CONTENTS.

A Paper on the Early Quarantine Arrangements of Salem. By
Robert S. Rantoul, .......................... 1

Regular Meeting, Monday, January 16, 1882, .................. 57

Regular Meeting, Monday, February 6, 1882, .................. 58

Winter Field Meeting, Saturday, February 11, 1882, at Che-

bacco Ponds, .................................................................. 58

The Excursion, 58.—Account of the Wenham Lake Ice Company, 58.—
Remarks by the President, 62; Mr. Robert S. Rantoul 62; Rev.
George H. Hosmer, 63; Mr. John H. Sears, Buds and the ramifi-
cation of Branches, 63.

Regular Meeting, Monday, February 20, 1882, .................. 67
Remarks on the death of Rev. Samuel Johnson: Rev. E. B. Willson,
68; Mr. Wm. P. Andrews, 68.—Resolutions on the death of Rev.
Samuel Johnson, 69.—Rev. C. F. Rice, Sketch of Trip to Europe, 70.

Regular Meeting, Monday, March 20, 1882, ...................... 70
E. P. Robinson, Esq., What I know about Whaling, 70.

Regular Meeting, Monday, April 3, 1882, ....................... 71
Prof. G. F. Wright, The Terminal Moraine in Pennsylvania, 71.—
Discussion by Rev. R. Randall Hoes, John H. Sears. Prof. I. J.
Osborn, 73.

Regular Meeting, Monday, May 1, 1882, ......................... 74
Remarks by the President, on the observance of May-Day, 74.—Mr.
John H. Sears, Early spring flowers, 74.

Annual Meeting, Monday, May 15, 1882, ......................... 77
Officers elected, 78; retrospect of the year: members, 79; field meet-
ings, 80; excursions, 82; lectures and concerts, 83; meetings, 84;
publications, 85; library, 85; art exhibition, 96; horticultural, 99;
museum, 102; financial, 105; extract from Secretary's report, 104.

An Amendment to the Act of Incorporation, .......................... 104

(iii)
CONTENTS.

Carcinological Notes; No. 5. By J. S. Kingsley, .. 105

Popular Errors regarding the Duration of Life. By Adoniram
C. Orne, ... 133

The Flora of Oak Island. By Herbert A. Young, .. 144

Opening of a newly discovered shellheap at Ipswich. By John
Robinson, .. 158

Remarks by Mr. F. W. Putnam, 161.

Arrowmaker's Wigwam at Pine Grove. By John Robinson, 163
CARCINOLOGICAL NOTES; NUMBER V.¹

BY J. S. KINGSLEY.

In the present number of these notes I have gathered a number of new species and remarks on little known forms of macrurous Crustacea, the results of my studies of the collections at Salem, Boston and Philadelphia, together with outline illustrations of some hitherto unfigured forms.

Genus *PENÆUS* Fabr.

Mr. E. J. Miers has recently given a revision of the species of this genus (Proc. Zool. Soc'y, London, 1878, pp. 298-310) and I would here give the localities of the specimens which I have examined.

*Penœus affinis.*

Specimens in the Museum of the Peabody Academy of Science, Salem, Mass., from Hawaian Islands (A. Garrett), Hong Kong (Capt. W. H. A. Putnam), Zanzibar (Capt. Webb).

¹The previous articles of this series may be found in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1880. (No. I, pp. 34-37; No. II, pp. 135-155, pl. X; No. III, pp. 179-186; No. IV, pp. 187-224.)
Penaeus amazonicus.
Specimens in the Museum of the Boston Society of Natural History from the upper Amazon (James Orton).

Penaeus avirostris Dana.
Boston Society: Japan (E. S. Morse).

Penaeus braziliensis Latr.
P. brevirostris Kingsley.
Boston Society: Trinidad (W. O. Crosby), Bahamas (Dr. Henry Bryant). Union College: Sarasota Bay, Marcou Pass and Charlotte Harbor, Fla., Beaufort, N. C. (H. E. Webster). Peabody Academy: Rio Grande, Brazil (Capt. Harrington); Bahia, Brazil (Prof. C. F. Hartt); Magdalena River, New Granada (A. P. Smith); Realigo, West coast of Nicaragua (J. A. McNiel).

Penaeus brevicornis M.-Edw.
Peabody Academy: China (Capt. W. H. A. Putnam).

Penaeus canaliculatus Oliv.
Boston Society: Japan (Prof. E. S. Morse).

Penaeus constrictus Stimp.

Penaeus kroyeri Heller.
Xiphopenes hartii Smith.
Peabody Academy: Abrolhos, Brazil (Prof. C. F. Hartt).

Penaeus monocerus Fabr.
Peabody Academy: Whampoa, China (Capt. W. H. A. Putnam).

Penaeus monodon Fabr.
Peabody Academy: Hong Kong (Capt. W. H. A. Putnam).

Penaeus sculptilis Heller.

Penaeus semisulcatus Dr. Haan.
**Penseus setiferus** Linn.


