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REPORTS ON THE SCIENTIFIC RESULTS OF THE EXPEDITION TO THE TROPICAL PACIFIC, IN CHARGE OF ALEXANDER AGASSIZ, BY THE U. S. FISH COMMISSION STEAMER "ALBATROSS," FROM AUGUST, 1899, TO MARCH, 1900, COMMANDER JEFFERSON F. MOSER, U. S. N., COMMANDING.

XVI.

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XXVII.

THE SCHIZOPODA.

By H. J. HANSEN.

WITH TWELVE PLATES.

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Prof. H. NOUVEL



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INTRODUCTORY REMARKS.

THE collection dealt with in the present paper is extremely large, both as to the number of species, sixty-three, and especially as to the numbers of the specimens of the major part of the forms. A small portion of the material was captured by the late Alexander Agassiz near the Fiji Islands in 1897, a still smaller lot was secured during the trip of the "Albatross" in 1899-1900, but the vast majority has been collected by Dr. Agassiz in 1904-1905 in the Eastern Pacific. When we wish to get a closer insight into the whole topic it is, however, necessary to consider separately the two orders still not infrequently united under the name Schizopoda, viz. Mysidacea and Euphausiacea. And a comparison with the results of the exploration of the Dutch "Siboga" Expedition in the Indian Archipelago is interesting.

Of the order Mysidacea only twenty-three species are at hand, fifteen of which were secured in 1904-1905, while the remaining eight forms were exclusively gathered during the earlier trips just mentioned. Fifteen species in all from the Expedition in 1904-1905 is in reality a small number as compared with the number of species already known of this order. But the explanation of this fact is given below, and when we consider the order Euphausiacea the aspect is quite different. Of the last-named order the collection contains forty species, all with a single exception taken in 1904-1905 (some among them besides in 1899-1900 or off the Fiji Islands), but as only seventy-three species of this order are known from all seas, it will be seen that Dr. Agassiz during that single Expedition captured more than half of the world's fauna. The "Siboga" gathered only twenty-five species of Euphausiacea but no less than forty-seven species of Mysidacea. The explanation of this startling difference between the results of the Agassiz Expedition of 1904-1905 and the "Siboga" Cruise is that the Euphausiacea are nearly all true oceanic forms, while the majority of the Mysidacea either inhabit shallow water, or live pelagically, or not far from the bottom to a few hundred fathoms and within no very great distance from land. And while the "Siboga" in the main explored the straits and comparatively

smaller seas between the innumerable islands in the Indian Archipelago, the Agassiz Expedition of 1904-1905 had the great majority of its Stations in the open ocean and far from any coast.

On the Mysidacea at hand some remarks may be added. The eight species not captured in 1904-1905 are small, pelagic forms taken near, or at most only some miles from the coast; four among them are new, and one of these differs so much from earlier known forms that it was necessary to establish a new genus for its reception. Of the fifteen species taken in 1904-1905 four are new; three of these belong to well-known genera, while a new genus is established for the fourth. But by far the most important gain was the capture of *Chalaraspis alata* (Will.-Suhm, MS.) G. O. Sars. This genus as defined by Sars with its single species has been described by him from a couple of sketches drawn by Willemoës-Suhm during the "Challenger" Expedition, as the single specimen had been lost. The genus belongs to the interesting suborder Lophogastrida, comprising in all only six genera; the Agassiz Expedition secured some specimens of *Chalaraspis*, and among them an adult male, thus rendering it possible to give a detailed account of this hitherto rather enigmatic type.

The material of Euphausiacea is, as already stated, very rich, and besides it is important in various respects. Among its forty species six could not be referred to earlier established forms, but in a paper published in May, 1911,¹ I have given preliminary descriptions of these, and other, new species. Perhaps one might expect that the number of undescribed species had been considerably higher, but in the years 1905-1910 I had established a comparatively large number of species of this order on animals from the Atlantic or the Indian Archipelago; the major part of the species of the order have a very large or frequently even vast distribution, and consequently more than three fourths of the Euphausiacea from the East Pacific were known before from the Indian Archipelago ("Siboga") or from the Atlantic, or from both Oceans. But the collection made it possible to extend our knowledge of the distribution of the major part of the species very much; furthermore, as the material, of nearly all the new species, and besides of several earlier established but hitherto imperfectly known species, is rich and generally well preserved, it was possible to give a full account of these forms. And without entering into other points elucidated by the collection, for instance, the distribution of many of the species within the area explored, geographical variation of some forms, etc., another

¹ H. J. Hansen: The Genera and Species of the Order Euphausiacea, with Account of remarkable Variation. Bull. Mus. Océan. Monaco, No. 210.

consideration ought to be pointed out. In the Synopsis mentioned (1911) I set forth several reasons for the belief "that comparatively few, probably not a dozen, species in the oceans of the globe are still undiscovered." And if that view be correct it must be admitted that the results of the Agassiz exploration in 1904-1905 are as to this order of Crustacea wonderfully rich, because during that trip thirty-nine species were collected, thus a little more than half of the species hitherto known — and not far from half of the species really existing!—The collection contains besides a large number of larvae, of Euphausiacea, but on this topic it may be sufficient to refer to my remarks in the chapter on the larval stages (p. 283-294).

As to the classification of the Mysidacea and some characters in the Euphausiacea — especially the important copulatory organs of first pair of pleopods in the male — I may refer to the account in my paper on the "Siboga" Schizopoda frequently quoted on the following pages. Only a few points may be added. Recently I found that in some genera (Thysanopoda, Nematoscelis, and Nematobranchion) the maxillulae afford valuable specific characters or characters for groups of species belonging to the same genus, furthermore that in a few genera the maxillae show specific differences of some interest, finally that in the genus *Nematoscelis* the thoracic legs afford excellent characters for dividing the genus into two natural groups.— The nomenclature of the cephalothoracic appendages in the two orders is identical with that applied in the "Siboga" paper.

The geographical distribution of each species is mentioned. I have attempted in all cases to give a full abstract of all trustworthy statements in the literature, but as to several species of various genera (*Euphausia*, *Nematoscelis*, *Stylocheiron*) most of the earlier statements had to be discarded as the species in question were "collective." I have added a good many statements based on the material of the Copenhagen Museum, but do not think it well to insert still unpublished results based on collections to be reported on in the near future, namely those from the Swedish Antarctic Expedition, from the U. S. National Museum, etc.

And now I may express my deep regret that Dr. A. Agassiz did not live to see the publication of this paper, because it would certainly have been a satisfaction for that great explorer to see how rich his collection of these groups of Crustacea and especially of the oceanic Euphausiacea in reality was and how important it proved for the advancement of this branch of zoological science.

Finally I desire to render my sincere thanks to the authorities of the Museum of Comparative Zoölogy for their friendliness, and especially for allowing me to employ my two very able countrymen, Mr. T. N. Möller, the engraver, and Mr. J. Bech, the copper-plate printer, for the reproduction of my drawings.

Copenhagen, Sept. 18, 1911.

THE SCHIZOPODA.

I. THE ORDER MYSIDACEA.

A. SUBORDER LOPHOGASTRIDA.

CHALARASPIS WILLEMÖES-SUHM (1875).

Description.—Integument soft. Carapace thin, submembranaceous, without processes, anteriorly produced as a very broad but somewhat short frontal plate (Plate 1, fig. 1a), and with the postero-lateral rounded wings reaching to the end of the thorax or a little more backwards; the cervical groove very strong.

