

XLIII.—*Natural History Notes from H.M. Royal Indian Marine Survey Ship 'Investigator,' Commander T. H. Heming, R.N., commanding.* — Series III., No. 2. *An Account of the Deep-sea Crustacea dredged during the Surveying-season of 1897-98.* By A. ALCOCK, Major, Indian Medical Service, Superintendent of the Indian Museum, and A. R. S. ANDERSON, Captain, Indian Medical Service, Surgeon-Naturalist to the Survey.

[Continued from p. 27.]

MACRURA.

Family Penæidæ.

PENÆUS, Fabr.

Penæus rectacutus, Sp. Bate.

Penæus rectacutus, Sp. Bate, 'Challenger' Macrura, p. 266, pl. xxvi fig. 2 (exc. 2 z).

Metapenæus rectacutus, Wood-Mason & Alcock, Ann. & Mag. Nat. Hist., Oct. 1891, pp. 274, 275.

Spence Bate suggests that *Penæus serratus* and *Penæus rectacutus* may prove to be the same species. The former, of which there are two 'Challenger' specimens from Fiji in the Indian Museum, possesses no epipodite on the twelfth segment, while the latter has one.

In the males of this species the outer branch of the antennular flagellum is about twice the length of the inner and has a very stout base suddenly narrowing and tapering into a long filamentous extremity; from about the middle of the lower and inner side of this thickened base a small sharp conical tooth, as in *Metapenæus coniger*, projects; the inner branch is horizontally flattened in the proximal quarter of its length, and here forms a rigid semicircular loop downwards below the outer branch, as in *Penæus serratus*; on again reaching the level of the outer branch it gives off a small flattened hooked process articulating with the conical tooth on the outer branch, and becoming twisted on itself, and so vertically flattened lies alongside and in close apposition to the outer branch. Towards its extremity the inner branch becomes thin and filiform like the outer.

The absence of a rudimentary anterior arthrobranchia from the thirteenth segment seems to exclude this species from Wood-Mason's genus *Metapenæus*.

4 ♂, 3 ♀, from Station 235, 370-419 fathoms.

PARAPENÆUS, S. I. Smith.

Parapenæus investigatoris, sp. n.

Allied to *Parapenæus fissurus*, Sp. Bate, having the same branchial formula as we described for that species in Journ. Asiat. Soc. Bengal, vol. lxiii. pt. ii. 1894, p. 144 (from which, by a copyist's error, the epipodite on appendage 8 was omitted); the same longitudinal and vertical fissures in the carapace; a similar dorsal carina, bearing a single sharp tooth on the gastric region, and produced into a rostrum ciliated inferiorly, furnished with six teeth superiorly; a similar compressed abdomen, with the carina of the fourth, fifth, and sixth segments ending in a small tooth covering a small V-shaped notch in the posterior dorsal margin of the fourth and fifth segments; and a very similar telson and swimmeret.

It can at once be distinguished from *Parapenæus fissurus*, of which there are two 'Challenger' specimens from Zebu in the Indian Museum, by the presence of a well-marked sharp branchiostegal tooth placed slightly behind the anterior margin of the carapace, and not on it as in Spence Bate's species. It further differs in the length of the rostrum, which reaches only just beyond the end of the first joint of the antennulary peduncle instead of beyond the end of the second joint; in the rostrum sloping gently upwards in its proximal, gently downwards in its distal half; in the relative shortness of the carapace, which, exclusive of the rostrum, is only very little more than $\frac{1}{3}$ the length of the abdomen instead of nearly $\frac{1}{2}$ the length; in the great relative length of the sixth abdominal segment, which is $2\frac{1}{2}$ times the length of the fifth segment instead of about $1\frac{3}{4}$ times its length; in the third abdominal segment being non-carinate; in the inner plate of the swimmeret extending for about $\frac{1}{4}$ its length beyond the extremity of the telson; in the inner branch of the antennulary flagellum being slightly the longer, nearly as long as the carapace exclusive of the rostrum, and gradually expanding at its base, while the outer branch expands suddenly into a base considerably thicker than that of the inner branch; in the "thelycum" being of a different structure; and in never appearing to grow to the same size as *Penæus fissurus*.

5 ♀, 2 ♂, from Station 233, 185 fathoms.

3 ♀, 6 ♂, from Station 235, 370-419 fathoms.

2 ♀, 1 ♂, from Station 166, 133 fathoms.