**Genus PALKMON** Fabr.

**Palsemon africanus** n. s.

Carapax microscopically granulate, hepatic spine present. Rostrum shorter than the antennal scales, with nine or ten teeth above and five or six below, the tip three toothed. First pair of feet slender; the middle of the carpus extending as far forward as the tip of the antennal scale; hand about one-third the length of the carpus, fingers with pencils of hairs. Second pair of feet equal, greatly elongate and armed with longitudinally arranged spiniform tubercles; the meros is shorter than the carpus and about equal to the palm. Carpus slightly shorter than the hand, fingers occupying from one-third to two-fifths of the manus, completely closing, the occludent margins smooth, toothless and covered with hairs. Its nearest allies are *P. idee* Heller, from which it differs in the shorter carpus and longer meros; *P. acanthurus*, which has a longer and reflexed rostrum, and *P. japonicus* de Haan, in which the first pair of feet are much longer. It may prove to be *P. macrobrachion* Hecklots (Addit. Faun. Africam Occid.) but the description of that species is too imperfect to decide the question.

West coast of Africa; *P. du Chaillu* (Philadelphia Academy). West coast of Africa; Dr. Perkins (Boston Society of Natural History, *type*).

**Palsemon grandimanus** Randall.

The types (two in number) of this species are still preserved in the Philadelphia Academy.

**Palsemon jamaicensis** (Herbst) Oliv.

*P. carcinus* Leach, Zool. Misc., ii, p. 92, pl. 92, 1815.


An examination of Randall's type of *P. punctatus*, which is preserved in the museum of the Philadelphia Academy of Natural Sciences, shows it to belong to the well-known *P. jamaicensis*. In the same collection are specimens from St. Martin's (Dr. Rigjersma), San Domingo (W. M. Gabb), Guatemala (W. S. Vaux), Cuba (Guerin), Brazil (Dr. T. B. Wilson). In the Peabody Academy of Science there are specimens brought by J. A. McNiel from Polvon, on the west coast of Nicaragua.
PALÆMON LONGIMANUS Fabricius.

_P. lar_ Fabr., l. c., p. 402, 1798.

These three descriptions were doubtless drawn from individuals of the same species, and of the two Fabrician names I have chosen _longimanus_ to stand for the species, as it is to a certain extent descriptive.

**Palæmon ohionis** Smith.

This species was described by Professor Smith from specimens taken in the Ohio river at Cannelton, Indiana. Prof. S. A. Forbes (Bulletin Ill. Mus. Nat. Hist., i, p. 5, 1876) reports it from several places in Illinois and, on the authority of boatmen, from St. Louis to New Orleans, growing larger towards the south. I have seen specimens in the museum of the Boston Society of Natural History from Milliken's Bend, Miss. (C. A. Shurtleff), and in the Museum of the Academy of Natural Sciences of Philadelphia, from Vicksburg, Miss. (L. C. Rice) and Mississippi (Guerin-Meneville, types of _P. sallaei_ Guer. MS.).

**Palæmon sinensis** Heller.

Specimens of this species, which was originally described from Shanghai, were brought from Japan by Prof. E. S. Morse and are now in the museum of the Boston Society of Natural History.

**Palæmon acanthurus** Wiegmann.

_P. forceps_ Milne-Edwards.

Three specimens of this species in the Museum of the Peabody Academy brought by J. A. McNiel from the west coast of Nicaragua. It has hitherto been known only from the eastern shores of this continent.

**Genus LEANDER Desmarest.**

**Leander hammondii** n. s. Pl. I, fig. 2.

Carapax smooth; rostrum elongate, a fifth longer than carapax and considerably recurved, its dorsal margin armed with nine or ten nearly equidistant teeth, the two posterior being on the carapax; inferior margin six-toothed, the apex bifid. Last two joints of antennular peduncle subequal, and together about equalling the preceding joint. The two basal joints armed externally with a slender spine, each of which extends beyond the middle of the succeeding joint. Three
BY J. S. KINGSLEY.

antennular flagella, the two outer (and stouter) branches being united for about a fifth of their length. Antennal scale narrow and very long, nearly equalling the rostrum in length. Antennal flagellum slightly longer than the whole body. External maxilliped hirsute, small, slender and not reaching beyond the tip of the antennular peduncle. First pair of feet slender, extending half way between tip of antennular peduncle and the apex of the rostrum. Second pair also slender; ischium, meros, and carpus sub-equal. Palm inflated, fingers about equal to palm, depressed, slender and gaping; and extending their whole length beyond the rostrum. Remaining feet slender, propodal joints spinulose beneath. Telson slender, triangular, with four dorsal aciculi and its apex armed with four small spines, the two outer ones the shorter. Length of body 29 mm., carapax 13 mm., second pair 15 mm.

The specimens on which this species is founded are in the museum of the Peabody Academy of Science at Salem, Mass. (no. 171), and were brought from Baker's Island, North Pacific, by Capt. Joseph Hammond, who for many years has been in charge of the Exhibition Rooms of the Academy and for whom I have named the species. Its closest relative seems to be L. modestus Heller (Verh. k. k. zool. bot. Gesellschaft in Wien xii, pl. 527, 1862) from Shanghai, from which it appears to differ in the shape of the rostrum, hands, etc.

Genus Anchistia Dana.


A few details of this species are given on plate II, fig. 10.

Genus ALPHEUS Faber.

(Including Betaeus, Dana.)

