

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW RECENT CRINOIDS FROM THE INDIAN OCEAN.

BY AUSTIN HOBART CLARK.*

At the suggestion of Dr. F. A. Bather, the Indian Museum has entrusted to me for study the magnificent collection of recent crinoids brought together as a result of the operations of the Royal Indian Marine Surveying Steamer *Investigator*. Covering as it does the region from the Malay Peninsula to the Persian Gulf, the collection is one of extraordinary interest, for by its aid the westward extension of many East Indian genera can be accurately traced, and it is possible to form a very clear concept of the progressive diminution in intensity of the wonderfully rich East Indian fauna as one travels westward.

Most of the species in the collection are represented by large series, and there is an astonishingly complete representation of those very small forms so common in the East, which are frequently disposed of in published reports as "unidentifiable young," graphically bringing out the thoroughness with which the collectors of the *Investigator* performed their labors.

I wish to record my appreciation of the great kindness shown me by Dr. F. A. Bather and Dr. N. Annandale of the Indian Museum in entrusting to me a collection of such great interest and importance as is that of the *Investigator*.

The complete report upon this collection will be published by the Indian Museum in their series of monographs dealing with the Indian fauna.

FAMILY ZYGOMETRIDÆ.

GENUS EUDIOCRINUS P. H. Carpenter.

Eudiocrinus minor sp. nov.

Type.—Cat. No. 71B = ⁸⁶²⁷/₆ Indian Museum, from the Andaman Islands.

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Centro-dorsal a thin disk, the bare flat dorsal pole 1 mm. in diameter; cirrus sockets arranged in a single marginal row.

Cirri XII, 12, 5 mm. long; first two joints twice as broad as long, third half again as broad as long, fourth twice as long as broad; following joints very gradually decreasing in length, the antepenultimate being about one-third again as long as broad; third and fourth joints strongly "dice-box shaped," fifth and sixth slightly so, the following with practically straight edges; cirri proximally almost round in cross-section, after the fifth joint becoming laterally compressed, and therefore broader in lateral view; no dorsal spines or projections; opposing spine median, small, scarcely equaling one-fourth the diameter of the penultimate joint in height.

Arms and pinnules as in *Eudiocrinus ornatus*, the overlapping of the brachials and pinnulars being moderately marked; arms 15 mm. long.

Color (in spirits).—White.

FAMILY HIMEROMETRIDÆ.

GENUS DICHIROMETRA A. H. Clark.

Dichrometra aranea sp. nov.

Type.—Cat. No. 5620 Indian Museum, from 8° 51' 30'' N. lat., 81° 11' 52'' E. long.; 28 fathoms.

This new form is nearest to *D. finschii* from New Britain; it differs from that species in having somewhat fewer cirrus joints (53-66), and in having P₃ nearly or quite as long as P₂, while the joints in the distal portion of the proximal pinnules are much elongated, instead of subequal, slightly longer than broad as in *finschii*. The lower pinnules are comparatively slender, but slightly stiffened; P₂ is about as stout as P₁, and 2 mm. longer.

Color (in spirits).—Light brownish yellow.

GENUS CYLLOMETRA A. H. Clark.

Cyllometra mollis sp. nov.

Type.—Cat. No. 15F, Indian Museum, labeled, with a question mark, Kurrachi.

Centro-dorsal discoidal, thin, the polar area flat, 2 mm. in diameter; cirrus sockets arranged in one and a more or less partial second crowded row.

Cirri xx, 20-22, 10 mm. long; first joint short, second and third about twice as broad as long, the remainder very slightly broader than long becoming almost squarish on the terminal five or six; second and following joints with the distal dorsal edge produced and finely spinous, this projection progressively narrowing distally, at the same time very slowly moving to a more proximal position, after about the eighth becoming a pair of small subterminal tubercles, which on the last five to seven joints give place to small median tubercles; opposing spine much larger than the spines on the preceding joints, triangular, the apex terminal to nearly median, in height reaching to one-half or rather more of the diameter of the penultimate joint; terminal claw very slightly longer than the penul-

imate joint, moderately stout and moderately curved basally, becoming more slender and less curved distally.

