Trichodina pediculus, die Polypenlaus, die ich in über hundert Exemplaren auf manchem Polypen vorfand, ganz unbehelligt sich auf ihrem Wirte herumtummelt, so erregt es gewiß noch mehr unsre Verwunderung, daß ein allerdings in puncto Nahrungsaufnahme außerordentlich leistungsfähiges Infusor, *Prorodon teres*, sogar erfolgreich den Polypen angreift, indem es sich mit dem sehr erweiterungsfähigen Munde über das Ende eines Fangarmes herstülpt (Fig. 2.), um diesen

Fig. 1.

Fig. 2.

Fig. 1. Halb umgestülptes Exemplar von *Hydra fusca*. Vergr. 35 : 1.
Fig. 2. *Prorodon teres* auf einem Arm von *Hydra fusca*. Vergr. 75 : 1.

nun allmählich, manchmal sogar bis zum Grunde, einfach zu verdauen. Wer schon beobachtet hat, wie z. B. *Didinium nasutum* die oft an Größe den Räuber selbst übertreffenden Pantoffeltierchen in sich hineinlutscht, oder wie *Prorodon*, ebenso wie ja auch *Frontonia*, sogar größere Rädertierchen trotz deren lebhafter Gegenwehr bewältigt und verschlingt, der wird über die geschilderte Infusorienleistung an sich nicht weiter erstaunt sein; verwunderlich bleibt nur die Widerstandsfähigkeit des Einzellers gegenüber dem doch in das Körperinnere gelangenden Nesselgift seines Beutetieres.

12. Descriptions of eleven new Crinoids belonging to the Families Calometridae and Thalassometridae discovered by the »Siboga« in the Dutch East Indies.

By Austin H. Clark.

eingeg. 21. Februar 1912.

The work of the Dutch steamship »Siboga« in the East Indies brought about the discovery of many new species of unstalked crinoids and the accumulation of a vast amount of data bearing on geographical

distribution and on other problems connected with these animals. As it will take some time to digest the data presented and to prepare the final comprehensive report for the »Siboga« series it has seemed advisable to publish preliminary descriptions of the new forms in order to guard against anticipation.

In the present paper those belonging to the families Calometridae and Thalassometridae are considered.

Family Calometridae.

Neometra sibogae sp. nov.

The centrodorsal is thin discoidal, the broad polar area flat, 4 mm in diameter; the cirrus sockets are arranged in a single, fairly regular, marginal row.

The cirri are XV, 31—36, about 25 mm long, large and stout; their bases are crowded against those of the adjacent cirri, and the first segment is more or less sharply flattened laterally; the first two segments are about twice as broad as long, the following gradually increasing in length and becoming nearly, sometimes quite, as long as broad on the fifth; the next two or three segments are similar, and the following very gradually decrease in length so that those in the outer fourth of the cirri are about twice as broad as long; in the outer fourth or fifth the cirri taper very gradually so that the tip is comparatively slender; the distal edges of the segments all around is everted and prominently overlapping; from the tenth onward the dorsal surface of the segments is sharply carinate; at first this affects only the distal part, but it soon comes to occupy the entire dorsal surface of the segments, standing up in the form of a high median keel the crest of which is parallel to the longitudinal axis of the cirrus.

The radials are even with the edge of the centrodorsal in the median line, but are strongly produced in the angles of the calyx where they separate widely the bases of the IBr_1; the ventral edge of this anterior process, which is straight and not spatulate or otherwise modified, is equal in length to the lateral edges of the IBr_1; the cirrus sockets encroach more or less upon the radial as do those of *Oreometra mariae*.

