be found off Long Island and Vineyard Sounds. It extends northward to Greenland and Northern Europe.

**EUPAGURUS LONGICARPUS** Stimpson. (p. 339.)

Proceedings Acad. Nat. Sci., Philadelphia, 1858, p. 237, 1859. *Pagurus longicarpus* Say, loc. cit., p. 163, 1817; Gould, op. cit., p. 330; DeKay, op. cit., p. 20, Pl. 8, fig. 22.

Massachusetts Bay to South Carolina.

MACROURA.

**GEBIA AFFINIS** Say. Plate II, fig. 7. (pp. 367, 530.)

Loc. cit., p. 195, 1817.

Long Island Sound to South Carolina.

**CALLIANASSA STIMPSONI** Smith, sp. nov. Plate II, fig. 8. (p. 369.)

Carapax smooth and shining. Greater cheliped (fig. 8) about three times as long as the carapax; carpus and hand convex on both sides; carpus sometimes considerably longer, sometimes not at all longer than broad; both fingers of the same length, and about as long as the basal portion of the dactylus; the prehensile edge of the dactylus without a strong tooth or tubercle at base. Smaller cheliped about half as long as the greater; carpus and hand about equal in length; fingers equal, slender, as long as the basal portion of the propodus. Abdomen smooth and shining above, gradually increasing in breadth to the fifth segment; second segment longest, much longer than broad; third and fifth equal in length; fourth shorter, and sixth a little longer than third or fifth; telson much broader than long, shorter than the fourth segment.

Length of a large specimen, 61<sup>mm</sup>; length of carapax, 15; length of larger cheliped, 44.

In the character of the chelipeds this species seems to be closely allied to *C. longimana* Stimpson, from Puget Sound.

Our species ranges from the coast of the Southern States north to Long Island Sound.

**HOMARUS AMERICANUS** Edwards. (pp. 395, 492, 522.)

Hist. nat. des. Crust., tome ii, p. 334, 1837. *Astacus marinus* Say, loc. cit., p. 165, 1817, (not of Fabricius.)

New Jersey to Labrador.

**CRANGON VULGARIS** Fabricius. Plate III, fig. 10. (pp. 339, 529.)

Supplementum Entomologiæ system., p. 410, 1798. *Crangon septemspinus* Say, loc. cit., p. 246, 1818.

North Carolina to Labrador and Europe. In depth it extends from low water to 60 or 70 fathoms, and probably much deeper.

**HIPPOLYTE PUSIOLA** Kroyer. (p. 395.)

Monografisk Fremstling Hippol., p. 319, Pl. 3, figs. 69-73, 1842.

Vineyard Sound and northward to Greenland and Europe.

**VIRBIUS ZOSTERICOLA** Smith, sp. nov. Plate III, fig. 11. (p. 369.)

Female: Short and stout. Rostrum about as long as the carapax, and reaching nearly, or quite, to the tip of the antennal scale; the upper edge nearly straight and unarmed, except by two, or rarely three, teeth at the base; under edge with three (sometimes two or four) teeth on the anterior half. Carapax smooth and armed with a stout (supra-orbital) spine on each side at the base of the rostrum and above and a little behind the base of the ocular peduncle, a small (antennal) spine on the anterior margin beneath the ocular peduncle, and a stout (hepatic) spine behind the base of the antennæ. Inner flagellum of the antennula extending very slightly beyond the tip of the antennal scale; outer flagellum considerably shorter. Abdomen geniculated at the third segment; the posterior margin of the third segment prominent above, but not acute.

The males differ from the females in being smaller, much more slender, and in having the rostrum narrower vertically.

The color in life is very variable. Most frequently the entire animal is bright green, sometimes pale, or even translucent, tinged with green. Others were translucent, specked with reddish brown, and with a broad median band of dark brown extending the whole length of the body.

Length of female, 20-26<sup>mm</sup>; male 15-20.

It is at once distinguished from *V. pleuracanthus* Stimpson, to which, in many characters, it is closely allied, by its very much longer rostrum.

Among eel-grass about Vineyard Sound, and probably common at other points on the coast.

*Virbius pleuracanthus* Stimpson, (Annals Lyceum Nat. Hist., New York, vol. x, p. 127, 1871,) abundant upon the coast of New Jersey, will very likely be found farther north. In habit it is similar to the species just described.

**PANDALUS ANNULICORNIS** Leach. Plate II, fig. 6. (p. 493.)

Malacostraca Podophthalmata Britannicæ, Pl. 40, 1815.

Deep water in Vineyard Sound, off Newport, &c.

North of Cape Cod it is common, and extends to Greenland and Europe. In depth it extends down to 430 fathoms at least.

**PALÆMONETES VULGARIS** Stimpson. Plate II, fig. 9. (pp. 479, 529.)

Annals Lyceum Nat. Hist., New York, vol. x, p. 129, 1871. *Palæmon vulgaris* Say, Journal Acad. Nat. Sci., Philadelphia, vol. i, p. 224, 1818.

Massachusetts to South Carolina.

*PENÆUS BRASILIENSIS* Latroille.

Edwards, Hist. nat. des Crust., tome ii, p. 414; Gibbes, loc. cit., p. 193; Stimpson, Annals Lyceum Nat. Hist., New York, vol. x, p. 132.

According to Stimpson, this species has been found in the Croton River at Sing Sing, New York, by Professor Baird. It will therefore be very likely to occur in the rivers of Southern New England. It is common on the coast of the Southern States, and extends to Brazil.

SQUILLOIDEA.

*SQUILLA EMPUSA* Say. (pp. 369, 536.)

Loc. cit., p. 250, 1818; DeKay, op. cit., p. 32, Pl. 13, fig. 54; Gibbes, Proceedings Amer. Assoc., 3d meeting, p. 199.

Florida to Cape Cod.

The young of this species is figured on Plate VIII, fig. 36.

MYSIDEA.

*MYSIS STENOLEPIS* Smith, sp. nov. Plate III, fig. 12. (p. 370.)

Male: Anterior margin of the carapax produced into a very short, broad, and obtusely rounded rostrum, and each side at the inferior angle into a prominent, acutely triangular tooth, between which and the base of the ocular peduncle there is a broad and deeply rounded sinus. Peduncle of the antennula about a third as long as the carapax along the dorsal line; the sexual appendage slender, tapering, nearly as long as the peduncle; inner flagellum half as long as the outer. Antennal scale rather longer than the carapax along the dorsal line, narrow, about ten times as long as broad, tapering to a slender and acute point, both edges ciliated and nearly straight; flagellum about as long as the rest of the animal. Abdomen somewhat geniculated between the first and second segments; sixth segment about twice as long as the fifth. Appendages of the fourth segment reaching nearly to the distal extremity of the sixth segment; inner ramus slender, slightly longer than the base; outer ramus naked, composed of six segments; the first, third, and fourth subequal in length, and together equaling about three-fourths of the entire length; the second, fifth, and sixth subequal; penultimate segment armed with a stout spine on the outside at the distal extremity, and the last segment terminated by a similar spine. Inner lamella of the appendages of the sixth segment extending slightly beyond the telson, narrow and tapering to an obtuse tip; outer lamella narrow, linear, about seven times as long as broad, nearly a third longer than the inner, both edges ciliated and nearly straight, and the tip narrow and somewhat truncated. Telson considerably longer than the sixth segment, tapering slightly, the sides nearly straight, and each armed with about twenty-four spines; the extremity cleft by a deep sinus rounded at bottom, and its margins convex posteriorly and armed with very numerous slender spines.

Length of a male from tip of rostrum to extremity of telson, 23.2<sup>mm</sup>; length of carapax along the dorsal line, 6.5; length of antennal scale, 6.7; length of telson, 3.8. Length of female, 30<sup>mm</sup>.



The females differ but little from the males except in the usual sexual characters. The figure, (Plate III, fig. 12,) made from a small female specimen, does not properly represent the anterior margin of the carapax.

In life the young females are semi-translucent, a spot on each ocular peduncle, the peduncles and inner flagella of the antennule, the antennal scale, the telson and caudal lamellæ more or less blackish from deposits of black pigment, while each segment of the abdomen is marked with a rudely stellate spot of black.

Large males of this species were found in the autumn among eel-grass, at New Haven, Connecticut, and the young abundantly in the same situation in May. Young females were collected in abundance during June and July, among the eel-grass in the shallow bays and coves about Vineyard Sound, while adult females, with the marsupial pouches filled with young, were collected, at Wood's Hole, in abundance, April 1, by Mr. V. N. Edwards.

*MYSIS AMERICANA.* Smith, sp. nov. (p. 396.)

Anterior margin distinctly rostrated, but only slightly projecting; evenly rounded, the inferior angle projecting into a sharp tooth. Antennulæ, in the male, with the densely ciliated sexual appendage similar to that in *M. vulgaris* of Europe; the outer flagellum nearly as long as the body, the inner slightly shorter. Antennal scale about three-fourths as long as the carapax, about nine times as long as broad, tapering regularly from the base to a very long and acute tip; both margins ciliated. Appendages of the fourth segment of the abdomen in the male similar to those in *M. vulgaris*. The outer ramus is slender and naked, and its pair of terminal stylets are equal in length, slender, curved toward the tip, and the distal half armed with numerous short setæ; the ultimate segment of the ramus itself is little more than half as long as the stylets, the penultimate segment four or five times as long as the terminal. Inner lamella of the appendages of the sixth segment about as long as the telson, narrow, slightly broadened at the base, and tapering to a slender but obtuse point; outer lamella once and a half as long as the inner, and eight times as long as broad, slightly tapering, the extremity subtruncate. Telson triangular, broadened at base, the lateral margins slightly convex posteriorly, and armed with stout spines alternating with intervals of several smaller ones; the tip very narrow, truncate, armed with a stout spine each side, and two small ones filling the space between their bases. Length 10 to 12<sup>mm</sup>.

This species was found, in April, at Beesley's Point, New Jersey, in pools, upon salt-marshes, and at the same locality the stomachs of the spotted flounder were found filled with them. Professor D. C. Eaton found it in great abundance among sea-weeds, &c., just below low-water mark, at New Haven, Connecticut, May 5, 1873. It was also taken in the dredge, in 4 to 6 fathoms, at New Haven, Connecticut, and in 25

fathoms off Vineyard Sound, and has been found in the stomachs of the shad, mackerel, &c.

HETEROMYSIS FORMOSA Smith, gen. et sp. nov. (p. 396.)

