

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 61, NUMBER 15

NOTES ON THE RECENT CRINOIDS IN
THE BRITISH MUSEUM

BY

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(PUBLICATION 2242)

CITY OF WASHINGTON
PUBLISHED BY THE SMITHSONIAN INSTITUTION
DECEMBER 31, 1913

The Lord Baltimore Press
BALTIMORE, MD., U. S. A.

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PREFACE

During the summer of 1910 I paid a short visit to the British Museum for the purpose of studying the magnificent collection of recent crinoids, more especially the comatulids, preserved in that institution.

Thanks to the courtesy of Professor F. Jeffrey Bell, who, in the most generous manner and, I fear, at no inconsiderable personal inconvenience, did everything which lay in his power to facilitate and to expedite my work, I was able in the limited time at my disposal to examine the entire collection of recent comatulids, taking copious notes on all the specimens upon which published records have been based, and identifying all of the unnamed material, at the same time drawing up diagnoses of such new species as I found.

It was my wish to leave with Professor Bell my diagnoses of these new species so that he might describe them under his own name, as it seemed somewhat presumptuous for me to publish new and interesting observations based upon the material under the care of Professor Bell; he, however, with his usual courtesy, insisted that he had no such feeling about the matter, and urged me to publish the descriptions of the new species I found under my name alone as opportunity offered.

It would take months of study and preparation to do adequate justice to the comatulid collection of the British Museum, and I therefore feel that I owe the Trustees of the institution and Professor Bell an apology for presenting in printed form the results of my necessarily somewhat cursory examination; but on the other hand I was able to clear up many obscure points and to settle definitely many determinations about which there has always been much doubt, especially in regard to species of which the types are in the continental museums which I visited either just before or just after my

visit to London, so that these notes, though not extended, possess a certain value.

While at the British Museum I examined and took notes upon about 1538 specimens, distributed in the several families as follows: Comasteridæ 417, Zygometridæ 25, Himerometridæ 180, Stephanometridæ 15, Mariametridæ 29, Colobometridæ 84, Tropiometridæ 91, Calometridæ 5, Thalassometridæ 72, Charitometridæ 64, Antedonidæ 513, Pentametrocrinidæ 11, Atelecrinidæ 2, Pentacrinitidæ 7, and Holopidæ 2; 21 specimens examined were not identified.

Family COMASTERIDÆ A. H. Clark

Subfamily CAPILLASTERINÆ A. H. Clark

Genus PALÆOCOMATELLA A. H. Clark

PALÆOCOMATELLA DIFFICILIS (P. H. Carpenter)

Actinometra difficilis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 93, pl. 52, figs. 1, 2 (1).

Actinometra pulchella 1888. P. H. CARPENTER, *T. c.*, p. 304 (part) (1).

1. "Challenger" Station No. 192.—One specimen. There are sixteen or seventeen cirrus segments, of which the third, a transition segment, is the longest, about three and one-half times as long as its median diameter, slightly constricted centrally. The cirri are proportionately very long, the distal end of the second segment being nearly as far from the center of the animal as the anterior angle of the IIBr axillary. The outer cirrus segments have rather strong dorsal processes.

On page 93 of the "Challenger" Report Carpenter, under the name of *Actinometra difficilis*, refers to this specimen, citing the two figures on plate 52, and says of it, "the two outer radials [*i. e.*, the two ossicles of the IBr series], the two distichals [IIBr series], and the first two brachials are respectively united by syzygy;" but later (p. 306), referring to the same specimen and the same figures, he says, "after repeated changes of opinion I have come to the conclusion that there is a bifascial articulation [*i. e.*, synarthry] in each case."

The former meager diagnosis, combined with the reference to the figures, in spite of the fact that it is based upon misconception of the structure of the animal and is therefore wholly erroneous, serves, according to the rules of the International Committee on nomenclature, to establish the name *difficilis*, even though he suppressed this name later.

Genus **COMATELLA** A. H. Clark**COMATELLA NIGRA** (P. H. Carpenter)

1. *No Locality*.—One specimen. One of the division series is of four segments, of which the two outer are united by synarthry.

COMATELLA STELLIGERA (P. H. Carpenter)

Actinometra tenax 1874. LÜTKEN, Cat. Mus. Godeffroy, vol. 5, p. 190 (1).

Actinometra stelligera 1888. P. H. CARPENTER, "Challenger" Report, *Comatulæ*, p. 308 (1, 2, 3).

Antedon bassett-smithi 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 393 (4).

Actinometra simplex 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (5).

Actinometra maculata 1894. BELL, *T. c.*, p. 395 (6); p. 396 (7, 8).

1. *Samoa and Fiji*.—One specimen with thirty-three arms; all the division series are external in reference to the IBr series.

2. *Reef of Atagor; Professor J. B. Jukes*.—One specimen.

3. "Challenger" Station No. 174.—Two specimens.

4. *Macclesfield Bank; 13-36 fathoms*.—One specimen.

5. *Macclesfield Bank; 13 fathoms*.—One specimen with twenty arms; the cirrus segments number eighteen.

6. *Parry's Shoal; 12 fathoms*.—One specimen with twenty-one arms 90 mm. long; the cirri are XXV, 17-20 (usually the latter), 15 mm. to 18 mm. long. This specimen is very like No. 5, but the whole animal is a trifle stouter. The color is green, with fine yellow spots.

7. *Macclesfield Bank; 13-36 fathoms*.—One specimen with twenty arms 80 mm. long; the cirri are XXII, 18-20 (usually the latter), 18 mm. long; the centrodorsal has a broad flat dorsal pole 5 mm. in diameter. The color is red brown.

8. *Macclesfield Bank*.—One specimen with twenty-six arms; the cirri are X, 18.

COMATELLA MACULATA (P. H. Carpenter)

Actinometra maculata 1888. P. H. CARPENTER, "Challenger" Report, *Comatulæ*, p. 307 (1).—1902. BELL, in GARDINER, *Fauna and Geography of the Maldive and Laccadive Archipelagoes*, vol. 1, part 3, p. 225 (2).

Actinometra sp. 1898. BELL, Proc. Zoöl. Soc. London, 1898, p. 849 (3).

Actinometra multiradiata 1909. BELL, Trans. Linn. Soc. (Zoöl.), (2), vol. 13, part 1, p. 20 (4).

1. "Challenger" Station No. 186.—One specimen, resembling the specimen which I described from Bowen (*Actinometra fusca* [Lütken, MS.], "Challenger" Report, p. 307; Vid. Medd. fra den Naturhist. Forening i København, 1909, p. 138) but with somewhat larger cirri.

2. *West Reef, Hulule, Male, Maldives*.—One specimen with seventeen arms.

3. *Outer part of reef at Rotuma; "the only crinoid seen at Rotuma or Funafuti."*—One specimen.

4. *Salomon; from reef; 8/6/05*.—One specimen with twenty-six arms 85 mm. long; the cirri are XXI, 15-18 (usually 17 or 18). Compared directly with the type of the species (1) this specimen is found to differ only in its more numerous arms; all the IIIBr series are developed externally.

Genus **NEOCOMATELLA** A. H. Clark

NEOCOMATELLA EUROPÆA A. H. Clark

Actinometra pulchella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 304 (part) (1).

1. "*Porcupine*" Station No. 31 (1870); 477 fathoms.—One specimen, small and badly broken, with twenty arms. One of the IIBr series is lacking, and a single IIIBr series is developed, externally, on another ray. The mouth is subcentral. Only one cirrus stump with four segments is present; the cirrus segments are exceptionally long, the fourth being four times as long as broad, or even rather longer.

NEOCOMATELLA ATLANTICA A. H. Clark

Actinometra pulchella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 304 (part) (1).

1. *St. Paul's Rocks, 10-80 fathoms; "Challenger."*—One large badly broken specimen with twenty arms. The distal dorsal edges of the pinnule segments are very strongly everted and produced so that the dorsal pinnule profile is deeply serrate. The longest cirrus stump remaining is 12.5 mm. long with nine segments, the sixth the longest, slightly over twice as long as broad; the following segments are slightly shorter; the sixth and following have the distal dorsal edge slightly produced.

Genus **CAPILLASTER** A. H. Clark

CAPILLASTER SENTOSA (P. H. Carpenter)

Actinometra sentosa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 325 (1).—1902. BELL, in GARDINER, Fauna and Geography of the Maldivian and Laccadive Archipelagoes, vol. 1, part 3, p. 225 (2).

1. *Banda; "Challenger."*—Two specimens.

2. *North Male, Maldives*.—One fine specimen.

CAPILLASTER MULTIRADIATA (Linné)

Actinometra multiradiata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 322 (1).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (2).—BRIT. MUS., MS. (3).

Actinometra fimbriata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 317 (4, 5).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (6, 7, 8, 9).—1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. I, part 3, p. 225 (10.)—BRIT. MUS., MS. (11, 12, 13).

Actinometra coppingeri 1884. BELL, "Alert" Report, p. 168 (14).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 320 (15, 16).

Actinometra parvicirra 1888. BELL, Proc. Zoöl. Soc. London, 1888, p. 384; p. 387 (17).—1894. THURSTON, Madras Government Museum Bulletin, No. 2, p. 106; p. 114 (17.)—BRIT. MUS., MS. (18, 19).

Antedon anceps BRIT. MUS., MS. (20).

Actinometra multifida BRIT. MUS., MS. (21).

1. "Challenger" Station No. 186.—One specimen.

2. Northwestern Australia.—Three specimens.

3. No Locality.—One specimen with seventeen arms about 40 mm. long; three of the IIBr series are 2 and two are 4 (3 + 4); each of the latter bears internally a IIIBr 3 (2 + 3) series. The IIBr 2 series may be immediately followed by a syzygial pair (the normal first syzygial pair) or the second and third brachials may be united by syzygy; these two types of proximal arm structure are of about equal frequency. There are 21 cirrus segments.

Half of the animal alone would certainly be identified as *Comatella maculata*, the other half as *Capillaster multiradiata*.

4. Banda; "Challenger."—Two specimens.

5. "Challenger" Station No. 208.—One specimen.

6. Macclesfield Bank; 22-30 fathoms.—One specimen with seventeen arms.

7. Macclesfield Bank; 23-40 fathoms.—One specimen.

8. Macclesfield Bank; 30-40 fathoms.—One specimen.

9. Macclesfield Bank; 45 fathoms.—One specimen.

10. Male, Maldives.—One fine specimen with twenty-two arms.

11. Tizaid Reef; 27 fathoms.—One specimen.

12. Tizaid Reef; 8½ fathoms.—One specimen.

13. No Locality.—One specimen.

14. Flinders Island, Clairmont, northeastern Australia; 11 fathoms; sand and mud; "Alert."—One specimen.

15. Banda; 17 fathoms; "Challenger."—One specimen.

16. Zamboanga; 10 fathoms; "Challenger."—One specimen.

17. Tuticorin, Madras Presidency; E. Thurston.—Two specimens, one with twenty-one, the other with twenty-five arms.

18. *No Locality*.—One specimen; five of the IIIBr series are 1, and one is 3 (2 + 3).

19. "*Antarctic Expedition*."—One specimen.

20. *Blanche Bay, New Britain; Arthur Willey*.—One specimen with twelve arms; the arms expand very rapidly to about the sixteenth brachial, then taper distally; the brachials are shaped essentially as those of *Comatula solaris*, strongly convex externally, with a strongly concave anterior border; they are also strongly triangular instead of being more or less oblong as usual.

21. *Singapore*.—One specimen with fourteen arms 120 mm. long; the cirri are 20 mm. long and are composed of twenty-one segments.

Genus NEMASTER A. H. Clark

NEMASTER LINEATA (P. H. Carpenter)

Actinometra lineata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 327 (1).

1. *Bahia, 7-20 fathoms; "Challenger"*.—Three specimens with twenty-nine, twenty-nine and nineteen arms.

Genus COMISSIA A. H. Clark

COMISSIA PEREGRINA (Bell)

Actinometra peregrina 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 402 (1).

1. *Macclesfield Bank; 55-60 fathoms*.—One specimen. The cirri are XIII, 25-30 (usually nearer the latter), 20 mm. long; the fifth is a transition segment. The mouth and the anal tube are equally excentric. The ten arms are 120 mm. long; the synarthrial tubercles are only slightly evident; the distal edges of the brachials are moderately produced; the distal intersyzygial interval is three oblique muscular articulations.

This species is closely related to *C. lütkeni*, but may be at once distinguished by the greater number of cirrus segments. There is a great development of small spines, especially on the pinnulars, so that the animal has the curiously "dry" feeling characteristic of *C. lütkeni*, and especially of *C. dumetum*.

COMISSIA PECTINIFER A. H. Clark

Comissia pectinifer 1911. A. H. CLARK, Annals and Mag. Nat. Hist. (8), vol. 7, p. 644 (1).

1. *Christmas Island; H. M. S. "Flying Fish"*.—One specimen. The centrodorsal is discoidal, moderately large; the bare polar area

is flat; the cirrus sockets are arranged in three crowded marginal rows.

The cirri are XXXIV, 14-16 (usually the latter), 14 mm. long; the eighth is a transition segment; the longer proximal segments are nearly or quite twice as long as broad, slightly constricted centrally; the last two segments before the penultimate are about as long as broad to one-third broader than long; the outer cirrus segments are very highly polished and bear small dorsal tubercles.

The ten arms are about 90 mm. long; the ossicles of the IBr series are so closely joined that the articulation between them has all the appearance of a syzygy, but they are well separated laterally; the arms resemble those of the other species of *Comissia*; the distal edges of the brachials overlap rather strongly; syzygyies occur between the third and fourth brachials, again between the eleventh and twelfth and fifteenth and sixteenth, and distally at intervals of three oblique muscular articulations.

There are terminal combs on the pinnules as far as P_4 ; the comb of P_4 has fifteen or sixteen teeth, beyond which are a few segments which do not bear processes; the teeth are exceptionally long; in P_4 there are only nine segments preceding the comb; P_1 is 12 mm. long, and bears a comb composed of twenty-five very long teeth.

COMISSIA IGNOTA A. H. Clark

Actinometra, sp. nov. 1884. BELL, "Alert" Report, p. 510 (1, 2).

Comissia ignota 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 17 (1, 2).

Actinometra pectinata BRIT. MUS., MS. (1).

1. *Marie Louise Island, Amirante Group; 17 fathoms; "Alert."*—Nine specimens, one of which is six rayed.

This is the type locality of the species, and it was from these specimens that the original description was drawn up.

2. *Isle des Neufs, Amirante Group; 17 fathoms; coral; "Alert."*—One specimen.

Genus LEPTONEMASTER A. H. Clark

LEPTONEMASTER VENUSTUS A. H. Clark

1. *Cuba.*—Two specimens.

Subfamily COMACTINIINÆ A. H. Clark

Genus COMATULELLA A. H. Clark

COMATULELLA BRACHIOLATA (Lamarck)

Comatula rosea BRIT. MUS., MS. (1).

1. *Port Phillip, Victoria.*—One fine specimen.

Genus **COMATULA** Lamarck
COMATULA ROTALARIA (Lamarck)

Actinometra jukesii 1879. P. H. CARPENTER, Proc. Roy. Soc., vol. 28, p. 390 (1).

Actinometra jukesii 1884. BELL, "Alert" Report, p. 168 (2, ?3, ?4).

Actinometra paucicirra 1884. BELL, "Alert" Report, p. 169 (3, 4).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 291 (6, 7).

1. *Cape York; Professor J. B. Jukes*.—One specimen.
2. *Albany Island, Queensland; 3-4 fathoms; mud; "Alert"*.—One large and typical specimen with twenty arms.
3. *Prince of Wales Channel, Torres Strait; 7 fathoms; "Alert"*.—One fine specimen.
4. *Prince of Wales Channel, Torres Strait; 5-7 fathoms; sand and shell; "Alert"*.—Two small specimens, one with three, the other with four cirri. These are the types of *paucicirra*.
5. *Torres Strait; 4 fathoms; "Alert"*.—Two twenty armed specimens; one has one cirrus stump remaining; in both the centrodorsal is not yet sunk to the level of the dorsal surface of the radials.
6. *"Challenger" Station No. 187; Cape York*.—About a dozen specimens; all appear to be twenty armed and typical.
7. *Aru (Arrow) Islands; "Challenger"*.—Small specimens which have not entirely lost their cirri.
8. *No Locality*.—One fine specimen with twenty-one arms; the centrodorsal is stellate, countersunk to the level of the dorsal surface of the radials; there are no subradial clefts; the single IIIBr series is externally developed, and resembles the IIBr series.
9. *Holothuria Bank*.—One specimen.
10. *Holothuria Bank; 34 fathoms*.—One specimen.

COMATULA ETHERIDGEI A. H. Clark

Comatula ethridgei 1911. A. H. CLARK, Memoirs of the Australian Museum, vol. 4, part 15, p. 741 (1, 2).

1. *Holothuria Bank; 38 fathoms*.—Three specimens.
2. *Baudin Island, northwestern Australia; 8-15 fathoms*.—One specimen.

These have been described in detail in the reference cited.

COMATULA SOLARIS (Lamarck)

Antedon milberti 1884. BELL, "Alert" Report, p. 156 (10).

Actinometra solaris 1884. BELL, *T. c.*, p. 164 (1); p. 165 (2).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 288 (1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14).

Actinometra solaris var. *albonotata* 1884. BELL, *T. c.*, p. 165 (3).

Actinometra intermedia 1884. BELL, *T. c.*, p. 166 (4).—BRIT. MUS., MS. (6).

Actinometra robusta 1884. BELL, *T. c.*, p. 167 (5, ?7).

Actinometra strota 1884. BELL, *T. c.*, p. 167 (6, ?8).—1888. P. H. CARPENTER, *T. c.*, p. 290 (11, 16).

1. *Prince of Wales Channel, Torres Strait; 5-7 fathoms; "Alert."*—Two specimens.

2. *Torres Strait; 10 fathoms; sand; "Alert."*—Four specimens, three of which are small.

3. *Albany Island, Queensland; 3-4 fathoms; "Alert."*—One specimen.

4. *Albany Island; 3-4 fathoms; mud; "Alert."*—Six specimens.

5. *Port Curtis; 5-11 fathoms; "Alert."*—One magnificent specimen.

6. *Port Molle; "Alert."*—One specimen.

7. *Prince of Wales Channel; "Alert."*—Six specimens.

8. *Port Molle; 12 fathoms; "Alert."*—One fine specimen; there are no cirri; the centrodorsal is reduced to a pentagonal plate which is not quite sunk to the level of the radials.

9. *Fitzroy Island, Queensland; "Alert."*—One specimen.

10. *Port Denison; "Alert."*—One specimen.

11. *Cape York; "Challenger."*—Five specimens.

12. *"Challenger" Station No. 187.*—Six specimens.

13. *Billiton.*—Three specimens, all of the slender armed type; this species appears never to attain the stout armed "*robusta*" form except in Australia.

14. *Singapore.*—One specimen of the slender armed type.

15. *Holothuria Bank, northwestern Australia.*—One specimen.

16. *Cape York; Professor J. B. Jukes.*—Seven specimens.

17. *No Locality; Professor J. B. Jukes.*—One specimen.