HALIPORUS, Spence Bate.

Haliporus taprobanensis, sp. n.

This species appears to be nearly allied to *Haliporus thetis*, Faxon. The carapace is leathery, with deep cervical and longitudinal grooves. The dorsal carina is thrice interrupted in its course—by the cervical groove, by a broad shallow groove about midway between the cervical groove and the posterior margin of the carapace, and again close to the hinder margin of the carapace. Here the carina ends as a small tubercle separated from the posterior margin by the dorsal extremity of the longitudinal groove; in front of the cervical groove the carina is very prominent, armed with four teeth, and produced into a short slightly upraised rostrum, fringed below with long hairs. The rostrum, which appears to have been broken and imperfectly repaired, reaches just beyond the end of the cornea, ends in a sharp straight point, and is armed above with two small teeth near its base; succeeding these is a pair of minute teeth at the same level, one on each side of the rostrum, and beyond these a couple of sinuosities.

The first antennal tooth is separated from the tooth behind it by a groove running obliquely downwards and backwards from the level of the eye-stalk. On the posterior margin of the cervical groove is a well-marked sharp tooth, continued posteriorly into an elevated rounded ridge, running backwards parallel to and at a little distance from the longitudinal groove. The branchiostegal tooth, situated at the lower end of the frontal margin, is not so minute as in *Haliporus thetis*, and is continued backwards as an elevated ridge to the posterior margin of the carapace.

The abdomen is compressed and throughout carinate dorsally. The first, second, and third segments are marked by a deep transverse groove separating an anterior smooth articular from a posterior part of each segment. In the first segment the articular portion is nearly as long as the part behind the groove, the posterior half alone of which is elevated into a carina. In the second and third segments the articular portion forms only about $\frac{1}{4}$ of the total length of the segment, and the entire part behind the groove is carinate. The fourth, fifth, and sixth segments are carinate throughout their entire length. The carina is grooved in its centre and produced into a small sharp tooth at the posterior extremities of the fourth, fifth, and sixth segments; the posterior dorsal central margin of the second, third, fourth, and fifth segments is slightly notched V-wise. The transverse grooves on the

first to third abdominal segments are continued down on the pleuræ of these segments; furthest down and most marked on the first, the shortest distance and least marked on the third. The first to fifth segments are also furrowed by a transverse groove in their posterior quarter running nearly parallel to the hinder edge of each tergum, but bending obliquely forward and downward on reaching the pleuræ, where they fade away before attaining the margin. The fifth and sixth segments have an elevated horizontal ridge at the union of the pleuræ and terga, and the sixth possesses in addition an elevated ridge passing obliquely upwards and backwards from its articulation with the fifth segment to its posterior margin. The sixth segment is very slightly longer than the fifth. The telson lacks its extremity; dorsally it is widely grooved and on each side of the groove is an elevated ridge ending posteriorly in a short sharp spine. From these ridges the sides slope down obliquely, bear three minute spinules on either side, and have their lower margins fringed with hair.

The swimmeret is similar to that of *Haliporus thetis*, only differing in the sculpturing.

The appendages appear to be very like those of *Haliporus thetis*.

The branchial formula is:—

	Pleuro- branchia.	Arthro- branchia.	Podo- branchia.
VII.	1 (rudimentary)	Ep.
VIII.	2 (ant. small)	1+Ep.
IX.	1	2	r+Ep.
X.	1	2	r+Ep.
XI.	1	2	Ep.
XII.	1	2	Ep.
XIII.	1	2	Ep.
XIV.	1	0	
	<hr style="width: 50%; margin: 0 auto;"/> 6	<hr style="width: 50%; margin: 0 auto;"/> 13	<hr style="width: 50%; margin: 0 auto;"/> 1+2r+7 Ep.

There is not even a microscopic trace of any podobranch on the epipodites of the second and third pairs of legs, while that of the first pair is present on one side only.

The exopodites of all the ambulatory legs are small but plainly visible.

The points in which this species differs from *Haliporus thetis* are:—the larger branchiostegal spine situated at the lower end of the frontal margin, and not some distance back on the inferior margin; the absence of the two bifurcations of the carina on the carapace, the dorsal carina of the first abdo-

mental segment only occupying about $\frac{1}{4}$ the dorsal length of the segment; the absence of the longitudinal furrows on the sides of the abdominal segments; the shortness of the sixth segment; and a different branchial formula.

