

3. On a Collection of Crustacea made by Capt. H. C. St. John, R.N., in the Corean and Japanese Seas. By EDWARD J. MIERS, F.L.S., F.Z.S.—Part I. Podophthalmia. With an Appendix by Capt. H. C. St. JOHN.

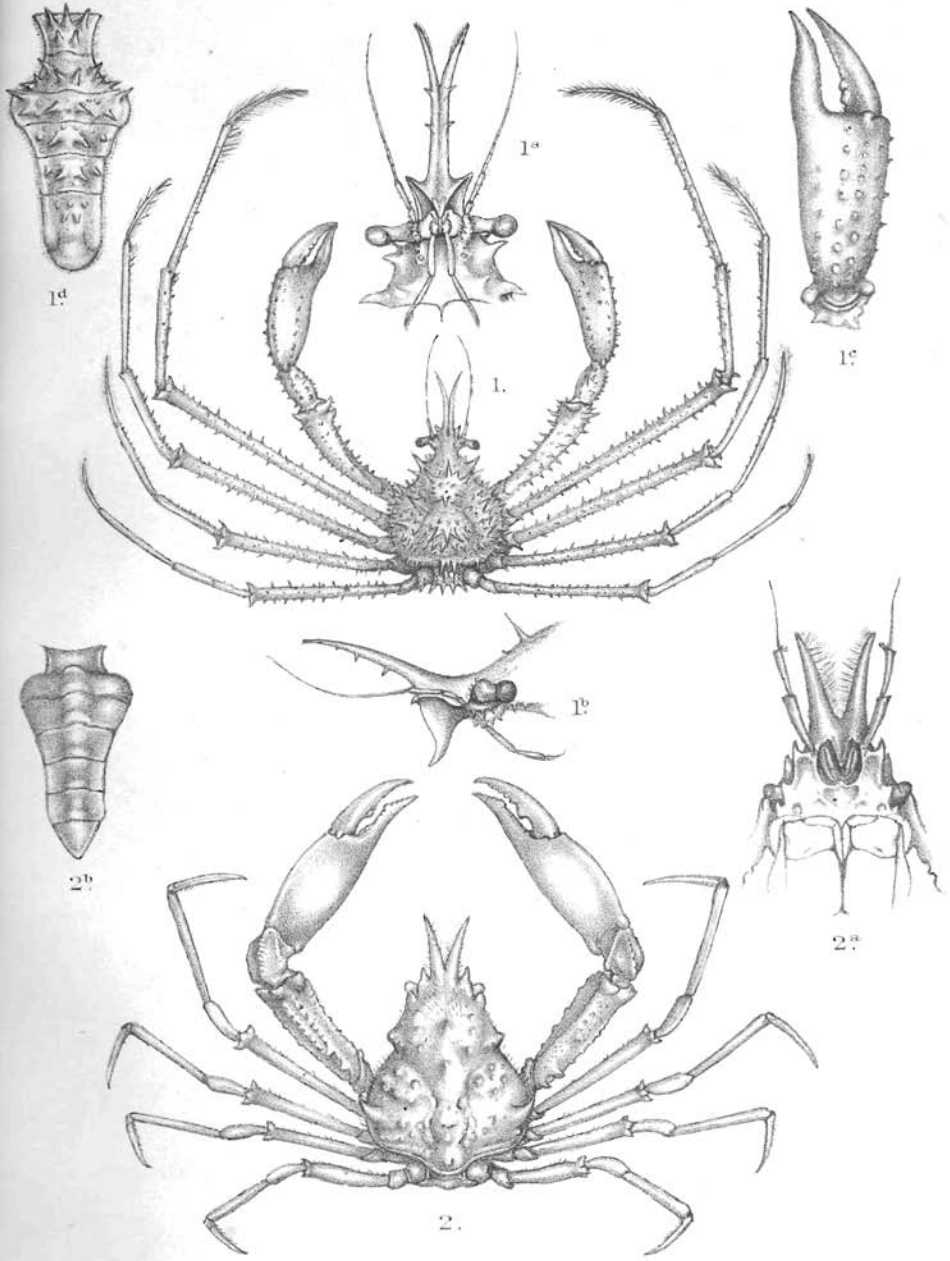
[Received November 23, 1878.]

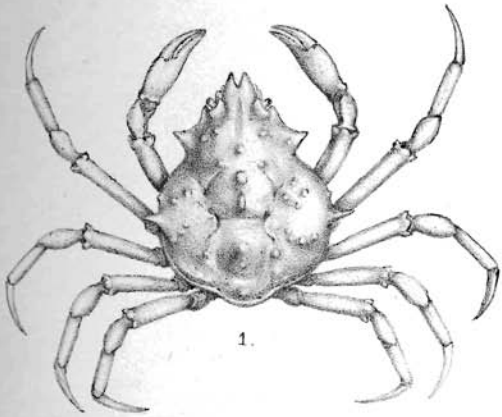
(Plates I.—III.)

The collections of Crustacea made by Capt. H. C. St. John while engaged in surveying the Japanese coasts between the years 1870 and 1877 have been presented by Dr. J. Gwyn Jeffreys, F.R.S., to the Trustees of the British Museum, and are of so much interest, both from the geographical distribution of the species and on account of the many novelties collected, that I have thought it desirable to bring an account of them before the Society. The specimens were nearly all obtained by dredging; and Capt. St. John has furnished an interesting account of the mode adopted by him in collecting and separating the specimens, which is printed below as an Appendix. But few of the larger and well-known littoral species, which are so well described and figured by De Haan in his standard work upon the Crustacea of Japan (in Siebold, 'Fauna Japonica,' 1833-50), are represented in the collection.

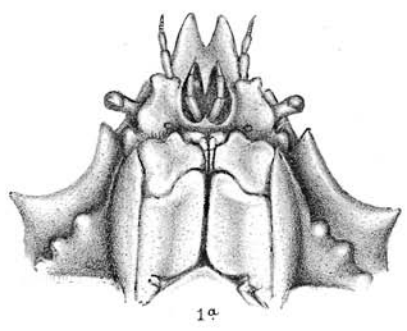
Comparatively little was known of the Crustacean fauna of the deeper waters of this region until the publication, in 1857-60, of a series of papers by the late Dr. W. Stimpson, the eminent American carcinologist, on the Decapoda collected by the U.S. Expedition to the North Pacific under Commanders C. Ringgold and J. Rodgers, in the 'Proceedings of the Philadelphia Academy of Sciences,' which contain short Latin diagnoses of a large number of new species (many of them obtained at considerable depths), and in which also a considerable number of species previously described by Milne-Edwards, Dana, Adams and White, and others are added to the Japanese fauna. It is much to be regretted that no fuller account of these collections should ever have appeared, and that Stimpson's preliminary report did not extend beyond the Decapoda. As Capt. St. John's collections were made in the same region, many of Stimpson's species occur in them; and in their determination I have been greatly aided by comparing them with a series of specimens from the Japanese Seas, named by Dr. Stimpson himself, and presented some years ago by the Smithsonian Institution to the British Museum.

It is remarkable, under the circumstances, that the present collection should contain so many forms which are new to science, while so many of Stimpson's species still remain *desiderata* to the national collection; and this goes far to prove that a rich harvest will yet reward the collector of marine Invertebrata in the Japanese region, and that even more interesting results may be expected in many regions where no dredging-operations have yet been attempted. The

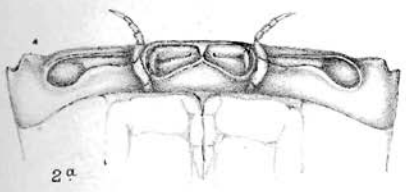




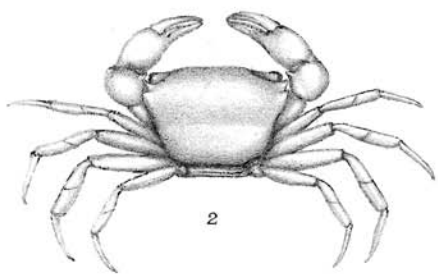
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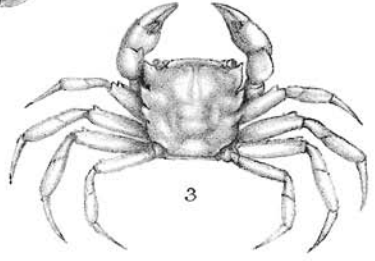
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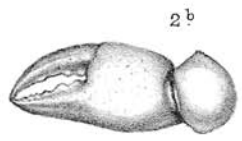
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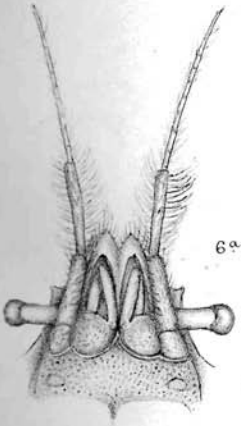
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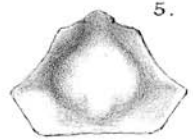
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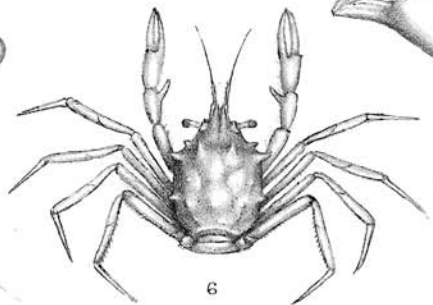
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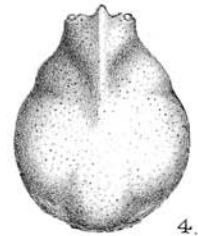
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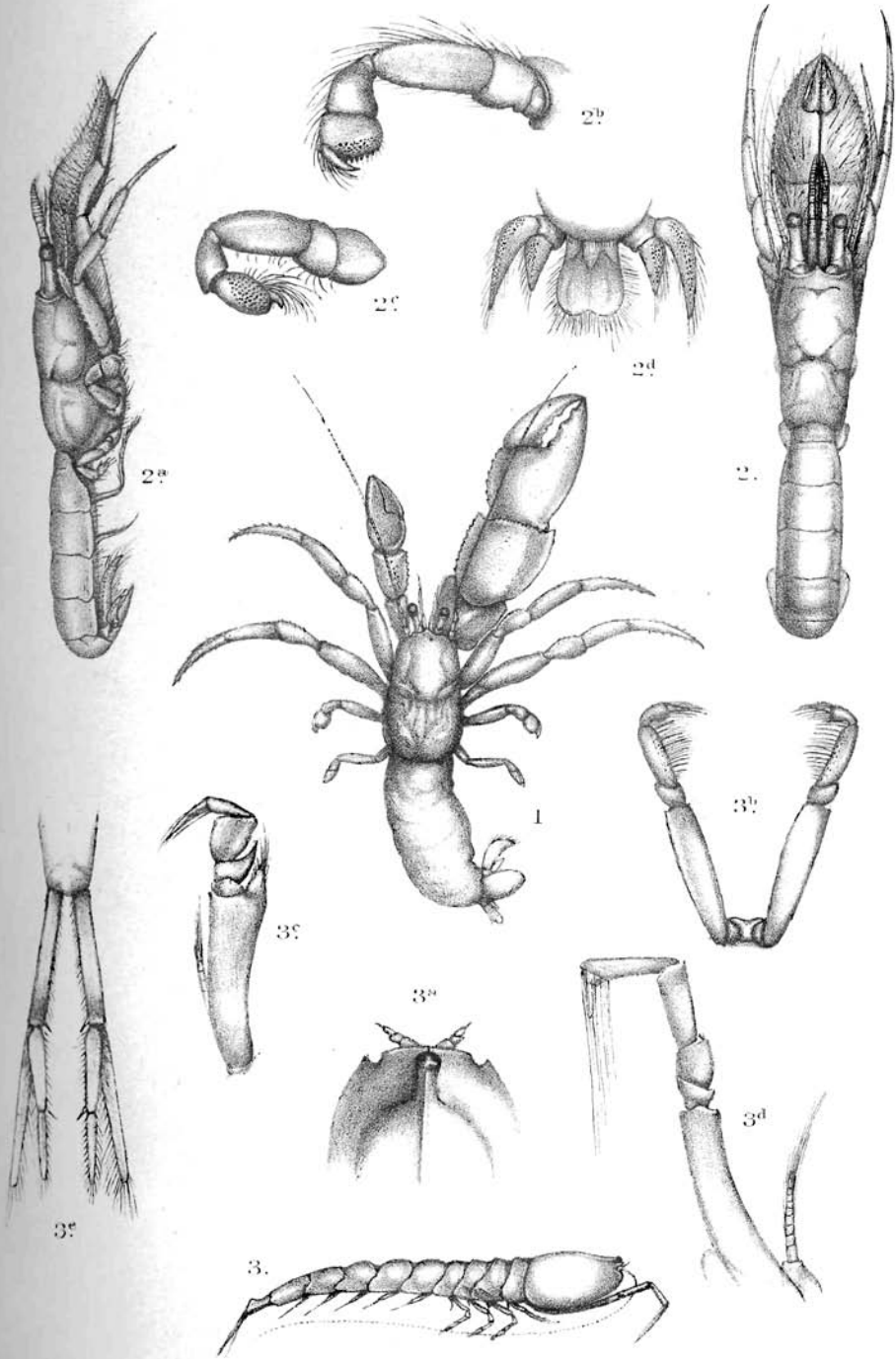
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4.



careful manner in which the exact particulars regarding the locality, depth, and, in some cases, the temperature of the water have been recorded by Capt. St. John gives additional scientific value to the present collection; and although it is to be regretted that the labels belonging to a few of the bottles had unfortunately been washed off and lost before the collection was received by the Trustees, yet Capt. St. John assures me that all these specimens were collected in or near the Corean Straits. The only species not obtained in these seas or in the Japanese region is the remarkable Crab *Gonatonotus pentagonus* of Adams and White, which was dredged in the Javan sea, near Billiton Island, at a depth of 12 fathoms.

In the present communication 64 species or well-marked varieties belonging to the Podophthalmia are noticed; and of these 26 are apparently new to science, besides which there are several which for different reasons I have refrained from designating by a specific name. The names and the families to which they appertain are given in the systematic list which follows, where also I have noted the localities and the geographical range, when known.

In a second paper I hope to describe the remainder of the species collected, which belong chiefly to the orders Amphipoda and Isopoda, and to the Cirripedia and Pycnogonida, and are not less interesting than the Podophthalmia.

List of Species described in the present paper.

PODOPHTHALMIA.

DECAPODA.

BRACHYURA.

OXYRHYNCHA v. MAIOIDEA.

MAIIDÆ.

Pugettia quadridens (De Haan). Corean Channel, Japan, Hong Kong: p. 23.

P. incisa (De Haan). Corean Channel, Japan: p. 23.

Oregonia hirta, Dana. Japan, California: p. 24.

Pleistacantha sancti-johannis, gen. and sp. n. Japanese seas (North Pacific coast): p. 24.

Achæus spinosus, n. Corean Channel: p. 25.

A. tuberculatus, n. Corean Channel: p. 25.

Hyastenus diacanthus (De Haan). Japan, Corean Channel, Australian and Indo-Malayan seas: p. 26.

H. (Chorilia) japonicus, n. Japanese seas: p. 27.

Doclea orientalis, n. Kunasiri Isl.?, Yeso Island: p. 28.

PARTHENOPIDÆ.

Gonatonotus pentagonus, Ad. & White. Javan Sea, Borneo, North-east Australia: p. 29.

Lambrus intermedius, n. Corean Channel: p. 29.

CYCLOMETOPA V. CANCROIDEA.

CANCRIDÆ.

Actea granulata, Audouin. Japanese seas, Indo-Pacific region : p. 30.

Actæodes tomentosus (M.-Edw.), var. Goto Islands, Indo-Pacific region : p. 30.

Leptodius exaratus (M.-Edw.), var. Corean Channel, Japanese seas : p. 31.

ERIPHIIDÆ.

Pilumnus hirsutus, Stm. Corean Channel, North-China seas : p. 31.

P. dehaanii, n. Gulf of Yedo : p. 32.

PORTUNIDÆ.

Thalamita sima, M.-Edw. Japanese seas, Indo-Pacific region : p. 32.

Goniosoma ornatum, A. Edw. Seas of Eastern Asia : p. 33.

G. variegatum (Fabr.). Indian and East-Asian seas : p. 33.

Portunus corrugatus (Pennant). British seas, Mediterranean, Red Sea, Japan : p. 33.

CORYSTIDÆ.