18. *No Locality.*—One specimen.

COMATULA PURPUREA (J. Müller)

Actinometra solaris 1884. BELL, "Alert" Report, p. 165 (1).

Actinometra pectinata 1884. BELL, *T. c.*, p. 165 (2).

Actinometra alternans 1884. BELL, *T. c.*, p. 169 (3).

Actinometra pectinata BRIT. MUS., MS. (1, 2, 4).

1. *Torres Strait; "Alert."*—One specimen.

2. *Dundas Strait, northwestern Australia; 17 fathoms; mud; "Alert."*—Two small specimens with the characteristic cirrus arrangement already developed.

3. *Port Molle; 12-20 fathoms; rock; "Alert."*—One specimen.

4. *No Locality*.—One specimen.
5. *Dimes Island, New Guinea*.—One young specimen.
6. *Australia*.—One specimen.

COMATULA PECTINATA (Linné)

Antedon irregularis 1884. BELL, "Alert" Report, p. 161 (1).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (22).

Actinometra solaris 1884. BELL, "Alert" Report, p. 164 (2, 3, 4, 5, 6, 7, 8, 9).—BRIT. MUS., MS. (10, 11).

Actinometra sp. juv. 1884. BELL, "Alert" Report, p. 170 (12).

Actinometra pectinata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 284 (13, 14).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (15, 16, 17, 18, 19, 20, 21).—BRIT. MUS., MS. (24, 25, 26).

Actinometra parvicirra 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (23).

Comatula rosularis BRIT. MUS., MS. (27).

Actinometra echinoptera BRIT. MUS., MS. (28).

1. *Prince of Wales Channel; 7 fathoms; sand; "Alert."*—One young specimen.
2. *Prince of Wales Channel; 7 fathoms; sand; "Alert."*—One small specimen.
3. *Warrior Reef, Torres Strait; "Alert."*—One specimen.
4. *Port Curtis; 0-11 fathoms; sand and shell; "Alert."*—One specimen.
5. *Arafura Sea; "Alert."*—One specimen.
6. *Thursday Island; "Alert."*—Three specimens.
7. *Thursday Island; 4-6 fathoms; "Alert."*—One small specimen.
8. *Thursday Island; "Alert."*—One specimen with arms 65 mm. long.
9. *Thursday Island; "Alert."*—Two specimens.
10. *Port Molle; 14 fathoms; rock; "Alert."*—Two specimens.
11. *Port Molle; 14 fathoms; rock; "Alert."*—One specimen.
12. *Dundas Strait, northwestern Australia; 17 fathoms; mud; "Alert."*—One young specimen.
13. *Cape York; 8-12 fathoms; "Challenger."*—One specimen.
14. *Zamboanga; 10 fathoms; "Challenger."*—Two specimens of the stout armed type.
15. *Holothuria Bank; 34 fathoms.*—One eleven armed specimen.
16. *Holothuria Bank; 24 fathoms.*—Five specimens.
17. *North side of Holothuria Bank; 36 fathoms.*—Two fine specimens.
18. *Holothuria Bank.*—Two specimens.
19. *Baudin Island, northwestern Australia*—One specimen.
20. *Northwestern Australia.*—Seven specimens.

21. *Northwestern Australia*.—One young.
22. *Baudin Island; 8-15 fathoms*.—Two small specimens.
23. *Bassett-Smith Bank; 9 fathoms*.—One specimen.
24. *14° 50' S. lat., 125° 40' E. long.*—Two small specimens.
25. *Billiton*.—One specimen with moderately stout arms, and cirri XV.
26. *Singapore*.—One specimen of the slender armed type.
27. *No Locality*.—One specimen.
28. *No Locality*.—One specimen.
29. *No Locality*.—One specimen.

Genus COMACTINIA A. H. Clark

COMACTINIA ECHINOPTERA (J. Müller)

Actinometra meridionalis BRIT. MUS., MS. (1, 2).

1. *22° S. lat., 40° W. long.; 35-40 fathoms*.—Three specimens, two small and one large; the latter has ten arms 100 mm. long, and eleven cirrus segments.
2. *Barbados*.—One specimen.

COMACTINIA MERIDIONALIS (Agassiz and Agassiz)

Actinometra meridionalis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 301 (1).—BRIT. MUS., MS. (2, 3).

1. *Bahia; 7-20 fathoms; "Challenger"*.—Four specimens.
2. *18° 50' S. lat., 38° 47' W. long.; 30-34 fathoms; 75° Fahr.*—One specimen with arms 60 mm. long, resembling the specimens called *brasiliensis* by Lütken.
3. *Gulf Stream; 100 fathoms; A. Agassiz*.—One specimen.

Subfamily COMASTERINÆ A. H. Clark

Genus COMASTER L. Agassiz

COMASTER BELLI (P. H. Carpenter)

Actinometra belli 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 334 (1).

Actinometra nobilis 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (2).

Actinometra multifida 1894. BELL, *T. c.*, p. 394 (3).

1. "*Challenger*" Station No. 186.—Two specimens; one has five large cirri; the other resembles the specimens from Torres Strait in the U. S. National Museum collection.
2. *Western Australia*.—One specimen; the cirri are XII, 17-18, 13 mm. long; there are slight dorsal tubercles on the last six seg-

ments; the carination of the earlier pinnule segments is very prominent.

3. *Northwestern Australia*.—One specimen, with VII cirri.

COMASTER TYPICA (Lovén)

Actinometra multifida 1884. BELL, "Alert" Report, p. 169 (1, 2).

Actinometra variabilis 1884. BELL, "Alert" Report, p. 169 (3).

Actinometra typica 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 296 (4).—1899. BELL, Willey's Zoölogical Results, part 2, p. 134 (5).

1. *Prince of Wales Channel, Torres Strait; 5-7 fathoms, "Alert."*—One young specimen with sixty-four arms 75 mm. long; there are usually six post-radial axillaries; the cirri are VII, 15; they are becoming reduced, and show signs of disappearing.

2. *Australia*.—Two specimens, just like those determined as *typica* in the collection of the Australian Museum; both are small; there are five or six post-radial axillaries; the interradial dorsal perisomic areas are heavily plated; there are no cirri, though the cirrus sockets are still well formed.

3. *Thursday Island; 3-4 fathoms; sand; "Alert."*—Four specimens; there are six post-radial axillaries.

4. *Near Kandavu, Fiji; "Challenger."*—One small specimen.

5. *Blanche Bay, New Britain; Dr. Willey*.—Two specimens.

COMASTER GRACILIS (Hartlaub)

Actinometra sp. 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 402 (1).

Actinometra typica 1899. BELL, Willey's Zoölogical Results, part 2, p. 134 (2).—BRIT. MUS., MS. (5).

Antedon indica 1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. I, part 3, p. 224 (3).

Actinometra stellata BRIT. MUS., MS. (4).

Actinometra tridistichata BRIT. MUS., MS. (1).

1. *Macclesfield Bank; 30 fathoms*.—One specimen.

2. *Blanche Bay, New Britain; Dr. Willey*.—One specimen; there are three or four post-radial axillaries.

3. *Hulule, Maldives*.—One specimen; in some cases VBr are present.

4. *Fiji*.—One specimen.

5. *"Section A. Ship"; 7 fathoms*.—Arms.

COMASTER MULTIBRACHIATA (P. H. Carpenter)

Actinometra multibrachiata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 299 (1).

1. *Banda; 17 fathoms.*—One specimen, exactly like the large specimens which I have recorded from the Philippine Islands; the sub-radial clefts are large and deep.

COMASTER DISTINCTA (P. H. Carpenter)

Actinometra distincta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 295 (1).

Actinometra parvicirra 1888. P. H. CARPENTER, *T. c.*, p. 338 (2).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (3).

Antedon brevicirra 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 400 (4).

1. *Zamboanga; 10 fathoms.*—One specimen.

2. *Zamboanga; 10 fathoms.*—One specimen; there are apparently twenty-one arms; one cirrus remains, with twelve segments. The characteristic terminal combs and the presence of combs on the distal pinnules show that this is a species of *Comaster* and not of *Comanthus*.

3. *Macclesfield Bank.*—One specimen with between thirty-five and forty arms.

4. *Macclesfield Bank; 20-35 fathoms.*—One small specimen with numerous cirri and about forty-five arms.

COMASTER FRUTICOSUS A. H. Clark

Actinometra regalis 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (1).

1. *Macclesfield Bank; 30 fathoms.*—One specimen; the cirri are XVII, 13-15; there are about one hundred and fifty arms.

Genus COMANTHERIA A. H. Clark**COMANTHERIA ALTERNANS (P. H. Carpenter)**

Actinometra alternans 1884. BELL, "Alert" Report, p. 169 (1).

1. *Port Molle; 12-20 fathoms; rock; "Alert."*—One fine specimen.

COMANTHERIA BRIAREUS (Bell)

Antedon briareus 1884. BELL, "Alert" Report, p. 163 (1).

Actinometra divaricata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 332 (2).

Actinometra parvicirra 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (3).

Actinometra duplex BRIT. MUS., MS. (4).

Actinometra typica BRIT. MUS., MS. (5).

1. *Port Denison*; 3-4 fathoms; "*Alert*."—One specimen.
2. *Banda*; 17 fathoms; "*Challenger*."—One specimen.
3. *Baudin Island*; 8-15 fathoms; *October, 1890*.—One specimen with between seventy-five and eighty arms.
4. *Bassett-Smith Bank*; 9 fathoms.—One small specimen.
5. *Billiton*.—One small specimen.

COMANTHERIA ROTULA A. H. Clark

Actinometra parvicirra BRIT. MUS., MS. (1).

1. *No Locality*.—One specimen with thirty-four arms 70 mm. long; the IIBr series are 4 (3 + 4) and the IIIBr series are 2; a single IVBr series is present, 2, developed externally on the only IIIBr 4 (3 + 4) series, which itself is external. The cirri are V, 13, 6 mm. long, small and weak.

Genus COMANTHINA A. H. Clark

COMANTHINA SCHLEGELII (P. H. Carpenter)

Actinometra multifida 1884. BELL, "*Alert*" Report, p. 169 (1).

Actinometra nobilis 1888. P. H. CARPENTER, "*Challenger*" Report, *Comatulæ*, p. 336 (2).—BRIT. MUS., MS. (9, 12).

Actinometra duplex 1888. P. H. CARPENTER, *T. c.*, p. 335 (3).—1894. BELL, *Proc. Zool. Soc. London*, 1894, p. 396 (6).—BRIT. MUS., MS. (5, 7).

Actinometra regalis 1888. P. H. CARPENTER, *T. c.*, p. 347 (4).—BRIT. MUS., MS. (10).

Actinometra typica 1902. BELL, in GARDINER, *Fauna and Geography of the Maldiva and Laccadive Archipelagoes*, vol. 1, part 3, p. 225 (8).

1. *Percy Island, Queensland*; "*Alert*."—One specimen with sixty-three arms 85 mm. to 90 mm. long; a single cirrus with fifteen segments remains. The interradial dorsal perisomic plating is very heavy, the plates being exceptionally thick, and rounded dorsally. The five key plates stand out large and prominent in the interradial angles, being especially convex dorsally.

2. *Zamboanga*; "*Challenger*."—Five specimens, exactly like those in the U. S. National Museum from the Philippine Islands.

3. *Banda*; "*Challenger*."—A young specimen with five cirri remaining.

4. *Banda*; "*Challenger*."—Two immature specimens; one has the cirri VIII, 15-17; the other has four large and two small cirri, and a few cirrus stumps.

5. *Bassett-Smith Bank*; 9 fathoms.—One small specimen with a remarkable development of interradial plating.

6. *Macclesfield Bank; 13 fathoms.*—One specimen; the centrodorsal bears the stumps of a row of cirri.

7. *Blanche Bay, New Britain.*—One specimen; there are XIII stout cirri about the edge of the centrodorsal.

8. *Suvadiva, Maldives.*—One enormous specimen.

9. *Philippines.*—One specimen.

10. *Malacca.*—One specimen.

11. *Solomon Islands; H. M. S. "Penguin."*—One large specimen.

12. *No Locality.*—One specimen.

Genus **COMANTHUS** A. H. Clark

Specific Group **BENNETTIA** A. H. Clark

COMANTHUS BENNETTI (J. Müller)

Actinometra bennetti 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (1).—1899. BELL, Willey's Zoölogical Results, vol. 2, p. 134 (2, 5).

Actinometra grandicalyx 1899. BELL, Willey's Zoölogical Results, vol. 2, p. 134 (3).

Actinometra peroni BRIT. MUS., MS. (4).

1. *Macclesfield Bank; 13 fathoms.*—One small specimen.

2. *Loyalty Islands.*—One large specimen; the cirri are XXIV, 21-22, smooth, stout and well developed, arranged in two rows on the centrodorsal; the outer IIIBr series are 2; all the other division series are 4 (3 + 4); VBr series are present.

3. *New Britain.*—One specimen.

4. *Lelti Island.*—One beautiful specimen with seventy-two arms, resembling the specimen from the Pelew Islands in the Copenhagen Museum.

5. *Loyalty Islands.*—One specimen similar to No. 2, but with somewhat larger and stouter cirri; the cirri are XXXIII, 21; the division series are 4 (3 + 4) except the IIIBr series which are mostly 2; when IIIBr 4 (3 + 4) series occur they are internal; VBr series are present.

COMANTHUS TRICHOPTERA (J. Müller)

Actinometra trichoptera 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 345 (1).—1888. BELL, Ann. and Mag. Nat. Hist. (6), vol. 2, p. 402 (2).—1890. P. H. CARPENTER, Proc. Roy. Soc. Victoria, vol. 2 (N. S.), p. 135 (3).—BRIT. MUS., MS. (4, 5).

1. *Port Jackson, New South Wales; "Challenger."*—One specimen.

2. *Port Phillip; Victoria; J. Bracebridge Wilson.*—Two specimens.

3. *Port Phillip Head; J. Bracebridge Wilson.*—Twenty-three specimens.

4. *No Locality.*—One specimen.

5. *No Locality.*—One specimen.

COMANTHUS WAHLBERGII (J. Müller)

Actinometra parvicirra 1888. P. H. CARPENTER, "Challenger" Report, *Comatulæ*, p. 338 (1).—1905. BELL, *Marine Investigations in South Africa*, vol. 4, p. 141 (2, 3).

Antedon capensis 1905. BELL, *Marine Investigations in South Africa*, vol. 4, p. 139 (4).

Actinometra paucicirra BRIT. MUS., MS. (5).

1. *Simon's Bay, Cape Colony; 10-20 fathoms; "Challenger."*—One specimen with twenty arms, resembling those from the Cape of Good Hope and from False Bay.

2. *False Bay, Cape of Good Hope.*—Eight specimens; of these one has thirteen arms, one has fifteen, three have sixteen, two have seventeen, and one has nineteen. The centrodorsal is broad, flat and circular just as in *C. trichoptera*. The cirri are VI-XII, 15-16; the sixth is a transition segment. The arms are short, stout and rapidly tapering, suggesting the conditions found in *Comatulella brachiolata*. The division series are close together and broad, and their component ossicles have everted distal edges. The brachials overlap conspicuously.

3. *False Bay, Cape of Good Hope.*—Two specimens; one of these has the cirri XXV, 15-17; the sixth is a transition segment; there are twenty-one arms; nine IIBr 4 (3 + 4) series are present, and there are two IIIBr 2 series, one external and one internal. A smaller specimen has nineteen arms and cirri XIV, 13-14.

4. *Cape of Good Hope.*—Two specimens.

5. *Cape of Good Hope.*—Four specimens; three of these have twenty and one has twenty-one arms; in the last the arms are 60 mm. long; the cirri are XII, 15-16, 10 mm. long; the fifth, sixth or seventh (usually the sixth) is a transition segment; the centrodorsal is thin discoidal, the broad flat dorsal pole 4 mm. in diameter. Attached to the cirri of one of the twenty armed specimens I found thirteen pentacrinoid young; these possess seventeen columnars.

6. *Cape of Good Hope.*—One small specimen.

7. *Cape of Good Hope; Station No. 508A.*—Twenty young specimens with from ten to twelve arms.

8. *No Locality.*—One specimen with twenty arms.

Remarks.—This species, which is entirely distinct from *C. parvicirra*, has never been properly understood. The centrodorsal is broad and flat, just as in *C. trichoptera*, but the cirri are not so slender as in that species. The brachials have rather strongly everted distal ends. The division series are broad and very close together laterally. The arms expand somewhat from the base to about the twelfth or fourteenth brachial. The transition segment in the cirri is usually not particularly marked.

On the whole this species comes closest to *C. trichoptera*, but it is a much smaller form with shorter and stouter arms and stouter cirri.

Most of the specimens recorded above from False Bay have an arm length of from 30 mm. to 35 mm., and a cirrus length of 7 mm.

COMANTHUS SAMOANA A. H. Clark

Actinometra parvicirra BRIT. MUS., MS. (1).

Actinometra trachygaster BRIT. MUS., MS. (2).

1. *No Locality.*—One specimen with twenty arms 60 mm. long; seven of the IIBr series are 2, the other three being 4 (3 + 4).

2. *Samoa.*—Two specimens.

Specific Group VANIA A. H. Clark

COMANTHUS ANNULATA (Bell)

Actinometra annulata 1882. BELL, Proc. Zoöl. Soc. London, 1882, p. 535, pl. 35 (1).

Actinometra parvicirra 1887. BELL, Sci. Trans. Roy. Dublin Soc. (2), vol. 3, p. 645 (2, 3).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 338 (6, 7).—1888. BELL, Proc. Zoöl. Soc. London, 1888, p. 384 (8).—1894. THURSTON, Madras Government Museum Bulletin, No. 1, p. 28 (8).

Actinometra valida 1888. P. H. CARPENTER, "Challenger" Reports, Comatulæ, p. 314 (4).

Actinometra littoralis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 346 (5).

Actinometra gracilis (Lütken) BRIT. MUS., MS. (13).

1. *Cape York.*—Four specimens; one of these has forty arms and VIII cirri, deficient on a part of the periphery of the centrodorsal; another has thirty-nine arms and IX cirri, lacking on a part of the periphery of the centrodorsal; a third specimen has thirty-nine arms and cirri XII, 16-17; all of the division series with the exception of one IIBr series are 4 (3 + 4); the fourth specimen is broken.

2. *Ceylon.*—One specimen with forty-three arms; seven of the IIBr series are 2 and three are 4 (3 + 4); the IIIIBr and subsequent series are all 4 (3 + 4); there are only very small rudiments of cirri.

3. *Ceylon*.—One specimen with about forty arms.
4. "*Challenger*" Station No. 186.—One specimen.
5. *Banda; 17 fathoms; "Challenger."*—One specimen, resembling the one from Torres Strait in the U. S. National Museum.
6. "*Challenger*" Station No. 174.—One specimen with about forty arms; the centrodorsal is stellate with rudimentary cirrus stumps.
7. *Banda; "Challenger."*—One specimen with about forty arms; the centrodorsal is small and countersunk, entirely without cirri.
8. *Tuticorin, Madras; E. Thurston*.—Two specimens; one has sixty-eight arms; there are IV cirri, one large, the remainder diminishing in size; the larger have 13-14 segments; the other has forty-three arms and cirri XV, 14-16.
9. *Holothuria Bank; 34 fathoms*.—Two specimens.
10. *Northeastern Australia; J. B. Jukes*.—One specimen.
11. *Torres Strait; J. B. Jukes*.—One specimen.
12. *Solomon Islands; H. M. S. "Penguin"*.—One specimen.
13. *No Locality*.—One small specimen with forty-four arms; the cirri are IV, 16-17.