The division series spread out horizontally from the radials as in the species of the genus *Comanthus*; the division series are very narrow and very strongly rounded, so that they are very widely separated; the extreme ventrolateral border of the ossicles of the division series is produced in the shape of a thin flange with a smooth and sharp outer border which runs from the distal edge of the interradial production of the radials to the second brachial; but the produced borders are dorsally only visible as far as the IBr axillary; from the ends of the interradial

processes of the radials these produced borders are (viewed ventrally) parallel as far as the IIBr axillary, but as the IIBr series make a very considerable angle to each other they disappear dorsally at the IBr axillary.

There are from thirty to forty arms 70 mm to 75 mm long; extra axillaries are always external; the arms resemble those of *N. multicolor*.

P_1 is 10 mm or 11 mm long with twenty-nine segments, slender, but not so weak as usual in the genus, more or less stiffened; the first two segments are enormously enlarged, subequal, three to four times as broad as long, nearly twice as large as the first two segments of P_2; the third segment occupies about one third of the distal edge of the second and is about as long as broad; the following segments are slightly longer than broad, becoming about as long as broad in the distal half of the pinnule. P_2 is 11 mm or 12 mm long, straight and stiff, though not particularly enlarged, with eighteen to twenty-one segments of which the fourth and following are about twice as long as broad; the first is about three times as broad as long in the median line, and about twice as broad basally as the third; the second is about as long, but not quite so broad, and bears a slightly rounded carinate process; the third is about half again as long as broad. P_3 is 15 mm long with seventeen segments which are more elongate than those of P_2, being nearly or quite three times as long as broad; the pinnule is in general similar to P_2, but is very slightly stouter with the first two segments only very slightly enlarged and the second with the carinate process much reduced; the third segment is narrowly carinate, at least basally. P_4 is 11 mm long with fifteen segments, those beyond the third very long; the second to the fourth are slightly carinate. P_5 is 9 mm long with thirteen segments resembling P_4 but with slightly shorter segments.

Type Locality. — »Siboga« Station No. 305.

Calometra diana sp. nov.

The centrodorsal is thin discoidal, the flat dorsal pole 3,5 mm in diameter; the cirrus sockets are arranged in a single fairly regular marginal row.

The cirri are XVI, 42—43, 30 mm to 33 mm long, rather slender, resembling those of *C. discoidea*; the fifth-tenth segments, which are the longest, are about twice as long as broad; the distal fifteen or sixteen are slightly broader than long, but the cirri taper slightly at the tip so that the last three before the penultimate are as long as broad or slightly longer; the earlier longer segments show a slight tendency to become »dice-box shaped,« and the short distal segments possess the high carinate spines characteristic of the family.

The radials are short in the median line, but extend far up in the angles of the calyx where they form a broad process with parallel sides and a straight or convex distal border which entirely and widely separates the bases of the IBr_1; in width this anterior process from the radials is equal to about half the length of the ventrolateral edge of the IBr_1; the IBr_1 are oblong, nearly or quite three times as broad as long, with the ventrolateral edge produced into a thin flange-like border with a smooth outer edge which is about twice as wide proximally as distally, proximally being even with the distal edge of the radial process; the axillaries are broadly pentagonal, not quite twice as broad as long; the dorsal surface is slightly excavated so that the distal edges appear prominent; the thin produced ventrolateral border of the IBr_1 is continued on to the axillaries where, viewed ventrally, it is seen to have its sides parallel; viewed dorsally it disappears under the produced lateral angles of the axillary.

$IIBr_2$; the synarthrial tubercles are small and narrow, but greatly produced as in *Perometra diomedeae*; they are proportionately smaller and narrower than in that species, though nearly as high.

The IBr_1 sometimes bears a small rounded tubercle just anterior to the proximal half of the synarthrial tubercle; the axillary has a more or less prominent narrow rounded median carination running anteriorly from the base of the distal half of the synarthrial tubercle often terminating, approximately on a level with the lateral angles, in a prominent tubercle; these are repeated on the ossicles of the IIBr series and on the first two brachials.