Trichocarcinus dentatus, n. Japan, Corean Channel : p. 34.

T. affinis, n. Corean Channel : p. 35.

Telmessus acutidens (Stm.). Japanese seas : p. 36.

CATOMETOPA V. GRAPSOIDEA.

MACROPHTHALMIDÆ.

Gelasimus lacteus, De Haan. Japanese and Corean seas : p. 36.

GRAPSIDÆ.

Heterograpsus longitarsis, n. Japanese and Corean seas : p. 37.

Platygrapsus depressus (De Haan), junr. Chinese, Japanese, and Corean seas : p. 37.

Helice tridens, De Haan. Seas of Japan and China : p. 38.

Leiolophus planissimus (Herbst). Indo-Pacific and Atlantic region : p. 38.

CARCINOPLACIDÆ.

Heteroplax? nitidus, n. Corean Channel : p. 39.

RHIZOPIDÆ.

Typhlocarcinus villosus, Stm. Corean Channel, Hong-Kong : p. 40.

OXYSTOMATA V. LEUCOSIIDEA.

LEUCOSIIDÆ.

Leucosia hamatosticta, Ad. & White, var. Corean Channel, Kagosima, "Eastern seas : " p. 40.

Pseudophilyra tridentata, gen. and sp. n. Corean Channel : p. 41.

Philyra, sp. Matoya : p. 41.

Myra dubia, n. Corean Channel : p. 42.

Ebalia rhomboidalis, n. Corean Channel : p. 42.

E. minor, n. Corean Channel : p. 43.

E. bituberculata, n. Japanese seas (North Pacific coast) : p. 43

Cryptocnemus pentagonus, Stm. Corean Channel, Gulf of Kago
sima : p. 43.

Arcania globata, Stm. Corean Channel, China Sea, "Eastern
seas:" p. 44.

A. orientalis, n. Corean Channel, Japanese seas (North Pacific
coast) : p. 44.

ANOMURA.

DROMIDEA.

DROMIIDÆ.

Cryptodromia, sp. Japanese seas (North Pacific coast) : p. 44.

HOMOLIDÆ?

Paratymolus vubescens, gen. and sp. n. Matoya : p. 45.

RANINIDEA.

Ranina serrata, Lam. Japan, Indo-Pacific region : p. 46.

Lyreideus tridentatus, De Haan? Japan, Kada Bay : p. 46.

PORCELLANIDEA.

Porcellana spinulifrons, n. Corean Channel : p. 46.

Pachycheles stevensii, Stm. Japanese and Corean seas : p. 47.

LITHODIDEA.

Hapalogaster dentatus (De Haan). Japan, Goto Islands : p. 47.

Cryptolithodes expansus, n. North Japan : p. 47.

PAGURIDEA.

Eupagurus cavimanus, n. Japanese seas (Tsugar Straits): p. 48.

Pomatocheles jeffreysii, gen. and sp. n. Corean and Japanese seas :
p. 49.

GALATHEIDEA.

Galathea orientalis, Stm. Corean Channel, Hong Kong (Ly-i-
moon Straits) : p. 51.

Munida japonica, Stm. Corean Channel, Gulf of Kago-sima : p. 51.

MACRURA.

THALASSINIDEA.

GEBIIDÆ.

Gebia major, De Haan. Japan, Katsura, and Kada Bay : p. 52.

CARIDEA.

CRANGONIDÆ.

Paracrangon echinatus, Dana. Yedo Island, California, Puget
Sound : p. 52.

ALPHEIDÆ.

- Alpheus bisincisus*, De Haan. Japan, Katsura, Corean Channel : p. 53.
A. japonicus, n. Japanese seas (North Pacific coast) : p. 53.
A. kingsleyi, n. Japanese seas (North Pacific coast) : p. 54.
A. gracilipes, Stm.? Corean Channel, Tahiti : p. 55.
Rhynchocyclus planirostris (De Haan). Japan, Ly-i-moon Straits, near Hong Kong : p. 55.
Hippolyte leptognatha, Stm. Japan, Gulf of Yedo, Hakodadi : p. 56.
Pandalus gracilis, Stm. Corean Channel, Gulf of Hakodadi : p. 56.

PENÆIDEA.

PENÆIDÆ.

- Penæus affinis*, M.-Edw. Japanese and Corean seas, Indo-Pacific region : p. 56.

CUMACEA.

- Heterocuma sarsi*, gen. and sp. n. Corean and Japanese seas : p. 58.
H. sarsi, var. *granulata*, n. Corean Channel : p. 58.

Remarks on the Geographical Distribution of the Species.

The Crustacean fauna of Japan includes many species of restricted range and peculiar to the seas of Eastern Asia, besides many of the common and widely-spread littoral Indo-Pacific forms; but it also presents affinities with the European and especially the Mediterranean fauna, and that of the west coast of the American continent. As illustrating the European affinities I may note the occurrence, both in the South-European and Japanese seas, of such well-known genera as *Achæus*, *Ebalia*, and *Eupagurus*, and the remarkable genus *Latreillia* (of this latter I have seen no specimens), and of the *Portunus corrugatus*, Pennant, originally described from the British coast; moreover the *Penæus distinctus*, De Haan, is either identical with or closely allied to the Mediterranean *Solenocera siphonocera*, Philippi, and in the present collection occur species of the genera *Mæra* and *Pycnogonum*, scarcely distinct from the well-known European *M. truncatipes* and *P. littorale*. The last-mentioned is a boreal species; but the instances above given (and others which might be cited) show that the relationship which does exist is not confined to forms which may have made their way from Europe to Japan along the northern shores of Asia.

The affinity of the Japanese with the Western-American Crustacean fauna is similarly evidenced by the existence of many genera common to the shores of both regions, the species being either identical or very closely allied, so closely, indeed, that further comparative study might show the relationship is even more near than is now suspected. Instances in the present collection are the genera *Pugettia*, *Oregonia*, *Trichocarcinus*, *Telmessus*, *Heterograpsus*, *Haplogaster*, *Fachycheles*, *Paracrangon*, *Rhynchocyclus*, among the Podophthalmia.

Many of the genera thus common to the two regions are scarcely

found elsewhere, and are peculiarly characteristic of the Pacific coasts of America. Some, having a boreal range (*Echidnocerus*, *Hapalogaster*), evidently pass from one continent to the other *viâ* Behring's Straits; but instances are not wanting (although rare) of forms which have never been shown to have a boreal range occurring on both coasts of the Pacific. An example occurs in the present collection in the curious Shrimp *Paracrangon echinatus*, Dana, in the case of which I have satisfied myself, by actual comparison, of the identity of examples from Puget Sound, California, and Yedo Island. *Hyastenus* (*Chorilia*) *japonicus*, and *Telmessus acutidens*, Stm., may, upon further comparison, prove to be identical with their American congeners.

BRACHYURA.

OXYRHYNCHA vel MAIOIDEA.

MAIIDÆ.

PUGETTIA QUADRIDENS.

Menæthius quadridens, De Haan, Faun. Japon. Crust. p. 97, pl. xxiv. fig. 2, ♂ (*Halimus*), and pl. G (1839).

Pugettia quadridens, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 219 (1857).

This species is very closely allied to the *Pugettia gracilis*, Dana (U.S. Expl. Exp. xiii. p. 117, pl. iv. fig. 3, 1852), from the Californian coast; but the lateral lobes or expansions of the carapace are less broad and triangular in shape, and more acute at the extremity. In the females the carapace is more convex than in the males, with the hepatic regions more convex.

Otarranai, $5\frac{1}{2}$ fathoms, lat. $43^{\circ} 12'$ N., long. $141^{\circ} 1'$ E.; Isenomi Straits, low-water mark; Corean Channel, lat. $33^{\circ} 12\frac{1}{2}'$ N., long. $129^{\circ} 5'$ E., 9 fathoms. Males, females, and young were collected.

Stimpson's specimens were from Simoda, Japan, and Hong Kong.

PUGETTIA INCISA.

Menæthius incisus, De Haan, Faun. Japon. Crust. p. 98, pl. xxiv. fig. 3, ♀ (*Halimus*), and pl. G (1839).

Pugettia incisa, Stm. Proc. Ac. Nat. Sci. Phil. p. 219 (1857).

Three specimens, males, all of small size, were obtained of this species, which differs from its congeners in the auriculiform shape of the first pair of lateral expansions of the carapace, in which it exhibits some affinity with the genera *Hyas* and *Hyastenus*, from the first of which it differs in the slender divergent horns of the rostrum, and from the second in the far less perfectly defined orbits. Although the basal joint of the antennæ is somewhat broader, the structure of the antennal and orbital regions is essentially that of *Pugettia*.

Gulf of Yedo (bottom soft mud and hard sand); Corean Channel, lat. $33^{\circ} 10'$ N., $129^{\circ} 12'$ E., at 36 fathoms.

This and the preceding species were previously unrepresented in the British-Museum collection.

OREGONIA HIRTA ?

? *Oregonia hirta*, Dana, Amer. Journ. Sci. and Arts (ser. 2), xi. p. 270 (1851); U.S. Expl. Exp. xiii., Crust. i. p. 107, pl. iii. fig. 3 (1852).

Two specimens of an *Oregonia* were collected, both females, the larger and mature example densely overgrown with sea-weed. These agree in almost every respect with specimens of *Oregonia hirta*, from California (Puget's Sound), in the collection; but the legs are rather more robust, and the branchial regions more convex. The examination of males might show that they belong to a distinct species; for the present, however, they cannot be regarded as distinct.

Japan, Cape Blunt, lat. 41° 41' N., long. 141° 0' E. (depth 35 fathoms).

PLEISTACANTHA, gen. nov.¹

Carapace triangular, convex, and spinose. Rostrum long and slender, composed, as in *Oregonia*, of two spines, which are in contact with one another to near their extremities. Eyes laterally projecting. Orbits not defined, the inferior walls wanting, the superior and posterior represented by two or three spines. Antennules long; interantennular septum with a prominent spine projecting downward. Antennæ with the basal joint extremely slender and armed with three spines; the flagellum long, reaching almost to the extremity of, and visible in a dorsal view at, the side of the rostrum. Ischium (or second) joint of the outer maxillipeds longer than the merus-joint, which has a short spine at its antero-external angle; the exognath very slender. Legs, as in *Egeria*, very long; the anterior pair robust, with the fingers acute and meeting near their apices along their inner margins, but leaving an *hiatus* at base when closed. The ambulatory legs are slender, and diminish successively in length to the last pair; their terminal joints are long, slender, and densely hairy. The male postabdomen is 6-jointed, the inflexed portion oblong, the terminal joint transverse and rounded at its distal extremity.

This genus must be placed near *Oregonia*, with which it is nearly allied in the structure of the rostrum and orbital and antennal region; but it differs in the convex and spinose carapace and greatly elongated legs, which gives it more the aspect of *Egeria*, and would necessitate its being placed among the *Macropodiens* in Milne-Edwards's arrangement. From *Egeria* it differs in the structure of the orbital and antennal region, &c.

PLEISTACANTHA SANCTI-JOHANNIS, sp. n. (Plate I. fig. 1.)

Carapace covered with very numerous small spines of uniform size; interspersed with these are longer spines, of which three are placed in a transverse series on the front and one at the back of the gastric region, two on the cardiac, two on the intestinal and about three on each branchial region; there are also several longer spines placed behind the eyes and on the sides of the branchial regions. Rostrum

¹ πλείστος, superl. of πολύς, many; and ἄκανθα, a spine.

nearly half as long as the carapace, the spines of which it is composed divergent near their extremities, and armed on their undersides with two or three spinules. Anterior legs with the arm and wrist covered with small spines; arm with a strong conical curved spine on the upper margin at its distal extremity; palm robust, about as long as the arm, with fewer spinules arranged in longitudinal series; fingers naked. Ambulatory legs with numerous small spinules; the terminal joints, and in the last pair the two preceding joints are without spines and hairy. Length of carapace to base of rostrum $\frac{3}{4}$ inch, breadth about $\frac{7}{12}$ inch; length of anterior leg $3\frac{1}{8}$ inches.

This species was obtained at a depth of 63 fathoms, in October 1874, in lat. $34^{\circ} 1' N.$, long. $136^{\circ} 20' E.$

A single male individual was collected. As it is certainly one of the most striking novelties in the collection, I have much pleasure in dedicating it to its indefatigable discoverer, Capt. H. C. St. John, R.N.

ACHÆUS SPINOSUS, sp. n.

Carapace triangular, narrowed behind the orbits, as in *Achæus* (*Inachus*) *lorina*, and armed with six spines above, viz. one on the gastric, one (which is bilobate) on the cardiac, and two on each branchial region; there are also two or three small spines or tubercles on the sides of the body, beneath the hepatic and branchial regions. The rostrum, as in all the species of the genus, is very small and bilobate. Eye-peduncles robust, laterally projecting and armed with a strong tubercle in front. Anterior legs (in the male) robust; arm and wrist with a few scattered granules above; palm swollen, with about six spinules on the upper margin and a few small granules on the lower margin, near its base; fingers acute, with a wide hiatus at base when closed, both the fingers with a strong tooth on their inner margins near the base; both are faintly cristated on their outer margins. Ambulatory legs very slender, the terminal joint of the last pair strongly falcated. Terminal postabdominal segment subtriangular. Length $\frac{1}{3}$ inch, breadth $\frac{1}{4}$ inch.

A single specimen (male) was collected at a depth of 30 fathoms, in lat. $34^{\circ} 10' N.$, long. $136^{\circ} 47' E.$

The nearest ally of this species seems to be the *Achæus lorina* (*Inachus lorina*, Ad. & White, Zool. Samarang, Crust. p. 3, pl. ii. fig. 2, 1848), from Mindanao, from which it differs in the number and disposition of the spines of the carapace. Both of these species externally resemble *Inachus*, but differ in the absence of defined orbits and in the falcated posterior legs, on account of which they must be referred to *Achæus*.

ACHÆUS TUBERCULATUS, sp. n.

There are several specimens of a species of *Achæus* in the collection, which are all unfortunately in an imperfect condition, the anterior and most of the ambulatory legs being absent. The carapace is triangular and broader than in the preceding species, without spines, not constricted behind the interocular region; the regions are con-

vex and well defined; and there is a very prominent conical tubercle upon the cardiac region which is not bilobate, also a broad lobe or tubercle upon the hepatic region. The eye-peduncles are smooth; the posterior legs have the last joint but slightly falcated. The postabdomen of the male is broader than in the preceding species, the terminal segment transverse. Length (of male) nearly $\frac{5}{12}$ inch, breadth nearly $\frac{1}{3}$ inch.

Specimens were collected at a depth of 36 fms., in lat. $33^{\circ} 10' N.$, long. $129^{\circ} 12' E.$; and there are others without definite locality attached.

This species resembles the *Achæus lacertosus* of Stimpson (Proc. Ac. Nat. Sci. Phil. p. 218, 1857), from Australia, Port Jackson, in the distinctly defined regions of the carapace, the presence of an hepatic lobe, and the smooth eye-peduncles, but differs in the very prominent tubercle or blunt spine on the cardiac region, which is present in both sexes, whereas Stimpson, in his description of *Achæus lacertosus*, says, "*superficie levi spinis carente.*" I must therefore regard it as distinct. Stimpson's species was from Port Jackson, Australia.

Achæus japonicus, De Haan (Faun. Jap. Crust. p. 99, pl. xxix. fig. 3, 1839), is described and figured as devoid of spines on the carapace, and the eye-peduncles as being 4-spinulose; there is no hepatic lobe.

HYASTENUS DIACANTHUS.

Naxia diacantha, De Haan, Faun. Japon. Crust. p. 96, pl. xxxiv. fig. 1, and pl. G (1839).

Hyastenus diacanthus, A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. viii. p. 250 (1872).

Hyastenus verreauxii, A. M.-Edw. *l. c.* p. 250 (1872).

A single male specimen of this common inhabitant of the Japanese seas was obtained at Ousima, Japan, in 9 fathoms of water on a sandy bottom.

Two other specimens of this genus are in the collection; the first, a small female specimen, was collected in lat. $33^{\circ} 4' N.$, long. $129^{\circ} 18' E.$, at a depth of 23 fathoms. All the limbs are unfortunately missing. It differs in the much greater divergence of the horns of the rostrum, and very probably belongs to a distinct species; but, on account of its mutilated state, I refrain from describing it as such.

In the second, the horns of the rostrum are more than half the length of the carapace and but slightly divergent; the carapace is convex, narrower and more elongated than in *Hyastenus diacanthus*, and without any spines or tubercles, and is covered with a very short close pubescence.