Body rather short and stout. Carapax broad behind and tapering anteriorly; the anterior margin produced into an obtusely triangular rostrum. Ocular peduncles short and thickened nearly to the base. Peduncle of the antennula stout, extending to the tip of the antennal scale; the terminal segment in the male wanting the usual elongated sexual process, but having in its place a very dense tuft of long hairs; inner flagellum nearly as long as the carapax; outer flagellum stout at base and more than twice as long as the inner. Antennal scale about three and a half times as long as broad, not quite reaching to the extremity of the peduncle of the antennula, ovate, obtuse at the tip, external margin without a spine and ciliated like the inner; peduncle elongated, penultimate segment considerably longer than the ultimate; flagellum nearly as long as the entire body. Mandibles, maxillæ, first and second maxillipeds, as in *Mysis*. The first pair of legs (second pair of gnathopoda) differ remarkably from those in all the described genera of Mysidæ. The whole leg is stouter than in the succeeding pairs, and the terminal portion, corresponding to the multiarticulate portion of the inner branch (endopodus) in *Mysis*, &c., consists of only three segments including the terminal claw; the first of these segments is stout, slightly shorter than the preceding (meral) segment, and armed with stout spines along the distal portion of the inner margin; the second segment is very short, not longer than broad, and closely articulated to the preceding segment so as to admit of very little motion; the ultimate article is a long, slightly curved claw, freely articulated to the preceding segment. In the five posterior pairs of legs the terminal portion of the inner branch is multiarticulate as in *Mysis*, in the first composed of five segments, besides a stout terminal claw like that in the preceding pair, and in the four remaining pairs of six segments and a slender terminal claw. The exopodal branches of all the legs are well developed.

Abdomen a little more than twice as long as the carapax, the sixth segment a little longer than the fifth. The appendages of the first five segments alike in both sexes; short, rudimentary, and like the same appendages in the female *Mysis*. Inner lamella of the sixth segment projecting very slightly beyond the extremity of the telson, broad, ovate; outer lamella only a little longer than the inner, about two-sevenths as long as broad, inner margin quite convex, outer very slightly, tip rounded. Telson short, broad at base, and narrowed rapidly toward the extremity, the width at base about two-thirds the length, at the extremity only a third as wide as at base; the lateral margins each armed with twelve to fourteen spines, which increase in size distally, and a very long terminal spine; the posterior margins cleft by a sinus deeper than broad, and armed with numerous small spines.

In life the males are semitranslucent and nearly colorless, while in the females the antennulæ, the flagella of the antennæ, the ocular peduncles, the thorax with the marsupial pouch, and the articulations of the caudal appendages are beautiful rose color.

Length of a male, 6.0<sup>mm</sup>; carapax along the dorsal line, 1.8; antennal scale, 0.70; telson, 0.90. Length of a female, 8.5<sup>mm</sup>; carapax, 2.5; antennal scale, 0.88; telson, 1.16.

The absence of the sexual appendages from the antennulæ of the male, the peculiar structure of the anterior legs, and the similarity of the abdominal appendages in the two sexes, at once separate the genus *Heteromysis* from all known allied genera.

THYSANOPODA, species. (452.)

A great number of small specimens were taken from the stomach of mackerel caught twenty miles off No Man's Land, July 18, 1871.

Several were also caught swimming at the surface in Vineyard Sound, April 30, 1873, by V. N. Edwards.

A single specimen of a species apparently the same as this was taken at New Haven, Connecticut, May 5, 1873, by Professor D. C. Eaton.

CUMACEA.

DIASTYLIS QUADRISPINOSA, G. O. Sars. Plate III, fig. 13. (p. 507.)

Öfversigt af Kongl. Vet.-Akad. Förh., 1871, Stockholm, p. 72.

Dredged in 23 fathoms of Martha's Vineyard and in 29 fathoms of Buzzard's Bay. It is also found in the Bay of Fundy. Sars's specimens were dredged by the Josephine expedition in 18 fathoms off Skinnecock Bay, Long Island, and in 30 to 35 fathoms, latitude 39° 54' north, longitude 73° 15' west, off the coast of New Jersey.

Our specimens agree well with Sars's description, except that the second segment of the inner ramus of the lateral caudal appendages has but three, or rarely four, spines upon the inner margin, while in Sars's specimens there were five.

DIASTYLIS SCULPTA Sars.

Loc. cit., p. 71.

With the last species, in 18 fathoms, off Skinnecock Bay, according to Sars.

DIASTYLIS ABBREVIATA Sars.

Loc. cit., p. 74.

Rare in 30 to 35 fathoms, off the coast of New Jersey, with the first species, (Sars.)

EUDORELLA PUSILLA Sars.

Loc. cit., p. 79.

Not infrequent in 18 fathoms, off Skinnecock Bay, (Sars.)

*EUDORELLA HISPIDA* Sars.

Loc. cit., p. 80.

Rare in 30 to 35 fathoms, with the other species mentioned, off the coast of New Jersey, (Sars.)

AMPHIPODA.

*ORCHESTIA AGILIS* Smith, sp. nov. Plate IV, fig. 14. (p. 314.)

Male: Antennula not quite reaching the distal extremity of the penultimate segment of the antenna; second and third segments of the peduncle about equal in length, and each slightly longer than the first; flagellum about as long as the two last segments of the peduncle. Antenna less than half as long as the body; segments of the peduncle stout and swollen, the ultimate longer than the penultimate; flagellum stout, compressed vertically, much shorter than the peduncle, composed of twelve to fifteen segments. Propodus in the second pair of legs short and thickened laterally, the palmary margin with a small prominence on the outer edge of the posterior angle, behind which the tip of the dactylus closes, and along the inner edge, inside the dactylus, with a thin ridge, which is broken by a small notch near the posterior angle, so that the margin when viewed laterally shows a broad lobe next the base of the dactylus and two small, rounded lobes next the posterior angle, the tip of the dactylus resting between the small lobes; dactylus slender, curved so as to fit closely the palmary margin, and furnished with very minute setæ along the prehensile margin. Posterior thoracic legs slightly longer than the preceding; carpus in full-grown specimens short, much swollen, and thickened so as to be nearly cylindrical.

Female: Carpus and hand in the second pair of legs unarmed; propodus short, slightly spatulate in outline, with a pair of minute setæ at the base of the dactylus, which is very short, not reaching the extremity of the propodus.

Length: male, 10-15<sup>mm</sup>; female, 10-14.

Bay of Fundy to New Jersey.

*ORCHESTIA PALUSTRIS* Smith, sp. nov. (p. 468.)

Male: Antennulæ reaching slightly beyond the distal extremity of the penultimate segment of the peduncle of the antennæ. Antennæ less than half as long as the body; peduncle slender; flagellum slender, longer than the peduncle, composed of eighteen to twenty-six segments. Propodus in the second pair of legs nearly oval in outline, the palmary margin spinous, regularly curved to the posterior angle, which projects on the outer edge in a slight, rounded prominence, within which the tip of the dactylus closes; dactylus slender, curved so as to nearly fit the palmary margin, and furnished with minute setæ along the prehensile margin. Posterior thoracic legs slightly longer than the preceding; carpus and propodus both long and slender.

The female differs from the male as in the last species.

Length, male, 15-22<sup>mm</sup>; female, 12-18<sup>mm</sup>.

Cape Cod to New Jersey, and very likely farther north and south.

## TALORCHESTIA LONGICORNIS Smith. (p. 336.)

*Talitrus longicornis* Say, loc. cit., p. 384, 1818. *Orchestia longicornis* Edwards, His. nat. des. Crust., tome iii, p. 18, 1840; De Kay, op. cit., p. 36, Pl. 7, fig. 19.

Cape Cod to New Jersey, and probably farther south.

## TALORCHESTIA MEGALOPHTHALMA Smith. (p. 336.)

*Orchestia megalophtalma* Bate, Catalogue Amphip. Crust., British Museum, p. 22, 1862.

Cape Cod to New Jersey, and probably farther south.

*Talitrus quadrifidus*, De Kay, (op. cit., p. 36, Pl. 14, fig. 27,) may be based on the female of one of the preceding species, but it so is badly described and figured as to be indeterminate.

## HYALE LITTORALIS Smith. (p. 315.)

*Allorchestia littoralis* Stimpson, Marine Invertebrata of Grand Manan, p. 49, Pl. 3, fig. 36, 1853; Bate, Catalogue Amphip. Crust., British Museum, p. 48, Pl. 8, fig. 2, 1862.

This species was found at New Haven, Connecticut., by Professor Verrill, May 5, 1873, and is one of the inhabitants of rocky shores, piles of wharves, &c. I have found it at Provincetown, Massachusetts, and it is abundant in the Bay of Fundy. It is undoubtedly abundant on the whole New England coast, but its station upon the shore is so high up on the beach that it is likely to be overlooked.

## LYSIANASSA, species. (p. 431.)

A species of this genus, as restricted by Boeck, was several times dredged in Vineyard Sound and Buzzard's Bay.

Several other species of *Lysianassina* were taken in Vineyard Sound and the neighboring region, but they have not yet been sufficiently studied to be enumerated. The species of this group are much less common and the individuals smaller on the coast of Southern New England than they are upon the coast of Maine and farther north.

## LEPIDACTYLIS DYTISCU\$ Say. (p. 339.)

Loc. cit., p. 380, 1818.

Georgia to Cape Cod.

## PHOXUS KROYERI Stimpson. (p. 501.)

Marine Invertebrata of Grand Manau, p. 58, 1853.

Rare in Vineyard Sound and usually in deep water. Common in the Bay of Fundy.

## UROTHOÏ, species. (p. 452.)

A species with long, slender antennæ and very large black eyes, and apparently belonging to this genus, was taken in great numbers at the surface at Wood's Hole, on the evening of July 3, and on one or two other occasions. In life it was whitish, slightly tinged with orange-yellow.

## MONOCULODES, species. (p. 452.)

A single specimen taken at the surface in Vineyard Sound, December 21, by Mr. V. N. Edwards.

**LAPHYSTIUS STURIONIS** Kroyer. (p. 457.)

Nat. Tidsskrift, vol. iv, p. 157, 1842. *Darwinia compressa* Bate, Report Brit. Assoc., 1855, p. 58; Catalogue Amphip. Crust., Brit. Mus., p. 108, Pl. 17, fig. 7; Bate and Westwood, Brit. Sessile-eyed Crust. vol. i, p. 184, wood cut.

A parasitic amphipod, apparently quite identical with this species of Europe, was found in the mouth of a goose-fish (*Lophius Americanus*) taken in Vineyard Sound. A species, apparently the same, was also taken from the back of a skate (*Itaia levis*) in the Bay of Fundy the past summer. It is readily distinguished by its broad depressed form, and by having the third to fifth pairs of legs very stout and their distal segments forming powerful talon-like claws, while the first and second pairs are small and slender.

