SPONGES

FROM

THE ATLANTIC AND ARCTIC OCEANS

AND

THE BEHRING SEA

DESCRIBED BY

KONRAD FRISTEDT.

(WITH TEN PLATES.)

In the year 1886, intrusted by Prof. S. Lovén with examination of the great collection of sponges in the State Museum at Stockholm, I found that many of the arctic sponges in that collection were unknown. I was therefore authorized by Prof. A. E. Nordenskiöld to describe the forms of those that had been obtained during the Swedish arctic expeditions.

With regard to the classification, I have followed Prof. Oscar Schmidt as I did in my former treatise on sponges from the west-coast of Sweden, and with regard to the regions, I have, with a few exceptions, followed Dr C. Forsstrand*).

If we first examine the *Calcispongiæ,* we find that there are but very few species representing this great group. No species have been obtained in the Siberian Ocean, and only two in the Beaufort's Sea. This fact may be owing to the imperfect exploration of these seas. Nor have any Calcispongiæ been gathered on the west-coast of Greenland. The other four are from the European Arctic Sea and the Barent's Sea, and one of them, the *Sycandra utriculus,* has also been found on the limits of the two regions, the European Arctic Sea, on the one side, and the Barent's Sea, on the other. The *Sycandra arctica* is the most common Calcispongia in the arctic seas.

Of *Hexactinellidæ* two species have been found, which I have not been able to identify with any forms previously known. Both these species were dredged up to the west of the Kara Sea.

There were no specimens of *Lithistidæ* captured during these expeditions. It is possible that no Lithistidæ are to be found in the most northerly parts of the arctic seas.

The fourth group, the *Halisarcinæ,* is represented by a single species.

Of the fifth group I could hardly expect to find any species, since this group, with few exceptions, belongs to more southern

*) Det arktiska hafsområdets djurgeografiska begränsning med ledning af skalkräftornas *(crustacea malacostraca)* utbredning, Upsala 1886.

seas. Not even the *Dysidea*, which is most common on the coasts of Norway and Great-Britain, is to be found here.

The *Chalineæ* are rather numerously represented, and especially is one species, identified by me as *Chalina arbuscula*, much spread. It is found as well in the European Arctic Sea and the Barent's Sea as in the Behring Sea. Still more common than this species is the *Cribrochalina variabilis*, at least in the Siberian Arctic Ocean and the Beaufort's Sea. A few specimens are from the limits of the Barent's Sea and the Kara Sea.

The following group, very common in the arctic seas, is represented by numerous specimens. I am sorry to say that I have not been able to identify more than a few of them. The rest I have described as new species, though one or other may have been described before.

The group *Suberitidinæ* is represented by several species of which the *Suberites montalbidus* is the most common. It is found in all the seas west of Greenland as far as to the Behring Sea. The new species *Tethya sibirica* is obtained only in the Siberian Arctic Ocean and in the Beaufort's Sea.

The following group, the *Desmacidinæ*, is represented by very numerous genera and species, the greater part of them being obtained in the seas west of Nova Zembla. Only a few are found east of cape Tscheljuskin.

The *Chalinopsinidæ* are very rare to the east of Nova Zembla. Only one species, the *Clathria Lovèni*, is obtained in the Siberian Arctic Ocean.

The *Geodia Baretti*, the only representative of the group *Geodinidæ*, is very numerous in the sea east of Greenland.

The following abbreviations are used in this work:

Sp.	=	expedition to Spitzbergen	1872—1873.
N. S.	=	» » Nova Zembla	1875.
S.	=	» » Greenland	1883.
V.	=	» of the »Vega»	1878—1880.

The figures after the locality indicate the numbers of the stations.

I. Calcispongiæ O. S.

Genus Ascetta H.

Ascetta coriacea Mont. (H.)

Plate 22, fig. 1—2.

Ascetta coriacea, Hæckel, Die Kalkschwämme, II, pag. 24, III, Taf. 8, Taf. 5, Fig. 2 a—2 c.

»Connexive Varietät»:

Ascaltis coriacea new var.

Several specimens of this sponge were obtained during the Swedish arctic expeditions. The outer shape agrees with Hæckel's figures of the same species, especially with fig. 32 and 33, Plate 3. The anatomical structure corresponds very nearly with Hæckel's description, excepting the spicules. In Hæckel's specimens there are spicules of only one kind, viz. equiangular triradiate, the radii of the same size and the apices obtusely pointed. Our specimens have also quadriradiate spicules. Three of the radii are almost of the same size and equiangular, obtusely pointed as the radii of the triradiate spicules. The fourth radius is more slender, a little curved and sharply pointed. This radius is therefore very different from the others, and since the quadriradiate spicules are very rare, I believe that our specimens are a hitherto unknown »Connexive Varietät» of *Ascetta coriacea* H., which according to Hæckel ought to be called *Ascaltis coriacea*. The typical and the more rare quadriradiate spicules are figured in Plate 22, fig. 1—2.

At first I was a little doubtful whether I should identify the species above-mentioned with *Ascaltis canariensis* Miklucho (H.) or not. Our specimens almost agree with the figure, that Hæckel has given of the species in op. cit. III, Plate 9, fig. 1. Spicules triradiate agree with those of *A. canariensis;* but the

quadriradiate spicules are not of the same shape as those of *A. canariensis*. Besides that the locality, where *A. canariensis* has been found — the Canaries, as the name indicates — is too distant from the regions, where our specimens were dredged up, to allow these to be identical with *A. canariensis*.

As Hæckel under several other species has mentioned »Connexive Varietäten», there is nothing wonderful in finding such a variety of *Ascetta coriacea*.

The largest specimen of this sponge, which I have seen, was round and a little depressed. The greatest diameter about 40 mm.

Habitat. Smeerenberg Bay, depth 25 fathoms (32 Sp.); Norskö, depth 18—25 fathoms (16 Sp.); Lat. 79° 53', Long. 14° 50', depth 55 fathoms (244 Sp.); Arsuk Bay, depth 75 fathoms (562 S.); East-Greenland, depth 350 fathoms (500 S.).

Genus **Ascandra** H.

Ascandra complicata Mont. (H.)

Ascandra complicata, Hæckel, Die Kalkschwämme, II, pag. 93, III, Taf. 15, Fig. 1 a—1 k.

Our specimens of this species agree very well with Hæckel's description and figures. In the same manner as *Ascandra botryoides* Ellis et Sol. (Fristedt) the specimens of *A. complicata*, which are all from the expedition of the Vega, are congregated, forming tufts of variable sizes or incrusting branches of sea-weeds.

Habitat. Several specimens from Jinretlen, depth 15 fath., (1006 V.), and from Pitlekai, depth 10—14 fathoms (1015, 1027, 1031, 1035 and 1036 V.).

Ascandra mirabilis n. sp.

Plate 22, fig. 3—13, Plate 26, fig. 1—2.

This species is represented by only one specimen, forming an oval tube, 15 mm in length and 7 mm in breadth. The inner surface is smooth. The outer is rather rough owing to the large acerate spicules, and presents a certain resemblance

to a chess-board, because of the structure of the radial tubes which resembles that of *Ascandra Schmidtii* H. The mouth of cloaca is furnished with a ciliary fringe of very long acerate spicules. This peristome extends only one mm outside the true osculum, but 5 mm into the cloaca of the sponge. On issuing out of the sponge it is surrounded by a fringe of triradiate spicules.

Skeleton. The skeleton consists of triradiate, quadriradiate spicules, of large acerate from dermis and peristome, and of very minute, straight or slightly curved acerate spicules.

Triradiate spicules (Plate 22, fig. 7—12). These spicules are numerous and more variable in this species than in other Calcispongiæ which I have seen. The rays are often nearly of the same diameter and length, but there are not rarely triradiate spicules, which have two rays of the same size and the third shorter, as in fig. 7.

Triradiate spicules of the radial-tubes, figured in Plate 22, fig. 11, are very characteristic for this species; the lateral radii are not of the same length, the proportion between the lengths being 2 : 1. Triradiate spicules, figured in the same Plate, fig. 8, are not numerous and not typical for the species.

Quadriradiate spicules (Plate 22, fig. 13). The spicule of this kind are exceedingly rare. The proportion between the apical and the other rays is about 2 : 1.

The length of the rays of the triradiate and quadriradiate spicules varies very much. The length of the two short rays of the spicule, figured 12, is about 0,15 mm, all the other triradiate and quadriradiate spicules being figured in the same proportion.

The large acerate spicules from dermis and peristome (Plate 22, fig. 3—4). These spicules vary much in length: from one mm to 5 mm. The spicules of the peristome and dermis are almost of the same diameter, the first a little longer. Consequently the peristome is not as usual composed of linear acerate spicules.

The minute acerate spicules (Plate 22, fig. 5—6). The spicules of this kind are exceedingly minute, being only 0,07 mm in

length, either straight or a little curved at one point. The diameter of these minute spicules is comparatively great.

Colour. Grey-white, when preserved in spirit.

Habitat. East-coast of Greenland, Lat. 65° 40', Long. 35° 32' W., depth 25—40 fathoms (578 S.).

Genus Leucandra H.

Leucandra cylindrica n. sp.

Plate 22, fig. 14—22, Plate 26, fig. 3.

This species is represented in the collection of arctic sponges in the Zoological State Museum at Stockholm only by solitary forms from Pitlekai. There is much resemblance between our specimens of the above-mentioned species and Hæckel's description of *Leucandra ananas* Mont. (H.) *)

The spicules of *L. cylindrica* agree with those of *L. ananas*, the quadriradiate of the inner surface excepted. In *L. cylindrica* these spicules have a much larger apical ray than in *L. ananas*. And, besides that, our new species has a kind of minute acerate spicules, inflated near one point and slightly spined along the same point, which spicules are not to be found in *L. ananas*.

The sponge forms a cylindrical arcuated or straight tube, attached to branches of sea-weed. The base is round and usually bent round the branche. Most specimens are furnished with a short ciliary tube of long, slender, acerate spicules. The outer surface is slightly roughned in examples from stat. 1015, smooth in the rest. The central cylindrical cloaca is nearly as long as the sponge and armed with the apical ray of the quadriradiate spicules. The length of the greatest specimen is 40 mm.

Skeleton. The skeleton consists of gastric quadriradiate spicules with long apical ray, of parenchymal quadriradiate spicules with shorter apical ray, of large dermal acerate, of very slender acerate spicules from the peristome, of very minute acerate spicules from the gastric layer, and of triradiate spicules.

*) Hæckel, op. cit. II, pag. 200, III. Taf. 32, Fig. 5 a—5 f, Taf. 40, Fig. 1—8.

The gastric quadriradiate spicules (Plate 22, fig. 22). All the rays are of the same diameter, sharply pointed and curved. The apical ray is about 0,7 mm in length, the lateral rays reaching a length of 0,2 mm.

The parenchymal quadriradiate spicules (Plate 22, fig. 21). All the rays of these spicules are of nearly the same diameter and length, the apical ray a little longer. The length of the rays is 0,2—0,3 mm. These spicules are not so sharply pointed as the gastric quadriradiate.

The triradiate spicules (Plate 22, fig. 17—20) are as usually distinguished by a great variability in their size; all the rays are of the same diameter and sharply pointed, slightly curved or straight. In one part of the spicules the rays are of the same length, 0,2—0,3 mm, in another one of the rays is much longer than the lateral rays, the proportion between their length being 2 : 1. These spicules are the most numerous in this species.

The dermal acerate spicules (Plate 22, fig. 14). Straight, sharply pointed and a little projecting from the outer surface; their length not exceeding 2 mm.

The linear acerate spicules of the peristome (Plate 22, fig. 15). These spicules are very slender and straight, their length not more than 2,5 mm.

The gastric acerate spicules (Plate 22 fig. 16) are very minute, being only 0,09 mm in length, and having near one of the points a small inflation. Most of these spicules are microspined along the inflated point.

Colour. When alive, light grey; when dried, pure white.

Habitat. Pitlekai, depth 12 fathoms (1015, 1035, 1036 V.).

Genus Sycandra H.

Sycandra arctica H.

Sycandra arctica, Haeckel, Die Kalkschwämme, II, pag. 353, III, Taf. 55, Fig. 1 a—1 v, Taf. 60, Fig. 15.

In the collection of arctic sponges, gathered during the Swedish expeditions above-mentioned, there are several specimens

of this species. The largest is from Norskö, measuring in length with the peristome 40 mm, in diameter 15 mm. The length of the peristome is very great, 15 mm. All specimens have a very rough surface owing to the prominent large acerate spicules of the dermis.

Colour. White, yellowish or grey, when preserved in spirit, the peristome silver-coloured.

Habitat. Norskö, depth 18—25 fathoms (16 Sp.); Mossel Bay, depth 3 fathoms (123 Sp.); Duym Point, depth 50 fathoms (254 Sp.); Greenland, Tessiursak, depth 15—40 fathoms (535 S.).

Sycandra utriculus O. S. (II.)

Sycandra utriculus. Hæckel, Die Kalkschwämme, II, pag. 370, III, Taf. 55, Fig. 3 a—3 t, Taf. 58, Fig. 4.

This species is represented in the collection of sponges, dredged up during the Swedish arctic expeditions, by several fine and well preserved specimens from Spitzbergen and Nova Zembla. All the specimens are furnished with an osculum armed with a short ciliary fringe. Only a few specimens are fringeless. The outer surface of the sponge is smooth or slightly hispid. Most specimens are cylindrical, about 6 mm in diameter and 25 mm in length. The largest, dredged up at Nova Zembla, is a little compressed, with a very great central cloaca and a large ovoid osculum. The length of this large specimen is 40 mm, the greatest diameter about 20 mm. The surface of this specimen is smooth.

The measures of the spicules agree well with those given by Hæckel.

The colour of the dried sponge is cream-white; a little darker, when preserved in spirit; the gastral surface, and the portions near the central cloaca are always much darker than the superficial parts.

Habitat. Spitzbergen, Foul Bay, depth 4 fathoms (37 Sp.); Mossel Bay, depth 1—2,5 fathoms (75, 153, 200 Sp.); Tromsö, Karlsö, depth from 5 to 15 fathoms (Sp.); Matotschkin-Schar, depth 4—6 fathoms (74 N. S.).

II. Hexactinellidæ O. S.

Genus Hyalonema Gray

Hyalonema rosea n. sp.

Plate 23, fig. 1—11, Plate 26, fig. 5.

This new *Hyalonema* is represented by only three specimens, which are very fine and well preserved, all from the east coast of Greenland. All the specimens are round or rather elliptical and compressed, the form slightly agreeing with that of a *Polymastia* Bow., the mamulæ naturally excepted. The three examples are almost of the same size, one a little larger, the greatest diameter 40 mm, the shortest not exceeding 25 mm. The height is tolerably constant, only 5 mm. The surface is even, but slightly hispid, the spicules being congregated in irregular bundles and projecting from the surface. The lower surface is a little concave. The distal margin obtusely attenuated. Oscula are minute, numerous, and dispersed. The consistency of the sponge like that of tolerably firm felt.

Skeleton. The skeleton consists of large hexradiate spicules, only five of the rays being well developed; one of the rays is much longer than the others; of smaller hexradiate, all the rays being well developed; of rosettes of one kind; of slightly curved obtuse spicules with both the terminations microspined, and the spicule not rarely inflated at the middle; of very large acerate, sometimes spined along the points; of small, spined acerate spicules with four inflations at the middle, and finally of more rare spinulate spicules, the heads of which are microspined.

The large obtuse spicules (Plate 23, fig. 3—4). These spicules are always more or less curved and armed with very minute spines at both the terminations. They are very numerous and often inflated at the middle. The length of such a spicule does not exceed 10 mm.

The large acerate spicules (Plate 23, fig. 1). The spicules of this kind are the largest in this species. They are usually totally smooth, but sometimes slightly spined at the points. The central cavity is very large and seems to communicate

outwards. The length varies from 10 to 15 mm. These spicules are the most numerous, and together with the large obtuse ones they form the greater part of the inner skeleton.

The spinulate spicules (Plate 23, fig. 2) are not numerous. The one termination is sharp-pointed, the other rounded to a head, which is microspined as are the terminations of the obtuse spicules. The length of the spinulate spicules is about 5 mm. These spicules are, as already stated, rare in this species, and therefore I believe that they are only deformities of other typical spicules, probably of the large acerate ones.