This specimen is also an immature female, and was obtained at a depth of 18 fathoms, near Cape Sima. It would not be advisable to make this the type of a new species by giving it a distinct appellation; but it is distinguished from its nearest ally, *H. diacanthus*, by the total absence of the lateral epibranchial spines, which are present, although very small, in examples of *H. diacanthus* of the same size.

HYASTENUS (CHORILIA) JAPONICUS, n. sp. (Plate I. fig. 2.)

Carapace triangular, rounded behind, with the regions separated by well-marked depressions, and covered with small distant tubercles; of these there are about eight on the gastric and each branchial region, one or two on the hepatic and genital, and one larger on the intestinal region; the cardiac region is very convex. There is a spine on the side of each branchial region. The horns of the rostrum are straight, not half as long as the carapace, and more divergent than in *C. longipes*. On the pterygostomial regions, and on the sides of the carapace, there is a series of small tubercles. The anterior legs (in the adult male) are robust, the arm granulated and ridged on its under, inner, and outer sides, granulated above, and with two spines near its proximal extremity on its upper and two or three on its under surface; wrist granulated and ridged on its upper and outer surface; palm smooth, compressed, acutely carinated above; fingers smooth, denticulated on their inner margins near their apices, the upper with a strong tooth near its base; when closed, they have a wide hiatus at base. The ambulatory legs are slender, smooth, diminishing successively in length from the first to the last; the terminal joints almost immobile and bent at right angles to the preceding. Length of carapace of an adult male about 1 inch to base of rostrum; greatest breadth about $\frac{5}{8}$ inch.

A good series, including males, females, and young, were collected at a depth of 100 fathoms, in lat. $41^{\circ} 40'$ N., long. $141^{\circ} 10'$ E.

The description was taken from an adult male. In the females and younger animals several differences are remarked; notably, the anterior legs are much slenderer, legs granulated and ridged, the fingers nearly straight, without a hiatus and strong tooth at base.

The nearest ally of this species is unquestionably the *C. longipes* of Dana (U.S. Expl. Exp. Crust. i. p. 91, pl. i. fig. 5), from the coast of Oregon. The arrangement of the tubercles is nearly the same; but the one now described differs in its shorter, more divergent rostral spines, the shorter spines upon the basal joint of the antennæ, and in the arms never being spinulose along the whole of their upper surface, &c., and must be regarded, at least provisionally, as distinct. There is very little hair on the front and sides of the carapace and rostrum; and the hands are nearly naked.

Chorilia scarcely differs generically from *Hyastenus*, the structure of the orbits and antennal region and the characteristic length of the first pair of ambulatory legs being the same in both. It may be convenient, however, to retain the name as a subgeneric division including those species of *Hyastenus* in which the carapace is *tuberculated and uneven above*—e. g., the present species, *Chorilia longipes*, and the *Hyastenus oryx* and *verrucosipes* of White.

DOCLEA.

The genera *Libinia*, *Libidoclea* and *Doclea* constitute, in Dana's arrangement, a natural group, characterized by their *very convex and orbiculate or shortly pyriform and tuberculated or spinose carapace*

and *emarginate rostrum*. It is extremely difficult to find reliable characters by which to define the genera, as the species pass into one another by almost insensible gradations. At one end of the series are those which belong undoubtedly to the genus *Libinia*, in which the carapace is triangulate rather than orbiculate, with a distinct supraocular tooth, the rostrum prominent, with the spines coalescent and divergent only toward the apex, which thus appears notched, the orbits circular and well defined, with usually a single closed fissure above, the basal joint of the antennæ moderately dilated, and the legs usually of moderate length, the first pair rather slender in the male. At the opposite extremity of the series are the species of *Doclea* in which the carapace is orbiculate in outline, the rostrum very short, the supraocular spine absent, the basal joint of the antennæ narrower, the orbits scarcely defined at all below, the legs usually very long, those of the first pair in the male short, with the palm dilated. The genus *Libidoclea* of Milne-Edwards and Lucas is somewhat intermediate between the two former, having the triangulate carapace, prominent rostrum, dilated basal antennal joint of *Libinia*, with the incomplete orbits and long legs of *Doclea*; the typical species, *L. granaria* (Edw. & Luc. in D'Orbigny's Voy. Amér. Mérid. vi. Crust. p. 8, pl. iii. fig. 1 & pl. iv. fig. 1, 1845), from Valparaiso, possesses an additional character in the existence of a notch on the anterior margin of the third joint of the outer maxillipeds; and the tooth in the middle of the outer margin of the basal joint of the antennæ is very strong; the former of these fails, however, in the *Libidoclea coccinea* of Dana (U.S. Expl. Exp. xiii. Crust. p. 88, pl. i. fig. 3), from Patagonia, which also has a shorter rostrum. In certain species of *Libinia* (*L. emarginata*) there is a small blunt tooth on the outer margin of the basal antennal joint. There appears, then, to be no alternative between restricting the genus *Libidoclea*, by adopting the single character of the emarginate third joint of the outer maxillipeds, or extending its definition until it shall include all the species intermediate between the two older genera. The former is perhaps the preferable course, as, if the latter were adopted, it would be impossible to assign any definite characters to the genus.

DOCLEA ORIENTALIS, sp. n. (Plate II. fig. 1.)

The carapace is convex and subpyriform, with six tubercles in the middle line, of which the first three are on the gastric, two (one more elevated) on the cardiac, and one on the intestinal region; none of these are large and spiniform. There are two prominent tubercles on the lateral anterior margins, one of them placed at some distance behind the orbits, and one on the sides of the branchial region. There are four small tubercles on the front of the gastric region, forming, with the first of the median series, a figure $\begin{smallmatrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \end{smallmatrix}$, seven or eight on the branchial region, on each side, and three on the pterygostomian region. The rostrum is short, but little longer than broad, and notched to its middle. The orbits have a supraocular tooth, a wide hiatus above, and two fissures below. The basal joint of the antennæ is rather

broad, with an obscure tooth on its outer margin. Anterior legs in the female small; hands compressed, and fingers straight; the ambulatory legs short, those of the first pair not much exceeding in length the greatest breadth of the carapace. Length of carapace and rostrum 1 inch $2\frac{1}{2}$ lines, breadth $11\frac{1}{2}$ lines.

Two specimens, females, were obtained, one at Kunashir (Kunasiri Island?), N. Japan, at a depth of 11 fathoms, bottom small stones; the other from the N.E. coast of Yeso Island.

The nearest ally of this species seems to be the *Doclea gracilipes* of Stimpson (P. Ac. Nat. Sci. Phil. p. 216, 1857), from Hong-Kong, from which it differs in the tuberculation of the carapace and very short anterior legs.

Streets, in a notice of the genus *Libinia* (P. Ac. Nat. Sci. Phil. p. 106, 1870), has described a new species, *L. rhomboidea*, from the East Indies, which may easily be distinguished from the present by the existence of strong spines on the branchial regions and lateral margins.

Another Asiatic species is the *Libinia bidentata*, A. M.-Edw. (Journ. Mus. Godeffroy, i. pt. 4, p. 77, 1873), from the Amoor, which has fewer spines upon the surface of the body. Several *Doclea* have also been described by Bleeker (Acta Soc. Sci. Indo-Neerl. ii. pp. 7-15, 1857), from the Indian archipelago; but none have any near affinity with *Libinia orientalis*.

PARTHENOPIDÆ.

GONATONOTUS PENTAGONUS.

Gonatonotus pentagonus, Ad. & White, P. Z. S. 1847, p. 58; Zool. Samarang, Crust. p. 33, pl. vi. fig. 7 (1848).

Javan Sea, near Billiton Island, lat. $3^{\circ} 21' S.$, long. $108^{\circ} 39' E.$ Dredged at a depth of 12 fathoms.

The single specimen collected is a male, and differs from the female from Borneo, figured by Adams and White, only in the greater length and strength of the anterior legs; the postabdomen is seven-jointed and narrow. There are two young specimens of this species, from reefs on the N.E. coast of Australia, in the British-Museum collection.

This is the only species of Crustacean collected elsewhere than in the Japanese and Corean seas.

LAMBRUS INTERMEDIUS, sp. n.

Carapace triangular, almost destitute of tubercles above, and without large spines on the margins; on the upper surface are three elevated ridges, one on the gastric and cardiac, and one on each branchial region; the median ridge is marked with about four obscure tubercles; the branchial ridges are obscurely granulated; and on the sides of the branchial regions are seven to eight small triangular marginal teeth, which under a lens are seen to be denticulated; the last of these is the largest; on the posterior margin are seven small distant tubercles. There is an elongate depression between the eyes. The rostrum is triangular, smooth and acute; the anterior legs are of moderate length

(for a species of this genus); the arm with a longitudinal line of granules on its anterior and posterior margins and on its upper surface; the wrist nearly smooth; the hand trigonous, smooth on its three faces, with a line of small tubercles or granules on its outer and inner margins; of these about four on the outer margin are somewhat larger and equidistant; all the tubercles of the anterior legs are seen under a lens to be themselves granulated; the mobile finger has three or four spines on its upper margin; the ambulatory legs are very small and compressed; the margins of the merus-joints of the last two pairs are granulated. Length about $\frac{1}{3}$ inch, greatest breadth about $\frac{7}{12}$ inch.

Corean seas (no exact particulars regarding the locality). One male individual collected.

This species belongs to the same group as the *L. lamellifrons*, Ad. & Wh., *L. gracilis*, Dana, and *L. affinis*, A. M.-Edw. From the latter (of which there is a large series from the Javan and Indian seas in the British-Museum collection) it differs in the much fewer tubercles of the carapace and arms, which are less rounded, and from the two former in the much greater breadth of the carapace behind the orbits, and the absence of spines on the outer margin of the hands, &c.

CYCLOMETOPA vel CANCROIDEA.

CANCRIDÆ.

ACTÆA GRANULATA.

Cancer granulatus, Audouin, Explic. Planches, p. 87, de Savigny, Egypte, Atlas, Crust. pl. vi. fig. 2 (1809).

Cancer savignyi, M.-Edw. Hist. Nat. Crust. i. p. 378 (1834).

Actæa granulata, De Haan, Faun. Japon. Crust. p. 18 (1835); A. M.-Edw. Nouv. Archiv. Mus. Hist. Nat. i. p. 275 (1865).

? *Actæa pura*, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 32 (1858).

A small male example is in the collection without definite locality attached. This species appears to be common in the Indo-Malayan, Australian, and Japanese seas; and its range extends to the Red Sea, Mozambique, and the Mauritius.

ACTÆODES TOMENTOSUS, VAR.

Zozymus tomentosus, M.-Edw. Hist. Nat. Crust. i. p. 385 (1834).

Actæodes tomentosus, Dana, Crust. U.S. Expl. Exp. xiii. (i.) p. 197 (1852).

Actæa tomentosa, A. M.-Edw. N. A. Mus. H. N. i. p. 262 (1865).

In this variety the carapace is very broad in proportion to its length, the granules with which it is covered small and very numerous, the anterior areolets scarcely, and the posterior (*e. g.* the cardiac) not at all, distinguishable; the colour is dull red. Length rather more than $\frac{1}{3}$ inch, breadth $\frac{7}{12}$ inch.

Collected at the Goto Islands, at low-water mark.

The two males and female collected, on account of the indistinguishability of the areolets, present a very different appearance both

from the typical *A. tomentosus* and the species or variety designated *A. affinis* by Dana (U.S. Expl. Exp. xiii. Crust. i. p. 198, pl. xi. fig. 3), from the Paumotu or Society Islands; yet I find no characters which would justify me in considering them a distinct species.

LEPTODIUS EXARATUS, var.

Chlorodius exaratus, A. M.-Edw. Hist. Nat. Crust. i. p. 402 (1834).

Xantho affinis, De Haan, Faun. Japon., Crust. p. 48, pl. xiii. fig. 8 (1835).

Two very small specimens of a *Leptodius*, without particulars regarding locality, appear to belong to a well-marked variety of the common *L. exaratus*, or even to a distinct species. As the specimens are immature, it is not advisable to give them a distinct specific name. The carapace is depressed, the areolets scarcely marked and somewhat eroded towards the front and antero-lateral margins; the three posterior antero-lateral marginal teeth are small and sub-acute, the others obsolete; the frontal lobes are broad, with the anterior margin straight, and they are separated by a very small median notch. The anterior legs have the wrist and hand very rugose on their upper and outer surfaces; the ambulatory legs somewhat dilated and compressed, and the tarsal joints very narrow. Length 3 lines, breadth $4\frac{1}{2}$ lines.

ERIPHIIDÆ.

PILUMNUS HIRSUTUS.

Pilumnus hirsutus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 37 (1858).

The large series collected agree in all respects with Stimpson's diagnosis. The outer orbital spine is smaller than the three spines of the antero-lateral margin, which are acute. The larger hand (which is usually the right, but in some individuals the left) is granulated on its upper, and in younger specimens more minutely on its outer, surface; the lower finger is usually in a straight line with the lower margin of the hand. The smaller hand is granulispinulose on its upper and outer surface. In one or two specimens the granules are fewer and more acute, and the lower finger forms a slight angle with the inferior margin of the hand.

This is evidently a very common and abundant species in the Corean seas. Specimens were collected at seven different localities in or near the Corean Straits, at depths varying from 12-40 fathoms. It was, however, previously unrepresented in the British-Museum collection.

I should have regarded this species as being synonymous with the *Pilumnus minutus* of De Haan (Faun. Jap., Crust. p. 50, pl. iii. fig. 2), which is very shortly characterized, were it not that the antero-lateral margins are described and figured as "4-dentatis" (not spinose), and the orbits as "inermibus" by De Haan.

Stimpson's specimens of *P. hirsutus* were collected in the North-China sea and near Ousima Island.

PILUMNUS DEHAANII, sp. n.

The carapace is broader than long, convex, and everywhere covered with a close velvety pubescence, so that no traces of the regions are visible. Antero-lateral margins shorter than the postero-lateral, and armed with three small spines (excluding that of the outer orbital margin, which is not at all prominent). The orbital margins and the front (seen in a dorsal view) are minutely denticulated. In an anterior view the frontal margin is sinuated, with a median notch. The anterior legs are short, robust, the right slightly the larger; the arm trigonous and very short; the wrist with a few conical acute granules on its anterior and upper surface; the palm smooth on its inner, and armed on its upper and all its outer surface with numerous, crowded, unequal, conical, acute tubercles; fingers acute, meeting when closed, the upper granulous at base. The ambulatory legs are slightly compressed and hairy. Length $3\frac{1}{2}$ lines, breadth $4\frac{1}{4}$ lines.

The single specimen, a female, was found within the shell of a species of *Balanus* collected in the Gulf of Yedo.

This species, on account of the closely pubescent carapace and form of the hands, has more of the aspect of an *Actumnus* than of *Pilumnus*, but differs in the acute fingers and spiniform antero-lateral teeth from that genus.

I cannot refer it to any of the numerous published descriptions. It is readily distinguished by the nearly equal and closely tuberculated hands, the tubercles extending halfway along the mobile finger and covering the outer surface of the hand to the apex of the immobile finger. The fingers are nearly colourless. From the *P. actumnoides* of M. A. Milne-Edwards from New Caledonia (Nouv. Arch. Mus. H. N. ix. p. 247, pl. x. fig. 3, 1873), to which it bears some resemblance, it is at once distinguished by the fewer lateral marginal teeth, &c.

It has also some affinity with the *Pilumnus setiger* and *P. squamosus* of De Haan, which have been referred by M. A. Milne-Edwards, rightly I believe, to *Actumnus*. From the former it differs in the regions of the carapace being obliterated, and from the latter in the conical (not squamiform) tubercles of the hands, which are not seriatly disposed; from both, probably, in the spiniform marginal teeth.

PORTUNIDÆ.

THALAMITA SIMA.

Thalamita sima, Milne-Edw. Hist. Nat. Crust. i. p. 460 (1834); Stimpson, Proc. Ac. Nat. Sci. Phil. p. 39 (1858); A. M.-Edw. Arch. Mus. Hist. Nat. x. p. 359 (1861).

Portunus (Thalamita) arcuatus, De Haan, Faun. Japon., Crust. pp. 10, 43, pl. ii. fig. 2, pl. xiii. fig. 1 (1835).

A female example was collected of this species, which seems to

be commonly distributed along the Asiatic coasts from the Red Sea to Japan, and is also found on the coasts of Australia and New Zealand.

