

NOTES ON NEW ENGLAND ISOPODA.

By OSCAR HARGER.

The marine Isopoda collected by the United States Commission of Fish and Fisheries having been placed in my hands by Professor Verrill, a report has been prepared including full descriptions, with figures of most of the species, except the *Bopyridæ*. Besides the collections of the Fish Commission, I have, through the kindness of Professor Verrill, had access to other extensive collections made principally by himself and Prof. S. I. Smith, at various points along the coast from Great Egg Harbor, New Jersey, to the Bay of Fundy, as is more fully detailed in the report now ready for publication. On account of unexpected delay in the publication of the report, it has been thought best to prepare the following brief summary of its contents, with especial reference to facts not hitherto published. Only such references are here given as are necessary to the understanding of the names adopted, and, in general, the distribution on the New England coast only is indicated.

The *Bopyridæ* have been identified by Professor S. I. Smith, who has also rendered other important assistance in the preparation of the report, of which the present paper may be regarded as an abstract.

The *Oniscidæ*, not being properly marine, are in general not included in the report; but three species, two of them as yet found only on the coast, are included as being commonly found by marine collectors. They are the first three of the following list, which embraces also all the marine Isopoda known to inhabit the waters of New England:

Philoscia vittata Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 429, 1818.

A southern species found as far north as Barnstable, Mass.

Scyphacella arenicola Smith, Rep. U. S. Fish Com., part i, p. 568 (274), 1874.

Sandy beaches, from Great Egg Harbor, New Jersey, to Nantucket, Mass. Not yet found north of Cape Cod.

Actoniscus ellipticus Harger, Am. Jour. Sci., III, vol. xv, p. 373, 1878.

Shores of Long Island Sound at Savin Rock, and Stony Creek, near New Haven. Collected by Professor Verrill.

Cepon distortus Leidy, Jour. Acad. Nat. Sci. Phil., II, vol. iii, p. 150, pl. xi, figs. 26-32, 1855.

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

Gyge Hippolytes Bate and Westwood, Brit. Sess. Crust., vol. ii, p. 230, 1868.—*Bopyrus Hippolytes* Kröyer, Grönlands Amfipoder, p. 306, pl. iv, fig. 22, "1838."

Parasitic on *Hippolyte*, etc., and found as far south as Massachusetts Bay.

Phryxus abdominalis Lilljeborg, Öfversigt af Kongl. Vetenskaps Akademiens Förh. Stockholm, 1852, p. 11.—*Bopyrus abdominalis* Kröyer, Naturhist. Tidssk., Bind iii, p. 102, 289, pl. 1, 2, (1840); Gaimard's Voyage en Scandinavie, etc., Atlas, pl. xxix, fig. 1 a-u, "1849."

Parasitic on *Pandalus*, *Hippolyte*, etc., and found as far south as Massachusetts Bay.

Dajus mysidis Kröyer, Gaimard's Voyage en Scandinavie, etc., Atlas, pl. xxviii, fig. 1, "1849."—*Bopyrus mysidum* Packard, Mem. Soc. Nat. Hist. Boston, vol. 1, p. 295, pl. viii, fig. 5, 1867.

Parasitic on *Mysis*, but not hitherto found south of Labrador.

Jæra albifrons Leach, Edinburgh Encyclopædia, vol. vii, p. 434, "1813-14"; Trans. Linn. Soc. London, vol. xi, p. 373, 1815.—*Jæra copiosa* Stimpson, Mar. Invert. Grand Manan, p. 40, pl. iii, fig. 29, 1853.

Common throughout the New England coast under sea-weed, in tide pools, etc. A comparison of specimens received from Oban, Scotland, through the kindness of Rev. A. M. Norman, indicates that our species must be regarded as identical with the well-known British species, and is therefore common to the two coasts.

Janira alta = *Asellodes alta* Stimpson, Mar. Invert. Grand Manan, p. 41, pl. iii, fig. 30, 1853.

A northern species not as yet found south of Massachusetts Bay, occasionally collected in tide-pools, but usually dredged, and extending to a depth of 190 fathoms.

This species is easily distinguished specifically from *J. maculosa* Leach, the type of the genus, but does not appear to differ by characters of generic importance, and I have therefore referred it to the older genus.

Janira spinosa, n. sp.