The small spined acerate spicules (Plate 23, fig. 5). These spicules are very numerous, but still I believe that they are varieties of the following kind. Their spination and central inflations made me come to that conclusion. They are spined all over, and furnished with four bulbous inflations at the centre; these inflations correspond to the four shorter rays of the following kind of spicules. The length is tolerably constant, not exceeding 0,25 mm.

The smaller hexradiate spicules (Plate 23, fig. 8, 9, 11) are of three separate kinds. In the largest the rays have a length of about 0,1 mm, two of the rays being a little longer than the other. The second kind of hexradiate spicules agree very much with the first mentioned. The difference only consists in the size. The rays of these smaller spicules are 0,05 mm. As the above-mentioned they are also spined. The third kind of smaller hexradiate spicules differs more from the two others. The rays are more slender and smooth, the points being curved. The length of each ray is about 0,03 mm. All these hexradiate spicules are very numerous in the inner, softer parts of the sponge.

The very large hex(quinque)radiate spicules (Plate 23, fig. 6—7). These spicules have properly only five rays, the sixth being more or less undeveloped. One of these five rays is much longer than the others. The proportion between this ray and the other four is 3 : 1. This longer ray is slightly curved and smooth. The others are straight and microspined at the terminations, which are either obtuse or sharply pointed. The whole ray is rarely microspined but furnished with rare, large, sharply pointed spines (fig. 7). These spicules are not numerous.

The rosette spicules (Plate 23, fig. 10) are the smallest of all the spicules of this species, and are rather rare. The rosette is quadriradiate, the arms being smooth, straight, radiating at equal angles from the centre, and terminate with four small inflations, to which each of the four very slender, sharply pointed and smooth rays is attached. The length from the centre of the spicules to the point of a ray is 0,025 mm.

Colour. The sponge is felt-grey, with a tint of rose, when preserved in spirit; light-grey, when dried.

Habitat. The east-coast of Greenland, depth 125 fathoms (579 S.).

Hyalonema foliata n. sp.

Plate 23, fig. 12—17, Plate 26, fig. 6.

This new species is represented by several greater and smaller fragments, which all probably appertain to only two or at the most to three specimens. Almost all the pieces are compressed, blade-like and a little concaved, tending to cyathiform; and I have seen one specimen attached to a stone by a short pedicle; this specimen was as the others broken in the margins, but I could easily detect its cyathiform shape.

The surface is smooth; the consistency like that of the preceding species. The largest specimen is ventilabriform, the length about 50 mm, the breadth 30 mm; the thickness is the same in all our specimens, not exceeding 3 mm. Oscula are minute, numerous, and dispersed; pores inconspicuous. The great skeleton-spicules are dispersed without order, and the smaller disposed as in *Hyalonema rosea* Fristedt. The spicules of these species agree much with each other, but the small rosettes, figured Plate 13, fig. 15, are sufficiently characteristic to separate both the species.

Skeleton. The skeleton consists of spinulate spicules, the head being spined; of arcuated obtuse spicules, terminally spined; of very large, smooth acerate spicules (all these three kinds of spicules agree with those of *Hyalonema rosea):* of rosettes of two kinds, and of hexradiate spicules of three kinds.

The obtuse spicules (Plate 23, fig. 3—4). These spicules are slightly curved, sometimes inflated at the centre, and all are microspined at the obtuse terminations. Very numerous.

The large acerate spicules (Plate 23, fig. 1) are a little greater than those of *Hyalonema rosea*. They are also very numerous.

The spinulate spicules. The spicules of this kind have a greater head than those of the preceding species, but in other respects they agree well with those of *H. rosea*. They are not numerous, though not as rare as in *H. rosea*. The length of all these three kinds of spicules is about the same as in *H. rosea*.

The large hex(quinque)radiate spicules (Plate 23, fig. 12). These spicules are very few in number and very often quite smooth, exceedingly rarely microspined at the sharply pointed ends. The rays are slightly curved, one being much longer than the others, but of the same diameter. The length of the largest ray is 2,8 mm. The shortest ray is about 1,4 mm in length.

The larger microspined hexradiate spicules (Plate 23, fig. 13) differ from the smaller spicules of the same kind by their rays, which are all well developed in the greater kind. Five of the rays are 0,2 mm in length, the sixth being about 0,4 mm. All the rays are microspined, straight, and more or less obtusely pointed.

The smaller microspined hexradiate spicules (Plate 23, fig. 14). In these spicules only five rays are well developed; the sixth is very minute and obtuse, while the others are obtusely pointed as in the larger hexradiate microspined spicules. All the rays are straight and microspined, the length of the well-developed ones being 0,1 mm, of the minute ray only 0,02 mm; this ray is of the same diameter as the others.

The rosettes with sharply pointed branches (Plate 23, fig. 17) resemble a little the rosettes of *H. rosea*, figured Plate 23, fig. 10. Here we have also a thick central cross, every branche terminating in *two* slender, smooth, slightly curved and sharp-pointed arms. The size from the centre of the cross to the point of an arm is about 0,08 mm.

The rosettes with obtuse branches (Plate 23, fig. 15—16). These rosettes differ in many ways from the above described ones. They are simple and radiating into all sides from the centre; they are not sharp-pointed, but they have at the ends a bonnet-like inflation. This inflation is at the margin divided in four great spines. The rest of the spicules is microspined, excepting the bonnet-like inflation, which is smooth. These spicules are almost as numerous as the preceding ones and have also the same size, viz. 0,08 mm from the centre to the termination of a ray.

Colour. Cream-white in the dried state or when preserved in spirit.

Habitat. Baffin Bay, Lat. 75° 26′ N., Long. 67° 27′ W., depth 260 fathoms (542 S.).

III. **Halisarcinæ** O. S.

Genus **Halisarca** Dujardin.

? **Halisarca Dujardinii** Johnston

Halisarca Dujardinii, Johnston, Brit. Spong. pag. 192, Plate 16 fig. 8, 1842.

This species is represented by only one specimen from the expedition of the Vega. This specimen is large, forming a compressed cake-like mass, the greatest diameter being 75 mm, the smallest about 50 mm; the thickness varies much, not exceeding 10 mm. The surface is smooth, the consistency very fleshy.

As the structure of the *Halisarcinæ* O. S. is so very uniform I, who have not seen any specimen of *Halisarca* Duj., am a little doubtful, whether I shall identify this species as *Halisarca Dujardinii* Johnston, or not.

Habitat. Port Clarence, depth 4—6 fathoms (1049 V.).

IV. **Chalineæ** O. S.

Genus **Chalina** Grant.

Chalina arbuscula Verrill.

Chalina arbuscula, Verrill, Un. St. Com. fish., I, pag. 409 and 472.

Several specimens of this species agree closely with specimens from the west-coast of Sweden, described by Fristedt in »Bidrag till kännedomen om de vid Sveriges vestra kust lefvande Spongiæ», Kongl. Svenska Vet.-Akad. Handlingar, Bd 21, N:o 6, pag. 50; the rest of the specimens differ a little from the Swedish ones in the outer shape, but the spicules are of the same size as those of the Swedish specimens, viz. 0,15—0,18 mm in length.

Colour. Preserved in spirit, light-, rarely dark-brown; when dried a little lighter.

Habitat. Taimur Bay, depth 40 fathoms; Actinia Bay, depth 5—10 fathoms; Port Clarence, depth 4—6 fathoms; Konyam Bay (Behring Strait), depth 15—16 fathoms (28, 29, 1049, 1058 V.); Mossel Bay, depth 15—20 fathoms (79 Sp.). Several specimens from all these localities.

Chalina Vega n. sp.

Plate 23, fig. 18, Plate 26, fig. 7.

This species is represented by several specimens, all dredged up during the expedition of the Vega. The sponge is arbuscular, pedicelled. Surface even. Oscula terminal or often lateral, slightly elevated. The branches are frequently anastomosing, a little compressed, the greatest diameter not exceeding 5 mm. The length of the largest specimen is about 90 mm, divided into three great branches and furnished with numerous slightly elevated oscula, placed only on one side. The consistency is very fragile. The spicules are, as generally, disposed in nets. The fibres are not so well developed as in other Chalinæ which I have seen.

Skeleton. The skeleton consists of only acerate spicules.

The acerate spicules (Plate 23, fig. 18). The length of these spicules is 0,17 mm; they are slightly curved or straight, comparatively thick and short-pointed, like those of *Isodictya mammeata* Bow., figured in Mon. Brit. Spong., Vol. III, Plate 51, fig. 8.

Colour. The sponge is greyish, when preserved in spirit.

Habitat. S. E. from Liakov-island, depth 8—9 fathoms (53—54 V.).

Chalina grœnlandica n.-sp.
Plate 23, fig. 19.

This species differs from the other species which I have seen. It is blade-shaped, the margins more or less broken. Only two specimens were obtained, both probably fragments of only one. The larger of the two is about 60 mm in length, 30 mm in breadth, the thickness being only 5 mm. The surface is smooth, furnished with a few larger oscula. The consistency is exceedingly soft and fragile.

Skeleton consists of only acerate spicules, disposed in nets.

The acerate spicules (Plate 23, fig. 19) are slightly curved, short-pointed and 0,2 mm in length.

Colour. Light with a tint of yellow, when preserved in spirit.

Habitat. East-coast of Greenland, depth 140 fathoms (581 S.).

With regard to the species *Chalina* Grant, *Reniera* Nardo and *Amorphina* O. S., I have been very doubtful whether I should indicate only the genus or both the genus and the species, as I now have done. I have not been able to identify more than a few of them with forms, previously known; the greater part, however, I have described as new, though one or several of them may have been described before

In order with certainty to decide if one of the above-mentioned species may be identical with one described before, typical specimens are, at least in most cases, required for comparison. Only when specimens of these three genera have been the objects of a very careful and minute examination in the hand of an able spongiologist, there can be any possibility of explaining these genera. Before this is done I shall give new specific names to some of the forms.

Genus **Cribrochalina** O. S.

Cribrochalina variabilis Vosmær.

Plate 26, fig. 4.

Cribrochalina variabilis, Vosmær, Report on the Sponges dredged up in the Arctic Sea by the »Willem Barents» in the years 1878 and 1879 (in Niederl. Archiv für Zool., Supplementb. I, 1882, pag. 36, Plate 1, fig. 16—17, Plate 3, fig. 67—69, and Plate 4, fig. 145—147).

This species is represented by several fine and large specimens, much varying in size and shape. Most of them resemble those which are figured by Vosmær. I have not separated all the forms as distinct varieties, because I have found in our collection many transitions between the two varieties, described by Vosmær. All the specimens are in a very good condition and preserved in spirit. Colour greyish. The sponge is generally infundibuliform; I have seen only one specimen which was compressed, cake-like and deprived of the stem. The oscula are congregated in the upper concaved part of the infundibulum. There is no difference in colour between the pedicle or stem and the body. Some specimens are cylindrical, the diameter of the body of the sponge often not much greater than that of the stem. The spicules agree well with those described and figured by Vosmær. Most specimens are attached to stones and other hard objects. The largest specimen is infundibuliform, 80 mm in height, and 90 mm in diameter at the margin of the funnel. The cylindrical specimens have a diameter of about 5 mm. The consistency is very soft and flexible.

Habitat. Between Stolbovoi-island and Liakov-island, depth

(53—54 V.); Lat. 71° 39', Long. 157° 15' E., depth 10 fath. (56 V.); Cape Schelagskoi, depth 12 fath. (58 V.); Pitlekai, depth 15 fath. (1006 V.); two Engl. miles north from Pitlekai, depth 12 fath. (1016 V.); Jugor schar, depth 10—14 fath. (138 N. S.).

V. Renierinæ O. S.

Genus Reniera Nardo.

Reniera cinerea Grant (O. S.).

Isodictya cinerea, Bowerbank, Mon. Brit. Spong., II, pag. 274, III, Plate 48, fig. 1—5.

Only one specimen was obtained of this species. It thickly incrusts a Corallineæ, *Lithothamnium polymorphum*, and is furnished with one slightly elevated osculum. The specimen is small, the greatest diameter not exceeding 20 mm, the smallest about 10 mm, and the thickness 5 mm.

The sponge agrees well with specimens obtained from the west-coast of Sweden, in external shape as well as in size of spicules. The colour is yellow.

Habitat. Mossel Bay, depth 9—12 fathoms (54 Sp.).

Reniera tubulosa n. sp.

Plate 24, fig. 1.

Of this new species there are two specimens, both obtained during the arctic expedition 1872—1873. The larger specimen thickly incrusts a *Lithothamnium* and is furnished with two large tubes, in the points of which the oscula are situated. The length of this specimen is 60 mm, the breadth about 30 mm, and the heighest tube 30 mm. The diameter of the rounded tube-opening is 6 mm. The smaller specimen does not incrust, but grows freely, rounded and furnished with three not elevated oscula. The surface is smooth, abundantly covered with fine grains of sand. The consistency is very soft and fragile.

Skeleton. The skeleton consists of only acerate spicules.

The acerate spicules (Plate 24, fig. 1). These spicules are, as usual, slightly curved, sharp-pointed, 0,2 mm in length. Part of them are disposed in nets; the fibres are feebly developed and multispiculated. With regard to the thickness there are two kinds of acerate spicules, the proportion of the thickness 1 : 2; the length is the same in both.

Colour. Dried and preserved in spirit, yellowish.

Habitat. Norskö, depth 15—25 fathoms (14 Sp.); Mossel Bay, 20 fathoms (96 Sp.).

Reniera ventilabrum n. sp.

Plate 24, fig. 3, Plate 27, fig. 8.

This very fine sponge is represented by one specimen, broken in three pieces. This *Reniera* is ventilabriform, and as to the outer shape it agrees with *Isodictya infundibuliformis* L. (Bow.). The surface is even, perforated by frequent minute oscula. The length of the restorated specimen is about 170 mm, the breadth about the same, and the thickness 3—4 mm. The margins are slightly attenuated and rounded. The fibres, radiating from the middle of the blade, are arcuated towards the surfaces. These fibres are multispiculated and connected with spicules disposed in nets. The consistency is rather fragile.

Skeleton. As a true *Reniera* this new species has only one kind of spicules, viz. acerate.

The acerate spicules (Plate 24, fig. 3) are generally straight, rarely curved, sharp-pointed, with a length of 0,25 mm.

Colour. Brownish with a tint of yellow in the specimen preserved in spirit; a little dried piece of the same is slightly lighter in colour.

Habitat. Lat. 79° 55′ N., Long. 10° 27′ E., depth 280 fathoms (286 Sp.).

Reniera arctica n. sp.
Plate 24, fig. 2.

Three specimens more or less broken represent this species. The surface is smooth. Oscula are situated in slightly elevated tubes, and are rounded, 2 mm in diameter. The consistency is not so fragile as that of the preceding species. The habitus of this sponge corresponds tolerably well to that of *Amorphina panicea* Pallas (O. S.), but there is a great difference both in the dermis and in the inner structure, especially in the disposition of the spicules. The sponge is thickly incrusting. The largest specimen is 40 mm in length, the breadth being 20 mm, and the thickness about the same.

Skeleton. The skeleton consists of acerate spicules.

The acerate spicules (Plate 24, fig. 2). In this species these spicules are exceedingly slender, straight and sharp-pointed, the length being 0,3 mm.

Colour. The sponge is yellowish, when preserved in spirit.

Habitat. Norskö, depth 10 fathoms (the number of the stat. unknown).

Genus **Amorphina** O. S.

Amorphina panicea Pallas (O. S.).

Halichondria panicea, Bowerbank, Mon. Brit. Spong., II, pag. 229, III, Plates 39—40.
Amorphina panicea, O. Schmidt, Grundz. einer Spong.-fauna des Atl. Geb., pag. 77.

In the sponge-collection of the Zoological State-Museum at Stockholm there are exceedingly numerous specimens of this common species both from the Swedish and Norwegian coasts, and from the arctic regions, excepted those explored during the expedition of the Vega. The specimen from the expedition to Greenland in the year 1883 coats the greater part of a large stone. In this specimen the surface is not so

smooth as is usual in this species, it being corrugated and presenting numerous small roughnesses. The surface of the other specimens agrees very well with that of the typical *Amorphina panicea* Pallas (O. S.). The oscula are small, dispersed and slightly elevated. The spicules are of the same size and form as those of Swedish specimens.

Colour. Yellowish, not so much varying as in Swedish and English specimens.

Habitat. Vardö, depth 60 fathoms (3 Sp.); Möller Bay, depth 15—20 fath., (48 N. S.); Waigat Strait, north from Disco-island, depth 20—35 fath. (S.).