Uku Sima ; lat. $33^{\circ} 15\frac{1}{2}'$ N., long. $129^{\circ} 5'$ E.

GONIOSOMA ORNATUM.

Portunus (Thalamita) truncatus, De Haan, Faun. Japon., Crust. pp. 10, 43, pl. ii. fig. 3, & pl. xii. fig. 3 (1835), nec Fabr.

Goniosoma ornatum, A. M.-Edw. Arch. Mus. Hist. Nat. x. p. 376 (1861).

Two specimens (males) were collected—one in Ousima Harbour at 8 fathoms, on a bottom of sandy mud and broken shells, the other in lat. $34^{\circ} 6'$ N., long. $136^{\circ} 15'$ E., at a depth of 11 fathoms.

This species has not, so far as I know, been recorded elsewhere than in the seas of Eastern Asia. Specimens are in the British Museum from the Philippines.

GONIOSOMA VARIEGATUM.

Portunus variegatus, Fabr. Ent. Syst. Suppl. p. 364 (1798).

Cancer callianassa, Herbst, Naturg. Krabben, iii. (2) p. 45, pl. liv. fig. 7 (1801).

Thalamita callianassa, M.-Edw. Hist. Nat. Crust. i. p. 464 (1834).

Charybdis variegatus, De Haan, Faun. Japon., Crust. pp. 10, 42, pl. i. fig. 2 (1835); Stimpson, Proc. Ac. Nat. Sci. Phil. p. 39 (1858).

Goniosoma callianassa, A. M.-Edw. Arch. Mus. Hist. Nat. x. p. 382 (1861).

A single specimen, in which all the legs (except the fifth natatory legs) are wanting, and without definite locality, is in the collection.

It seems evident that the name of *variegatum* should be retained for this species, as Milne-Edwards, who was the first to apply to it Herbst's later name of *callianassa*, considers the *variegatum* as only a marked variety of the same species. There is a specimen from Hong-Kong in the British-Museum collection.

PORTUNUS CORRUGATUS.

Cancer corrugatus, Pennant, Brit. Zool. iv. p. 5, pl. v. fig. 9 (1877).

Portunus corrugatus, Leach, Ed. Encycl. vii. p. 390 (1814), Linn. Trans. xi. p. 315 (1815); Mal. Pod. Brit. pl. vii. figs. 1, 2 (1825); M.-Edw. Hist. Nat. Crust. i. p. 443 (1834); De Haan, Faun. Japon., Crust. p. 40 (1835); Bell, Brit. Crust. p. 94 (1853); A. M.-Edw. Arch. Mus. Hist. Nat. x. p. 401, pl. xxxvi. fig. 3 (1861); Heller, Crust. südl. Europa, p. 86 (1863).

Portunus strigilis, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 38 (1858); A. M.-Edw. Arch. Mus. Hist. Nat. x. p. 402 (1861).

Three specimens, of small size (two males and a female), of *Portunus* are in the collection, which agree in every respect with ex-

amples of the common *P. corrugatus* of the European seas. The strigose and hairy carapace, and the form of the frontal lobes, of the teeth of the antero-lateral margins, of the anterior and ambulatory legs, of the male postabdomen, and intromittent organs, are identical in the Japanese specimens and examples of the same size from the Mediterranean. It cannot be doubted that this is also the species described by Stimpson under the name of *P. strigilis*, and of which M. Alphonse Milne-Edwards, when he published his monograph of the *Portunidæ*, had not seen examples.

Goto Island Ojica, at low-water mark; same locality, lat. $33^{\circ} 12\frac{1}{2}'$ N., long. $129^{\circ} 5'$ E., at 9 fathoms; also at lat. $32^{\circ} 49'$ N., long. $128^{\circ} 54'$ E., at 11 fathoms.

I am inclined to regard the species described as *P. subcorrugatus* by A. Milne-Edwards (A. Mus. H. N. x. p. 402, pl. xxxvi. fig. 2), from the Red Sea, as a mere variety of this species, from which it differs only in the obscure trilobation of the front. There is an example from Naples in the British-Museum collection. Its distribution, therefore, so far coincides with that of the typical *P. corrugatus* that it is found both in the European and Oriental regions—that is, on either side of the Isthmus of Suez.

CORYSTIDÆ.

TRICHOCARCINUS.

Trichocera, De Haan, Faun. Japon., Crust. p. 16 (1833).

The genus *Trichocera*, founded by De Haan, appears to be scarcely generically distinct from *Cancer*, its chief characteristics (and those wherein it exhibits a degradation from the Cancroid type) consisting in its narrower, more convex carapace and longer antennules, on which account it has been placed by Dana and other authors in the *Corystidæ*. It is necessary, if it be retained, to alter its designation, as the name *Trichocera* had been previously employed (in 1803) for a genus of Dipterous insects.

I have therefore slightly modified the termination of De Haan's name, and propose *Trichocarcinus* for the few species of this group, which includes, besides the two now described, only the *Trichocarcinus gibbosulus* (De Haan) and *Trichocarcinus oregonensis* (Dana).

TRICHOCARCINUS DENTATUS, sp. n.

Carapace smooth, minutely granulated, with the gastric, cardiac, and the middle of the branchial regions convex; there are two somewhat higher elevations on the gastric and each branchial region. Front five-toothed, the middle one very small, the two outer separated from the rest by a wide interval. Antero-lateral margins with nine, flat, subequal teeth, which are in contact with one another at their bases and broadly triangulate at their apices, and with their margins granulated; behind the ninth tooth is usually a small tooth on the postero-lateral margin, which is defined by a line of granules. The anterior legs are rather robust; there are three spines on the wrist, on the inner and outer surface, and upper mar-

gin near the distal extremity. Hand with usually two spines on its upper margin, and three longitudinal raised lines on its outer surface.

Length of largest male $10\frac{1}{2}$ lines, breadth 1 inch; of largest female, length 1 inch 1 line, breadth $1\frac{1}{2}$ inch.

Specimens were collected off the Corean coast, in lat. $34^{\circ} 30' N.$, long. $125^{\circ} 20' E.$, at 37 fathoms; in lat. $33^{\circ} 10' N.$, long. $129^{\circ} 12' E.$, in 36 fathoms; in lat. $33^{\circ} 21' N.$, long. $128^{\circ} 48\frac{1}{2}' E.$, at 22 fathoms; and at Otarranai, lat. $43^{\circ} 12' N.$, long. $141^{\circ} 1' E.$, at $5\frac{1}{2}$ fathoms, on a bottom of coarse sand.

In the females the gastric and branchial regions are very much more convex than in the males.

There is considerable variation in the sculpture of the wrist and hands. In some specimens the wrist is roughly ridged on its outer surface; in others it is nearly smooth. The spine on the middle of the upper margin of the hand is sometimes obsolete.

This species differs both from the *T. gibbosulus*, De Haan, from Japan, and the *T. oregonensis*, Dana, from Puget Sound, in the much broader subequal teeth of the antero-lateral margin, in which it has more resemblance to some species of *Cancer*, e. g. *C. edwardsii*, Bell; but it cannot be confounded with that or any other of the genus known to me.

TRICHOCAECINUS AFFINIS, sp. n.

Carapace everywhere granulated and sparsely pubescent, with the middle of the gastric and of the cardiac region convex, and a tubercular prominence on each side of the gastric, one smaller on the hepatic, and three on each branchial region. Front three-toothed. Antero-lateral margins with nine, alternately larger and smaller, acute triangular teeth (including the outer orbital tooth); the margins of these teeth are seen under a lens to be minutely denticulated; there is a smaller tooth on the postero-lateral margin behind the last tooth of the antero-lateral margins. Wrist and hand with three series of spinules on the outer surface; wrist with a strong spine, and hand with two spinules on its upper margin. Ambulatory legs pubescent. Length of female $\frac{5}{12}$ inch, breadth rather more than $\frac{1}{2}$ inch.

A male was collected at a depth of 50 fathoms, in lat. $33^{\circ} 19' N.$, long. $129^{\circ} 7\frac{1}{2}' E.$; and there is a female individual without definite locality also in the collection.

The species is allied to *T. gibbosulus*, De Haan (Faun. Japon., Crust. p. 45, pl. ii. fig. 4, and pl. xiii. fig. 3), which it resembles in the unequal teeth of the antero-lateral margins; but it differs in the much stronger tuberculation of the carapace, and in having only two spines on the upper margin of the hand.

A larger series might show it to be the young of *T. gibbosulus*; but the two specimens before me differ very much from De Haan's figure of that species.

TELMESSUS.

Telmessus, White, Ann. & Mag. Nat. Hist. (ser. 1) xvii. p. 497 (1846).

Platycorystes, Brandt, Bull. Phys. Math. Acad. Pétersb. vii. p. 179 (1849).

Cheiragonus, Stimpson, Boston Journ. Nat. Hist. vi. p. 465 (1857).

The term *Cheiragonus* appears to have been adopted for this genus on insufficient grounds; it is referred to by Latreille, without description, simply as follows:—"g. *Cheiragone* (Mém. de l'Acad. de St. Pétersb. 1812)," (see Fam. Nat. Règne Anim. p. 270, 1825). On referring to Tilesius' specific description in (Mém. Acad. Pétersb. v. p. 347, pl. vii. fig. 1, 1815), we find it headed *Cheiragonus*, the description commencing with the words *Cancer cheiragonus*. It seems evident to me that Tilesius intended the term *Cheiragonus* as a specific name for the Kamtchatkan species, which must be designated *Telmessus cheiragonus*, as White's generic name *Telmessus* comes next in priority and is accompanied by a description.

TELMESSUS ACUTIDENS.

Cheiragonus acutidens, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 40 (1858).

Japan, Kunashir, lat. 43° 34' N., long. 145° 20' E., at 11 fathoms, on a bottom of small stones, three specimens, and N.E. of Yedo Island, in lat. 44° 27' N., long. 14° 22' E., one specimen.

This species is separated from the *Telmessus serratus* of the western American coast by a very slight character, the somewhat longer and slenderer teeth of the lateral margins, particularly the third tooth; yet the distinction is constant as far as the series before me serves to prove. Two of the specimens are prettily speckled with brownish red, the spots being visible beneath the close pubescence of the carapace. The carapace of the largest of the four specimens only measures $\frac{3}{4}$ inch in length; and the form of the teeth might undergo some modification as the animal increases in size.

It was previously unrepresented in the British-Museum collection.

Tilesius' species, *Telmessus cheiragonus* from Kamtchatka, is described and figured as having much longer and slenderer marginal spines than even *T. acutidens*; and in the absence of specimens for comparison, I cannot unite the two species.

CATOMETOPA vel GRAPSOIDEA.

MACROPHTHALMIDÆ.

GELASIMUS LACTEUS.

Ocypode (Gelasimus) lactea, De Haan, Faun. Japon., Crust. pp. 26, 54, pl. xv. fig. 5 (1835); M.-Edw.?, Ann. Sci. Nat. (sér. 3), Zool. xviii. p. 150, pl. iv. fig. 16 (1852).

Four specimens (males) are in the collection, without any particulars regarding the locality at which they were collected.

This species is distinguished by the form of the front, which at base is about one fourth the width of the carapace, with the sides slightly converging to the distal extremity, the margin of which is nearly straight. The oblique ridge on the inner surface of the larger hand is distinctly granulated; the fingers are not sulcated externally; and their inner margins are simply granulated without teeth or lobes in the adult. In younger individuals there is a very small tubercle or granule in the middle of the inferior margins. It is probable that the species figured by Milne-Edwards under the name of *G. lacteus* (*l. c.*) is to be referred to a distinct species, as the lower finger has a distinct subterminal tooth. This species has been hitherto unrepresented in the national collection, as the specimen purchased by the Trustees as from the Leyden Museum under this name, and referred to by White (List Crust. Brit. Mus. p. 36, 1847), belongs to Milne-Edwards's first section of the genus, and is identical with the *G. forcipatus* of Adams and White.

GRAPSIDÆ.

HETEROGRAPSUS LONGITARSIS, sp. n. (Plate II. fig. 3.)

Carapace nearly as long as broad, quadrate, the surface somewhat uneven and sparsely hairy; the frontal margin straight, without a median sinus; the postfrontal lobes distinctly marked, the lateral margins straight, not arcuated anteriorly as in most species of the genus, and with three prominent acute teeth. The outer maxillipeds have the third joint not dilated at its antero-external angle, and the exognath narrow as in other species of the genus. The anterior legs are clothed with short pubescence, not robust; wrist with a small spine on its inner margin; hand with a longitudinal raised line on its outer surface, and with a patch of hair on its inner surface in the males; fingers straight. Ambulatory legs slender, compressed, with short close hair disposed in longitudinal series; the tarsal joints of all the legs long and slender. Postabdomen of male nearly as in *H. penicillatus*. Length and breadth about $\frac{1}{2}$ inch.

Otarranai, lat. $43^{\circ} 12' N.$, long. $141^{\circ} 1' E.$, at $5\frac{1}{2}$ fathoms, bottom coarse sand (three males and a female); Yokoska Dock, in Gulf of Yedo, one young individual taken from the ship's bottom; and in lat. $33^{\circ} 12\frac{1}{2}' N.$, long. $129^{\circ} 5' E.$, at 9 fathoms, one young male.

This species is at once distinguished from the Japanese *H. sanguineus* and *H. penicillatus*, De Haan, and most species of the genus, by the narrower hairy carapace with straight sides, and the slender elongated tarsal joints of the fifth ambulatory legs; in these characters it approaches the genus *Cyrtograpsus*, in which genus, however, the outer maxillipeds leave a wider hiatus when closed, and the lateral margins of the carapace are 4-dentated.

PLATYGRAPSUS DEPRESSUS, junior?

Platynotus depressus, De Haan, Faun. Japon., Crust. pp. 37, 63, pl. viii. fig. 2 (1835); M.-Edw. Ann. Sci. Nat. (sér. 3) Zool. xx. p. 199 (1853).

Platygrapsus depressus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 104 (1858).

Two small specimens (male and female) are in the collection. These differ from the description and figure of De Haan, and from an adult male of *P. depressus* in the British-Museum collection, in the existence of a small spine on the wrist at the antero-internal angle; and the posterior tooth of the lateral margins of the carapace is obsolete in one, and very obscurely indicated in the other specimen. The hands are slenderer, and the fingers straight and regularly denticulated on their inner margins, whereas in the adult male the fingers are arcuate and the upper has on its inner margin near the base a large and prominent tooth.

Matoya, $6\frac{1}{2}$ fathoms; lat. $34^{\circ} 13' N.$, long. $136^{\circ} 73' E.$, 48 fathoms.

This species is a common inhabitant of the Chinese and Japanese seas.

The generic name instituted by De Haan, *Platynotus*, having been previously employed, was changed by Stimpson to *Platygrapsus*. A second species, *P. convexiusculus*, described by Stimpson from the Loo-Choo Islands, is scarcely sufficiently distinguished by the characters given.

The genus *Platygrapsus* is distinguishable from *Heterograpsus* and other allied genera, with which it has affinities and which are represented in the Japanese seas, by the form of the second and third joints of the outer maxillipeds, which are *obliquely* articulated with one another, whereas in those genera the margins along which the articulation takes place are *at right angles with* the lateral margins of the joints.

HELICE TRIDENS.

Ocypode (Helice) tridens, De Haan, Faun. Japon., Crust. pp. 28, 57, pl. xi. fig. 2, and pl. xv. fig. 6 (1835).

Helice tridens, M.-Edw. Ann. Sci. Nat. (sér. 3), Zool. xx. p. 189 (1853); Stimpson, Proc. Ac. Nat. Sci. Phil. p. 105 (1858).

E. Japan, Yamada, lat. $39^{\circ} 32' N.$, long. $141^{\circ} 53' E.$, at depth of 7 fathoms; bottom sandy, with broken shells.

A single specimen, an adult female, in the collection. Length 1 inch, breadth nearly 1 inch 4 lines.

This fine species was previously unrepresented in the British-Museum collection.

LEIOLOPHUS PLANISSIMUS.

Cancer planissimus, Herbst, Naturg. Krabben u. Krebse, iii. pl. lix. fig. 3 (1804),

Plagusia clavimana, Desm. Consid. Crust. p. 127, pl. xiv. fig. 2 (1825); M.-Edw. Hist. Nat. Crust. ii. p. 92 (1837).

Acanthopus planissimus, De Haan, Faun. Japon., Crust. p. 30 (1835).

Leiolophus planissimus, Miers, Cat. New-Zeal. Crust. p. 46 (1876); Ann. & Mag. Nat. Hist. (ser. 4) i. p. 153 (1878)

Four examples, a male and three females, without definite locality, are in the collection.