**CALLIOPIUS LÆVIUSCULUS** Boeck. (p. 315.)

Crust. Amphipoda borealia et arctica, p. 117, 1870. *Amphithoë lavinscula* Kroyer Grönlands Amphipoder, p. 53, Pl. 3, fig. 13, 1838. *Calliope lavinscula* Bate, Catalogue Amphip. Crust. Brit. Mus., p. 148, Pl. 28, fig. 2, 1862; Bate and Westwood, op. cit., vol. i, p. 156, wood cut.

Vineyard Sound and northward to Greenland, Northern Europe, and Spitzbergen.

**PONTOGENEIA INERMIS** Boeck. (p. 452.)

Op. cit., p. 114, 1870. *Amphithoë inermis* and *crenulata*, Kroyer, Grönlands Amphipoder, pp. 47, 50, Pl. 3, figs. 11, 12, 1838. *Iphimedia vulgaris* Stimpson, Marine Invertebrata of Grand Manan, p. 53, 1853. *Atylus inermis*, *crenulatus*, and *vulgaris* Bate, Catalogue Amphip. Crust. Brit. Mus., pp. 138, 139, 142, Pl. 27, figs. 5, 6, 1862. *Atylus vulgaris* Packard, Memoirs Boston Soc. Nat. Hist., vol. i, p. 298, 1867. (Not *Atylus (Paramphithoë) inermis* Packard, loc. cit., p. 298, Pl. 8, fig. 3.)

Taken at the surface in Vineyard Sound, in March, by Mr. V. N. Edwards. It is abundant, in company with *Calliopius laeviusculus*, about the Bay of Fundy in pools left by the tide, and ranges north to Labrador and Greenland.

**GAMMARUS ORNATUS** Edwards. Plate IV, fig. 15. (p. 314.)

Annales des Sci. nat., tome xx, 1830, p. 367, Pl. 10, figs. 1-10; Hist. nat. des Crust., tome iii, p. 47; Bate, op. cit., p. 212, Pl. 37, fig. 8. *Gammarus locusta* Gould, op. cit., p. 334. *Gammarus puler* Stimpson, Marine Invert. Grand Manan, p. 55.

New Jersey to Greenland.

**GAMMARUS ANNULATUS** Smith, sp. nov. (p. 314.)

Anterior margin of the head produced each side beneath the antennule into a truncated lobe, which extends farther forward than in *G. ornatus*; eyes scarcely reniform, less elongated than in *G. ornatus*, and their lower margins not reaching, by considerable, the anterior border of the truncated lobe. Antennæ longer than the antennulæ; the ultimate segment of the peduncle longer than the penultimate; the flagellum much more slender, the segments more elongated and with fewer hairs, than in *G. ornatus*. Hands of the first pair of legs more elongated than in *G. ornatus*, and the palmary margins very oblique. Propodus in

the second pair very narrow and elongated, subcylindrical, slightly flattened on the inner side, the palmary margin longitudinal, and scarcely distinct from the posterior margin. Fourth segment of the abdomen with a median fascicle of two large and two small spines, but no lateral fascicles. Fifth and sixth segments with both median and lateral fascicles of spines.

Color in life grayish white, the posterior margins of the segments bordered with brown, giving the body an annulated appearance.

Length, 12-18<sup>mm</sup>.

New Haven, Connecticut, and Eastport, Maine, and doubtless abundant at other points on the coast.

This species closely resembles the fresh-water *G. fasciatus*, but is distinguished from it by the proportions of the segments of the peduncles of the antennæ, and by wanting the lateral fascicles of spines upon the fourth segment of the abdomen.

GAMMARUS NATATOR Smith, sp. nov. (p. 439.)

Male: Eyes large, elongated, but only slightly reniform. Antennula short and stout, about three-sevenths as long as the body; flagellum but little longer than the peduncle; secondary flagellum nearly half as long as the primary. Antenna considerably longer than the antennula; penultimate segment of the peduncle reaching to the extremity of the peduncle of the antennula; ultimate segment of the peduncle longer than the penultimate; flagellum about two-thirds as long as the peduncle. Both antennulæ and antennæ are furnished with very long hairs, of which many on the antennulæ are plumose. First, second, and third epimera margined on the inferior edges with long cilia. First pair of legs more slender than the second; propodus oval, twice as long as broad, palmary margin continuous with the inferior, with a very narrow lamellar edge, a stout obtuse spine in the middle, and two smaller ones at the inferior angle; dactylus strongly curved. In the second pair the propodus is more than half as broad as long, and somewhat rectangular in outline, except that the palmary margin is slightly oblique; the palmary margin has a narrow lamellar edge, with a slight emargination in the middle, from which a stout obtuse spine arises, and at the inferior angle there are two or three smaller spines, as in the first pair. The inferior edges of the carpi and propodi of both pairs of legs are thickly clothed with long hairs. Natatory legs reaching to the tips of the telson. Second and third segments of the abdomen with the sides produced backward, and the postero-inferior angle acute. Fourth segment with only a median fascicle of spines; fifth and sixth segments with median and lateral fascicles. Rami of the posterior caudal stylets lanceolate, five or six times as long as broad, the outer extending beyond the inner by the length of its terminal article, which is very slender, almost spiniform, the edges of both rami clothed with long plumose hairs. Each division of the telson nearly three times as long as broad.

In the female the hands of the first and second pairs of legs are smaller and slenderer, and the propodi somewhat oval and nearly alike in both pairs; otherwise the females do not differ from the males, except that the rami of the posterior caudal stylets are, perhaps, a very little shorter and broader in proportion.

Length, 10-12<sup>mm</sup>.

Vineyard Sound, in vast numbers at the surface of the water, usually among floating sea-weeds and eel-grass. Also from stomach of mackerel, May 20.

**GAMMARUS MARINUS** Leach. (p. 486.)

Trans. Linnæan Soc., London, vol. xi, p. 359, 1815; Bate, Catalogue Amphip. Crust., Brit. Mus., p. 215, Pl. 38, fig. 4; Bate and Westwood, Brit. Sessile-eyed Crust., vol. i, p. 370, wood-cut.

A species which I cannot distinguish, by the published figures and descriptions, from this common species of Europe, was not uncommon, associated with *Amphithoë maculata*, under stones at the Wepecket Islands, Gull Island, Cuttyhunk Island, and at other places on Vineyard Sound and Buzzard's Bay. It has also been found at Watch Hill, Rhode Island, and at New Haven, Connecticut, by Professor Verrill. It is at once distinguished from all the other species of our coast by its slender form, slender antennæ, by having the sides of the second and third segments of the abdomen narrow and not produced or acute at the postero-inferior angle, and by having the outer rami of the posterior caudal stylets four or five times as long as the inner.

**GAMMARUS MUCRONATUS** Say. (p. 479.)

Loc. cit., p. 376, 1818; De Kay, op. cit., p. 37. *Gammaracanthus mucronatus* Bate, op. cit., p. 203.

Readily distinguished from the other species of the coast by having the posterior margin of each of the anterior segments of the abdomen produced into a slender, spiniform, dorsal tooth. In life, it is translucent, tinged with green, or yellowish green, minutely specked with brown or black; these black or brown markings and the green color being frequently so arranged as to give the antennæ and legs a banded appearance. Our species cannot be referred to Bate's genus *Gammaracanthus*, for the dorsal margin is not distinctly carinated, and the third, fourth, and fifth segments of the abdomen are furnished with fascicles of spines.

Usually in brackish water, North Carolina to Cape Cod, and, according to Say, from Florida also.

**MœERA LEVIS** Smith, sp. nov. (p. 315.)

Eyes nearly round; black in alcoholic specimens. Antennula two-thirds as long as the body; first and second segments of the peduncle equal in length, third about two-thirds as long as the second; flagellum about as long as the peduncle. Antenna about as long as the peduncle of the antennula; ultimate and penultimate segments equal in length, antepenultimate very short; flagellum much shorter than the peduncle. Legs of the first pair small; carpus as broad as the propodus, but little



longer than broad, the posterior margin straight and furnished with fascicles of stout hairs; palmary margin nearly transverse, slightly arcuate, and armed with short setæ; dactylus slender and fitting closely the palmary margin. Legs of the second pair larger; carpus short, as broad as the base of the propodus, the posterior angle thickly clothed with stout hairs; propodus in the male stout, broadest distally, the palmary margin expanded toward the inferior angle and excavated on the inner side to receive the long and strongly curved dactylus; in the female, elongated, slightly narrowed distally, the posterior margin continuous and nearly parallel with the palmary, and furnished with fascicles of stout hairs. Fifth pair of legs but little longer than the third or fourth; sixth and seventh much longer than the fifth, subequal, stout, their meral and carpal segments considerably expanded, especially in the male. Ultimate caudal stylets projecting a little beyond the preceding pairs; rami short, broad, and with spinous tips; the outer ramus slightly longer and broader than the inner, and its outer margin armed with a very few fascicles of spinules. Telson reaching to the bases of the rami of the posterior caudal stylets, nearly as broad as long, and cleft two-thirds of the way to the base.

Length, 5-7<sup>mm</sup>.

New Jersey, Long Island Sound, Vineyard Sound.

*MELITA NITIDA* Smith, sp. nov. (p. 314.)

Eyes small, round, black. Antennula about two-thirds as long as the body; first segment of the peduncle slightly shorter than the second, which is nearly twice as long as the last; flagellum longer than the peduncle. Antenna shorter than the antennula, but the peduncle considerably longer than the peduncle of the antennula, the penultimate segment being scarcely shorter than the penultimate segment of the antennula, while the ultimate segment is subequal with it. First pair of legs with the carpus longer and broader than the propodus; propodus oblong, slightly curved; dactylus very small but stout, curved, and attached in a notch in the middle of the extremity of the propodus, not closing upon the extremity of the propodus but projecting inward. Second pair of legs stout; carpus short, triangular; propodus somewhat oval, the palmary margin oblique, arcuate, continuous with the posterior margin, and armed with a series of minute spines and with numerous stiff hairs, the clothing of hairs continuing round upon the posterior margin to the carpus; dactylus curved, tip resting within the palmary margin. Third pair of legs slightly longer than the fourth. Three posterior pairs slender, the fifth somewhat shorter than the sixth and seventh, which are subequal, and have the anterior margins of the bases armed with small spines and the posterior margins minutely serrate. None of the dorsal margins of the segments of the abdomen serrate or emarginate, but the margin of the fifth segment armed with several slender spines on each side near the median line of the dorsum. Penultimate caudal stylets not quite reaching the tip of the preceding

pair. The ultimate pair very long and armed with fascicles of spines along the margins. Divisions of the telson slender, spinous at the tips.

In life dark greenish slate-color, changing in alcohol to dark slate. Length, 7-9<sup>mm</sup>.

New Jersey to Cape Cod.

AMPELISCA. Plate IV, fig. 17. (pp. 431, 507.)

The species of this genus found upon our coast have not yet been carefully studied. At least two species were taken in Vineyard Sound and Buzzard's Bay. The genus is readily recognized, but the species are difficult to distinguish.