A second species of this genus was obtained in the summer of 1878, and on examination it appears to be as yet undescribed, although somewhat resembling *J. laciniata* G. O. Sars, but distinguished by the double instead of single row of spines along the dorsal region of the thorax.

The head is strongly rostrate, and has the antero-lateral angles acutely produced, but shorter than the median rostrum. The eyes are small and black, and placed a little behind the middle of the head, at about an equal distance from the median line and the lateral margin. The antennulæ are slender, and slightly surpass the first four segments of the antennæ. The antennæ are about as long as the head and thorax together, and the scale attached to the second peduncular segment is slender and pointed, surpassing the third segment. The flagellum forms about half the length of the antenna, and is slender, tapering, and multi-articulate.

The thoracic segments are all acutely produced at the sides into one or two salient angles, forming a row of acute serrations along the sides of the body. The first segment has a single angle produced somewhat

forward around the sides of the head; the second, third, and fourth segments usually present two serrations, both the anterior and posterior angles being produced and acute, and the last three segments are produced and directed more and more backward. In the dorsal region, each segment bears a pair of sharp tubercles or spines. Anteriorly these spines are near the front margins of the segments and directed forward, but become posteriorly more erect and nearer the middle of the segment, and the last three pairs are directed backward, the last pair being near the hinder margin of the seventh segment. The legs are slightly spiny, the first pair but little thickened in the females. The pleon tapers at the sides, where it is minutely serrulate. Its posterior angles are salient and acute, like the anterior angles of the head. The uropods are of moderate length, about as long as the pleon, and composed of a cylindrical basal segment, bearing two rami, of which the inner is somewhat the larger, and nearly as long as the basal segment. Both, together with the basal segment, are sparingly bristly.

The color in alcohol is nearly white. Length 8^{mm}.

Two specimens of this species were collected at Banquereau by Captain Collins, of the schooner Marion, August 25, 1878. They were found adhering to the cable of the schooner.

Munna Fabricii Kröyer, Naturhist. Tidssk., II, Bind ii, p. 380, 1847; Gaimard's Voyage en Scandinavie, etc., Atlas, pl. 31, figs. 1 a-g, 1849.

Casco Bay, near Portland, Me., Eastport and Western Bank, from low water to 150 fathoms.

Munnopsis typica M. Sars, Christiania Vidensk. Selsk., 1860, p. 84, 1861; Bidrag til Kundskab om Christiania Fjordens Fauna (Nyt Magazin), p. 70, pl. vi, vii, figs. 101-138, 1868.

This species has been taken in the Bay of Fundy in 60 fathoms; also, by Mr. J. F. Whiteaves, in the Gulf of Saint Lawrence.

Eurycope robusta Harger, Am. Jour. Sci., III, vol. xv, p. 375, 1878.

Not yet found south of the Gulf of Saint Lawrence, where it was taken by Mr. J. F. Whiteaves in 220 fathoms, muddy bottom.

Chiridotea cœca Harger, Am. Jour. Sci., III, vol. xv, p. 374, 1878.—*Idotea cœca* Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 424, 1818.

Common on the southern coast of New England, and taken as far north as Halifax in the summer of 1877.

Chiridotea Tuftsii Harger, Am. Jour. Sci., III, vol. xv, p. 374, 1878.—*Idotea Tuftsii* Stimpson, Mar. Invert. Grand Manan, p. 39, 1853.

This species has been taken at various points along the coast from Long Island Sound to Halifax, but was regarded as rare until the summer of 1878, when it was collected in abundance at Gloucester, Mass.

Idotea irrorata Edwards, Hist. nat. des Crust., tome iii, p. 132, 1840.—*Stenosoma irrorata* Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 423, 1818.—*Idotea tricuspadata* Desmarest, Dict. des Sci. nat., tome xxviii, p. 373, 1823; Consid. Crust., p. 280, 1825.

This species is common throughout the coast of New England, but is more abundant southward, being to a great extent replaced toward the north by the next species.

A comparison of English and European specimens with our own leaves no doubt of the identity of the species on the opposite coasts of the Atlantic. Being a common European species, it has been mentioned by many authors under a variety of names, which are more fully quoted and discussed in the report. Say's name appears to be the earliest that can be certainly connected with the species.

Idotea phosphorea Harger, Rep. U. S. Fish Com., part i, p. 569 (275), 1874.