Radials about even with the edge of the centro-dorsal; 1 Br₁ oblong, about three times as broad as long, not in contact basally; 1 Br₂ (axillary) pentagonal, about twice as broad as long, the lateral edges about half as long as those of the 1 Br₁, making with them a very obtuse angle; 1 Br series and lower brachials with a slightly indicated rounded median carination.

Arms 10, 65 mm. long, resembling those of *C. informis*, to which this species is most closely related.

P_u absent; P₁ small and weak, 4 mm. long with fourteen joints, the first short, the second squarish, the following gradually increasing in length, becoming twice as long as broad distally; joints in the distal third with the distal edges armed with fine spines; P₂ 13 mm. long, stouter than P₁, though of the same proportions, with seventeen joints, which become squarish at the third and twice as long as broad terminally; second and following with a few spines on the distal edge; P₃ 6 mm. long, basally as stout as P₂, but not tapering so rapidly, and therefore less delicate distally, with fifteen joints, the distal elongated; P₄ 4 mm. long, not so delicate as P₁, with ten joints; P₆ 3 mm. long, following pinnules increasing slowly in length, the distal pinnules being 7 mm. long, slender, with elongated joints.

Color (in spirits).—Brown, the perisome darker.

FAMILY TROPIOMETRIDÆ.

GENUS CALOMETRA A. H. Clark.

Calometra magnifica sp. nov.

Type.—Cat. No. 15A = $\frac{8417}{8}$ Indian Museum; Malay Archipelago, 160 fathoms.

Centro-dorsal hemispherical, the bare polar area convex, 2 mm. in diameter; cirrus sockets arranged in two or three closely crowded irregular marginal rows.

Cirri xx, 41-48, 40 mm. long; first cirrus joint short, the next two about twice as broad as long, the following gradually increasing in length to the fifth or seventh, which is about one-third broader than long; following joints similar to almost the middle of the cirrus, at which point they begin to decrease gradually in length, being twice as broad as long in the terminal portion; at about the eighth joint the median portion of the distal dorsal edge begins to project in a small \wedge -shaped spine; this very slowly increases distally, the whole dorsal surface of the joint becoming rounded-carinate and rising somewhat at the same time, until in the terminal third the cirrus joints bear broad spatulate carinate processes, equal in height to about one-third their diameter; opposing spine triangular, similar in shape and size to the spine on the preceding joint, blunt, the apex terminal, arising from the distal two-thirds of the penultimate joint, about equal to half the diameter of the penultimate joint in height; terminal claw conical, equal in length to the penultimate joint, stout, slightly curved.

Disk completely covered with a pavement of rather small rounded plates, those in the angles of the calyx between the division series bearing conical processes in their centers; this calcareous covering is not closely united to the perisome beneath, except along the ambulacra, but draws away from it in drying; ambulacra with side and covering plates highly developed.

Ends of the basal rays visible as small, though prominent, tubercles in the angles of the calyx; radials even with the centro-dorsal, but over the ends of the basal rays extending upward in a narrow slightly wedge-shaped (base upward) process, which terminates distally in a spatulate process between the lateral edges of the 1 Br₂; 1 Br₁ short, slightly trapezoidal, not in contact basally, about four times as broad as long, rather strongly convex dorsally, with a rather prominent narrow rounded median ridge; 1 Br₂ (axillary) pentagonal, nearly or quite twice as broad as long, the lateral edges slightly shorter than those of the 1 Br₁, making with them an obtuse angle, with a narrow rounded median ridge similar to that on the 1 Br₁ in the proximal half; 11 Br 2, with the rounded median ridge much less prominent than on the 1 Br series.