BYBLIS SERRATA Smith, sp. nov. (p. 501.)

Female: Dorsum rounded above, with no trace of a longitudinal carina upon the abdomen; third segment of the abdomen broadly rounded at the postero-lateral angle. Antennula about as long as the peduncle of the antenna; fourth segment of the peduncle of the antenna longer than the fifth. Inferior margins of the epimera of the first and second pairs of legs serrate, with slender and acute teeth alternating with the marginal cilia; carpus in the first pair scarcely if any longer than the propodus; carpus in the second pair very much longer than the propodus. In the third and fourth pairs of legs the dactylus as long as the propodus. Basal segment in the seventh pair of legs expanding distally, the posterior margin nearly straight, the anterior and inferior margins evenly arcuated, and reaching as far as the distal end of the carpus; carpus about as long as the ischium and merus together, a little less than twice as long as broad, and armed with long spines upon the anterior and distal margins, but the posterior margin wholly unarmed; propodus almost as long as the carpus, and nearly four times as long as broad, anterior margin unarmed, the posterior armed upon the outside with two transverse rows of three or four spines, decreasing in size as they recede from the margin, the distal end with a spine each side the slender dactylus. Rami of the first pair of caudal stylets equal, as long as the base; outer rami of the second pair shorter than the inner; rami of the posterior pair equal, longer than the bases, reaching to the tips of the rami of the first pair. Telson as long as the breadth at base, cleft rather more than half its length, the lateral margins arcuate, and rapidly converging toward the evenly rounded extremity.

Alcoholic specimens are pale yellowish, the epimera, bases of the posterior legs, and the sides of the abdomen specked and mottled with numerous points of dark pigment crowded irregularly together.

Length, 10-12<sup>mm</sup>.

Deep water off Vineyard Sound and Buzzard's Bay.

PTILOCHEIRUS PINGUIS Stimpson. (p. 431.)

Marine Invertebrata of Grand Manan, p. 56, 1853. *Protomedea pingus* Bate, Catalogue Amphip. Crust. Brit. Mus., p. 170, Pl. 31, fig. 2, 1862.

Common on the whole coast of New England upon muddy bottoms

and north to Labrador. In depth it extends down to 150 fathoms, and probably much farther.

*MICRODEUTOPUS MINAX* Smith, sp. nov. (p. 479.)

Antennula about two-thirds as long as the body; first segment of the peduncle stout, about as long as the head; second segment a little longer and much more slender; third segment nearly half as long as the first; flagellum slender, about a third longer than the peduncle; secondary flagellum very small, consisting usually of but one segment. Antenna about two-thirds as long as the antennula; ultimate and penultimate segments of the peduncle equal in length, and each fully twice as long as the antepenultimate; flagellum scarcely as long as the last segment of the peduncle. Hands of the first pair of legs in the male greatly developed; carpus very large, scarcely longer than the breadth in the middle; superior margin strongly arcuate, the inferior angle produced into a stout process opposed to the propodus, and the inferior margin arcuate and armed distally with two teeth, a large and prominent one at the base of the terminal process, the other small, obtuse, or even obsolete; propodus not more than half as long as the carpus, much longer than broad, the inferior margin with two broad obtuse teeth; dactylus stout, a little shorter than the propodus. Legs of the second pair with the basal segment broad and squamiform; carpus elongated; propodus as long as the carpus and as broad as its distal portion, rectangular, about two and a half times as long as broad; dactylus short and hooked at the tip. In the female the hands of the first pair of legs are only moderately developed; carpus broad; propodus scarcely as broad as the carpus, rectangular, the palmary margin somewhat oblique, and the inferior margin armed with a spine at the obtusely rounded inferior angle. In the second pair the basal segment is not expanded but narrow; the carpus and propodus much as in the male, except that they are clothed with numerous long, plumose hairs. The bases of the first and second pairs of caudal stylets are armed with a long, slender, spiniform process, arising from the distal end just below the bases of the rami. The outer rami of the posterior stylets are a little longer than the inner. All the stylets extend to the same point.

Length, about 4<sup>mm</sup>.

Long Island Sound and Vineyard Sound.

Another species of *Microdeutopus* was collected in Vineyard Sound, but it was not abundant.

*AUTONOE*, species. (p. 415.)

A species belonging apparently in this genus, as defined by Boeck, was common in Vineyard Sound, living in tubes in masses of a compound Ascidian (*Amouroucium pellucidum* Verrill) in 3 to 8 fathoms. It is 6 or 7<sup>mm</sup> in length, and in life the antennulæ and antennæ are obscurely banded and specked with pink; the body above, except upon the fifth segment and the posterior part of the abdomen, is almost black, the

color extending down upon the epimera, while the legs and caudal appendages are semi-translucent. The eyes are large and black.

*AMPHITHOË MACULATA* Stimpson. Plate IV, fig. 16. (p. 315.)

Marine Invertebrata of Grand Manan, p. 53, 1853.

Vineyard Sound to the Bay of Fundy and Labrador.

*AMPHITHOË VALIDA* Smith, sp. nov. (p. 315.)

Male: Eyes round, black in alcoholic specimens. Antennulæ and antennæ subequal in length. Peduncle of the antennula extending scarcely beyond the distal extremity of penultimate segment of the peduncle of the antenna; the second segment but little longer than the first; ultimate segment short and slender. Ultimate and penultimate segments of the peduncle of the antenna subequal in length. First pair of legs short, compressed; carpus as broad as the propodus; propodus broad, oval in outline, the posterior and palmary margins forming a continuous, nearly semicircular curve; dactylus fitting closely the palmary margin. Second pair of legs very large; carpus small; propodus oblong, broadest at the distal extremity, very large and thickened, the outer surface convex, the inner flattened, palmary margin transverse, with a broad, low, median tooth, and a rounded prominence at the inferior angle, within which the tip of the very stout and strongly curved dactylus closes.

The female differs in having the hands of the first pair of legs slightly more elongated, and those of the second pair smaller than in the male, and the palmary margin slightly oblique.

Color in life, bright green.

Length, 10-13<sup>mm</sup>.

New Jersey and Long Island Sound.

*AMPHITHOË LONGIMANA* Smith, sp. nov. (p. 370.)

Male: Eyes round, and, in specimens preserved in alcohol, black. Antennula slender and as long as the body; second segment of the peduncle a little longer than the first; third segment about half as long as the second; flagellum about twice as long as the peduncle. Antenna considerably stouter and slightly shorter than the antennula, the peduncle about twice as long as the flagellum; third segment of the peduncle a little more than half as long as the first segment of the peduncle of the antennula; fourth segment nearly three times as long as the third; fifth considerably longer than the fourth; flagellum a little longer, or sometimes only as long, as the fifth segment of the peduncle. Hands of the first and second pairs of legs stout and much elongated. Carpus in the first pair nearly as long as the first segment of the peduncle of the antennula, narrow; propodus much more than twice as long as broad, as wide and long as the carpus, of the same width throughout, slightly curved, and the very short palmary margin transverse; dactylus stout, very little curved, more than half as long as the propodus, and projecting far beyond its inferior edge; the posterior margins of

both propodus and carpus densely clothed with long, stiff hairs. Carpus in the second pair of legs short, with an angular prominence upon the posterior side; propodus as long as in the first pair, and much broader, the palmary margin oblique, projecting at the inferior angle, just inside of which there is a deep sinus in the margin. Posterior edges of the bases of the sixth and seventh pairs of legs unarmed.

In the female the antennæ are shorter and not quite as stout, and the hands of the first and second pairs of legs are very much shorter, smaller, and much less hairy; in the first pair the carpus and propodus are very much shorter and proportionally broader, and the palmary margin of the propodus more oblique; in the second pair the propodus is short and somewhat oval, with a slight prominence at the inferior angle of the palmary margin.

Length, 6-9<sup>mm</sup>.

New Jersey; Great South Bay; Long Island; Vineyard Sound. Common among eel-grass in sheltered situations. The young, even 5 or 6<sup>mm</sup> long, were taken at the surface in Vineyard Sound several times.

*AMPHITHOË COMPTA* Smith, sp. nov. (p. 370.)

Eyes small, round, red in life, but fading in alcohol to whitish. Antennula slender, as long as the body; first segment of the peduncle as long as the head; second slightly longer than the first; last a third as long as the second; flagellum very slender, nearly three times as long as the peduncle. There is a rudimentary secondary flagellum, not longer than the first two segments of the primary flagellum and very slender. Antenna a little shorter than the antennula; the peduncle very little shorter than that of the antennula; last two segments about equal in length, the penultimate reaching as far as the same segments of the antennula; flagellum about as long as the peduncle. First and second pairs of legs, in the male, about equal in size, as long as the head and thorax together, and clothed on both margins with long, plumose hairs. Carpus in the first pair longer than, and as broad as, the propodus, the distal extremity truncate and right-angled at the inferior margin; the propodus much longer than broad, the palmary margin oblique, very nearly straight, and armed at the inferior angle upon the inner side with a stout spine. Carpus in the second pair narrower than in the first, the distal extremity obliquely rounded at the inferior angle; propodus as long as the carpus and no broader, the palmary margin less oblique than in the first pair, without any spine, and the inferior angle slightly projecting; dactylus, strongly curved and closing by the margin of the propodus. In the female the legs of the first and second pairs are nearly alike in form, very much smaller and weaker than in the male, and only sparsely clothed with mostly simple hairs, except upon the inferior margin of the carpus in the second pair. In both pairs the carpus is about as long and broad as the propodus; the propodus is short, narrowed toward the carpus, the palmary margin oblique, convex in outline, with the inferior angle rounded and armed with a stout spine on the inside. Second

and third segments of the abdomen produced into a slight angular prominence at the postero-inferior angle. The posterior edges of the bases of the sixth and seventh pairs of legs not serrated but armed with two to four small spines. First and second pairs of caudal stylets extending scarcely beyond the posterior pair. In the first pair there is a long, slender spine projecting from the distal extremity of the base beneath the rami.

Length of largest specimen examined, 13<sup>mm</sup>.

North Carolina to Cape Cod. Common among eel-grass. Taken at surface in Vineyard Sound.

**PODOCERUS FUCICOLA** Smith. (p. 493.)

*Cerapus fucicola* Stimpson, Marine Invertebrata of Grand Manan, p. 48, Pl. 3, fig. 34, 1853.

This species was dredged by Professor Verrill, in 4 to 5 fathoms, off Watch Hill, Rhode Island, in April, 1873. It is common in the Bay of Fundy.

**PODOCERUS**, species. (p. 494.)

Another species of the same genus was taken in abundance with the last. It is a large and dark-colored species.