There are sixteen arms in the type, about 70 mm long; the brachials are essentially as in *Neometra multicolor*, but each bears a prominent low narrow rounded carination which ends distally in a more or less spinous production of the distal edge; this carination lies alternately on either side of the median line, this alternation being most pronounced in the proximal part of the arm.

P_1 is 10 mm long, slender and weak, with from twenty-eight to thirty-three segments of which the first two are enormously enlarged and the remainder very small, about as long as broad; P_2 is long, stiff and spine-like, though rather slender, 13 mm to 15 mm long, with from eighteen to twenty-two segments; P_3 is 17 mm long with twenty segments and resembles P_2, but is slightly stouter with slightly longer component segments of which the first two are only slightly enlarged.

Type Locality. — »Siboga« Station No. 294.

Family Thalassometridae.

Pterometra venusta sp. nov.

The centrodorsal is thick discoidal or columnar, the sides nearly parallel, 6 mm broad at the base and 2,5 mm high; the cirrus sockets are arranged in ten equally spaced columns, each column separated from its neighbors on either side by a shallow groove from one fourth to one third of a cirrus socket in width; there are two, more rarely three, cirrus sockets to a column; the dorsal pole of the centrodorsal bears a rosette of five prominent tubercles.

The cirri are XX—XXV, 99—113, 77 mm long, stout basally and tapering slightly distally, though this distal taper is more gradual and therefore not so marked as in *Pterometra trichopoda*; the longest cirrus segments are from one third to one half again as long as broad; in the earlier segments the ventral distal edge is rather prominent; after the eighth the median portion begins to project, overlapping the base of the next succeeding segment, this after the eleventh or twelfth becoming a sharp ventral spine which persists as far as the twentieth, or even the twenty-third segment; at first this ventral spine makes a considerable angle with the longitudinal axis of the segments, but distally its outer part becomes more nearly parallel to it; the dorsal processes arise very slowly and are never very prominent; they first appear on about the twenty-third segment; the cirri are moderately compressed laterally.

The radials and division series resemble those of *Pt. trichopoda* but are slightly broader and more robust so that the arm bases open out at a somewhat broader angle.

The arms are twenty-eight in number in the type.

P_1 is 10 mm long with eighteen segments of which the terminal four or five are abruptly smaller than the preceding; it is considerably stouter and more sharply triangular than P_1 in *Pt. trichopoda*; P_2 is 11,5 mm long with sixteen segments, strongly though not sharply triangular, tapering evenly to a slender tip; the outer segments are about twice as long as broad, without projecting distal edges; P_3 is 15 mm or 16 mm long with sixteen segments of which those in the distal half are much elongated and slender with prominent spines at the prismatic angles; P_4 is 17 mm long with fifteen segments, similar to P_3 but with a slightly more even taper and hence appearing stouter distally.

Type Locality. — »Siboga« Station No. 117.

Thalassometra marginalis sp. nov.

This new species is closely related to *Th. rustica* and to *Th. magnicirra*.

The arms are seventeen or eighteen in number and about 95 mm long; the cirri are 50 mm long with 60 segments.

This form differs from *Th. rustica* in having the proximal edge of the IBr_1 produced into a narrow rim which projects over the radials, entirely concealing them; the ends of the basal rays are very prominent as high dorsoventrally elongate tubercles which are usually rather longer than the dorsoventral length of a cirrus socket; in the interradial angles the IBr_1 are cut away to accomodate the basal rays whereas in *Th. rustica* they are separated from the basal rays by the radials which form a continuous band all around the calyx.

Type Locality. — »Siboga« Station No. 226.

Thalassometra magna sp. nov.

This new form is related to *Th. gigantea*, but is easily distinguished from that species by the presence of a strong carination on the IBr_1, $IIBr_1$, $IIIBr_1$ and first brachial, these ossicles being in *Th. gigantea* quite without carination though it occurs on all those immediately following; the cirri are proportionately longer and more slender than those of *Th. gigantea*, and are composed of more numerous segments; the arms are also more numerous. It is also related to *Th. annandalei* but is a larger and more robust species with larger and stouter cirri, irregularly dentate instead of smooth lateral borders to the proximal ossicles, and without the great development of spines on the dorsal surface of the proximal ossicles characteristic of *annandalei*.