Twenty arms about 120 mm. long; first brachial small, wedge-shaped, twice as broad as long exteriorly, almost entirely united interiorly; second brachial considerably larger, irregularly quadrate, both usually with a slight trace of a rounded median keel; third and fourth brachials (syzygial pair) oblong, half again as broad as long; next four brachials oblong, twice as broad as long, with a low tubercle in the proximal half of the median line; following two or three brachials wedge-shaped, the following triangular, about as long as broad; arm tips not preserved. On the lower part of the arm traces of tubercles are found on alternate sides of the median line; the proximal third of the arm is somewhat compressed laterally, and bears on either side a shallow lateral groove. The arms increase slowly in diameter up to about the twelfth brachial; from the fourth onward the brachials have moderately projecting finely spinous distal edges. Syzygies occur between the third and fourth brachials, again between the eighteenth and nineteenth (rarely the seventeenth and eighteenth or twentieth and twenty-first), and distally at intervals of four to nine (usually six to eight) oblique muscular articulations.

P₁ 8 mm. long, slender and weak, with twenty joints, the first broad, slightly wedge-shaped, about twice as broad as the length of its proximal edge, produced distally into a high rounded carinate process; second joint longer, half again as broad as long, bearing a large fan-shaped carinate process with a scalloped or dentate distal edge; third and fourth considerably less in diameter than the second, slightly longer than broad, with strong oblong carinate processes; following joints non-carinate, slowly increasing in length, becoming twice as long as broad in the terminal portion; after the second joint the pinnule is rather sharply triangular; in the distal half the joints project somewhat over the bases of the succeeding joints at the angles of the prism, this increasing toward the tip where the ends of the joints overlap all around and are more or less spinous; P₂ 14 mm. long, slender, but stiff, with twenty-one joints;

first joint broad, about twice as wide as its proximal diameter, roundedly carinate distally; second joint wedge-shaped, about as broad as long proximally, with a thin carinate process about twice as broad as high distally; third one-third longer than broad, strongly carinate distally, but the carination not quite so high as that on the preceding joint; fourth twice as long as broad, carinate distally like the third; following joints about two and one-half times as long as broad, slightly longer in the terminal part; the pinnule is strongly styliform, the joints being more or less produced anteriorly at the angles of the prism in the shape of a spine overlapping the bases of the succeeding joints; the distal ends of the joints are somewhat prominent and finely spinous, this becoming more pronounced distally; P_3 15 mm. long, similar to P_2 , though very slightly stouter; P_4 14 mm. long; P_5 12 mm. long; P_6 10 mm. long, similar to P_3 , but with proportionately somewhat longer joints, which in the distal portion have more expanded ends; P_6 has fifteen joints; P_7 10 mm. long, slightly stouter than P_6 , with about the same number of joints, which are proportionately rather shorter; P_8 9 mm. long, stouter than P_7 , especially on the third, fourth and fifth joints, none of which are more than twice as long as broad; following pinnules of the same length and in general similar; the third—seventh joints are somewhat broadened, the pinnule tapering evenly from a maximum width on the fourth to a slender tip, with much elongate joints which have expanded and spinous distal ends; distal pinnules slender, 10 mm. long.

Color (in spirits).—White.

***Calometra spinosissima* sp. nov.**

Type.—Cat. No. 13B = $\frac{9046}{6}$ Indian Museum; from the Andaman Islands.

Centro-dorsal discoidal, moderately thick, the bare polar area flat, 3 mm. in diameter; cirrus sockets arranged in a single crowded marginal row.

Cirri moderately slender, XI, 42–55, 25 mm. long; first joint about three times as broad as long, the following slowly increasing in length to the sixth or seventh, which is nearly as long as broad, then remaining similar to the twelfth or fifteenth, then very gradually decreasing so that the joints in the terminal portion are twice as broad as long; at about the fifteenth joint a low sharp dorsal keel makes its appearance, at first in the distal portion only, but soon along the entire dorsal surface, which very slowly increases in height, becoming very prominent on the short terminal joints, though never exceeding more than one-fourth their diameter in height; opposing spine and terminal claw as in *C. multicolor*, to which form this species is most closely related.

Disk lacking; side and covering plates very highly developed along the brachial and pinnule ambulaera.