**CERAPUS RUBRICORNIS** Stimpson. Plate IV, fig. 18.

Marine Invertebrata of Grand Manan, p. 46, Pl. 3, fig. 33, 1853; Bate, Catalogue Amphip. Crust. Brit. Mus., p. 256, Pl. 45, fig. 4.

Not common south of Cape Cod, but very abundant in the Bay of Fundy and north to the coast of Labrador. In depth it extends down to 100 fathoms at least.

**CERAPUS MINAX** Smith, sp. nov.

Antennulæ and antennæ about equal in length, rather more than half as long as the body. Second pair of legs greatly developed in the male, the hand nearly half as long as the body; carpus elongated, narrow, nearly three times as long as the breadth in the middle, the posterior angle projecting into a broad process about as long as the dactylus, and armed on the inside with a tooth nearly as stout as the distal part of the process itself, but projecting only about half as far; propodus about half as long as the carpus, twice as long as broad; dactylus considerably shorter than the propodus, the tip in most of the larger specimens furnished with a pencil of long hairs. In the female the hand in the second pair of legs is small; the carpus produced into a long process on the inferior edge of the propodus to the palmary margin; propodus short, broad, somewhat oval, the palmary margin arcuate and armed with several short spines on the portion next the carpal process.

Length, about 4<sup>mm</sup>.

Long Island Sound, Vineyard Sound.

? **CERAPUS TUBULARIS** Say. (p. 396.)

Loc. cit., p. 49, Pl. 4, fig. 7-11, 1817.

Several specimens of a small amphipod, dredged, June 27, in Vineyard

Sound, among masses of a large compound Ascidian, (*Amouroucium pelucidum*), in eight to ten fathoms, off Nobska Point, are probably this species, but unfortunately females only were obtained, while Say describes and figures the male alone. In our specimens, the antennulæ and antennæ are spotted with very dark purplish-brown, the anterior part of the body almost black, the middle and posterior portions spotted with black, or very dark purplish brown. They are between 4 and 5<sup>mm</sup> long and inhabit unattached tubes as described by Say. The tubes are regularly cylindrical, quite thin and delicate, black, about 5<sup>mm</sup> long, and 0.4<sup>mm</sup> in diameter, and are carried about by the animal very much as the larvæ of some of the Phryganeidæ carry about their tubes in fresh water. In the structure of the caudal appendages, our specimens are quite different from the species usually referred to *Cerapus*, but I have not thought best to make any changes in nomenclature until the discovery of the male shall make it certain whether our specimens belong to the species described by Say.

*COROPHIUM CYLINDRICUM* Smith. (p. 370.)

*Podocerus cylindricus*, Say loc. cit., p. 387, 1818, (not of Bate, Catalogue Amphip. Crust. Brit. Mus., p. 256.)

New Jersey to Vineyard Sound. Very abundant among weeds and hydroids about piles of wharves, and almost everywhere in shallow water.

Length, about 4<sup>mm</sup>.

*SIPHONÆCETES CUSPIDATUS* Smith, sp. nov. (p. 501.)

Male: Head produced into a long, slender, acute rostrum, and each side between the antennula and antenna into a long lobe rounded at the end where the eye is situated, and contracted toward the base. Antennula reaching about to the middle of the fourth segment of the peduncle of the antenna; segments of the peduncle equal in length; flagellum scarcely longer than a segment of the peduncle, and composed usually of five segments. Antenna a little longer than the body; third segment of the peduncle a little longer than any segment of the peduncle of the antennula; fourth segment nearly twice as long as the third; last segment nearly one-half longer than the third; flagellum a little shorter than the last segment of the peduncle. Legs much like Kroyer's figures of *S. typicus*, those of the first pair with the carpus twice as long as broad; propodus slightly narrower and a little longer than the carpus, the posterior edge furnished with long hairs and several stout spines. Legs of the second pair much stouter. Posterior caudal stylets with the terminal process fully as long as the ramus itself, the ramus as broad as long, the extremity obtusely rounded and furnished with very long hairs. Telson broader than long, transversely elliptical.

In the female the antennæ and second pair of legs are more slender than in the male.

In alcoholic specimens the antennulæ are marked with narrow bands of black or dark brown upon each segment of the flagellum and at

both ends of the second and third segments of the peduncle, and the antennæ are obscurely banded and tinged with a lighter color.

Length, about 6<sup>mm</sup>.

It inhabits tubes constructed of grains of sand.

In deep water off Vineyard Sound and Buzzard's Bay.

UNCIOLA IRRORATA Say. Plate IV, fig. 19. (p. 340.)

Loc. cit., p. 389, 1818; Stimpson, *Marine Invertebrata of Grand Manan*, p. 45.

This species grows to a much larger size than described by Say, being frequently 15<sup>mm</sup> in length.

New Jersey to the Bay of Fundy, and probably much farther north, and from low water to more than 400 fathoms in depth.

HYPERIA, species. (p. 439.)

A large species of *Hyperia* was several times found upon the large red jelly-fish (*Cyanea*) in Vineyard Sound. The same species is common in the Bay of Fundy, but has not been identified with certainty.

Another species of *Hyperia* was taken at the surface, in company with *Salpa*, in Vineyard Sound, early in September.

PIIRONIMA, species. (p. 439.)

A species of this peculiar genus was taken at the surface, in company with *Salpa*, off Gay Head, early in September. It is closely allied to the *P. Atlantica* of Guérin. According to Professor Verrill's notes it is, in life, translucent, scarcely tinged with yellowish white, and nearly invisible in the water; the eyes red.

Another form allied to the last was taken with it, and is possibly the male of the same species, but differs from it, and from the characters usually assigned to the genus, in possessing well-developed antennulæ. In life, according to Professor Verrill, it was translucent whitish, the body spotted with dark brown, and the eyes blackish.

THYRÓPUS, species.

A single specimen of a species of this genus was taken with the *Phronima* and *Salpa*, off Gay Head, early in September.

CAPRELLA GEOMETRICA Say. Plate V, fig. 20. (p. 480.)

Loc. cit., p. 390, 1818; Bate, *Catalogue Amphip. Crust. British Mus.*, p. 357, Pl. 56, fig. 8.

North Carolina to Vineyard Sound, especially among eel-grass; very abundant in Great Egg Harbor, New Jersey, April, 1871.

CAPRELLA, species. (p. 316.)

A larger species of *Caprella*, which is common in the Bay of Fundy, was frequently dredged in Vineyard Sound.

#### ISOPODA.

SCYPHACELLA Smith, gen. nov.

Near *Scyphax*, Dana.\* Antenna composed of eight distinct segments,

\* U. S. Exploring Expedition, *Crust.*, p. 734, Pl. 48, fig. 5.



with a geniculation at the articulation of the fourth with the fifth segment; terminal portion, corresponding to the flagellum, composed of three closely articulated segments, besides a minute apical one; mandibles slender, without palpi; exposed portion of the maxillipeds formed of only two segments; the basal one with a narrow, elongated portion, which is abruptly narrowed at the articulation of the terminal segment, and sends a slender process beneath it to the middle of its inner margin; the terminal segment much narrower than the basal, and tapering toward the extremity; legs subequal, the posterior not shorter than the others; terminal segment of the abdomen produced between the posterior caudal appendages, which are short and essentially as in the allied genera.

This genus differs from *Scyphax* most notably in the form of the maxillipeds, which in *Scyphax* have the terminal segment broad and serrately lobed, while in our genus it is elongated, tapering, and has entire margins. In *Scyphax*, also, the posterior pair of thoracic legs are much smaller than the others, and weak; the last segment of the abdomen is truncated at the apex, and the articulations between the segments of the terminal portion of the antennæ are much more complete than in our species. The general form and appearance of the genera are the same, and the known species agree remarkably in habits, the *Scyphax*, according to Dana, occurring on the beach of Parua Harbor, New Zealand, and found in the sand by turning it over for the depth of a few inches.

SCYPHACELLA ARENICOLA Smith, sp. nov. (p. 337.)

Body elliptical; abdomen not abruptly narrower than the thorax; the whole dorsal surface, except the extremity of the abdomen, covered with small, depressed tubercles, which give rise to minute spinules; eyes prominent, round; antenna a little longer than the breadth of the body; first and second segments short, equal; third, fourth, and fifth successively longer, the fifth being rather longer than the terminal portion, which is more slender than the fifth segment, tapers regularly to the tip, and is composed of three successively much shorter segments, and a very short, somewhat spiniform, but obtuse, terminal one; all the segments, except the minute terminal one, scatteringly beset with spinules; legs beset with small spines; the ischial, meral, carpal, and propodal segments subequal; terminal process of the last segment of the abdomen narrow, triangular, with the apex slightly rounded, and the dorsal surface a little concave; posterior caudal appendages much shorter than the abdomen; rami slightly unequal, the outer stout, spinulose, the inner a little shorter and much more slender.

Color, in life, nearly white, with chalky white spots and scattered, blackish dots arranged irregularly. Eyes black.

Length, 3-4<sup>mm</sup>.

Found at Somers's and Beesley's Points, on Great Egg Harbor, New Jersey, in April, 1871, burrowing in the sand of the beaches, just above

ordinary high-water mark, in company with several species of *Staphylinidae*, and will very likely be found on Long Island and the southern coast of New England.

**PHILOSCIA VITTATA** Say.

Jour. Acad. Nat. Sci., Philadelphia, vol. i, p. 429, 1818.

Under rubbish below high-water mark, Connecticut and New Jersey.

**SPHÆROMA QUADRIDENTATA** Say. Plate V, fig. 21. (p. 315.)

Jour. Acad. Nat. Sci. Philadelphia, vol. i, p. 400, 1818.

Massachusetts to Florida.

**IDOTEA CÆCA** Say. Plate V, fig. 22. (p. 340.)

Loc. cit., p. 424, 1818. Gould, Invertebrata of Massachusetts, p. 337, 1841.

Massachusetts to Florida.

**IDOTEA TUFTSII** Stimpson. (p. 340.)

Marine Invertebrata of Grand Manan, p. 39, 1853.

Bay of Fundy and off New London, Connecticut.

**IDOTEA IRRORATA** Edwards. Plate V, fig. 23. (p. 316.)

Hist. nat. des Crust., vol. iii, p. 132, 1840. *Stenosoma irrorata* Say, loc. cit., p. 423, 1818; Gould, Invertebrata of Massachusetts, p. 338, 1841.

Bay of Fundy to Great Egg Harbor, New Jersey.

**IDOTEA ROBUSTA** Kroyer. Plate V, fig. 24. (p. 439.)

Naturhist. Tidssk., 2d R., Bind ii, p. 108, 1846; Stimpson, Proceedings Acad. Nat. Sci., Philadelphia, 1862, p. 133.

South shore of Long Island to the Arctic Ocean. A pelagic species.