One specimen (♀), measuring 160 millim. from tip of rostrum to end of broken telson, was caught at Station 219, 550 fathoms.

BENTHESICYMUS, Spence Bate.

Benthescyamus investigatoris, sp. n.

This species is very closely allied to *Benthescyamus Bartletti*, S. I. Smith, agreeing with it except in the following points:—the dactylus of the external maxilliped is truncated, but terminates in a pair of small curved spines apparently functioning as pincers; the fourth abdominal segment is carinated in its posterior three quarters; and the long slender spine is absent from the fifth abdominal tergum.

Station 222, 400–200 fathoms, 2 ♂, 1 ♀.

Station 228, 640 fathoms, 1 ♀.

Station 234, 498 fathoms, 1 ♂, 1 ♀.

Station 235, 370–419 fathoms, 1 ♀.

Family Crangonidæ.

PONTOCARIS, Spence Bate.

Pontocaris media, sp. n.

The only points in which this species disagrees with the description and figures of Spence Bate's *Pontocaris pennata* ('Challenger' Crustacea Macrura, p. 499, pl. xci.) are the following:—

(1) The rostrum is pointed, not bifid at tip.

(2) The infero-lateral carina on either side is bluntly and evenly serrated, not smooth.

(3) The eyes are very much smaller, the orbital notch is more pronounced, and the tooth at its outer angle much larger—the condition of parts being like that of *Pontocaris propensalata* (Spence Bate, *op. cit.* p. 496, pl. xc. fig. 2).

(4) The wing-like processes of the antero-lateral angles of the carapace are not quite so oblique.

(5) As in *P. propensalata*, the fifth, sixth, and seventh thoracic sterna are longitudinally carinated.

(6) The antennal scale is short and subcircular, somewhat as in *P. propensalata*.

From *P. propensalata* it differs in having seven carinæ on the carapace instead of five, and in the far more elaborate sculpture of the abdominal terga, as well as in the greater obliquity of the antero-lateral angles of the carapace.

Four specimens from the Andamans, 55 fathoms.

Family Alpheidæ.

ALPHEUS, Fabr.

Alpheus Shearmii, sp. n.

This species in the frontal region of its carapace resembles *Alpheus tridentatus*, Dana, while the hand of its right chela resembles that of *Alpheus gracilipes*, Stimpson.

The integument is thin and submembranous.

The carapace is perfectly smooth, rounded and non-carinate superiorly; the rostral and supraocular teeth are subequal and very short; the eyes are somewhat deficient in pigment and so small that they cause no projection upwards of the carapace.

Near each postero-lateral angle of the telson is a couple of small spines and on each side of the dorsal surface of the telson is a similar couple of spines.

The telson and plates of the swimmeret are fringed with long hair.

Of the antennular base the first joint is slightly longer than the second and the latter about twice the length of the third. The antennular acicle is flat and tapers quickly from its base to a slender sharp needle-like point reaching about one third the way along the second joint.

The antennal scale is wide, thin and convexly curved in its anterior and inner margins, thickened and slightly concave as to its outer margin, which terminates in a short sharp tooth.

The right great chela, the only one present, is twisted so that the finger and thumb lie horizontally. The lower and inner margin of the hand is quite smooth and continuous with the thumb, the outer and upper margin presents a V-shaped notch close to the articulation of the hand and finger. Running from end to end of the upper surface of the hand, close to its outer margin, is a groove with a well-marked rounded crest on its inner side. The distal end of the crest ends on a level with the notch on the upper margin in a somewhat prominent smoothly rounded eminence.

The opposable edge of the thumb is slightly curved and

armed with two small teeth near the joint, while the corresponding edge of the finger is nearly straight and armed with a single tooth near the joint. The large plug-like tooth usually present on the fingers of shallow-water forms is wholly absent.

Station 232, 430 fathoms, one specimen.

Family Pandalidæ.

PANDALUS, Leach.

Pandalus ? ensis, A. Milne-Edwards.

Pandalus ? ensis, A. Milne-Edwards, Rec. Fig. Crust.

With some doubt we identify with this species three specimens—one perfect with the exception of the fourth and fifth pairs of legs, which are absent, the other two considerably broken, trawled at Station 233, 185 fathoms. They only differ from the figure in possessing three instead of two teeth on the dorsal margin of the rostrum. The position of these three teeth differs in the three specimens, although occupying much the same space as the two teeth of the type. In all other respects our specimens appear to be the same as the type.