Ends of the basal rays visible as small rhombic areas in the angles of the calyx, but not raised above the general surface of the radials, and therefore not especially obvious; radials short in the median line, but extending up into the angles of the calyx in the form of an equilateral triangle,

the rounded apex of which entirely separates the bases of the 1 Br₁; 1 Br₁ slightly trapezoidal, about twice and one-half as broad as long, the ventro-lateral margins very thin; 1 Br₂ (axillary) pentagonal, as long as, or only slightly shorter than, broad, the lateral edges nearly or quite as long as those of the 1 Br₁, slightly constricted just below the lateral angles; 11 Br 2, the first united in the proximal two-thirds, diverging at approximately a right angle distally.

Nineteen arms (in the type) 130 mm. long, resembling in the main those of *C. multicolor*.

P₁ 10 mm. long, very slender and weak, with thirty-five joints, the first proportionately very much enlarged, twice as broad as long, with a strong carinate process, the second much shorter, strongly trapezoidal, the remainder very small and squarish; P₂ somewhat longer, but stiff and spine-like, with elongated joints like P₃; P₃ 20 mm. long, not especially stout but very stiff, with about twenty joints, the first about twice as broad as long, slightly carinate, the second trapezoidal, about as broad distally as the proximal length, the third half again as long as broad, the fourth over twice as long as broad, the remainder two and one-half to three times as long as broad and even longer distally; the joints have slightly projecting and spinous distal ends, this character increasing in intensity distally; P₄ similar to P₃ and of the same length; the following pinnules decrease to 12 mm. on P₆, then become somewhat stouter, and more slender again distally, though remaining of the same length; the joints in the distal portion of all the pinnules have prominent, somewhat expanded, spinous distal ends. The pinnules on the outer arms of each ray appear to be considerably longer than those on the inner.

Color (in spirits.)—White, thickly blotched on the rays, arms, and pinnules with purple, which color also forms on the rays and division series a more or less defined dorso-lateral line.

FAMILY THALASSOMETRIDÆ.

SUBFAMILY THALASSOMETRIDÆ.

GENUS CROTALOMETRA A. H. Clark.

Crotalometra rustica sp. nov.

Type.—Cat. No. 19A = ^{84.0.9} Indian Museum; Malay Archipelago, 30 fathoms.

Centro-dorsal apparently as in *C. magnicirra*, with the cirrus sockets arranged in ten columns, two in each radial area.

Cirri xx, about 70 (69 to broken tip), 85 mm. long, large and stout; first three joints subequal, about three times as broad as long, fourth slightly longer, fifth squarish or slightly longer than broad, following joints about one-third longer than broad, after the eighteenth becoming squarish, and after four or five more about twice as broad as long; eighteenth a transition joint; after the transition joint the dorsal surface of each joint gradually rises to a subterminal dorsal tubercle, which, however, never projects in the form of a spine; the tubercle is at first rather broad transversely and rounded dorsally, but distally it becomes narrower, so

that the dorsal surface of the joints becomes bluntly carinate. The dorsal edge of the cirri presents a slightly serrate appearance.

Ends of the basal rays visible as prominent dorso-ventrally elongate tubercles in the angles of the calyx; radials projecting very slightly beyond the edges of the centro-dorsal; 1 Br₁ very short, band-like, above five times as broad as long, convex proximally, concave distally, in close lateral apposition; 1 Br₂ (axillary) broadly pentagonal, half again as broad as long, all the sides strongly concave; the lateral edges of the two components of the 1 Br series taken together are evenly and strongly concave, the proximal width of the 1 Br₁ and the distal width of the 1 Br₂ being about the same; both these joints are sharply flattened laterally, with the apposed edges somewhat everted. 11 Br 4 (3 + 4), very strongly rounded dorsally like the 1 Br, in close lateral apposition and sharply flattened, the lateral edges somewhat produced; the joints of this division series are proportionally rather long.

