PROCEEDINGS
OF THE

## BIOLOGICAL SOCIETY OF WASHINGTON

## NEW GENERA AND SPECIES OF CRINOIDS.

BY AUSTIN H. CLARK.

Through the kindness of my friend Dr. Th. Mortensen, I have been enabled to examine the large and exceedingly interesting colleetion of recent erinoirls belonging to the University of Copenhagen, Denmark. Aside from its importance in shedding considerable light upon the species inhabiting the Indo-Pacific-Japanese region, and showing, from the large number of forms taken at a single locality (Singapore), how very rich this region really is, the collection is of great interest in including many specimens bearing the MS. names of Professor C. F. Lütken, names which have been more or less of a puzzle to students of the group, for, although many of them have crept into the literature, and several of them have been identified...hy Dr. P. H. Carpenter and Dr. C. Hartlaub, there still remain a number which have never been identified with any described species, and which were never diagnosed by Professor Lïtken.

Dr. Carpenter and Dr. Hartlaub were apparently unaware that any of these names had been published; but in the lists of crinoids given in the catalogue of the Museum Godeffroy in Hamburg most of these names occur as nomina nudd, with a locality attached. Unfortumately, but few volumes of this catalogue are to be found in America; I have been able to consult Vol. IV, and part of Vol. V; Mr. W. K. Fisher has very kindly furnished me with the data from the remainder of Vol. V. Dr. Mortensen wrote to Professor Pfeffer at Hamburg for information in regard to the other volumes, which he courteously supplied, so that I believe we are now correctly informed as to the place of publication, and the identification, of all of Professor Lütken's nominal species.

36-Proc. Biol. Soc. Wash., Vol. XXI, 1908.

Mainly from the results of the investigations carried on by the United States Fisheries steamer Albatross, and by Mr. Alan Owston, of Yokohama, in his yacht the Golden Hind, sixty-two comatulids are already known from southern Japan, and eight more from the northern part of that country, making seventy in all. In spite of this seemingly long list, I recently hazarded a remark that there probably were yet many crinoids in those waters of which we had no knowledge; and the oceurrence, in this collection, of six additional species from Japan shows that my suspicions were well founded.

The species of Himerometra described, excepting $H$. grandis, all helong to that group of the genus comprising such species as $H$. milberti, $I$. anceps, and $H$. variipinnu, in which the rays are in apposition, often more or less flattened laterally, and the middle and distal brachials are exceedingly short and oblong.

In the following diagnoses the number of the cirri is given in Roman numerals, the number of their component joints (exclusive of the terminal claw) in Arabic; thus (under Comanthus decameros) " Cirri xL, 16-17" signifies that the species has forty cirri, each of sixteen or seventeen joints. In designating the pinnules, the distichal ( 11 Br ) pinnule is represented as $P_{1}$, the palmar pinnule as $P_{P}$, the post-palmar pinnule as $P_{P r}$; pinnules of the outer side of the arm are referred to hy Arabic numerals; thus $P_{1}$ is the pinnule of the second brachial, $P_{2}$ that of the fifth, $P_{3}$ that of the seventh, ete.; italies denote pinnules on the inner side of the arm, $P_{a}$ being the pinnule of the fourth brachial, $P_{b}$ that of the sixth, $P_{c}$ that of the eighth, ete.

I have, as before, followed Dr. F. A. Bather's suggestion in regard to brachials united ly syzygy, considering them as two separate brachials, not as a single one "with a syzygy," as was done hy Carpenter and Hartlaub.

Detailed discussion of the species herein deseribed is reserved for the completed report on the collection, now in preparation.

> Family COMAsterides. GENUS COMANTHLS A. H. Clark.
Comanthus intricata (lütken MS.) sp. nov.
Actinometra intricata Lütken MS. (part).*

[^0]Centro-dorsal a very thin pentagonal plate, scarcely raised above the surface of the radials; three of the basal joints of a single cirrus remain.

Irm bases united to, and including, the first distichal, but well separated from that point onwarl ; distichals, palmars, and post-palmars (five of the last are present) $4(3+4)$; a single distichal series and three palmar series 2. Forty-five arms 195 mm . long, of short triangular or werlge-shaped joints, over twice as broad as long, with everted distal ends.