Eyes small, light reddish. Antennular peduncles (figs. 1a-1b) short and extremely thick; inner flagellum thin, about as long as the peduncle.—Antennal squama not jointed, with the outer margin serrate beyond the middle (fig. 1c).—Maxillulæ (fig. 1e) without palp and without setae or spines on the inner lobe.—Maxillæ (fig. 1f) somewhat reduced; the lobe from second (²) and third (³) joint distally rounded, undivided; the palp (p) very short, unjointed, and scarcely marked off; the exopod strongly developed, very broad.—Maxillipeds (fig. 1g) with the exopod about as long as the endopod, which distally is a little broader than in Lophogaster.

Gnathopods slightly shorter than the following pair of legs, shaped as in Lophogaster, with the seventh joint somewhat thick, a little curved, distally rounded, and strongly setose.—Legs somewhat slender, and the last pair (fig. 1i) considerably thinner than the first (fig. 1h) or second pair; claw long or very long, thin; exopod well developed in all pairs (the ovigerous female is unknown).

Sixth abdominal segment with two pairs of acute teeth from the lateral margin (fig. 1k), but the segment is not divided into two sections by any suture. Uropods with the endopod slightly overreaching the telson and a little longer than the exopod, which is not jointed towards the end (fig. 1l). Telson (fig. 1l) oblong-triangular, with the narrow end truncate, with lateral spines, and a couple of dorsal keels.

Remarks.—This genus is perhaps more allied and similar to Lophogaster M. Sars than to any other genus of the suborder; from the genus named it is, however, easily distinguished by the shape of the frontal plate, the reduced eyes, the less developed maxillæ, the long uropods, etc. As to the use of the

name *Chalaraspis* I follow Sars (Challenger Rept., p. 51). Willemoës-Suhm left two figures of a species to which he had given the name *Chalaraspis alata*. The only specimen obtained by the "Challenger" had been lost, and therefore Sars described the genus and the species from the drawings made by Suhm. The drawings have been rendered as woodcuts by Sars; they were evidently somewhat imperfect or inaccurate in several particulars. The figures show the animal as having the carapace exceedingly large, covering the two anterior abdominal segments and the lateral part of third segment. Among the "Albatross" material I found specimens agreeing tolerably with Suhm's figures in all main features excepting the relative length of the carapace, but as specimens of allied genera, *Gnathophausia* and *Eucopia*, sometimes are contracted to such a degree that the carapace covers two segments of the abdomen, no stress can be laid on the apparently very long carapace shown by Suhm's drawings, as his specimen in all probability has been very much contracted. And Sars's diagnosis of the genus agrees, so far as it goes, in the main with the description founded on my specimens.

1. *Chalaraspis alata* WILLEMOËS-SUHM, MS. G. O. SARS.

Plate 1, figs. 1a-11.

1885. *Chalaraspis alata* G. O. SARS, Challenger Rept., 13, p. 51. (Two text-figures).

Sta. 4665. Nov. 17, 1904. Lat. 11° 45' S., long. 86° 5.2' W. 300 fms. to surface. 1 very young specimen.

Sta. 4672. Nov. 21, 1904. Lat. 13° 11.6' S., long. 78° 18.3' W. Top of Tanner net, 400 fms. to surface. 2 immature specimens (bad).

Sta. 4675. Nov. 22, 1904. Lat. 12° 54' S., long. 78° 33' W. 300 fms. to surface. 1 immature specimen.

Sta. 4719. Jan. 14, 1905. Lat. 6° 29.8' S., long. 101° 16.8' W. 300 fms. to surface. 1 male.

Description.—General aspect somewhat similar to that of *Lophogaster*.—The frontal plate somewhat short but very broad, with the anterior transverse margin straight or even slightly emarginate and the lateral angles broadly rounded (figs. 1a-1b). The carapace has the cervical groove not only deep but very curiously shaped; seen from the side (fig. 1b) the groove seems to be formed by two transverse furrows which unite laterally, while the anterior furrow is again dorsally bifid; on the side the furrow is bent and is far from reaching the lower margin of the carapace. A little more than the anterior fourth of the lateral margin of the carapace is hollowed in a peculiar way, and somewhat above the whole lateral margin a furrow runs from near the front to the hind margin. Between the antero-lateral rounded angles of the frontal plate and the cervical groove a pair of feeble longitudinal keels are seen (fig. 1a), and the area between these keels is feebly concave; a branchial groove is feebly developed, and rarely the posterior third of the carapace has the middle line

distinctly keeled. The postero-lateral part of the carapace at each side is somewhat produced backwards and rounded as in *Eucopia*.

The eyes (fig. 1b, o.) are small, a little compressed, seen from above (fig. 1a) oblique-ovate, light reddish.—The antennular peduncles short and extremely thick; second joint with an oblong, slender, moderately short process on the outer side; third joint with the front margin projecting in an oblong, very acute process above the insertion of the upper flagellum and a somewhat similar process more downwards on the inner side of the joint; the upper flagellum thin, with numerous joints and about as long as the peduncle; lower flagellum very strong.—Last joint of the antennal peduncle with a small process on the outer side just below the insertion of the squama; the squama itself is a thin plate reaching somewhat beyond the end of the antennular peduncle, it is somewhat more than twice as long as broad (fig. 1c) with the inner margin very convex and setose, the outer margin a little bent angularly near or a little beyond the middle and its proximal part glabrous, the distal part serrate with 9–12 acute saw-teeth somewhat different in size.

The five anterior abdominal segments somewhat thick, dorsally flatly convex, and some among them even with a small, a little excavated dorsal area; lateral plates of the anterior segments rounded, on fifth, and sometimes on fourth, segment the postero-lateral angle is produced in a tiny or small, acute tooth. Sixth segment about as long as the fifth, with two pairs of obliquely transverse, somewhat short and shallow furrows; the two pairs of lateral teeth very acute. The uropods (fig. 1l) with the endopods slightly overreaching the telson and a little longer than the exopod, which has the end truncate and three or four faint serrations along the outer margin. Telson (fig. 1l) very oblong-triangular, scarcely three times as long as broad, above with a pair of high, longitudinal, very feebly serrate keels a little from the lateral margins, and the area between these keels excavated longitudinally; the distal half of each lateral margin with 5 or 6 spines; the end of the telson truncate, but hairs or spines wanting — perhaps lost? — in the specimens.

Length of the largest specimen, a probably adult male, 35 mm.

Remarks.— I do not entertain the slightest doubt that the species described here is *C. alata*. And I think it very important that it has been possible to fill the gap in our knowledge of the only hitherto imperfectly studied genus of the small but highly interesting suborder Lophogastrida.

Distribution.— The "Challenger" specimen was taken in the South Pacific: "lat. 50° 1' S., long. 123° 4' E.; depth, 1800 fathoms." It is certainly a bathypelagic form.

GNATHOPHAUSIA WILLEMOËS-SUHM (1875).

The material is scanty, consisting of seven specimens belonging to three well-known species.

2. *Gnathophausia ingens* (DOHRN).

1870. *Lophogaster ingens* DOHRN, Zeitschr. wiss. Zool., 20, p. 610; taf. 31, figs. 12-14.

1885. *Gnathophausia ingens* G. O. SARS, Challenger Rept., 13, p. 30, pl. 2.

— *Gnathophausia calcarata* G. O. SARS, Challenger Rept., 13, p. 35, pl. 4.

1891. *Gnathophausia bengalensis* WOOD-MASON, Ann. Mag. Nat. Hist., ser. 6, 8, p. 269.