Twenty arms about 150 mm. long, deep and compressed, strongly rounded dorsally; first brachial very short, strongly concave anteriorly; second brachial much larger with a posterior rounded process incising the first; third and fourth brachials (syzygial pair) about as long as broad, concave dorsally and laterally like the 11 Br_{3 + 4}; following brachials to the ninth wedge-shaped, half again as broad as long; following brachials triangular, about as long as broad, in the terminal portion of the arm becoming wedge-shaped and slightly longer. After the proximal third of the arm the brachials develop prominent and spinous distal ends and a striated dorsal surface. Syzygies occur between the third and fourth brachials, again between the fifteenth and sixteenth to nineteenth and twentieth, and distally at intervals of four to nine oblique muscular articulations.

P_D 15 mm. long, large and stout in the basal half, then tapering to a slender tip, with about twenty-five joints, the second—seventh broader than long, the remainder about as long as broad; P₁ 12 mm. long, with twenty-three joints, much less stout than P_D, the outer joints somewhat spinous along their dorsal ridge; P₃ 7 mm. long, considerably more slender than P₂, tapering evenly from the base to the end of the proximal half, slender from there onward, with sixteen joints, all but the first two approximately squarish; following pinnules about the same length, but scarcely tapering at all until near the tip, hence appearing somewhat stouter; they are composed of about fourteen joints; distal pinnules moderately slender, 12 mm. long with twenty joints, the first trapezoidal, about twice as broad distally as its median length, the second trapezoidal, somewhat broader distally than the median length, the remainder slightly longer than broad; the dorsal ridge is very sharp and more or less spinous.

Color (in spirits).—White.

SUBFAMILY CHARITOMETRINÆ.

GENUS PACHYLOMETRA A. H. Clark.

Pachylometra macilenta sp. nov.

Type.—Cat. No. 16 Indian Museum; 10° 47' 45" N. lat., 72° 40' 20" E. long.; 705 fathoms.

Centro-dorsal a short truncated cone, moderately large, the bare polar area flat, 2.5 mm. in diameter; cirrus sockets arranged in ten columns of usually two each, the columns of adjacent radial areas closely crowded and more or less alternating, those within the same radial area usually slightly separated anteriorly.

Cirri xx, 21–22, 25 mm. to 36 mm. long, comparatively long and slender; first joint very short, second twice as broad as long, third about as long as broad, following gradually increasing to the sixth, which is about half again as long as broad; next two or three joints similar, the following very gradually decreasing in length, those in the terminal third of the cirrus being about as long as broad; antepenultimate joint about one-third longer than broad; penultimate joint half again as long as broad, slightly less in diameter than the preceding; opposing spine very small, though prominent, terminally situated, directed obliquely forward; terminal claw about as long as the penultimate joint, stout basally, becoming slender in the distal half, moderately curved. The cirri are moderately compressed in the distal two-thirds; the two or three joints before the penultimate have slight traces of terminal dorsal tubercles.

Disk covered with a pavement of very small plates; side and covering plates well developed along the ambulacra.

Ends of the basal rays visible as large rhombic tubercles in the angles of the calyx; radials only visible as a large transversely oblong tubercle between the centro-dorsal and the 1 Br₁; 1 Br₁ very short, arcuate, in close lateral apposition, the proximal edge more or less crenulate, and bearing a large and rather high transversely oval median tubercle; 1 Br₂ (axillary) rhombic, very short, somewhat over twice as broad as long, the edges somewhat crenulate and somewhat produced, the proximal imbricating more or less over the anterior border of the 1 Br₁; the lateral edges are very short, in close apposition; it bears a rather large and high rounded median tubercle; 11 Br 4 (3 + 4) in close lateral apposition and sharply flattened, with the lateral edges slightly everted; the distal edge of 11 Br₁ is somewhat everted, and the proximal edge of 11 Br₂ more strongly everted, the latter imbricating slightly over the former except in the median line; 11 Br₁ usually bears a strong rounded median tubercle like that on the two components of the 1 Br series.

Thirteen arms (in the type) 170 mm. long, elongated and comparatively slender, resembling those of *P. robusta*.

The pinnules in general resemble those of *P. robusta*, but the pinnules in the proximal part of the arm are strongly carinate.

***Pachylometra investigatoris* sp. nov.**

Type.—Cat. No. 13A = ^{84.07}/₆ Indian Museum; Malay Archipelago, 30 fathoms.