COMANTHUS PARVICIRRA (J. Müller)

- Actinometra cumingii* 1884. BELL, "Alert" Report, p. 167 (14).
- Actinometra parvicirra* 1884. BELL, *T. c.*, p. 168 (11, 13).—1887. BELL, *Sci. Trans. Roy. Dublin Soc.* (2), vol. 3, p. 645 (15).—1888. BELL, *Proc. Zoöl. Soc. London*, 1888, pp. 384, 387 (15, 17).—1888. P. H. CARPENTER, "*Challenger*" Report, *Comatulæ*, p. 339 (1, 3, 4, 7, 8, 10, 12).—1894. BELL, *Proc. Zoöl. Soc. London*, 1894, p. 396 (19, 20, 21, 22, 23, 24, 26, 27, 28).—1894. THURSTON, *Madras Government Museum Bulletin*, No. 2, p. 106 (15); p. 114 (17).—BRIT. MUS., MS. (30).
- Actinometra cumingi* 1887. BELL, *Sci. Trans. Roy. Dublin Soc.* (2), vol. 3, p. 645 (16).—1888. BELL, *Proc. Zoöl. Soc. London*, 1888, p. 387 (16).—1904. CHADWICK, in HERDMAN, *Report Ceylon Pearl Oyster Fisheries*, vol. 2, *Suppl. Report XI*, p. 153 (16).—BRIT. MUS., MS. (33).
- Actinometra elongata* 1888. P. H. CARPENTER, "*Challenger*" Report, *Comatulæ*, p. 311 (6).
- Actinometra simplex* 1888. P. H. CARPENTER, *T. c.*, p. 312 (9).
- Actinometra rotalaria* 1888. P. H. CARPENTER, *T. c.*, p. 313 (5).—1894. BELL, *Proc. Zoöl. Soc. London*, 1894, p. 396 (25, 29).—BRIT. MUS., MS. (32).
- Actinometra quadrata* 1888. P. H. CARPENTER, "*Challenger*" Report, *Comatulæ*, p. 331 (2).
- Actinometra variabilis* 1894. BELL, *Proc. Zoöl. Soc. London*, 1894, p. 394 (18).
- Antedon cumingi* 1894. THURSTON, *Madras Government Museum Bulletin*, No. 2, p. 117 (17).
1. *Amoy, China; Swinhoe*.—Twenty-eight specimens.
 2. *Tongatabu; "Challenger"*.—One specimen with sixteen arms.
 3. *Ternate; "Challenger"*.—One specimen with twenty arms

80 mm. long; all of the IIBr series are present, two 2 and eight 4 (3 + 4).

4. *Zamboanga*; "Challenger."—Four specimens, with fourteen, twenty-two, thirty-two and thirty-three arms respectively; in the first there are five well developed cirri, interrarial in position; in the others the cirri are much reduced or rudimentary.

5. *Zamboanga*; "Challenger."—One specimen.

6. *Banda*; "Challenger."—Two specimens, one with about forty arms; the centrodorsal is small, and sunk to the level of the radials; the other is the type of Carpenter's *Actinometra elongata*.

7. *Banda*; "Challenger."—One small specimen with eighteen arms and four cirri.

8. *Admiralty Islands*; "Challenger."—One small specimen.

9. *Admiralty Islands*; "Challenger."—One specimen.

10. "Challenger" Station No. 186.—Two specimens; one is small with sixteen arms, the other larger with thirty arms.

11. *Warrior Reef, Torres Strait*; "Alert."—One specimen with twenty arms.

12. *Torres Strait*; *Professor J. B. Jukes*.—One specimen.

13. *Port Molle*; "Alert."—One specimen with fifteen arms and cirri IX, 11-12; there are five IIBr 4 (3 + 4) series; the interrarial plating is just beginning to develop.

14. *Port Molle*; "Alert."—One small specimen.

15. *Ceylon*.—One specimen with twenty arms.

16. *Ceylon*.—One small specimen.

17. *Madras*.—Two specimens.

18. *Bassett-Smith Bank*; 9 fathoms.—Two specimens.

19. *Macclesfield Bank*; 10-13 fathoms.—One specimen with twenty arms and cirri II, 11. This is a slender specimen with the spinosity of the brachials, pinnulars and pinnule tips exaggerated.

20. *Macclesfield Bank*; 22-30 fathoms.—One specimen with eighteen arms.

21. *Macclesfield Bank*; 22-30 fathoms.—One specimen with twenty-two arms.

22. *Macclesfield Bank*; 13-36 fathoms.—Two specimens, each with twenty arms; one has VII, the other no cirri.

23. *Macclesfield Bank*; 29-32 fathoms.—One specimen with sixteen arms; there are no IIIBr series; three cirri are present, all on one semi-circumference of the centrodorsal.

24. *Macclesfield Bank*; 22-30 fathoms.—Two small specimens; one has fourteen arms, the other sixteen arms and two cirri.

25. *Macclesfield Bank*; 13-36 fathoms.—One specimen with

twenty-one arms; the ten IIBr series are 2; the single IIIBr series, which is internally developed, is 4 (3 + 4); there are four cirri.

26. *Macclesfield Bank; 13 fathoms.*—Two specimens; the larger has twenty arms.

27. *Macclesfield Bank; 13-36 fathoms.*—One specimen with about thirty arms; there are V cirri.

28. *Macclesfield Bank; 26 fathoms.*—One small specimen with fourteen arms.

29. *Macclesfield Bank; 20-35 fathoms.*—One specimen with thirteen arms.

30. *Fremantle, Western Australia.*—One specimen.

31. *Seychelles; 34 fathoms.*—Two specimens; one of these is typical, with twenty arms and four cirri; the other is a small individual.

32. *No Locality.*—One specimen.

33. *Mauritius.*—Two small specimens, with thirteen and fourteen arms respectively, very close to, if not, *C. parvicirra*.

Family ZYGOMETRIDÆ A. H. Clark

Genus ZYGOMETRA A. H. Clark

ZYGOMETRA MICRODISCUS (Bell)

Antedon microdiscus 1884. BELL, "Alert" Report, p. 163 (1, 2).

Antedon multiradiata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 96 (4).—BRIT. MUS., MS. (5, 8, 11).

Antedon variipinna BRIT. MUS., MS. (3).

Antedon macronema BRIT. MUS., MS. (10).

1. *Port Molle, Queensland; 12 fathoms.*—In this, the type specimen, the disk is just beginning to regenerate. The enormously long proximal pinnules, which recall those of such species of *Himero-metra* as *H. bartschi*, and the very long cirri, which are from 40 mm. to 45 mm. in length, are the characteristic features of the species.

2. *Nicol Bay, northwestern Australia.*—Two specimens.

3. *Albany Island; "Alert."*—One specimen.

4. "Challenger" Station No. 187.—These two specimens, the types of Carpenter's *Antedon multiradiata*, are in reality small examples of this form.

5. *Holothuria Bank.*—One fine specimen.

6. *Northwestern Australia.*—One broken specimen with about forty arms.

7. *Torres Strait; 10 fathoms; sand.*—One specimen.

8. *Lewis Island, Dampier Archipelago, Western Australia.*—One specimen.

9. *Holothuria Bank*.—Fragments.
10. *No Locality*.—One specimen.
11. *Lewis Island, Dampier Archipelago*.—One specimen.
12. *Somerset Passage; 5-9 fathoms*.—One specimen.

ZYGOMETRA ELEGANS (Bell)

Antedon elegans 1884. BELL, "Alert" Report, p. 162 (1, 2, 3).

Antedon irregularis 1884. BELL, *T. c.*, p. 161 (6).

Antedon fluctuans 1888. P. H. CARPENTER, "Challenger" Report, *Comatulae*, p. 94 (4, 5).

1. *Port Molle; 12-20 fathoms; "Alert"*.—Examination of these types shows that this species has shorter cirri than the preceding, and small and weak proximal pinnules.
2. *Port Molle; 12-20 fathoms; rock; "Alert"*.—One specimen.
3. *Port Molle; 12-20 fathoms; rock; "Alert"*.—One small specimen.
4. "*Challenger*" Station No. 190.—Three specimens.
5. *Torres Strait; 10 fathoms; sand; "Alert"*.—One small specimen.
6. *Prince of Wales Channel; 7 fathoms; sand*.—One young specimen with arms 20 mm. long; on one of the rays the original synarthry has not as yet become changed into a pseudosyzygy.
7. *Baudin Island, northwestern Australia*.—One small specimen.
8. *Baudin Island; 8-15 fathoms*.—One very small specimen.

ZYGOMETRA PUNCTATA A. H. Clark

Heterometra bengalensis 1911. A. H. CLARK, *Australian Museum Memoirs*, vol. 4, p. 768 (1).—*Die Fauna Südwest-Australiens*, vol. 3, Lief. 13, pp. 440, 443, 444, 446 (1).

Zygometra punctata 1912. A. H. CLARK, *Proc. Biol. Soc. Washington*, vol. 25, p. 24.

1. *Holothuria Bank; 15 fathoms*.—One specimen with eighteen arms and cirri X, 29-31, 20 mm. long; long dorsal spines are developed on the cirri from the eleventh segment onward.

Genus EUDIOCRINUS P. H. Carpenter

EUDOCRINUS INDIVISUS (Semper)

Eudiocrinus granulatus 1894. BELL, *Proc. Zoöl. Soc. London*, 1894, p. 397, pl. 23 (1).

1. *Macclesfield Bank; 34-40 fathoms*.—This is a large specimen, the arms being between 85 mm. and 90 mm. long; there are 18-20 cirrus segments. I can see no differences whatever between this specimen and others undoubtedly referable to *indivisus* which I have examined from the Philippine Islands.

Family HIMEROMETRIDÆ A. H. Clark

Genus AMPHIMETRA A. H. Clark

AMPHIMETRA CRENULATA (P. H. Carpenter)

Antedon decipiens 1884. BELL, "Alert" Report, p. 159 (1, 2, 3, 4).

Antedon irregularis 1884. BELL, *T. c.*, p. 161 (5, 6, 7).

Actinometra solaris 1884. BELL, *T. c.*, p. 164 (8).

Antedon variipinna 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 256 (9, 10, 14).—1894. BELL, Proc. Zool. Soc. London, 1894, p. 394 (12, 13, 15, 17).—BRIT. MUS., MS. (11).

Antedon philiberti BRIT. MUS., MS. (16).

1. *Prince of Wales Channel*; "Alert."—Two small specimens.
2. *Prince of Wales Channel*; 7-9 fathoms; "Alert."—One specimen.
3. *Arafura Sea*; 32-36 fathoms; mud, sand and shell; "Alert."—One small specimen.
4. *Dundas Strait, northwestern Australia*; 17 fathoms; mud; "Alert."—One specimen.
5. *Prince of Wales Channel*; "Alert."—Thirty-four small specimens.
6. *Prince of Wales Channel*; 7 fathoms; sand; "Alert."—Thirty-six specimens.
7. *Torres Strait*; 10 fathoms; sand.—Eleven fine specimens.
8. *Prince of Wales Channel*; 5-7 fathoms; "Alert."—One small specimen.
9. *Aru Islands*; "Challenger."—Three specimens.
10. *Torres Strait*; "Alert."—Five specimens.
11. $14^{\circ} 50' S. lat., 125^{\circ} 40' E. long.$ —One small specimen.
12. *Holothuria Bank*; 24 fathoms.—Six typical, large, very rugged specimens, with the lateral processes on the pinnule segments exceptionally well pronounced; one of the specimens has ten, one eleven, one twelve, one thirteen, one fifteen and one seventeen arms.
13. *Northeast of Holothuria Bank*; 15-20 fathoms.—One small specimen with fifteen arms.
14. "Challenger" Station No. 186.—Two small specimens.
15. *Holothuria Bank*; 38 fathoms.—Four small ten armed specimens.
16. *Northeastern Australia*; Professor J. B. Jukes.—One specimen.
17. *Baudin Island, Western Australia*.—One specimen with greatly exaggerated lateral processes on the segments of the proximal pinnules.

AMPHIMETRA NEMATODON (Hartlaub)

Antedon milberti 1884. BELL, "Alert" Report, p. 156 (1).

1. *Port Molle, Queensland; 12-20 fathoms.*—One small specimen.

AMPHIMETRA ANCEPS (P. H. Carpenter)

Antedon clemens 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 229 (2).

Antedon anceps 1888. P. H. CARPENTER, *T. c.*, p. 254 (1).

1. "Challenger" Station No. 212.—Three specimens; these appear to be small specimens of the species which I described in detail under the name of *Craspedometra aliena* (Proc. U. S. Nat. Mus., vol. 37, p. 31).

2. "Challenger" Station No. 212.—One specimen; this most certainly represents the same species as do the preceding.

AMPHIMETRA PRODUCTA (A. H. Clark)

?*Antedon lævissima* BRIT. MUS., MS. (1).

1. *Fadiffolu, Maldives.*—One ten armed specimen; there are 23-25 cirrus segments which from the tenth onward bear small dorsal spines; the segments of the lower pinnules have slightly projecting and spinous distal ends.

AMPHIMETRA FLORA, new species

Antedon lævissima 1902. BELL, in GARDINER, Fauna and Geography of the Maldiva and Laccadive Archipelagoes, vol. 1, part 3, p. 224 (1, 2, 3).

Description.—The cirri are XV, 30, stout, as in *A. milberti*; all the segments are subequal, and all are broader than long, the longest being about one-third broader than long; the tenth and following bear prominent and sharp dorsal spines.

There are twelve arms 170 mm. long.

The longest proximal pinnules are about 20 mm. long and rather slender; the distal ends of their segments are perfectly smooth; the earlier segments are strongly carinate.

1. *Mulan, Maldives.*—One specimen, from which the preceding description was taken.

2. *Mulan, Maldives.*—One specimen with ten arms 180 mm. long, similar to the preceding; the cirri, as in the specimen described, are stout, strongly curved, and about 20 mm. long; the proximal pinnules are strongly carinate basally.

3. *Mulan, Maldives*.—One specimen with thirteen arms rather smaller than the two preceding, but with the proximal pinnules rather more strongly carinate; there are 29-30 cirrus segments, of which the tenth or eleventh and following bear dorsal spines.

AMPHIMETRA AFRICANA A. H. Clark

Amphimetra africana 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 20 (1, 2).

Antedon ?milberti BRIT. MUS., MS. (1).

Actinometra sp. BRIT. MUS., MS. (2).

1. *Zanzibar*.—One young specimen; the cirri are XVI, 25-27; the tenth and following segments bear long sharp dorsal spines; there are ten arms.

2. *Waxin*.—One specimen; this has twenty-three arms 120 mm. long; the IIBr series are 4 (3 + 4) and the IIIBr series are 2; the cirri are XX, 27; long sharp dorsal spines are developed from the tenth segment onward.

AMPHIMETRA MILBERTI (J. Müller)

Antedon milberti 1884. BELL, "Alert" Report, p. 156 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 194 (2, 3).

1. *Port Molle*; "Alert."—One specimen.

2. "Challenger" Station No. 212.—One typical, but rather small specimen.

3. "Challenger" Station No. 203.—One specimen.

AMPHIMETRA MOLLERI (A. H. Clark)

Antedon milberti BRIT. MUS., MS. (1).

1. *Java Sea*.—One specimen.

2. ? *Brazil*.—One specimen.

AMPHIMETRA DISCOIDEA (A. H. Clark)

Antedon milberti 1884. BELL, "Alert" Report, p. 156 (1, 2, 3, 4, 5, 6, 7).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (8, 9, 10).—BRIT. MUS., MS. (11).

Actinometra brachiolata BRIT. MUS., MS. (12).

1. *Port Molle*; 12-20 fathoms; "Alert."—One fine specimen.

2. *Port Molle*; "Alert."—Three specimens.

3. *Port Denison*; "Alert."—Three specimens.

4. *Port Denison*; "Alert."—Three beautiful large specimens.

5. *Prince of Wales Channel*; 7-9 fathoms; sand; "Alert."—Fourteen specimens.

6. *Torres Strait; 10 fathoms; sand; "Alert."*—Seven specimens; all are brownish yellow, the cirri deep purple, narrowly banded with white at the articulations.

7. *Torres Strait; 10 fathoms; sand; "Alert."*—One specimen, entirely purple.

8. *Northwestern Australia; 8-15 fathoms.*—Two specimens; in color these are slaty gray, purplish ventrally.

9. *Holothuria Bank; 15 fathoms.*—One specimen.

10. *Western Australia.*—Three typical specimens.

11. *No Locality.*—One specimen.

12. *No Locality.*—One specimen.

AMPHIMETRA PAPUENSIS A. H. Clark

Actinometra intricata BRIT. MUS., MS. (1).

1. *Tonga and Fiji.*—One small specimen; the cirri have twenty-five segments, of which the outer are more spiny than usual; this resembles the specimens from Hood Lagoon and Port Moresby, New Guinea, in the collection of the Australian Museum.

AMPHIMETRA PINNIFORMIS (P. H. Carpenter)

1. *Holothuria Bank; 15 fathoms.*—One specimen, probably of this species; the ten arms are 50 mm. long; the cirri have twenty-two segments, of which the fifth and following bear long dorsal spines, and of which the longest are not quite so long as broad.

AMPHIMETRA DENTICULATA (P. H. Carpenter)

Antedon denticulata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 130 (1).

1. "Challenger" Station No. 190.—This species was well described and figured by Carpenter; it proves to belong to the genus *Amphimetra*, and is related to *A. pinniformis*.

Genus HIMEROMETRA A. H. Clark

HIMEROMETRA MARTENSI (Hartlaub)

1. *Pulau Obin, Singapore.*—One specimen, resembling those from Singapore in the Copenhagen and U. S. National Museums.

HIMEROMETRA ROBUSTIPINNA (P. H. Carpenter)

Antedon inopinata 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 398 (1).

1. *Macclesfield Bank; 13-36 fathoms.*—The centrodorsal resembles that of the other species of the genus.

The cirri are XXX, 26-34, 30 mm. to 35 mm. long, stout; the sixth- or seventh-eighth segments are the longest, slightly broader than long to half again as broad as long; the segments in the outer half of the cirri are about twice as broad as long; the outer segments are slightly carinate, the carination on the last six or seven terminating distally in a small spine.

The forty-six arms are 140 mm. long; nine of the IIBr series are 4 (3 + 4), and one is 2; the IIIBr series are all 4 (3 + 4) except one (internal); the remaining division series are all 4 (3 + 4), except two IVBr series which are 2; the division series are strongly convex and widely separated, as is usual in the genus.

The proximal pinnules are about 20 mm. long with from seventeen to twenty segments, very stout and nearly smooth, the distal edges of the segments being only very slightly swollen; all the segments are short, about twice as broad as long in the proximal half of the pinnules, becoming about as long as broad toward the tip.