The centrodorsal is conical, the tip truncated, 5,5 mm broad at the base and 5 mm long; the dorsal pole is approximately flat and is covered with fine papillae; it measures about 1,5 mm in diameter; the cirrus sockets are in ten columns usually of four, the columns of each radial area being in close contact with those of adjacent radial areas exteriorly but separated interiorly by a bare slightly concave area which is proximally nearly or quite as broad as the adjacent cirrus sockets.

The cirri are XXX—XL, 66—74, 70 mm to 85 mm long; the longest cirrus segments are nearly or quite twice as long as broad.

The ends of the basal rays are visible as dorsoventrally elongate tubercles bridging over the very deep but very narrow subradial clefts; the radials are very short with a slight rounded median prominence and with a few small teeth on the distal margin; the IBr_1 are short, between four and five times as broad as long, broadly V-shaped in a direct lateral view; the proximal and distal edges are parallel; both the proximal and distal edges are slightly everted; the former bears along its margin a few short irregularly placed spines; the latter bears, on either side of the median line, about eight regular teeth which begin one third of the

distance from the median line and gradually increase in length to the anterolateral angle; this series of teeth is continued inward toward the median line by small, and progressively smaller, spines; the lateral edges are slightly produced and smooth; the anterolateral angles bear a few prominent blunted spines; in the center of the ossicle there is a prominent and sharp, though not especially high, median keel; the axillaries are broadly rhombic, the lateral angles truncated, about twice as broad as long; the lateral edges are not quite so long as those of the IBr_1 and are produced and irregularly and coarsely spinous; the distal edges and the outer part of the proximal edge are slightly everted and finely spinous; a prominent keel resembling that on the IBr_1, runs nearly its whole length; nine IIBr series are present, all 4 (3+4); they resemble the IBr series and, like them, are prominently carinate; their lateral borders are produced and are irregularly denticulate or spinous; nine IIIBr series are present, all 4 (3+4), resembling the IIBr series; the produced and denticulate borders extend as far as the base of P_2 externally and as far as the fifth or sixth brachial internally.

The twenty-eight arms are about 120 mm long and in general resemble those of *Th. gigantea*; the first two brachials are carinate; the following have slightly everted and finely spinous distal edges, and have the dorsal (but not the lateral) surface covered with very numerous short fine spines; as the brachials become triangular the proximal edges lose their eversion while that of the distal edges becomes recumbent and more prominently spinous; the spinosity of the dorsal surface gradually becomes arranged in definite lines forming a series of sharp serrate longitudinal striations.

Type Locality. — »Siboga« Station No. 251.

Thalassometra margaritifera sp. nov.

This new form is very close to *Th. hirsuta*; the eversion of the proximal and distal edges of the ossicles of the IBr series and of the first two brachials is less marked than in *Th. hirsuta* and the spinosity is coarser, the spines being more uniform in size and more thickly distributed over the dorsal surface of the ossicles; they are also more numerous and longer on the dorsal surface so that there is less difference between the spines of the dorsal surface and those of the everted edges; the median carination is more rounded than that of *Th. hirsuta* and is studded with spines resembling those of the general dorsal surface.

Type Locality. — »Siboga« Station No. 45.

Thalassometra perplexa sp. nov.

This new form is closely related to *Th. pergracilis*, from which it differs in having the calyx smooth with merely a trace of a thickening

of the edges of the ossicles, which are smooth or show only traces of very minute spines.

The cirri are 37 mm long with 62—65 segments.

Type Locality. — »Siboga« Station No. 211.

Crotalometra sulcata sp. nov.