1906. *Gnathophausia ingens* ORTMANN, Proc. U. S. Nat. Mus., 31, p. 28.

— *Gnathophausia calcarata* ORTMANN, Proc. U. S. Nat. Mus., 31, p. 30, pl. 1, figs. 2a, 2b.

Sta. 3681. Aug. 27, 1899. Lat. 28° 23' N., long. 126° 57' W. 350 fms. to surface. 1 specimen.

Remarks.—The specimen, which measures about 68 mm., agrees well with Ortmann's description of *G. calcarata* G. O. S. Dr. A. Alcock kindly sent me Wood-Mason's type of *G. bengalensis* and I can confirm Ortmann's interpretation that it is identical with *G. calcarata*. Wood-Mason said that "the upper lateral keels are strongly roof-shaped," but Ortmann was unable to understand the meaning of this sentence; I suppose, however, that Wood-Mason intended to say that the keels in question protrude laterally as eaves above the vertical sides of the carapace, when this is seen from behind or in an optic transverse section.

Ortmann (l. c., p. 28-30 and p. 34) was of the opinion that *G. ingens* (Dohrn) G. O. Sars, is the full-grown female of *G. calcarata* (Will.-Suhm, MS.) G. O. S., and I am able to add three points corroborating his view. I examined Sars's "Challenger" specimens of *G. ingens* (Dohrn) in the British Museum and found that it possessed the two pairs of oblique keels on the upper surface of the carapace, these keels being even well developed and completely similar to those on the type of *G. calcarata*; Ortmann rightly supposed that these keels had been overlooked by Dohrn and Sars. Furthermore Sars's figure of the ventral epimeral plates of the sixth abdominal segment in *G. ingens* is incorrect; the slit between the two posterior lobes of the plate is longer and narrower in proportion to the breadth of the lobes than in his fig. 6 (Pl. II), and, what is of more importance, each lobe has its outer terminal angle produced into a somewhat short, pointed tip, while the inner terminal angle at the slit is acute but very slightly produced, thus situated somewhat in front of the outer tip and shaped about as in *G. calcarata*, but differing notably from Sars's fig. 6 of *G. ingens*. Finally Sars says in the diagnosis of *G. ingens*: "branchiostegal spines obsolete," but he overlooked that these spines had been broken off in his specimen. I think one is now justified in adopting Ortmann's supposition and may safely take the step to withdraw *G. calcarata*, considering it only as a synonym.

Distribution.—According to the literature this species is known from off the West coast of Africa, "Laos," from the Gulf of Mexico, the Bay of Bengal, the Arafura Sea, South of Mindanao, the Hawaiian Islands, and is common in the California region in the East Pacific.

3. *Gnathophausia gracilis* WILLEMÖES-SUHM.

1875. *Gnathophausia gracilis* WILLEMÖES-SUHM, Trans. Linn. Soc. London, ser. 2, 1, p. 33, pl. 9, fig. 1.
 1885. *Gnathophausia gracilis* G. O. SARS, Challenger Rept., 13, p. 48, pl. 7, figs. 6–10.
 1891. *Gnathophausia brevispinis* WOOD-MASON & ALCOCK, Ann. Mag. Nat. Hist., ser. 6, 7, p. 269.
 1895. *Gnathophausia brevispinis* FAXON, Mem. Mus. Comp. Zool., 18, p. 216, pl. J.
 1906. *Gnathophausia gracilis* ORTMANN, Proc. U. S. Nat. Mus., 31, p. 39.

- Sta. 4651. Nov. 11, 1904. Lat. 5° 47.1' S., long. 82° 59.7' W. 2222 fms., trawl. 1 specimen.
 Sta. 4652. Nov. 11, 1904. Lat. 5° 44.7' S., long. 82° 39.5' W. 400 fms. to surface. 1 small specimen.
 Sta. 4656. Nov. 13, 1904. Lat. 6° 54.6' S., long. 83° 34.3' W. 2222 fms., trawl. 1 specimen.
 Sta. 4709. Dec. 30, 1904. Lat. 10° 15.2' S., long. 95° 40.8' W. 2035 fms., trawl. 1 specimen.
 Sta. 4715. Jan. 2, 1905. Lat. 2° 40.4' S., long. 90° 19.3' W. On way up from 1743 fms. 1 specimen.

Remarks.—The largest specimen, a male from Sta. 4709, is 69 mm. long; a female with the marsupium well developed (from Sta. 4656) is 65 mm. long, and another female with marsupium (from Sta. 4715) is 62 mm. These three large specimens have on the gastric area an oblong, rather high, lamellar, sub-triangular, dentate crest terminating in a spiniform process; besides they have the lateral plates of the five anterior abdominal segments expanded posteriorly; the expansion of the plates of first segment is small in the two females, moderately large in the male, and the expansions increase in all three specimens gradually and considerably in size from first to fourth segment, while those of the fifth segment are somewhat smaller. In the smallest specimen, measuring 25 mm., the anterior dorsal spine on first abdominal segment is extremely small, the lateral plates of the abdominal segments are not expanded posteriorly, and the lamellar crest on the gastric area is rudimentary with a small spine above; in the fifth specimen, which is 37 mm. long, the last-named lamellar crest is developed nearly as in the large specimens, but the lateral plates of the second to the fifth abdominal segments are very feebly expanded.

I have examined the type-specimen of Willemöes-Suhm and G. O. Sars; it measures 41 mm. and is preserved in the British Museum. It has on the gastric region a small, oblong, triangular, lamellar plate with a spine on the vertex and a little farther behind there are four small saw-like teeth in a longitudinal row; furthermore the lateral plates of the abdominal segments are feebly expanded nearly as in the above mentioned specimen measuring 37 mm. Dr. Alcock loaned me the type of *G. brevispinis*, and an examination gave the

result that it is identical with *G. gracilis* Will.-Suhm, as already pointed out by Ortmann.

Ortmann's elaborate account of this characteristic species is very good; my own examination of the types corroborates his statements and critical remarks. The study of the five specimens from the Agassiz collection and the two types mentioned shows that the lamellar crest is well developed both in full-grown and a little more than half-grown specimens, but rudimentary in a much smaller specimen, while the expansion of the lateral plates of the five abdominal segments is well developed only in full-grown specimens and feebly developed in specimens measuring 37-41 mm. in length. It may be added that the anterior dorsal spiniform process on first abdominal segment is always much smaller than the posterior, but proportionately considerably longer in large than in small specimens. The character pointed out by Ortmann that "there are two triangular, pointed epimeral lappets on each side of the anterior part of the sixth segment" is very interesting.

Distribution.—According to the literature this species has a wide distribution:—Atlantic at Lat. 1° 22' N., long. 26° 36' W., Bay of Bengal, off Galapagos, off Panama, and off Central California. It is a bathypelagic species, taken in depths from more than 600 to more than 2000 fathoms to surface, the only exception being the small, not half grown specimen from Sta. 4652 taken in 400 fathoms to surface.

4. *Gnathopausia zoëa* WILLEMOËS-SUHM.