Notwithstanding the remarks of my friend Mr. Lockington (Ann. & Mag. Nat. Hist. V, i, p. 466, 1878), I am still of the opinion that these two genera should be united and the examination of many hundred specimens of the two forms in the largest museums of America, only renders me more certain of my position. Mr. Miers says (Proc. Zoöl. Soc., 1879, p. 52): "There is probably scarcely any genus of Crustacea in which the species are more numerous, and which more greatly needs revision than the present," with which I fully agree. I commenced a revision some three years ago, but for several reasons I have been unable to finish it. Moreover, some sheets of my manuscript having been mislaid I cannot give this list of species that completeness which I could wish and which it once possessed. Still it is to be
hoped that the following notes which embrace almost every species, nominal or otherwise, will aid some future reviser in the work.

To aid in the identification of forms I have thrown the species into groups characterized by more or less prominent features; but there remain a number of nominal forms which (either from inadequacy of description or from the works in which they are published being inaccessible to me) are not so arranged.

A. Rostrum present; orbital hoods prolonged into spines.
   a. Dactylus of 1st pair normal, i.e., working in a vertical plane and above the pollex.
   * Larger hand constricted above and below.
   § A spine on basal joint of antenna.

**Alpheus megacheles Norman.**


*Dieneicia rubra* Westwood, l. c., p. 552 (1835).


England to the Mediterranean (Auct.).

**Alpheus thetis White.** Pl. II, fig. 7.


Miers Zoöl. Voyage Erebus & Terror, Crustacea, p. 5, pl. iv, f. 7 (1875).

The following description giving some details additional to those of Mr. Miers, is drawn from two specimens in the museum of the Academy of Natural Sciences of Philadelphia, presented by Dr. T. B. Wilson and labelled in Adam White’s handwriting. They agree well with the figure quoted above and may be regarded as typical.

Front three spined, rostrum slightly longer than the ocular spines and separated from them by deep sulci. Second joint of antennular peduncle much the longest, the peduncle equaling the antennal scale in length. External maxillipeds much exceeding the antennal scales.
Larger hand longer than the carapax and shaped much as in *A. strenuus* Dana, but more elongate. Both margins are constricted and a well marked longitudinal sulcus runs backward on the lower margin. The inner and outer surfaces of the hand are sulcate. The fingers are nearly as long as the palm, the dactylus being slightly longer than the pollex. The carpus of the second pair is five jointed; first joint as long as the next two, second as long as the third and fourth, which are equal and together are as long as the fifth. The hand is about as long as the fourth and fifth carpal joints together.

New Zealand! (Dr. Wilson, Phil. Acad.); New Holland (White).

**Alpheus bellimanus** Lockington.

San Diego, Cal. (Lockington).

**Alpheus sulcatus** Kingsley.

Panama! and Zorritas, Peru! (F. H. Bradley, Yale College).

**Alpheus dentipes** Guerin.

Mediterranean (Guerin, Lucas and Heller).

**Alpheus equidactylus** Lockington.

Monterey, Cal. (Lockington).

§§ No spine on basal joint of antenna.

**Alpheus Websteri** Kingsley. Pl. II, fig. 5.


In this species the constriction on the lower margin of the palm is very slight and possibly it should be placed near *A. lottinii* (infra), but it appears, however, to be more closely allied to *Alpheus sulcatus* than to any other form. The types are in the collection of Union College and were brought from Key West, Fla., by Prof. H. E. Webster, to whom the species is dedicated.
**CARCINOLOGICAL NOTES;**

**Alpheus euchirus Dana.**

Possibly this species should be arranged here. I have, however, placed it in the section with contorted hands. The dactylus works slightly out of the vertical plane.

** Larger hand notched above, entire below.**

§ A spine on basal joint of antenna.

**Alpheus gracilipes Stimpson.**


**Alpheus malleator Dana.**


**Alpheus gracilis, Heller.**


§§ No spine on basal antennal joint.

**Alpheus trispinosus Kingsley.**


What reason Dr. Stimpson had for calling this a *Betæus* I cannot imagine; for, according to his description, it has a long rostrum and the larger hand is not inverted, the only characters given for the genus *Betæus* by Dana.

Port Jackson, Australia (Stimpson).

*** Larger hand with both margins entire.  

§ First joint of carpus of second pair of feet shorter than, or at the most equal to, the second and third joints. A spine on the basal joint of the second antenna.

**Alpheus socialis Heller.**

*Alpheus socialis* Heller. Reise der Novara, Crustaceen, p. 106, pl. 10, f. 1 (1865); Miers Catalogue New Zealand Crustacea, p. 82 (1876).  
Auckland, Sydney (Heller); New Zealand (Miers).
Alpheus panamensis Kingsley.


Acajutla, Central America! and Panama! (F. H. Bradley, Yale College Museum).

Alpheus lottinii Guerin.

*Alpheus lottinii* Guerin. Voyage Coquille, Crustaces, p. 38, pl. III, f. 3 (1830).