Lower pinnules not expecially long or stout; $\mathrm{P}_{\mathrm{D}} 23 \mathrm{~mm} .-25 \mathrm{~mm}$. long with about sixty joints; $\mathrm{P}_{\mathrm{P}} 20 \mathrm{~mm}$. long; $\mathrm{P}_{1} 17 \mathrm{~mm}$. long; $\mathrm{P}_{2} 10 \mathrm{~mm}$. long.

Color (in spirits).-Dark brown.
Type locality.-Bowen, Queensland.
Type, in the collection of the University of Copenhagen.
Comanthus decameros sp. nov.
Centro-lorsal discoidal, hearing mumerons marginal cirri in roughly three irregular and crowded, more or less alternating rows.

Cirri $\mathrm{xl}, 16-17,20 \mathrm{~mm}$. long; first joint very short, second slightly longer than broad to about twice as long as broal, the third to the sixth two and one-half to three times as long as broad, then decretsing in length, the last two joints being squarish; opposing spine represented by a low tubercle; terminal claw about as long as penultimate joint, moderately stont, and moderately curred.

Ends of hasal rays very prominent in the angles of the calyx; radials concealed; first costals short, oblong, widely free laterally ; costal axillaries broadly pentagonal, about twice as brod as long. Ten arms 125 mm . long; first seven oreight brachials slightly wedge-shaped, then triangular, about as long as broarl; in the outer portion of the arms the brachials have projecting and finely spinons distal ends. Syzygies occur between the third and fourth brachials, again between the thirteenth and fourteenth to seventeenth and eighteenth (usually nearer the former), and distally at intervals of three to tive (usually three or four) oblique muscular articulations. The arms are rugged and tubercular basally, but are not enlarged or swollen.
$\mathrm{P}_{1} 2: m \mathrm{~mm}, \mathrm{P}_{2} 2 \mathrm{~mm} ., \mathrm{P}_{3} 15 \mathrm{~mm}$, and $\mathrm{P}_{4} 10 \mathrm{~mm}$. in length, the last with a genital gland; the following pinnules increase gratually in length, reaching 2mm. distally. The distal dorsal end of the proximal pinnule joints of the lower four or five pimmule pairs is prominent, giving these pinmules a serrate dorsal outline basally; the distal ends of all the pinnule joints are projecting and finely spinous. The teeth on the terminal comb on the proximal pinnules are low and rounded; the comb is not found after $\mathrm{P}_{3}$.

Color (in spirits).-Brownish yellow, the cirri lighter, the perisome darker.

Type locality. $32^{\circ} 22^{\prime}$ N. lat., $128^{\circ} 42^{\prime}$ E. long., off the Goto Islands, near Nagasaki, Japan; 170 fathoms.

Type, in the collection of the University of Copenhagen.
The only species with which this could be confusel is C. cumingii of the East Indies; but the large number of long cirri with comparatively numer-
ous joints, and the absence of the swollen condition in the basal portion of the arms distinguish it at once.

## Family Himerometride. <br> Gents himerometrd A. H. Clark.

Himerometra grandis sp. nov.
Centro-dorsal thick-discoidal, a rather small polar area bare; cirrus sockets arranged in two or three crowded marginal rows.

Cirri xxur, 31-38 (nsually $32-36$ ), 30 mm . long, rather stout; the eighth to the tenth joints are squarish, the remainder not so long as broad; from the eleventh onward sharp carinations are developed which may take the form of small spines; opposing spine centrally or suhteminally situated, but short, not reaching one-half the diameter of the jenultimate joint in height; terminal claw somewhat longer than the pemultimate joint, rather abruptly curved.

Rays and division series as in $I I$. regalis, to which this species is most closely related, but post-palmars are developed exteriorly. Forty-five arms 110 mm . long, resembling those of $I$. regatis.

Proximal pinnules more slenter than those of $I I$. regalis; $\mathrm{P}_{1}$ about 10 mm . long, with twenty-xix to thirty joints, slender and Hagellate; $\mathrm{P}_{2}$ and $P_{3} 20 \mathrm{~mm}$. long, slender, though stiffer than $P_{1}$ with, in $P_{2}$ twentysix to thirty, in $P_{3}$ twenty to twenty-five joints, the third squarish, after the fifth rather over twice as long as broad; $P_{4} 9 m m$. long, more slender than $\mathrm{P}_{1}$; distal pinnules 10 mm . long.