1875. *Gnathopausia zoëa* WILLEMOËS-SUHM, Trans. Linn. Soc. London, ser. 2, 1, p. 32, pl. 9, figs. 2-15; pl. 10, fig. 4.
 1885. *Gnathopausia zoëa* G. O. SARS, Challenger Rept., 13, p. 44, pl. 6, figs. 6-10.
 — *Gnathopausia willemoesii* G. O. SARS, Challenger Rept., 13, p. 38, pl. 5, figs. 1-6.
 1891. *Gnathopausia sarsi* WOOD-MASON and ALCOCK, Ann. Mag. Nat. Hist., ser. 6, 7, p. 187.
 1906. *Gnathopausia zoëa* ORTMANN, Proc. U. S. Nat. Mus., 21, p. 42.
 1908. *Gnathopausia zoëa* H. J. HANSEN, The Danish Ingolf-Exp., 3, 2, p. 93, pl. 4, figs. 3a-3c.
 1910. *Gnathopausia zoëa* H. J. HANSEN, Siboga-Exp., 37, p. 17.
 Sta. 4641. Nov. 7, 1904. Lat. 1° 34.4' S., long. 89° 30.2' W. 633 fms., trawl. 1 specimen.

Remarks.—As to variation, size, etc., of this species I refer to Ortmann's paper and to the remarks in my two recent treatises. The specimen from the Agassiz Expedition is about half grown and shows nothing of interest.

Distribution.—This species is common in the tropical and northern temperate Atlantic, where it is found northwards even to West of Iceland: Lat. 64° 45' N., long. 29° 06' W. (Ingolf-Exp.); it has been taken in the Bay of Bengal, in the Indian Archipelago, and is widely distributed in the tropical and northern temperate Pacific. Detailed statements on the geographical and bathymetrical occurrence are found in Ortmann's paper and in my two recent reports.

EUCOPIA DANA (1852).

The genus comprises four species, three of which are represented in this collection. In the account of the "Siboga" Schizopoda I have given an analytical key to the species and have dealt with the synonymy.

5. *Eucopia unguiculata* (WILLEMOËS-SUHM).

1875. *Chalaraspis unguiculata* WILLEMOËS-SUHM, Trans. Linn. Soc. London, ser. 2, 1, p. 37-40, pl. 8 (partim).
 1905. *Eucopia unguiculata* H. J. HANSEN, Bull. Mus. Océan. Monaco, no. 42, p. 3.
 1910. *Eucopia unguiculata* H. J. HANSEN, Siboga-Exp., 37, p. 20, pl. I, fig. 3a.

In this list I do not include Sars's account of his *Eucopia australis* Dana in the "Challenger" Rept., p. 55, pls. 9-10, because he, as pointed out in the "Siboga" paper, has confused three species, viz. *E. australis* Dana with figs. 1-2 on his pl. 9, *E. sculpticauda* Faxon, to which his figures 13-17 on pl. 10 belong, and *E. unguiculata* Will.-Suhm, to which at least the majority of his other figures belong.

- Sta. 4646. Nov. 8, 1904. Lat. 4° 1.6' S., long. 89° 16.3' W. 300 fms. to surface. 1 specimen.
 Sta. 4650. Nov. 10, 1904. Lat. 5° 22' S., long. 84° 39' W. 300 fms. to surface. 1 specimen.
 Sta. 4652. Nov. 11, 1904. Lat. 5° 44.7' S., long. 82° 39.5' W. 400 fms. to surface. 1 specimen.
 Sta. 4655. Nov. 12, 1904. Lat. 5° 57.5' S., long. 80° 50' W. 400 fms. to surface. 1 specimen.
 Sta. 4664. Nov. 17, 1904. Lat. 11° 30.3' S., long. 87° 19' W. 300 fms. to surface. 1 specimen.
 Sta. 4667. Nov. 18, 1904. Lat. 11° 59.5' S., long. 83° 40.4' W. 300 fms. to surface. 5 specimens.
 Sta. 4668. Nov. 19, 1904. Lat. 12° 9.3' S., long. 81° 45.2' W. Bottom of Tanner net, 300 fms. 1 specimen.
 Sta. 4669. Nov. 19, 1904. Lat. 12° 12.7' S., long. 80° 25.6' W. 300 fms. to surface. 6 specimens.
 Sta. 4671. Nov. 20, 1904. Lat. 12° 6.9' S., long. 78° 28.2' W. 300 fms. to surface. 8 specimens.
 Sta. 4672. Nov. 21, 1904. Lat. 13° 11.6' S., long. 78° 18.3' W. 400 fms. to surface, Tanner net, closed bottom. 1 specimen.
 Sta. 4676. Dec. 5, 1904. Lat. 14° 28.9' S., long. 81° 24' W. 300 fms. to surface. 3 specimens.
 Sta. 4679. Dec. 7, 1904. Lat. 17° 26.4' S., long. 86° 46.5' W. 300 fms. to surface. 1 specimen.
 Sta. 4716. Jan. 2, 1905. Lat. 2° 18.5' S., long. 90° 2.6' W. 600 fms. to surface. 1 specimen.

Remarks.—The largest specimen, an adult male from Sta. 4676, measures 33 mm. in length, and is thus uncommonly large; the largest female with marsupium, from Sta. 4655, is 32 mm. long.

Distribution.—The species is common in the Western Mediterranean and the northern temperate Atlantic and extends far northwards, as it has been taken in the Davis Straits at Lat. 61° 50' N. and West of Iceland at Lat. 64° 38' N., long. 32° 37' W. (Ingolf-Exp.). It is known from some localities in the Indian Archipelago; as shown above, it is not uncommon in a good portion South of Lat. 4° S. of the area explored in 1904-1905, and it is probably widely distributed in the tropical and temperate Pacific; Ortmann (1906) records a specimen from

North Coronado Island, California. Its distribution southward in the three large Oceans is still unknown. The majority of the localities enumerated in the literature by the authors until July 1905 for *E. australis* Dana certainly belong to *E. unguiculata*, but some among them to *E. major* or *E. australis*, and all specimens referred before July 1895 to *E. australis* should be reexamined. The real *E. australis* Dana is a very large Antarctic species. The species has, as far as I know, never been taken near the surface.

6. *Eucopia major* H. J. HANSEN.

1910. *Eucopia major* H. J. HANSEN, Siboga-Exp., 37, p. 21, pl. 1, figs. 4a-4b.

Sta. 4645. Nov. 8, 1904. Lat. 3° 37.6' S., long. 89° 43.1' W. 1955 fms., trawl. 1 specimen (only a fragment).

Sta. 4651. Nov. 11, 1904. Lat. 5° 41.7' S., long. 82° 59.7' W. 2222 fms., trawl. 2 specimens.

Sta. 4742. Feb. 15, 1905. Lat. 0° 3.4' N., long. 117° 15.8' W. 2320 fms., trawl. 1 specimen.

Remarks.— This species was established on a badly preserved female with marsupium secured by the "Siboga" and measuring 42 mm. in length. The specimens from the Pacific are also badly preserved; a male, from Sta. 4651, is 58 mm. long, and a female, from Sta. 4742, with the marsupial plates perhaps not fully developed is even about 60.5 mm. But I am inclined to think that these specimens had been a little shorter in the living state than in their present bad and seemingly extended condition.

The species is easily separated from *E. unguiculata* by its much larger size, the largest specimen recorded of the last-named species was only 38 mm., and especially by having its short eyes looking forwards, occupying less than one fourth of the outer margin of the whole appendage (stalk + cornea), while in *E. unguiculata* the cornea looks in the main outwards and occupies more than one third, frequently about two fifths, of the same outer margin. *E. major* is readily distinguished from *E. australis* Dana by having the terminal joint of the exopod of the uropods distinctly broader than long, while in *E. australis* it is longer than broad; besides the eye-stalks are proportionately longer and narrower in *E. australis* than in *E. major*.