CHLOROTOCUS, A. Milne-Edwards.

Chlorotocus gracilipes, A. Milne-Edwards, var. *andamanensis*, nov.

Three specimens were obtained at Station 233, 185 fathoms, and differ from the figure of the species in the Rec. Fig. Crust. in the following points:—the rostrum, in our one unbroken specimen, is armed with four teeth only on its lower margin; there is a small sharp ocular spine; the dorsal carina behind the orbital margin bears five teeth in two, four teeth in one specimen; the postero-inferior angle of the fifth abdominal pleura is pointed and sharp, not rounded; the sixth abdominal pleura is produced postero-inferiorly into a small sharp tooth, not rounded; the telson bears at its extremity, in addition to the sharp central tooth, a pair of lateral movable spines, and between these and the central tooth bunches of long stiff hairs.

HETEROCARPUS, A. Milne-Edwards.

Heterocarpus levigatus, Spence Bate.

Heterocarpus levigatus, Spence Bate, 'Challenger' Macrura, p. 633, pl. cxii. fig. 3.

In one specimen, 178 millim. long from tip of rostrum to end of telson, the dorsal crest is armed with four large teeth, while in seven other specimens there are five teeth on the crest. The under margin of the rostrum is armed with eleven to thirteen teeth. (In Spence Bate's type the rostrum was broken.) In the smaller specimen the rostrum is bent up at an acute angle and the dorsal spines are relatively longer than in the larger specimens.

Station 232, 430 fathoms, eight specimens.

New to the Indian fauna.

PLESIONIKA, Spence Bate.

Plesionika affinis, sp. n.

Closely allied to *Plesionika uniproducta* and *Plesionika unidens*.

Carapace smooth, dorsally carinate in rather more than its anterior half, armed behind the level of the orbit with three procumbent teeth on the carina, which is produced into a slender rostrum rather longer than the dorsal length of the carapace. At first the rostrum curves quickly downwards to the level of the antennules, on reaching which it continues with a slight downward tendency to its tapering extremity. On its dorsal margin above the eye are three procumbent teeth, the most anterior at the level of the cornea, and close to the tip is a minute spinule; on the anterior fourth of its lower margin are some six minute procumbent spinules.

The anterior margin of the carapace is similar in form to that of *Plesionika uniproducta*, and, like it, armed with well-developed teeth corresponding to the antennules and the fronto-lateral angle.

The third abdominal segment in its posterior dorsal quarter is surmounted by an upstanding carina produced posteriorly into a sharp well-marked tooth overhanging the fourth segment. The rest of the abdominal segments are smooth. The sixth segment is rather more than twice the length of the fifth segment.

The second joint of the antennal base is armed with a long sharp tooth like that of *Plesionika uniproducta* (vide 'Challenger' Macrura, pl. cxiii. fig. 1 c).

Two specimens, 36 millim. from tip of rostrum to end of telson, were obtained at Station 236, 172-303 fathoms.

Family Pasiphæidæ.

PASIPHÆA, Savigny, Edw.

Pasiphæa unispinosa, Wood-Mason.

Pasiphæa unispinosa, Wood-Mason, Ann. & Mag. Nat. Hist., Feb. 1893, pp. 163, 164; Illustrations Zoology 'Investigator,' Crustacea, pt. i. 1894, pl. iii. fig. 7, ♀.

Pasiphæa cristata americana, Faxon, Bull. Mus. Comp. Zool. vol. xxiv. p. 208, Aug. 1893.

Pasiphæa americana, Faxon, Mem. Mus. Comp. Zool. vol. xviii. pp. 173-175, pl. xlv. figs. 1-1 e (1895).

Our specimens, both the types and that taken this season, agree in all particulars with Faxon's lucid, concise, and very careful description of *Pasiphæa americana*.

One large female, 116 millim. from anterior end of carapace to end of telson, the terminal few millim. of which are wanting, was taken at Station 229, 360 fathoms.

Family Homaridæ.

NEPHROPSIS, Wood-Mason.

Nephropsis Stewarti, Wood-Mason.