Color (in spirits).-Reddish brown.
Type locality.- $33^{\circ} 10^{\prime}$ N. lat., $129^{\circ} 18^{\prime}$ E. long., Hirado Straits, Japan; 40 fathoms.

Type, in the collection of the University of Copenhagen.

## Himerometra molleri (Lütken MS.) sp. nov.

## Alecto mülleri Lütken Ms.

Centro-dorsal thick-discoidal, with a moderately large flat polar area, the marginal cirri in one and a partial seeond irregular row.

Cirri xw, $34-37,20 m m$. long, mowlerately stout, all the joints snbequal, about twice as browl as long, very slightly shorter basally, very shohtly longer distally, the sixth and following bearing small sharp-pointed modian dorsal spines; opposing pine rising from entire dorsal surface of penultimate joint, blunt, not reaching in height one-third the diameter of that joint, the apex median or sub-terminal in position ; terminal claw longer than penultimate joint, stout, slishtly curved.

Costals and lower brachials deep, in close apposition, laterally flattened ("wall-sided"); brachials as in $I I$. milberti ; synarthrial tubereles prominent, but small; ten arms abont 115 mm . long.
$P_{1} 10 m m$. long, slemder, thagellate, with eighteen joints; $P_{2} 15 \mathrm{~mm}$. long, much stouter, with twenty-one joints, the first two not quite so long as
broad, the third squarish, the remainder half again as long as broad; $\mathrm{P}_{3} 1$ limm. long, resembling $\mathrm{P}_{2}$, though slightly more slender; $\mathrm{P}_{4} 9 \mathrm{~mm}$. long, slightly more slemer than $\mathrm{P}_{3} ; \mathrm{P}_{5}$ and following pinnnles fomm. long, very semder, and flagellate distally; the distal pimmules are 12 nm . long.

Type locality.-"Indian Ocean."
Type, in the collection of the University of Copenhagen. Another specimen in the same collection was taken in the Straits of Malacea.

Himerometra schlegelii (Lïtken Ms.) sp. nov.
Alecto schlegelii Lütken MS.
Centro-dorsal thick-disenidal, the polar area thickly cosereal with small low thattenerl tubercles, bearing two closely crowled alternating rows of cirrus suckets.

Cirri xv, $26-35$ (nsually $30-35$ ), about 20 mm . long; first joint short, second about twice as broad as long, third slightly longer, fourth sofuarish; following to the twelfth or fourteentil sflarish (some of the more proximal oceasionally slightly longer than broad), the length then very gratually diminishing, so that the terminal joints are abont one thired broaler than long; from the twelfth joint onward comparatively long sharp doral spines are developed; upposing spine considerably longer than the spines on the few preceding joints, about equal to the diameter of the penultimate joint in length, and rather slender, abruptly curved basally, but nearly straight in its distal half.

Radials projecting slightly beyond the edge of the centru-dorsal; first costals oblong, three or four times as broad as long, the lateral edges swollen into an elongate tuberele, aml in clove apposition; costal axillaries broadly pentagonal, abont twice as broal as long, in lateral apmoition; distichals (when present) $+(i+4)$. Ten to thirteen arms about 70 mm . long; first brachial short, slightly longer outwardly than inwardly, interiorly mited for about two-thirds of their length; second brachial somewhat larger and irregularly quadrate, rising to a rather prominent tuberele with the first brachial, resembling that between the costals; third and fourth brachials (syzygial pair) about as long as the second brachial (three times as broad as long), oblong; following six brachials oblong, about three times as broad as long, then becoming wedge-siaped or almost triangular, gradually becoming oblong again and decreasing in lengtl, the joints in the distal half of the arm being extremely short and discoidal, with projecting distal edges. Syzygies occur mewally between the third and fourth (once between the fourth and fifth) brachials, again between the eleventh and twelfth to serenteenth and eighteenth (with oceasionally an additional one between the ninth and tenth), and distally, in one specimen at intervals of nine or ten, in the other of eleven to twenty-five oblique muscular articulations.
The costals and first two brachials are in close apposition, and are laterally Hattenert.
$P_{1}$ abont 5 mm . long, comparatively slender, tapering evenly from
the base to the delicate tip, with about eighteen joints, all of which are practically squarish; $\mathrm{P}_{2}$ about 7.5 mm . long, slightly stonter than $\mathrm{P}_{1}$, but slember and delicate distally, with about eighteen jointe of which the first two are not quite so long as broad, the next two are squarish, the remainder gratually becoming elongated and about twice as long as broad distally; $\mathrm{P}_{3}$ about ${ }^{1} \mathrm{~mm}$. longer than $\mathrm{l}_{2}$, stouter and stiffer, though the joints are in the same number and proportion; $P_{1}$ resembling $P_{3}$, but shorter and somewhat less stout, with about twelve joints, of which the first two or three are not quite so long as broad, the following squarish, becoming rather longer than broad distally; distally the pinnules slowly increase in length and become moreslender; the distal pinnules are fimm. long, moderately slender, with about twenty joints, the first not so long as broad, the second squarish, the following heoming gradhally longer, reaching a length of about twice the brearth distally.