Distribution.— A single specimen was captured in the Indian Archipelago by the "Siboga," and in 1910 some specimens were secured by the Prince of Monaco in the Atlantic West of Southern Spain. In 1906 Ortmann enumerated six localities in the North Pacific northwards to Lat. 56° 12' N. and one locality in the West Indies for *E. australis*, but as *E. australis* Dana is an Antarctic species his determinations cannot be correct. As he had separated *E. unguiculata* from his *E. australis* I think that the specimens from his seven

localities belong either all to *E. major* or some to *E. major* and others either to a hitherto undescribed species or that they are young specimens of *E. sculpticauda* Faxon.

7. *Eucopia sculpticauda* FAXON.

1893. *Eucopia sculpticauda* FAXON, Bull. Mus. Comp. Zoöl., **24**, p. 218.
 1895. *Eucopia sculpticauda* FAXON, Mem. Mus. Comp. Zoöl., **18**, p. 219, pl. K, figs. 2, 2d; pl. 53, figs. 1-1d.
 1905. *Eucopia intermedia* H. J. HANSEN, Bull. Mus. Océan. Monaco, no. 30, p. 5, figs. 2-3. (Young).
 1905. *Eucopia sculpticauda* H. J. HANSEN, Bull. Mus. Océan. Monaco, no. 30, p. 6-7; fig. 4.
- Sta. 4645. Nov. 8, 1904. Lat. 3° 37.6' S., long. 89° 43.1' W. 1955 fms., trawl. 1 adult female.
 Sta. 4648. Nov. 9, 1904. Lat. 4° 43' S., long. 87° 7.5' W. 300 fms. to surface. 1 young specimen.
 Sta. 4652. Nov. 11, 1904. Lat. 5° 44.7' S., long. 82° 39.5' W. 400 fms. to surface. 4 specimens (1 female with marsupium, 3 young specimens).
 Sta. 4657. Nov. 13, 1904. Lat. 7° 12.5' S., long. 84° 9' W. 300 fms. to surface. 2 young specimens.
 Sta. 4664. Nov. 17, 1904. Lat. 11° 30.3' S., long. 87° 19' W. 300 fms. to surface. 2 young specimens.
 Sta. 4667. Nov. 18, 1904. Lat. 11° 59.5' S., long. 83° 40.4' W. 300 fms. to surface. 1 young specimen.
 Sta. 4676. Dec. 5, 1904. Lat. 14° 28.9' S., long. 81° 24' W. 300 fms. to surface. 1 young specimen.
 Sta. 4715. Jan. 2, 1905. Lat. 2° 20.4' S., long. 90° 19.3' W. 300 fms. to surface. 1 young specimen.
 Sta. 4721. Jan. 15, 1905. Lat. 8° 7.5' S., long. 104° 10.5' W. 2084 fms., trawl. 2 adult females.
 Sta. 4724. Jan. 17, 1905. Lat. 11° 13.4' S., long. 109° 39' W. 1841 fms., trawl. 1 adult female.

Remarks.—As already mentioned in the "Siboga" paper *E. intermedia* is only the young, differing from large or adult specimens in having the telson scarcely or not at all constricted a little before the tip and without any network of ridges on a portion of its surface, furthermore by having the first pair of thoracic legs somewhat less thick than in the adult, but yet much thicker than in the three other species of the genus.

As seen in the list, five females with marsupium have been captured. The smallest female (from Sta. 4652) is only 30 mm. long, the largest (from Sta. 4724) is 49 mm., the three other respectively 31.6 mm., 34.5 mm. and 36.5 mm. Faxon has mentioned a female measuring 66 mm. in length.

Distribution.—Faxon established *E. sculpticauda* on some specimens from the tropical Pacific (the Galapagos, the Gulf of Panama, off Central America); Ortmann (1905) enumerated two specimens from the Hawaiian Islands. It has been taken by the "Investigator" in the Bay of Bengal, by the Prince of Monaco in various places within the triangular area between Gibraltar, the Azores, and the Canary Islands; finally West of the Hebrides and Southwest of Iceland at Lat. 62° 25' N., long. 28° 30' W. (Ingolf-Exp.).

It is interesting that all the specimens captured by the "Albatross" at the six Stations in depths from 300 fms. to surface are not full grown, while one adult female is from 400 fms. to surface and the four other adult females from much greater depths to surface. This seems to confirm my observations

as to *Gnathopausia zoëa* Will.-Suhm, *Sergestes arcticus* Kr., and *Sergestes robustus* Smith, "that small specimens are often at least found nearer the surface than the larger and that the wholly developed specimens are always only met with in deeper layers."

B. SUBORDER MYSIDA.

BOREOMYSIS G. O. Sars (1869).

8. *Boreomysis media*, sp. nov.

Plate 1, figs. 2a-2b.

Sta. 4652. Nov. 11, 1904. Lat. 5° 44.7' S., long. 82° 39.5' W. 400 fms. to surface. 1 adult female (Type).

Sta. 4655. Nov. 12, 1904. Lat. 5° 57.5' S., long. 80° 50' W. 400 fms. to surface. 1 adult female.

Sta. 4675. Nov. 22, 1904. Lat. 12° 54' S., long. 78° 33' W. 300 fms. to surface. 1 adult female.

Description.—Frontal plate very considerably produced (fig. 2a), with the transition between the front margin and the oblique lateral margin considerably curved; the front margin is produced in a conspicuous, triangular, acute rostrum. Eyes of very moderate size, brownish, somewhat depressed, scarcely as broad as the end of the stalk, which is a little broader than long and with a triangular process of moderate size on the upper surface. The antennal squama somewhat short, only three times as long as broad, with the outer margin nearly straight, the inner considerably convex and the end scarcely more than half as broad as the squama a little behind the middle; the terminal margin somewhat oblique and the outer tooth very distinct.

Exopod of uropods (fig. 2b) eight times as long as broad, with a couple of spines placed a little beyond the end of the proximal sixth of the outer margin. Telson scarcely three times as long as broad, because its proximal third is very broad; from the end of that third the telson tapers strongly to the beginning of the distal fourth, where it is narrow, only two fifths as broad as at the base; its terminal fourth widens feebly to the end; the incision, which occupies one fifth or one sixth of the whole length, has no angles on its margins and its proximal part is shaped as a triangle with its two sides a little convex. Each lateral margin from the end of the proximal third to near the distal end is furnished with about 10-11 moderately small spines and 18-20 very small spines, the latter regularly arranged between the former and generally two small spines in each interval (fig. 2b, a); along the distal part of the margin the spines are more equal in size, small.

Length of a female with marsupium (from Sta. 4652) 19.5 mm.

Remarks.—This species is allied to *B. sibogae* H. J. H., but differs especially in having the antennal squama conspicuously broader with the end oblique and the inner margin more convex; furthermore, the telson is distally much narrower and the incision conspicuously shorter than in *B. sibogae*.

9. *Boreomysis fragilis*, sp. nov.

Plate 1, fig. 3a; Plate 2, fig. 1a.