A comparison of the types of Guerin and of Randall shows the specific identity of the two so-called species. Guerin's figure is poor, that of Dana is far better. The bottle containing Guerin's type bears the label (in his handwriting) "303 *Alpheus lottini. Guer. Voy. Coq. Edw. 2. 353, Ile de France;" while the manuscript catalogue of his collection (which was purchased by Dr. Thomas B. Wilson, and by him presented to the Academy of Natural Sciences of Philadelphia) has "303 *A. lottinii* Guer. Voy. Coq. Edw. 2. 353 (type) Nouvelle Irland, 1 Alk." In the published description Nouvelle Irland is given as the locality. Under these circumstances I am inclined to believe that the locality "Ile de France" was a slip of the pen.

New Ireland! (Guerin, Phil. Acad. *type*); Sandwich Islands! (T. Nuttall, Phil. Acad., Randall's *type*); Zanzibar! (C. Cooke, Peabody Acad.); Red Sea, Nicobar and Sydney (Heller); Fiji (Dana); Mauritius (Edw.); Society and Friendly Islands.

Alpheus rouxii Guerin.


Bombay (Guerin).

This in all probability is the same as the preceding. Guerin's description runs: "Très voisin de l'A. ventrosus, Edw., p. 352. Il en diffère par ses pattes mâchoires externes qui ne sont pas larges et obtuses au bout, mais qui sont, au contraire, larges à la base du dernier article, avec son extrémité effilée et aigüe; par l'article basilaire des antennes externes qui porte une forte épine atteignant presque la moitié de la pièce lamelleuse du pédoncule."
Alpheus ventricosus Kingsley.

Cryptophthalmus ventricosus Costa, Fauna Napoli, Crostacei, pl. vii, f. 3.²

I place this species in this section with some doubt, as I know nothing of the presence or absence of an antennal scale. Dr. Heller (Crustaceen des südlichen Europas, p. 272, 1863) regards this identical with his Alpheus lavimanus, but Costa's figure represents a widely different species. Dr. Heller also quotes as a synonym "Cryptophthalmus costae, Prestandrea Nuovi annali d. sc. nat. 1838, p. 298," a paper which I have not seen. Dr. Heller's synonymy is, however, never to be relied upon.

§§ First joint of carpus of second pair of feet larger than the second and third together.

Alpheus minus Say.


Beaufort, N. C.! (H. C. Yarrow, Yale College); Florida! A. S. Packard, jr., Peabody Academy); Martinique! (Guerin's type of A. sauleyi in Philadelphia Academy); Bermudas! (G. B. Goode, Yale College); Panama! (F. H. Bradley, Yale College); Bahamas! (H. Bryant, Boston Society); Trinidad! (W. O. Crosby, Boston Society).

Alpheus neptunus Dana.


²This work is one of the wonders of book-making. It has neither consecutive pagination nor systematic numbering of plates, there being half a dozen "Pl. I," and others in similar proportion. The parts themselves are not numbered, nor are the signatures dated or numbered. In the two copies which I have seen, the covers, in which the parts were issued, were wanting and so I can not give the dates. Some parts were apparently issued before the publication of the first volume of Milne Edwards’ Classic (1834), while others were not written until 1851.
Alpheus læviusculus Lockington. Ann. & Mag., V, i, p. 474 (1878); (nec Dana).

Alpheus charon Heller. Verhandlung der zoöl.-bot. Gesellschaft in Wien, Bd. xi, p. 27 (1861).

The Alpheus læviusculus of Lockington is certainly the same as the A. biungulus of Stimpson.

Eastern seas. ? W. coast America.

Alpheus spiniger Stm.


Near Loo Choo (Stm).

Alpheus tricuspidatus.


Red Sea (Heller).

Alpheus lævimanus Heller.


Mediterranean (Heller).

Alpheus tenuimanus Lockington.


Gulf of California (Lockington).

The following species which belong in section *** I am not able to assign more nearly to their proper position, on account of insufficient detail in the descriptions and figures.

Alpheus doto White, Miers.


Sir Charles Hardy’s Island, Australia (Miers).
Alpheus poeyi Guerin.


The type of this species is preserved, though in an imperfect condition, in the museum of the Philadelphia Academy.

Cuba! (Guerin).

Alpheus bidens Edw.


In Milne Edwards's figure (l. c.) this species is represented as having a four jointed carpus, probably an error on the part of the artist.

Asiatic seas (M. Edw.), New Holland (Olivier).

Alpheus villosus Edw.

*Palaxmon villosus* Olivier, l. c., p. 664 (1790).


Asiatic seas (Edw.), New Holland (Oliv.)

Alpheus spinifrons Edw.


*Alpheus panamensis* Kingsley, may prove to be this species but only a study of Milne Edwards's type can determine; his description is utterly inadequate and would apply to several other species as well.

Chili (Edw.).

Alpheus savignyi Guerin.


Egypt (Savigny).

Alpheus comatularum Haswell.


Queensland (Haswell).

b. Hand contorted, the dactylus working either in a horizontal plane or in a vertical one below the pollex.

* No spine on the basal joint of the antenna.
Alpheus streptochirus Stm.
Cape Verdes Is. (Stm.).

Alpheus brevipes Stm.
*Alpheus brevipes* Stm. Proceedings Phil. Acad., p. 30 (1860).
Hawaiian Is. (Stm.)

Alpheus barbara Lockington.
*Alpheus barbara* Lckn.

Alpheus euchirus Dana.
*Alpheus euchirus* Dana.