Found throughout the coast, but more abundant northward.

Idotea robusta Kröyer, Naturhist. Tidssk., II, Bind ii, p. 108, 1846; Gaimard's Voyage en Scandinavie, etc., Atlas, pl. xxvi, fig. 3 a-r, 1849.

A pelagic species.

Synidotea nodulosa Harger, Am. Jour. Sci., III, vol. xv, p. 374, 1878.—*Idothea nodulosa* Kröyer, Naturhist. Tidssk., II, Bind ii, p. 100, 1846; Gaimard's Voyage en Scandinavie, etc., Atlas, pl. xxvi, fig. 2, 1849.

A northern species, found at Halifax, N. S., and 125 miles southward, in from 16 to 190 fathoms. Also from George's Bank.

Synidotea bicuspidata = *Idotea bicuspidata* Owen, Voyage of the Blossom, Crustacea, p. 92, pl. xxvii, fig. 6, 1839.—*Idotea marmorata* Packard, Mem. Soc. Nat. Hist. Boston, vol. i, p. 293, pl. viii, fig. 6, 1867.—*Idotea pulchra* Lockington, Proc. Cal. Acad. Sci., vol. vii, p. 45, 1877.

The determination of the synonymy of this species rests principally upon the work of Messrs. Streets and Kingsley in the Bulletin of the Essex Institute, vol. ix, p. 108, 1877. It has not yet been found south of the Grand Bank.

Erichsonia filiformis Harger, Rep. U. S. Fish Com., part i, p. 570 (276), pl. vi, fig. 26, 1874.—*Stenosoma filiformis* Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 424, 1818.

A southern species, not yet found north of Cape Cod.

Erichsonia attenuata Harger, Rep. U. S. Fish Com., part i, p. 570 (276), pl. vi, fig. 27, 1874.

Great Egg Harbor, New Jersey, and Noank, Conn. The species will probably be found at other localities, among eel-grass, on the southern shore of New England.

Epelys trilobus Smith, Rep. U. S. Fish Com., part i, p. 571 (277), pl. vi, fig. 28, 1874.—*Idotea triloba* Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 425, 1818.

A southern species, rare north of Cape Cod, but extending, with some other southern species, to Quahog Bay, on the coast of Maine.

Epelys montosus Harger, Rep. U. S. Fish Com., part i, p. 571 (277), 1874.—*Idotea montosa* Stimpson, Mar. Invert. Grand Manan, p. 40, 1853.

Replaces the preceding species for the most part at the north, but found also as far south as Long Island Sound. It has been obtained from a depth of 40 fathoms.

Astacilla granulata = *Leachia granulata* G. O. Sars, Arch. Math. og Naturvid. Christiania, B. ii, p. 351 (proper paging 251), 1877.—*Astacilla Americana* Harger, Am. Jour. Sci., III, vol. xv, p. 374, 1878.

St. George's Banks, 1877, and Banquereau, 1878. I have seen no specimens of Sars's species for comparison, but his description appears to apply perfectly to the specimens described by myself before seeing his paper.

Sphæroma quadridentatum Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 400, 1818.

A southern species, scarcely passing north of Cape Cod, but occurring at Provincetown, Mass.

Limnoria lignorum White, Pop. Hist. Brit. Crust., p. 227, 1857.—“*Cymothoa lignorum* Rathke, Skrivt. af Naturh. Selsk. v. 101, t. 3, f. 14, 1799.”—*Limnoria terebraus* Leach, Edinburgh Encyc., vol. vii, p. “433, 1813-14”; Trans. Linn. Soc. London, vol. xi, p. 371, 1815.

This genus was associated with the *Asellidæ* by Edwards without an examination of the specimens, and, so far as I know, he has been followed by recent authors. An examination of its structure appears to point unmistakably to affinity with the *Sphæromidæ*. I have not, however, thought best to include it in that family, but have placed it in a family by itself, the *Limnoriidæ*.

The species extends throughout the New England coast.

Cirolana concharum = *Conilera concharum* Harger, Rep. U. S. Fish Com., part i, p. 572 (278), 1874.—*Ega concharum* Stimpson, Mar. Invert. Grand Manan, p. 42, 1853.

Not found north of Cape Cod, but abundant at Vineyard Sound.