- Sta. 4650. Nov. 10, 1904. Lat. 5° 22' S., long. 84° 39' W. 300 fms. to surface. 3 specimens.
 Sta. 4652. Nov. 11, 1904. Lat. 5° 44.7' S., long. 82° 39.5' W. 400 fms. to surface. 1 specimen.
 Sta. 4655. Nov. 12, 1904. Lat. 5° 57.5' S., long. 80° 50' W. 400 fms. to surface. 1 adult female.
 Sta. 4671. Nov. 20, 1904. Lat. 12° 6.9' S., long. 78° 28.2' W. 300 fms. to surface. 1 specimen.
 Sta. 4676. Dec. 5, 1904. Lat. 14° 28.9' S., long. 81° 24' W. 300 fms. to surface. 1 specimen.
 Sta. 4679. Dec. 7, 1904. Lat. 17° 26.4' S., long. 86° 46.5' W. 300 fms. to surface. 2 adult specimens, male (Type) and female.

Description.—Frontal plate considerably produced, subtriangular (fig. 3a), with the lateral margins very feebly convex and a little concave in front at the rostral process, which is triangular, acute, and bent a little upwards. Eyes very small, reddish brown, looking forwards and especially downwards, only a narrow strip being visible from above; the eye-stalks increase somewhat in breadth from the base outwards and are somewhat longer, measured from the middle of the terminal margin, than broad; at the upper inner angle produced into an oblong-triangular process reaching considerably beyond the cornea.

The antennal squama is somewhat less than four times as long as broad, broadest somewhat before the middle and there almost twice as broad as at the end; the outer margin is feebly concave, the terminal margin oblique, and the outer tooth very distinct.

Exopod of the uropods (fig. 1a) seven times as long as broad, with a couple of fine spines on the outer margin at the end of its naked basal fifth. Telson proportionately broad, scarcely more than three times as long as broad, but at the beginning of its terminal fourth only about two fifths as broad at a little from the base; the terminal incision, which occupies about one fifth of the total length, has its proximal portion triangular and a little acuminate, while the major part of the lateral margins of the incision are more or less distinctly diverging. The lateral margins of the telson are furnished with a moderately small number of spines; seven or eight at each side are somewhat small but yet considerably or much longer than the others which are very or extremely small.

In the adult male the exopod of third pair of pleopods is about half as long again, the exopod of second pair about one third as long again, as the endopod.

Length of the male 12 mm., of a female with marsupium 13 mm.

Remarks.— This small species is allied to *B. microps* G. O. Sars, but differs especially in having the process at the end of the eye-stalks very much larger and the longer lateral spines on the telson much shorter than in the last-named species. The integuments are thin; not a single specimen is really well preserved, and the majority a good deal mutilated and somewhat shrivelled; most of them are besides immature or small.

It may be mentioned that a small, oblong ganglion is found at the base of the process on the eye-stalks; this ganglion is connected with the large optic ganglion by a couple of nerve fibres, and from it a fibre runs towards the end of the process, which probably may have some sensory function.

SIRIELLA DANA (1850).

Of this very large genus four species are at hand, three of which were taken in 1904–1905, and a fourth in 1900.

10. *Siriella thompsonii* (H. MILNE EDWARDS).

1837. *Cynthia thompsonii* H. MILNE EDWARDS, Hist. Nat. Crust., 2, p. 462.
 1852. ?*Siriella vitrea* DANA, U. S. Expl. Exp. Crust., 1, p. 656, pl. 43, figs. 6a–6m.
 — ?*Siriella brevipes* DANA, U. S. Expl. Exp. Crust., 1, p. 658, pl. 44, figs. 1a–1q.
 1861. *Cynthia inermis* KRÖYER, Nat. Tidsskr., 3, R. 1, p. 44, tab. 2, fig. 6, a–g.
 1868. *Siriella edwardsii* CLAUS, Zeitschr. wiss. Zool., 17, p. 271, taf. 18.
 1882. *Siriellides indica* CZERNIAVSKY, Mon. Mysid., 1, p. 103, tab. 31, figs. 1–6.
 1885. *Siriella thompsoni* G. O. SARS, Challenger Rept., 13, p. 205, pl. 36, figs. 1–24.
 1910. *Siriella thompsonii* H. J. HANSEN, Siboga-Exp., 37, p. 31 (with further notes on synonymy).
- Sta. 4571. Oct. 7, 1904. Lat. 33° 40' N., long. 119° 35' W. 4 fms., surface net. 2 specimens.
 Sta. 4576. Oct. 8, 1904. Lat. 29° 52' N., long. 116° 56' W. Surface. 1 specimen.
 Sta. 4611. Oct. 18, 1904. Lat. 10° 33' N., long. 88° 30' W. Surface. More than 30 specimens.
 Sta. 4615. Oct. 19, 1904. Lat. 9° 7' N., long. 85° 11' W. Surface. 2 specimens.
 Sta. 4617. Oct. 20, 1904. Lat. 7° 45' N., long. 82° 25' W. Surface. 1 specimen.
 Sta. 4619. Oct. 20, 1904. Lat. 7° 15' N., long. 82° 8' W. Surface. 2 specimens.
 Sta. 4635. Nov. 4, 1904. Lat. 3° 52.5' N., long. 84° 14.3' W. Surface. 3 specimens.
 Sta. 4640. Nov. 6, 1904. Lat. 0° 39.4' S., long. 88° 11' W. Surface. 1 specimen.
 Sta. 4646. Nov. 8, 1904. Lat. 4° 1.6' S., long. 89° 16.3' W. Surface. 1 specimen.
 Sta. 4648. Nov. 9, 1904. Lat. 4° 43' S., long. 87° 7.5' W. Surface. 1 specimen.
 Sta. 4667. Nov. 18, 1904. Lat. 11° 59.5' S., long. 83° 40.4' W. Surface. 1 specimen.
 Sta. 4671. Nov. 20, 1904. Lat. 12° 6.9' S., long. 78° 28.2' W. Surface. 3 specimens.
 Sta. 4677. Dec. 5, 1904. Lat. 14° 37.5' S., long. 81° 41' W. Surface. 1 specimen.
 Sta. 4678. Dec. 6, 1904. Lat. 16° 31.2' S., long. 85° 3.8' W. Surface. 1 specimen.
 Sta. 4680. Dec. 7, 1904. Lat. 17° 55' S., long. 87° 42' W. Surface. 13 specimens.
 Sta. 4682. Dec. 8, 1904. Lat. 19° 7.6' S., long. 90° 10.6' W. Surface. 2 specimens.
 Sta. 4683. Dec. 9, 1904. Lat. 20° 2.4' S., long. 91° 52.5' W. 300 fms. to surface. 1 specimen.
 Sta. 4685. Dec. 10, 1904. Lat. 21° 36.2' S., long. 94° 56' W. 300 fms. to surface. 2 specimens.
 Sta. 4686. Dec. 10, 1904. Lat. 22° 2.2' S., long. 95° 52' W. Surface. 2 specimens.
 Sta. 4688. Dec. 11, 1904. Lat. 23° 17.2' S., long. 98° 37.5' W. Surface. 3 specimens.
 Sta. 4692. Dec. 13, 1904. Lat. 25° 40.4' S., long. 104° 1.3' W. Surface. 1 specimen.
 Sta. 4694. Dec. 22, 1904. Lat. 26° 34' S., long. 108° 57.3' W. Surface. 4 specimens.