**A spine on the basal joint of the antennæ.

Alpheus clamator Lockington.
Sta. Barbara Is. (Lock.),

Alpheus collumianus Stm.
Bonin Is. (Stm.)

The following species belong in the section with the three-spined front (A) but no details are given of the hands and so their affinities cannot be recognized from the descriptions given.

Alpheus acutofemoratus Dana.
Balabac Straits (Dana).

Alpheus monoceros Heller.
Red Sea (Heller).

B. Rostrum spiniform, ocular hoods rounded, not spiniform.
a. Basal joint of antennal with an external spine.
* Larger hand constricted above and below.
§ First joint of carpus of second pair longer than the second joint.
Alpheus parvirostris Dana.


Balabac Straits (Dana), Red Sea (Heller).

Alpheus diadema Dana.


In this species the constriction of the larger hand is very slight and possibly the affinities are with A. fasciatus, infra, and the name is for that reason repeated there.

Hawaiian Islands (Dana).

Alpheus parvimanus Kingsley.

Alpheus parvimanus Kingsley, Bulletin, etc., p. 195 (1877).

Panama! (F. H. Bradley, Yale College Museum).

Alpheus sulcatus Kingsley.

Alpheus sulcatus Kingsley, Bulletin, etc., p. 193 (1877).

Panama! Zorritas, Peru! (F. H. Bradley, Yale Museum).

This species has affinities with this section and hence is repeated.

§§ First and second joints of carpus of second pair of feet equal.

Alpheus normannii Kingsley.

Alpheus affinis Kingsley, Bulletin, etc., p. 195, 1871 (nec Guise).


Panama! (F. H. Bradley, Yale Museum).

Alpheus packardii Kingsley, Pl. II, fig. 2.


Key West, Fla.! (H. E. Webster, Union College Museum).

§§ First joint of carpus shorter than the second.

Alpheus spinicaudus Lockington.


Gulf of California (Lockington).

** Larger hand notched above, entire below.

§ First carpal joint shorter than second.
Alpheus pugnax Dana.

Hawaiian Islands (Dana).

§§ First and second carpal joints equal.

Alpheus insignis Heller.

Red Sea (Heller).

*** Both margins of larger cheliped entire.
§ First carpal joint larger than second.

Alpheus fasciatus Lockington.

Gulf of California (Lockington).

Alpheus diadema Dana. Vide supra.

§§ First and second carpal joint nearly equal.

Alpheus novozelandiae Miers.

Alpheus novozelandiae Miers, Ann. and Mag. N. H. p. 82, pl. II, f. 2 (1876).
New Zealand (Miers).

§§§ First carpal joint shorter than the second.

Alpheus ruber Milne Edwards.

Cryptophthalmus ruber Costa op cit.
Mediterranean! (Phila. Acad.)

§§§§ No details of carpal joints.
Alpheus crassimanus Heller.


Nicobars (Heller).

b. Basal joint of antennae without an external spine.

*Dactylus* working in a horizontal plane, at right angles to the usual one.

**Alpheus cylindricus** Kingsley.

*Alpheus cylindricus* Kingsley, Bulletin, etc., iv, p. 196 (1877).

Panama! (F. H. Bradley, Yale Museum).

**Dactylus normal.

§ Both margins of larger cheliped constricted.

Alpheus bisincisus De Haan.

*Alpheus bisincisus* De Haan, Fauna Japonica, Crustacea, pl. XLV, f. 3 (1849).

*Alpheus avaris* De Haan, l. c. p. 179 (1849).


Japan (De Haan), Tongatabu (Dana), Eastern Seas (Auct.).

Alpheus lobidens De Haan.


Japan (De Haan).

Alpheus Edwardsii Audouin.


*Alpheus neptunus* White, Zool. Erebe. and Terror, pl. iv, f. 3 (1874).

Red Sea (Heller), Mozambique (Bianconi), Port Essington, Australia (Miers).

Alpheus heterochelis Say.


*Halopsyche lutaria* Saussure, Rev. et Mag. de Zoologie, 1857, p. 100.

From North Carolina! to Brazil, Rio Janeiro! West Indies! Panama! Realijo, Nicaragua! This form belongs to both coasts of tropical and sub-tropical America. Mr. Lockington (Ann. and Mag. Nat. Hist. V, i, p. 475, 1878) reports it from Lower California.

**Alpheus pacificus** Dana.


Hawaiian Is. (Dana).

**Alpheus japonicus** Miers.


Japan (Miers).

**Alpheus spinicaudus** Lockington.


Lower California (Lockington).

**Alpheus jourdainii** Guerin.


No locality given.

**Alpheus sculptimanus** Guerin.

*Alpheus sculptimanus* Guerin, l. c. p. li, 1837.

Janaon (Guerin).

**Alpheus laevigatus** Guerin. Pl. II, fig. 3.


**Alpheus strenuus**.


Alpheus rhamode White, l. c.

Torres Straits, Sydney, Tongatabou, Philippines.

§§ Upper margin of larger chela notched, the lower entire.

Alpheus brevirostris Edw.


Alpheus kingsleyi Miers.

Alpheus kingsleyi Miers, P. Z. S. London, 1879, p. 54.
Japan (Miers).

Alpheus rapax Fabr.