**IDOTEA PHOSPHOREA** Harger, sp. nov. (p. 316.)

Resembling *I. irrorata* in size and shape, but easily distinguished from that species by the pointed abdomen.

Antennæ less than half the length of the body, antennulæ attaining the end of the third segment of the antennæ. Front slightly excavated with the lateral angles salient. Head about twice as broad as long, turgid, and usually with a pair of tubercles on the vertex. Eyes placed a little before the middle of the lateral margin, hemispherical, black. First segment of thorax produced laterally around the back part of the head nearly to the eyes, showing no epimeral sutures. Second segment much longer on the median line, but shorter at the sides than the first; the epimera occupy the anterior two-thirds of the lateral margin. Third segment slightly longer than the second; the epimera occupying still more of the lateral margin. Fourth segment of about the same length as third; the epimera occupying nearly or quite all the lateral margin. The remaining three thoracic segments gradually decrease in size; the epimera occupy the whole lateral margin and increase in size posteriorly. The first two abdominal segments are distinct and acute at the sides. The third is similar to these at the sides, but is only separated

from the last by an incision reaching about half way to the median line, last segment entire, ovate behind, and cuspidate. The style on the second pair of branchial plates in the male is slender, surpasses the laminae, and reaches the middle of the terminal cilia; it is obliquely truncated at the end.

Many of the specimens, especially the smaller ones, are furnished with a row of prominent tubercles along the back, and sometimes with lateral rows.

Length, 10-25 <sup>mm</sup>; breadth, 3-7.5<sup>mm</sup>.

Long Island Sound to Bay of Fundy.

*ERICHI SONIA FILIFORMIS* Harger. Plate VI, fig. 26. (p. 316.)

*Steniosoma filiformis* Say, loc. cit., p. 424, 1818.

Small, slender, and nearly linear in outline. Antennulæ not quite attaining the fourth segment of the antennæ, which are six-jointed, and more than half as long as the body, with the first segment short, second and third increasing in length, last three segments about equal; head elevated between the eyes, where it is surmounted by a bifid tubercle; first and second thoracic segments with a lateral salient angle behind the evident angulated epimera; third and fourth segments with their lateral borders emarginate, and the epimera concealed or rarely visible from above at the emargination; last three thoracic segments angulated in front of the epimera, which are also angular. This arrangement, especially in the smaller specimens, gives the appearance of fourteen serrations on each side of the thorax. There is a row of tubercles along the median line. Abdominal segments consolidated into a single piece, which is furnished with a divergent tooth on each side near the base, and is expanded and obtusely triangular at the apex. The style on the second pair of branchial plates in the male is strong and curved, surpasses the cilia, and is acute and sharply serrate near the end.

Length, 5-9<sup>mm</sup>.

Vineyard Sound to Great Egg Harbor, New Jersey.

*ERICHI SONIA ATTENUATA* Harger, sp. nov. Plate VI, fig. 27. (p. 370.)

Body smooth, narrowly linear in outline. Antennulæ slightly surpassing the second segment of the antennæ, which are more than half the length of the body, and have the last segment longest. Head excavated in front; eyes small, black, prominent; first thoracic segment short; second, third, and fourth segments about equal in length, twice as long as the first; third segment broadest, last three segments gradually decreasing in length. Epimera visible from above only in the last two or three segments, but the sutures are evident, except in the first segment, and their position moves gradually from the anterior portion of the segment in the second to the posterior in the seventh segment. Abdominal segments consolidated into a single piece, which is slightly dilated laterally near the base, and obtusely triangular at the tip. The

style on the second pair of branchial plates in the male is straight, slightly surpasses the cilia, and is acute at the end.

The color in life is usually uniform dark green, sometimes with an obscure dorsal stripe of a lighter color.

Length, 15<sup>mm</sup>.

Abundant among eel-grass at Great Egg Harbor, New Jersey, and also found at New Haven, Connecticut.

**EPELYS TRILOBUS** Smith. Plate VI, fig. 28. (p. 370.)

*Idotea triloba* Say, loc. cit., p. 425, 1818.

Great Egg Harbor, New Jersey to Vineyard Sound.

**EPELYS MONTOSUS** Harger. (p. 370.)

*Idotea montosa* Stimpson, Marine Invert., Grand Manan, p. 40, 1853.

Bay of Fundy to Long Island Sound.

**JÆRA COPIOSA** Stimpson. (p. 315.)

Loc. cit., p. 40, Pl. 3, fig. 29, 1853. *J. nivalis* Packard, Memoirs Boston Soc. Nat. Hist., vol. i, 296, (non Kroyer.)

Long Island Sound to Labrador.

**LIMNORIA LIGNORUM** White. Plate VI, fig. 25. (p. 379.)

Pop. Hist. Brit. Crust., p. 227, Pl. 12, fig. 5. *Cymothoa lignorum* Rathke, Skrivt. af Naturh. Selsk., vol. 101, t. 3, f. 14, 1799, (teste Bale and Westwood.) *Limnoria terebrans* Leach, Trans. Linn. Soc., London, vol. xi, p. 371, 1815. Gould, Invertebrata of Massachusetts, p. 388, 1841.

Great Egg Harbor, New Jersey, to the Bay of Fundy and Europe.

**NEROCILA MUNDA** Harger, sp. nov. (p. 459.)

Elongated, oval, smooth, and polished. Antennæ and antennulæ nearly equal in length, about as long as the head. Head flattened, about one-third broader than long, slightly narrowing anteriorly, produced and broadly rounded in front, subequally trilobed behind, the middle lobe largest. Eyes black, consisting of an irregularly rounded patch of rather indistinct ocelli visible both above and below. First thoracic segment longer than the others, excavated in front for the three lobes of the head; epimeral sutures of this segment indistinct, but the posterior lateral angles of the segment are somewhat produced and broadly rounded. The next three segments have this angle produced so as to become a small tooth in the fourth thoracic segment; in the last three segments it is much produced, becoming a long acute tooth in the seventh. The epimera of the second segment are rounded behind; the remaining epimera are slightly angular behind, becoming more acute anteriorly; those of the second, third, and fourth segments extend backward about as far as the segment to which they belong, but in the last three segments the produced angles of the segments surpass the epimera, so that the angle of the sixth segment nearly attains the end of the seventh epimeron.

The abdomen is composed of six segments, the first five short and about equal in length; the sixth equal in length to the other five, truncate in front and rounded behind. The spines beneath the abdomen, or "abdominal epimera," are acute, the second a little more slender than the first, and extending not quite to the posterior angle of the fourth abdominal segment. The internal plate of the caudal stylets is oval and obliquely truncate, shorter than the external, which is narrow, ovate, acute behind, extending about half its length beyond the tip of the abdomen and longer than the preceding segment of the stylet. Claws of the anterior feet strongly hooked, those of the posterior feet feebly so.

Color, in alcohol, brown, with two narrow dorsal bands of lighter color.

Length, 15<sup>mm</sup>; breadth, 7<sup>mm</sup>.

This species is allied to *N. bivittata*, but differs from that species as figured by Milne Edwards, (Atlas du Règne animal de Cuvier, Crust., Plate 66, fig. 5,) in the shortness of three posterior epimera, the regularly rounded terminal segment of the abdomen, and the shape of the caudal stylets.

A single specimen was obtained on the dorsal fin of *Ceratacanthus aurtiacus*.

CONILERA CONCHARUM Harger. (p. 459.)

*Ega concharum* Stimpson, Marine Invert. Grand Manan, p. 42, 1853.

Vineyard Sound; Charleston, South Carolina.

LIVONECA OVALIS Harger. Plate VI, fig. 29. (p. 457.)

*Cymothoa ovalis* Say loc. cit., p. 394, 1818.

These animals are usually distorted, and not, as represented in the figure, symmetrical on the two sides.

The specimen figured was taken from a blue-fish near the gill.

ANTHURA BRUNNEA Harger, sp. nov. (p. 426.)

Nearly uniform in size throughout, but slightly narrower anteriorly. Antennulæ and antennæ nearly equal in length, scarcely longer than the head. Front projecting between and each side of the bases of the antennulæ into prominent angles. Eyes small and situated in the sides of the lateral prominences. Thoracic segments smooth and shining above; the third with a slight semicircular depression on the middle of the anterior margin. This depression is still more strongly marked on the three following segments. First segment slightly longer and narrower than the others; second to fifth about equal; sixth and seventh considerably shorter; the seventh about three-fourths the length of the sixth; all the segments carinated below. Dorsal surface of the basal portion of the abdomen similar to the posterior segment of the thorax, showing no indication of segments. Terminal portion flat, smooth, and narrowly ovate at tip. Appendages of the penultimate segment lamelliform, similar in form to the terminal plate but not quite equaling it. First pair of feet short and thickened. All the feet slightly hairy.

In life whitish mottled with dull, purplish brown above. Eyes black, retaining their color in alcohol. Length, 14–15<sup>mm</sup>.

Great Egg Harbor, New Jersey, and Vineyard Sound.

**ANTHURA BRACHIATA** Stimpson. (p. 511.)

Marine Invertebrata of Grand Manan, p. 43, 1853.

This species is greatly constricted at the articulations of the second thoracic segment, and by that character is easily distinguished from *A. brunnea*.

Bay of Fundy to Vineyard Sound.

**TANAIS FILUM** Stimpson. (p. 381.)

Marine Invertebrata of Grand Manan, p. 43, 1853.

Bay of Fundy to Vineyard Sound.

**CEPON DISTORTUS** Leidy. (p. 557.)

Jour. Acad. Nat. Sci. Phila., vol. iii, p. 149, Pl. 11, figs. 26–32, 1855.

Branchial cavity of *Gelasimus pugilator*, Atlantic City, New Jersey.

#### ENTOMOSTRACA.

The Ostracoda and the minute Copeopoda of our coast have not yet been sufficiently studied by any one for us to attempt to enumerate even the more common species.

#### COPEPODA.

**SAPPHIRINA**, species. Plate VII, fig. 33. (p. 439.)

A beautiful species of this remarkable genus was taken off Gay Head, Martha's Vineyard, September 2 and 8.

#### PHYLLOPODA.

**ARTEMIA GRACILIS** Verrill.

Amer. Jour. Sci., 2d series, vol. xlviii, p. 248, 1869; Proceedings Amer. Assoc. Adv. Sci., vol. xviii, p. 235, figs. 1 and 2, 1870.

In tubs of concentrated sea-water at New Haven, Connecticut; Charlestown, Massachusetts; and in salt-vats at Falmouth, Massachusetts.

#### SIPHONOSTOMA.

**ERGASILUS LABRACES** Kroyer. (p. 459.)

Nat. Tidsskrift, 1863-'64, p. 303, Pl. 11, fig. 2, (teste Zoological Record for 1865.)