? Amorphina fallax Bow. (Fristedt).

Aymeniacidon fallax, Bowerbank, Mon. Brit. Spong., II, pag. 177, III, Plate 33, fig. 15—18.

Amorphina fallax, Fristedt, Bidrag till kännedomen om de vid Sveriges vestra kust lefvande Spongiæ (in Kongl. Sv. Vet.-Akademiens Handlingar, Bd 21, N:o 6), pag. 26, Taff. 2, fig. 6—7.

I cannot with any certainty say, whether our specimens are *Amorphina fallax* Bow. (Fristedt) or not. The spicules are of the same kind and size, viz. slightly curved, acuate, sometimes spinulated, the length being about 0,4 mm. The disposition of the spicules is likewise the same as in this species.

The colour of the species from the expedition of the Vega is more yellow than that of the Swedish specimens, which are of a more or less light ash-colour. The surface is smooth. The largest specimen is attached to a *Laminaria,* forming a finger-like body; the length is 50 mm, the diameter not exceeding 15 mm. Oscula are generally minute, dispersed; one of them on the top of the sponge is larger. Consistency soft. The other specimens from the expedition to Nova Zembla in the year 1875 are much smaller and of a lighter colour, agreeing more than the first-mentioned with Swedish specimens.

Habitat. Taimur Strait, Actinia Bay, depth 5—10 fathoms (29 V.); eastern mouth of Jugor schar, depth 10 fath. (143 N. S.); Matotshkin schar, depth unknown (192 N. S.).

Amorphina fasciculata n. sp.

Plate 24, fig. 5, 6.

There was dredged up only one specimen of this sponge. It incrusts a bryozoon, forming one piece, the length being 25 mm, the breadth 15 mm, and the thickness not exceeding 15 mm. The surface is slightly rough. Oscula minute, dispersed. The consistency fragile. The spicules are not numerous, and they are situated, the great without order, the small fasciculated. Dermal membrane pellucid.

Skeleton. The skeleton consists of acuate spicules of two distinct kinds.

The acuate spicules (Plate 24, fig. 5, 6). The larger of these spicules are 0,6 mm in length, slightly curved at the base and sharp-pointed at the other termination. These spicules are dispersed in the tissues without order.

The smaller, hair-fine acuate spicules are arcuated in the same manner as the larger, but they are exceedingly fine, a little shorter and contrary to the others, fasciculated. They are about as numerous as the larger ones.

Colour. The sponge is dark with a tint of grey, when dried.

Habitat. North from Spitzbergen, Lat. 80° 7′ N., Long. 16° 54′ E., depth 60 fathoms (256 Sp.).

Amorphina nodosa n. sp.

Plate 24, fig. 7, 8.

This *Amorphina* is the largest of all the species described in this volume. It is represented by only one specimen from the arctic expeditions of Prof. Nordenskiöld.

This species is elongated, the length being about 100 mm, the thickness and the breadth 50 mm. I have seen another specimen from Groenland, which is much larger, almost spherical and of the size of a head. Surface, inner structure and spicules are the same in both specimens. The surface is rough, furnished with numerous, 1—5 mm long papillæ, and

between these papillæ with several small ditches. The oscula are minute, dispersed. The consistency fragile.

Skeleton. The skeleton consists of *acerate* spicules of two kinds, which both are slightly arcuated and tapering from the middle to the sharp-pointed terminations. The large are 0,75 mm in length; the small, more slender, are only 0,15 mm long.

Colour. The colour of specimens dried or preserved in spirit is yellowish.

Habitat. From the expedition to Spitzbergen during the years 1872—1873; locality and depth unknown.

Amorphina renieroides n. sp.

Plate 24, fig. 9, Plate 27, fig. 9.

This species is represented by several pieces, probably fragments of only one specimen. Outer form, consistency and surface agree well with a *Reniera* Nardo — and therefore I have given the name of *renieroides* to this species — but the disposition of the spicules indicates that we have to deal with a species of *Amorphina* O. S. Characteristic for this sponge is the variable size of the spicules. The sponge forms irregular, nodular masses, attached to hard objects, such as stones, shells etc. The best preserved piece is 60 mm in length, upwards divided in two parts. The surface is even and smooth. The oscula are large and few in number, often furnished with a small peristome, in the outer shape slightly agreeing with that of many *Calcispongiæ*. The consistency is tolerably firm. The interstitial canals and cavities are well developed.

Skeleton. The skeleton consists of *acerate* spicules; in this sponge these spicules vary more than in others which I have examined. Their size is 0,2—0,6 mm. The larger are the most numerous. They are all curved. The smaller are almost of the same diameter as the greater.

Colour. When preserved in spirit, yellowish brown.

Habitat. Konyam Bay, depth 2—16 fathoms (1058 V.).

Amorphina grisea n. sp.
Plate 24, fig. 10, Plate 27, fig. 10.

Of this species we have numerous specimens from the arctic regions, and the sponge seems to correspond to *Amorphina panicea* Pallas (O. S.) on our coasts. The form is very variable. There are both formless, coating masses and arborescent specimens; the branches are in most cases dichotomously divided and slightly compressed; the length of the most typical specimen is 110 mm; the thickness of the branches about 6 mm. There are greater, but not so typical specimens in the collection. The dermis is thin, translucent. The surface is smooth and even, like that of *Amorphina panicea* Pallas (O. S.). Oscula few, dispersed, variable in size, generally placed laterally.

The ***skeleton*** consists of *acerate* spicules, not exceeding 0,6 mm in length, part of them being only 0,3 mm. They are smooth, slightly curved, tapering from the middle to the sharp points.

Colour. The colour is variable. Most specimens are ash-grey, a few of them yellowish grey or rarely yellow, all the specimens being preserved in spirit.

Habitat. West from the Kamenni-islands, depth 19 fathoms (21 V.); in the mouth of Chatanga Bay, depth 15 fathoms (41 V.); North from the mouth of Olenek, Lat. 73° 44', Long. 121° 20' (47 V. [the specimens from this locality and stat. 1035 V. are of a lighter colour than the other specimens]); S. E. from Liakov-island, depth 8—9 fathoms (53—54 V.); Jrkaipij (Northcape of Siberia), depth 3—6 fathoms (68 V.); Pitlekai, depth 12 fathoms (1016 V.); the same locality, depth 10—14 fath. (1031, 1035 V.).

As may be easily found this species agrees very well with *Amorphina renieroides* Fristedt in several respects as in the size and form of the spicules etc.; but, shape and colour apart, they may, however, easily be distinguished from each other by the structure of the dermal membrane. *Amorphina grisea* Fristedt has the dermis well developed with horizontal spicules, while the dermis of *Amorphina renieroides* only with difficulty can be separated from the other body of the sponge, the

spicules of this last-mentioned species being oblique or rectangular towards the surface.

This difference in the structure of the dermis as well as in the net-work of the spicules may, I hope, be a good characteristic for distinguishing the two genera *Amorphina* and *Reniera*, the species *A. renieroides* thus being a connecting lenk between the genera.

Amorphina fibrosa n. sp.
Plate 24, fig. 11, 12.

This sponge forms irregular masses, incrusting stones, bryozoons, sea-weeds etc. The surface is smooth and even. Oscula are few in number, not large. The consistency is firm owing to the fibres being tolerably well developed.

Skeleton. The skeleton consists of long acerate spicules.

The acerate spicules (Plate 24, fig. 11, 12) are slightly curved, tapering from the middle to the sharp-pointed terminations, the length varying from 0,5 to 0,9 mm; the latter size being the most common. The spicules are congregated into long fascicules or irregularly dispersed.

Colour. The colour of specimens preserved in spirit is dark-brown.

Habitat. Behring Strait, Lat. 65° 14′ N., Long. 171° W., depth 25 fathoms (1054 V.).

Genus **Eumastia** O. S.

Eumastia sitiens O. S.
Plate 24, fig. 13, Plate 27, fig. 11.

Eumastia sitiens, O. Schmidt, Grundz. einer Spong.-Fauna des Atl. Geb., pag. 42, Taf. 5 Fig. 12.

This species is represented by several well preserved and very fine specimens. The form varies much, according to the objects, to which it is attached. But all the specimens are furnished with the characteristic, large cloacal fistulæ, which are free at the distal extremities, but coalesced at the lower

fistules is very characteristic. The dermis is nearly totally free from the inner substance or the kernel. This dermis is also of a lighter colour than the kernel and more sarcodeless. I have not seen the oscula, yet they are probably minute and dispersed. The finest specimen grows freely, probably in sand or clay, the length being 40 mm, the thickness 25 mm, and the height 50 mm, the cloacal fistulæ included. These fistulæ are slightly compressed, obtuse, the diameter varying from 2 to 5 mm. The sponge often contains stones, shells and other hard objects.

The ***skeleton*** consits of *acerate* spicules (Plate 24, fig. 13), which are straight and sharp-pointed, tapering from the middle. The length is 0,7—0,9 mm, consequently a little longer than those of the specimen, described by O. Schmidt, the spicules of which are 0,69 mm in length. The colour of the sponge is yellowish, when preserved in spirit, slightly lighter, when dried.

Habitat. Pitlekai, depth unknown (1006 V.); Lat. 65° 10' N. Long. 169° 50 W., depth 25 fathoms (1054 V.). The colour of the specimens from the stat. 1054 is darker than those from stat. 1006.

In the sponge-collection of the Zoological State Museum at Stockholm there are several specimens of this species, obtained at the west-coast of Greenland during the expedition of the »Ingegerd» and »Gladan» in the year 1871.

Genus Isodictya Bow.

Isodictya Dicksonii n. sp.

Plate 24, fig. 14.

This sponge is, no doubt, nearly allied to *Isodictya infundibuliformis* L. (Bow.). The only difference exists in the spicules, which here are only of one kind, acuate, while *I. infundibuliformis* has spicules of two kinds, acuate and acerate. The species is represented by two specimens. One is very large, fan-shaped, attached by a short pedicle to a large stone. The length of this specimen is 270 mm, the breadth 450 mm, and the thickness 5 mm, the margin being a little attenuated. The surface and consistency quite as those of *Isodictya infundibuliformis*. Oscula are numerous, small, dispersed.

Skeleton. The skeleton consists of only one kind of spicules, viz. acuate.

The acuate spicules (Plate 24, fig. 14) are perfectly smooth, tapering from the round base to the sharp point. They are generally slightly curved near the base. The length is 0,3 mm.

The spicules are, as in *Isodictya infundibuliformis,* congregated in a net-work more or less regular.

Colour. The larger of the two specimens is ash-grey, the smaller yellowish-light, both are preserved in spirit.

Habitat. Greenland, Baffin Bay, Lat. 75° 26′ N., Long. 67° 27′ W., depth 260 fathoms (542 S.).

VI. Suberitidinæ O. S.

Genus Suberites Nardo.

Suberites montalbidus Carter.

Suberites montalbidus, Carter, Ann. and Mag. of Nat. Hist., ser. 5, vol. 6, pag. 256.

Suberites montalbidus, Fristedt, Bidrag till kännedomen om de vid Sveriges vestra kust lefvande Spongiæ, Kongl. Svenska Vet.-Akad. Handlingar, Bd 21, N:o 6, pag. 19, Tafl. 2, fig. 4 a—4 e.

Suberites spec., Vosmær, Report on the sponges dredged up in the arctic sea by the »Willem Barents» in the years 1878 and 1879 (in Nied. Arch. Zool., Suppl. 1, pag. 32, Plate 1, fig. 22—23, Plate 4, fig. 140—144).

In the collection of sponges, obtained during the Swedish arctic expeditions conducted by Prof. A. E. Nordenskiöld, there are several specimens of this species. All agree very well with *Suberites spec.,* described by Vosmær. The spicules are: 1) acuate, transient to spinulate, 2) microspined inflato-acerate, and 3) microspined inflato-obtuse (= inflato-cylindrical Bow., Mon. I).

At my first examination of specimens of *Suberites montalbidus* Carter from the west-coast of Sweden, I could not find the spination of the small inflato-acerate and obtuse spicules; the

spination is also very minute, and in order to be observed accurately requires a microscopical power of about 500. Thus I have been able to see a very minute spination of this spicules also in Swedish specimens. It is therefore without doubt that our arctic specimens and those from the coast of Sweden, as well as the specimens described by Carter and Vosmær, are identical. The peculiar difference between Swedish specimens and those described by Carter, on one side, and specimens from the arctic regions and *Suberites spec.* Vosmær, on the other, exists only in the external shape. Specimens of the two latter kinds are deprived of the light layer of sarcode on the top, a difference, I think, too slight to separate these forms as different species or varieties. Carter has probably overlooked the microspination of the above-mentioned spicules. The largest specimen is 50 mm in diameter, rounded and a little depressed. Several specimens have the size only of a hazel-nut.

The surface is smooth and even, sometimes gelatinous. Most specimens grow freely, only a few are attached to worm-tubes, stones and other hard objects.

The *colour* is greyish or grey with a tint of yellow.

Habitat. West from Kamenni-islands, Lat. 74° 8′ N., Long. 82° 12′ E., depth 12 fathoms (21 V.); Taimur Strait, Actinia Bay, Lat. 76° 18′ N., Long. 95° 30′ E., depth 5—10 fathoms (29 V.); between Stolbovoi- and Liakov-islands, Lat. 73° 53′ N., Long. 138° E., depth 12 fathoms (51 V.); Irkaipij (Northcape of Siberia), depth 3—6 fathoms (68 V.); Pitlekai, depth unknown (1006 V.); Konyam Bay, depth 2—16 fathoms (1058 V.); the west-mouth of Jugor schar, depth 10—14 fathoms (138 N. S.); West from Greenland, Tessiursarsvak, depth 3—10 fathoms (522 S.); the east-coast of Greenland, Lat. 65° 40′ N., Long. 35° 32′ W., depth 25—40 fathoms (578 S.).

Suberites spermatozoon O. S. (Fristedt)

Cometella spermatozoon, O. Schmidt, Zool. Ergeb. Nordscef., Pl. 1 Fig. 2.
Suberites spermatozoon, Fristedt, op. cit., pag. 18.

This minute *Suberites* is represented by ten specimens, which all agree well with specimens from the west-coast of Sweden, described by Fristedt in loc. cit. They are all

pyriform, furnished with a slender pedicle, sometimes divided in numerous and very fine branches. The spicules agree well with those of Swedish specimens. The largest specimen is 20 mm in length, the radix included; the greatest diameter not exceeding 3 mm. The colour of dried specimens is light-grey; preserved in spirit, yellowish, but not as red as Swedish specimens.

Habitat. Kara Sea, depth 21 fathoms (158 N. S.).

Genus **Artemisina** Vosmaer.

Artemisina suberitoides Vosmaer.

Plate 24, fig. 15—17.

Artemisina suberitoides, Vosmaer. The Sponges of the »Willem Barents» Exped. 1880—1881, pag. 25, Plate 1, fig. 16, Plate 4, fig. 11—14, and Plate 5, fig. 51—55. (In Bijdragen tot de Dierkunde. Uitgegeven door het Genootschap Natura Artis Magistra, te Amsterdam.)

? *Suberites arciger*, O. Schmidt, Grundzüge einer Spongien-Fauna des Atlantischen Gebietes, Leipzig 1870, pag. 47, Taf. 5, Fig. 6.

There are two specimens of this species, both almost of the same shape, viz.: more or less rounded. The surface is smooth and even. The consistency is fleshy, much agreeing with that of *Suberites montalbidus* Carter and *Suberites ficus* Esper (O. S.). Oscula inconspicuous. The largest and best developed specimen is 30 mm in length, the breadth as well as the length is about 18 mm.

Skeleton. The skeleton consists of acuate or subspinulate spicules, minute anchorate and great tricurvate-acerate spicules, the terminations spined.

The acuate spicules (Plate 24 fig. 15). These spicules are 0,5 mm in length, and generally straight; they are not rarely furnished with a minute, bulbous inflation at the base (spinulate).

The tricurvate-acerate spicules (Plate 24, fig. 16). These are very large and vary much in size. The length between both

terminations is in the largest about 0,4 mm. Their terminations are furnished with comparatively long spines.

The minute anchorate spicules (Plate 24, fig. 17). These spicules are the smallest which I have seen; they are only 0,0075 mm in length and require a careful examination to be discovered.

Only by these spicules this species is to be distinguished from *Suberites arciger* O. S. As they are exceedingly minute, it is possible that O. Schmidt has overlooked them, and thus this species is identical with *S. arciger* O. S.