Nephropsis Stewarti, Wood-Mason, Journ. Asiat. Soc. Bengal, vol. xlii. pt. ii. 1873, p. 39, pl. iv., and Ann. & Mag. Nat. Hist. (4) xii. 1873, p. 59; A. Milne-Edwards, Ann. Sci. Nat. Zool. (5) xix. pl. xx. figs. 1-3; Alcock & Anderson, Journ. Asiat. Soc. Bengal, vol. lxiii. pt. ii. 1894, p. 161; Anderson, Journ. Asiat. Soc. Bengal, vol. lxxv. pt. ii. 1896, p. 96; Ill. Zool. 'Investigator,' Crustacea, pt. iv. pl. xxvii. figs. 1, 1 a (1896).

In this species, as in *Nephropsis atlantica*, the lateral rostral spines are variable in position. In one of the males captured this year, instead of being as usual in the posterior, the spines are situated in the anterior half of the rostrum, which is short, slightly curved, and very similar to the rostrum of *Nephropsis Carpenteri*. In consequence of the shortness of the rostrum the antennular peduncles equal it in length.

Two males, one from Station 229, 360 fathoms, the other from Station 233, 185 fathoms.

Colours in life: upper surface of abdomen very pale orange, extreme outer border of terga bright red, pleuræ white; inner leaf of swimmeret bright red, outer leaf white, bordered by pale orange; upper surface of posterior $\frac{3}{4}$ of carapace orange, suddenly changing to bright red in the anterior $\frac{1}{4}$ and rostrum; sides of carapace white; the two small dorsal tubercles and the faint ridge joining them white; antennular base

white, flagella bright red; antennal base and proximal half of flagellum white, distal half of flagellum pale orange; large cheliped white, except finger and thumb, which are pale orange, extreme tips of finger and thumb white; hands and fingers of second, third, and fourth pairs of walking-legs bright red, remainder of legs white; lower surface of thorax and abdomen white.

Family Callianassidæ.

CALASTACUS, Faxon.

Calastacus felix, sp. n.

This species differs from *Calastacus stilirostris* and *C. investigatoris* in the following particulars:—the carapace is covered with a scanty growth of short, stiff, yellowish, forwardly directed hairs, springing either singly or in groups of two or three from the bottom of small pits in the surface of the test, these hairs being both longer and stouter on the gastric region than elsewhere. The lateral margins of the rostrum, like those of *Calastacus investigatoris*, extend backwards a short distance on either side of the carapace as outstanding ridges, each bearing a couple of spines, the anterior pair of which is much larger than the posterior. A dorsal carina extends from the base of the rostrum to the posterior margin of the carapace, where it ends on a small lobe projecting into the gap left between the backwardly projecting pleuræ of the carapace. The tubercle at the posterior termination of the carina of *C. investigatoris* is only represented in this species by a small irregularity of the carina. Occupying the anterior $\frac{2}{3}$ of the gastric region is a line of small, sharp, forwardly projecting teeth arranged in the form of a horseshoe, with its free ends turned backwards. The rostrum bears on each side a pair of asymmetrically arranged teeth.

A small, somewhat irregular, but pigmented cornea is present.

Of the great cheliped the wrist, near its junction with the hand, is considerably wider than the wrist-hand joint, especially on its lower margin, which projects as a blunt tooth. In the other two species the carpo-propodal joint is as wide as the widest part of the carpus.

Near the centre of the cutting-edge of the immobile finger is a large tooth. The carpus, propodus, and dactylus are covered with long, coarse, but somewhat sparse hair like that on the carapace.

The second pair of walking-legs is absent.

On the hands and fingers of the third and fourth pairs are small corneous prickles, arranged either singly or in transverse rows of two or three.

The abdominal segments are dorsally carinate, the carina being most prominent on the anterior three segments, gradually widening and becoming less and less marked on the fourth, fifth, and sixth segments.

The telson ends in a rounded central lobe, running down to which is a dorsal central groove. On the lateral margins of the telson are a few small teeth and near the proximal end one considerably larger than the others.

A median longitudinal ridge divides the inner plate of the swimmeret into two nearly equal parts and terminates distally in a small sharp tooth. A similar ridge divides the outer plate of the swimmeret into two subequal parts; the movable segment is very small, its inner end just passing beyond the central ridge, and the margin of the suture is armed with a few small acute teeth, as also is the distal half of the outer border of the plate with five similar small teeth.

In *Calastacus investigatoris* and *felix* both male and female external genital orifices are present, as in *Parastacus*, described by Dr. Emar Lönnberg in 'Zool. Anzeiger' of June 2, 1898. On this point Faxon is silent in his description of *Calastacus stilirostris*.

CALLIANASSA, Leach, A. Milne-Edwards.

Callianassa lignicola, sp. n.