Centro-dorsal a truncated cone, 7 mm. broad at the base and 5 mm. high, the cirrus sockets arranged in two columns of three to five each in each radial area, the two columns of each area separated by a narrow median line not quite so broad basally as the cirrus sockets, distally narrowing and ending in a point at about the level of the third or fourth

cirrus socket; the columns of each area are closely crowded against, and tend to alternate with, the columns in adjacent areas.

Cirri xl, 25-28, about 40 mm. long; first joint very short, second and third equal in size, about twice as broad as long, fourth slightly longer, fifth as long as broad; sixth, seventh and eighth joints the longest, slightly longer than broad to about one-third again as long as broad, the following very gradually decreasing in length so that those in the distal half are about as long as broad, or, in some cases, slightly broader than long; third joint from the end slightly longer than broad; antepenultimate about one-third longer than broad; penultimate, which is somewhat less in diameter than the preceding, half again as long as broad; distal dorsal edge of the distal joints showing an inclination to develop low blunt tubercles; opposing spine represented by a small blunt tubercle, terminally situated; terminal claw long, about as long as the penultimate joint, moderately slender, and moderately curved. The cirri are rounded basally, but moderately compressed in the distal two-thirds; there is no trace of carination.

Disk completely covered by a pavement of small plates; side and covering plates strongly developed on the pinnule ambulacra.

Ends of the basal rays visible as large rhombic tubercles in the angles of the calyx; radials concealed; 1 Br₁ short, four or five times as broad as long, chevron-shaped, with a more or less wavy proximal and distal border, in close lateral apposition; the apposed edges are somewhat thickened and produced and there are a few low broad tubercles on the distal border; 1 Br₂ (axillary) rhombic, twice as broad as long, rising to a rather sharp dorso-ventrally elongate tubercle with the 1 Br₁; 11 Br 4 (3 + 4); on three of the 11 Br series the syzygy is replaced by a synarthry; 11 Br 2 (1 + 2), developed interiorly. The division series are very strongly rounded dorsally and have a slightly indicated median carination; they are in very close lateral apposition and the lateral edges are slightly produced and everted as in *Glyptometra*.

Thirty-two arms (in the type) 150 mm. long; first two or four brachials oblong, short, united in syzygial pairs which are not quite so long as broad; following two or three brachials oblong, somewhat over twice as broad as long, then becoming wedge-shaped, twice as broad as long, and slightly longer and more oblique after the proximal third of the arm, where the brachials have slightly prominent distal ends.

P_D 17 mm. to 20 mm. long, very slender and flagellate distally, with from fifty to fifty-three joints: first two joints disproportionately large, twice as broad as long, strongly flattened exteriorly; third joint about half as broad as the first and half as long as the second, twice as broad as long; following joints to the fifteenth decreasing in diameter and increasing in length, at first twice as broad as long, becoming after the fifteenth uniformly small and about as long as broad; P₁ about the same length with forty-five joints, similar, but much less stout basally and not tapering so rapidly; P₂ 13 mm. long with about thirty joints about as stout basally as the preceding pinnules, but tapering much more gradually, the first eight joints about three times as broad as long, then gradually becoming longer and

squarish about the eighteenth and in the terminal part longer than broad; P₃ about 15 mm. long, and P₄ 16 mm. or 17 mm. long, resembling P₂; P₅ similar, 13 mm. long; P₆ similar and of the same length; P₇ and the following pinnules 12 mm. long with the joints in the proximal two-thirds slightly expanded laterally; in the next four or five the pinnules decrease in length to 8 mm., while the expansion of the joints becomes more pronounced, beginning on the second, reaching a maximum on the fourth or fifth, then gradually dying away distally; distal pinnules stout as in the other species of the genus, 10 mm. long.

Color (in spirits).—Yellowish brown.

FAMILY ANTEDONIDÆ.

GENUS EUMETRA A. H. Clark.

Eumetra indica sp. nov.

Type.—Cat. No. 4G, Indian Museum; Port Blair, Andaman Islands.