As I have not had type-specimens to compare with, I cannot with certainty say whether they are identical or not. I have not seen those peculiar, rounded spicules which are figured by O. Schmidt.

It is rather strange to find anchorate spicules in a species so closely allied to *Suberites* Nardo; but both consistency, acuate spicules and tricurvate-acerate spicules agree so well with *Suberites arciger* O. S., that this species is likely to be a true species of the *Suberitidinæ* O. S.

And as O. Schmidt afterwards says with regard to the spicules of *Suberites arciger* O. S.: »Es würde nach dieser neuen Nadelform ebenso gut möglich sein, dass diese Spongie den Stammformen der Desmacidinen näher steht als den Suberiten», *A. suberitoides* Vosmaer may justly be considered as such a primordial species of the Desmacidinæ.

Colour. Yellow, when dried or preserved in spirit.

Habitat. Spitzbergen, depth 40 fathoms; Kola Bay, depth 95—100 fathoms.

Genus **Hymeraphia** Bowerbank.

Hymeraphia verticellata Bow.

Hymeraphia verticellata, Bow., Mon. Brit. Spong., II, pag. 145, III, Plate 27, fig. 1—3.

This species, very remarkable by its spicules, is represented by only one specimen, dredged up during the deep sea dredging in the neigbourhood of North-cape in the year 1875. The specimen is very minute, probably only a fragment of a larger one.

The surface is furnished with numerous pointed mammulæ, being in length about 2 mm. The whole specimen is 10 mm long and 6 mm broad. The colour is light yellow. The spicules agree well with those of Bowerbank's type-specimen, figured III, Plate 27, fig. 1—3.

Habitat. North-cape, Lat. 71° 13', Long. 26° 2', depth 180 fathoms (30 N. S.).

Hymeraphia spitzbergensis n. sp.

Plate 24, fig. 18—20, Plate 27, fig. 12.

This species is a true *Hymeraphia* according to the description given by Bowerbank of this genus in his Monograph, vol. I, pag. 189. In our collection we have only one specimen of this species; it incrusts a worm-tube, 20 mm long, 5 mm thick. From a single basal membrane spring numerous large spicules passing through the surface of the sponge, which is therefore hispid almost as the thin-haired tail of a rat. I have not seen the oscula which are probably, as in other *Hymeraphiæ*, minute, dispersed.

Skeleton. The skeleton consists of very long spinulate spicules and of slender acuate or rarely subspinulate spicules.

The long spinulate spicules (Plate 24 fig. 18) are by their base attached to the basal membrane. They are generally slightly flexuous, tapering from the base to the long and slender point. The length of these spicules is variable, not exceeding 2,5 mm.

The slender acuate spicules (Plate 24, fig. 19, 20). The disposition of these spricules is very characteristic. They are collected in bundles, placed in the inner parts of the sponge and not passing through the dermis as the spinulate spicules. The length is 0,3 mm. They are as the other kind straight or curved.

Colour. Grey, when dried.

Habitat. Spitzbergen (Sp.); the exact locality and the depth unknown.

Genus Tecophora O. S.

Tecophora semisuberites O. S.

Tecophora semisuberites, O. Schmidt, Atl. Spong., Taf. 6, Fig. 2, pag. 50.

This species is represented by numerous specimens, varying much in size and form, being from 5 to 20 mm in height. They are all well preserved, and a few of them attached to stones. The colour is the same as in Swedish specimens; both spicules and inner structure of the sponge agree well with the description made by O. Schmidt, op. cit. The smallest specimens have only one mammilla, the largest numerous.

Habitat. Baffin Bay, Omenak Bay, west- and east-coast of Greenland; depth varying from 116 to 410 fathoms.

Genus Polymastia Bow.

Polymastia brevis Bow.

Polymastia brevis, Bowerbank, Mon. Brit. Spong., II, pag. 64, III, Plate 11, fig. 1—9.

Only two specimens represent this interesting species; one is attached to a stone, the other to a small shell. Both specimens are broken. The spicules agree perfectly with the figures which Bowerbank has given and with those of a true *Polymastia* Bow.; but the shape and the structure of *Polymastia brevis* Bow. differ so much from other *Polymastiæ* Bow. that I should be inclined to transfer this species to another genus. I believe that *Polymastia brevis* Bow. is nearly allied to the genus *Cornulum* Ctr. The spicules, of course, differ much from those of the species of *Cornulum* Ctr which Carter has described. But an outward character may sometimes be of more importance than a difference of spicules, especially when the shape is so peculiar as that of *Polymastia brevis* Bow. and *Cornulum* Ctr.

Artemisina suberitoides Vosmær, very nearly allied to *Suberites* Nardo, has anchorate spicules, which are commonly typical for the genera *Esperia, Hastatus* and other genera nearly allied to these. I have not changed the genus-name, because I have not seen Bowerbank's type-specimen of the species.

Habitat. Between Spitzbergen and Nova Zembla, Lat. 70° 49', Long. 21° 55' depth 150 fathoms (25 N. S.).

Polymastia penicillus Mont. (Vosmær).

Polymastia penicillus, Vosmær, Niederländ. Archiv für Zoolog., Supplementb. I, p. 26, Pl. 1, fig. 12—13, and Pl. 4, fig. 127—132.

Numerous specimens represent this species. All the specimens are furnished with well developed mammulæ, which often are inflated at the free terminations. This species is very variable in outer shape, but the spicules are similar in all forms. I have labelled numerous species from the coast of Sweden as *Polymastia mamillaris* O. F. Müller (Bow.), because they agree well with Bowerbank's description of the species, so named. But the specimens from the arctic regions agree more with forms described and figured by Vosmær as *P. penicillus* Mont. (Vosmær), and therefore I have labelled these as *Polymastia penicillus* Mont. (Vosmær), the only difference between these two forms existing in their outer shape, their spicules being of the same size and kind. The forms labelled as *Polymastia penicillus* Mont. (Vosmær) are also generally hirsute at the margins and on the upper surface; the other forms are more smooth. The mammulæ are exceedingly variable in size and number.

The sponge is usually attached to stones, shells and other hard objects.

The *colour* varies from yellow to yellowish grey or light ash-grey. The largest specimen is 60 mm in length, 40 mm in breadth, the thickness not exceeding 15 mm. The single smooth specimen in the collection of arctic sponges has numerous straight, slightly compressed mammulæ, the length being about 5 mm.

Habitat. The east-coast of Greenland, depth 130 fathoms (580 S.); North-East from Petrovski Bay, Lat. 76° 52′, Long. 116° E., depth 36 fathoms (39 V.); Lat. 76° 40′, Long. 115° 30′ E., depth 35 fathoms (40 V.); Matotschkin schar, Gubin Bay, depth 5—15 fathoms (42 N. S.); Spitzbergen, Lat. 80° 7′, Long. 16° 54′ E., depth 60 fathoms (256 Sp.).

Polymastia paupera n. sp.

Plate 24, fig. 21.

During the expedition to Greenland in the year 1883 only one specimen was dredged up. This specimen, broken

at the margins, forms a piece, 45 mm in length, 25 mm in breadth and about 5 mm in thickness. The surface is smooth, not furnished with the characteristic mammulæ. Oscula inconspicuous. The consistency firm.

The ***skeleton*** consists of spinulate spicules.

The spinulate spicules (Plate 24, fig. 21) are furnished with a great head. Sometimes the spicules are bi- or tri-spinulate; they are straight or slightly curved, sharp-pointed. The length is variable, not exceeding 1 mm.

Colour. The sponge is ash-grey, when preserved in spirit; lighter, when dried.

Habitat. The east-coast of Greenland, depth 130 fathoms (580 S.).

Genus **Radiella** O. S.

Radiella spinularia Bow. (O. S.).

Tethea spinularia, Bowerbank, Mon. Brit. Spong., II, pag. 94, III, Plate 15, Fig. 23—30.
Radiella spinularia, O. Schmidt, Atl. Spong., pag. 76.

Of this species we have only one specimen, obtained during the above-mentioned expedition. This specimen is round, compressed, and perfectly agrees with the Swedish ones in outer shape, colour, and inner structure. In the middle of the upper surface, there is one very small mammula; the marginal parts are darker than the other parts around the mammula. The greatest diameter of the specimen is about 25 mm, the thickness at the middle 8 mm, tapering towards the margin.

Habitat. The east-coast of Greenland, depth 130 fathoms (580 S.).

Genus Tethya Lmk.

Tethya muricata Bow.

Tethea muricata, Bow., Phil. Trans., Vol. 148, Part 2, pag. 308, Plate 25, fig. 18.
Thenea muricata, Vosmær, Niederländ. Archiv für Zoologie, Supplementband I, pag. 5, Plate 1, fig. 1—8, Plate 2, fig. 1—21, Plate 4, fig. 114—115.

This species is represented by fine specimens, all obtained during the expedition to Greenland in the year 1883. They agree well with the description and the figures given by Vosmær.

The largest specimen is of the size of a great hen-egg.

Habitat. Baffin Bay, Lat. 75° 26′ N., Long. 67° 27′ W., depth 260 fathoms (542 S.); Davis Strait, Lat. 59° 33′ N., Long. 43° 25′ W., depth 120 fathoms (576 S.); East-coast of Greenland, depth 130 fathoms (580 S.).

Tethya sibirica n. sp.

Plate 24, fig. 22—28, Plate 28, fig. 17.

Sponge ovoid or subspherical, furnished with numerous roots, by which it is attached to stones or other hard objects. The surface is slightly hispid from projecting spicules and armed with ridges or tubercles, which are joined in the upper part of the sponge. The consistency is tolerably firm. Sometimes the tubercles or ridges of the lower part are pointed to the roots; but then they are only undeveloped roots. Oscula few, rarely more than two, generally one of them is situated on the top of the sponge. The size of the sponge varies much. The smallest specimen is only as great as a hazel-nut. The largest is ovoid, the longer diameter being 90 mm, the shorter about 5 mm. This specimen is slightly compressed. The length of the roots varies from 5 to about 50 mm. One of the roots is usually larger than the others.

Skeleton. The skeleton consists of long and short acerate spicules, of very slender porrecto- and recurvo-ternate spicules, and of sigmoid bihamate spicules.

The large and long acerate spicules (Plate 24, fig. 22) are very numerous, forming the greater part of the radiating fasciculi. The length is 3,5—5 mm. They have the greatest diameter at the middle, tapering towards the fine and long points. They are usually straight, sometimes, however, slightly curved towards the terminations.

The small acerate spicules (Plate 24, fig. 23). These spicules are less numerous than the large ones and more variable in size. Most of these spicules are 0,8 mm in length.

The porrecto-ternate spicules (Plate 24, fig. 24, 25). These spicules are very slender, generally curved towards the points. One of the three branches is usually longer than the other two. The length of the shaft of this spicule is about 0,3 mm, the short branches 0,07 mm and the long one about 0,14 mm in length. The branches are generally straight.

The recurvo-ternate spicules (Plate 24, fig. 26) are slightly thicker than the porrecto-ternate; they are also slightly curved. The length of the shaft is 3,5 mm; the branches are of the same size, viz. 0,14—0,2 mm. Both these last-mentioned spicules occur in about the same quantity.

The sigmoid bihamate spicules (Plate 24, fig. 27, 28) are very numerous; their length is about 0,03 mm.

This species has a certain resemblance to *Tetilla polyura* O. S.*), as in the porrecto-ternate spicules, in the knotty surface, and in the ovoid form. But our new species of *Tethya* has not sigmoid-bihamate spicules of the same kind as *T. polyura* O. S. In the last-mentioned species these spicules are knotty, but they are smooth in *Tethya sibirica* Fristedt. The roots are not of the same structure. Besides, the surface of *T. polyura* O. S. is more hispid than that of *Tethya sibirica* Fristedt.

Colour. The colour of specimens preserved in spirit is yellowish or yellowish grey.

Habitat. Chatanga Bay, Lat. 75°, Long. 113° 50′ E., depth 15 fathoms (41 V.); Actinia Bay, depth 5—10 fathoms (29 V.); Pitlekai (1006 V.).

*) O. Schmidt, Grundzüge einer Spongienfauna des Atlantischen Gebietes, 1870, pag. 66, Taf. 6, Fig. 8.

Tethya cranium Lmk.

Tethea cranium, Bowerbank, Mon. Brit. Spong., II, pag. 83, III, Plate 14, fig. 1—6.

This species is represented by three specimens, all dredged up during the expedition to Greenland in the year 1883. The largest is ovoid, the greatest diameter being 40 mm and the smallest 30 mm. Both the outer form and the spicules agree perfectly with Bowerbank's description of the species and with examples from the Norwegian coast.

Habitat. East-coast of Greenland, depth about 350 fathoms (500 S.); West-Greenland, Lat. 65° 15', Long. 53° 30', depth 75 fathoms (506 S.); West-Greenland, Lat. 75° 26' N., Long. 67° 27' W., depth 260 fathoms (542 S.).

VII. Desmacidinæ O. S.

Genus Gellius Gray.

Gellius arcoferus Vosmær.*)

Plate 24, fig. 29—31, Plate 28, fig. 16.

Gellius arcoferus, Vosmær, The Sponges of the »Willem Barents» Exped. 1880—1881, pag. 29, Plate 4, fig. 18—19, Plate 5, fig. 87—90.

During the Swedish arctic expeditions there were dredged up two specimens of this species, one of which is well preserved, the other broken into small pieces. The sponge is variable in form. The greatest specimen is cake-like, round, the diameter about 90 mm. The surface is smooth or slightly hispid. Oscula numerous, dispersed. The consistency is very fragile. The sponge grows probably freely in sand or clay.

Skeleton. The skeleton consists of acerate spicules, of tricurvate spicules and of minute C-formed acerate spicules.

*) Not until the printing of this treatise had commenced did the author obtain the above mentioned work of Vosmær. Consequently figures and detailed descriptions of this species and of *Artemisina suberitoides* — although already accurately described by Vosmær — have been given here.

The acerate spicules (Plate 24, fig. 29). The spicules of this kind are more or less disposed in nets or fasciculated; they are usually straight, rarely slightly curved at the middle, tapering from the middle towards the short-pointed terminations. The length is about 0,4 mm.

The tricurvate spicules (Plate 24, fig. 30) are numerous and agree well with those of *Desmacella punicea* Fristedt*); they are of a comparatively great diameter, more or less curved at the middle and at the points.

The minute C-formed acerate spicules (Plate 24, fig. 31). These spicules are very minute, only 0,01 mm in length between the two terminations. They are very numerous both in the dermis and in the inner parts.

Colour. Yellowish grey, when dried or preserved in spirit.

Habitat. North-east from the eastern Taimur-peninsula, Lat. 76° 52′, Long. 116° E., depth 36 fathoms (39 V.); Greenland, Lat. 59° 33′ N., Long. 43° 25′ W., depth 120 fathoms (576 S.).

Genus **Desmacella** O. S.

Desmacella rosea n. sp.

Plate 24, fig. 32—35, Plate 28, fig. 13.

This sponge is represented by a very fine specimen from the east-coast of Greenland. The form is leaf-like. The surface is uneven and hispid when the dermal membrane is absent, otherwise smooth. The dermal membrane is thin, pellucid, only attached to the other sponge-body by fine fibres formed by the dermis in the following manner. The dermis is furnished with numerous funnel-like depressions, which by degrees are closed, forming a fibre. The oscula and pores are minute, dispersed. The consistency is rather firm. There are in the collection several broken specimens, all from the same locality and probably pieces of only one specimen. The largest is 50 mm in length, 40 mm in breadth and 8 mm in thickness.

*) K. Fristedt, Bidrag till kännedomen om de vid Sveriges vestra kust lefvande Spongiæ (in Kongl. Sv. Vet.-Akad. Handl., Bd 21, N:o 6, pag. 29, Tafl. 2, fig. 9 a—9 d).

Skeleton. The skeleton consists of spicules of two kinds, viz.: spinulate spicules and minute C- and S-formed (bihamate) spicules.

The spinulate spicules (Plate 24, fig. 32, 33). The size of these spicules varies considerably. They are all furnished with a well developed head, abruptly sharp-pointed in the other termination; they are usually straight, rarely slightly curved. The length varies from 0,25 to 0,5 mm. The largest spicules are the most numerous.

The minute bihamate spicules (Plate 24, fig. 34, 35). These spicules, both C- and S-formed, are numerous. The straight length between the points is about 0,025 mm.