This is a small species, the carapace measuring 3·3 millim., the abdomen 11·5 millim.

The form of the carapace resembles that of *Callianassa pachydactyla*, similar longitudinal and oblique grooves being present in both species. Anteriorly it is produced into an acute small rostrum.

The abdominal segments are all smooth. The first is considerably narrower in front than behind; the second, which also increases in width posteriorly, is by far the longest of all the segments and almost twice the length of the first. The telson is well developed, diminishing in width posteriorly, and on its dorsal surface is a broad median furrow expanding posteriorly to the full width of the telson; the end is square, with the corners rounded off. The outer plate of the swimmeret is about $\frac{1}{3}$ longer than the inner plate and armed on its outer straight margin with a small tooth. The pleuræ of all the abdominal segments are very short, smooth, and gently rounded at their margins.

The eye-stalk is triangular in section; its inner margin is prolonged into a short acute spine beyond the level of the cornea, and on its outer side is the small, circular, darkly pigmented cornea.

The peduncle of the first antennæ is about $\frac{1}{3}$ the length of the carapace and terminates in two flattened flagella. The peduncle of the second antennæ is rather longer than that of the first and ends in a tapering slender flagellum about $1\frac{1}{3}$ times the length of the carapace.

The second and third joints of the external maxilliped are expanded to form an irregular oblong cover. On the upper-side of the second joint is a prominent pectinate ridge.

The right is over twice the bulk, although not much longer than the left great cheliped. The lower margin of the ischium is armed with five small, subequal, acute, saw-like teeth; the proximal end of the lower margin of the merus bears one somewhat larger tooth, and the distal three joints, except for a small tooth on the cutting-edge of the thumb, are smooth and unarmed. The second, third, and fourth pairs of legs are of the usual type; the fifth terminates in a mass of hair obscuring the small subchelate finger.

The appendages of the first two abdominal segments are small and slender, the first terminating in a single thin short limb, while the second ends in a pair of slightly stouter limbs. The appendages of the succeeding three segments contrast strongly with the first two pairs; they terminate in a pair of flattened subequal branches fringed with long hair, the outer branch sickle-shaped, the inner lancet-like. On the inner side of each inner limb is a short tooth-like process.

Two specimens, one a female measuring 14.8 millim. in extreme length, the other 11 millim., were obtained from burrows in the interior of water-logged mangrove-twigs at Station 233, 185 fathoms.

Colour in life chalky white.

Family Eryontidæ.

PENTACHELES, Spence Bate.

Pentacheles sculptus, S. I. Smith.

Pentacheles sculptus, S. I. Smith, Bull. Mus. Comp. Zool. x. 1882-83, pp. 23-31, pls. iii., iv.

Polycheles sculptus, Faxon, Mem. Mus. Comp. Zool. vol. xviii. 1895, p. 122, pl. C, fig. 2.

Five specimens (four males, one female) were obtained at Stations 230 and 231, 834 and 836 fathoms respectively.

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From tip of rostrum to end of telson they vary from 119 to 74 millim.

All our specimens show the distinctive peculiarities not of Faxon's Pacific variety, but of the typical Atlantic species. In shape and general appearance they resemble *Pentacheles phosphorus*, but can at once be distinguished from this by having two instead of one spine on the outer side of the basal antennular joint, by being armed with one spine instead of two between the rostral spines and the pair of spines about the centre of the gastric area, by having no spines on the carapace posterior to the cervical groove and between the median carina and the sublateral carina, and by the presence of a procumbent spine on the first five instead of the first four abdominal segments.

New to the Indian fauna.

ERYONICUS, Spence Bate.

Eryonicus indicus, sp. n.

Closely resembling *Eryonicus cæcus*, Bate (Faxon), from which it differs in the following particulars:—the dorsal median spines are arranged thus—2 (rostral), 1, 1, 2, 1, 1, 2, 2, 1, 2; the anterior three groups of spines, exclusive of the rostral, are considerably larger than those figured by Faxon; behind the orbit there are but three spinules on the gastric region; the branchial ridge bears 7, not 5 spinules; the last spine on the lateral carina is by far the largest of all those on the animal; the 5 large spines on the lower of the two ridges below the lateral carina are considerably smaller than the last spine of the lateral carina, show no regular diminution in size from the first to the last (indeed, the middle one is the longest), and are both followed and preceded by a row of denticles on the ridge; the dorsal row of spines on the abdomen consists of one spine on the first, second, fifth, and sixth segments and two spines on the third and fourth segments, the spines of each pair being united by a connecting longitudinal ridge, and the posterior spine of each pair much exceeding the anterior in length; on the proximal end of the telson is one spine; only about the inner half of the orbit is filled by the eye-stalk, between which and the outer orbital margin is a wide gap crossed anteriorly by a conical process of the eye-stalk, similar to that of *Eryonicus cæcus*, which, however, does not quite reach the outer margin of the orbit; the basal joint of the first antenna ends in a long internal and a short external spine, and is not fringed