The general structure of this species resembles that of *C. propinqua*, but the cirri are proportionately larger, longer and more robust, 60 mm to 65 mm long with 63—64 segments, and the ossicles of the IBr series and lower brachials are almost smooth as in *C. vera*. It differs markedly from both of these in having the distal angles of the IBr_1 and the proximal angles of the axillaries, and the corresponding angles of the first two brachials and of the elements of the first syzygial pair, widely cut away forming large and prominent rhombic water pores; the edges of the ossicles bordering these water pores are more or less everted and coarsely denticulate, or bear a few coarse spines.

Type Locality. — »Siboga« Station No. 161.

Crotalometra vera sp. nov.

This species is closely related to *C. propinqua*; the edges of the segments of the IBr series and of the earlier brachials are but very slightly if at all everted, and are armed with exceedingly fine spines or are quite smooth; the spines within the distal angle of the axillary and on the dorsal surface of the ossicles are exceedingly short and fine and difficult to detect.

The type has ten arms about 130 mm long; the cirri are 60 mm long and are composed of 62—69 segments of which the longest are from one third to one half again as long as broad; the sixth or seventh is a transition segment.

Type Locality. — »Siboga« Station No. 173.

Cosmiometra helene sp. nov.

The centrodorsal is moderate in size, truncated conical, about 4,5 mm broad at the base and about 2,5 mm high interradially; the cirrus sockets are arranged in ten columns of two or three each, the columns being close together interradially but separated in the midradial line by a wedge-shaped area at first about as broad as a cirrus socket but coming to an apex just beyond the last socket in the adjacent columns; this bare area is entirely covered with fine more or less sharp granulations; the dorsal pole is irregular, 2 mm in diameter.

The cirri are XXV, 53—61, 37 mm to 47 mm long, moderately stout; the longest segments are half again as long as broad or slightly longer; the sixth is a transition segment.

The radials are entirely concealed; the IBr_1 are short, about four times as broad as the lateral length, slightly convex proximally, distally incised by a rounded process from the axillary so that in the median line they are about two thirds of the lateral length; the proximal border bears very numerous fine short spines; the distal border is similarly modified, but the spines become more or less obsolete in the median third; the lateral borders are similarly modified, but the spines extend further inward over the dorsal surface of the ossicle and are more developed; the lateral thirds of the dorsal surface are rather thickly covered with fine short spines; the axillaries are rhombic, somewhat over twice as broad as long, the lateral angles truncated, forming lateral edges which are about one third as long as the lateral edges of the IBr_1; the proximal border is modified like the distal border of the IBr_1; the distal borders are very finely spinous; the lateral fourths of the dorsal surface are rather thickly covered with fine short spines resembling those covering the lateral thirds of the IBr_1; the synarthrial tubercles are low and but slightly marked; the division series are only slightly convex dorsally; they are in very close lateral apposition and are sharply flattened; the IIBr series are 2, both of the component ossicles resembling the corresponding ossicles of the IBr series, but the proximal and distal borders are more finely spinous and the spinous modification of the dorsal surface is proportionately not so broad exteriorly and is very narrow interiorly.

The twenty arms are from 95 mm to 100 mm long, resembling those of *C. komachi*; the dorsolateral spinous ornamentation runs up in a very narrow and progressively narrowing band to the third or fourth brachial both externally and internally.

Type Locality. — »Siboga« Station No. 253.

Stenometra acuta sp. nov.

This species is most closely related to *S. hana* of Japan, but it is at once distinguishable from that form by the much shorter cirri which have fewer segments; the carination of the proximal brachials is somewhat sharper and more prominent than in *S. hana*.

The type has the cirri XII, 51—58, 25 mm long; the first three segments (sometimes also the fourth) bear dorsally a fine median carination ending distally in a small spine as in *S. hana*.

The twelve arms are about 60 mm long.

Type Locality. — »Siboga« Station No. 294.