This species is very widely distributed, occurring both in the Indo-Pacific and Atlantic Regions.

CARCINOPLACIDÆ.

HETEROPLAX? NITIDUS, sp. n. (Plate II. fig. 2.)

Carapace smooth, glabrous and shining, subtrapezoidal, transverse, its greatest breadth being at the level of the second lateral marginal tooth; in front of this the carapace and frontal region is obliquely deflexed; behind it the carapace is nearly flat, and the lateral margins straight and slightly convergent to the straight posterior margin. Lateral margins with two small teeth, including the outer orbital tooth. Front about one third the breadth of the anterior margin of the carapace, with the anterior margin straight. Eyes about equalling the front. Antennæ with the first joint about twice as long as the second, which is small, occupying the hiatus between the inner angle of the orbit and the frontal margin. Outer maxillipeds with the third joint quadrate, and about half as long as the second joint, which is smooth and longitudinally sulcated on its outer surface; exognath robust.

Anterior legs (in the female) rather robust; arm very short, smooth; wrist smooth externally, and with a small tubercle on its inner surface; hand smooth, without tubercles or granules; fingers straight and acute, crossing at the tips when closed. Postabdomen of female 7-jointed. Length 3 lines, breadth rather over 4 lines. Colour whitish; brownish pink on front of carapace.

A single specimen, a female, was collected at a depth of 40 fathoms in the Corean Straits, lat. $33^{\circ} 40' N.$, long. $182^{\circ} 55' E.$

I have some doubt whether this species should be referred to the genus *Heteroplax*, which is only known to me by Stimpson's diagnosis, according to which the basal antennal joint is longer and occupies the orbital hiatus. The species in other respects appears referable to the genus. The longitudinal ridges on the palate are distinct. In this character and in the broader front and shorter eye-peduncles it differs from *Gonoplax*, while *Litocheira* of Kinahan, another allied form, has, on the contrary, much shorter eyes and broader and less deflexed front than the species here described. Specimens of the species *L. bispinosa*, on which the last-mentioned genus was founded, are in the British-Museum collection from Australia; and in these the longitudinal palatal ridges are distinctly marked. Kinahan, however, in his description says that they do not exist.

RHIZOPIDÆ.

TYPHLOCARCINUS VILLOSUS.

Typhlocarcinus villosus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 96 (1858).

A very small male individual is in the collection, without definite locality, which I refer to this species. The carapace and legs are clothed with a dense, short, whitish pubescence, with longer hairs on the margins, near which the scattered granules, which are elsewhere probably concealed by the hairy coat, are visible. The hands are covered with minute subseriate acute granules. The antero-lateral marginal teeth are very small, and can only be seen by removing the hairs. Length $2\frac{1}{2}$, breadth 3 lines.

The specimen agrees with one (a female of larger size) from the Chinese seas, in the British Museum, presented by the Smithsonian Institution.

OXYSTOMATA vel LEUCOSIIDEA.

LEUCOSIIDE.

LEUCOSIA HÆMATOSTICTA, junior?

Leucosia hæmatosticta, Ad. and White, Zool. Samarang, Crust. p. 54, pl. xii. fig. 2 (1848); Bell, Trans. Linn. Soc. xxi. p. 289 (1855); Cat. Leucos. Brit. Mus. p. 8 (1855)

Two specimens were collected, in which the beautiful coloration is very well preserved, and which differ from the typical specimens in the British-Museum collection and White's figure as follows:—The blood-red spots on the carapace and legs are more numerous and smaller, the tubercles on the arms proportionally smaller but similarly disposed, the postabdomen of the male with the sides nearly straight and the second joint not constricted, whereas in the typical *L. hæmatosticta* the second joint is broad at base and greatly narrowed near the distal extremity (see figure quoted). Length of male $4\frac{1}{2}$ lines.

Lat. $33^{\circ} 10'$ N., long. $129^{\circ} 12'$ E., at a depth of 36 fathoms. June, 1876. One male. A female is in the collection without definite locality.

The differences mentioned, although at first sight sufficiently marked, are probably due to the difference in age of the specimens, which agree in the form of the carapace, front, thoracic sinus, and legs. The male individual obtained by Mr. Adams measures rather more than $\frac{1}{2}$ inch ($6\frac{1}{2}$ lines).

PSEUDOPHILYRA, gen. nov.

Allied to and intermediate between *Leucosia* and *Philyra*, but differing from the former genus by the absence of the pit or cavity in the subhepatic region which Prof. Bell has called the *thoracic sinus*, and from *Philyra* in the prominent tridentate front and slenderer straighter exognath of the outer maxillipeds.

So far as I am aware, this genus includes only the following species, *Pseudophilyra tridentata* and *Pseudophilyra perryi*, described by

me in 1877 as *Leucosia perryi*, and which is distinguished from *P. tridentata* by the smooth and polished carapace, which is defined by a *continuous* marginal beaded line. (See Trans. Linn. Soc., Zool. i. p. 238, pl. xxxviii. figs. 19-21, 1877.)

The genus *Leucisca* of MacLeay (Annulosa in Smith's Zool. S. Africa, p. 70, 1838), which resembles *Leucosia*, and in which no mention is made of the existence of a *thoracic sinus*, differs from *Pseudophilyra* and *Leucosia* in having the exognath of the outer maxillipeds robust and curved, and the eyes placed on either side at the base of the front, not at the antero-external angles.

PSEUDOPHILYRA TRIDENTATA, sp. n. (Plate II. fig. 4.)

Carapace (with front) longer than broad, very coarsely punctulated except on the frontal region, where the punctulations are very fine. Frontal margin tridentate, the front itself narrowed and much produced, as in the genus *Leucosia*. There is a distinct elevation on the hepatic region, and immediately in front of it a marked depression. A minutely beaded line defines the posterior and postero-lateral margins of the carapace, becoming obsolete on the antero-lateral margin. The inferior surface of the body is smooth; the exognath of the outer maxillipeds is rather broad, but its outer margin nearly straight, not arcuated as usual in *Philyra*. The postabdomen of the male has all the joints except the last coalescent, but the sutures are not entirely obliterated. Colour light brownish-pink. Length $4\frac{1}{2}$, breadth 4 lines.

One specimen, a male, was collected in lat. $33^{\circ} 4' N.$, long. $129^{\circ} 18' E.$, in 23 fms.

In this specimen the legs are unfortunately wanting; an anterior leg that was in the same phial, and probably belongs to the specimen, has the arm very finely tuberculated, wrist and hand smooth, fingers slightly gaping at base when closed.

PHILYRA, sp.

Several specimens (males and females) of a species of *Philyra*, on account of their small size (their length is only about 3 lines), I do not designate by a distinct specific name, as they may not be fully matured. They resemble *Ph. platycheira*, De Haan, in the form of the carapace, which is nearly smooth and marked with a distinct depression between the cardiac and branchial regions, in the very finely granulated arms, &c. The anterior legs, however, are much shorter than in that species, the palm shorter and more swollen, and the fingers less compressed. The pterygostomial region is not angulated, and the intestinal region rather convex. From the *P. pisum* described by De Haan this species differs in the non-angulated pterygostomial region, from the *P. tuberculosa*, Stimpson, from Hong-Kong, in the non-tuberculated carapace, and from the *P. unidentata*, Stimpson, from the China Sea, in the form of the front. It may not improbably be a distinct species from any hitherto described.

Collected at Matoya, in $6\frac{1}{2}$ fms.

The colour is light yellowish brown, flecked with spots of darker brown, of which two are rather prominent and situated one on each branchial region.

MYRA.

The species of this genus, all of which occur in the seas of Eastern Asia, bear a very close resemblance to one another; and the form and tuberculation of the carapace and anterior legs not improbably alter considerably as the animal increases in age. On this account it is not without much hesitation that I regard the specimens described below as belonging to a distinct and undescribed form, as they are all of small size; but they cannot, in the present state of our knowledge, be referred to any of the known species.

MYRA DUBIA, sp. n.

Carapace convex, rhomboid-oval, longer than broad, and covered with minute distant granules; there is a faintly but distinctly marked longitudinal median raised line. The median spine or tubercle is but little longer than the lateral ones, conical and acute; and a short distance in front of it, on the front of the intestinal region, is another very small but distinct tubercle. Front and hepatic regions as in *Myra carinata*. Anterior legs about twice as long as the body, slender; arm distinctly and hand finely granulated; fingers straight and acute. Postabdomen of the male elongate-triangular, with the sides nearly straight; surface smooth and flat; all the joints except the last coalescent. Length $6\frac{1}{2}$ lines, breadth $5\frac{1}{2}$ lines.

Three specimens, males, are in the collection, without definite locality.

The nearest ally of this species is evidently the *Myra carinata* of Bell from the Philippines, from which it differs in the broader carapace with shorter median posterior spine. Moreover it differs from this and all the other species of the genus in the existence of the small tubercle in front of the posterior spine. There is, however, in the British-Museum collection a male individual from Hong-Kong, of much larger size, which *may* be identical with the Japanese species, in which the tubercle does not exist. From *Myra fugax*, *affinis*, *elegans*, and *mamillaris* it differs in the form of the tubercles of the posterior margin and postabdomen of the male.

EBALIA RHOMBOIDALIS, sp. n.

Carapace rhomboidal, rather broader than long, uniformly and finely granulated; cardiac and intestinal regions convex but not tuberculated. Frontal margin straight. Antero-lateral margins straight and not interrupted, forming nearly a right angle with the postero-lateral margins, which are nearly straight; posterior margin, behind the intestinal prominence, obscurely bilobated. A moderately prominent longitudinal median ridge joins the front and the intestinal prominence with the elevated cardiac region; and from the cardiac and intestinal regions transverse ridges reach to the postero-lateral margins. There is no tubercle on the pterygostomian

region. Anterior legs rather long and nearly smooth; arm obscurely trigonous, but without prominent angles; palm moderately convex; fingers straight and acute. Postabdomen of male with all the segments except the last coalescent. Length $5\frac{1}{2}$ lines, breadth 6 lines.

A male and female are in the collection, without definite locality.

This species differs from most of the genus in the entire absence of tubercles upon the carapace. It has some affinity with *Ebalia tuberosa*, Pennant (*E. pennantii*, Leach), from the British seas, but differs in the uninterrupted lateral margins and in the form of the front, which in that species is concave.

EBALIA MINOR, sp. n.

This species resembles the preceding; but the carapace is broader and very much more coarsely granulated on the frontal, cardiac, branchial, and intestinal regions and antero-lateral and postero-lateral margins. The front is slightly concave. The intestinal region is much less prominent, and there is scarcely any trace of longitudinal and transverse ridges; the posterior and postero-lateral margin of the carapace is slightly revolute. Length 3 lines, breadth $3\frac{1}{2}$ lines.

Three males and one female were collected with the preceding; and all are of much smaller size than the fully-grown male of the preceding species, to which they bear much external resemblance. The distinctions, however, are not sexual, and appear too considerable for the two forms to be varieties of one and the same species.

EBALIA BITUBERCULATA, sp. n.

This species resembles the *E. rhomboidalis*; but the longitudinal and transverse ridges on the carapace and the depressions on the branchial region are much more strongly marked; in the centre of the carapace, upon the branchial region, are two distinct tubercles; the posterior margin is broader and straight, not bilobed.

A single female example was obtained at 52 fms., in lat. $34^{\circ} 12'$ N., long. $136^{\circ} 28'$ E.

CRYPTOCNEMUS PENTAGONUS. (Plate II. fig. 5.)

Cryptocnemus pentagonus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 161 (1858).

A single male individual is in the collection, obtained at 36 fms., in lat. $33^{\circ} 10'$ N., long. $129^{\circ} 12'$ E., in June 1876. It has unfortunately lost all its legs, but agrees in all respects with Stimpson's description.

This is a most interesting addition to the British-Museum collection, as only three species have been described, the present being the only one not figured hitherto, and that on which the genus was founded. A comparison of the figure now given with that of the *C. holdsworthi* described by me last year in Trans. Linn. Soc. (ser. 2), Zool. i. p. 241, pl. xxxviii, figs. 30-32, will show the differences in the form of the carapace and rostrum between the two species.

ARCANIA GLOBATA.

Arcania globata, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 160 (1858).

A single specimen, male, was collected in 24 fms., in lat. $34^{\circ} 8'$ N., long. $126^{\circ} 24'$ E.

The legs are unfortunately wanting; but the form and armature of the carapace and rostrum agree exactly with Stimpson's description. Its nearest allies are apparently the *Arcania tuberculata* of Bell (Trans. Linn. Soc. xxi. p. 310, pl. xxxiv. fig. 8, 1855)—from which it differs in the longer, more acute, and equal spines on the surface of the body,—and the *Arcania erinacea* of Fabricius, which has the legs spinulose and the front much more deeply incised. There is a second specimen, from the "Eastern Seas," in the British-Museum collection.

I take this opportunity of noting that the *Arcania granulosa* described by me (Trans. Linn. Soc. ser. 2, Zool. i. p. 240, pl. xxxviii. fig. 29, 1877) must probably be united with the *Arcania 11-spinosa* of De Haan, Faun. Japon., Crust. p. 135, pl. xxxiii. fig. 8 (1841), the characters given not being sufficient to distinguish it from that species.

ARCANIA ORIENTALIS, sp. n.

Carapace subglobose, compressed, with the front somewhat produced, and with two depressions, well defined posteriorly, separating the cardiac and branchial regions; the whole of the upper surface covered with small closely-placed granules. Cardiac and intestinal regions very high and convex. Front slightly bilobed, with a median sulcus between the eyes; lateral margins of the carapace without spines; posterior margin straight, and forming on each side a prominent but rounded angle with the postero-lateral margins. Anterior legs rather slender, with the arm very finely granulated; wrist and hand nearly smooth. Postabdomen of the male narrow-triangular, with all the joints except the first and last coalescent; the coalesced portion is marked with a longitudinal median sulcus, a prominence on each side at base, and a prominent acute tubercle at the distal extremity, the terminal joint is narrow and elongated. Length and breadth about 3 lines.

Two individuals, males, are in the collection:—one obtained in lat. $33^{\circ} 10'$ N., long. $129^{\circ} 12'$ E., at 36 fms.; the other at 30 fms., in lat. $34^{\circ} 10'$ N., and long. $136^{\circ} 47'$ E.

This species is distinguished from its congeners by the evenly granulated carapace, which is quite destitute of spines. The granules in one specimen preserve some faint traces of a red coloration.

ANOMURA¹.

DROMIDEA.

DROMIIDÆ.

CRYPTODROMIA, sp.

A very small specimen, obtained at 30 fathoms, in lat. $34^{\circ} 10'$ N., long. $136^{\circ} 47'$ E., is in the collection.

¹ For convenience' sake, Dana's arrangement and nomenclature of the groups of *Anomura* is followed.

The frontal portion of the carapace is triangular, deflexed, concave above, with five obscure marginal teeth (including the supraocular and median frontal teeth). Carapace convex, sparsely pubescent, without any indication of the different regions; antero-lateral margin with three small teeth. The anterior legs are small, weak, pubescent, and smooth. The second and third legs are compressed, pubescent, and with a tubercle at the distal extremity of the penultimate and antepenultimate joints. This individual may be the young of *C. tumida*, Stimpson, from the island of Ousima; it would not in any case be desirable to constitute it the type of a new species. Length barely 3 lines. The specimen is a young male.

HOMOLIDÆ?

PARATYMOLUS.

The carapace is shaped nearly as in *Homola*, e. g. with the front and postfrontal region deflexed, behind the hepatic region flat, with the sides nearly straight. The front is prominent and narrow, composed of two coalescent spines. The antennules are small and apparently broken in the single specimen collected. The antennæ are elongated, the joints of the peduncle hairy, the flagella very slender. The eyes are slender, of normal shape, the peduncles cylindrical and laterally projecting, not, as in *Homola*, divided into two portions. The outer maxillipeds are rather slender, the second about twice as long as the third joint, the exognath slender and not prolonged beyond the end of the third joint. The anterior legs in the female very slender, fingers longer than the slender palm; the ambulatory legs all alike in form, slender, smooth, the tarsal joints long, straight, and unarmed, those of the fifth pair not raised upon the dorsal surface of the cephalothorax. Postabdomen (of female) jointed, ovate.