Colour. This species is of a very fine rose-colour, when dried or preserved in spirit.

Habitat. East-coast of Greenland, depth 125 fathoms (579 S.).

Desmacella porosa n. sp.

Plate 24, fig. 36, 37, Plate 28, fig. 15.

One large specimen represents this new species. The sponge is thickly incrusting, forming an irregular knoll, the greatest diameter 90 mm, the smallest 60 mm. The dermal membrane is thin, pellucid, perforated by several holes giving it the appearance of a net. Only a small part of the dermal membrane is present. The other part of the surface is even, slightly rough.

Oscula are numerous, dispersed.

The sponge is perforated by several, tolerably large channels, resembling *Euspongia* Bronn. The skeleton spicules form a net-work like the species of *Reniera* Ndo.

Skeleton. The skeleton consits of acerate spicules and of bihamate spicules.

The acerate spicules (Plate 24, fig. 36). These spicules agree well with those of several species of *Reniera;* they are slightly curved or straight, tapering from the middle towards the sharp points. The length is constant, 0,35 mm.

The bihamate spicules (Plate 24, fig. 37) are very characteristic for this species. They are comparatively large and irregularly C- or S-curved. Such a spiculum is figured by O. Schmidt in »Grundzüge einer Spongienfauna Atl. Geb.», Pl. 5, Fig. 15, but I have not seen the description of that species*) which is armed with these spicules, and therefore I cannot identify my new species. The length across the spicules is 0,12 mm.

Colour. Yellow.

Habitat. Davis Strait, Lat. 61° 15′ N., Long. 49° 11′ W., depth 70 fathoms (561 S.). Hex da Labrador

Desmacella Peachii Bow. (O. S.) var. **grœnlandica** n. var.
Plate 24, fig. 38—45, Plate 28, fig. 14.

The shape of this new variety tolerably well agrees with that of *Desmacella Peachii* Bow. (O. S.); the surface is rugged and open; the sponge is mostly formed by fascicules of large acuate spicules; the sarcode is very sparing. The whole dermal membrane is destroyed. Oscula and pores inconspicuous. The specimen is 30 mm in length, 20 mm in breadth and 12 mm in thickness.

Skeleton. The skeleton consists of large acuate, small linear acerate spicules and bihamate spicules of two kinds.

The large acuate spicules (Plate 24, fig. 38) are the most numerous; these spicules form the firm fibres of the sponge-body; they are slightly curved near the base, tapering from it towards the point. Exceedingly rare are obtuse spicules, which naturally are monstrous forms of the acuate ones. The length is 1,2 mm.

The linear acerate spicules (Plate 24, fig. 39, 40). These spicules are of two kinds, one of them being 0,25 mm in length, the other 0,075 mm. They are congregated in fascicules and exceedingly slender and straight.

*) Named *Desmacella* sp.

The bihamate spicules (Plate 24, fig. 41, 42, 43) are both C- and S-curved; they are very numerous in the interstitial membranes. The smallest are only 0,0075 mm.

In the sponge-body there are numerous gemmules, composed of minute silver-shining balls. The kernel of the gemmule is darker than the outer parts, and there is a small depression like that in the globular spicules of a *Geodia* Lmk; but here, I believe, we have true gemmules. I have figured these gemmules Plate 24, fig. 44, 45.

Colour. The colour is light with a tint of yellow.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Genus **Desmacidon** Bow.

Desmacidon Jeffreysii Bow.

Desmacidon Jeffreysii. Bowerbank, Mon. Brit. Spong., II, pag. 347, III Plate 62, fig. 1—5.

There are only some small pieces of this sponge, the largest about 40 mm in length and breadth; the thickness 6 mm. But the form and consistency of these pieces agree so well with *Desmacidon Jeffreysii* Bow., that there can be no doubt of our having this species before us, although we do not see its spicules, which agree with those figured by Bowerbank. Remnants of the cloacæ are also visible.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Genus **Hastatus** Vosmaer sens. lat. Fristedt.

Hastatus Robertsoni Bow. (Fristedt).

Halichondria Robertsoni, Bowerbank, Mon. Brit. Spong., IV, pag. 100, Plate 5, fig. 8—14.

Hastatus Robertsoni, Fristedt, Bidrag till kännedomen om de vid Sveriges vestra kust lefvande Spongiæ (i Kongl. Sv. Vet.-Akad. Handlingar, Bd 21, N:o 6, pag. 34).

This species is represented by several specimens. Both the outer habitus and the inner structure agree well with those of

specimens from the Swedish coast, which I have examined. The largest specimen is about 60 mm in length, the thickness and the breadth the same, viz. 30 mm.

Habitat. Foul Bay, depth 15 fathoms (27 Sp.); Jinretlen, depth unknown (1006 V.); Konyam Bay, depth 2—16 fathoms (1054 V.).

Hastatus ambiguus Bow. (Fristedt).

Microciona ambigua, Bowerbank, Mon. Brit. Spong., II, pag. 136, III, Plate 25.

Hastatus ambiguus, Fristedt, op. cit., pag. 31, Plate III, fig. 1 a—1 h.

In the collection of arctic sponges of the Zoological State Museum at Stockholm there are only three examples of this species. All the specimens are incrusting shells of *Pecten*. The thickness of the crusts varies from one to two mm. The spicules agree, without exception, with those figured by Bowerbank, op. cit.

Habitat. North from Spitzbergen, Lat. 80° 7' N., Long. 16° 54' E., depth 60 fathoms (256 Sp.).

Hastatus foliatus n. sp.

Plate 25, fig. 7—12.

Only one specimen represents this species. The sponge is broken at the margins, and is probably a small fragment of a much larger specimen. The form is leaf-like, 35 mm in length, the greatest breadth being 30 mm and the thickness only 3 mm. The surface is smooth and even, perforated by numerous small, dispersed oscula. The consistency is fragile.

The ***skeleton*** consists of spined acuate, smooth hastate or obtuse spicules, equianchorate and slender bihamate spicules.

The spined acuate spicules (Plate 25, fig. 7, 8) are exceedingly variable in size. The smaller are only 0,15 mm in length, the larger 0,8 mm. They have the greatest diameter at the base; the small are often a little inflated at the base. They are totally spined and generally curved.

The hastate (obtuse) spicules (Plate 25, fig. 9). The spicules of this kind are very few in number and totally smooth. Their length is 0,2 mm; the ends are obtuse or hastate.

The equianchorate spicules (Plate 25, fig. 10). These spicules are numerous both in the dermal membrane and in the interstitial membranes. Their length is 0,035 mm.

The bihamate spicules (Plate 25, fig. 11, 12) are both C- and S-curved; they are very slender. The length between the points is about 0,02 mm.

Colour. From light to light-grey, when preserved in spirit.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Hastatus indistinctus n. sp.

Plate 25, fig. 13—19.

This sponge is massive, elongated, the length 45 mm, the thickness 20 mm, and the breadth 15 mm. It is attached to a *Balanus*. The surface is smooth and even. I have seen neither oscula nor pores. The dermal membrane is well preserved, thin and spiculous. The consistency is fragile.

Skeleton. The skeleton consists of spined or smooth acuate spicules, of hastate or obtuse, equianchorate and of bihamate spicules, the last-mentioned of two kinds.

The (spined) acuate spicules (Plate 25, fig. 13) are most often spined, the spines being exceedingly few in number. Sometimes the spicules of this kind are totally smooth. They are straight or slightly curved. The length 0,35 mm.

The hastate (obtuse) spicules (Plate 25, fig. 14) are totally smooth; the ends are generally sharp-pointed, rarely, as in the figure, obtuse. They are often curved, the length being 0,2 mm.

The equianchorate spicules (Plate 25, fig. 15, 16). These spicules are very numerous; their length is 0,025 mm.

The great bihamate spicules (Plate 25, fig. 17, 18) are C- and S-curved, the straight length between the points being 0,05 mm.

The small bihamate spicules (Plate 25, fig. 19) are more numerous than the preceding. They are very minute; the straight length between the points is only 0,0005 mm.

Colour. Yellowish brown, when dried.

Habitat. Spitzbergen, Lat. 80° 7′ N., Long. 16° 54′ E., depth 60 fathoms (256 Sp.).

Genus **Myxilla** O. S.

Myxilla septentrionalis n. sp.

Plate 24, fig. 4.

This sponge is coating, thin, the greatest thickness not exceeding 3 mm. Our single specimen is 80 mm long, its greatest breadth 20 mm. The surface is even and smooth, gelatinoid. Oscula and pores are not visible. The outer part of the sponge is like that of a fleshy *Suberites* Nardo, but the consistency is much softer in this new species.

The ***skeleton*** consists of obtuse spicules.

The obtuse spicules (Plate 24, fig. 4) are congregated in fascicules and tolerably numerous; they are generally straight. One termination is a little thicker than the other, sometimes slightly spinulated, the length 0,3 mm.

Colour. The colour is yellowish-grey, when preserved in spirit.

Habitat. Konyam Bay, depth 2—16 fathoms (1058 V.).

Genus **Cornulum** Carter.

Cornulum ascidioides n. sp.

Plate 25, fig. 1, 2, Plate 29, fig. 21.

The outer form and shape sufficiently indicate a species of the genus *Cornulum* Carter. Four specimens represent the

species, the largest of which is like an *Ascidia*. The body, or rather the dermal layer, is inflated, containing the comparatively sparing, softer sarcode-portion, thus in shape tolerably agreeing with *Polymastia brevis* Bow. The length of the largest specimen is 30 mm, the breadth 20 mm, the thickness 15 mm. There are three cloacal fistulæ, the largest being 10 mm in length. These fistulæ are hollow, as being continuations of the greater bottle-shaped part. They are open, ending in an osculum. This specimen is attached to a stone; the other specimens are only fragments.

The ***skeleton*** consists of spicules only of two kinds, viz.: obtuse spicules and equianchorate spicules.

The obtuse spicules (Plate 25, fig. 1) are totally smooth, straight or slightly curved. The length is 0,8 mm. These spicules form the dermal layer, but are rarely present in the inner portions.

The equianchorate spicules (Plate 25, fig. 2). The spicules of this kind are only to be found in the kernel. The shaft is a little inflated near the hooks. They are very numerous, 0,07 mm in length.

Colour. The colour is light or light-grey, when dried or preserved in spirit.

Habitat. Baffin Bay, Lat. 68° 8′ N., Long. 58° 47′ W., depth 169—183 fathoms.

Cornulum textile Carter.

Cornulum textile, Carter, Ann. Mag. Nat. Hist., Ser. 4, Vol. 18, 1876, pag. 309, Plate 12, fig. 9, Plate 15, fig. 28 a, b.

Among the sponges from that locality, viz. Baffin Bay, where the preceding species have been found, there are two specimens of this species. Both agree well with Carter's description and figures. They are attached to corals. The surface is even and smooth. The inner portions fasciculated, the fascicules radiating from the centre of the sponge obliquely

upwards the dermal layer. Oscula or pores not visible in our specimens. The finest specimen is 40 mm in length; the greatest diameter is at the top 7 mm, tapering towards the pedicle, which is only 2 mm in diameter. The other specimen is a little larger, but broken and not so well preserved as the first mentioned. The colour is ash-grey.

Habitat. Baffin Bay, Lat. 72° 32′ N., Long. 56° 5′ W., depth 116 fathoms.

Cornulum enteromorphoides n. sp.

Plate 25, fig. 3—6, Plate 29, fig. 22.

Only one specimen represents this new species. The outer shape resembles very much that of *C. textile* Carter. The only difference is the pedicle, which is wanting in this species. The specimen is attached to a coral. The surface is even and smooth. I have seen neither oscula nor pores. The length is 40 mm. The sponge is cylindrical, the diameter about 10 mm. The thickness of the dermal layer varies from 0,5 to 1 mm. The inner portions agree tolerably well with those of *C. textile* Carter. The consistency is the same as of the two preceding species of this genus.

The ***skeleton*** consists of spined acuate spicules, hastate (mucronate) or obtuse spicules, and of large, and small equianchorate spicules.

The spined acuate spicules (Plate 25, fig. 3) are the largest and most numerous of the skeleton-spicules. They are always a little curved and totally spined, tapering from the round base to the pointed termination. The length is very constant, 0,4 mm, the thickness varies a little.

The hastate (obtuse) spicules (Plate 25, fig. 4). The spicules, so named by me, are both mucronate, hastate and obtuse, in this species generally mucronate; but the difference between these kinds of spicules is often so little, that I call them all hastate. They are straight, not so numerous as the preceding. One termination is generally more slender than the other, both terminations being slightly spined. The length is 0,3—0,35 mm.

The large equianchorate spicules (Plate 25, fig. 5). These spicules are very like those of the preceding species; the length is 0,07 mm.

The small equianchorate spicules (Plate 25, fig. 6). The length of these spicules is only 0,025 mm.

Colour. The colour is light with a tint of yellow.

Habitat. Baffin Bay, depth 169 fathoms.

Genus **Esperia** Nardo sens. lat. Fristedt.

Esperia nigricans Bow. (Vosmær).

Halichondria nigricans, Bow., Mon. Brit. Spong., II, pag. 266, III, plate 45, fig. 25—31.
Esperia nigricans, Vosmær, Notes Leyd. Mus., pag. 144.

The most common shape of this sponge is that of a formless mass, but specimens from the expedition to Greenland in the year 1883 are ventilabriform, like those of *Phakellia robusta* Bow. The length of the largest specimen is 120 mm, the breadth 95 mm and the thickness 6 mm. This example is broken at the margins, being only a fragment of a larger specimen. The others are thicker, incrusting shells. The colour of the sponge is dark, when preserved in spirit.

Habitat. North from Spitzbergen, Lat. 79° 47′ N., Long. 11° 15′ E., depth 100 fathoms (288 Sp.); Greenland, Lat. 59° 33′ N., Long. 43° 25′ W., depth 120 fathoms (576 S.).

Esperia Pattersoni Bow. (Vosmær).

Halichondria Pattersoni, Bowerbank, Mon. Brit. Spong., II, pag. 225, III, Plate 46, fig. 1—6.
Esperia Pattersoni, Vosmær, Sponges Leyd. Mus., pag. 144.

The specimens, representing this species, agree well with Bowerbank's description and figures, in form as well as to inner structure. The surface is corrugated; the consistency

very fragile. Oscula tolerably small, dispersed. The colour is nut-brown or blackish-brown.

Habitat. Spitzbergen, Vaigat-islands, Lat. 79° 20′ N., Long. 19° 5′ W., depth 60 fathoms (Sp.; the number of the stat. unknown).

Esperia lingua Bow. (O. S.).

Hymeniacidon lingua, Bowerbank, Mon. Brit Spong., II, pag. 187.
Raphiodesma lingua, id. ibidem, III, Plate 47, fig. 8 and Plate 77.
Esperia lingua, O. Schmidt, Grundzüge einer Spongienfauna des Atl. Geb., pag. 76.

There is no difference between the arctic specimens of this species and specimens from the west-coast of Sweden and Norway. The specimens are large and formless, the largest being about 120 mm in length, and only a little smaller in breadth. The thickness is 40 mm. The colour is yellow.

Habitat. Greenland, Lat. 61° 15′ N., Long. 49° 11′ W., depth 70 fathoms (56 S.); Lat. 59° 33′ N., Long. 43° 25′ W., depth 120 fathoms (576 S.).

Esperia lingua Bow. (O. S.) var. **arctica** n. var.
Plate 25, fig. 20—24, Plate 29, fig. 18.

At first I was doubtful, whether I should regard this variety as a true species distinct from *Esperia lingua* Bow. (O. S.), or as a variety. But there is so great a resemblance between our new variety and *Esperia lingua* Bow. (O. S.), that I at last decided to regard our specimens only as a variety. The sponge is incrusting hard objects, as worm-tubes, stones, shells etc. The surface is smooth, furnished with numerous knolls. Oscula are small, dispersed. The consistency is fragile as in *Esperia lingua* Bow. (O. S.). The largest specimen is 50 mm in length, 30 mm in breadth and 25 mm in thickness. The knolls are about 3 mm in hight and of the same diameter.

Skeleton. The skeleton consists of acuate spicules, of linear acuate, of inequianchorate spicules of two kinds and of bihamate spicules.

The acuate spicules (Plate 25, fig. 20) are smooth, generally slightly curved, the greatest diameter being at the middle, tapering towards the base and the pointed end. These spicules are the most numerous in the sponge. The length is 0,35 mm.