Centro-dorsal conical, 3 mm. broad at the base and 3 mm. high, the cirrus sockets arranged in six closely crowded alternating rows. The centro-dorsal as a whole resembles closely that of *Hathrometra*.

Cirri about LXX, all lacking.

Radials extending slightly beyond the edge of the centro-dorsal, diverging at an acute angle in the angles of the calyx; 1 Br₁ somewhat trapezoidal, about three times as broad as long, not in contact basally; 1 Br₂ (axillary) rhombic, the free lateral edges rather longer than those of the 1 Br₁, forming with them somewhat more than a right angle; synarthrial tubercles moderately developed.

Ten arms, about 60 mm. long; first brachial longer outwardly than inwardly, slightly incised by the second, not united interiorly, but the inner edges diverging at approximately a right angle; second brachial nearly twice as large, irregularly quadrate, with a rounded posterior projection incising the first; third and fourth brachials (syzygial pair) about as long as broad; next eight or nine brachials slightly wedge-shaped, half again as broad as long, then becoming almost or quite triangular, about as long as broad, and further out on the arm wedge-shaped again and longer than broad. Syzygies occur between the third and fourth, ninth and tenth, and fourteenth and fifteenth brachials, and distally at intervals of three oblique muscular articulations.

P₁ about 6 mm. long, very slender and delicate, somewhat stiffened, with about nine joints, the first about as long as, or slightly longer than, broad, the second and third twice as long as broad, the following gradually increasing in length and becoming exceedingly elongated distally; P₂ about 10 mm. long, proportionately stouter than P₁ and stiffer, with fifteen joints, the first squarish, the second slightly longer than broad, the third twice as long as broad, the remainder three to four times as long as broad; P₃ 8 mm. long with fifteen joints, similar to P₂ but slightly less stout; P₄ like P₃; P₅ 5 mm. long, slightly more slender than P₄, with ten joints, which have slightly everted spinous distal ends; following pinnules similar; the distal pinnules are lacking.

Color (in spirits).—Light brownish yellow with traces of a broad median dorsal line of purple.

FAMILY PENTACRINITIDÆ.

GENUS METACRINUS P. II. Carpenter.

Metacrinus batheri sp. nov.

Type.—Cat. No. $\frac{8410}{6}$, Indian Museum; Malay Archipelago; 160 fathoms.

Stem stout, 7 mm. in diameter, strongly stellate in cross section, with the produced interradial angles broadly rounded instead of sharp; cirrus sockets confined to the nodals, transversely oblong, the shorter diameter equal to the height of the nodals; nodals produced at the interradial angles into high dorso-ventrally elongate tubercles, occupying their entire lateral edges; internodals six or seven, alternating in size, the longer with the angles produced into dorso-ventrally elongate tubercles resembling those on the nodals, but somewhat smaller; radial faces of internodals with low broad rounded ridges, showing a tendency to break up into tubercles, between the produced interradial angles.

Cirri 45 mm. to 50 mm. long (about seven times the diameter of the stem) with forty-eight to fifty joints, the first four very short, subequal, the following increasing to the ninth which is nearly, or quite, as long as broad, then remaining similar for five or six joints and very gradually decreasing in length distally, so that the later joints are about twice as broad as long; cirri at first transversely oval in cross section, gradually becoming round and after the first six or seven joints laterally compressed; on the terminal six or seven joints there are indications of a median tubercle; terminal claw as long as the two preceding joints, conical, only slightly curved.

Basals very prominent, shield shaped, in lateral apposition all around the calyx, strongly produced downward over the angles of the stem; radials narrow and band-like, of equal height all around the calyx, four or five times as broad as long in the median line; 1 Br 4 (1 + 2); 11 Br five to eleven (usually about seven); arms dividing four or five times, with usually one more axillary exteriorly than interiorly in reference to the 11 Br series; arms as far as the 11 Br axillary robust, the articular tubercles rather strongly indicated, the dorsal surface perfectly smooth; beyond the 11 Br axillary the brachials have prominent finely spinous distal ends, and are rough to the touch.

The pinnules are essentially like those of *M. acutus*.

Color (in spirits).—White.