The systematic position of this genus is somewhat uncertain, as the specimen, which is unique and very small, cannot be dissected with safety. Stimpson placed his genus *Tymolus* among the *Dorippidæ*; but the outer maxillipeds of *Paratymolus* are more of the Maioid than of the Leucosiid type; and on account of its general resemblance to *Homola* I place it, at least provisionally, with that genus among the Anomura Maiidica. Although the legs are not dorsally raised upon the cephalothorax, it evinces a certain degradation from the Brachyural type in the absence of defined orbits, the long antennæ, and several other points; but it may hereafter be thought better to place it among the Maioid Brachyura. The outer maxillipeds are less pediform than in *Homola*, but less distinctly operculiform than in the generality of Maioid Crustaceans.

PARATYMOLUS PUBESCENS, sp. n. (Plate II. fig. 6.)

Carapace and legs everywhere covered with a close velvety pubescence; a strong spine at the angle of the hepatic region, and another smaller in front of it, two small tubercles in front of the gastric and one on the cardiac region, and two in the middle of the

postero-lateral margin. Arms smooth; wrist with a long spine on its inner margin. The slender terminal joints of the legs are longer than the preceding joints. Length of carapace and rostrum barely 3 lines.

A single female example was collected at Matoya, at a depth of $6\frac{1}{2}$ fms.

This specimen is of very small size; but in the form of the fifth ambulatory legs it appears to be generically distinct, both from *Homola* and *Tymolus*, an allied genus from the Japanese seas, described by Stimpson; from the former genus it is further distinguished by the form of the eyes, and from the latter by that of the front, which is not quadridentate.

RANINIDEA.

RANINA SERRATA.

Cancer raninus, Linn. Syst. Nat. (ed. xii.), p. 1039 (1766).

Ranina serrata, Lam. Syst. An. sans Vert. p. 256 (1801); M.-Edw. Crust. in Cuvier, Règne Animal (ed 3), Atlas, pl. xli; Dana, U.S. Expl. Exp. xiii. Crust. i. p. 404 (1852).

Ranina dentata, Latr. Encycl. Méth. p. 268 (1825); M.-Edw. Hist. Nat. Crust. ii. p. 194, pl. xxi. figs. 1-4 (1837); De Haan, Faun. Japon., Crust. p. 139, pl. xxxiv. ♂ adult, pl. xxxv. fig. 1, ♀ adult, figs. 2 & 3, front of ♂, fig. 4, front of ♀ (1841).

A single individual, a male, was collected in Olvasi, Nipon, of moderate size, of this well-known species, which appears to be widely distributed through the Indo-Pacific region.

LYREIDEUS TRIDENTATUS?

Lyreideus tridentatus, De Haan, Faun. Japon., Crust. p. 140, pl. v. fig. 6 (1849).

A single specimen in imperfect condition was collected in Kada Bay, which I refer to De Haan's species with some doubt, as it differs in several particulars from the figure in the 'Fauna Japonica,' and the figures illustrating this work are, as a rule, most accurate. The carapace in the specimen before me is proportionally narrower, barely equalling in width half the total length. The greatest width at the lateral spines is attained at a greater distance from the front than in the specimen figured by De Haan; the median triangular lobe of the front is narrower; and there are four spines on the inferior margin of the hand.

If the species should prove upon comparison to be distinct, it may be designated *L. elongatus*. It in any case forms an interesting and valuable addition to the national collection, in which the genus was hitherto unrepresented; nor does it appear that any specimens were collected in the United States Expedition to the North Pacific, as none are mentioned in Stimpson's Report.

PORCELLANIDEA.

PORCELLANA SPINULIFRONS, sp. n.

Two small specimens are in the collection, the exact locality

whence they were obtained not being stated. They differ from the description of *P. latifrons* Stimpson (Proc. Ac. Nat. Sci. Phil. p. 243, 1858), only in the following particulars. There are only two spines on the lateral margins of the carapace in front of the branchial regions, and one behind the outer orbital spine. The denticulations of the frontal lobes are very minute, but more numerous than in *P. latifrons*—about 9 on the median lobe and 4 on each lateral lobe; there are only two spines on the posterior margin of the carpus.

It is possible that a larger series would show these differences are not of specific importance.

PACHYCHELES STEVENSII.

Pachycheles stevensii, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 242 (1858).

Two specimens are in the collection, without definite locality (male and female). This species was previously unrepresented in the collection of the British Museum. Stimpson's specimens were from the west coast of the island of Jesso, Japan.

With one exception (the *P. natalensis*, Krauss) the only species of this genus, besides the two described by Stimpson, inhabit the American coasts—another indication of the affinity existing between its Crustacean fauna and that of the Japanese seas.

LITHODIDEA.

HAPALOGASTER DENTATUS.

Lomis dentata, De Haan, Faun. Japon., Crust. p. 219, pl. xlvi. fig. 3 (1849).

Hapalogaster dentatus, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 245 (1858).

A single specimen, female, in mutilated condition, was collected at the Goto Islands at low-water mark. It agrees well with a specimen from Simoda, presented to the British Museum by the Smithsonian Institution.

This species belongs to a genus which, having a boreal range, is found on the west coast of the American continent as well as on the shores of Eastern Asia. An allied species, *H. mertensii*, has been described by Brandt from Sitka, and a third, *H. cavicauda*, by Stimpson from California.

CRYPTOLITHODES EXPANSUS, sp. n.

The species which I have thus designated is represented only by a single small specimen in dried condition. The carapace is transversely oval, with the lateral wing-like expansions broadly rounded, the surface everywhere minutely punctulated. The rostrum is scarcely at all deflexed, truncated, and but very obscurely tridentate at its distal end. There is a convexity upon the gastric, and one more prominent upon the cardiac region, on either side of which is a less elevated tubercle, the three forming a transverse series. A longitudinal median ridge extends from the gastric prominence

nearly to the distal end of the rostrum. There are no tubercles on the lateral expansions of the carapace; but the lateral margins are obscurely toothed, as in *C. typicus*. The anterior legs have the palms tuberculated externally; and the ambulatory legs are cristate, as in that species. Length to end of rostrum $4\frac{1}{2}$ lines, breadth 6 lines.

North Japan.

From *Cryptolithodes typicus*, Brandt, from California, this species differs in the less-deflexed rostrum, the absence of tubercles on the lateral lobes of the carapace, and the shape of these expansions, which are broadly rounded, with the lateral margins regularly arcuated, whereas in *C. typicus* the latero-anterior and latero-posterior margins form a more or less distinct angle one with another. It is probable that this character will always suffice to differentiate the species, even if the others should fail in older individuals. *C. sitchensis*, Brandt, from Sitka, has, according to Stimpson, a tridentate rostrum and smooth hands.

C. alta-fissura, Spence Bate, from Vancouver Island, of which there is a specimen in the Museum, is distinguished by the broad, flat, and rectangular rostrum, and the deep notch in the carapace in which the eyes are situated¹.

PAGURIDEA.

EUPAGURUS CAVIMANUS, sp. n. (Plate III. fig. 1.)

Carapace slightly punctulated on the sides in front of the branchial regions, and with a small acute median frontal lobe. Eye-peduncles subcylindrical, scarcely shorter than the peduncles of the antennæ, not constricted in the middle, their basal scales entire, and concave above. Antennules with the peduncles rather longer than the eyes. Antennæ with their slender basal acicles a little shorter than the peduncles. Anterior legs very unequal; larger (right) leg with the arm very short, trigonous, concave on its outer surface, and with a few spinules on its distal upper margin; wrist about as long as broad, and much broadest at its distal extremity, convex and faintly punctulated on its outer surface, its inner surface smooth and concave, and its upper and lower margins distally produced into thin crests, the upper of which is obscurely serrated; hand with the upper and lower margins parallel and subcristiform, slightly convex, and nearly smooth on its outer surface, mobile finger not cristate above, and about as long as the upper margin of the palm. Smaller leg very slender, wrist externally granulated and serrated above; palm subovate, smooth, and concave on its outer surface. Legs of second and third pairs slender, nearly smooth, the terminal joints rather longer than the preceding, and with short stiff hairs on their upper and lower margins.

¹ There is also a dried specimen in the Museum, from Vancouver Island, which closely resembles *C. typicus*, but is distinguished by the form of the rostrum, which is obtusely triangular, and does not project beyond the anterior margin of the carapace. This I propose to designate *C. brevifrons*.

One individual was collected at a depth of 100 fathoms, in lat. 41° 40' N., long. 141° 10' E.

By the form of the ophthalmic scales, the dilated carpus of the right anterior leg, and the externally concave palm of the left anterior leg, this species is easily distinguishable from its congeners.

It does not seem to be allied in any close degree to any of the species described by Stimpson from the Chinese and Japanese seas. In *Eupagurus forceps*, M.-Edw., a Chilean species, which has the wrist of the larger hand strongly cristate above and beneath, the fingers of the smaller hand are described as being very long, slender, and acute, whereas in *E. cavimanus* they are of moderate length.

There are a few other specimens of Paguridea in the collection, which, being in mutilated condition, cannot be determined with certainty. One, obtained at the Goto Islands at low-water mark, has lost the postabdomen and one of the anterior legs, but is perhaps referable to the *Pagurus lanuginosus* of De Haan. Another, which, like *Pomatocheles jeffreysii*, inhabited a shell of *Dentalium*, is too imperfect to be described.

POMATOCHÉLES, gen. nov.¹

Cephalothorax and its appendages as in the *Paguridæ*. Carapace with a median frontal lobe, and postfrontal and other sutures; posteriorly it is partly membranaceous. Postabdomen as in the *Macrura*, extended, straight, with parallel sides, composed of seven distinct segments, inferiorly closed by two longitudinally-folding membranaceous flaps, which meet in the middle line. Eye-peduncles slender, cylindrical, straight. Antennules and antennæ rather short, the latter with simple multiarticulate flagella. Antennal aciculum small. Outer maxillipeds subpediform. Anterior legs (as in *Cancelus*) equal; hands bent obliquely downwards from the wrists, and flattened above, fingers opening horizontally, and acute at tips. Second and third legs slender, elongated, terminal joints long, straight, and acute. Fourth and fifth legs small and weak; last joint of fourth pair with a small terminal claw, and that of the fifth pair with a tuft of hairs and minute claw at its distal end. Postabdominal appendages of the second to fifth segments slender, those of the second segment elongated, and 4- or 5-jointed, the rest short. Appendages of the penultimate segment (uropoda) with two lamellate unequal rami. Telson membranaceous in its distal half, and divided by a terminal notch into two rounded lobes.

I have much pleasure in dedicating the single species of this remarkable genus to Dr. J. Gwyn Jeffreys, F.R.S., by whom the entire series of Crustacea collected by Capt. St. John was presented to the British Museum.

POMATOCHÉLES JEFFREYSII, sp. n. (Plate III. fig. 2.)

The animal is slender and elongated. The carapace is marked

¹ πῶμα, a lid, and χηλή, a claw.

with a distinct postfrontal and lateral suture, besides two smaller and less distinct sutures on the sides towards the lateral margins. The median frontal lobe is broadly triangulate and rounded at apex. The first postabdominal segment is very small, the five following subequal, with the lateral margins straight, the last small, transparent, and membranaceous in its distal half, and ciliated on its margins, the terminal median notch very small. The ocular peduncles are a little shorter than the frontal margin, and are furnished with very small scales at base. The corneæ are of a red-brown colour. The antennules are half as long again as the eye-peduncles, the antennæ about as long as the antennules; the aciculum at base very small, acute, not half as long as the eye-peduncles. The anterior legs are much as in *Cancellus*; the arms with a slight denticulated crest on their upper surface, the wrists very short and slightly denticulated above; the flattened upper surface of the palms is covered with thick short hair, the surface beneath being smooth, and the straight inner and arcuate outer margins very slightly denticulated. The slender and elongated legs of the second and third pairs have the antepenultimate joint short, the two following long and straight, the last in particular very long, slender, and acute. The truncated distal end of the last joint of the fourth leg is armed with a series of short stiff setæ or spinules, and a small claw or spine; that of the fifth pair is densely ciliated. The basal portion of the uropoda is short and broad, and bears two unequal lamelliform rami, which are of spongy texture on the outer surface, and ciliated on the margins; the outer is twice as long as the inner. Length 5 lines.

Two specimens were collected, inhabiting a species of *Dentalium*, at a depth of 58 fathoms, in lat. 32° 43' N., long. 129° 28' E., preserved in spirit. They were so firmly ensconced in the narrow conical shell that forms their home, that the one from which the foregoing description was mainly taken could not be extracted without breaking the shell. The chelæ of the anterior legs, meeting above the head, and in close contact along their flat inner margins, form a perfect operculum, fitting the aperture of the shell (hence the name of the genus), serving to defend its inhabitant against foreign intruders.

Subsequently two other specimens, in a dry state, were extracted from specimens of *Dentalium*, collected in 48 fathoms, in lat. 34° 13' N., long. 136° 37' E. They appear to be males, as the genital apertures are visible at the base of the fifth legs.

This remarkable form is of great interest as apparently establishing a transition from the Paguridea to the Macrura. In the form of the carapace, eyes, antennæ, and cephalothoracic limbs it has so much affinity with *Cancellus*, that, had the rest of the animal been wanting, I should have considered it a species of that genus. But in the narrow, straight, and distinctly-segmented postabdomen, and in the form of its appendages, it far more nearly approaches the Macrura than does *Cancellus*. Perhaps its nearest allies are to be found in the little-known genus *Prophylax* of Latreille¹, and *Glau-*

¹ In Cuv. R. A. (ed. 2), p. 78 (1829).

cothoë of Milne-Edwards¹. The latter, which is placed by Dana in the *Gebüideæ*, is only known to me by the figures and descriptions of its author; it presents decided affinities with the Paguridea in the form of the fourth and fifth legs of the cephalothorax, eyes, antennæ, and anterior legs, which are more distinctly Macruran in type. *Glaucothoë* has been considered by Mr. Spence Bate² to be but the immature condition of *Pagurus*; and he figures and notices a specimen of that or a closely-allied genus that had been taken floating on the surface of the sea. Whether his contention be correct or not (and his remarks and figures do not appear to me to suffice to decide the question), there can, I think, be little doubt that the specimens of *Pomatocheles* I have examined are mature; and the fact that they had been found at considerable depths permanently ensconced within the shell of *Dentalium* seems confirmatory of that opinion. From *Glaucothoë Pomatocheles* is easily distinguished by the form of the chelæ of the anterior legs and of the carapace, not to mention other characters.

GALATHEIDEA.

GALATHEA ORIENTALIS.

Galathea orientalis, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 252 (1858).

A large series of this species was collected, the specimens agreeing in all respects with Stimpson's description, and the number of spines on the gastric region and lateral margins being remarkably constant; only it is to be noted that the large spine on the inner surface of the wrist varies considerably in size, sometimes not being much larger than the other spinules of the anterior legs; there is usually a small tooth on the inner margin of the immobile finger.

This species, like the *Pilumnus hirsutus* and *Cymodocea trilobata*, to be described in the second part of this Report, is a very common inhabitant of the Chinese seas, having been dredged at no fewer than nine different localities in or near the Corean Straits, at depths varying from 12 to 50 fathoms. Stimpson's specimens were from the Ly-i-moon Straits, near Hong-Kong.

MUNIDA JAPONICA.

Munida japonica, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 252 (1858).

A single specimen was collected in the Corean Straits, lat. 33° 14' N., long. 182° 55' E., at a depth of 40 fathoms. The legs are, unfortunately, wanting; but in the form of the carapace and rostrum, and the number and position of the spines of the cephalothorax, it agrees perfectly with Stimpson's description, whose specimens were collected at Kagosima, Japan.

¹ Ann. Sci. Nat. sér. 1, xix. p. 334 (1830); Hist. Nat. Crust. ii. p. 306 (1837); and Atlas, in Cuv. R. A. Crust. (ed. 3), pl. xliii. fig. 2.

² Rep. Brit. Assoc. p. 53 (1865); Ann. & Mag. Nat. Hist. ser. 4, ii. p. 115, pl. ix. fig. 3 (1868).

MACRURA.

THALASSINIDEA.

GEBIIDÆ.

GEBIA MAJOR.

Gebia major, De Haan, Faun. Japon., Crust. p. 165, pl. xxxv. fig. 7 (1849).

Several specimens are in the collection from Katzura and Kada Bay, some obtained from coarse sand and gravel 18 to 20 inches below surface. The spinules on the upper margin of the hand, mentioned by De Haan, are very small, and concealed by the longer hairs, so as to be scarcely distinguishable.

CARIDEA.

CRANGONIDÆ.

PARACRANGON ECHINATUS.