Color (in spirits). -Dull flesh-color, the perisome brown.
Type locality.-Japan.
Type, in the collection of the University of Copenhagen.

## Himerometra producta sp. nor.

Centro-dorsal low-hemispherical, almost disendal, bearing cirri in two crowded alternating rows; polar area moderate in size, with a raised and ronghened center, surromed by one or two rows of more or less obliterated cirrus sockets.

Cirri xys, 24-26, 15 mm . Jong, slender; first three joints very short, fourth not quite twice as broad as long, fitth to eighth half again as long as broad, then deereasing in length, after the tenth or eleventh being about as long as broad; ninth and following joints sharply farinate, on some of the cirri bearing small sub-terminal dorval spines; opposing spine terminal, rather large, arising from the whole dorsal surface of the penultimate joint, its anterior edge being a contimation in astraght line of the distal erge of the penultimate joint; terminal claw somewhat longer than the penultimate joint, rather slender, moderately curved.

Radials short, their dorsal sides parallel to the dorso ventral axis of the animal; first costals very short, four or five times as broad as long ; costal axillaries broadly pentagonal, rather over twier as hat as long, rising to a slight, smooth, rommed tuberele with the first costal; three distichal series present in the typer, all $+(3+4)$. Thirtern arms inmm. long; first two brachials wedge-shaped; next six oblong, there or four times as broad as long, then short wedge-shaped, becoming oblong again and wery short after about the middle of the arm.
$P_{3}$ slender, flagellate distally, 5mm. long, with seventeen to twenty joints, the first not so long as broad, the second to the fifth squarish, then becoming elongated, and about twice as long as lorod distally; the first seven or eight joints somewhat carinate; $\mathrm{P}_{2}$ similar to $\mathrm{P}_{1}$, 7 mm . long; the distal joints are somewhat longer, and the earimation of the lower joints is more marked; in addition to the dorsal carination there is a lateral carination (only slightly marked on $P_{1}$ ) especially evident toward
the end of each joint; $P_{3}$ comparatively stout and stiff, Smm. long, with twelve joints, the first not quite so long as broad, the second squarish, the following becoming elongated, and about three times as long as hroat distally; the second to the fifth joints have a sharp dorsal keel, and from the third onward the median portion of the exterior surface of the distal end of the joints is produced, forming a moderate "lateral process," as described by Carpenter in $H$. varïpinma; this is repeated, thongh not so strongly, on the opposite side of the pinnule; in the distal portion the entire distal end of the joints is somewhat overlapping; $P_{4}$ and following pimmles tmm. long, with twelve joints, increasing in length to the third, which is squarish, then increasing distally to abont three times as long as broad, the three or four terminal joints shorter again. The distal pimmes are 6 mm . long.

Color (in spirits).-Flesh color, clonded with violet.
Type locality.-Singapore.
Type, in the collection of the University of Copenhagen.
Himerometra ensifer sp. nov.
Centro-dorsal thick-discoidal, the cirrus sockets arranged in two closely crowled, irregular, more or less alternating rows.

Cirri xv-xx, 30, 20mm.-25mm. long; first joint very short, the following gratually increasing to the sixth, which is squarish; next five or six joints slightly longer than broad, the length then very gradnally decreasing, the distal joints being about one-third broader than long; fenth and following joints with well developed dorsal spines; opposing spine and terminal claw as in $I I$. schlegelii.