Alpheus rapax Fabricius, Suppl. Ent. Syst. p. 405, 1798, De Haan, op. cit. p. 177, pl. XLV, f. 2 (1849).
Japan (De Haan).

Alpheus malabaricus Fabr.

Alpheus malabaricus Fabr., Suppl. f. 405 (1798) De Haan, op. cit. p. 177, Pl. XLV, f. 1 (1849).
Alpheus brevicristatus De Haan, l. c.
Japan (De Haan).

§§§ Both margins of the larger chela entire.

Alpheus chiragricus Edw.

Asiatic Seas (Edw.)

Alpheus crinitus Dana.

Balabac Straits (Dana).

Alpheus obesomanus Dana.

Samoan Is.! (Phila. Acad.) Fiji Archipelago (Dana).
Alpheus floridanus Kingsley, Pl. II, fig. 8.


Alpheus mitis Dana.


Balabac Straits (Dana).

Alpheus paracrinitus Miers.


Goree, Senegambia (Miers).

C. Front of carapax truncate, rostrum absent, orbital hoods without spiniform prolongation.
   a. Hands normal.

Alpheus frontalis Edw.


New Holland (Edw.), Tahiti (Heller).

Alpheus emarginatus Edw.


Locality unknown (Edw.).

Alpheus pachychirus Stm.


Loo Choo (Stm.).

Alpheus simus Guerin.


Cuba (Guerin).

Alpheus affinis Guerin.


Bombay (Guerin).
124

Carcinological Notes;

Alpheus sinuosus Guerin. Pl. II, fig. 6.

Alpheus sinuosus Guerin, in De Sagra, p. li (1857).
Callao, Chili! (Guerin, type in Philadelphia Academy).

b. Hands inverted.

Alpheus longidactylus.


Alpheus harfordi Kingsley. Pl. II, fig. 4.

Betæus equimanus Lckn. Proc. Cal. Acad., vii, p. 43 (1876); non Dana.
Alpheus equalis Kingsley, l. c., p. 199 (1877).

Alpheus australis Kingsley.

Betæus australis Stm. Proc. Phil. Acad., p. 31 (1860).
Port Jackson, Australia (Stm).

Alpheus æquimanus Kingsley.


Alpheus candei Guer.


Santa Barbara! (W. G. W. Harford, Yale, Peab. Acad.) ; San Diego, Cal. ! (Yale, Dr. E. Palmer); Bermudas! (J. M. Jones, Yale); Key West, Fla.! (H. E. Webster, Union College); Cuba! (Guerin, Phil. Acad.).
Alpheus truncatus Kingsley.

Terra del Fuegia (Dana).

Alpheus scabrodigitus Kingsley.

*Betæus scabrodigitus* Dana, l. c., p. 560, pl. xxv, f. 12 (1852).
Valparaiso (Dana).

The following species are either too imperfectly characterized to admit of recognition, or do not belong to the genus Alpheus as at present restricted.

**Alpheus aculeatus** Sabine = *Hippolyte grönlandica*.

**Alpheus amethysteus** Risso = *Anchistia amethystea*.

**Alpheus amphitrite** White MS.

**Alpheus avarus** Fabr.

**Alpheus caramote** Risso = *Peneus caramote*.

**Alpheus cougneti** Risso = *Hippolyte sp*.

**Alpheus elegans** Risso = *Gnathophyllum elegans*.

**Alpheus elongatus** Risso = *Hippolyte sp*.

**Alpheus ensiferus** Risso = *Hippolyte sp*.

**Alpheus marmoratus** Fabr. = *Hippolyte marmoratus*.

**Alpheus monopodium** Bosc. = *Alpheus edwardsii*.

**Alpheus olivieri** Risso = *Hippolyte sp*.

**Alpheus polaris** Sabine = *Hippolyte polaris*.

**Alpheus punctulatus** Risso = *Hippolyte sp*.

**Alpheus pelagicus** Risso = *Hippolyte sp*.

**Alpheus scriptus** Risso = *Anchistia scripta*.

**Alpheus sivado** Risso = *Pasiphæ sivado*.

**Alpheus spinus** Leach = *Hippolyte spinus*.

**Alpheus tamulus** Fabr.

**Alpheus tyrrenhus** Risso = *Pontonia tyrrenhus*.

**Alpheus viridis** Otto = *Hippolyte sp*.
Of the following species I can say nothing, as the descriptions are in works at present inaccessible to me.

Alpheus galathea.

Port Essington, Australia.

Alpheus alope White.

Alpheus alope White. List B. M. Crustacea, p. 75, 1847 (s. d.); Miers Zool. Erebus and Terror, p. 5, pl. iv, f. 6 (1875).
Port Stephens, Australia.

Alpheus costae.

Mediterranean.
This is given by Heller (Crust. süd. Europa, p. 272, 1863) as a synonym of A. lavimanus; but whether it be that species or A. ventricosus or rather a distinct species I have not the means at hand to determine.

Alpheus digitalis De Haan.

Alpheus digitalis De Haan. Fauna Japonica, p. 178, pl. xlv, f. 4.
Japan (De Haan).

Alpheus forceps White MS.

Alpheus latifrons A. Milne Edwards.

Samoan Islands (A. M.-E.).