Remarks.—This species is very similar to the succeeding, but the cirri are larger and rather stouter and the proximal pinnules are shorter, about as stout in the proximal part but tapering more rapidly and without the flagellate tip; the segments in the outer part of these pinnules also do not possess the strongly everted distal edges seen in those of *H. sol*. The cirri of *H. robustipinna* are in their details much the same as those of *H. sol* but for the presence of a distinct, though small, spine on the last five or six segments; that on the antepenultimate is nearly as large as the opposing spine.

HIMEROMETRA SOL A. H. Clark

Antedon palmata 1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. 1, part 3, p. 224 (1, 2).

1. *Kolumaduli, Maldives; 38 fathoms.*—The centrodorsal is thick discoidal, with a strongly concave dorsal pole 4 mm. in diameter.

The cirri are XXI, 25, 27, 28, and 30, 25 mm. to 30 mm. long; the longest segments, in the proximal third, are nearly or quite as long as broad; the distal segments are slightly broader than long, sometimes as much as one-third broader than long; the terminal ten or twelve have a small and low median dorsal tubercle, sometimes scarcely noticeable until near the end of the cirrus; the opposing spine is well developed and conspicuous. The cirri as a whole are stout, stouter than those of the other species of the genus, with approximately subequal segments.

The forty-one arms are 140 mm. long; the IIBr series are 4 (3 + 4); the IIIBr series are 4 (3 + 4) externally, 2 internally;

the IVBr series (when present) are 4 (3 + 4). The division series are strongly convex and widely separated as is usual in the genus.

P_d is 18 mm. long with from thirty to thirty-two (usually the latter) segments, which are nearly twice as broad as long in the proximal half, but become about as long as broad in the distal third and terminally as long as broad; after the fourth or fifth the segments develop strongly everted and produced distal dorsal edges, this character gradually dying away in the distal third of the pinnule; this eversion is smooth and not serrate. The proximal pinnules are very stout, but also very long, and taper distally to a flagellate tip as in *H. magnipinna*; but the eversion of the distal ends of the segments is much greater than in that species, and the cirri are stouter.

2. *Kolumaduli, Maldives; 38 fathoms.*—One specimen; the cirri are XXXV, 27-29; there are fifty-one arms; only one of the division series (a IIIBr series internally developed) is 2, all the others being 4 (3 + 4); the proximal pinnules are exactly as in the other, 18 mm. to 21 mm. long.

Genus **HETEROMETRA** A. H. Clark

HETEROMETRA QUINDUPLICAVA (P. H. Carpenter)

Antedon quinduplicava 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 262 (1).

1. "Challenger" Station No. 212.—One specimen, resembling those collected by the "Albatross" in the Philippines; the outer cirrus segments are slightly carinate dorsally.

HETEROMETRA REYNAUDII (J. Müller)

Antedon reynaudi 1887. BELL, Sci. Trans. Roy. Dublin Soc. (2), vol. 3, p. 645.—1888. BELL, Proc. Zoöl. Soc. London, 1888, pp. 384, 387 (1).—1894. THURSTON, Madras Government Museum Bulletin, No. 2, p. 114 (1).

1. *Tuticorin, Madras.*—Two fine specimens, one with eighteen, the other with seventeen arms; in the former the arms are 90 mm. and the cirri 25 mm. long; one of the IBr series has no further division.

HETEROMETRA SAVIGNII (J. Müller)

Antedon savignyi 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, pp. 252, 380 (2).

1. *Gulf of Suez.*—Two specimens, both small.

2. *Kurrachi.*—Seven specimens; one with seventeen, two with eighteen, one with nineteen, two with twenty and one with twenty-

one arms. The largest has the arms 130 mm. and the cirri 25 mm. long. The specimen with twenty-one arms has three IIBr 2 series; two of them are on the same post-radial series, one of these being followed by a single internal IIIBr 2 series. One of the specimens with eighteen arms has a single internal IIIBr 2 series. In the remaining specimens only IIBr 4 (3 + 4) series are present.

No differences could be detected between these specimens and those from the Gulf of Suez.

Family STEPHANOMETRIDÆ A. H. Clark

Genus STEPHANOMETRA A. H. Clark

STEPHANOMETRA TUBERCULATA (P. H. Carpenter)

Antedon tuberculata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 232 (1).—1899. BELL, Willey's Zoölogical Results, vol. 2, p. 133 (2).

Antedon ?spicata 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (3).

1. "Challenger" Station No. 174.—One specimen with thirty arms; P_1 is slender and flexible, becoming very slender and flagellate distally; P_2 is much enlarged, stiff and spine-like, nearly half again as long as P_3 , with twelve segments; P_3 resembles P_2 , but is shorter and slightly less stout; P_4 is very short, small, but more or less stiffened; P_5 resembles P_4 .

2. *Lifu, Loyalty Islands*.—Two specimens, one with thirty arms 120 mm. long; the cirri are LII, 25-28 (usually 25), 20 mm. to 30 mm. long; P_2 has fifteen segments; P_3 has eleven or twelve segments. The other is similar.

3. *Macclesfield Bank; 20-35 fathoms*.—One specimen smaller than the type, but otherwise exactly like it.

4. *Pulau Obin, Singapore*.—One specimen with thirty arms.

5. *Cocos Island; Dr. Wood-Jones*.—One specimen with thirty arms.

STEPHANOMETRA MARGINATA (P. H. Carpenter)

Antedon marginata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 230 (1).

1. "Challenger" Station No. 208.— P_3 , though not especially enlarged and about the length of the succeeding pinnules, is more of the character of P_2 and is somewhat stouter than the succeeding; it is flagellate distally; P_2 curves strongly backward and is not erect, as is usual in *S. monacantha*.

Possibly this species is a form of *S. monacantha*, though probably it is distinct.

STEPHANOMETRA MONACANTHA (Hartlaub)

Antedon flavomaculata 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 400 (1).

1. *Macclesfield Bank; 13 fathoms.*—One small specimen with arms 65 mm. long; P_2 has thirteen segments.

STEPHANOMETRA INDICA (Smith)

Comatula indica 1879. SMITH, Ann. and Mag. Nat. Hist. (4), vol. 17, p. 406 (1); Phil. Trans. Roy. Soc., vol. 168, p. 564 (1).

Antedon indica 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 225 (1).

Antedon palmata 1888. BELL, Proc. Zoöl. Soc. London, 1888, pp. 384, 387 (2, 3).—1894. THURSTON, Madras Government Museum Bulletin, No. 1, pp. 28 (2), 53 (?); No. 2, pp. 106 (?), 114 (?).

Actinometra maculata 1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. 1, part 3, p. 225 (4).

Antedon ?spicata BRIT. MUS., MS. (5).

1. *Rodriguez.*—One broken specimen. This species is best described as resembling *S. monacantha*, but with P_2 longer and composed of more numerous segments; though slender distally, P_2 is not flagellate.

2. *Tuticorin, Madras.*—One large specimen.

3. *Tuticorin, Madras.*—One beautiful specimen with thirty arms 110 mm. long; P_2 is rather longer than usual and has fifteen or sixteen segments.

4. *Hulule, Male, Maldives.*—One specimen with thirty arms about 85 mm. long; as is usual in the species of this genus which have thirty arms all the IIIBr series are external; the cirri are XXIX, 22-23, 20 mm. long; P_2 is 14 mm. to 16 mm. long with from thirteen to fifteen segments; P_3 is small and weak like P_4 , and is not more than half as long as P_1 ; this is very similar to the somewhat larger specimen recorded just above (2).

5. *Male, Maldives.*—One specimen with twenty-five arms resembling the preceding (3) but slightly larger; P_2 has from thirteen to sixteen segments.

6. *Muhlos, Maldives.*—One specimen with fourteen arms 65 mm. long; P_1 is long and very slender; P_2 is enlarged and stiff, but distally flagellate, with fifteen segments; P_3 and the following pinnules are scarcely more than half as long as P_2 ; P_1 is long and very slender; the cirri are smooth with from seventeen to nineteen segments, of which the shorter distal are slightly carinate.

7. *Seychelles; 34 fathoms; "Sea Lark."*—One small specimen.

Family MARIAMETRIDÆ A. H. Clark

Genus MARIAMETRA A. H. Clark

MARIAMETRA VICARIA (Bell)

Antedon vicaria 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 400 (1).

Antedon ?variispina 1894. BELL, *T. c.*, p. 396 (2).

1. *Macclesfield Bank; 30-40 fathoms.*—One specimen; the cirri are XXIII, 29-31 (usually 29), slender, 20 mm. long; long sharp dorsal spines are developed from the ninth or tenth segment onward; the longest cirrus segment (just before the development of the dorsal spines) is about twice as long as broad.

The twenty-four arms are 60 mm. long; the dorsolateral ornamentation of the division series and arm bases occupies exactly the same areas as in *M. subcarinata*, but it is much more prominent and more irregular; instead of having a finely and evenly tuberculated surface the sides of the rays are converted into a spongy looking mass which causes the edges of the rays to appear denticulate; the median keel on the division series and brachials is much higher than in *M. subcarinata*. The arms and division series have a narrow dark purple median line. III Br series when developed are always external.

The disk is covered with small plates.

2. *Macclesfield Bank; 50 fathoms.*—One specimen; the cirri are XXIII, 33-36, 23 mm. long; dorsal spines are developed from the tenth segment onward; in this specimen the cirrus segments are not so long proportionately as in the preceding. One of the cirri is regenerating the distal portion.

There are between twenty-five and thirty arms 65 mm. long; very fine spines are developed in the areas of ornamentation; these little fuzzy spines cover the radials and a small part of the proximal edge of the I Br₁, extending thence upward interradially; at the articulations the ornamentation extends somewhat dorsalward, following along the articular divisions, and it may even narrowly bridge the division series at the synarthries, a condition not occurring so markedly in the other specimen.

In both individuals the division series are sharply flattened laterally, and both have the same median carination of the division series and lower brachials and the same deep purple narrow median line.

Genus DICHROMETRA A. H. Clark

DICHROMETRA FLAGELLATA (J. Müller)

1. *Pulau Obin, Singapore.*—Five specimens.

DICHROMETRA AFRA A. H. Clark

1. *Zanzibar*.—Two small specimens.

Genus LIPAROMETRA A. H. Clark

LIPAROMETRA ARTICULATA (J. Müller)

Antedon articulata 1884. BELL, "Alert" Report, p. 160 (1).

Antedon reginæ 1884. BELL, "Alert" Report, p. 160 (2).

1. *Port Molle, Queensland; 12-20 fathoms; rock; "Alert."*—One specimen.

2. *Port Molle, Queensland; 12-20 fathoms; rock; "Alert."*—One specimen; the cirri are about XXV, 29, 30, 32, 34; the longest cirrus segments are about as long as broad, and the distal are about one-third broader than long; stout, though not long, dorsal spines are developed from the thirteenth or fifteenth onward; as a whole the cirri are moderately stout.

The thirty-eight arms are about 100 mm. long.

P_1 is 14 mm. long; P_2 is about 22 mm. long, very slender and delicate, flagellate, soft and not stiffened, with forty-three segments which are only slightly longer than broad; P_3 is similar to P_2 , but the following pinnules are shorter; P_4 is 10 mm. long. There is but a slight difference in basal stoutness between the earlier pinnules, but P_2 and P_3 taper much less rapidly than the others.

LIPAROMETRA REGALIS (P. H. Carpenter)

Antedon regalis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 237 (1).

1. *Tongatabu Reefs; "Challenger."*—One specimen; this species is much like the Japanese *L. grandis*, but it is a smaller and in every way more delicate form; there are no distal cirrus spines. The figure given of it in the "Challenger" report is excellent.

Genus LAMPROMETRA A. H. Clark

LAMPROMETRA PROTECTUS (Lütken)

Antedon conjungens 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 233 (1).

Antedon similis 1888. P. H. CARPENTER, *T. c.*, p. 235 (2).

Antedon occulta 1888. P. H. CARPENTER, *T. c.*, p. 236 (3).

Antedon palmata 1888. BELL, Proc. Zoöl. Soc. London, 1888, pp. 384, 387 (4).—1894. THURSTON, Madras Government Museum Bulletin, No. 1, pp. 28 (4), 53 (?); No. 2, pp. 106 (?), 114 (?).

Antedon indica 1899. BELL, Willey's Zoölogical Results, vol. 2, p. 133 (5).

Antedon æquipinna BRIT. MUS., MS. (6).

Antedon protectus BRIT. MUS., MS. (7).

1. *Cebu Reefs; "Challenger."*—One specimen; I cannot see any way in which it differs from true *protectus*.
2. "*Challenger*" Station No. 174.—One specimen with thirty arms; none of the cirrus segments are quite so long as broad.
3. "*Challenger*" Station No. 174.—Three specimens.
4. *Ramesvaram, Gulf of Manaar.*—Two small specimens.
5. *Blanche Bay, New Britain.*—One specimen.
6. *Fiji.*—One specimen.
7. *Tonga.*—One typical specimen.
8. *Andaman Islands.*—One specimen.
9. *Edge of Reef off Nam-Zit Island.*—One specimen.

Remarks.—I cannot see that the type of Carpenter's *Antedon similis* presents any valid characters by which it may be separated from the earlier *Antedon protectus*.

It also appears to be the same thing as Bell's *Antedon moorei*, though the type of the latter is a young and immature individual with the dorsal processes on the outer cirrus segments a trifle more conspicuous.

The type of *Antedon similis* is regularly thirty armed, and is in every way stouter than the type of *Antedon moorei*; the cirrus segments are never quite so long as broad, while the earlier are longer than broad in *moorei*.

The pinnules of the type of *Antedon similis* resemble those of certain varieties of *protectus*.

LAMPROMETRA GYGES (Bell)

Antedon gyges 1884. BELL, "Alert" Report, p. 160 (1).

Antedon tenera 1890. HARTLAUB, Nachr. Ges. Göttingen, Mai 1890, p. 180.—

1891. HARTLAUB, Nova Acta Acad. German., vol. 58, No. 1, p. 66.

Antedon articulata BRIT. MUS., MS. (2, 3).

1. *Thursday Island; 3-4 fathoms.*—One specimen; the cirri are XXXV, 24-29 (usually 28), 20 mm. to 25 mm. long; from the eleventh onward the segments are strongly carinate dorsally or are supplied with broadly rounded dorsal spines. The arms are forty-one in number (four being broken off), 80 mm. long. P_2 is the longest, but slender, similar to P_1 but longer; P_3 is slender and weak, not nearly so long as P_1 ; the basal segments of these earlier pinnules are more or less carinate.

2. *Port Essington, Coburg Peninsula, Northern Territory of South Australia.*—One specimen.

3. *North of Cape Hillsboro'; H. M. S. "Rattlesnake."*—One specimen.

LAMPROMETRA PALMATA (J. Müller)

Antedon palmata BRIT. MUS., MS. (1, 2).

1. *Red Sea*.—One fine specimen.

2. *Muscat*.—One specimen with thirty-six arms and cirri XLV, 22-25.

Remarks.—Carpenter's record of this species from Ceylon ("Challenger" Report, Comatulæ, p. 379) is based upon an example of *Lamprometra protectus*; *L. palmata* does not occur farther eastward than Arabia.

Family COLOBOMETRIDÆ A. H. Clark

Genus CENOMETRA A. H. Clark

CENOMETRA EMENDATRIX (Bell)

Antedon emendatrix 1892. BELL, Ann. and Mag. Nat. Hist. (6), vol. 9, p. 428 (1).

Antedon spicata 1909. BELL, Trans. Linn. Soc. (Zool.), (2), vol. 13, part 1, p. 20 (2).

1. *Mauritius*.—Four specimens, with twelve, fourteen, nineteen and twenty-one arms; P_2 is comparatively slender; the proximal segments of the lower pinnules are strongly carinate.

2. *Seychelles; 39 fathoms; "Sea Lark"*.—Four specimens; one of these has twenty-two arms 100 mm. long; there are two IIIBr series, both externally developed; P_2 has from nineteen to twenty-one segments, of which the proximal are carinate; the cirri are XX, 32-35; another has fourteen arms 90 mm. long, and cirri XIV, 34-41; a third specimen has about fifteen arms; the fourth, and smallest, specimen has twelve arms, a single derivative from a IBr axillary bearing both a IIBr series and beyond it an external IIIBr series.

CENOMETRA CORNUTA A. H. Clark

Antedon sp. (near *macronema*) 1894. BELL, Proc. Zool. Soc. London, 1894, p. 394 (1).

1. *No Locality*.—One broken specimen.

2. *Adele Island, northwestern Australia*.—One specimen with twenty-six arms about 110 mm. long.

The cirri are XIV, 35-37, about 20 mm. long, rather slender, with short segments none of which are less than twice as broad as long; the proximal segments are flattened dorsally; in the distal half of the cirri the segments bear dorsally a pair of tubercles with their apices well separated.

The lateral processes on the ossicles of the division series are broad with truncated or roundedly incised outer margins.

The twenty-six arms are about 110 mm. long.

P_2 is very stout and very strongly curved with from eleven to fourteen (usually twelve) segments, most of which are about as long as broad; on the distal side the distal ends are strongly everted and serrate, this being well marked on the second; there is a very slight straight edged blunt carination of the first three segments of the earlier pinnules, which is quite different in appearance from the high sharp convex carination characteristic of *C. emendatrix*.

Both of the specimens are alike in color, white and purple in bands about one-quarter of an inch in width, the cirri brown.

Genus **CYLLOMETRA** A. H. Clark

CYLLOMETRA MANCA (P. H. Carpenter)

Antedon manca 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 226 (1).

1. "*Challenger*" Station No. 192.—The longest cirrus segments are scarcely longer than broad; the dorsal spines on the outer cirrus segments are not nearly so broad as those of *C. disciformis*, but resemble rather those of *C. albopurpurea*.

CYLLOMETRA ALBOPURPUREA A. H. Clark

1. *Inland Sea, Japan*.—Three fine specimens with fourteen, fifteen and nineteen arms 70 mm. to 80 mm. long.

CYLLOMETRA DISCIFORMIS (P. H. Carpenter)

Antedon disciformis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 228 (1).

1. *Cebu Reefs*.—Four specimens; the dorsal spines on the outer cirrus segments are long and sharp; the longest cirrus segments are nearly twice as long as broad.

Genus **DECAMETRA** A. H. Clark

DECAMETRA TIGRINA (A. H. Clark)

1. *Toba Harbor, Japan*.—One specimen.

2. *Japan*.—Two specimens, one large and one small.

DECAMETRA INFORMIS (P. H. Carpenter)

Antedon informis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 205 (1).

1. "*Challenger*" Station No. 208.—One specimen, well figured by Carpenter.

DECAMETRA ALAUDÆ A. H. Clark

Decametra alaudæ 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 33 (1, 2).