Disk completely covered with a payement of small plates.
Arms as in $H$. discoidea; but the synarthrial tubercles are prodnced extravagantly, as in Perometra diomedea, giving the amimal a very characteristic appearance.

All the proximal pimmles have squarish joints; $P_{1}$ is 7 inm. long, very slender, with 20 joints; $P_{2}$ is 7 mm . long, stouter than $\mathrm{P}_{1}$, with 17 joints; $\mathrm{P}_{3}$ is similar to $\mathrm{P}_{2}$, but is only 5 mm . long, with 16 joints; $\mathrm{P}_{4}$ and the following pimnles are less stont than $\mathrm{P}_{2}$ and $\mathrm{P}_{3}$ (thongh stonter than $\mathrm{P}_{1}$ ), 5mm. long, with 1 : joints.

The ten arms are 80 mm . long.
Color (in spirits). -Nearly white to dark brown, the perisome darker; the cirri of the lighter specimens are nsually purplish.

Type locality.-Singapore.
Type, in the eollection of the University of Copenhagen.

Gents Cyllometra A. II. Clark.
Cyllometra anomala sp. nov.
Centro-dorsal a thick disk with a broal, slightly concave, polar area, the eirrus sockets arranged in two irregnlar, crowderl, more or less alternating rows.

Cirri xxx, 21-28 (usually abont 25), $10 \mathrm{~mm}-12 \mathrm{~mm}$. long; first six or eight joints not so long as broad, the remainder stuarish; dorsal surface of the joints smooth, rarely in the terminal two or three with a slight trace of a minute central tubercle; opmoing spine prominent, though small, reaching to not more than about one-third the diameter of the penultimate joint in length; terminal claw rather longer than the penultimate joint, morlerately curved.

Radials concealed by the centro-dorsal ; first costals slightly trapezoidal, very short, four times, or rather more, as broat as long; costal ixillaries about half again as broad as long, and, like the first costals, free laterally; seven distichal series are present, one of 2 , the remainder of 4 joints with a synarthry between the first and second and third and fourth; * the second distichal, except when axillary, always beare a pinment; there are three palmar series of 2 , of which the seeonl is not an axillary, these being, therefore, strictly homologons with the distichal series in Ciintacrinus, and in the alnormal specimen of Heliometrat temeri which I described not long ago. $\dagger$ 'ieventeen arms about $\boldsymbol{j} \boldsymbol{j o m m}$. long, resmbling those of $C$. manca or C. albopurmerea; the pinmale of the fourth (epizygal) brachial is present on abont half of the arms.

Color (in spirits). White, the cirri with narrow hands of light parple, the polar area of the centro-dorsal deep parple, the division series and discoidal lower brachials with a median line of purple, the remaimer of the arms crosed by purple bands about equal to one brachial in width, separated by white bands of the same width.

Type locality.-Off Xipon, Japan.
Type, in the collection of the University of Conenhagen.

Grave OLIGOMETRA A. II. Clark.
Oligometra pulchella \&p. nov.
This is a delicate and rather slemeter secies, similar in general buid to O. gracilicirra from the Philippine Islands, thongh the cirri are proportionately only wne-half as long, with about half as many joints.

Centro-dorsal discoidal, the large polar area cireular, Hat, and ummarked; cirrus sockets in a single marginal row.

Cirri xiv, $16-2: 3$ (nsually abont 18 ), 7 mm . long, comparatively slender; first joint short, the following gradually incrasing in length to the sixth, which, with those following, js: squarish; fourth and following joints with a low transverse ridge extending entirely across the flattened dorsal surface of the joints, in the earlier joints subterminal in position, at about the eighth becoming median; this ridge is finely spinous, and appears as a very small dorsal spine in lateral view; opposing spine delicate, median

[^1]in position, standing out vertically from the dorsal surface of the penultimate joint, not reaching quite half the diameter of that joint in length; terminal claw rather longer than the pemultimate joint, stont, and strongly curved.