Sta. 4695.	Dec. 23, 1904.	Lat. 25° 22.4' S., long. 107° 45' W.	300 fms. to surface. 2 specimens.
Sta. 4696.	Dec. 23, 1904.	Lat. 24° 40.3' S., long. 107° 5.3' W.	Surface. 7 specimens.
Sta. 4698.	Dec. 24, 1904.	Lat. 22° 50.4' S., long. 105° 31.7' W.	Surface. 1 specimen.
Sta. 4700.	Dec. 25, 1904.	Lat. 20° 28.8' S., long. 103° 26.3' W.	Surface. 5 specimens.
Sta. 4702.	Dec. 26, 1904.	Lat. 18° 39.5' S., long. 102° W.	Surface. 1 specimen.
Sta. 4704.	Dec. 27, 1904.	Lat. 16° 55.3' S., long. 100° 24.6' W.	Surface. 1 specimen.
Sta. 4706.	Dec. 28, 1904.	Lat. 14° 18.7' S., long. 98° 45.8' W.	Surface. 1 specimen.
Sta. 4709.	Dec. 30, 1904.	Lat. 10° 15.2' S., long. 95° 40.8' W.	300 fms. to surface. 1 specimen.
Sta. 4710.	Dec. 30, 1904.	Lat. 9° 30.5' S., long. 95° 8.3' W.	Surface. 1 specimen.
Sta. 4712.	Dec. 31, 1904.	Lat. 7° 5' S., long. 93° 35.5' W.	Surface. 11 specimens.
Sta. 4718.	Jan. 13, 1905.	Lat. 5° 32.4' S., long. 90° 32.2' W.	Surface. 1 specimen.
Sta. 4720.	Jan. 14, 1905.	Lat. 7° 13.3' S., long. 102° 31.5' W.	Surface. 1 specimen.
Sta. 4723.	Jan. 16, 1905.	Lat. 10° 14.3' S., long. 107° 45.5' W.	Surface. 14 specimens.
Sta. 4725.	Jan. 17, 1905.	Lat. 11° 38.3' S., long. 110° 5' W.	Surface. 7 specimens.
Sta. 4727.	Jan. 18, 1905.	Lat. 13° 03' S., long. 112° 44.9' W.	Surface. 12 specimens.
Sta. 4729.	Jan. 19, 1905.	Lat. 14° 15' S., long. 115° 13' W.	Surface. 6 specimens.
Sta. 4741.	Feb. 11, 1905.	Lat. 8° 29.7' S., long. 122° 56' W.	Surface. 1 specimen.

Remarks.—Adult specimens of both sexes vary extremely in length. The smallest female with marsupium (from Sta. 4702) is 4.4 mm. long, another female (from Sta. 4696) scarcely 4.5 mm., while the largest female (from Sta. 4680) is 9.6 mm. from the end of the frontal plate to the tip of the telson. One of the smallest males (from Sta. 4678) is 6.6 mm., and the largest male (from Sta. 4677) is 9.8 mm. The number of spines on the distal part of the outer margin of first joint of the exopod of the uropods varies from 3 to 6.

Three females from Sta. 4727, two from Sta. 4680, and one female from Sta. 4611 and from Sta. 4671, have an Epicarid, probably *Dajus siriellae* G. O. Sars, in the marsupium.

Distribution.—According to the literature and the collections seen by me this species is widely distributed in the tropical and warmer temperate areas of the Atlantic, the Indian Ocean, and the Pacific; the Copenhagen Museum possesses specimens from about fifty places in these Oceans. In the Atlantic it has been taken northwards to Lat. 42° N., long. 44° W., southwards to Lat. 40° 32' S., long. 52° 2' W., in the Indian Ocean southwards to Lat. 40° 4' S., long. 53° 25' E. (specimens from these three localities in the Copenhagen Museum); in the Pacific it was taken at Lat. 33° 40' N. in 1904, and southwards it is known from a point between Sidney and Wellington (G. O. Sars). It has generally been captured at the surface; I am even inclined to think that the specimens from the three Stations named above from "300 fms. to surface" were taken near the surface.

11. *Siriella gracilis* DANA.

1852. *Siriella gracilis* DANA, U. S. Expl. Exp. Crust., 1, p. 658, pl. 44, figs. 1a-1g.
 1885. *Siriella gracilis* G. O. Sars, Challenger Rept., 13, p. 209, pl. 36, figs. 25-28.
 1910. *Siriella gracilis* H. J. Hansen, Siboga-Exp., 37, p. 31.

Sta. 4592.	Oct. 13, 1904.	Lat. 18° 20' N., long. 103° 40' W.	Surface.	2 specimens.
Sta. 4607.	Oct. 17, 1904.	Lat. 12° 00' N., long. 91° 30' W.	Surface.	1 specimen.
Sta. 4611.	Oct. 18, 1904.	Lat. 10° 33' N., long. 88° 30' W.	Surface.	10 specimens.
Sta. 4619.	Oct. 20, 1904.	Lat. 7° 15' N., long. 82° 8' W.	Surface.	5 specimens.
Sta. 4640.	Nov. 6, 1904.	Lat. 0° 39.4' S., long. 88° 11' W.	Surface.	1 specimen.
Sta. 4712.	Dec. 31, 1904.	Lat. 7° 5' S., long. 93° 35.5' W.	Surface.	3 specimens.
Sta. 4716.	Jan. 2, 1905.	Lat. 2° 18.5' S., long. 90° 2.6' W.	Surface.	2 specimens.
Sta. 4720.	Jan. 14, 1905.	Lat. 7° 13.3' S., long. 102° 31.5' W.	Surface.	11 specimens.
Sta. 4723.	Jan. 16, 1905.	Lat. 10° 14.3' S., long. 107° 45.5' S.	Surface.	About 30 specimens.
Sta. 4725.	Jan. 17, 1905.	Lat. 11° 38.3' S., long. 110° 5' W.	Surface.	8 specimens.
Sta. 4729.	Jan. 19, 1905.	Lat. 14° 15' S., long. 115° 13' W.	Surface.	1 specimen.
Sta. 4733.	Jan. 21, 1905.	Lat. 16° 57.4' S., long. 120° 48' W.	Surface.	1 specimen.

Besides this species was taken by the "Albatross" in 1899 at a single place:—
Hyd. Sta. 3789. Sept. 9, 1899. Lat. 2° 38' N., long. 137° 22' W. Surface.
3 specimens. "Albatross."

Distribution.—This slender and small species, which has only been taken at the surface, is known from the Bay of Bengal (the author), is common in the Indian Archipelago ("Siboga"), and from here it is, according to the literature, distributed across the Pacific in its tropical area; Sars has mentioned it from the North Pacific. It has never been taken in the Atlantic.

12. *Siriella media* H. J. HANSEN.

1910. *Siriella media* H. J. HANSEN, *Siboga-Exp.*, **37**, p. 38, pl. 4, figs. 3a-3k.

Butaritari, Gilbert Islands, Jan. 6, 1900. Lagoon. Surface. Light. 9 specimens (1 adult male, 8 immature specimens). "Albatross."

Remarks.—The presence of an adult male rendered it possible to determine the species. The strong setae of both rami of fourth pair of pleopods agree in every main point and even in most of minute particulars with my drawings (figs. 3e and 3f) in the paper quoted. The proximal joint of each exopod of the uropods with only 13 spines. The male is 9.5 mm. long.

Distribution.—*S. media* was hitherto known only from seven places in the Indian Archipelago ("Siboga").

13. *Siriella aequiremis* H. J. HANSEN.

1910. *Siriella aequiremis* H. J. HANSEN, *Siboga-Exp.*, **37**, p. 40, pl. 3, figs. 4a-4c; pl. 4, figs. 1a-1i.

Sta. 4592. Oct. 13, 1904. Lat. 18° 20' N., long. 103° 40' W. Surface. 1 specimen.