Alpheus minor De Haan.

Alpheus minor De Haan, op. cit., p. 180, pl. xlv, f. 6.
Japan (De Haan).

Alpheus triton White MS.
Alpheus lineifer Miers.


Samoan Islands (Miers).

This species belongs either in the section with Alpheus bisincisus or in that which contains A. parvirostris and A. spinicaudus; but as no details are given regarding antennal spine and carpal joints, its affinities cannot be more closely indicated.

Genus HIPPOLYTE Leach.

Hippolyte prionota Stimpson. Pl. II, fig. 9.


I figure this beautiful species from a specimen from Puget Sound, in the collection of the Philadelphia Academy.

Genus CARIDINA Edw.

Caridina africana nov. sp. Pl. I, fig. 3.

Carapax smooth, compressed; suborbital spine alone present; rostrum nearly as long as the carapax; its apex slightly reflexed and armed above and below with minute teeth. Peduncle of antennulae about as long as the rostrum, its penult and last joints subequal. Antennal scale slightly longer than antennular peduncle, its apex regularly ovate, its sides parallel, no spine on the basal joint. Ambulatory feet very slender, short, the carpus of the first pair about as long as the palm, of the second as long as the handfingers of both terminated by pencils of short hairs. Dactyli of three posterior pairs of feet slightly curved, simple and about one-fifth the length of the propodal joints. Telson narrow, the sides straight and but slightly converging to the truncate tip which falls a little short of the narrow caudal lamellae of the sixth segment.

Zulu Mission, South Africa (S. A. Grout).

Genus XIPHOCARIS Martens.

In my revision of the genera of Palaemonidae (Proc. Acad. Nat. Sci. Phila., 1879, p. 426), I referred the single species of this genus to Caulurus of Stimpson; but having since seen specimens, I have
found that its affinities are not with the Palæmonidæ, but rather with Atya and Caradina, as it possesses the mandibles characteristic of that group.

Genus **HIPPOLYSMATA** Stimpson.

**Hippolysmata wurdmanni** Stimpson. Pl. I, fig. 8.

**Hippolysmata intermedia** Kingsley. Pl. I, fig. 4.

I give figures of some details of these two species to aid in their identification.

Genus **NECTOCRANGON** Brandt.

**N. alaskensis** nov.

Carapax but little depressed, with four prominent equally spaced teeth in the median line, the anterior one forming the rostrum, and with a fifth smaller tooth between the first and second. A strong spine on each hepatic region. Front strongly elevated, the orbits elongate, tubular, and each with two spiniform teeth above. Pterygostomian spine very prominent. Peduncle of antennulae barely reaching to middle of the antennal scale, and the flagella not reaching its tip, otherwise both pairs of antennæ are much as in *N. lar*. The external maxilipeds and thoracic feet present no important differences from *N. lar*. The sterna of the three last thoracic segments bear large prominent spines. The abdomen has a median dorsal carina, which on the sixth segment and telson is double as in the previously described species. Length about one and one-half inches.

Marmot Island, Kodiak Archipelago, Alaska (Dr. W. H. Jones, Philadelphia Academy).

Genus **CRANGON** Fabricius.

**Crangon tenuifrons** nov. Pl. I, fig. 10.

Carapax depressed, its surface uneven, with two spines in the median line above, of which the posterior is just behind the middle and the smaller, anterior one at the base of the rostrum. Rostrum elevated, arcuate, somewhat elongated, and reminding one of that of *Sabinea septemcarinata*. Subocular, pterygostomian, and hepatic spines prominent. Antennulae with a broad basal scale, the peduncle extending nearly to the middle of the antennal scale. Two flagella present, the outer thicker one reaching the tip of the antennal scale,
the inner extending a little farther. Antennal scale narrow, elongate, flagellum two-thirds as long as the body. External maxillipeds with the distal joints hairy, and exceeding by half their length the antennal scales. First pair of feet much as in C. vulgaris, the carpus with a spine on each side below. The occludent margin of the hand very oblique. Second and third pairs of feet slender, the second chelate and a little shorter than the third; fourth and fifth pairs elongate cylindrical, the dactyli styliform. First five joints of the abdomen with a median carina, the sixth and telson with two carinal telson elongate, sides straight, tip acute.

Length two inches.

Marmot Island, Kodiak Archipelago, Alaska (Dr. W. H. Jones, Phila. Acad.).

I insert for comparison figures of C. vulgaris (pl. I, fig. 5), C. boreas (pl. I, fig. 6), and C. franciscorum (pl. I, fig. 7).

**Crangon vulgaris Fabr.** Pl. I, fig. 5.

I have examined numerous specimens of this species from the east and west coasts of America and from Europe, and fully agree with Professor Smith in uniting with it the form formerly known as C. nigricauda. Specimens in the Peabody Academy from Beverly, Mass. (No. 138) have the sixth and seventh abdominal segments sulcate above as in the majority of the west coast forms. Kinahan's figures (Proc. Roy. Irish Acad., viii, pl. iv, 1864) are very incorrect. The second pair of feet are greatly larger than in any specimens I have seen, and the joints of the external maxillipeds are wholly unlike those found in nature.