with hair on its inner margin; the second pair of abdominal appendages bear on the inner terminal branch a single long blunt process or stylambliis, and not a pair of processes.

One specimen, measuring 42 millim. from tip of rostrum to end of telson, was obtained at Station 230, 824 fathoms.

There are very good grounds for believing that the specimen came from a considerable depth.

Since writing the above, one of us has trawled a second slightly larger specimen off Colombo in 480-428 fathoms. The colours in life were:—carapace pale brown; abdomen dirty white; swimmeret slightly tinged with pink; first and second antennæ, fingers of great cheliped, and second, third, and fourth pairs of thoracic legs pale pink.

Family Stenopidæ.

? RICHARDINA, A. M.-Edw.

Richardina, A. Milne-Edwards, Recueil de Figures de Crustacés.

A little Crustacean, which was found inhabiting a Hexactinellid sponge dredged at 498 fathoms in the Andaman Sea, closely resembles, and may even perhaps be identical with, the *Richardina spinicincta* figured by M. A. Milne-Edwards on pl. viii. of the work above cited.

It is as closely as possible related to *Stenopus* and *Stenopusculus*, from which it seems to differ chiefly in the stouter and more compact body, in the shorter and less lax appendages, in the reduction of the spinature of the body, and in the complete absence of pigment from the eye.

? *Richardina spongicola*, sp. n.

The cephalothorax, which is of thinner texture than the other parts, is short, broad, and tumid; the prominent posterior edge of the cervical groove is armed with a row of procumbent spines, and a second concentric but shorter row of spines surrounds the base of the rostrum; otherwise the carapace is smooth.

The rostrum, which is nearly a third the length of the rest of the carapace, has the dorsal edge serrated throughout and the ventral edge serrated at the tip only.

The eyes, which are on short stoutish stalks, are quite without pigment and have some spinules round their base dorsally.

The antennal scale is falciform; its outer edge ends in a spine, its inner convex edge is strongly ciliated.

The external maxillipeds are stout, a little longer than the

first pair of legs, and nearly as long as the combined carapace and rostrum; their ischium and merus are compressed and somewhat broadened.

Except for a few spinules on the carpus of the great cheliped the legs are smooth.

The first three pair of legs are truly chelate and the last two pair are apparently so, since their small dactylus ends in a pair of claws.

The first pair is slender. [The second pair is broken off in our single specimen.] The third pair is of Alphean oddness, the left being slender and non-elongate, while the right is nearly as long as the body without the telson and is very massive, especially as regards the hand. The last two pair have a three-joint carpus and a two-joint propodite.

The abdomen is perfectly smooth except for the telson, which is longitudinally divided into two lobes by a deep groove, the strong convexity of each groove being spiny.

The first pair of abdominal legs in the female are uniramous, the last pair (swimmeret) have the outer edge of the outer lobe serrated.

The single specimen, which is an egg-laden female, measures 26 millim. from the tip of the rostrum to the tip of the telson.

The eggs are few and are of very large size—nearly 1.5 millim. in diameter after contraction in spirit.

Order STOMAPODA.

Squilla leptosquilla, Brooks.

Squilla leptosquilla, W. K. Brooks, 'Challenger' Stomapoda, p. 30, pl. i. figs. 1 & 2.

Three very fine specimens from the Andaman Sea, 185 and 370–419 fathoms. They undoubtedly came from the depths.

Order AMPHIPODA.

Cystisoma spinosum (Fabr.), Stebbing.

Cystisoma spinosum, Stebbing, 'Challenger' Amphipoda, p. 1319, pls. cliv.–clvi.

Two specimens from the Andaman Sea, 498 and 172–303 fathoms. Though they came up in the trawl they were accompanied by such pelagic forms as *Salpa*, *Pyrosoma*, and *Firuloïdes*, with which no doubt they were associated in life.