According to Kroyer, found upon the striped bass (*Roccus lineatus*) from Baltimore, and liable, therefore, to occur on the coast of New England.

**ARGULUS CATOSTOMI** Dana and Herrick. (p. 459.)

Amer. Jour. Sci., 1st series, vol. xxx, p. 383, 1836, and vol. xxxi, p. 297, plate, 1837.

Parasitic on the "sucker" (*Catostomus*) in Mill River, near New Haven, Connecticut.

## ARGULUS LATICAUDA Smith, sp. nov. (p. 452.)

Carapax orbicular, longer than broad; antero-lateral margin with a deep sinus from which a deep sulcus extends to the center of the carapax; sinus of the posterior margin about twice as deep as broad, extending a little less than a third of the length of the carapax. Eyes large. Body scarcely projecting beyond the posterior margin of the carapax. Tail orbicular, slightly longer than broad, its posterior sinus narrow, extending scarcely a fourth the length. Antennulae and antennae much as in *A. Catostomi*, to which the species bears considerable resemblance. The squamiform appendage upon the base of the prehensile legs expands into a broad posterior margin, which is divided into three broad, closely approximated lobes, of which the extremities are broad, truncated, and slightly and irregularly excavated; the terminal portion of the leg is much as in *A. Catostomi*, the ultimate segment longer than the penultimate and armed at the tip with two claws. Natatory legs short, the anterior ones not projecting beyond the carapax.

In alcoholic specimens most of the carapax is opaque and black with a thick deposit of pigment.

Length of entire animal, in the largest specimen, 5<sup>mm</sup>; length of carapax, 3.7; breadth of carapax, 3.2; length of tail, 1.3; breadth of tail, 1.1.

Found among algae in Vineyard Sound.

A small specimen taken at surface early in September had the opaque portions of the carapax dark brown in life, and in alcohol it retains about the same color.

## ARGULUS LATUS Smith, sp. nov. (p. 452.)

Carapax large, orbicular, broader than long; the antero-lateral border with a broad shallow sinus; the sinus of the posterior margin not deeper than broad, its depth scarcely more than a fifth of the length of the carapax. Body projecting considerably beyond the posterior margin of the carapax. Tail a third as long as the carapax, about two-thirds as broad as long, the lateral margins slightly curved and nearly parallel, the sinus very broad and extending more than a third of the whole length. Disks of the sucking legs about a fourth as wide as the carapax. Squamiform appendage upon the base of the prehensile legs with a papillose area upon the expanded distal portion, the posterior margin without teeth or lobes, but the outer margin of the expanded portion armed with numerous very small teeth; ultimate segment longer than the penultimate, and apparently without any hooks at the tip. Natatory legs all long, even the anterior projecting beyond the sides of the carapax.

Color of alcoholic specimens yellowish white.

Length, 3.0<sup>mm</sup>; length of carapax, 2.2; breadth of carapax, 2.5; length of tail, 0.7; breadth of tail, 0.45.

Taken at the surface, in Vineyard Sound, July 1.

**ARGULUS MEGALOPS** Smith, sp. nov. (p. 452.)

Carapax subelliptical, longer than broad; the antero-lateral margin with a deep sinus; the posterior lobes of the carapax, each side of the shallow and narrow sinus, broadly rounded. Eyes very large, their diameter a tenth as great as the breadth of the carapax. Body projecting much beyond the posterior margin of the carapax. Tail somewhat ovate, about two-thirds as broad as long, the sinus only a small notch, extending not more than a tenth of the length. Natatory legs very long, all projecting beyond the carapax. Squamiform appendages upon the bases of the prehensile legs, with a papillose area upon the expanded portion, and the posterior margin armed with three rather slender teeth, separated by broad spaces; the terminal segment of the leg armed with two small hooks.

Color of alcoholic specimens, yellowish white.

Length, 2.2<sup>mm</sup>; length of carapax, 1.3; breadth of carapax, 1.0; length of tail, 0.7; breadth of tail, 0.47.

Vineyard Sound, taken at the surface, July 8.

**ARGULUS ALOSÆ** Gould. (p. 459.)

Invertebrata of Massachusetts, p. 340, 1841.

Parasitic upon the alewife in Massachusetts Bay, according to Gould.

**CALIGUS CURTUS** Müller. (p. 459.)

Entomostraca, p. 130, Pl. 21, figs. 1, 2, 1785; Kroyer, Nat. Tidsskrift, vol. i, p. 619, Pl. 6, fig. 2, 1837. *Caligus Mülleri* Leach, Encycl. Brit., Suppl., vol. i, p. 405, Pl. 20, figs. 1-8, 1816, (teste Baird et al.); Baird, British Entomostraca, p. 271, Pl. 32, figs. 4, 5. *Caligus Americanus* Pickering and Dana, Amer. Jour. Sci., vol. xxxiv, p. 225, Pl. 3-5, 1838; Dana, U. S. Expl. Expd., Crust., Pl. 93.

Abundant upon the cod-fish of our coast and of Europe. It is probably the *Caligus piscinus* of Gould and other American writers.

**CALIGUS RAPAX** Edwards. (p. 457.)

Hist. nat. des Crust., tome iii, p. 453, Pl. 38, fig. 9-12, 1840; Baird, op. cit., p. 270, pl. 32, figs. 2, 3; Steenstrup and Lütken, Bidrag til Kundskab om det aabne Havs Snyltekrebs og Lerneer, p. 359, Pl. 2, fig. 4, 1861.

Vineyard Sound, on the sting ray, (*Trygon centroura*), and small specimens, both male and female, taken at the surface at Wood's Hole, September 3, in the evening. These specimens from the surface, according to Professor Verrill's notes, were light flesh color, thickly speckled with minute brown spots, the eyes bright red.

**LEPEOPHTHEIRUS**, species. (p. 459.)

A species with a long tail, and somewhat like the *L. gracilis*, (Van Benaden sp.), was found upon the sting ray (*Trygon centroura*) taken in Vineyard Sound.

**LEPEOPHTHEIRUS**, species. (p. 459.)

A species with a very short tail, and approaching Heller's genus *Anuretes*. South shore of Long Island, upon a flounder, (*Chanopsetta ocellaris*.)



The *Lepeophtheirus salmonis* Kroyer, is found upon the salmon of the northern coast of New England.

ECHTHROGALEUS COLEOPTRATUS Steenstrup and Lütken. (p. 459.)

Op. cit., 380. *Dinematura coleoptata* Guérin, Iconographie du Règne animal, Crust. Pl. 35, fig. 6. *Dinemoura alta* Baird, British Entomostraca, p. 285, Pl. 32, figs. 6, 7.

Vineyard Sound, September 19, from the back fin of the mackerel-shark, (*Lamna punctata*.) It has been found upon the English coast and off the Azores.

ECHTHROGALEUS DENTICULATUS Smith, sp. nov. (p. 459.)

Carapax broader than long, with a very slight median emargination in the outline of the front. Posterior portion of the body scarcely longer and not quite as wide as the carapax. Dorsal plates, or elytra, covering much more than half the genital segment, their inner and posterior margins armed with a regular series of small teeth. The posterior lobes of the genital segment somewhat triangular and each terminated by a stout spine. Dorsal plate of the tail elongated, obtusely rounded at the extremity, and exposed from above by the very broad sinus in the genital segment. The tail itself broad, somewhat rectangular, but narrowed distally and not projecting behind the dorsal plate; the terminal lamellæ nearly as long as the tail, narrow, linear, nearly three times as long as broad, and armed at the tip with several setæ.

Length, 9<sup>mm</sup>; breadth of carapax, 5.1; length of elytra along the inner margin, 2.5.

Vineyard Sound, on Atwood's shark, (*Carcharias Atwoodi*.)

? PANDARUS CRANCHII Leach. (p. 459.)

Dict. des Sci. nat., tome xiv, p. 535, 1819, (teste Edwards et al.); Edwards, Règne animal de Cuvier, 3<sup>me</sup> éd., Crust., Pl. 78, fig. 2; Steenstrup and Lütken, op. cit., Pl. 11, fig. 22.

A number of specimens of a *Pandarus*, taken from a dusky shark (*Eulamia obscura*) on the south side of Long Island in 1870, differ only very slightly from the figures and descriptions of *P. Cranchii* quoted above.

PANDARUS, species. Plate VII, fig. 31. (p. 457.)

Vineyard Sound, on Atwood's shark, (*Carcharias Atwoodi*.) It is, perhaps, only a variety of the last species, but differs considerably from it, wanting almost wholly the series of spines upon the posterior margin of the carapax, having the caudal appendages shorter and obtuse, besides some slight differences in the natatory legs.

NOGAGUS LATREILLII Leach. Plate VII, fig. 32. (p. 457.)

Dict. des Sci. nat., tome xiv, p. 536, 1819, (teste Edwards et al.); Règne animal de Cuvier, Crust., Pl. 79, fig. 3; Hist. nat. des Crust., tome iii, p. 459; Steenstrup and Lütken, op. cit., p. 384, Pl. 9, fig. 18.

Vineyard Sound, in company with the last species, on Atwood's shark. All the species of *Nogagus* are males of the allied genera, *Pandarus*,

*Echthrogaleus*, &c., and are only provisionally retained in a separate group, until it can be determined to which of these genera the different species really belong. This species is probably a *Pandarus*, and very likely the male of the last species.

Our specimens differ slightly from the figures given by Steenstrup and Lütken, the dentiform prominences on the sides of the genital segment in our specimens being much smaller than represented in their figures, the segments of the tail somewhat shorter and broader, and the terminal lamellæ also shorter and broader, while in other respects they agree well. Steenstrup and Lütken's specimens were taken from sharks caught in latitude 31° north, longitude 76° west, (in the Gulf Stream, off the South Carolina coast,) and in latitude 40° south, longitude 31° west, while Leach's came from latitude 1° south, longitude 4° east.

*NOGAGUS TENAX* Steenstrup and Lütken. (p. 457.)

Op. cit., pp. 384, 388, Pl. 10, fig. 20, 1861.

Vineyard Sound, with the last species, upon Atwood's shark. It has nearly as extended a range as the last species.

It is very different from the last species, having the branches of the posterior pair of natatory legs each composed of a single segment, and the tail also composed of a single segment, which is broader than long, and has the short, truncate caudal lamellæ attached to its obliquely truncated posterior angles. Length, 4.5<sup>mm</sup>.

This species probably belongs to a different genus from the last, and is perhaps the male of *Echthrogaleus denticulatus*, with which it was associated. Both species of *Nogagus*, the *Pandarus* and *Echthrogaleus denticulatus*, were, however, all found on the same specimen of the shark, so that the association of males and females in one or two instances is not very good proof of their identity.

*PANDARUS SINUATUS* Say. (p. 459.)

Loc. cit., p. 436, 1818.