**Crangon salebrosus Owen.**

This is probably to be found in North American waters; there are specimens in the museum of the Philadelphia Academy without locality, but which came with other American forms (Paracrangon echinatus, Hippolyte prionota, etc.). Its original locality, Kamtschatka, would seem to favor this idea.

**Crangon batei.**


This Australian species must be renamed, the term *intermedius* having been used in 1860 by Stimpson for a species from Behrings Straits. Mr. Bate is rather unfortunate with the species described in this paper,
CARCINOLOGICAL NOTES;

for with the exception of this and one other species, every form is assigned to a wrong genus. The genus Angasia is, as I have previously shown, synonymous with the earlier Tozeuma of Stimpson.

**Evaxius tricarinatus** n. g. et n. s. Pl. I, fig. 1.

A single imperfect specimen, lacking both chelipeds, forms the basis of this description. I should hesitate to describe it were its other characters so well marked as to render it a very distinct and interesting form.

Cephalothorax small, compressed; abdomen large and somewhat depressed. Body everywhere with a sparse pubescence, among which are interspersed larger hairs. Carapax with a median dorsal carina extending from the "cervical suture" as far as the eyes and terminating anteriorly by a sharp tooth; just behind this tooth occurs a broad and shallow emargination. On either side of this median carina is found a less conspicuous one extending from above the eyes half way back to the "cervical suture;" its anterior extremity likewise terminating in a tooth similar to that of the median carina. In front of these carinae the carapax is strongly deflexed and terminates anteriorly in a small triangular rostrum extending about half its length, beyond the eyes. The anterior and inferior margins of the carapax are smooth and unarmed. The basal joints of the antennæ are hairy, the two distal ones being subequal. Flagella two, of equal length, but the inner of smaller diameter; no spines or scales on the basal joints. Antenna without a basal scale, the penult joint compressed and over twice the length of the last joint; flagellum a little longer than the carapax. External maxillipeds pediform, flattened and extending to the extremity of the antennal peduncle. In the specimen the first pair of perelopoda had been broken off during life, but were in process of restoration; the chelæ were didactyle, the fingers being equal. Second pair of walking feet compressed; carpus and propodus subequal; the chelæ well formed. Third and fourth pairs also compressed, monodactyle, the propodus pectinate and bristled beneath. Fifth pair smaller, subchelate. Pleopoda small and inconspicuous. Lower margins of abdominal segments rounded. Caudal lamellæ broad with rounded extremities, each with a median

---

2This suture does not indicate the line of division between the head and thorax as is usually stated. Those who may be interested will find a masterly exposition of the meaning and significance of this line in the portions on the morphology of the Crustacea with which Professor Dana begins his splendid work on the Crustacea of the U. S. Exploring Expedition.
carina on the dorsal surface. Telson broad and rounded, ecarinate, pubescent above, extremity rounded. Length one and one-half inches.

The single specimen which is in the Museum of the Boston Society of Natural History was brought from Zanzibar by Dr. Charles Pickering.

This form clearly belongs to the Gebidæ as limited by Dana, but it is clearly separated from all known genera by well marked characters: from Gebia and its allies by the absence of the antennal scale and the chelate second pair of pereiopoda; from Axius in the absence of the antennal scale and from Gebiopsis A. Milne-Edwards, by the characters of the second pair of walking feet. Its position seems to be intermediate between Axius and Gebiopsis.

**Nephrops occidentalis** Randall. Pl. II, fig. 1.


When at work at the collections of the Philadelphia Academy, I was unsuccessful in my search for the type of this species, which was supposed to have been brought from the west coast of America. In the collection which formed the basis of Dr. Randall's paper, there were specimens from California and from the Sandwich Islands, and it is possible that some transfer of labels took place here as well as in the case of one of the *grapsidæ*. This supposition is rendered the more probable from the fact that this species has never been reported from our shores, except by Randall, and so far as I am aware, it has never been seen by carcinologists since his day. In going over the collections of the Boston Society, I found, however, three imperfect specimens from Mauai, Hawaiian Islands, presented by Dr. Winslow, which agree well with Dr. Randall's description, and one of which furnished the illustration accompanying the present article. It is a valid member of the genus, and can readily be identified by the figure and description.
EXPLANATION OF PLATES.

PLATE I.

Fig.

1 Evaxius tricarinatus.
2 Leander hammondi; a, antennula; b, carapax; c, second thoracic foot.
3 Caradina africana; a, second thoracic foot.
4 Hippolysmata intermedia.
5 Crangon vulgaris; a, mandible; b, chela; c, antennal scale.
6 Crangon boreas; with chela, mandible and antennal scale.
7 Crangon franciscorum and chela.
8 Hippolysmata wurdemanni and mandible.
9 Antennal scale of Crangon vulgaris (the form described as nigricauda).
10 Crangon tenuifrons.

PLATE II.

Fig.

1 Nephrops occidentalis.
2 Alpheus packardi.
3 Alpheus lavigatus; a, second thoracic foot.
4 Chela of Alpheus harfordi; a, anterior portion of carapax, etc.
5 Alpheus websteri.
6 Alpheus sinuosus.
7 Alpheus thetis.
8 Alpheus floridanus.
9 Hippolyte prionota.
10 Rostrum and a, antennula of Anchistia americana.