1. *Cargados Carajos; 30 fathoms; "Sea Lark."*—Two specimens, one large and one small; in the former the cirri are XV, 26, small and slender, all the segments subequal, about twice as broad as long; the ten arms are 90 mm. long; P_1 is slender and flagellate, 8 mm. long, with twenty-one segments which are about as long as broad; P_2 is much larger and stouter, tapering very gradually, stiffened, 11 mm. long, with sixteen segments, of which the fifth-seventh are half again as long as broad and the remainder about as long as broad or broader than long; from the fourth onward the segments have projecting distal edges and distal angles, the whole pinnule reminding one strongly of P_2 in *Cenometra*; P_3 is similar to P_2 but smaller and much more slender and flagellate distally, 10 mm. long, with nineteen segments; P_4 and the following pinnules are slender, small and weak, 6 mm. long; the distal pinnules are very slender, 10 mm. long.

2. *Cargados Carajos; 30 fathoms; "Sea Lark."*—One specimen; the cirri are XVII, 27-28, 14 mm. long, moderately slender; all the segments are subequal, about half again as broad as long; a transverse ridge begins to develop on the sixth or seventh, this becoming a pair of small low tubercles on the tenth or twelfth; the ten arms are 90 mm. long; P_a is absent; P_1 is slender, small and weak, 5 mm. long, with thirteen segments; P_2 is the largest pinnule, though it is not especially enlarged; it is slender and flagellate distally, 9 mm. long, with eighteen segments, most of which are nearly twice as long as broad; the outer have slightly prominent distal edges, and especially distal angles; P_3 is intermediate between P_1 and P_2 ; P_4 and the following pinnules are small and weak; the distal pinnules are very slender, 9 mm. long.

DECAMETRA MOLLIS (A. H. Clark)

1. *Kurrachi.*—Six specimens; the cirri are XII-XV, 20-23 (usually 22), 10 mm. long; the dorsal processes on the outer segments are very small; the ten arms are 65 mm. long; P_1 has about thirteen segments and resembles P_2 , but is usually about 1 mm. shorter and proportionately more slender; P_2 is the largest, but is slender, about 5 mm. long; most of its segments are about twice as long as broad, or even longer; the segments number about fourteen; those in the outer half are more or less prismatic, and have projecting outer

corners; P_3 is about like P_1 ; P_4 is shorter, and P_5 is shorter still; sometimes P_1 is considerably shorter than P_2 or than P_3 .

DECAMETRA MOEBIUSI A. H. Clark

Antedon laevissima 1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. 1, part 3, p. 224 (1).

Decametra möbiusi 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 31.

1. *Fadiffolu, Maldives*.—One specimen with arms 30 mm. long; there are 15 cirrus segments; P_2 is slender, not greatly longer than P_1 , composed of elongated segments with overlapping distal ends; P_1 is longer than P_3 and the following pinnules.

2. *Muhlos, Maldives*.—Three specimens with an arm length of from 55 mm. to 60 mm.; the cirri are XIV, 15, rather slender; P_1 is about two-thirds as long as P_2 , much more slender and less stiffened; P_2 is long but comparatively slender, with twelve segments, of which the distal are twice as long as broad and have projecting distal edges; P_3 and the following pinnules are shorter than P_1 .

DECAMETRA TAPROBANES (A. H. Clark)

Antedon laevissima 1902. BELL, in GARDINER, Fauna and Geography of the Maldive and Laccadive Archipelagoes, vol. 1, part 3, p. 224 (1, 2, 3).

1. *Fadiffolu, Muhlos, Maldives*.—One specimen.

2. *Muhlos, Maldives*.—Two specimens; the cirri are XIV, 24; P_1 is soft; P_3 resembles P_2 , but is smaller.

3. *Muhlos, Maldives*.—One specimen; there are 23 cirrus segments; P_2 is much enlarged, but P_1 and P_3 are also enlarged somewhat.

DECAMETRA ARABICA A. H. Clark

Antedon carinata BRIT. MUS., MS. (1).

Description.—The cirri are XIX, 26-27, 13 mm. long, slender; the proximal segments about twice as broad as long, the terminal about as long as broad; the ninth or tenth and following bear small paired dorsal spines.

The ten arms, which resemble those of the other species of the genus, are 110 mm. long.

P_4 is absent; P_1 is very small and weak, 4.5 mm. long; P_2 is 9 mm. long, composed of fifteen segments, most of which are twice as long as broad, with the distal edges produced and spinous and the distal angles produced, suggesting the conditions seen in *Oligometra serripinna*; the pinnule is comparatively slender, though stiff, and tapers evenly to the tip; P_3 is similar but shorter, 6 mm. to 7 mm.

long; P_4 is 4.5 mm. long; P_5 is similar, but shorter; the following pinnules are small and weak; the slender distal pinnules are 9.5 mm. long.

1. *Locality*.—Muscat, Arabia.

Remarks.—The material consists of sixteen specimens, of which that described is the largest.

The color is yellow, narrowly but frequently banded with purple, the cirri purplish; or, purple and yellow in large blotches.

Genus **COLOBOMETRA** A. H. Clark

COLOBOMETRA PERSPINOSA (P. H. Carpenter)

Antedon insignis 1882. BELL, Proc. Zoöl. Soc. London, 1882, p. 534 (1).

Antedon loveni 1884. BELL, "Alert" Report, p. 158 (1).

1. *Port Denison, Queensland; 3-4 fathoms; "Alert."*—One specimen.

Genus **OLIGOMETRIDES** A. H. Clark

OLIGOMETRIDES ADEONÆ (Lamarck)

Antedon adeonæ 1884. BELL, "Alert" Report, p. 156 (1).

Antedon pinniformis 1884. BELL, *T. c.*, p. 156 (2).

Antedon bidens 1884. BELL, *T. c.*, p. 158 (3).

1. "*Alert*" Station No. 87.—One specimen; the cirri are (about) XX, 21; the transverse ridge has moved so far back that it is near the proximal end of the cirrus segments, and the distal dorsal border of the segments has become prominent so that the bidentate appearance (in lateral view) is produced; the ten arms are 65 mm. long; P_1 is the longest pinnule, and is stiffened; P_2 is similar, but slightly shorter; P_3 is similar, but slightly shorter than P_2 ; the ends of the segments of these proximal pinnules tend to be slightly prominent. The general appearance of the animal is strikingly like that of *Tropiometra carinata*.

2. *Dundas Strait; northwestern Australia*.—One specimen.

3. *Torres Strait; 10 fathoms; sand; "Alert."*—One specimen, similar to that from Station No. 87.

4. *Baudin Island; 8-15 fathoms*.—One specimen.

Genus **OLIGOMETRA** A. H. Clark

OLIGOMETRA CARPENTERI (Bell)

Antedon milberti 1884. BELL, "Alert" Report, p. 156 (1).—1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (4).

Antedon carpenteri 1884. BELL, "Alert" Report, p. 157 (2, 3).

Antedon serripinna 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 394 (5, 6).

1. *Prince of Wales Channel, Torres Strait; 7-9 fathoms; sand; "Alert."*—One specimen.
2. *Port Curtis, Queensland; 7 fathoms; "Alert."*—One typical specimen with arms 55 mm. long.
3. *Port Curtis; 11 fathoms; sand and shell; "Alert."*—Three specimens.
4. *Northwestern Australia; 8-15 fathoms.*—Two specimens.
5. *Holothuria Bank; 24 fathoms.*—One specimen with the cirri XIV, 13-14.
6. *Holothuria Bank; 39 fathoms.*—One specimen exactly like the specimens from Queensland in the collection of the Australian Museum; the cirri are XI, 16-18.
7. *Bassett-Smith Bank; 9 fathoms.*—Two specimens.
8. *Baudin Island, northwestern Australia; 8-15 fathoms.*—One small specimen.

OLIGOMETRA SERRIPINNA (P. H. Carpenter)

Antedon carinata 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 396 (1).

1. *Macclesfield Bank; 29-32 fathoms.*—One specimen.

OLIGOMETRA ELECTRÆ A. H. Clark

1. *Red Sea, southeast of Messawa, Eritréa (15° 02' 30" N. lat., 41° 13' 30" E. long.); 20 fathoms; Cable-repair Ship "Electra."*—One specimen; this is an exceptionally ornate form with extravagantly developed processes on the proximal pinnules.

OLIGOMETRA OCCIDENTALIS A. H. Clark

Oligometra serripinna var. *occidentalis* 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 33 (1).

1. *Cargados Carajos; 30 fathoms; "Sea Lark."*—Nine specimens; the cirri are XIV-XVII, 18-22 (usually 19-20); the distal segments are about as long as broad; P_2 is much larger than P_1 or P_3 , and is composed of nineteen segments, most of which are about as long as broad or slightly longer than broad; the lateral processes at the distal ends of the outer pinnule segments are only slightly developed, and are small and delicate; the segments of the pinnules succeeding P_2 have rather strongly projecting distal edges and angles; the arms are from 70 mm. to 80 mm. long.

OLIGOMETRA CALEDONIÆ A. H. Clark

Oligometra caledoniæ 1911. A. H. CLARK, Bull. du Mus. d'hist. nat. de Paris, No. 4, 1911, p. 254.

1. *No Locality; Professor J. B. Jukes.*—One specimen.

Family TROPIOMETRIDÆ A. H. Clark**Genus TROPIOMETRA A. H. Clark****TROPIOMETRA CARINATA (Lamarck)**

Antedon carinata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 199 (1, 2).

Antedon capensis 1905. BELL, Marine Investigations in South Africa, vol. 4, p. 139 (3-10).

1. *Mauritius.*—Two specimens.
2. *Zanzibar.*—Seven specimens.
3. *Investigations in South Africa, Station No. 160.*—Two specimens.
4. *Investigations in South Africa, Station No. 165.*—One specimen; there are 28 cirrus segments.
5. *Investigations in South Africa, Station No. 15610.*—Two specimens.
6. *Investigations in South Africa, Station No. 96.*—Two specimens.
7. *Investigations in South Africa, Station No. 11801.*—Twenty-five specimens.
8. *Investigations in South Africa, Stations Nos. 15597/8.*—Three specimens.
9. *Investigations in South Africa, Stations Nos. 97, 98, 155.*—Two large specimens.
10. *Cape of Good Hope.*—One specimen.

TROPIOMETRA INDICA A. H. Clark

Antedon adeonæ 1887. BELL, Sci. Trans. Roy. Dublin Soc. (2), vol. 3, p. 645 (1).—1888. BELL, Proc. Zoöl. Soc. London, 1888, p. 387 (1, 2, 3).

1. *Ceylon.*—Fourteen specimens; the cirri are XXVI-XXIX, 23-26, 21 mm. or 22 mm. long; the outer segments are twice as broad as long as in *T. carinata*; the last four taper rather rapidly; the cirri are rather slender and weak, but very numerous, giving the animal a very characteristic appearance; they are arranged very irregularly, approximately in two and a partial third row on the centrodorsal; the proximal pinnules are stiffened.
2. *Ceylon.*—Three specimens.
3. *Tuticorin, Madras.*—One specimen.

TROIOMETRA PICTA (Gay)

Antedon dübeni 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 181 (1).

Antedon carinata 1888. P. H. CARPENTER, *T. c.*, p. 199 (2, 3, 4).—BRIT. MUS., MS. (5, 7, 8).

1. Bahia; 20 fathoms; "Challenger."—One young specimen.
2. Bahia; 7-20 fathoms; "Challenger."—Eleven specimens.
3. Rio de Janeiro.—Three specimens.
4. St. Helena; E. W. Alexander.—Two fine specimens; there are twenty-five cirrus segments.
5. Rio de Janeiro; Charles Darwin.—One large specimen.
6. Thirty-three miles east of Pernambuco; 23 fathoms.—Three specimens.
7. No Locality.—Four specimens.
8. No Locality.—One specimen.

Family CALOMETRIDÆ A. H. Clark

Genus OREOMETRA A. H. Clark

OREOMETRA MARIÆ A. H. Clark

Antedon macronema BRIT. MUS., MS.

Description.—The centrodorsal is thick discoidal, bearing a single fairly regular marginal row of cirrus sockets; the broad flat polar area is 4 mm. in diameter.

The cirri are XV, 44-47, 25 mm. to 27 mm. long, rounded rhombic in cross section, suggesting the cirri of *Neometra acanthaster*, but with the angles, as seen in cross section, less sharp and more rounded; all the segments are approximately equal, about twice as broad as long; the ventral and lateral distal edges of the segments project rather strongly over the bases of those succeeding; the cirri taper slightly in the outer half; on about the fourth segment a faint, very narrow longitudinal median ridge is visible; after the middle of the cirrus this becomes a narrow, low, sharp carination, slowly increasing in height distally so that terminally the segments bear fairly prominent rounded dorsal spines; in the distal third of the cirri supplementary spines appear, one on either side of the median carination, at first small and confined to the vicinity of the distal edge of the segments, but becoming terminally nearly as large as the median spine; the spine on the antepenultimate segment is single; the opposing spine is transversely flattened. As a whole the cirri are moderately stout, suggesting strongly those of *Neometra spinosissima*.

The radials are moderate in size, resembling those of *Neometra multicolor*, except that they are not produced interradially, or those of *Ptilometra macronema*. Their proximal border is marked with a series of crescentic gouges in which the proximal portion of the basal cirrus segments are lodged, and which represent the upper part of the cirrus sockets. These last are all partly on the centrodorsal and partly on the radials; the central canal, however, is always on the centrodorsal, though it may be only slightly below its margin.

The two elements of the IBr series appear to be united by syzygy, though the union is probably by a very close synarthry; the IBr₁ is oblong, two and one-half to three times as broad as long; the IBr₂ (axillary) is broadly pentagonal, twice as broad as long; the IBr₁ has a sharp tubercle in the middle near the proximal border, and another smaller one in the middle of its distal (anterior) margin; the IBr₂ (axillary) has a tubercle in the middle of each of the two distal edges; the IIBr₁ and the first brachials have a median tubercle on their proximal border, like the IBr₁; the IIBr₂ has a tubercle on each of its distal borders, like the IBr₂. The IBr series are broad, in close lateral apposition, and slightly flattened laterally, just as in *Ptilometra macronema*, and as in that species the component ossicles are very thin dorsoventrally. The IIBr series are 4 (3 + 4); the axillaries and preceding ossicles resemble those of the IBr series.

The seventeen arms are 60 mm. long; the brachials in general resemble those of such species as *Gephyrometra propinqua*; as in that species there is a rather sharp overlap, especially at the distolateral angles; the arms do not become laterally flattened distally, nor carinate.

Side and covering plates are well developed on the arms and pinules, as is usual in the genus; sacculi are abundant.

The disk is lacking.

P₁ is about 7 mm. long, small and weak, rather strongly prismatic, flexible, with eighteen segments; it is at first moderately stout, but tapers rapidly after the proximal third, becoming exceedingly slender and flagellate in the outer half; the proximal segments are broader than long, the distal slightly longer than broad; the first segment is about twice as large as the second, though it does not strike one as being especially enlarged; the second segment is also enlarged, but very slightly; it has a small dorsal carinate process, as has also the third, which is not enlarged. P₂ is stiff and spine-like, 8 mm. long, with ten segments, of which the first is short with a slight rounded dorsal carination, though not otherwise modified; the second is about

as long as broad, and the remainder are much elongated with slightly spinous distal ends. P_3 and P_4 are equal, slightly longer than P_2 but similar to it, with twelve segments; the first segment of P_3 may bear a slight rounded dorsal carination. P_5 is about as long as P_2 , but more slender and less spinous; the following pinnules are shorter than P_5 and are composed of eleven segments which have slightly prominent distal ends. The distal pinnules are 9 mm. long. All the pinnules are prismatic.

The ventral aspect of the radial pentagon shows it to be that of a typical member of the Calometridæ.

In color the calyx, division series, and the sides of the arms are light brown; a broad median band on the arms, most of the pinnules and the cirri are white.

Locality.—Unknown.

Genus CALOMETRA A. H. Clark

CALOMETRA DISCOIDEA (P. H. Carpenter)

Antedon discoidea 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 134 (1).

1. "Challenger" Station No. 192.—Four specimens, two large and two small; the IBr_1 are extended laterally to an anterior process from the radials so that there is a very prominent gap between the axillaries; the cirri are 38 mm. long; the longest cirrus segments are about one-third longer than broad or slightly longer.

Family THALASSOMETRIDÆ A. H. Clark

Genus PTILOMETRA A. H. Clark

PTILOMETRA MACRONEMA (J. Müller)

Antedon wilsoni 1888. BELL, Ann. and Mag. Nat. Hist. (6), vol. 2, pp. 402, 403 (1).—1890, P. H. CARPENTER, Proc. Roy. Soc. Victoria (N. S.), vol. 2, p. 135 (1).

Antedon incommoda 1888. BELL, Ann. and Mag. Nat. Hist. (6), vol. 2, p. 404 (4).

Antedon macronema 1890. P. H. CARPENTER, *T. c.*, p. 135 (2, 3).

1. *Port Phillip, Victoria*.—Seven young specimens.

2. *Port Phillip*.—A beautiful large specimen with eighteen arms resembling those in the Australian Museum collection from Kangaroo Island.

3. *Port Phillip*.—One beautiful specimen.

4. *Port Phillip*.—One young specimen.

5. *South Australia*.—Two specimens.

PTILOMETRA MUELLERI A. H. Clark

Antedon mauonema 1885. BELL, Proc. Linn. Soc. New South Wales, vol. 9 (1894), p. 497 (1, 3).

Antedon macronema 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 212 (2).—BRIT. MUS., MS. (4).

1. *Port Stephens, New South Wales*.—Four fine specimens.
2. *Port Jackson, New South Wales; 30-35 fathoms; "Challenger."*—Two typical specimens.
3. *Port Stephens; 6-8 fathoms*.—Four typical specimens.
4. *No Locality*.—Two specimens.
5. *Port Phillip, Victoria*.—One beautiful specimen.

Genus ASTEROMETRA A. H. Clark**ASTEROMETRA LONGICIRRA (P. H. Carpenter)**

Antedon longicirra 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 103 (1).

1. "*Challenger*" Station No. 192.—One specimen; the IBr₁ bears a short median ridge with a profile as figured; the axillary bears three tubercles.

ASTEROMETRA MIRIFICA A. H. Clark

Antedon longicirra 1893. BELL, Journ. Linn. Soc. (Zoöl.), vol. 24, p. 339 (1).

1. *Sahul Bank; 11° 30' S. lat., 125° E. long.*—Three specimens; one of these has the arms 105 mm. long and the cirri 87 mm. long; another is similar; the third is very small with arms only 35 mm. long, but it has already developed the compressed and overlapping brachials and the strong proximal carination of the adults.

Remarks.—This species is very easily distinguished from *A. longicirra* by the stout high keels on the ossicles of the IBr series and first two brachials, which are practically confluent on succeeding ossicles; the axillaries bear a single sharp keel.

Genus STYLOMETRA A. H. Clark**STYLOMETRA SPINIFERA (P. H. Carpenter)**

Antedon spinifera BRIT. MUS., MS. (1).

1. *Barbados, British West Indies*.—One specimen.

Genus COSMIOMETRA A. H. Clark**COSMIOMETRA GARDINERI A. H. Clark**

Cosmiometra gardineri 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 38 (1).