The linear acuate spicules (Plate 25, fig. 21) are not so numerous as the preceding ones. They are always straight and very slender, the length varying from 0,2 to 0,25 mm.

The inequianchorate spicules (Plate 25, fig. 22, 23) are of two sizes plainly distinct from each other. The larger spicules are disposed in rosettes as those of *Esperia lingua* Bow. (O. S.), the spicules in the rosettes being fewer in the variety. The length is 0,08—0,1 mm. The smaller inequianchorate spicules are disposed without any order; the length of them is only 0.025—0,03 mm.

The bihamate spicules (Plate 25, fig. 24) are C-curved, the straight length between the points 0,05 mm.

Colour. The colour is yellow.

Habitat. Behring-islands, depth 5—10 fathoms (1078 V.).

Esperia helios n. sp.

Plate 25, fig. 25—29.

Only one specimen represents this species. This specimen is rounded and as large as a hazel-nut. The surface is hispid on account of projecting fascicules of spicules. Oscula minute, dispersed; the consistency is tolerably firm. The sponge is growing freely.

The ***skeleton*** consists of acuate spicules, of inequianchorate and bihamate spicules.

The acuate spicules (Plate 25, fig. 25) form the greater part of the skeleton; they are disposed without any order. They are sometimes subspinulate and often slightly curved. The length is 0,35 mm.

The inequianchorate spicules (Plate 25, fig. 26, 27). These spicules are only of one kind, 0,08 mm in length. They are all congregated in rosettes as those of *Esperia lingua* Bow. (O. S.).

The bihamate spicules (Plate 25, fig. 28, 29) are comparatively slender. They are C- or S-curved, the straight length between the points being 0,05 mm.

Colour. Dark, when preserved in spirit.

Habitat. Pitlekai, depth 12 fathoms (1035, 1036 V.).

Esperia Sophia n. sp.

Plate 25, fig. 30—32.

The specimen of this new species is massive, probably thickly incrusting hard objects. The surface is even, slightly hispid. Oscula few, small and dispersed. Dermal membrane pellucid, spiculous. The consistency tolerably firm. The length of the single specimen, which represents this species, is 25 mm, the breadth 20 mm and the thickness 10 mm.

The ***skeleton*** consists of spined acuate spicules, obtuse spicules, and equianchorate spicules.

The spined acuate spicules (Plate 25, fig. 31) are the largest. Their length is 0,5 mm. They are always slightly curved, the greatest diameter being at the base, tapering towards the pointed termination. They are totally spined, though the spines are few in number.

The obtuse (cylindrical) spicules of the dermis (Plate 25, fig. 31). These spicules are most often curved; the terminations are round, sometimes microspined. The length is about 0,3 mm.

The equianchorate spicules (Plate 25, fig. 32) are very numerous. Their length is 0,033 mm.

Colour. The colour of the dried specimen is light with a tint of yellow.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Esperia villosa Carter.

Plate 25, fig. 33—38, Plate 29, fig. 19.

Esperia villosa, Carter, Ann. Mag. Nat. Hist., Ser. 4, Vol. 14, pag. 213, Plate 13, fig. 13—15, Plate 15, fig. 36.

This sponge is thickly incrusting stones and other hard objects. It is compressed, more or less blade-like, the largest

specimen being 90 mm in length, about 60 mm in breadth and 15 mm in thickness. The species is furnished with very firm fibres, filled up with the softer membranes. The upper surface is smooth and even, the lower uneven.

Skeleton. The skeleton consists of acuate spicules, of small anchorate spicules, larger anchorate (= trenchant bih.) spicules and very large bihamate spicules.

The large acuate spicules (Plate 25, fig. 33) form the fibres. They are sometimes slightly curved near the base; their length is 0,6 mm.

The large anchorate spicules (Plate 25, fig. 34, 35) are very variable in size and form. They are generally 0,1 mm in length. These spicules resemble very much those, named *trenchant bih.* by Vosmaer, Bowerbank and other authors.

The small anchorate spicules (Plate 25, fig. 36, 37) are true anchorate ones; their length is only 0,03 mm. They are equiended and more numerous than the preceding kind.

The bihamate spicules (Plate 25, fig. 38, 39) are very large and exceedingly numerous, the straight length between the points varying from 0,1 to 0,16 mm. Sometimes one of the ends is divided into three small points.

Colour. Light-grey with a tint of yellow, when dried or preserved in spirit.

Habitat. East-coast of Greenland, depth 140 fathoms (581 S.).

Genus **Forcepia** Carter.

Forcepia grœnlandica n. sp.

Plate 25, fig. 40—46.

This species is represented by one specimen from Greenland, which is thickly incrusting a coral. The sponge is formless, massive, the surface being uneven. Oscula are small, dispersed. The consistency very fragile.

Skeleton. The skeleton consists of spined acuate spicules, obtuse spicules, bihamate spicules, equianchorate spicules, and spined forcepiform spicules.

The spined acuate spicules (Plate 25, fig. 40) are totally spined, the spines being comparatively few in number. They are thickest at the base, sometimes subspinulate, generally curved. The length is 0,5—0,55 mm.

The obtuse spicules (Plate 25, fig. 41). These spicules are very few, totally smooth and usually a little inflated at the terminations. The length is 0,4 mm.

The bihamate spicules (Plate 25, fig. 43, 44) are comparatively large, C- and S-formed, the straight length between the points being 0,1—0,15 mm.

The anchorate spicules (Plate 25, fig. 42) are abundant in the inner membranes as well as in the dermal membrane. Their length is 0,035 mm.

The forcepiform spicules (Plate 25, fig. 45, 46). These spicules are very characteristic for the species. One of the branches is shorter than the other, the proportion being 1 : 2. They are inflated at the ends and wholly microspined. The length of the greater branche, which is curved, is 0,05 mm.

Colour. The colour is yellow with a tint of rose.

Habitat. East-coast of Greenland, depth 125 fathoms (579 S.).

Genus **Cribrella** O. S.

Cribrella hospitalis O. S.

Plate 25, fig. 47—50, Plate 29, fig. 20.

Cribrella hospitalis, O. Schmidt, Grundzüge einer Spongien-Fauna des Atl. Geb., pag. 56, Taf. 4, Fig. 12.

Cribrella hospitalis, Carter, Ann. and Mag. of Nat. Hist., Ser. 4, Vol. 18, pag. 313, Plate 13. fig. 18, and Plate 15, fig. 36 a, b.

Only one specimen represents this species. The sponge is blade-like, attached to a stone by a pedicle in the same manner as *Isodictya infundibuliformis* L. (Bow.), *Phakellia ventilabrum* L. (Bow.) etc. The length of the specimen is 40 mm, the breadth 30 mm, and the thickness 8 mm, the margins are

slightly attenuated. The spicules agree well with those figured by Carter op. cit. The spined acuate are 0,2—0,3 mm in length, the obtuse spicules 0,25 mm. The anchorate spicules differ a little from those described by Carter. In our specimen there are two kinds of anchorate spicules, the larger perfectly agreeing with those figured by Carter, they are 0,05 mm in length; the spicules of the other kind are only 0,02 mm in length, but in shape they are quite like the larger ones. The sponge is cream-coloured.

Habitat. East-Greenland, depth 130 fathoms (580 S.).

Genus **Melonanchora** Carter.

Melonanchora elliptica Carter.

Plate 25, fig. 5—55.

Melonanchora elliptica, Carter, Ann. Mag. Nat. Hist., Ser. 4, Vol. 14, pag. 212, Plate 13, fig. 6—12, and Plate 15, fig. 35 a, b; Deep-sea sponges from the Atl. Ocean.

The consistency, the form and the colour agree totally with those of *Melonanchora elliptica* Carter. The surface is furnished with tubercles, and the dermal layer is easily separated from the other soft sponge-body. Our specimens were growing freely. All our specimens are fragments.

Skeleton. The skeleton consists of obtuse spicules, of melonanchors, of equianchorate spicules.

The obtuse spicules (Plate 25, fig. 51) are smooth, slightly curved or straight. The ends are sometimes slightly inflated. Their length is 0,05 mm.

The melonanchorate spicules (Plate 25, fig. 52) are very numerous, their length being 0,07 mm.

The equianchorate spicules (Plate 25, fig. 53—55) are of two kinds, the larger 0,06 mm in length, the length of the smaller being only 0,015 mm.

Colour. Grey, when preserved in spirit.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Genus **Cladorhiza** Wyv. Thoms.

Cladorhiza abyssicola M. Sars.

Cladorhiza abyssicola, M. Sars (manuscr., edited by G. O. Sars), On some remarkable forms of animal Life from the great deeps of the Norwegian coast, 1, pag. 69, Plate 6, fig. 16—34.

Several specimens of this sponge were dredged up in Baffin Bay, simple small branches as well as larger ones, the latter being well developed. The spicules and the outer shape of these specimens agree perfectly with the description and figures, which Sars has given of this species.

Habitat. Baffin Bay, depth 116—215 fathoms.

Cladorhiza Nordenskiöldii n. sp.

Plate 25, fig. 56—59, Plate 31, fig. 25.

A single specimen represents this very fine and interesting species. The sponge has not, as the other *Cladorhizæ* Wyv. Thoms., roots. The lower part is expanded and attached to a hard object. The sponge consists of a stem, 225 mm in length, the greatest thickness being 5 mm, the smallest 2 mm, and of branches, which are very minute, not exceeding 0,5 mm, and placed laterally, the upper part of the sponge being compressed. The stem is hard, compact, light yellowish, composed of acuate spicules arranged longitudinally and parallel to each other, forming a spiral cord. The branches are composed of acuate spicules. The cortex is very characteristic. In dried state it is snow-white. The spicules of the cortex are curved obtuse ones, microspined and arranged in resemblance to the spicules of the axis of *Axinella* O. S.

Oscula or pores not visible.

Skeleton. The skeleton consists of large acuate spicules, curved obtuse spicules, bihamate and inequianchorate spicules.

The acuate spicules (Plate 25, fig. 26) form the axis of the stem and the branches. These spicules are generally straight,

the greatest diameter at the middle, tapering towards the round base and the abruptly pointed end. The length is 0,9—1 mm.

The obtuse spicules of the cortex (Plate 25, fig. 57) are always more or less irregularly curved; one of the terminations is generally a little inflated; they are microspined, the spines being exceedingly minute, smaller than in other microspined spicules which I have seen. The length is 0,12 mm.

The bihamate spicules (Plate 25, fig. 58) are both C- and S-curved, the straight length between the points being 0,02 mm.

The inequianchorate spicules (Plate 25, fig. 59) are not so numerous as the other spicules of the sponge. Their length is 0,06 mm.

Colour. Yellowish with a tint of rose.

Habitat. East-coast of Greenland, depth 130 fathoms (580 S.).

Cladorhiza nobilis n. sp.

Plate 25, fig. 60—65, Plate 31, fig. 26.

The single specimen, which represents this species, is very fine and well preserved. It is the most beautiful sponge from the arctic regions of all the sponges of the Zool. State-Museum at Stockholm. The shape corresponds well to O. Schmidt's and Hansen's figures of *Cladorhiza concrescens* O. S.*) and *Desmacidon* (!) *giganteum* Hansen**). But these two species are compact, and our new species is hollow. The length of the species is 110 mm, the thickness at the middle 10 mm. The sponge is furnished with 24 branches, which are inflated at the ends. The length of these arms or branches is about 25 mm, the thickness 2—3 mm; the diameter of the bulbous inflations is 6 mm. Two of the lower branches and eight of the upper ones are anastomosing; the others are free. The surface is even and tolerably smooth, the branches exceedingly slightly hispid. I have not seen the root of this species. It was broken off by the dredge.

*) O. Schmidt. Die Spongien des Meerbusen von Mexico, pag. 83. Taf. 10, Fig. 8—9.

**) G. A. Hansen, Den norske Nordhavsexpedition 1876—78, XIII, Spongiadæ, pag. 14, Pl. 2, fig. 12—13, Pl. 7, fig. 8.

Skeleton. The skeleton consists of acuate spicules, of slender obtuse spicules, of bihamate and of anchorate spicules of two kinds.

The acuate spicules (Plate 25, fig. 60) are mostly straight; they are totally smooth, the greatest diameter being at the middle, tapering towards the base and the pointed termination. These spicules are placed both in the body and in the arms, nearest to the central cavities. Their length is 0,9 mm.

The obtuse spicules (Plate 25, fig. 61) are very slender and smooth, mostly slightly curved; they are not numerous. The length is 0,2 mm; one end is inflated.

The bihamate spicules (Plate 25, fig. 64, 65). These spicules are comparatively slender, both C- and S-curved. The straight length between the points is 0,04 mm.

The anchorate spicules (Plate 25, fig. 62, 63) agree well with those of other Cladorhizæ. They are of two kinds, one 0,08 mm in length, the other 0,02 mm. The larger are more numerous than the smaller and furnished with more teeth.

Colour. The sponge-body and the arms are snow-white, the bulbous inflations of the branches white with a tint of yellow, when preserved in spirit; all the parts a little lighter, when dried. The lower part of the stem is grey, the surface being covered with fine sand or clay, strongly adhering.

Habitat. The east-coast of Greenland, depth 130 fathoms (680 S.).

Cladorhiza cupressiformis Carter.

Plate 25, fig. 66—69, Plate 31, fig. 27.

Esperia cupressiformis, Carter, Ann. Mag. Nat. Hist., Ser. 4, Vol. 14; On deep-sea sponges from the Atlantic Ocean, pag. 215, Plate 14, fig. 16—19 and Plate 15, fig. 37.

The only difference between our specimen and *Cladorhiza cupressiformis* described by Carter consists in the absence of the forcepiform spicules. The sponge is long, round, echinated with short processes, these processes being more or less united

by a layer of sarcode. The length of the single specimen, which represents this species, is 80 mm, the 8 mm long pedicle included. The pedicle is free from processes. The diameter of the sponge is about 5 mm, that of the pedicle only 2 mm.

Skeleton. The skeleton consists of acuate (and rarely subspinulate) spicules and of inequianchorate spicules varying in size.

The acuate spicules (Plate 25, fig. 66) of the axis as well as those of the processes are parallel. Those of the processes are much more slender than those of the stem. They are quite smooth and straight, the length being $0{,}_{85}$ mm.

The inequianchorate spicules (Plate 25, fig. 67—69) are very characteristic for this species. The smaller end is furnished with a bow-shaped appendix, attached to the end by a short shaft, which is curved towards the larger end. The length of these spicules is about $0{,}_{025}$ mm.

Colour. The colour is light-grey with a tint of yellow, when preserved in spirit.

Habitat. West from Taimur, Lat. 76° 18′ N., Long. 92° 20′ E., depth 40 fathoms (28 V.).

VIII. **Chalinopsidinæ** O. S.

Genus **Clathria** O. S.

Clathria Lovèni n. sp.

Plate 25, fig. 70—72, Plate 30, fig. 24.

This interesting and remarkable sponge is represented by several specimens dredged up during the expedition of the

Vega. The shape of the sponge agrees well with the figure of *Clathria coppingeri* S. O. Ridley, given in »Report on the zoological collections made in the Indo-Pacific Ocean during the voyage of H. M. S. »Alert» 1881—1882», pag. 445, Plate 40, fig. F. It is erect, irregularly ramous. The branches, issuing from a tolerably short, firm pedicle, are divided into numerous slender branches. These branches are united by lateral branches, forming a net-work of subquadrangular cells, which are often filled up with the softer sponge-substance. The pedicle and the branches are of a very firm consistency. The other tissue is soft. Oscula and pores are not visible. The length of the specimen represented by figure 24 in Plate 30 is 170 mm, and its breadth about 160 mm. The thickness is 10 mm. The diameter of the pedicle is 15 mm, that of the branches only 2 mm. The sponge is attached to stones and other hard objects, growing as an *Axinella* O. S. The basal attachment of this sponge is expanded.

The ***skeleton*** consists of acuate (sometimes subspinulate) spicules and of inequianchorate spicules.

The acuate spicules (Plate 25, fig. 70) are straight or slightly curved, smooth, tapering from the middle towards the base and the sharp point. They are sometimes slightly inflated at the base. The length is 0,35—0,45 mm.

The inequianchorate spicules (Plate 25, fig. 71, 72) are of two kinds. *The large ones* are congregated in rosette-shaped groups, resembling those of *Esperia lingua* Bow. (O. S.), the spicules of each rosette of *Clathria* however being fewer. The length is 0,1 mm. These rosettes are very numerous in the inner, softer membranes.