Cirolana polita = *Conilera polita* Harger, in Smith and Harger, Trans. Conn. Acad., vol. iii, p. 3, 1874.—*Ega polita* Stimpson, Mar. Invert. Grand Manan, p. 41, 1853.

St. George's Banks, Salem, and Eastport (Stimpson), rare.

Ega psora Krøyer, Grönlands Amfipoder, p. 318, “1838.”—*Oviscus psora* Linné, Syst. Nat., ed. x, tom. i, p. 636, 1758.—*Ega emarginata* Leach, Trans. Linn. Soc. London, vol. xi, p. 370, 1818.

Parasitic on the Cod, Halibut, etc.; also dredged on St. George's Banks.

Nerocila munda Harger, Rep. U. S. Fish Com., part i, p. 571 (277), 1874.

On dorsal fin of *Ceratacanthus aurantiacus*, Vineyard Sound.

Ægathoa loliginea Harger, Am. Jour. Sci., III, vol. xv, p. 376, 1878.

Mouth of Squid, New Haven, Conn.

Livonecca ovalis White, List Crust. Brit. Mus., p. 169, 1847.—*Cymothoa ovalis* Say, Jour. Acad. Nat. Sci. Phil., vol. i, p. 394, 1818.

White and several other British carcinologists use the orthography *Lironecca*; but in the Dictionnaire des Sciences naturelles, tome xii, where the genus is established by Dr. Leach, the name occurs, in French and Latin, nine times on pages 352 and 353, spelled always with *v* as the third letter. I have, therefore, adhered to that orthography, although there is reason for supposing that Dr. Leach intended to use the form *Lironecca*.

Parasitic on Bluefish, etc.; not yet found north of Cape Cod.

Anthura polita Stimpson, Proc. Acad. Nat. Sci. Phil., vol. vii, p. 393, 1855.—*Anthura brunnea* Harger, Rep. U. S. Fish Com., part i, p. 572 (278), 1874.

A southern species, not found north of Cape Cod until the summer of 1878, when it was taken at Gloucester, Mass. Usually found among Eel-grass or mud in shallow water.

Paranthura brachiata = *Anthura brachiata* Stimpson, Mar. Invert. Grand Manan, p. 43, 1853.

A northern species, but found as far south as Vineyard Sound, from 27 to 115 fathoms.

Ptilanthura tenuis Harger, Am. Jour. Sci., III, vol. xv, p. 377, 1878.

Rare, but found throughout the New England coast. The remarkably elongate flagellum of the antennulæ belongs to the males only.

Gnathia cerina = *Praniza cerina* Stimpson, Mar. Invert. Grand Manan, p. 42, pl. iii, fig. 31, 1853; and, also, *Aneus Americanus* Stimpson, op. cit., p. 42, 1853; the former being the female form and the latter that of the adult male.

A northern species, not yet found south of Cape Cod, occurring in from 10 to 220 fathoms, and, in the young stages, parasitic on fish.

Tanais vittatus Lilljeborg, Bidrag til Känn. Crust. Tanaid., p. 29, 1865.—*Crossurus vittatus* Rathke, Fauna Norwegens, (Nova Acta Acad., vol. xx,) p. 39, pl. i, figs. 1-7, 1843.

This species has been found at Noank Harbor, Conn., and will probably be found at other localities on our coast. I have had no European specimens for comparison, and, unfortunately, have not had access to some important European literature on the subject, but do not know of any character by which to distinguish it from Rathke's species, and have therefore regarded it as identical.

This genus is well separated from the next by the pleon, which bears only three pairs of pleopods and uniramous uropods, and by the remarkable incubatory sacs attached to the fifth thoracic segment of the females, and unlike anything else found among the *Isopoda*. They have been described by Rathke, Willemoes-Suhm, and others.

Leptocheilia algicola = *Paratanais algicola* Harger, Am. Jour. Sci., III, vol. xv, p. 377, 1878.—*Leptocheilia Edwardsii* Bate and Westwood, Brit. Sess. Crust., vol. ii, p. 134, 1868, (males).—*Tanais flum* Harger, Rep. U. S. Fish Com., part i, p. 573 (279), 1874, not of Stimpson.