Paracrangon echinatus, Dana, Proc. Ac. Nat. Sci. Phil. p. 20 (1852); U.S. Expl. Exp. xiii. Crust. i. p. 538, pl. xxxiii. fig. 6 (1852); Stimpson, Boston Journ. Nat. Hist. v. p. 497 (1857).

A single specimen, apparently a male, was collected north-east of Yedo Island, in lat. $44^{\circ} 27' N.$, long. $141^{\circ} 22' E.$, and differs in no respect whatever from the Californian species described by Dana, which was described from specimens dredged in Puget Sound, and of which authentic examples from California are in the Museum collection, presented by the Smithsonian Institution.

The occurrence of the single species known of this curious genus (which, with the hands of a *Crangon*, has the external appearance, elongate rostrum, &c. of a *Hippolyte*, and which is remarkable for the total obsolescence of the cephalothoracic legs of the second pair) on both sides of the Pacific Ocean is a noteworthy fact; and it is probable that, with further opportunities of comparison, other species will be shown to have a similarly extended range.

ALPHEIDÆ.

ALPHEUS.

There is probably scarcely any genus of Crustacea in which the species are more numerous, and which more greatly needs thorough revision than the present. Not only are the characters in themselves hardly to be defined and accurately appreciated without the aid of well-executed figures, but we do not know at present how far those which are generally adopted in distinguishing the species (*i. e.* the form and sculpture of the hands and the proportional length of the joints of the wrists of the anterior legs) may be modified by the age and sex of the individual. Under these circumstances it is not without considerable hesitation that I describe below two species as new, which, however, are distinct from any hitherto recorded, so far as I can judge from the materials available to me for comparison.

ALPHEUS BIS-INCISUS.

Alpheus bis-incisus, De Haan, Faun. Japon., Crust. pl. xlv. fig. 3 on plate, *Alpheus avarus* in text, l. c. p. 17; Stimpson, Proc. Ac. Nat. Sci. Phil. p. 30 (1860), nec *Alpheus avarus*, Fabricius, *vide* Stimpson.

Two specimens are in the collection, one female, in fine condition, obtained at Katsura, on the east coast of Japan, and a smaller individual, without definite locality.

Dr. Stimpson, in his report, quoted above, retains the name of *bis-incisus* for a species which he regards as distinct from the *Alpheus avarus* of Fabricius, with which, on the other hand, he considers the *Alpheus strenuus* of Dana (Expl. Exp., Crust. p. 543, pl. xxxiv. fig. 4), from Tongatabu, identical. Both species were collected in the American expedition to the North Pacific; and as I do not know the grounds on which he separated them, I follow for the present his nomenclature—although it would appear from comparison of the figures and descriptions that the *Alpheus bis-incisus* and *A. strenuus* are identical, while the *A. avarus* of Fabricius is described in such general terms that it would apply to several very different species; indeed by Milne-Edwards it is thought to be probably identical with *Alpheus brevirostris* of Olivier, which belongs to a different section of the genus from *A. bis-incisus* and *A. strenuus*.

ALPHEUS JAPONICUS, sp. n.

Carapace smooth. Rostrum narrow-triangular and acute, projecting rather beyond the orbits, which themselves project beyond the lateral margins of the carapace. Orbits without spines. Between the eyes and rostrum the carapace is very slightly concave. Second joint of the antennules not twice as long as the first. Anterior legs very unequal, the larger with the arm short, trigonous, enlarging distally, with a small spine at the distal end of its upper and lower margin; wrist very small, transverse; hand (with fingers) laterally compressed, very slightly contorted, nearly three times as long as broad; palm smooth, not cristate above, with the upper and lower margins straight and terminating in an acute lobe a short distance behind the articulation of the fingers; on the inner and outer sides of the palm, near the upper margin, is a longitudinal depression gradually obliterated towards the proximal extremity, that on the inner surface is narrow and triangulate, that on the outer broader and oblong in shape; the upper finger is broadest and rounded at its distal extremity, with a large tooth on its inner margin, fitting into a corresponding cavity on the inner margin of the lower finger; both are slightly hairy: the other anterior leg is slightly longer but very much more slender than the first described, which it resembles in the shape of the arm and wrist; the hand is very slender, smooth, and straight, no thicker than the wrist, the fingers hairy, and very slightly longer than the palm; the first joint of the wrist is longest, the third subequal and shortest, the fifth but little longer than the

third. The outer maxillipeds are densely hairy towards the extremities; the ambulatory legs slightly hairy on the penultimate joints.

Length of largest specimen about $1\frac{1}{2}$ inch.

Two specimens were collected:—one in lat. $34^{\circ} 6' N.$, long. $136^{\circ} 15' E.$, at 11 fathoms; the other in lat. $35^{\circ} 7' N.$, long. $136^{\circ} 55' E.$, at 3 fathoms, on a bottom of soft mud.

So far as can be judged from the descriptions of the numerous species of this genus, the one now described differs from all those of the same section (in which the rostrum rises from the margin of the front, the basal joint of the antennæ is without a spine, the larger hand excavated above and below, and the orbital margins without spinules) in the form and proportions of the anterior legs. The anterior legs somewhat resemble those of *A. bis-incisus* and *A. lobidens*, De Haan, but are much more slender and elongate, there is a spine at the distal end of both the upper and lower margins of the arms, and the lobes terminating the upper and lower margins of the larger hand are both acute.

ALPHEUS KINGSLEYI, sp. n.

Carapace smooth; upper orbital margins rounded and without spines. Rostrum acute, projecting little beyond the orbits, between the eyes very narrow-linear, and separated from them by deep depressions in the surface of the carapace. Antennules with the second joint of the peduncle more than twice as long as the first, and, like the antennæ, without a basal spine. Antennal scale narrow, with a prominent spine at its antero-external angle. Anterior legs very finely granulated, the margins of palms and fingers with long flexible hairs; in the larger (right) leg the arm is without spines at its distal extremity; wrist very small, transverse; hand (with fingers) rather more than twice as long as broad, laterally compressed; palm with its upper margin marked with two longitudinal lines of long hairs, and with a small transverse groove near the base of the mobile finger, inner and outer surface smooth, not carinated, outer surface slightly concave below upper margin, with a faintly-marked oblique impressed line near its base; lower margin straight, entire, subacute; fingers nearly as long as the palm, nearly straight, the upper broad and bluntly rounded at its distal extremity: the other leg is slender, smooth, the palm compressed, the fingers about twice as long as the palm, slightly arcuated, leaving a space between their inner margins, and crossing at the tips when closed. The second pair of legs has the first and second joints of the carpus each nearly as long as the three following together, the third and fourth joints being very short, the fifth but little longer. The dactyli of the following legs are slender and straight. Length about 1 inch 1 line.

One individual is in the collection, obtained with a specimen of the preceding species, in lat. $35^{\circ} 7' N.$, long. $136^{\circ} 55' E.$, at 3 fathoms, on a muddy bottom.

This species, on account of the form of the front and anterior legs, belongs to a small section of the genus *Alpheus* including the *A.*

brevirostris, Olivier, and *A. lobidens*, De Haan, and the *A. malabaricus* and *A. rapax*, Fabricius, as described and figured by the latter-mentioned author in the 'Fauna Japonica.' From the *A. brevirostris* it differs in the absence of crests upon the upper surface of the larger hand, the finger of which is proportionally much longer, and nearly straight, and from the three other species in the absence of ridges on the outer and inner surface of the palm, and of spines at the distal extremity of the arm, &c. It is evidently very nearly allied to *A. rapax*, which, however, is described (De Haan, *l. c.*) as having "*manus major glabra 4-costata, brachia carina superiore apice unispinosa.*"

I dedicate this species to Mr. J. S. Kingsley, of Salem, U. S., who, by his recent researches, has greatly facilitated the determination of the American species of this genus.

ALPHEUS GRACILIPES?

? *Alpheus gracilipes*, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 31 (1860).

I refer to this species with some hesitation a small individual collected in lat. 32° 49' N., long. 128° 54' E. It agrees in all particulars with Stimpson's description, based on a specimen from Tahiti, except that the orbits can scarcely be called acute in front, and the penultimate joint of the ambulatory legs is about 6-spined below. I may add that the larger hand is sparsely pilose and slightly twisted, the mobile finger about one third the total length of the hand. The smaller hand is wanting in the specimen.

RHYNCHOCYCLUS PLANIROSTRIS.

Cyclorhynchus planirostris, De Haan, Faun. Japon., Crust. p. 175, pl. xlv. fig. 7 (1849).

Rhynchocyclus planirostris, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 27 (1860).

Rhynchocyclus mucronatus, Stimpson, *l. c.* p. 28 (1860), var.

One adult female, with ova, was collected at Cape Sima, Nippon, at a depth of 18 fathoms, on a bottom of sand and broken shells, and one, apparently male, in the Gulf of Yedo. It is to be noted that in neither specimen is the wrist carinated above and spinose at apex, as in De Haan's description. In all other respects the female, however, agrees with the description and figure of that author. The second specimen, in the somewhat narrower longer rostrum, and the existence of but a single spine on the dorsal surface of the carapace, agrees with Stimpson's diagnosis of *R. mucronatus*, which was based on specimens collected in the Strait of Ly-i-moon, near Hong Kong; but the denticles on the anterior margin of the rostrum are more numerous in both individuals. In both, moreover, exist the spines on the anterior margin of the carapace, mentioned by Stimpson; and in both the joints of the wrist are of the same proportional length, *i. e.* the second longer than either the first and third. It is probable that Stimpson's species is at most a mere

variety of the *planirostris*; or the differences may be those peculiar to the male sex.

HIPPOLYTE LEPTOGNATHA, var.

? *Hippolyte leptognatha*, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 34 (1860).

Rather slender. Carapace dorsally carinated, the carina reaching nearly to the posterior margin; anterior margin with two small spines below the eye, and another at the antero-inferior angle. Rostrum elongated, longer than the carapace, its apex reaching beyond the end of the shorter thickened flagellum of the antennules; its upper margin straight, horizontal, and 6-dentate, the two or three last teeth situate on the dorsal crest, inferior margin with about six small and crowded teeth. The postabdomen is strongly geniculated. The outer maxillipeds slender and elongated, reaching nearly to the apex of the rostrum. Anterior legs rather slender; the palm longer than the fingers, and rather longer than the wrist. Wrist of second pair of legs 7-jointed, the second and sixth joints shortest, and the third joint the longest. Only one of the following legs exists in the specimen before me; in this the merus joint is armed with a series of spinules on its inferior margin, the penultimate joint is long, and the last joint short.

The single specimen, a female with ova, was collected in the Gulf of Yedo, and is in a mutilated condition.

It agrees in so many particulars with Stimpson's description of *H. leptognatha*, from Hakodadi, that I have not ventured to consider it distinct; as will be seen from the description, however, it differs in the more numerous teeth of the rostrum, of which fewer are placed on the dorsal surface of the carapace.

PANDALUS GRACILIS.

Pandalus gracilis, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 37 (1860).

A single specimen was obtained in the Korean Straits, in lat. 34° 8' N., long. 126° 24' E.; temp. of water 71°, at a depth of 17 fathoms. It is in a very mutilated condition, the legs being imperfect and rostrum broken at the tip; but it agrees well with Stimpson's description and a specimen presented by the Smithsonian Institution from Hakodadi.

PENÆIDEA.

PENÆIDÆ.

PENÆUS AFFINIS, M.-Edw.

Penæus affinis, M.-Edw. Hist. Nat. Crust. ii. p. 416 (1837); De Haan, Faun. Japon., Crust. p. 192, pl. xlvi. fig. 3, *barbatus* on plate (1849); Miers, Proc. Zool. Soc. p. 304 (1878).

Penæus velutinus, Dana, U.S. Expl. Exp. xiii., Crust. i. p. 604, pl. xl. fig. 4 (1852).

One male individual, was collected in lat. 32° 49' N., long. 128° 54' E.

This species has apparently a very wide geographical range, as there are specimens which do not seem to differ specifically in the British Museum from the Gulf of Suez and Western Australia; and I am informed in a letter from Mr. J. S. Kingsley, of the Peabody Academy of Science, Massachusetts, that the Museum of that Institution possesses specimens from Hong-Kong, the Sandwich Islands, and Zanzibar.

CUMACEA.

HETEROCUMA, gen. nov.

Cephalothorax without a distinct rostrum, and (viewed laterally) nearly straight in its dorsal outline. Five free segments of the body exposed. Postabdomen much longer than the carapace, terminal segment obsolete. Eye large and distinct. Antennules robust, 5-jointed, without any accessory flagellum, and with the first three joints of the peduncle dilated. Mandibles with the apex strongly dentated, the inner margins armed with 10-12 stiff setæ and with a prominent molar tubercle. First maxillæ with the slender flagella terminating in two unequal setæ. First and second maxillipeds 6-jointed; third maxillipeds 6-jointed, the basal joint considerably dilated, and produced at its extero-distal angle, which is subacute, the second joint very short, transverse, the third with its extero-distal angle greatly produced and acuminate, the fourth dilated and truncated at its distal extremity, and the fifth and sixth slender. First three pairs of legs palpigerous in both sexes. The appendages of the sixth postabdominal segment (uropoda) are elongated, the basal portion being about as long as the fifth postabdominal segment, and terminating in two flattened subequal rami, which are two-jointed and about as long as the base.

In the males there exist well-developed appendages on the ventral surface of the first five postabdominal segments, and the antennæ are well developed and have the last joint of the peduncle dilated and terminate in a slender flagellum, which is directed backward and is as long as the animal.

This genus is apparently nearly allied to *Eudorella*, Norman (*Eudora*, S. Bate), which it resembles in general form, the obsolescence of the terminal postabdominal segment, the form of the uropoda, &c., but differs in the existence of a well-developed eye, in the structure of the flagellum of the first maxilla, which terminates in two setæ, and particularly in the dilatation of the third and fourth joints of the third pair of maxillipeds. In the males, moreover, the first five postabdominal segments are all furnished with appendages.

It is also very nearly allied to *Leptocuma*, Sars, from Rio Plata, a genus recently described and beautifully figured by its distinguished author in Kongl. Vetensk.-Akad. Handl. xi. no. 5, p. 24; but in that genus the eye is indistinct, and not furnished with cornææ, the first pair of legs more robust, and, moreover, the third maxillipeds (so far as they could be seen without dissection in the unique specimen) are described as "of perfectly normal structure" in *Leptocuma*.

HETEROCUMA SARSI, sp. n. (Plate III. fig. 3.)

The body is slender; the carapace or dorsal shield is somewhat laterally compressed, with an obscure median dorsal keel, which is flattened and sulcated posteriorly, and terminates anteriorly in the oculigerous lobe. Viewed laterally, the dorsal outline of the carapace is nearly straight, the inferior or lateral margin is at first straight and parallel with the upper, but anteriorly it is curved upward toward the front. The antero-lateral margins meet in front of the eye, but are not prolonged into a rostrum. The surface is smooth, or only very minutely punctulated; on either side there is a wide and rather deep incision in the antero-lateral margin, through which the antennules are visible; and the lobe beneath the sinus is triangular and subacute.

Five free segments of the body are exposed, the first being very narrow and overlapped upon the sides by the carapace; the second is longest, with the latero-inferior margins straight; the third very short upon the dorsal surface, but, like the two following, produced backward at its postero-lateral angle. Similarly the first four post-abdominal segments are produced backward on the sides, the produced portion forming a subacute lobe; these segments are subequal, the fifth is longer, the sixth rather smaller than any of the preceding; all are marked with longitudinal depressions on the dorsal surface, which are best visible in the dried specimens; the last segment or telson is represented only by an obscurely bilobate tubercle.

The large black eye is placed immediately behind the frontal margin. The antennules, visible through the lateral sinus, are short and 5-jointed, the basal joint very short, the second longest and considerably dilated, the third dilated and shorter, the fourth slender and longer, and the fifth very small and ending in a pencil of setæ. The first pair of legs are greatly elongated and slender, the extremity being clothed with a pencil of long setæ, which arise near the distal end of the penultimate joint; the fifth pair of legs is very short. The appendages of the first five postabdominal segments in the male are biramose; the rami flattened, ovate, and fringed at their distal extremities with long and flexible cilia; those of the sixth segment (uropoda) are fringed with short stiff setæ along the inner margins of the base and the inner ramus, of which the two joints are subequal; in the outer ramus the basal joint is much shorter than the terminal. Length of animal (excluding appendages) not exceeding $\frac{3}{4}$ inch.