The smaller anchorate spicules are not congregated in rosettes; their length is only 0,035 mm. They occur dispersed in a very considerable number.

I have seen a few minute acerate spicules, trichites, the length being 0,05 mm, in only one small portion of the sponge preserved in Canada-balsam; but I have not figured these spicules, as they are so few, and possibly do not belong to this species.

Colour. The sponge in dried state is light grey or light straw-coloured.

Habitat. Cape Jakan, Lat. 68° 32′ N., Long. 177° 41′ E., depth 12 fathoms (60 V.).

Clathria corallorhizoides n. sp.

Plate 25, fig. 73—77, Plate 29, fig. 23.

This species is represented by a very fine specimen. The shape resembles the root of *Corallorhiza innata*. The length of the species is 80 mm. The surface is slightly hispid. Oscula and pores numerous, small, dispersed. The sponge is attached to the branch of a coral. The consistency is not firm.

Skeleton. The skeleton consists of large acuate spicules, of obtuse spicules, of equianchorate and of bihamate spicules.

The acuate spicules (Plate 25, fig. 73) are 0,5 mm in length, totally smooth and slightly curved near the base.

The obtuse spicules (Plate 25, fig. 74). The terminations of these spicules are often slightly inflated; they are straight or curved. Their length is 0,32 mm.

The equianchorate spicules (Plate 25, fig. 75). Their shaft is very thick, and the teeths well separated from each other. The length i 0,06 mm.

The bihamate spicules (Plate 25, fig. 76, 77). There are two kinds of these spicules. The larger ones are either C- or S-formed, the straight length between the points being 0,04 mm; the smaller are most often C-curved, the length being only 0,02 mm.

Colour. The sponge is cream-coloured, when preserved in spirit.

Habitat. Baffin Bay, Lat. 68° 8′ N., Long. 58° 17′ W., depth 169 fathoms.

Genus **Axinella** O. S.

Axinella rugosa Bow. (O. S.).

Dictyocylindrus rugosus, Bowerbank, Mon. Brit. Spong., II, pag. 119. III, Plate 20, fig. 1—4.
Axinella rugosa, O. Schmidt, Grundzüge einer Spongien-Fauna des Atl. Gebietes, pag. 61, Pl. 4, fig. 15.

This species is represented by five specimens; all these specimens differ from the Swedish ones. Their branches are joined in such a manner as to make the sponge look very like *Phakellia ventilabrum* L. (Bow.). Four specimens are infundibuliform, the largest being about 90 mm in height, and the greatest diameter of the funnel 30 mm.

Habitat. Greenland, Lat. 59° 33' N., Long. 43° 25' W., depth 120 fathoms (576 S.); East-coast of Greenland, depth 130 fath., (580 S.).

Axinella vermiculata Bow. var. **erecta** Carter.

Hymeraphia vermiculata, Bow. var. *erecta* Carter, Ann. and Mag. Nat. Hist., Ser. 4, Vol. 18, 1876. — Descrip. and fig. of deep-sea sponges and their spicules from the Atl. Oc., dredged up on board H. M. S. »Porcupine», chiefly in 1869, pag. 307, Plate 12, fig. 14 and Plate 15, fig. 26 a, b.

The above-mentioned species is represented by eight specimens well preserved. The largest is pedicelled, branching irregularly, the branches being very thick. This specimen is 100 mm in height. The branches are more or less compressed, anastomosing. The other specimens are less complicated, forming only one branch, slightly inflated at the termination. The specimens of this form agree with the figure, which Carter has given of this interesting sponge. The surface is very hispid, furrowed, the furrows being covered with the thin, reticulate dermal membrane. The spicules are like those described and figured by Carter. I have often seen these spicules divided in two branches at the one point.

The *colour* is yellowish white or yellowish grey.

Habitat. East-coast of Greenland, depth 350 fathoms (500 S.); Greenland, N.W. from Cape York, depth 5—10 fathoms (540 S.); East-coast of Greenland, depth 130 fathoms (580 S.); Northcape, Lat. 71° 13′ N., Long. 26° 2′ E., depth 180 fathoms (30 N. S.).

Whether *Hymeraphia vermiculata* Bow. is a young form of an *Axinella* O. S. or not, I am not able to decide, since I have had no specimen of *Hymeraphia vermiculata* Bow. for comparison. As for *Hymeraphia vermiculata* Bow. var. *erecta* Carter, I am quite convinced that this variety as well as *Axinella rugosa* Bow. (O. S.) is a true *Axinella* O. S. The reasons in favour of this are, the well developed axis, ramuli radiating from it, and the spicules, which are typical for an *Axinella* O. S.

Carter also says with regard to this variety: »Internal structure consisting of fasciculi branching and subdividing obliquely from a central axis amidst the sarcode» etc., thus perfectly demonstrating its inner structure like that of an *Axinella* O. S.

Bowerbank's description of the genus *Hymeraphia* Bow., Mon. Brit. Spong., Vol. 1, pag. 189, is following: »A single basal membrane, whence spring numerous large separate spicules, which pass through the entire thickness of the sarcodous stratum to, or beyond the dermal surface of the sponge.» He continues his description: »These peculiarities of structure indicate a common habit of extreme *thinness* in the species, and such is in reality the condition of those with which we are acquainted.» And then speaking about all the species of *Hymeraphia* Bow., described Vol. II, in respect to the thickness, he says with regard to *H. vermiculata* »coating small pebbles. None of them exceeded four lines in diameter, and the thickness not more than that of a sheet of writing paper»; with regard to *H. clavata:* »coating thin . . . . . It is exceedingly thin, and, in the dried state, can only be distinguished from the dark periostracum of the shell by the grains of extraneous matter, which are abundant on its surface . . . . .»; with regard to *H. verticellata:* »coating . . . . . about two lines in thickness . . . . .»; *H. stellifera:* »coating . . . . . exceedingly thin . . . .», it is evident, that the species described by Carter as *H. vermiculata* Bow. var. *erecta* Carter is a true *Axinella* O. S. separated from the genus *Hymeraphia.*

Probably *H. vermiculata* Bow. is also only a young form of a species, that cannot but be an *Axinella* O. S. There is also

in our collection of sponges a small specimen coating a stone. This specimen is only 6 mm in height, expanding like a thin layer towards the sides. Carter also admits the affinity, saying: »Thus we have a group of sponges extending from the lowest form, viz. *Hymeraphia vermiculata* Bow. to *Axinella* O. S. etc.»

IX. **Geodinidæ** O. S.

Genus **Geodia** Lmk.

Geodia Baretti Bow.

Geodia Baretti, Bowerbank, Proceed. Zool. Soc., 198, pl. 11, 1872.

Only three specimens from the arctic regions represent this species. A specimen from the east-coast of Greenland is a gigantic one. The greatest diameter is 270 mm, the smallest 200 mm. This specimen is furnished with one osculum, very deep and 40 mm in diameter.

Habitat. East-coast of Greenland, depth 130—140 fathoms (580—581 S.); Mossel Bay, depth 2—3 fathoms (97 Sp.).

Geographical distribution of the species.

Name.	Sea West from Greenland.	European Arctic Sea and Barent's Sea.	Kara Sea.	Siberian Arctic Ocean.	Beaufort's Sea.	Behring Strait and Sea.
Ascetta coriacea Mont. (H.) var. Ascaltis coriacea Fristedt		×				
Ascandra complicata Mont. (H.)					×	
Ascandra mirabilis Fristedt		×				
Leucandra cylindrica Fristedt					×	
Sycandra arctica H.		×				
Sycandra utriculus O. S. (H.)		×	×			
Hyalonema rosea Fristedt		×				
Hyalonema foliata Fristedt	×					
Halisarca Dujardinii Johnston						×
Chalina arbuscula Verrill		×	×			
Chalina Vega Fristedt				×		
Chalina groenlandica Fristedt		×				
Cribrochalina variabilis Vosmaer			×	×	×	
Reniera cinerea Grant (O. S.)		×				
Reniera tubulosa Fristedt		×				
Reniera ventilabrum Fristedt		×				
Reniera arctica Fristedt		×				
Amorphina panicea Pallas (O. S.)	×	×				
Amorphina fallax Bow. (Fristedt)			× ×			
Amorphina fasciculata Fristedt		×				
Amorphina nodosa Fristedt		×				
Amorphina renieroides Fristedt						×
Amorphina grisea Fristedt				×	×	
Amorphina fibrosa Fristedt						×
Eumastia sitiens O. S.					×	
Isodictya Dicksonii Fristedt	×					
Suberites montalbidus Carter	×	×	× ×	×	×	×
Suberites spermatozoon O. S. (Fristedt)			×			
Artemisina suberitoides Vosmaer		×				
Hymeraphia verticellata Bow.		×				
Hymeraphia spitzbergensis Fristedt		×				
Tecophora semisuberites O. S.	×	×				
Polymastia brevis Bow.		×				
Polymastia penicillus Mont. (Vosmaer)		×	×	×		
Polymastia paupera Fristedt		×				
Radiella spinularia Bow. (O. S.)		×				

Name.	Sea West from Greenland.	European Arctic Sea and Barent's Sea.	Kara Sea.	Siberian Arctic Ocean.	Beaufort's Sea.	Behring Strait and Sea.
Tethya muricata Bow.	×	×				
Tethya sibirica Fristedt				×	×	
Tethya cranium Lmk.	×	×				
Gellius arcoferus Vosmaer		×		×		
Desmacella rosea Fristedt		×				
Desmacella porosa Fristedt	×					
Desmacella Peachii Bow. (O. S.) var. groenlandica Fristedt		×				
Desmacidon Jeffreysii Bow.		×				
Hastatus Robertsoni Bow. (Fristedt)		×		×		×
Hastatus ambiguus Bow. (Fristedt)		×				
Hastatus foliatus Fristedt		×				
Hastatus indistinctus Fristedt		×				
Myxilla septentrionalis Fristedt						×
Cornulum ascidioides Fristedt	×					
Cornulum textile Carter	×					
Cornulum enteromorphoides Fristedt	×					
Esperia nigricans Bow. (Vosmaer)		×				
Esperia Pattersoni Bow. (Vosmaer)		×				
Esperia lingua Bow. (O. S.)	×	×				
Esperia lingua Bow. (O. S.) var. arctica Fristedt						×
Esperia helios Fristedt					×	
Esperia Sophia Fristedt		×				
Esperia villosa Carter		×				
Forcepia groenlandica Fristedt		×				
Cribrella hospitalis O. S.		×				
Melonanchora elliptica Carter		×				
Cladorhiza abyssicola Sars	×					
Cladorhiza Nordenskiöldii Fristedt		×				
Cladorhiza nobilis Fristedt		×				
Cladorhiza cupressiformis Carter				×		
Clathria Lovéni Fristedt				×		
Clathria corallorhizoides Fristedt	×					
Axinella rugosa Bow. (O. S.)		×				
Axinella vermiculata Bow. (Fristedt) var. erecta Carter	×	×				
Geodia Baretti Bow.		×				

List of the stations during the expedition to Spitzbergen in 1872—1873

(only the stations, in which sponges have been dredged up, being named).

Number.	Time.	Locality. Lat.	Locality. Long.	Quality of the bottom.	Depth in fathoms.
3	11/7 1872	66° 11' N.	12° 51' E.	Greyish, fine clay.	60
14	14/8 »	Norskö.		Stone- and sand-bottom.	15—20
16	19/8 »	»		Bottom hard.	18—25
27	23/8 »	Foul Bay.		Sand.	15
32	27/8 »	Smeerenberg Bay.		Stones and clay.	25
37	29/8 »	Foul Bay.		Sand.	4
54	29/10 »	Mossel Bay.		Lithotamnium-bottom.	10—12
76	13/11 »			Sea-weeds.	2,6
79	18/11 »	»		Lithotamnium.	15—20
96	4—8/12 »	»		Lithotamnium and sea-weeds.	18—20
97	9/12 »			Sand.	2—3
128	4/1 1873			Sea-weeds and sand.	3
153	20/2 »			Sea-weeds.	1
200	17/4 »	»		Sea-weeds.	1,5
244	3/7 »	79° 53' N.	14° 56' E.	Echinoderms and corals.	55
254	6/7 »	Duym-point.		Bryozoons.	50
256	7/7 »	80° 7' N.	16° 54' E.	Stone.	60
286	15/7 »	79° 55' »	10° 27' »	Mountain.	280
288	18/7 »	79° 47' »	11° 15' »	Clay.	100

List of the stations during the expedition to Nova Zembla and Jenisej in 1875.

Number.	Time.	Locality. Lat.	Locality. Long.	Quality of the bottom.	Depth in fathoms.
25	15/5 1875	70° 49' N.	21° 55' E.		150
30		71° 13' »	26° 2' »		180
42					
48	26/6 »	Möller bay.		Sea-weeds and sand.	15—20
74	9/7 »	Matotschkin Schar.			
138	31/7 »	Jugor Schar.		Stones and shells.	10—14
143	2/8 »	»		Sand.	10
158	7/8 »	Kara Sea.		Clay.	21
192		Matotschkin Schar.			

List of the stations during the expedition of the "Vega" in 1878—1880.

Number.	Time.	Locality. Lat.	Locality. Long.	Quality of the bottom.	Depth in fathoms.
21	10/8 1878	74° 8′ N.	82° 12′ E.	Grey clay.	19
28	13/8 »	76° 18′ »	92° 20′ »	Brown clay with stones.	40
29	14—16/8 »	76° 18′ »	95° 30′ »	Sea-weeds and stones.	5—10
39	22/8 »	76° 52′ »	116° »	Grey clay.	36
40	23/8 »	76° 40′ »	115° 30′ »	Clay..	35
41	24/8 »	75° »	113° 30′ »	Stones, clay and numerous shells of Saxicava.	15
47	26/8 »	73° 44′ »	121° 20′ »	Hard sand.	4
51	29/8 »	73° 58′ »	138° »	Soft clay.	12
53	31/8 »	73° 2′ »	142° 36′ »	Grey clay.	9
54	31/8 »	73° 5′ »	144° 20′ »	Grey clay.	8
56	2/9 »	71° 39′ »	157° 15′ »	Brown clay.	10
58	5—6/9 »	70° 14′ »	170° 17′ »	Clay (and stones).	12
60	7 8/9 »	69° 32′ »	177° 41′ »	Sand and clay with stones.	12
68	12—18/9 »	Ir-Kaipij.		Stones.	3—6
1006	16/6 1879	Pitlekai.		Clay and stones.	15
1015	26/6 »	»		Sand and stones.	12
1016	27/6 »				»
1027	5/7 »	»			10—14
1031	9/7 »	»			»
1035	15/7 »				12
1036	16/7 »	»		»	»
1049	22—25/7 »	Port Clarence.		Sand, stones and sea-weeds.	4—6
1054	27/7 »	65° 10′ N.	169° 50′ E.	Mud.	25
1058	29/7 »	Konyam Bay.		Sand mixed with clay.	2—16
1078	15—16/8 »	Behring-island.		Stones and sea-weeds.	

List of the stations during the expedition to Greenland in 1883.

Number.	Time.	Locality. Lat.	Locality. Long.	Quality of the bottom.	Depth in fathoms.
500	12/6 1883	East-Greenland.		Stones.	350
506	25/6 »	65° 15′ N.	53° 30′ W.	»	75
522	7/7 »	Tessiursarsvak.		Grey clay with stones and sea-weeds.	3—10
535	23/7 »	»		Mountain with shells.	15—40

Number.	Time.	Locality. Lat.	Locality. Long.	Quality of the bottom.	Depth in fathms.
540	$^{27}/_{7}$ 1883	Cape York.		Clay mixed with sand, and sea-weeds.	5—15
542	$^{29}/_{7}$ »	75° 26′ N.	67° 27′ W.	Hard clay with small and large stones.	260
561	$^{19}/_{8}$ »	61° 15′ »	49° 11′ »	Clay and stones.	70
562	$^{20}/_{8}$ »	61° 13′ »	48° 5′ »	Stones.	75
576	$^{31}/_{8}$ »	59° 33′ »	43° 25′ »	Stones.	120
578	$^{5}/_{9}$ »	65° 40′ »	35° 32′ »	Clay with stones and shells.	25—40
579	$^{6}/_{9}$ »	East-Greenland.		Grey clay with stones.	125
580	$^{6}/_{9}$ »	».		Clay and stones.	130
581	$^{6}/_{9}$ »	»		Grey clay with stones.	140

Explanation of the plates.

Plate 22.