1. *Saya de Malha; 135 fathoms; "Sea Lark."*—One specimen; this species is closely related to *C. woodmasoni*; the cirri are longer

and more slender than in that form, 30 mm. long, with 29-31 segments which are proportionately longer; there are twenty arms; the carination of the division series is broader than in *woodmasoni*; the lower brachials have a broad median keel quite different from the faintly indicated crest of *woodmasoni*; the outer brachials are very strongly overlapping and broadly carinate, the raised portion, when viewed dorsally, having a triangular shape, the apex of the triangle being proximal; the same type of carination is found in *woodmasoni*, but the triangles are narrower.

COSMIOMETRA WOODMASONI (Bell)

Antedon wood-masoni 1893. BELL, Journ. Linn. Soc. (Zoöl.), vol. 24, p. 340 (1).

1. *Sahul Bank*.—One specimen; the arms are 110 mm. long; in general this species resembles *C. crassicirra* from the Hawaiian Islands; the division series are strongly, but roundedly, carinate; there are 40-41 cirrus segments, of which the seventh is a transition segment; the cirri are comparatively short and stout, 27 mm. in length.

Genus STENOMETRA A. H. Clark

STENOMETRA QUINQUECOSTATA (P. H. Carpenter)

Antedon quinquecostata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 215 (1).

1. "*Challenger*" Station No. 192.—Three specimens, two large and one small; the cirri are proportionately larger and stouter than those of the Japanese *S. dorsata*; the arms are 100 mm. long; the sides of the division series are denticulate; the lateral portions of the proximal borders of the ossicles of the division series are also more or less denticulate; the crest of the carination is sharp, and nearly or quite straight; there is no pronounced denticulation.

Genus STIREMETRA A. H. Clark

STIREMETRA SPINICIRRA (P. H. Carpenter)

Antedon spinicirra 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 112 (1).

1. "*Challenger*" Station No. 164.—Three specimens; this is a curious small and delicate little species with curiously long cirrus spines.

STIREMETRA ACUTIRADIA (P. H. Carpenter)

Antedon acutiradia 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 113 (1).

1. "Challenger" Station No. 175.—One specimen; this is a small species; it is well figured by Carpenter.

STIREMETRA BREVIRADIA (P. H. Carpenter)

Antedon breviradia 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 110 (1, 2).

Antedon variospina BRIT. MUS., MS. (2).

"Challenger" Stations Nos. 175 (1) and 170a (2).—Four specimens; this species was well figured by Carpenter.

Remarks.—One of the specimens from the second locality bears the manuscript name *Antedon variospina*, a name which Carpenter inadvertently allowed to slip into the "Challenger" report.

Genus PARAMETRA A. H. Clark**PARAMETRA GRANULATA A. H. Clark**

Antedon compressa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 222 (1).

1. "Challenger" Station No. 201.—One specimen; the division series and lower brachials have a prominent narrow median keel which is continued along the arm and passes into the distal carination; the division series and lower brachials are considerably smoother than those of *P. compressa*, due to the absence of the eversion of their proximal and distal edges.

PARAMETRA COMPRESSA (P. H. Carpenter)

Antedon compressa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 222 (1).

1. "Challenger" Station No. 192.—Two specimens; the carination on the earlier segments is confined to the axillaries and the second brachials, and is rounded and inconspicuous; the lower brachials and the ossicles of the division series have rather strongly everted edges.

Genus CROTALOMETRA A. H. Clark**CROTALOMETRA MAGNICIRRA (Bell)**

Antedon magnicirra 1905. BELL, Marine Investigations in South Africa, vol. 4, p. 141 (1, 2).

1. Stations Nos. 12885/6.—Six specimens; the cirri are XV-XXV, 60-63; the eighth or ninth is a transition segment; the cirrus sockets

are arranged in ten columns, the two in each radial area separated from each other by furrows.

2. *Station No. 12792*.—One specimen.

CROTALOMETRA PORRECTA (P. H. Carpenter)

Antedon porrecta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 250 (1).

1. "*Challenger*" *Station No. 344*.—One large and two small specimens; in the former the cirri are XIV, 50 mm. to 54 mm. long; the eighth or ninth is a transition segment. This species is remarkable for the great size and stoutness of its cirri.

Genus **THALOSSOMETRA A. H. Clark**

THALASSOMETRA LUSITANICA (P. H. Carpenter)

Antedon lusitanica 1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, vol. 12, p. 368 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 109 (1).

1. "*Porcupine*" *Station 17a; 1870*.—Three specimens, agreeing with the published figures.

THALASSOMETRA LATIPINNA (P. H. Carpenter)

Antedon latipinna 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 116 (1).

1. "*Challenger*" *Station No. 232*.—One specimen; the edges of the ossicles of the IBr series are finely spinous; the brachials as far as they are preserved are finely spinous on the dorsal surface.

THALASSOMETRA ECHINATA (P. H. Carpenter)

Antedon echinata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 119 (1).

1. "*Challenger*" *Station No. 170*.—One small specimen.

THALASSOMETRA PERGRACILIS A. H. Clark

Antedon gracilis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 107 (1).

1. "*Challenger*" *Station No. 214*.—Four specimens; this is a slender species, about the build of *Th. attenuata* though more robust basally.

THALASSOMETRA MULTISPINA (P. H. Carpenter)

Antedon multispina 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 248 (1, 2).

1. "Challenger" Station No. 344.—Two specimens and one pentacrinoid young; the spines covering the animal are exceptionally fine.

2. "Challenger" Station No. 135.—One broken specimen.

THALASSOMETRA BISPINOSA (P. H. Carpenter)

Antedon bispinosa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 115 (1).

1. "Challenger" Station No. 147.—One specimen; this is a well developed and comparatively large species.

Genus AGLAOMETRA A. H. Clark**AGLAOMETRA VALIDA (P. H. Carpenter)**

Antedon valida 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 104 (1).

1. "Challenger" Station No. 214.—Two specimens; this is a large species, resembling in a general way *A. eupedata*; the anterior edges of the radials and the lateral edges of the IBr series and first two brachials are conspicuously dentate with fine well separated teeth.

AGLAOMETRA INCERTA (P. H. Carpenter)

Antedon incerta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 106 (1).

1. "Challenger" Station No. 170a.—One specimen; this is a large, robust species; the edges of the ossicles of the IBr series are spinous; the synarthrial tubercles resemble those of certain species of *Psathyrometra*.

Family CHARITOMETRIDÆ A. H. Clark**Genus PACHYLOMETRA A. H. Clark****PACHYLOMETRA ANGUSTICALYX (P. H. Carpenter)**

Antedon angusticalyx 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 242 (1).

1. "Challenger" Station No. 214.—Five small specimens.

PACHYLOMETRA INÆQUALIS (P. H. Carpenter)

Antedon inæqualis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 244 (1, 2, 3).

1. "Challenger" Station No. 174.—Two specimens, one large, and one small, the latter with only eleven arms.
2. "Challenger" Station No. 175.—One small specimen.
3. "Challenger" Station No. 170.—Three large specimens.

PACHYLOMETRA SCLATERI (Bell)

Antedon sclateri 1905. BELL, Marine Investigations in South Africa, vol. 4, p. 140 (1, 2, 3).

Antedon magnicirra BRIT. MUS., MS. (4, 5).

1. Station No. 12711.—Seven specimens.
2. Station No. 12676.—Five specimens.
3. No Locality.—Eleven specimens.
4. Station No. 12792.—Four specimens.
5. Stations Nos. 12885/6.—One specimen.

Remarks.—The centrodorsal bears radial furrows.

PACHYLOMETRA DISTINCTA (P. H. Carpenter)

Antedon distincta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 247 (1).

1. "Challenger" Station No. 210.—One specimen, resembling those in the U. S. National Museum from the Philippine Islands.

PACHYLOMETRA FLEXILIS (P. H. Carpenter)

Antedon flexilis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 217 (1).

1. "Challenger" Station No. 192.—Two fine specimens; this is a large, robust and handsome species.

PACHYLOMETRA PATULA (P. H. Carpenter)

Antedon patula 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 219 (1).—1893. BELL, Journ. Linn. Soc. (Zoöl.), vol. 24, p. 341 (2).

1. "Challenger" Station No. 192.—Two specimens.
2. Sahul Bank.—One young specimen.

PACHYLOMETRA ROBUSTA (P. H. Carpenter)

Antedon robusta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 220 (1).

Antedon patula 1893. BELL, Journ. Linn. Soc. (Zoöl.), vol. 24, p. 341 (2).

1. "Challenger" Station No. 192.—One specimen; this is a magnificent species, remarkable for its stoutness; it is well figured in the "Challenger" report.

2. *Sahul Bank*.—One specimen with ten arms.

Genus GLYPTOMETRA A. H. Clark**GLYPTOMETRA TUBEROSA (P. H. Carpenter)**

Antedon tuberosa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 126 (1).

1. "Challenger" Station No. 210.—Two specimens, and some pentacrinoid larvæ; in the larger specimen the ornamentation is prominent and pearly; the median keels are not quite so prominent as they are shown in the figure; in the smaller specimen the keels are proportionately larger and more regular.

Genus CHLOROMETRA A. H. Clark**CHLOROMETRA ACULEATA (P. H. Carpenter)**

Antedon aculeata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 128 (1).

1. "Challenger" Station No. 214.—One specimen; this is a small species with a narrow carination.

Genus CHARITOMETRA A. H. Clark**CHARITOMETRA BASICURVA (P. H. Carpenter)**

Antedon basicurva 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 120 (1).

1. "Challenger" Station No. 170a.—Five specimens; this species was well figured by Carpenter.

CHARITOMETRA INCISA (P. H. Carpenter)

Antedon incisa 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 124 (1).

1. "Challenger" Stations Nos. 170a and 174.—Three specimens.

Genus PÆCILOMETRA A. H. Clark

PÆCILOMETRA ACÆLA (P. H. Carpenter)

Antedon acæla 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 132 (1).

1. "Challenger" Station No. 214.—Six specimens; the constriction of the lower portion of the calyx seems to be a valid character for differentiating this species from *P. scalaris*.

Genus STROTOMETRA A. H. Clark

STROTOMETRA PARVIPINNA (P. H. Carpenter)

Antedon parvipinna 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 127 (1).

1. "Challenger" Station No. 192.—One specimen; this species is closely related to *S. hepburniana*; it is a larger form with much less expanded genital pinnules; there is a delicate median carination on the ossicles of the IBr series and on the first two brachials, which is easily traceable all along the arm; P_2 is rather more like P_1 than P_3 , though it is larger and has some of the characteristics of the latter. There are 11-13 cirrus segments.

Family ANTEDONIDÆ Norman

Subfamily ANTEDONINÆ A. H. Clark

Genus ANTEDON de Fréminville

ANTEDON PETASUS (Düben and Koren)

Antedon petasus BRIT. MUS., MS. (1).

Antedon bifida BRIT. MUS., MS. (2).

1. Bergen, Norway.—Two specimens.

2. Norway.—Three specimens.

ANTEDON BIFIDA (Pennant)

Antedon rosacea 1886. DENDY, Proc. Roy. Phys. Soc., Edinburgh, vol. 9, p. 180, pl. 10 (18).—1886. DENDY, Studies Biol. Laboratory Owens College, vol. 1, p. 299 (18).—1891. SLADEN, Proc. Roy. Irish Acad. (3), vol. 1, p. 687 (23).—1897. SLADEN, Trans. Roy. Irish Acad., vol. 31, p. 78 (3).—BRIT. MUS., MS. (2, 18, 23, 26).

Antedon bifida 1889. BELL, Ann. and Mag. Nat. Hist (6), vol. 4, p. 432 (29).—1892. BELL, Proc. Roy. Dublin Soc. (N. S.), vol. 7, p. 522 (24).—1892. BELL, Cat. Brit. Echinod. in Brit. Mus., p. 54 (4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 27, 28, 29, 30, 34, 35, 36).—1905. KEMP,

Rep. Fishery Board Ireland, 1902-3, part 2, No. 6, p. 179 (3).—BRIT. MUS., MS. (3, 5, 7, 8, 20, 25, 26, 31, 33, 37, 38).

Antedon rosaceus BRIT. MUS., MS. (1, 9, 10, 32).

Comatula patulata BRIT. MUS., MS. (35).

1. *Balta Sound, Shetland*.—Nineteen specimens; the cirri are XVIII-XXVI, 11-15 (usually 14-15); they are of the type characteristic of *A. bifida*, which differs from the type characteristic of *A. petasus* in being less strongly curved distally and composed in the outer portion of proportionately longer segments which are less flattened laterally, and hence appear less broad in lateral view. Some of these specimens have one or two cirri rather abruptly different from the rest and like those of *A. petasus*, with a more or less marked difference between the proximal and distal portions.

2. *Shetland; shallow water*.—About six specimens.

3. *Rockall*.—One specimen.

4. *Loch Hourn*.—One specimen.

5. *Off Tobermory, Mull; 30 fathoms*.—Two small specimens.

6. *Loch Etive; 15-20 fathoms*.—One specimen.

7. *Firth of Lorn; 5-110 fathoms*.—One specimen.

8. *Firth of Lorn; 20-30 fathoms*.—Two large specimens.

9. *Firth of Lorn; 50 fathoms*.—One specimen.

10. *Firth of Lorn; 50 fathoms*.—One fine specimen; the cirri are unusually numerous.

11. *Loch Craignish*.—Seven specimens.

12. *Loch Craignish*.—Six specimens.

13. *Four miles southeast of Sanda; 30-38 fathoms*.—Four specimens, showing an approach to *A. petasus*.

14. *Between the island of Sanda and Ailsa Craig; 24 fathoms*.—One fine specimen, showing an approach to *A. petasus*.

15. *Lamlash Bay, Arran; 7 fathoms*.—Dry pentacrinoids.

16. *Lamlash Bay, Arran*.—Seven specimens.

17. *Between Great Cumhae and Wemyss Ground*.—One specimen.

18. *Millport, Firth of Clyde*.—One twelve armed specimen.

19. *Firth of Clyde*.—Two specimens.

20. *Scotland*.—Thirteen specimens.

21. *Calf of Man*.—One specimen.

22. *Off Liverpool*.—Three specimens.

23. *Blacksod Bay, Ireland; 4 fathoms*.—Six specimens.

24. *Cleggan Bay, Ireland; 8-11 fathoms*.—One specimen.

25. *Roundstone, Ireland*.—About forty specimens.

26. *Roundstone, Ireland*.—Pentacrinoids.

27. *Kenmare River, Ireland*.—Two specimens.
28. *Kenmare River, Ireland*.—One specimen.
29. *Southwestern coast of Ireland; 250 fathoms*.—Four specimens; the cirri are XVIII- (about) XXX, 15-16.
30. *Plymouth*.—Eight specimens.
31. *Berry Head, Brixham; 13 fathoms*.—Five specimens.
32. *Herm, Channel Islands*.—Four specimens; the cirri are XXI-XXVIII, 12-13 (usually the latter).
33. *Herm, Channel Islands; tide mark*.—Three specimens.
34. *Entrance of British Channel*.—One specimen.
35. *British Ocean*.—Two medium-sized specimens.
36. *British Seas*.—Nine specimens.
37. *No Locality; Dr. Gray's collection*.—One specimen.
38. *No Locality*.—Two specimens.

ANTEDON HUPFERI Hartlaub

1. *Gorée, West Africa*.—Three specimens; there are 11-13 cirrus segments.

ANTEDON MEDITERRANEA (Lamarck)

Comatula mediterranea BRIT. MUS., MS. (6).

Antedon rosacea BRIT. MUS., MS. (2, 3, 7).

Antedon bifida BRIT. MUS., MS. (4).

Antedon phalangium BRIT. MUS., MS. (1).

1. *Bay of Marseilles; 60-80 meters*.—One specimen.
2. *Bay of Marseilles*.—Three specimens.
3. *Bay of Marseilles*.—One specimen.
4. *Nice*.—Two specimens.
5. *Naples*.—One fine specimen.
6. *Spezia*.—One specimen.
7. *No Locality*.—One specimen.

ANTEDON ADRIATICA A. H. Clark

Antedon bifida BRIT. MUS., MS. (1).

1. *Trieste*.—Two specimens.

Genus COMPSOMETRA A. H. Clark

COMPSOMETRA INCOMMODA (Bell)

Antedon wilsoni 1888. BELL, Ann. and Mag. Nat. Hist. (6), vol. 2, p. 403 (2).—BRIT. MUS., MS. (3, 6).

Antedon incommoda 1888. BELL, Ann. and Mag. Nat. Hist. (6), vol. 2, p. 404 (1, 3).—1889. BELL, Ann. and Mag. Nat. Hist. (6), vol. 3, p. 292.

Antedon sp nov. 1889. P. H. CARPENTER, Proc. Roy. Soc. Victoria (N. S.), vol. 1, p. 135 (1, 2, 3, 4, 5).

Antedon pumila 1889. BELL, Ann. and Mag. Nat. Hist. (6), vol. 3, p. 292 (4).

Compsometra lacertosa 1910. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 38, p. 275.

1. *Port Phillip, Victoria*.—Twenty-nine specimens.
2. *Port Phillip*.—Seven specimens.
3. *Port Phillip*.—Three fine specimens.
4. *Port Phillip*.—One specimen.
5. *Port Phillip Head*.—One specimen.
6. *South Australia*.—Two specimens.

COMPSOMETRA LOVENI (Bell)

Antedon loveni 1882. BELL, Proc. Zoöl. Soc. London, 1882, p. 534 (1).

Antedon pumila 1884. BELL, "Alert" Report, p. 157 (1).—1885. BELL, Proc. Linn. Soc. New South Wales, vol. 9 (1884), p. 497 (2).—1889. BELL, Ann. and Mag. Nat. Hist. (6), vol. 3, p. 292.—1890. P. H. CARPENTER, Proc. Roy. Soc. Victoria (N. S.), vol. 2, p. 135 (3).

1. *Port Jackson; 0-5 fathoms; "Alert"*.—One specimen.
2. *Nelson's Bay, Port Stephens*.—Four specimens.
3. *Port Phillip, Victoria*.—One specimen.

Genus IRIDOMETRA A. H. Clark

IRIDOMETRA ÆGYPTICA A. H. Clark

Iridiometra ægyptica 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 42 (1).

1. *Suez; 10 fathoms*.—One broken specimen; the cirri are XXV, 14-16 (usually 15-16), 10 mm. to 13 mm. long, comparatively stout; the first segment is short, the second about as long as broad, the fourth or fifth the longest, about two and one-half times as long as the median diameter; the following segments decrease slowly in length so that the antepenultimate is about one-third longer than broad. The longer proximal segments are constricted centrally and have enlarged distal ends; there are no dorsal processes; the opposing spine is prominent, terminal, and directed obliquely forward; the cirri as a whole are rather strongly compressed laterally.

The ten arms are apparently about 40 mm. long, and resemble those of *I. nana*.

P_1 is short, evenly tapering, about 5 mm. long, with eight segments which become twice as long as broad distally; P_2 is considerably larger and much longer, but evenly tapering and very slender distally, 9.5 mm. long with twelve segments which become much

elongated in the outer portion; P_3 is larger than P_2 , being much the largest pinnules on the arm, 13 mm. long with from eighteen to twenty segments, of which the distal are much elongated, three times as long as broad; the pinnule becomes very slender distally, and the ends of the component segments are slightly swollen, though not projecting nor spinous; P_4 is small and weak, 4.5 mm. to 5 mm. long, the outer segments much elongated and with somewhat swollen ends; P_5 is slightly longer than P_4 ; the following pinnules are similar to P_5 , gradually becoming more slender and increasing in length distally.