Radiak even with the efge of the centro-dorsal; first costals short, four or five times as hroal as their median length, not mited, the lateral edges straight; eostal axillaries triangular, about twice as broad as long, rising to a rather prominent median tnbercle with the first costals. Ten slender arms about 60 mm . long; first brachial short, wedge-shaperl, about twice as long ontwarlly as inwardly, inwardly united for about the proximal half, the distal free elges diverging at rather more than a right angle; recond brachial smilar in shape, but slightly larger, rising in the proximal median line to a moderate tuberde with the first; third and fomrth brachials (syzygial pair) slightly longer inwardly than outwartly, abont twice as broad as the longer lateral length; four following brachials oblong, rather ower three times as looad as long; seend syzygial pair wedge-shaped; following brachials triangular, not so long as broad, later beconing wedge-shaped, broaler than long, and, in the terminal portion of the arm, as long as, or even longer than, broad. A fter abont the tenth the brachials have rather strongly probluced and werlapping, finely serrate, distal edges, giving the arm a chatacteristically rongh appearance; this begins to die away in the onter half of the arm, and disappears in the distal third. Syzygies occur between the third and fourth brachats, again between the ninth and tenth (rarely the tenth and eleventh), fourteenth and fifteenth to seventeenth and eighteenth, and distally at intervais of five to eight (usually five) oblique monenlar articulations.
$P_{1}$ about 4 mm . long, moderately slender, tapering evenly from the base to the tip, with sixteen joints, of which the first two or three are not quite so long as broad, the remainder squarish; in its outer half the pimmle becomes styliform and then flattened; the last ten joints have their distal dorsal ends much produced, so that the dorsal ontline of the distal third (or rather more) of the pimmle is very strongly serrate; $\mathrm{P}_{2}$ about 6 mm . long, moch stouter than $\mathrm{P}_{1}$, much the largest pinnule on the arm, with abont nineteen joints, the first two not quite so long as broad, the remainder approximately squarish; after the third joint the pinnule gradually becomes sharply styliform, the distal dorsal end of the joints projecting in a romided, laterally flattemed tuberele. which soon beemes rery prominent; the base of this tubercle gradually involves more and more of the dorsal side of the joints, in the last ten or twelve arising from the whole dorsal surface, so that the terminal half of the pimnule, like the distal third of the first, is deeply scalloped in lateral riew; $\mathrm{P}_{3}$ about as large basally as $\mathrm{P}_{1}$, but shorter ( 3.5 mm .) with twelve joints, the first three not quite so long as broad, the fourth squarish, the remainder becoming gradually longer than broad, in the terminai portion about twice as long as broad; beyond the third joint the pimnle becomes rounded-triangular, and the distal dorsal end of the joints is prominent, though not excessively produced; $\mathrm{l}_{4}$ slightly smaller and more delicate with abont the same number of joints, which are proportionately longer
distally; following pinmles similar, but gradually becoming longer and more slemler, with longer joints ; the rounded-triangular condition of the distal portion of the pinmules is traceable to about the end of the proximal thirl of the arm; distal pinnules about 5.5mm. long, exceedingly slender, with abont twenty joints, the first trapezoidal, abont twice as broad as long, the second trapezoidal, abont as long as broal proximally, the thirl slightly longer than lroal, the remainder elongated with swollen articulations, distally three times as long as broad or even someWhat longer.

Color (in spirits).-White, with small bands and patches of light brown on the arms, the distal half of the cirri becoming brownish; or, white, similarly marked with deep violet; or, entirely tleep purple, sometimes with the two proximal pinmule pairs white; occasionally, brown; small speeimens are yellow.

Type locality.-Singapore.
Type, in the collection of the University of Copenhagen.

## Oligometra imbricata sp. nov.

## Antedon cupuliferus var. Lütken MS.

Centro-dorsal rather large, discoital, with a large concave polar area, the cirrus sockets in a single marginal row.

Cirri xvi-xyn, 23-28 (nsnally $24-26$ ), abont 1 2mm. long; all the joints but the terminal fise or six (which are squarish) are broader than long, the lasal very much so; they have prominent distal dorsal ends, showing a tendency to rise into a low transerse ridge; the dorsal surface of the joints is flattened; in the onter part of the cirrus a more distinct transrere ridge is fomd, whieh gradually becomes marrower, at the same time gaining in height, so that the last six or seven joints have minnte merlian doreal spines; "pposing ppine prominent, but slember, not reaching quite the diameter of the pemultimate joint in length; terminal chaw longer than the penultimate joint, strongly curred basally, but becoming nearly straight distally.