A good series of specimens of both sexes were collected at a depth of 40 fathoms in lat. $32^{\circ} 41' N.$, long. $128^{\circ} 57' E.$; one (a male) occurred at a depth of 50 fathoms, in lat. $33^{\circ} 19' N.$, long. $129^{\circ} 7\frac{1}{2}' E.$; and two males and a female were taken in lat. $32^{\circ} 49' N.$, long. $128^{\circ} 56' E.$

Var. *GRANULATA*.

In two or three specimens (male and female), collected, with the typical form, in 40 fathoms, in lat. $32^{\circ} 41' N.$, long. $128^{\circ} 57' E.$,

the carapace is more or less covered on its dorsal surface with small tuberculiform granules, which are largest along the line of the median dorsal carina, and are gradually obliterated toward the lateral margins.

As in all other respects these specimens resemble the typical forms, I have not ventured to regard them as belonging to a distinct species¹.

APPENDIX.

On the Method of Dredging and Separating the Specimens, &c., with Remarks on Temperature, &c. By Capt. H. C. ST. JOHN, R.N.

During the years 1870 to 1877, when employed surveying the Japanese coasts, I usually kept a small dredge pretty well at work.

There is so little trouble and the few arrangements necessary are so simple, that I venture to give a brief outline of the plan I adopted, hoping, if it meets the eyes of those who have business on the deep, that they might be induced, at any rate occasionally, to try their luck in a similar way.

After ascertaining the depth, the dredge (which was always kept ready, hanging over the stern) would be lowered into the water, a 28-pound lead attached to the rope 5 to 8 fathoms from the dredge; this is to ensure the dredge passing over or along the bottom at the right angle. If the ship is just moving through the water, so much the better; the dredge then goes out clear. I think about one mile an hour not too fast for the dredge to pass along the bottom, and half an hour generally long enough for it to remain down.

On its being brought up, a boy, whom I had shown how to sift the contents, immediately commenced operations, using three diffe-

¹ To complete the account of the Podophthalmia collected by Capt. St. John, I subjoin the following description of a Stomatopod crustacean without definite locality, which, being represented only by a single specimen in mutilated condition, I cannot determine with certainty. It is apparently allied to *Cyrtopia*, Dana. The carapace, which loosely covers the body, is attached only near its anterior margin, and is deeply excavated posteriorly on the dorsal surface, leaving three or four segments of the cephalothorax exposed. Anteriorly, it is prolonged forwards between and half conceals the eyes, and is armed with a strong median and two small lateral frontal spines; beneath the eyes there are two small spines on the lateral margins, and one on the postero-lateral lobe on either side of the median excavation. The surface of the carapace is covered with small scattered granules. The postabdominal segments are nearly smooth; the sixth has two teeth on its lateral margins. The terminal segment is entire, tapers slightly to its distal extremity, which is subtruncate and armed with two strong stiff setæ. The eyes are large, red, and only slightly project from beneath the margins of the carapace. The antennules have the peduncle thickened, and are furnished with two flagella, which are broken; but the outer in its imperfect state is nearly as long as the animal. The antennæ are furnished at base with an ovate leaf-like scale, and have each a single flagellum (unfortunately broken). The cephalothoracic legs are in very imperfect condition; but there seem to have existed six pairs, furnished (at least the anterior pair) with a palp and a branchial leaflet at base. The first five postabdominal segments are furnished with swimming-appendages; the appendages of the sixth segment have subequal rami, ciliated along their inner margins, the outer ovate-lanceolate, and the inner lanceolate and acute. Length about 9 lines ($\frac{3}{4}$ inch).

rent-sized sieves for the purpose, and placing every thing he found in a wooden tub filled with clean salt water. From this receptacle I always took the specimens myself, putting them at once into bottles with spirit. In working the contents of the dredge, care should be taken that the hand is not used to rub or force them through the sieves. The sieves ought to be shaken backwards and forwards in a tub of water; the sand or mud will quickly pass away, leaving all but microscopic life behind.

I usually kept a small canvas bag of the contents of the dredge previous to its being examined and just as it came up. If hung up, the contents of the bag soon harden and dry; it takes little room, and frequently contains interesting subjects for microscopic examination.

Generally quantities of animal life came up attached to the bag, outside as well as in. It is always well to examine the bag closely immediately the dredge reaches the surface. The small colourless and otherwise difficult-to-distinguish forms which abound in about 50 fathoms will then be more easily found by their movements, whereas if left to die, which they very soon do, they are far more difficult to find.

As the depth of water increases, so ought the distance of the 28-pound lead from the dredge, so as to ensure the lips of the dredge taking the bottom at a proper angle. I used a 2½-inch rope next the dredge, increasing that size at 200 fathoms to 3 inches.

The dredge was about 3 feet long by 18 inches wide. This size I found most convenient, the bag being about 3 feet 6 inches deep, and made of ordinary bread-bag stuff, with a good strong network bag outside to protect the inner or real bag from being torn or injured on the hard bottom.

During the seven years I spent in Japan most of the time was on the south coast, where, in consequence, the chief part of the dredgings were obtained. In 1871, however, I had an opportunity of dipping into the cold stream from the north, as it flowed past the north and north-east coast of Yedo. The temperature of this stream was 36° to 39° F. in the month of August, whereas that of the Kuro Siuvo or equatorial current, a small portion of which enters the Sea of Japan by the Korean Strait and passes out to the Pacific by the Tsuga Strait, was 58° to 60° at the same time, and in close proximity to the counterstream. These two currents rub together, but do not mix.

From the cold waters the most interesting things were obtained; and I feel sure there is much to be done in this particular portion of the globe, which may be termed the north-west corner of the Pacific.

When practicable, I always took the temperature at the bottom as well as at the surface.

EXPLANATION OF THE PLATES.

PLATE I.

- Fig. 1. *Pleistacantha sancti-johannis* (p. 24), male individual, natural size.
- 1 a. Inferior view of buccal, orbital, and antennal region of the same. $\times 3$ diameters.
 - 1 b. Lateral view of rostrum. $\times 3$ diameters.
 - 1 c. Outer view of hand of the same. $\times 3$ diameters.
 - 1 d. Postabdomen of the same. $\times 3$ diameters.
2. *Hyastenus (Chorilia) japonicus* (p. 27), male individual, dorsal view, natural size.
- 2 a. Orbital and antennal region of the same. $\times 2$ diameters.
 - 2 b. Postabdomen of the same. $\times 2$ diameters.

PLATE II.

- Fig. 1. *Doclea orientalis* (p. 28), female individual, natural size.
- 1 a. Inferior view of orbital and antennal region of the same. $\times 3$ diameters.
 2. *Heteroplax ? nitidus* (p. 39), female individual. $\times 2$ diameters.
 - 2 a. Inferior view of frontal, orbital, and antennal region of the same, further magnified.
 - 2 b. Outer view of hand of the same. $\times 4$ diameters.
 3. *Heterograpus longitarsis* (p. 37), male individual, natural size.
 - 3 a. Outer view of hand of the same. $\times 3$ diameters.
 4. *Pseudophilgra tridentata* (p. 41), male individual. $\times 3$ diameters.
 - 4 a. Outer view of hand of the same. $\times 2$ diameters.
 5. *Cryptocnemus pentagonus*, Stimpson (p. 43), carapace of male individual. $\times 3$ diameters.
 6. *Paratymolus pubescens* (p. 45), female individual. $\times 3$ diameters.
 - 6 a. Inferior view of buccal, antennal, and orbital region of the same. $\times 8$ diameters.
 - 6 b. Lateral view of carapace of the same. $\times 3$ diameters.

PLATE III.

- Fig. 1. *Eupagurus cavimanus* (p. 48), male individual. $\times 1\frac{1}{2}$ diameter.
2. *Pomatocheles jeffreysii* (p. 49), male individual, dorsal view. $\times 4$ diameters.
 - 2 a. Lateral view of the same. $\times 4$ diameters.
 - 2 b. Fourth cephalothoracic leg of the same, greatly magnified.
 - 2 c. Fifth cephalothoracic leg, greatly magnified.
 - 2 d. Terminal segment and uropoda, greatly magnified.
 3. *Heterocuma sarsi* (p. 58), male individual. $\times 3$ diameters.
 - 3 a. Front of cephalothorax, dorsal view, further magnified.
 - 3 b. Second maxilliped, greatly magnified.
 - 3 c. Third maxilliped of the same, greatly magnified.
 - 3 d. Leg of the first pair, greatly magnified.
 - 3 e. Terminal segment and uropoda, greatly magnified.

4. A few Remarks on Mr. Elliot's paper "On the Fruit-Pigeons of the Genus *Ptilopus*." By T. SALVADORI, C.M.Z.S.

[Received November 23, 1878.]

My friend Mr. Elliot, in his paper "On the Fruit-Pigeons of the Genus *Ptilopus*" (P. Z. S. 1878, pp. 500, 525) has requested that his conclusions should not be rejected or condemned until after the examination of materials at least approximating somewhat to that which he has consulted. I hope that he will allow that as regards Moluc-

can and Papuan species I have seen a good deal more than he has, and that I am not liable to the reproach of the Greek sculptor to the cobbler of Athens, "*Ne sutor ultra crepidam.*" Just for this reason I shall confine myself to some remarks on the Papuan and Moluccan species, leaving to somebody else to test Mr. Elliot's conclusions as to the species from other localities.

I shall follow Mr. Elliot's order.

18. PTILOPUS XANTHOGASTER.

I do not find among the synonyms the following:—*Ptilopus aurantiventris*, Rosenb. Tijdschr. Ned. Ind. xxix. p. 144 (1867); id. Reis. naar Zuidoostereil. pp. 81, 86 (1867).

The specimens from Lettie Island are smaller, with the head and the neck of a darker and less pure ashy white. Those from Koor are larger, with the neck whiter.

In the British Museum I examined a specimen marked Marianne Islands (!), smaller, but otherwise not different from those of the Ké Islands.

21. PTILOPUS SUPERBUS.

I have examined the type of *Lamprotreron porphyrostictus*, Gould; and there is not the least doubt that it is a female of this species.

As to the *habitat* of this species and of many others, I must make the remark that it is a pity Mr. Elliot has not mentioned the islands by groups; by mixing together Moluccan and Papuan islands he makes it very difficult to the reader to form a clear idea of the distribution of the species.

This bird has been found not only in the northern part of New Guinea, but also in the southern, on the Fly River and in Yule Island (*D'Albertis*).

22. PTILOPUS TEMMINCKI.

I did not made the mistake of calling this species *Megaloprepia formosa*. My *Megaloprepia formosa* (Ann. Mus. Civ. Gen. ix. p. 122) (1876) is the bird which Mr. Elliot calls *Ptilopus bernsteini*. Mr. Elliot might have perceived which was my bird from its *habitat*; and besides he knew very well that I was well acquainted with *P. temmincki*, as I suggested to him that this was the proper name for *Ptilopus formosus*, Gray.

24. PTILOPUS CORONULATUS.

The following important quotation is missing:—

Ptilonopus pulchellus, Wall. (nec Temm.), Ann. & Mag. Nat. Hist. (2) xx. p. 476 (1857), Aru.

This species is confined to the Aru Islands and to the southern part of New Guinea; the localities Salwatty and Sorong, and that of Jobie are wrong, and belong respectively to *P. trigeminus* and *P. geminus*. Ansus is not a distinct island, but a locality in the island of Jobie.

26. *PTILOPUS TRIGEMINUS*.

I question whether Mr. Elliot, who says that it may well be doubted if *P. trigeminus* should be separated from *P. geminus*, has ever seen a specimen of *P. trigeminus*. He says that the only difference is in the slightly paler crown. The case is quite the contrary. I have seen one specimen in the British Museum (Wallace's collection), most likely from Sorong, a second from Salwatty in Gould's collection, and many in the Museum of Leiden. They differ from *P. geminus* in the *brighter crown*, in the paler throat, in the saffron-colour round the violet spot of the abdomen being much reduced, and in the yellow of the lower part of the abdomen being less extended. In fact, as regards the pale violet crown, *P. trigeminus* is intermediate between *P. coronulatus* with a *bright violet crown*, and *P. geminus* with a pinkish, nearly white crown.

27. *PTILOPUS IOZONUS*.

The *habitat* of this species is the Aru Islands and *south* of New Guinea.

29. *PTILOPUS JOBIENSIS*.

The synonymy given is not exact; Mr. Rowley and I used the binomial name, and not a trinomial name like Schlegel.

This species, rather than approaching *P. humeralis*, is allied to *P. iozonus*, of which it is the northern representative. *P. humeralis* differs from both in the deep purple band on the small wing-coverts, whereas these both in *P. jobiensis* and *P. iozonus* are grey-violet; *P. jobiensis* differs from *P. jozonus* in having the tail above uniform green; in *P. iozonus* the tail has a very conspicuous apical grey band.

P. jobiensis lately has been found also in Tarawai or D'Urville Island (Atti R. Ac. Sc. Tor. xiii. p. 321).

31. *PTILOPUS NANUS*.

This species has been obtained by D'Albertis on the Fly River (Ann. Mus. Civ. Gen. ix. p. 43); and I think that it is confined to the south of New Guinea and Mysol.

32. *PTILOPUS MONACHUS*.

Mr. Elliot says that the birds from Ternate differ from those of Gilolo, and that the Gilolo bird may require separation. Mr. Gray in his 'Hand-list' had already mentioned that the specimens from Gilolo belong to a variety. I may say that I have seen many specimens from both localities, and that I have not been able to detect any real difference.

34. *PTILOPUS MELANOCEPHALUS*.

The locality Sula-bessie does not belong to this form, but to *P. chrysorrhous*.

I cannot offer any additional remark on the specimens from Flores (*P. melanauchen*, Salvad.); but I think that they belong to a form equivalent to *P. melanocephalus*, *P. melanospilus*, and *P. chrysorrhous*.

38. *PTILOPUS PORPHYREUS*.

This is not a Moluccan nor a Papuan species; still I may mention that, to avoid the confusion with *Columba porphyracea*, Temm. (1822), it would be better to call it *P. roseicollis*, Wagl. Besides Java it inhabits also Sumatra, as has been stated by Bonaparte. I have seen many skins from Sumatra, collected by Dr. Beccari.

42. *PTILOPUS ORNATUS*.

The authority of Laglaize for this species being found on Mount Arfak is not correct, as Mr. Laglaize was never there. Mr. Laglaize's specimens, which I have seen, are from Amberbaki, a locality far away from Mount Arfak.

44. *PTILOPUS PERLATUS*.

The locality Aru Islands does not belong to this species, but to *P. zonurus*. The two are representative forms, one living in Northern New Guinea, Jobie, and Salwatty, and the other in the Aru Islands and in the south of New Guinea, on the Fly River, where D'Alber-tis has lately collected several specimens entirely agreeing with those from the Aru Islands.

45. *PTILOPUS ZONURUS*.

Mr. Elliot could have added many quotations to the synonymy of this species; all the references to *P. perlatus* from the Aru Islands belong to it.

Beside the type, I have seen many specimens of this form from the Aru Islands and from the Fly River; and all of them show the grey band at the tip of the upper surface of the tail. *P. zonurus* has in that respect the same relation to *P. perlatus* that *P. iozonus* has to *P. jobiensis*. It is important to notice that *P. perlatus* and *P. jobiensis* are respectively the northern representative forms of *P. zonurus* and *P. iozonus*. Mr. Elliot's statement that *P. zonurus* is barely distinguishable from *P. perlatus* is rather inconsistent, after he has accepted as distinct *P. jobiensis* and *P. iozonus*, which differ exactly in the same particulars as *P. zonurus* from *P. perlatus*.

47. *PTILOPUS PECTORALIS*.

The synonymy of this species is not correct. Instead of *Columba virens*, Less. Voy. Coq. descr. ♀ [*sic*], it ought to be *Columba cyanovirens*, Less. Voy. Coq. Zool. i. 2, p. 713 (1828). The name of *C. cyanovirens* was given to the female of *P. superbus* and to the present species! It is important to notice the mistake, as, if Lesson had really named this species *C. virens*, this name would have had priority over that of *C. pectoralis*, Wagl. Isis, 1829, p. 739. From the localities Mr. Elliot has left out Koffiao (*Beccari*).

48. *PTILOPUS VIRIDIS*.

S. Müller and many others after him have said that this species is also found in New Guinea, near Lebo. But this is a mistake which has arisen from S. Müller having (*Verh. Land- en Volkenk.* p. 22) given the name of *Columba viridis* to a young specimen of *P. pectoralis*.