Remarks.—The pinnulation of this species is not very different from that of *I. parvicirra*, but the cirri are very much larger than those of that species.

IRIDOMETRA SCITA A. H. Clark

1. *Billiton.*—Two specimens.
2. *Macclesfield Bank; 35-41 fathoms.*—One specimen.

IRIDOMETRA NANA (Hartlaub)

1. *Male, Maldives.*—Five specimens; the largest has an arm length of 60 mm.

HYBOMETRA, new genus

GENOTYPE.—*Hybometra senta*, new species.

The characters of the genus are included with those of the type species in the following description.

HYBOMETRA SENTA, new genus and species

Description.—The general appearance of the animal resembles that of *Florometra magellanica* when not quite fully grown, but the centrodorsal is rounded conical as in *Hathrometra proluxa*; the brachials are very strongly overlapping with produced and very highly spinous distal edges; syzygies occur between the third and fourth brachials, again between the ninth and tenth and fourteenth and fifteenth, and distally at intervals of three (often four) oblique muscular articulations.

Cirri lost.

The ten arms are 90 mm. long; the distal edges of the brachials overlap very strongly, and are exceedingly spiny.

No P_1 preserved; P_2 is 9 mm. long, very slender, but very stiff and spine-like, with about fifteen segments, of which the first is rather large, half again as broad as long, the second is somewhat longer,

the third is about as long as broad, and the sixth and following are greatly elongated and very slender, with expanded and spinous distal ends; P_3 is similar, very slightly when at all longer, but slightly stouter, with fifteen segments, of which the outer are exceedingly elongated; P_4 is similar to P_3 and of the same length, very slightly larger basally; P_5 is 11 mm. long, resembling P_4 , but bearing a fusiform gonad; P_6 is similar to P_5 and of the same length; the following pinnules increase gradually in length, P_{14} being 14 mm. long with twenty-two segments, most of which are greatly elongated with very spinous distal ends; the distal pinnules are 15 mm. long. All the pinnules are slender and all are stiff, especially the lower, which are thorn-like; this stiffness, together with the exceptional development of spines on the distal borders of their component ossicles, gives the pinnules a great similarity to the pinnules of the species of *Colobometra*.

1. *Thirty-three miles east of Pernambuco, Brazil; 23 fathoms.*—One specimen.

Subfamily ZENOMETRINÆ A. H. Clark

Genus LEPTOMETRA A. H. Clark

LEPTOMETRA PHALANGIUM (J. Müller)

Antedon mediterraneus 1872. WYVILLE THOMSON, Proc. Roy. Soc. Edinburgh, vol. 7, p. 765.

Antedon phalangium 1881. P. H. CARPENTER, Zool. Anzeiger, JG. 4, p. 521 (4, 5, 6, 7, 8).—1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, vol. 12, p. 361 (4, 5, 6, 7, 8).—1886. P. H. CARPENTER, Trans. Linn. Soc. (Zoöl.), (2), vol. 2, p. 475 (1, 3, 4, 5, 6, 7, 8).—1894. KÖHLER, Mem. Soc. Zool. France, vol. 7, p. 425 (2).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 158 (1, 3, 4, 5, 6, 7, 8).—BRIT. MUS., MS. (2).

1. *Carthage*; "*Porcupine*," 1870—Three large specimens; the cirri are from 50 mm. to 55 mm. long; the distal intersyzygial interval is two oblique muscular articulations eight times, three oblique muscular articulations fourteen times, and four oblique muscular articulations twice.

2. *La Ciotat*.—Two specimens.

3. *Naples*.—Two specimens.

4. *Skerki Bank; 30-120 fathoms; "Porcupine," 1870.*—Four specimens.

5. *Skerki Bank; "Porcupine,"*—Six specimens; the cirri are from 43 mm. to 55 mm. long and are composed of 43-44 segments, the last five tapering rapidly to a sharp point.

6. *Bay of Benzert; 50-100 fathoms; "Porcupine," 1870.*—Five specimens.

7. *Bay of Benzert; "Porcupine," 1870.*—Four small specimens, exactly like specimens from Naples of the same size; there are 36-38 cirrus segments.

8. *Naples; Stazione Zoologica.*—One specimen; the cirri are from 55 mm. to 60 mm. long, XI, 47-48.

LEPTOMETRA CELTICA (Barrett and McAndrew)

Comatula woodwardii 1857. BARRETT, Ann. and Mag. Nat. Hist. (2), vol. 19, p. 33 (7).

Comatula celtica 1858. BARRETT and McANDREW, Ann. and Mag. Nat. Hist. (2), vol. 20, p. 44 (7).

Antedon celticus 1871. WYVILLE THOMSON, Proc. Roy. Soc. Edinburgh, vol. 7, p. 765.

Antedon phalangium 1881. P. H. CARPENTER, Zool. Anzeiger, JG. 4, p. 521 (7).—1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, vol. 12, p. 361 (1, 2, 3, 4, 5, 6, 7, 9).—1884. VON GRAFF, "Challenger" Report, Myzostoma, p. 32 (1, 2, 3, 4, 5, 6, 7, 9).—1886. P. H. CARPENTER, Trans. Linn. Soc. (Zoöl.), (2), vol. 2, p. 475 (1, 2, 3, 4, 5, 6, 7, 9).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 158 (1, 2, 3, 4, 5, 6, 7, 9).—1889. BELL, Ann. and Mag. Nat. Hist. (6), vol. 4, p. 433 (8).—1892. BELL, Cat. Brit. Echinod. in Brit. Mus., p. 59 (1, 2, 3, 4, 5, 6, 7, 8).—1892. BELL, Sci. Proc. Roy. Dublin Soc. (N. S.), vol. 7, p. 522.

1. *The Minch.*—Seventeen specimens.

2. *The Minch; 60 fathoms; "Porcupine."*—Three specimens.

3. *The Minch; "Porcupine," 1869.*—Three specimens.

4. *The Minch.*—Seven specimens.

5. *The Minch.*—Fifteen specimens.

6. *"Porcupine" Station No. 13 (1870); off Cape Mondego; 220 fathoms.*—Four specimens; the cirri are from 40 mm. to 45 mm. long with 42-48 (usually 43-44) segments; the arms are 75 mm. long.

7. *Sound of Skye; 25-40 fathoms.*—The cirri are 40 mm. long and are composed of 47 segments, of which those in the outer half are very slightly longer than broad, becoming slightly longer again terminally; the arms are 125 mm. long.

8. *Southwestern coast of Ireland; 250 fathoms; "Flying Fox."*—One specimen; the rays are in close lateral contact.

9. *Off Cape Sagres; 45 fathoms; "Porcupine."*—Four specimens, one very small; there are 49 segments in the longest cirri.

10. ? *Skerki Bank; "Dacia."*—One very small specimen. This individual probably came from the Seine Bank; it could not have been taken on the Skerki Bank, as the species does not occur there.

Remarks.—This species may be instantly distinguished from the Mediterranean *L. phalangium* by a glance at the cirri; these are

proportionately shorter and do not taper distally as do those of *L. phalangium*, so that they appear considerably stouter distally. While in the proximal third of the cirri the segments are of the same proportions as those in the proximal third of the cirri of *L. phalangium*, in the distal half they become shorter so that in the distal third they are usually only one-third again as long as broad and may be even shorter, nearly or quite as broad as long. In *L. phalangium* there is no decrease in the proportionate length of the cirrus segments distally, all the segments being about twice as long as broad. In *L. celticus* as the segments become shorter in the outer part of the cirri the distal dorsal edge becomes somewhat swollen so that the dorsal profile of the cirri is slightly scalloped; in *L. phalangium* these edges are always perfectly smooth.

The specimens from the Minch have the cirri XIV-XXIV, 43-50 (usually 43-47), 30 mm. to 40 mm. (usually 35 mm. to 40 mm.) long; the arms are from 105 mm. to 115 mm. in length; the distal inter-syzygial interval was counted in twenty-seven cases, and found to be: two oblique muscular articulations, once; three oblique muscular articulations, ten times; four oblique muscular articulations, ten times; five oblique muscular articulations, five times; six oblique muscular articulations, once.

Genus **ADELOMETRA** A. H. Clark

ADELOMETRA ANGUSTIRADIA (P. H. Carpenter)

Antedon angustiradia 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 253 (1).

I. "Challenger" Station No. 192.—One specimen.

Genus **BALANOMETRA** A. H. Clark

BALANOMETRA BALANOIDES (P. H. Carpenter)

Antedon balanoides 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 207 (1).

I. "Challenger" Station No. 201.—One specimen.

Subfamily **PEROMETRINÆ** A. H. Clark

Genus **PEROMETRA** A. H. Clark

PEROMETRA AFRA A. H. Clark

Perometra afra 1911. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 40, p. 43 (1).

I. *Providence Island, northeast of Madagascar; 125 fathoms; Professor J. Stanley Gardiner.*—Four specimens, three with fourteen and one with eleven arms. These were described in detail in the reference cited.

PEROMETRA PUSILLA (P. H. Carpenter)

Antedon pusilla 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 131 (1).

1. "Challenger" Station No. 192.—One specimen; this is a species of the genus *Perometra*, but it differs from *P. diomedæ* in possessing P_a ; the synarthrial tubercles are also much more strongly developed than in *P. diomedæ* of equal size; the radials have the characteristic features of the radials of *P. diomedæ*.

Subfamily HELIOMETRINÆ A. H. Clark

Genus HELIOMETRA A. H. Clark

HELIOMETRA GLACIALIS (Leach)

Asterias pectinata 1774. PHIPPS, A Voyage toward the North Pole, p. 284 (?2).—1775. PHIPPS, Voyage au pôle boréal fait en 1773, p. 200 (?2).—1820. SCORESBY, An Account of the Arctic Regions, vol. 1, p. 551 (?2).—1834. DEWHURST, The Natural History of the Order Cetacea and the oceanic inhabitants of the Arctic Regions, p. 284, species V (?2).

Alecto glacialis 1830. (LEACH), Catalogue of the Contents of the Museum of the Royal College of Surgeons of London, part 4, fasc. 1, p. 14, No. 85A (?30, ?31, ?32, ?33).—1833. (OWEN), Descriptive and Illustrated Catalogue of the Physiological Series of Comparative Anatomy contained in the Museum of the Royal College of Surgeons in London, vol. 1, p. 119, No. 435A (?30, ?31, ?32, ?33).—1837. (ANONYMOUS), Penny Encyclopedia, vol. 7, pp. 390, 391 (?30, ?31, ?32, ?33).—1867. KNIGHT, Natural History, or the Second Division of the English Encyclopedia, vol. 3, pp. 98, 100 (?30, ?31, ?32, ?33).

Comatula glacialis BRIT. MUS., MS. (30, 31, 32, 33).

Comatula sp. 1859. FORBES, in FORBES and GODWIN-AUSTEN, The Natural History of the European Seas, p. 47 (?3).

Antedon celticus 1873. WYVILLE THOMSON, The Depths of the Sea, pp. 76, 124, (4, 5, 6, 7).

Antedon eschrichtii 1877. DUNCAN and SLADEN, Ann. and Mag. Nat. Hist. (4), vol. 20, pp. 451, 468, 469 (10, 12, 14, 19, 20, 21, 22, 26).—1879. P. H. CARPENTER, Proc. Roy. Soc., vol. 28, p. 386 (24).—1881. DUNCAN and SLADEN, Memoir of the Arctic Echinodermata, p. 73 (10, 12, 14).—1886. LEVINSEN, Dijnphna-Togtets Zool.-botanisk Ulbytte, p. 410 (1).

Antedon celtica 1881. DUNCAN and SLADEN, Memoir on the Arctic Echinodermata, p. 75 (11 [figured specimen], 13).—1881. P. H. CARPENTER, Zool. Anzeiger, JG. 4, p. 521 (23).—1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, 1883-1884, pp. 365, 375.—BRIT. MUS., MS. (11, 13).

Antedon quadrata 1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, 1883-1884, p. 375 (6, 7).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 149 (6, 8, 9, 11, 13, 23).—BRIT. MUS., MS. (6, 8, 9, 23).

Antedon eschrichti 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 138 (1, 2, 3, 4, 5, 7, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24).—1892. BELL, Cat. Brit. Echinod. in Brit. Mus., p. 53 (4, 6, 7).—BRIT. MUS., MS. (1, 2, 3, 5, 7, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29).

Antedon bifida BRIT. MUS., MS. (4).

1. *Kara Sea*; "*Dijmphna*."—One small specimen.
2. *Northern coast of Spitzbergen*.—One medium-sized specimen.
3. *Spitzbergen*.—Four specimens.
4. $60^{\circ} 14' N. lat., 6^{\circ} 17' W. long.$; 632 fathoms.—One specimen.
5. "*Porcupine*" Station No. 57 (1869).—Two specimens.
6. "*Triton*" Station No. 4; $60^{\circ} 22' N. lat., 3^{\circ} 21' W. long.$; 327-430 fathoms.—One specimen.
7. "*Triton*" Station No. 4.—One specimen.
8. "*Valorous*" Station No. 6; $64^{\circ} 05' N. lat., 56^{\circ} 47' W. long.$; 410 fathoms; sandy mud.—One small specimen; P_1 and P_2 are similar; P_3 is like the succeeding pinnules and is only slightly longer than P_4 .
9. *Same locality*; 466 fathoms.—One small specimen.
10. *Franklin Pierce Bay, Greenland*; 13 fathoms.—Four large specimens; one of them is especially rugged and tuberculous.
11. *Discovery Bay, Greenland*; 25 fathoms.—One specimen; this was figured by Duncan and Sladen.
12. *Discovery Bay*; 25 fathoms; hard bottom.—One fine specimen.
13. *Discovery Bay*; 25 fathoms; hard bottom.—One small specimen.
14. *Franklin Pierce Bay*; "*Discovery*."—One specimen.
15. *Greenland*; 60 fathoms.—One specimen.
16. *Greenland*.—Three specimens.
17. *Greenland*.—One medium-sized specimen.
18. *Greenland*.—Two pentacrinoid larvæ.
19. *Arctic Expedition, 1875-'76*.—One fine specimen.
20. *Arctic Expedition, 1875-'76*.—One specimen.
21. *Arctic Expedition*; Coll. Hart.—One small specimen.
22. *Arctic Expedition*; Coll. Hart.—One specimen.
23. "*Challenger*" Station No. 48.—Four small specimens.
24. "*Challenger*" Station No. 48.—Two specimens.
25. *Cape Napoleon*.—Three specimens.
26. *No Locality* ("*Discovery*" collection).—Eight specimens.
27. *No Locality*.—One specimen.
28. *No Locality*.—One medium-sized specimen.
29. *No Locality*.—One specimen.

30. *No Locality*.—One specimen.
 31. *No Locality; Admiralty*.—One fine specimen.
 32. *No Locality*.—One fine specimen.
 33. *No Locality*.—One specimen.

Genus **PROMACHOCRINUS** P. H. Carpenter

Subgenus **PROMACHOCRINUS** P. H. Carpenter

PROMACHOCRINUS KERGUELENSIS (P. H. Carpenter)

Promachocrinus kerguelensis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 350 (1).

Promachocrinus kerguelenensis 1908. BELL, National Antarctic Expedition, Natural History, vol. 4, Echinod., p. 3 (2, 3, 4, 5, 6).

Antedon antarctica 1908. BELL, *T. c.*, p. 4 (7).

1. *Kerguelen Island; "Challenger"*.—One small specimen.
2. *East End of Barrier; 100 fathoms; "Discovery"*.—One specimen.
3. *Winter Quarters; "Discovery"*.—One very large specimen.
4. *Winter Quarters, No. 10 Hole; "Discovery"*.—Three large specimens; the cirri have 38-39 segments.
5. *Off Coulman Island; 100 fathoms; "Discovery"*.—Four specimens, three yellow and one purple.
6. *Christmas Harbor; "Discovery" Station No. 149E.*—Two specimens, one large and one small.
7. *Winter Quarters, No. 10 Hole; "Discovery"*.—One specimen.

Subgenus **ANTHOMETRA** A. H. Clark

ANTHOMETRA ADRIANI (Bell)

Antedon adriani 1908. BELL, National Antarctic Expedition, Natural History, vol. 4, Echinod., p. 4 (1, 2, 3, 4, 5, 6, 7, 8).

1. *Winter Quarters, 130 fathoms; "Discovery"*.—One specimen.
2. *Winter Quarters, 130 fathoms; "Discovery"*.—One fine specimen.
3. *Winter Quarters, 124 fathoms; "Discovery"*.—Two specimens.
4. *Winter Quarters, No. 10 Hole; 127 fathoms; "Discovery"*.—One small specimen.
5. *Winter Quarters, No. 10 Hole; "Discovery"*.—One small specimen.
6. *Winter Quarters, No. 10 Hole; "Discovery"*.—Two young specimens, with the carination of the arms well marked.
7. *Winter Quarters, No. 10 Hole; "Discovery"*.—Two large specimens.

8. *Mts. Erebus and Terror*.—Seven specimens.

Remarks.—This species is a true *Promachocrinus* in spite of the strong carination of the arms and the comparative slenderness of the cirri; both of these characters are seen, feebly developed, in the young of the other species of the genus as well as in the young of *Heliometra glacialis*. The longest cirri are about 55 mm. long and are composed of about 50 segments; the arms are strongly carinate from about the fourth brachial outward.

Subgenus SOLANOMETRA A. H. Clark

SOLANOMETRA ANTARCTICA (P. H. Carpenter)

Antedon antarctica 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 144 (1).—1908. BELL, National Antarctic Expedition, Natural History, vol. 4, Echinod., p. 4 (3).

Antedon australis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 146 (2).

Antedon adriani 1908. BELL, National Antarctic Expedition, Natural History, vol. 4, Echinod., p. 4 (4).

1. "Challenger" Station No. 151.—Three specimens.
2. "Challenger" Station No. 150.—Two specimens.
3. *Winter Quarters*; "Discovery."—Several specimens; these are probably *antarctica*, but their small size renders accurate determination difficult.
4. *Mts. Erebus and Terror*; "Discovery."—Two specimens.

Remarks.—The short cirri with comparatively few segments and the extraordinary roughness of the arms and pinnules, combined with the shortness of their component segments, distinguish this species from all the others of the genus.

I cannot find a single valid character whereby the specimens upon which is based Carpenter's name *australis* may be specifically differentiated from those which he called *antarctica*; they have the same extraordinary roughness of the arms and pinnules and the same short cirri composed of short segments, and are undoubtedly merely small and somewhat immature specimens. The character relied upon by Carpenter in separating the two forms is the same as that which he invoked to separate *Heliometra quadrata* from *H. glacialis*; *quadrata* has since been shown to be but the young of *glacialis*, and similarly *australis* now proves to be but the immature of *antarctica*.

In my paper on the crinoids of the Paris Museum (Bull. du Museum d'hist. nat., 1911, No. 4, p. 258), I wrote, under the heading of *Heliometra magellanica*, "Cette espèce est la même que l'*Antedon australis* et aussi que l'*Antedon rhomboidea* décrite par Carpen-

ter dans le rapport sur les échantillons recueillis par le ' Challenger. ' ” This, of course, is an error; *Antedon australis* is the same as *A. antarctica*, and *A. rhomboidea* is the same as *A. magellanica*.