Ratials even with the centro-dorsal; the costals and brachials have abont the same proportions as those of $O$. pulchella, and the synarthrial tubereles are about as prominent as in that species, hot the brachials have very strongly produced and overlapping distal edges.
$\mathrm{P}_{2}$ much longer and stonter than $\mathrm{P}_{1}$; the following pimmles decrease rapidly in size, remain miform, for some time, then slowly inerease distally; the proximal joints of the lower pimmles may be more or less carinate, and the distal joints expand somewhat from the proximal to the distal end, giving the edge of the pimmate a serated outline.

Color (in spirits). - frayish brown, the perisome darker.
Type lorulity.-?Tranquel)ar, Inrlia.
Type, in the collection of the Thisersity of Copenhagen.

Famin TROMOMETRIDAE.
Gence isterometr. 1 . H. Clark.
Asterometra lepida =p. nov.
Centro-dorsal roumlerdomical, about as long as broal at the base, the dirrus sockets arranged in ten crowded, but regular, columns, of manally two each, two columns to each radial area.

Cirri lacking, but, as the centro-lorsal and the cirrns sockets are proportionately smaller than in the three other species of the gemos, it may be inferred that the cirri are either shorter, or more shender, or both.

Disk lacking; brachial and pimnle ambulacra protected by large covering plates as in the other species of the genns.

Radials short, about four times as broad as long, with a prominent tubercle in the median line; first costals oblong, approximately three times as loroarl as long; costal axillaries broally pentagonal, not quite twice as broad as long; distichals ?, as in A. macropode and A. anthus. Eleven arms (in the type) 70 mm . long, resembling those of the other -precies of the genus, lont somewhat more slender basally.
$P_{1} 5.5 \mathrm{~mm}$. long, styliform, with ten joints, the first not quite so long as broad, the second slightly longer than broad, the third and following slightly longer than the second; $P_{2}$ i.5mm. long, with twelve joints, resembling $P_{1}$, and of the same diameter basally thongh, on alecount of its greater length, tapering more gradually; $P_{3}$ similar to $P_{2}$, with the same number of joints, but somewhat stouter; following pinnoles gradually increasing in length aml in momber of joints, the joints in the terminal portion becoming proportionately more elongated; $P_{10}$ is 9 mm . long, and the distal pinnules are $1=\frac{2 m}{}$. long, with fittern to seventeen joints, of which the first is about twice as broad as long, the seeond is suarish, the third about one-third longer than browl, amb the following increasing rery gradually in length, being distally about three times as long as broad.
('olor (in spirits).-Brownish white.
Type locality. - straits of Fomosa; $3 \overline{3}$ fathoms.
Type, in the collection of the University of Copenhagen.

## Fimily ANTEDONID.E.

Mastigometra gen. nov.
Genotype.-Mastigometra flagellifera sp. nov.
Centro-dorsal hemispherical; cirri resembling those of Autedon, but much more namerous; arm strncture as in Antodon; lower pinnules greatly elongated and exceedingly slender distally, $l_{1}$, twice as long as the cirri, $P_{3}$ and following pinnules abont as long as the cirri.

Mastigometra flagellifera (Lütken Ms.) sp. nov.
Contro-dorsal hemispherical, a rather small convex polar area bare.
Cirri $1--1 x x x, 15$, about lemm. Jong; first two joints short, about twice as broal as long; third about one-third again as long as broad;
fourth and fifth the lengest, about half again as long as broad; following joints decreasing gradually in length to the third from the end which is about one-third longer than broad, the last two being about half again as long as broad; opposing spine represented by a very small terminally situated tubercle, which may, however, be quite absent ; fourth and fifth joints rery slightly " dice-box shaped," but the remainder with ahost straight edges; there is no indication of any dorsal spines. Up to about the sixth joint the cirri are romnded in cross section; from that point onward they are somewhat compressed, and appear somewhat broader in lateral view.