Sta. 4619. Oct. 20, 1904. Lat. 7° 15' N., long. 82° 8' W. Surface. 7 specimens.

Hyd. Sta. 3789. Sept. 19, 1899. Lat. 2° 38' N., long. 137° 22' W. Surface. 1 adult female.

Remarks.—A couple of specimens are adult males, and the largest is 10.4 mm. The sexual setae on the endopod of fourth pleopods nearly as on fig. 1h in the "Siboga" paper, but the longest inner seta slightly overreaches the terminal, consequently intermediate between fig. 1h and fig. 1f.

Distribution.—*S. aequiremis* was established on specimens from the Indian Archipelago, where it was taken at ten places; furthermore it is known from the Arabian Sea, the Bay of Bengal, the Indian Ocean Lat at. $3^{\circ} 9' N.$, long. $84^{\circ} 44' E.$, and the China Sea (the author).

HEMISIRIELLA H. J. HANSEN (1910).

14. **Hemisiriella abbreviata**, sp. nov.

Plate 2, figs. 2a-2c.

Butaritari, Gilbert Islands. Jan. 6, 1900. Lagoon. Surface. Light. 1 female with young. "Albatross."

Description.—Slender.—Carapace extremely short, leaving along the middle line nearly more than three segments uncovered; the frontal plate (fig. 2a) somewhat feebly produced, constituting a low triangle with the vertex acute. Eyes moderately large, very light brownish; the stalks somewhat broader than long and broader than the retina. The antennulae with the third peduncular joint distinctly less than twice as long as broad. The antennal squama short, about two and a half times as long as broad, with the terminal lobe beyond the base of the marginal tooth twice as broad as long.

Uropods (fig. 2b) with the endopod not overreaching the exopod, with five marginal spines occupying only about one fifth of the outer margin of the proximal joint of the exopod, and the distal joint somewhat less than twice as long as broad. Telson (figs. 2b and 2c) proportionately short, not reaching the articulation of the exopod, distinctly less than twice as long as broad, with two pairs of spines at the end of the broad proximal part, while its longer distal part is linguiform, with the proximal third of its lateral margins conspicuously concave and the end broadly rounded; the lateral margins of a little less than the distal half of the telson only with 4-5 spines irregular as to size and intervals, while the terminal margin has three extremely small spines in the interval between three pairs of long spines, the inner pair of which are slightly shorter than the most lateral pair, while the intermediate pair are considerably longer than the others; terminal feathered setae not observed.

Length of the single adult female 5.5 mm.

Remarks.—This species is allied to *H. pulchra* H. J. H., but is smaller with the eyes larger, the third joint of the antennular peduncle shorter in proportion to breadth, and the telson broader with a small number of lateral spines and three pairs of long terminal spines. Though the elongate endopod of the

first pair of legs is lost I refer this species to Hemisiriella, because the preserved second joint of these legs is thicker than that of second pair, because the carapace is extremely short, etc.

ANCHIALINA NORMAN (1906).

No specimen of this very characteristic genus was taken by Dr. Agassiz in 1904-1905, but three species were secured by the "Albatross" in 1900 at Butaritari, Gilbert Islands, and one of these species is new to science. The genus has been revised in my "Siboga" paper.

15. *Anchialina typica* (KRÖYER).

1861. *Anchialus typicus* KRÖYER, Nat. Tidsskr., 3 R., 1, p. 53, tab. 2, fig. 7, a-l.

1910. *Anchialina typica* H. J. HANSEN, Siboga-Exp., 37, p. 52, pl. 7, figs. 2a-2k.

Butaritari, Gilbert Islands. Jan. 6, 1900. Lagoon. Surface. Light. 7 specimens. "Albatross."

Remarks.—The specimens are all adult males. They are somewhat small, measuring about 5.5 mm. in length, but they agree closely with smaller "Siboga" specimens in all particulars. The exopod of the third pair of pleopods has not four but only three long, slender processes, each with a terminal seta; these processes are found on the fifth, sixth, and seventh joint counted from the distal end, while in the "Siboga" specimen figured (fig. 2i) such processes are found on the fifth to the eighth joint; in small "Siboga" specimens such processes are wanting on the eighth joint or even on the seventh and the eighth joints, as already stated in my paper.

Distribution.—*A. typica* has a very wide distribution, and it may be sufficient to give an abstract of the statements in the "Siboga" paper. The species is known from tropical Atlantic (Kröyer), the West Indies, the Gulf of Siam, several places in the Indian Archipelago, and probably the Hawaiian Islands.

16. *Anchialina grossa* H. J. HANSEN.

1910. *Anchialina grossa* H. J. HANSEN, Siboga-Exp., 37, p. 54, pl. 7, figs. 3a-3n; pl. 8, figs. 1a-1d.

Butaritari, Gilbert Islands. Jan. 6, 1900. Lagoon. Surface. Light. 1 specimen. "Albatross."

Remarks.—The specimen is an immature female. In the shape of the frontal plate with rostrum, the size of the eyes and the shape of the exopod of the uropods it agrees perfectly with females of *A. grossa* from the Indian Archipelago.

Distribution.—*A. grossa* was taken at several places in the Indian Archipelago, and besides it is known from the Gulf of Siam and the Bay of Bengal (the author).

17. *Anchialina obtusifrons*, sp. nov.

Plate 2, figs. 4a-4c.

Butaritari, Gilbert Islands. Jan. 6, 1900. Lagoon. Surface. Light. 2 adult males. "Albatross."

Description.— This species is in most particulars closely allied and similar to *A. grossa*. Frontal plate in the male (fig. 4a) less broad than in *A. grossa* and produced in a long rostrum reaching slightly beyond the eyes; this rostrum has the lateral margins a little concave, these being proximally somewhat converging forward and distally parallel, while the end of the rostrum looks nearly truncate, but its terminal, obtusely triangular portion is in reality bent downwards and backwards below the apparently terminal part. The eyes are brown and slightly larger than in *A. grossa*, broader than the end of the stalk which widens considerably from the base outwards.

Third joint of the antennular peduncle less thick and conspicuously longer than in *A. grossa*, being half as long again as broad. Antennal squama about as in *A. grossa*.

Gnathopods (fig. 4b) nearly as in *A. grossa*; second joint very large and much longer than broad; fifth joint strongly expanded, and from the inner side with a very large, lamellar, oblong-triangular, distally blunt process directed inwards and much forwards; sixth joint broad. First pair of thoracic legs as the following pair, with sixth joint divided into three subjoints.

Exopod of third male pleopods (fig. 4c) in the main as in *A. grossa*, with the distal joints much altered and furnished with several processes which constitute a most complex organ, though different in several minor particulars from that in *A. grossa*. The gigantic lamellar process (a.) on the posterior outer side is much narrowed somewhat before the end and its most distal part is also a little widened; the joint (b.) bearing the terminal processes is much longer than in *A. grossa*, with a terminal, lamellar expansion covering in front the insertion of these processes (c., d., and e.); finally, the inner process (e.) has more than its distal half very slender, the ramification of the median process (d.) is somewhat different from that in *A. grossa*, and the very long outer process (c.) has its secondary branch (c.¹) adorned with a few low saw-like teeth.

Uropods with the endopod reaching about the end of the telson and somewhat longer than the exopod, which has the end broadly rounded, nearly truncate, and 15-17 spines along the outer margin.— Telson nearly as in *A. grossa*, but the proximal part of the terminal incision is narrower.

Length 7.5 mm.