Subgenus FLOROMETRA A. H. Clark

FLOROMETRA MAGELLANICA (Bell)

Antedon eschrichti var. *magellanica* 1882. BELL, Proc. Zoöl. Soc. London, 1882, p. 651 (1).

Antedon rhomboidea 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 148 (2, 4).

1. *Swallow Bay, Straits of Magellan; 12 fathoms; mud and rock.*—One specimen; P_3 is like the following pinnules; P_1 and P_2 are very long and flagellate with short segments; the arms are 190 mm. long.

2. "Challenger" Station No. 308.—One specimen; this resembles the specimen in the U. S. National Museum from Panama; the ossicles of the IBr series and the lower brachials have spinous edges and a few scattered spines along the borders; the lower segments of the proximal pinnules are very strongly carinate.

3. *Near Cape Providence, Straits of Magellan; H. M. S. "Sylvia."*—One specimen, closely resembling the type.

4. *Tom Bay, Patagonia.*—One young specimen.

Remarks.—So far as I am able to see the types of Carpenter's *Antedon rhomboidea* only differ from the type of Bell's *Antedon eschrichti* var. *magellanica* in being slightly more spinous proximally. This is merely an indication of immaturity. The two supposed species are undoubtedly identical.

Genus CYCLOMETRA A. H. Clark

CYCLOMETRA FLAVESCENS A. H. Clark

Cyclometra flavescens 1911. A. H. CLARK, Proc. Biol. Soc. Washington, vol. 24, p. 87 (1).

1. *South of Ras Sharwein, Arabia, or northwest of Sokotra (14° 20' N. lat., 52° 30' E. long.); 1200 fathoms; "Electra."*—One specimen, described in detail in the reference cited.

Genus HATHROMETRA A. H. Clark

HATHROMETRA PROLIXA (Sladen)

Antedon proluxa 1881. SLADEN, in DUNCAN and SLADEN, Memoir on Arctic Echinod., p. 77 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, pp. 166 (in text), 377 (1).—1892. BELL, Cat. Brit. Echinod. in Brit. Mus., p. 58 (2, 3).—1892. DANIELSSEN, Den Norske nordhavs-Expedition, 1876-8, vol. 5, No. 21, pp. 19, 23 (4).—BRIT. MUS., MS. (5).

Antedon hystrix 1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, vol. 12, p. 365 (2, 3).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 165 (2, 3).

Antedon celtica BRIT. MUS., MS. (4).

1. *Discovery Bay, Greenland*.—Five medium-sized specimens.
2. ? *Cold Area of Faroe Channel; "Porcupine," 1869*.—One specimen.
3. "*Triton*" Station No. 4; $60^{\circ} 22' N. lat., 8^{\circ} 21' W. long.$; 327-430 fathoms.—One specimen with nine arms; in one of the post-radial series the first and second brachials of the two arms are very close together and are followed by a common syzygial pair (third and fourth brachials).
4. "*Vøringen*" Station No. 373.—Two specimens.
5. *Finmark*.—One fine specimen.

HATHROMETRA DENTATA (Say)

Antedon sarsii 1882. VERRILL, Amer. Journ. Arts and Sci., vol. 23, p. 135 (?2).

Antedon dentatum 1882. VERRILL, *T. c.*, pp. 219, 222 (1, 2).—1889. (VERRILL), Report Commissioner of Fish and Fisheries, 1886, p. 860 (1, 2).

Antedon dentata 1884. VERRILL, Report Commissioner of Fish and Fisheries, 1882, pp. 657, 661 (1, 2).

Antedon tenella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 169 (1, 2).

1. *Off Martha's Vineyard*.—Four specimens.
2. *Off Martha's Vineyard; 183-258 fathoms*.—Three specimens.

HATHROMETRA NORVEGICA A. H. Clark

Antedon tenella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 169 (1).—1892. BELL, Cat. Brit. Echinod. in Brit. Mus., p. 57 (1).—BRIT. MUS., MS. (2, 3, 4).

Antedon sarsii BRIT. MUS., MS. (5).

1. "*Triton*" Station No. 5; 285-433 fathoms.—Two specimens; there are nineteen cirrus segments.
2. *Trondhjem Fjord, Norway; 150-300 fathoms*.—Twenty-two specimens; the arms are from 75 mm. to 80 mm. long; the cirri have 19-20 segments.
3. *Trondhjem Fjord; 150-300 fathoms*.—Two fine specimens.
4. *Norway; 800 fathoms*.—One beautiful large specimen with arms about 90 mm. long; the cirri have 21-22 segments; the gonads are much swollen.
5. *Norway*.—One specimen.

HATHROMETRA SARSII (Düben and Koren)

Antedon tenella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 169 (1).

Antedon sarsii BRIT. MUS., MS. (1).

1. *Shetland*.—Two specimens.

Genus TRICHOMETRA A. H. Clark**TRICHOMETRA ?DELICATA A. H. Clark**

Antedon alternata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 179, pl. 32, fig. 6 (1).

1. "Challenger" Station No. 218.—One specimen; this example undoubtedly belongs to some species of the genus *Trichometra*, probably to *T. delicata*.

Genus ISOMETRA A. H. Clark**ISOMETRA ANGUSTIPINNA (P. H. Carpenter)**

Antedon lineata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 183 (1).

Antedon angustipinna 1888. P. H. CARPENTER, *T. c.*, p. 189 (2).

1. "Challenger" Station No. 320.—One specimen.

2. "Challenger" Station No. 320.—One specimen.

Remarks.—This is a small and delicate species.

Subfamily THYSANOMETRINÆ A. H. Clark**Genus THYSANOMETRA A. H. Clark****THYSANOMETRA TENUICIRRA (P. H. Carpenter)**

Antedon tenuicirra 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 186 (1).

Antedon notata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 187 (in text), pl. 33, figs. 4, 5 (2).

1. "Challenger" Station No. 219.—One specimen; this species is closely related to *Th. tenelloides*, but it is a smaller form with longer brachials which are not so nearly oblong; there is the same short segmented P_1 ; P_2 and P_3 are large and stiffened; P_2 is slightly larger and longer than P_3 ; P_4 is smaller than P_2 and P_3 .

2. "Challenger" Station No. 219.—One specimen, smaller than the preceding; there are fifteen cirrus segments, of which the proximal are very long; P_1 is short with comparatively few long segments; P_2 and P_3 are large.

Genus COCCOMETRA A. H. Clark

COCCOMETRA HAGENII (Pourtalès)

Antedon hagenii 1869. POURTALÈS, Bull. Mus. Comp. Zoöl., vol. 1, No. 11, p. 355 (1).—1888. * A. AGASSIZ, Bull. Mus. Comp. Zoöl., vol. 15 ("Three Cruises of the 'Blake,'" vol. 2), p. 124 (1).

Antedon hageni 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 377 (1).

1. *Off Sombrero, West Indies; 105 fathoms.*—Four specimens.

Subfamily BATHYMETRINÆ A. H. Clark

Genus THAUMATOMETRA A. H. Clark

THAUMATOMETRA CYPRIS, new name

Antedon alternata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 179, pl. 32, figs. 5, 7, 8, 9 (1).

1. "Challenger" Station No. 236.—One specimen.

THAUMATOMETRA ALTERNATA (P. H. Carpenter)

Antedon alternata 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 179, pl. 18, figs. 1, 2, 3 (1, 2).

1. "Challenger" Station No. 169.—One specimen.

2. "Challenger" Station No. 170A.—Two specimens.

THAUMATOMETRA LONGIPINNA (P. H. Carpenter)

Antedon longipinna 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 185 (1).

1. "Challenger" Station No. 320.—One specimen; this is a delicate little species.

THAUMATOMETRA ABYSSORUM (P. H. Carpenter)

Antedon abyssorum 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 190 (1).

1. "Challenger" Station No. 147.—Two specimens; this form has the general appearance of a small specimen of *Th. tenuis*; it was well figured by Carpenter.

THAUMATOMETRA LÆVIS (P. H. Carpenter)

Antedon lævis 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 187 (1).

1. "Challenger Station No. 214.—One specimen; this is a very small and delicate species; Carpenter's figure of it is excellent.

THAUMATOMETRA REMOTA (P. H. Carpenter)

Antedon remota 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 184 (1).

I. "Challenger" Station No. 174.—Three specimens; this species, like most of the others in the genus, is very small and delicate; it was well figured by Carpenter.

THAUMATOMETRA EXIGUA (P. H. Carpenter)

Antedon exigua 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 178 (1).

I. "Challenger" Station No. 145.—Three specimens.

THAUMATOMETRA HIRSUTA (P. H. Carpenter)

Antedon hirsuta 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 188 (1).

I. "Challenger" Station No. 145.—One specimen.

Genus BATHYMETRA A. H. Clark**BATHYMETRA CARPENTERI A. H. Clark**

Antedon abyssicola 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 191 (1).

Bathymetra carpenteri 1908. A. H. CLARK, Proc. U. S. Nat. Mus., vol. 34, p. 235 (1).

I. "Challenger" Station No. 160.—One specimen, well figured by Carpenter.

BATHYMETRA ABYSSICOLA (P. H. Carpenter)

Antedon abyssicola 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 191 (1).

I. "Challenger" Station No. 244.—One specimen, well figured.

Family PENTAMETROCRINIDÆ A. H. Clark**Genus THAUMATOCRINUS P. H. Carpenter****THAUMATOCRINUS NARESI (P. H. Carpenter)**

Promachocrinus naresi 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 352 (1).

I. "Challenger" Station No. 214.—One specimen.

Remarks.—*Decamterocrinus borealis*, which I recently combined with *Th. naresi* as a synonym, is in reality a perfectly good species.

It is easily distinguished from the allied forms by the small size of the first and the large size of the second brachial, the latter being nearly or quite twice as large as the former. In *Th. naresi* the first three brachials are all of about the same size. *Th. borealis* is larger and more rugged than *Th. naresi*.

THAUMATOCRINUS RENOVATUS (P. H. Carpenter)

Thaumatoocrinus renovatus 1884. P. H. CARPENTER, Phil. Trans. Roy. Soc., 1883, p. 919.

Promachocrinus abyssorum 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 351 (1, 2).

1. "Challenger" Station No. 147.—Two specimens.

2. "Challenger" Station No. 158.—One specimen.

Remarks.—This is a small and delicate species.

Genus PENTAMETROCRINUS A. H. Clark

PENTAMETROCRINUS JAPONICUS (P. H. Carpenter)

Eudiocrinus japonicus 1882. P. H. CARPENTER, Journ. Linn. Soc. (Zoöl.), vol. 16, p. 499 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 84 (1).

1. "Challenger" Station No. 235.—Three specimens; these resemble the medium-sized specimens which I recorded from Japan.

PENTAMETROCRINUS SEMPERI (P. H. Carpenter)

Eudiocrinus semperi 1882. P. H. CARPENTER, Journ. Linn. Soc. (Zoöl.), vol. 16, p. 497 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 82 (1).

1. "Challenger" Station No. 169.—Two specimens; the disk is covered with a very close and abundant fine plating.

PENTAMETROCRINUS VARIANS (P. H. Carpenter)

Eudiocrinus varians 1882. P. H. CARPENTER, Journ. Linn. Soc. (Zoöl.), vol. 16, p. 496 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 81 (1).

1. "Challenger" Station No. 205.—Two specimens; these resemble the larger specimens which I have recorded from Japan and from the Indian Ocean.

Family ATELECRINIDÆ Bather

Genus ATELECRINUS P. H. Carpenter

ATELECRINUS BALANOIDES (P. H. Carpenter)

Atelecrinus balanoides 1881. P. H. CARPENTER, Bull. Mus. Comp. Zoöl., vol. 9, No. 4, p. 166 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 70 (1).

1. "Challenger" Station No. 122.—One specimen.

ATELECRINUS WYVILLII P. H. Carpenter

Atelecrinus wyvillii 1882. P. H. CARPENTER, Journ. Linn. Soc. (Zoöl.), vol. 16, p. 492 (1).—1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 72 (1).

1. "Challenger" Station No. 174C.—One specimen.

Family PENTACRINITIDÆ J. E. Gray

Genus ENDOXOCRINUS A. H. Clark

ENDOXOCRINUS PARRÆ (Gervais)

Pentacrinus mülleri 1884. P. H. CARPENTER, "Challenger" Report, Stalked Crinoids, p. 306 (1).

1. Near St. Eustatius; 531 fathoms; "Investigator."—One specimen.
2. Barbados.—Arms.

Genus ISOCRINUS H. von Meyer

ISOCRINUS ASTERIA (Linné)

Pentacrinus asterius 1884. P. H. CARPENTER, "Challenger" Report, Stalked Crinoids, p. 300 (1).

1. Off Saba; 320 fathoms; "Investigator."—One specimen.

ISOCRINUS DECORUS (Wyville Thomson)

Pentacrinus decorus 1884. P. H. CARPENTER, "Challenger" Report, Stalked Crinoids, p. 330 (1, 2).

1. Off Saba; 320 fathoms; "Investigator."—Three specimens; one of them has an enormously long stem showing the method of attachment.
2. Near St. Eustatius; 531 fathoms; "Investigator."—One specimen.

Genus **METACRINUS** P. H. Carpenter**METACRINUS ROTUNDUS** (P. H. Carpenter)

Metacrinus rotundus 1884. P. H. CARPENTER, "Challenger" Report, Stalked Crinoids, p. 344 (1).—1885. P. H. CARPENTER, Trans. Linn. Soc. (Zoöl.), (2), vol. 2, p. 436 (1).

1. *Japan; 70 fathoms.*—One specimen.

Family **HOLOPIDÆ**Genus **HOLOPUS** d'Orbigny**HOLOPUS RANGII** d'Orbigny

Holopus rawsoni 1870. GRAY, Ann. and Mag. Nat. Hist. (4), vol. 8, p. 394 (1).

Holopus rangi 1884. P. H. CARPENTER, "Challenger" Report, Stalked Crinoids, p. 199 (1).

1. *Barbados; 5 fathoms; Sir Rawson Rawson.*—Two specimens.

UNIDENTIFIED SPECIMENS

Family **COMASTERIDÆ** A. H. Clark**COMASTER** species

1. *Macclesfield Bank; 23-25 fathoms.*—One specimen with fifteen arms 55 mm. long; two IIIBr series are developed on two IIBr series; there is one additional IIBr series; the cirri are VII, but apparently will be lost when the animal is adult.

2. *Macclesfield Bank; 26 fathoms.*—Two smaller specimens.

Family **MARIAMETRIDÆ** A. H. Clark**ANTEDON MOOREI** Bell

Antedon moorei 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 401 (1).

1. *Macclesfield Bank; 13 fathoms.*—One specimen. The cirri are XVIII, 21-25, 17 mm. long; the longest proximal segments are about one-third longer than broad; the outer thirteen segments are slightly broader than long, and bear moderately developed dorsal spines.

The thirty-two arms are 60 mm. long; the IIBr and IIIIBr series, which are both 2, are in close lateral apposition, and the lateral borders of the component ossicles appear to be somewhat produced.

P_1 is similar to P_2 , but not quite so long nor so stout, and it tapers somewhat more rapidly. P_2 , which is the longest and largest pinnule on the arm, is considerably larger on the outer arms arising from each IBr axillary than on the inner; it is long, enlarged, slightly stiff-

ened, and tapers evenly to a flagellate and delicate tip, exactly resembling P_2 in *L. protectus*; it is composed of from sixteen to twenty-one segments, of which the third is about as long as broad and the distal are twice as long as broad; it is about one-half again as long as P_1 . P_3 is about as long as P_1 , but is slightly stouter and tapers less rapidly, more nearly resembling P_2 ; it is composed of sixteen segments. The following pinnules are small and weak.

ANTEDON FIELDI Bell

Antedon fieldi 1894. BELL, Proc. Zoöl. Soc. London, 1894, p. 401 (1).

1. *Macclesfield Bank; 22-30 fathoms.*—One specimen; this appears to be a small species belonging to some genus of Mariametridæ or Colobometridæ; there are strong transverse ridges on the cirrus segments.

2. *Macclesfield Bank; 13 fathoms.*—One similar specimen.

Family TROPIOMETRIDÆ A. H. Clark

? TROPIOMETRA species

Antedon adeonæ 1884. BELL, "Alert" Report, p. 156 (1).

1. *Port Molle, Queensland; 12-20 fathoms; "Alert."*—One specimen of what appears to be a new species of *Tropiometra* characterized by very slender cirri.

2. *"Alert" Station No. 87.*—One similar specimen.

Family THALASSOMETRIDÆ A. H. Clark

THALASSOMETRA species

1. *Northwest of Sokotra (14° 20' N. lat., 52° 30' E. long.); 1200 fathoms; Cable-repair Ship "Electra"; 7/10/09.*—One very fragmentary specimen of a new species of *Thalassometra*; the long and numerous spines on the calyx and arm bases suggest an affinity with *Th. bispinosa*.

Family CHARITOMETRIDÆ A. H. Clark

PACHYLOMETRA species

1. *Northwest of Sokotra (14° 20' N. lat., 52° 30' E. long.); 1200 fathoms; Cable-repair Ship "Electra"; 7/10/09.*—One large specimen with twelve arms, the IIBr series being 4 (3 + 4); the cirri are long; the calyx and arm bases are fairly smooth.

Family ANTEDONIDÆ Norman

COMPSOMETRA species

1. *Lewis Island, Dampier Archipelago, Western Australia.*—Eleven specimens, possibly referable to *C. loveni*.

HATHROMETRA species

Antedon dentata 1884. P. H. CARPENTER, Proc. Roy. Soc. Edinburgh, vol. 12, p. 362 (1, 2).

Antedon tenella 1888. P. H. CARPENTER, "Challenger" Report, Comatulæ, p. 169 (1, 2).

1. "Porcupine" Station No. 51.—One specimen partially decalcified and not specifically determinable, though it appears to belong to *H. proluxa*.

2. "Porcupine" Station No. 54.—One specimen; the cirri are stouter than those of *H. sarsii*; the longest cirrus segments are about four or four and a half times as long as the median diameter, not greatly constricted centrally; the centrodorsal is low and conical. Probably this is a young specimen of *H. proluxa*.

THAUMATOMETRA species

1. *Northwest of Sokotra (14° 20' N. lat., 52° 30' E. long.); 1200 fathoms; Cable-repair Ship "Electra"; 7/10/09.*—One specimen, apparently of a new species of the genus.

TYPE SPECIMENS OF COMATULIDS IN BRITISH MUSEUM

The types of the following species of comatulids are in the collection of the British Museum:

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<i>Comatella stelligera</i> (P. H. Carpenter).....	p. 3
<i>Comatella maculata</i> (P. H. Carpenter).....	p. 3
<i>Neocomatella europæa</i> A. H. Clark.....	p. 4
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<i>Capillaster sentosa</i> (P. H. Carpenter).....	p. 4
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NAMES PROPOSED FOR COMATULIDS NOW KNOWN TO BE SYNONYMS

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