Radiats even with the edge of the centro-dorsal; first costak very short, about five times as broad as long in the median line, narrowing rapidly anteriorly, not in appoition basally ; costal axillaries triangular, about one and one-hali times as broad as long, as broad hasally as the distal emt of the radials, and consequently overhanging on each side the narrow anterior end of the first costals. Ten arms probably about 120 mm . long; first brachial very obliquely wedge-shaped or ahost triangular, moch longer exterionly than interiorly, interiorly just in apposition basally, the free interior edges diverging practically in a straight line; second brachial irregularly quadrate, about as long as the outer edge of the first ; first two brachials and second costal with a somewhat produced and thickened border; synarthrial articulation hetween the first two brachials and the costals rising to a moderate tubercle; third and fourth brachials (syzygial pair) about half again as long interiorly as exteriorly, and about one and one-half times the greater length in width; next four hrachials oblong, about twice as broad as long, then becoming wedge-shaped, and after the second syzygy triangular, abont twice as broad as long, later hecoming wedge-shaped again and somewhat longer; distal portion of arms lacking; syzygies oefur between the third and fourth, ninth and tenth, and fourteenth and fifteenth to sixteenth and seventeenth brachials, and distally at intervals of three to seven (nsually three) oblique museular articulations. The distal ends of the brachials after the first syzgey are rather prominent.
$\mathrm{I}_{1}$ 25mm. long, moderately thick at the base but gradually tapering and in the distal half very slender and tlagellate, compored of forty joints, the first alout as long as broad, then gradually inceating in length, the tenth and following being about half again as long as bond; first five joints slightly constricted centrally; $\mathrm{P}_{2} 1 \mathrm{mmm}$. long, similar to the first, but not so stont basally, with abont thirty-five joints; $P_{3} 10 m m$. or $12 m m$. long, abont as stout hasally as the second, but less slender and flagellate distally, tapering more evenly from the bave to the tip, with twenty joints, resembling those of the first and second; it bears a long genital gland; $\mathrm{P}_{4}$ and following pinnules similar; the genital gland disappears about $\mathrm{l}_{12}$, after which the pimmes are about 15 mm . long, exeredingly slender, with about thirty-five joints, the first short and cresentie, the second irregnlarly gualrate, ahont as long as its distal diameter, the third squarish, the remainder gratually increasing in length, being about twice as long as broad in the distal half.

Color (in spirits).-Brownish yellow.

Type, in the collection of the University of Copenhagen, from an unknown locality.

## Genus heliometra A. H. Clark.

Heliometra glacialis biarticulata sub. sp. nov.
Similar to typical $H$. glacialis from Labrator and Greenland, but the proximal joints of the lower pimmles are more strongly carinate, the cirri are more noticeably spiny, the brachials rather more overlapping, and the distal intersyzyial interval is three instead of four oblique muscular articulations.

The longest cirri are abont 50 mm long, with $60-70$ joints; the arms are somewhat over 150 mm . long.
$P_{1} 27 \mathrm{~mm}$. long, with sixty short joints, the distal half rather prominently serrate: $\mathrm{I}_{2}$ similar, and of the same length; $\mathrm{P}_{3}{ }^{2}-5 \mathrm{~mm}$. long, all the joints proportionately slightly longer, most of them being abont half again as long as wide, and the distal portion not serrate; $\mathrm{P}_{4} 17 \mathrm{~mm}$. long, with twenty-six joints, the first six squarish, then gradually becoming elongate, and about twice as long as broad distally; this pimmle is stonter than the precerling, and, while tapering evenly to the tip, is not flagellate.

Color (in spirits). -Light yellow.
Type locality. - Strats of Tougarn, between Hokkaido and Honshu, Japan.

Type, in the collection of the University of Copenhagen.


[^0]:    *Not Actinometra intricata Lütken, Mus. (iodeffr. Cat. V, p. 190, 1874, and following authors, which is the Comatula rotalaria of Lamarck, 1816 , of which the Alecto parvicirra of Müller, 1811, is a synonym.

[^1]:    *This is an entirely new type of arm structure; in all other cases where the distichals are four in number, the two outor are mited by sy\%gy. I have abready pointed out, however (Proc. U. S. Nat. Mus., xxxy, p, 127, 1904), that this syzygy was in reality occupying the mosition of a symarthry, though I dit not then know of any species with this more primitive type of arm-structure.
    $\dagger$ Proc. U. S. Nat. Mus., x×xif, p. 267, fig. 1.