A male specimen, received from Guernsey, through the kindness of

Rev. A. M. Norman, appears to agree perfectly with the males of this species, though not with Kröyer's description of *Tanaïs Edwardsii*. I have not therefore united my species with his, though I think it possible they may prove identical.

The species occurs in considerable abundance at Noank Harbor, Conn., among algæ, and also at Vineyard Sound, and will probably be found at other localities on the southern shore of New England. It has also been collected by Professor Verrill, during the present summer, at Provincetown, Mass., in company with *Limnoria* and *Chelura*, in old piles.

The genus *Leptocheilia* has several years' priority over *Paratanais*, and, though founded on the male sex, ought, as I think, to be retained.

Leptocheilia limicola = *Paratanais limicola* Harger, Am. Jour. Sci., III, vol. xv, p. 378, 1878.

Massachusetts Bay, off Salem, 48 fathoms, mud.

Leptocheilia rapax, n. s.

Females of this species considerably resemble those of *L. limicola*, but may be distinguished by the following characters: The eyes are larger and more conspicuous; the last segment of the antennulæ is scarcely longer than the preceding, instead of nearly twice as long, as in *L. limicola*; the dactylus of the second pair of legs is somewhat shorter and the terminal spine less attenuated, and the external ramus of the uropods consists of a single very short and small segment, shorter than the basal segment of the inner ramus, which is not elongated. The inner ramus is five-jointed, instead of six-jointed, as in *L. alpicola*.

The males are remarkable for the long and slender prehensile hand terminating the first pair of legs. The body of the males is short and robust, with the segments well marked by constrictions. The head, with the united first thoracic segment, is short and rounded, bulging strongly at the sides just behind the eyes, which are conspicuous, somewhat less in diameter than the bases of the antennulæ, distinctly articulated, and coarsely faceted. The antennulæ are elongated, especially in the basal segment, which is more than one-third as long as the body, slightly swollen on the inner side, near the base, then tapering to the tip; the second segment is cylindrical, less than half as long as and more slender than the first; the third is less than half the length of the second, and is followed by about eight short flagellar segments, the last one tipped with setæ. The antennæ, when extended, do not attain the end of the basal antennular segment; the first three segments are short, the fourth longest, being longer than the first three together, the fifth slender and tipped with setæ. The terminal setæ of both antennulæ and antennæ arise in part from minute or rudimentary terminal segments. The first pair of legs forms the most striking feature of this species. These legs, when extended, are in general longer than the body of the animal, though they vary considerably in size, being usually proportionally smaller in the smaller specimens. In these legs, the segments preceding the carpus are short and robust; but the carpus is about half as long as the body, and the propodus

is even somewhat longer than the carpus, and usually strongly flexed beneath it. More than half the length of the propodus is made up of the slender digital process, which bears a low tooth on the inner side, near the base, and a stouter one near the slender incurved tip. The dactylus is slender, curved, and pointed, and armed with a few weak spinules along the inner margin. The forceps thus formed are capable of seizing and closing around the body of another individual.

The thoracic segments, except the first, are well separated; the second (first free) segment is shortest; the third, fourth, and fifth segments are of increasing length; the sixth is as long as the fifth; the seventh shorter. The first five segments of the pleon are of about equal length; the sixth shorter and obtusely pointed in the middle. The uropods consist on each side of a robust basal segment, bearing two rami, the outer short, and composed of a single segment, the inner five-jointed and tapering. Both rami are sparingly bristly. The males vary in length from 2.6^{mm} to 3.8^{mm}, and in breadth from 0.6^{mm} to 0.8^{mm}. The females are more slender. Color in alcohol nearly white or marked in the males by a brownish transverse band along the posterior margin of each segment.

This species was collected by Professor Hyatt and Messrs. Van Vleck and Gardner at Annisquam, Mass., in the summer of 1878.

Leptochelia filum = *Tanais filum* Stimpson, Mar. Invert. Grand Manan, p. 43, 1853.

“Bay of Fundy,” Stimpson.

Leptochelia cæca = *Paratanais cæca* Harger, Am. Jour. Sci., III, vol. xv, p. 378, 1878.

Collected along with *L. limicola* in 48 fathoms, mud, Massachusetts Bay, off Salem, 1877.