This species is apparently, as far as can be judged from Say's description, allied to *P. bicolor* Leach, a European species, which is probably not congeneric with the species which we have previously mentioned.

*CECROPS LATREILLII* Leach. (p. 459.)

Eucyl. Brit., Suppl., vol. i, p. 405, Pl. 20, 1816, (teste Edwards et al. ; Edwards, Hist. nat. des Crust., tome iii, p. 475; Baird, op. cit., p. 293, Pl. 34, figs. 1, 2.

According to Gould, (op. cit., p. 341,) this species has been found upon the sun-fish (*Orthogoriscus mola*) taken on the coast of Massachusetts.

*ANTHOSOMA CRASSUM* Steenstrup and Lütken. (p. 460.)

Op. cit., p. 367, Pl. 12, fig. 24, 1861. *Caligus crassus* Abildgaard, (teste Steenstrup and Lütken,) Naturh. Selsk. Skr., Bind iii, p. 49, pl. 5, [1794 ?] (teste Kroyer.) *Anthosoma Smithii* Leach, Eucyl. Brit., Suppl., vol. i, p. 406, Pl. 20, 1816, (teste Edwards et al. ; Kroyer, Nat. Tidsskrift, vol. i, p. 295, Pl. 2, fig. 2, 1836; Edwards, Hist. nat. des Crust., tome iii, 493, Pl. 39, fig. 5; Règne animal de Cuvier, Crust., Pl. 79, fig. 3; Baird, op. cit., p. 299, Pl. 33, fig. 9.

According to Gould, (op. cit., p. 341,) *Anthosoma Smithii* has been

found upon the mackerel-shark (*Lamna punctata*) taken on the coast of Massachusetts.

**LERNÆA BRANCHIALIS** Linné. (p. 460.)

Systema Naturæ; Edwards, Hist. nat. des Crust., tome iii, p. 528; Steenstrup and Lütken, op. cit., p. 403, Pl. 13, fig. 28.

Found attached to the gills of the cod in the Bay of Fundy, and, undoubtedly, extends as far south as that fish. It is common in Northern Europe.

**PENELLA PLUMOSA** DeKay. (p. 460.)

Op. cit., p. 60, 1844.

Found, according to DeKay, upon *Diodon pilosus*, and a species of *Rhombus*.

**ANCHIORELLA UNCINATA** Nordmann. (p. 460.)

Mikrographische Beiträge, Heft ii, p. 102, Pl. 8, figs. 8-12, Pl. 10, figs. 1-5, 1832; Baird, op. cit., p. 337, Pl. 35, fig. 9. *Lernæa uncinata* Müller, Zoologia Danica, vol. i, Pl. 33, fig. 2, 1788, (teste Nordmann et al.); Van Benaden, Poissons des côtes de Belgique, Mémoires Acad. Royale Belgique, tome xxxiii, Pl. 2, fig. 7, 1871.

Found upon cod-fish taken at New London, Connecticut. It is a common European species.

**LERNEONEMA RADIATA** Stp. and Ltk. Plate VII, fig. 30. (p. 458.)

Op. cit., p. 400, 1861. *Lernæocera radiata* Lescur, Journal Acad. Nat. Sci., Philadelphia, vol. iii, p. 288, Pl. 11, fig. 1, 1834.

At Great Egg Harbor, New Jersey, and in Vineyard Sound and Buzard's Bay, very common upon the menhaden, (*Brevoortia Menhaden*.)

**LERNEONEMA** ?, species. (p. 460.)

A species belonging to this, or a closely-allied genus, was found upon a species of *Carangus* taken in Vineyard Sound.

According to Gould, (op. cit., p. 341,) *Penella filosa* Cuvier, (Guérin, op. cit., Zoophytes, Pl. 9, fig. 3; Edwards, Hist. nat. des Crust., tome iii, p. 525,) has been found upon *Orthogoriscus mola*, and might, therefore, occasionally occur south of Cape Cod. The same author also mentions (p. 341) *Chondracanthus cornutus* Cuvier, (Nordmann, op. cit., p. 111, Pl. 9, figs. 5-10; Edwards, Hist. nat. des Crust., tome iii, p. 500, Pl. 40, figs. 18-22,) and *Branchiella Thyri* Cuvier, (Edwards, op. cit., tome iii, p. 512; Steenstrup and Lütken, op. cit., p. 420, Pl. 15, fig. 36,) as occurring upon the coast of Massachusetts.

CIRRIPEDIA.

**BALANUS AMPHITRITE** Darwin. (p. 381.)

Monograph of the Cirripedia, pp. 240, 614, Pl. 5, fig. 2, 1854.

Found upon the bottoms of ships, but probably does not live long after arriving upon our coast. It is found in all the tropical and warmer temperate seas.

*Balanus tintinnabulum* Linné, (Darwin, op. cit., pp. 194, 611, Pl. 1, 2,

fig. 1,) occurs with the last species, but has not been noticed living. It has about the same range as the *B. amphitrite*.

**BALANUS EBURNEUS** Gould. (p. 381.)

Op. cit., p. 15, Pl. 1, fig. 6, 1841, Darwin, op. cit., pp. 248, 614, Pl. 5, fig. 4.

From Massachusetts Bay to Florida and the West Indies. It sometimes occurs in brackish or even fresh water. Professor J. Wyman found it living about 50 miles up the St. John's River, Florida, where the water was fresh enough to drink, and the specimens lived well when transferred to a vessel of perfectly fresh water.

**BALANUS IMPROVISUS** Darwin.

Op. cit., pp. 250, 614, Pl. 6, fig. 1.

Darwin gives this species as occurring in England, Nova Scotia, United States, West Indies, and South America, so that it undoubtedly occurs upon the coast of New England.

**BALANUS CRENATUS** Bruguière. (p. 381.)

Encyclop. Method., 1798, (teste Darwin;) Darwin, op. cit., pp. 261, 615, Pl. 6, fig. 6.  
*Balanus rugosus* Gould, op. cit., p. 16, Pl. 1, fig. 10.

Dredged abundantly in Vineyard Sound. It ranges from the arctic regions of the Atlantic to the Cape of Good Hope and the West Indies.

**BALANUS BALANOIDES** Stimpson. (p. 305.)

Marine Invertebrata of Grand Manan, p. 39, 1853; Darwin, op. cit., pp. 267, 615 Pl. 7, fig. 2. *Lepas balanoides* Linné, Systema Naturæ, 1767, (teste Darwin.)  
*Balanus ovalaris* and *elongatus* Gould, op. cit., pp. 17, 18, Pl. 1, figs. 7, 8.

Extremely abundant between tides. It inhabits the whole North Atlantic.

**CORONULA DIADEMA** De Blainville. (p. 460.)

Dict. des Sci. nat., 1824, (teste Darwin;) Gould, op. cit., p. 12; Darwin, op. cit., pp. 417, 623, Pl. 15, fig. 3, Pl. 16, figs. 1, 2, 7. *Lepas diadema* Linné, Systema Naturæ, 1767, (teste Darwin.)

Attached to whales taken on the coast, both north and south of Cape Cod. It is found throughout the whole North Atlantic.

**LEPAS FASCICULARIS** Ellis and Solander. Plate VII, fig. 34. (p. 382.)

Zoophytes, 1786, (teste Darwin;) Darwin, op. cit., p. 92, Pl. 1, fig. 6.

Found in vast numbers in Vineyard Sound, in June and July, and frequently taken in the Bay of Fundy in August.

**LEPAS PECTINATA** Spengler. (p. 382.)

Darwin, op. cit., p. 85, Pl. 1, fig. 3. *Anatifa dentata* Gould, op. cit., p. 21, Pl. 1, fig. 11.

Attached to ships' bottoms, but probably does not live long after arriving on our coast. It lives throughout the warmer parts of the Atlantic.

**LEPAS ANATIFERA** Linné. (p. 382.)

Systema Naturæ, 1767, (teste Darwin;) Darwin, op. cit., p. 73, Pl. 1, fig. 1.

Occurs in the same way as the last species. It is common to the Atlantic, Pacific, and Indian Oceans, and the Mediterranean.

**LEPAS ANSERIFERA** Linné. (p. 382.)

Systema Naturæ, 1767, (teste Darwin;) Darwin, op. cit., p. 81, Pl. 1, fig. 4. *Anatifa striata* Gould, op. cit., p. 20.

This species probably occurs in the same way as the last. It has the same range.

**CONCHODERMA AURITA** Olfers. (p. 392.)

Darwin, op. cit., p. 141, Pl. 3, fig. 4. *Lepas aurita* Linné, Systema Naturæ, 1767, (teste Darwin.) *Otton Curieri* Gould, op. cit., p. 23.

On ships' bottoms, &c. It ranges through all the seas.

**CONCHODERMA VIRGATA** Olfers. (p. 392.)

Darwin, op. cit., p. 146, Pl. 3, fig. 2. *Lepas virgata* Spengler, 1790, (teste Darwin.) *Cineras vittata* Gould, op. cit., p. 22.

Occurs in the same way, and has the same range as the last species.

XIPHOSURA.

**LIMULUS POLYPHEMUS** Latreille. (p. 340.)

Hist. des Crust., (teste Edwards,) Hist. nat. des Crust., tome iii, p. 549; Say, loc. cit., p. 433; Gould, op. cit., p. 339; Packard, Memoirs Boston Soc. Nat. Hist., vol. ii, p. 155, Pl. 3-5, 1872, (on the development;) A. Milne Edwards, Annales des Sci. nat., 5<sup>e</sup> sér., tome xvii, nos. 1 et 2, Dec., 1872, Pl. 5-16, (on the anatomy.) *Monoculus Polyphemus* Linné, Systema Naturæ; *Polyphemus occidentalis* Lamarck, Hist. des Anim. sans vert.; De Kay, op. cit., p. 55, Pl. 11, fig. 50. *Limulus australis* Say, loc. cit., p. 436. *Xiphosura Polyphemus* White, List of Crust. in British Mus., p. 121, 1847.

Casco Bay, on the coast of Maine, to Florida.

ANNELIDA.

POLYCHÆTA.

**APHRODITA ACULEATA** Linn. (p. 507.)

Systema Naturæ, ed. xii, vol. i, p. 1084, 1767; Malmgren, Öfvers. af Kong. Vet.-Akad. Förhandlingar, 1835, p. 52; Johnston, Catalogue of British Non-Parasitical Worms, p. 101, Pl. 9, 1865; Quatrefages, Histoire naturelle des Annelés, vol. i, p. 191, 1865.

Off Gay Head in 15 to 19 fathoms, mud; Bay of Fundy, 10 to 106 fathoms, mud; St. George's Bank, 50 fathoms; northward to Labrador. Northern coasts of Europe to Great Britain and Mediterranean.