Of the forty-three species enumerated in the preceding list, the following eighteen have as yet been found only north of Cape Cod:

<i>Gyge Hippolytes</i> Bate and West-wood.	<i>Synidotea bicuspidata</i> Harger.
<i>Phryxus abdominalis</i> Lilljeborg.	<i>Astacilla granulata</i> Harger.
<i>Dajus mysidis</i> Kröyer.	<i>Cirolana polita</i> Harger.
<i>Janira alta</i> Harger.	<i>Æga psora</i> Kröyer.
<i>Janira spinosa</i> Harger.	<i>Gnathia cerina</i> Harger.
<i>Munna Fabricii</i> Kröyer.	<i>Leptochelia limicola</i> Harger.
<i>Munnopsis typica</i> M. Sars.	<i>Leptochelia rapax</i> Harger.
<i>Eurycope robusta</i> Harger.	<i>Leptochelia filum</i> Harger.
<i>Synidotea nodulosa</i> Harger.	<i>Leptochelia cæca</i> Harger.

The following ten have been found only south of Cape Cod:

<i>Scyphacella arenicola</i> Smith.	<i>Cirolana concharum</i> Harger.
<i>Actoniscus ellipticus</i> Harger.	<i>Nerocila munda</i> Harger.
<i>Cepon distortus</i> Leidy.	<i>Ægathoa loliginca</i> Harger.
<i>Erichsonia filiformis</i> Harger.	<i>Livonca ovalis</i> White.
<i>Erichsonia attenuata</i> Harger.	<i>Tanais vittatus</i> Lilljeborg.

The following fifteen have been found both north and south of Cape Cod:

<i>Philoscia vittata</i> Say.	<i>Epelys montosus</i> Harger.
<i>Jara albifrons</i> Leach.	<i>Sphaeroma quadridentatum</i> Say.
<i>Chiridoteca caeca</i> Harger.	<i>Limnoria lignorum</i> White.
<i>Chiridoteca Tuftsii</i> Harger.	<i>Anthura polita</i> Stimpson.
<i>Idotea irrorata</i> Edwards.	<i>Paranthura brachiata</i> Harger.
<i>Idotea phosphorea</i> Harger.	<i>Ptilanthura tenuis</i> Harger.
<i>Idotea robusta</i> Kröyer.	<i>Leptochelia algicola</i> Harger.
<i>Epelys trilobus</i> Smith.	

The following eleven species occur also on the coast of Europe:

<i>Gyge Hippolytes</i> Bate and Westwood.	<i>Astacilla granulata</i> Harger.
<i>Phryxus abdominalis</i> Lilljeborg.	<i>Limnoria lignorum</i> White.
<i>Jara albifrons</i> Leach.	<i>Ega psora</i> Kröyer.
<i>Munna Fabricii</i> Kröyer.	<i>Tanais vittatus</i> Lilljeborg.
<i>Munnopsis typica</i> M. Sars.	<i>Leptochelia algicola</i> Harger.
<i>Idotea irrorata</i> Edwards.	

NOTICE OF RECENT ADDITIONS TO THE MARINE INVERTEBRATA, OF THE NORTHEASTERN COAST OF AMERICA, WITH DESCRIPTIONS OF NEW GENERA AND SPECIES AND CRITICAL REMARKS ON OTHERS.

PART I—ANNELIDA, GEPHYREA, NEMERTINA, NEMATODA, POLYZOA, TUNICATA, MOLLUSCA, ANTHOZOA, ECHINODERMATA, PORIFERA.

By A. E. VERRILL.

Among the very extensive collections made during the past eight years by the U. S. Commission of Fish and Fisheries, under the direction of Professor Baird, there are still many species not recorded as American in any of the reports hitherto published; most of these are well-known Arctic or Northern European species, but others are still undescribed. As the final reports on the different groups will require a long time for their completion, owing to the vast number of specimens to be examined from more than a thousand localities, it has been thought desirable to record some of the more important additions to the fauna, without further delay.* More detailed descriptions and numerous figures will be published in the final reports, together with the details of their geographical distribution. All the species included in the following list, unless otherwise stated, have been collected by the U. S. Fish Commission.

*Many species have also been recorded in various articles in the American Journal of Science and Arts, during several years past. See, also, an important paper on the Podophthalmous Crustacea, by Professor S. I. Smith, and one on the Pycnogonida, by E. B. Wilson, in the Trans. Conn. Academy, vol. v, 1879.