Fig. 1—2. *Ascetta coriacea* var. The quadriradiate spicules are not so numerous as the triradiate ones.
» 3—13. *Ascandra mirabilis.*
» 14—22. *Leucandra cylindrica.* The minute acerate spicules, figured 16, are sometimes smooth.

Plate 23.

Fig. 1—11. *Hyalonema rosea.* 1. The one point of the long acerate spicules. 2. The terminations of the acuate (spinulate) spicules. 4. The middle portion of the same spicule as in fig. 3, being inflated at the centre. 7. The branched part of a quinqueradiate spicule, the branches being armed with very minute spines.
» 12—17. *Hyalonema foliata.* 16. One of the rays of the rosette figured 15, more magnified. The spicules of this sponge, which not are figured, are of the same kind and largeness as in the preceding species.
» 18. *Chalina Vega.*
» 19. *Chalina grœnlandica.*

Plate 24.

Fig. 1. *Reniera tubulosa.*
» 2. *Reniera arctica.*
» 3. *Reniera ventilabrum.*
» 4. *Myxilla septentrionalis.*
» 5—6. *Amorphina fasciculata.*
» 7—8. *Amorphina nodosa.*
» 9. *Amorphina renieroides.*
» 10. *Amorphina grisea.*

Fig. 11—12. *Amorphina fibrosa.*
» 13. *Enmastia sitiens.*
» 14. *Isodictya Dicksonii.*
» 15—17. *Artemisina suberitoides.*
» 18—20. *Hymeraphia spitzbergensis.* 20. Bundle of minute, slightly curved acuate spicules.
» 21. *Polymastia paupera.*
» 22—28. *Tethya sibirica.*
» 29—31. *Gellius arcoferus.*
» 32—35. *Desmacella rosea.*
» 36—37. *Desmacella porosa.*
» 38—45. *Desmacella Peachii* var. *groenlandica.* 44. Gemmule, composed by several very minute globular bodies, figured in fig. 45.

Plate 25.

Fig. 1—2. *Cornulum ascidioides.*
» 3—6. *Cornulum enteromorphoides.*
» 7—12. *Hastatus foliatus.*
» 13—19. *Hastatus indistinctus.*
» 20—24. *Esperia lingua* var. *arctica.* 22. Inequianchorate spicule, from front and side.
» 25—29. *Esperia helios.*
» 30—32. *Esperia Sophia.*
» 33—39. *Esperia villosa.* 39. Different form of the bihamate spicules.
» 40—46. *Forcepia groenlandica.* 46. The one end of a forcepiform spicule more magnified.
» 47—50. *Cribrella hospitalis.*
» 51—55. *Melonanchora elliptica.*
» 56—59. *Cladorhiza Nordenskiöldii.*
» 60—65. *Cladorhiza nobilis.*
» 66—69. *Cladorhiza cupressiformis.* 69. The inequianchorate spicule much less magnified to show the reciprocal largeness.
» 70—72. *Clathria Lovéni.*
» 73—77. *Clathria corallorhizoides.*

Plate 26.

Fig. 1. *Ascandra mirabilis.* (Magn. $^3/_1$.)
» 2. The same; section to show the inner part of the ciliary fringe. (Magn. $^3/_1$.)
» 3. *Leucandra cylindrica.* (Magn. $^4/_9$).

Fig. 4. *Cribrochalina variabilis.* One of the cylindrical specimens. Nat. size.
» 5. *Hyalonema rosea.* Nat. size.
» 6. *Hyalonema foliata.* Nat. size. Fragment of a specimen.
» 7. *Chalina Vega.* Nat. size.

Plate 27.

Fig. 8. *Reniera ventilabrum.* Nat. size. Fragment.
» 9. *Amorphina renieroides.* Nat. size.
» 10. *Amorphina grisea.* Nat. size.
» 11. *Ennastia sitiens.* Nat. size.
» 12. *Hymeraphia spitzbergensis.* (Magn. $^2/_1$.)

Plate 28.

Fig. 13. *Desmacella rosea.* Nat. size. Fragment.
» 14. *Desmacella Peachii* var. *grænlandica.* Nat. size.
» 15. *Desmacella porosa.* Nat. size.
» 16. *Gellius arcoferus.* Nat. size. Fragment.
» 17. *Tethya sibirica.* Nat. size.

Plate 29.

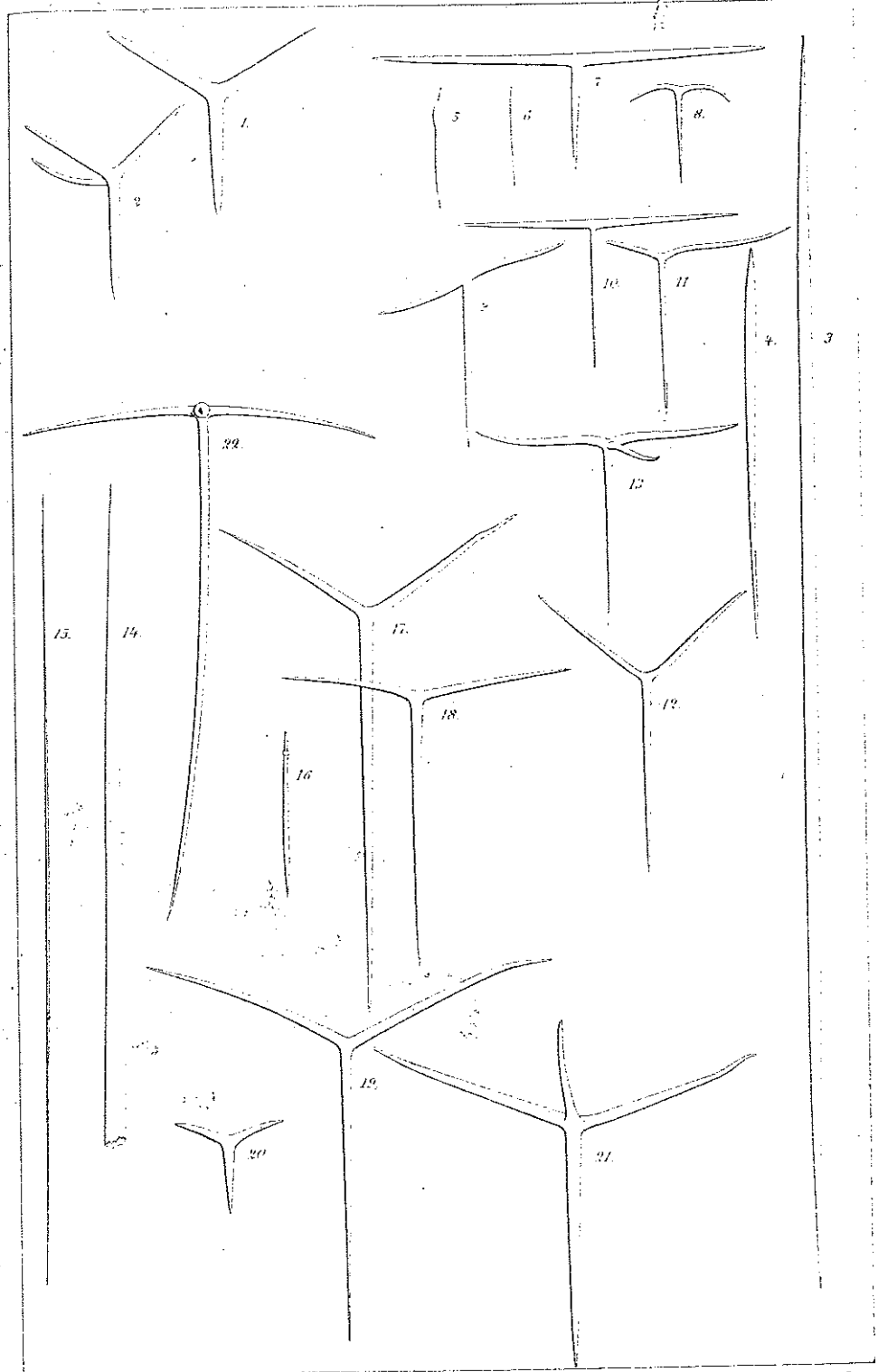
Fig. 18. *Esperia lingua* var. *arctica.* Nat. size.
» 19. *Esperia villosa.* Nat. size.
» 20. *Cribrella hospitalis.* Nat. size.
» 21. *Cornulum ascidioides.* Nat. size.
» 22. *Cornulum enteromorphoides.* Nat. size.
» 23. *Clathria corallorhizoides.* Nat. size.

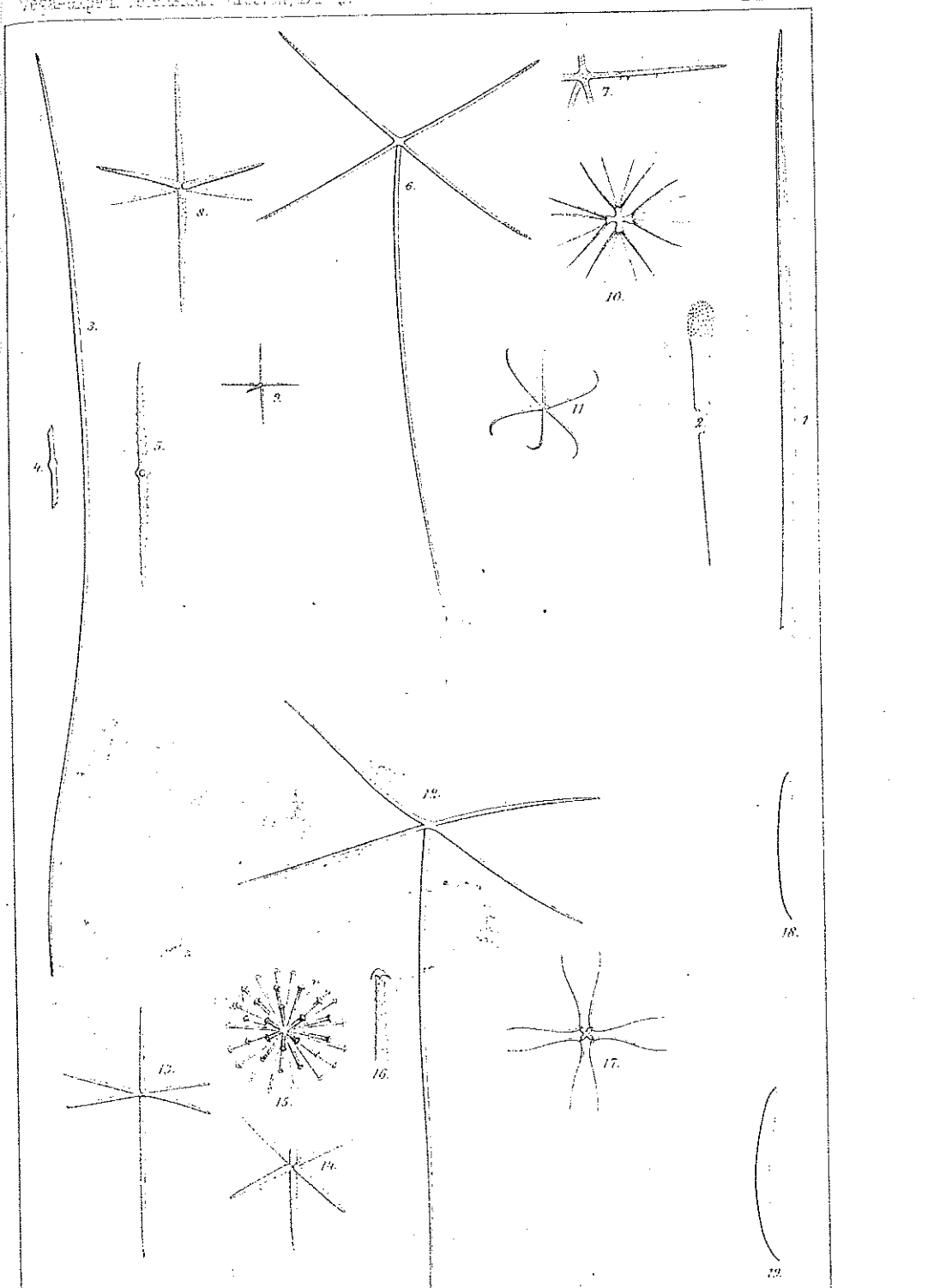
Plate 30.

Fig. 24. *Clathria Lovéni.* Nat. size.

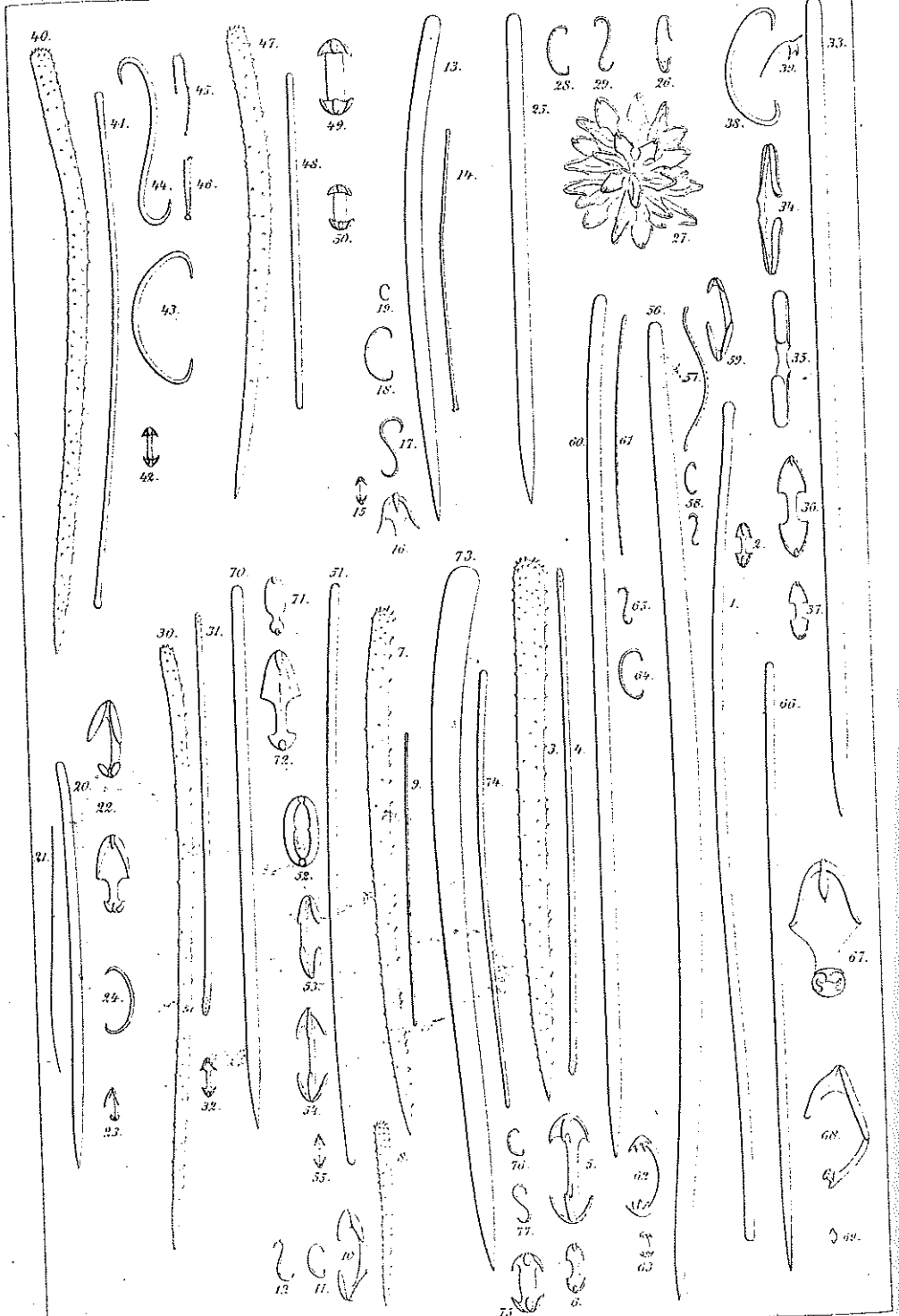
Plate 31.

Fig. 25. *Cladorhiza Nordenskiöldii.* Nat. size.
» 26. *Cladorhiza nobilis.* Nat. size.
» 27. *Cladorhiza cupressiformis.* Nat. size.


1.
2.
5.
6.
7.
8.
10.
11.
4.
3.
22.
12.
13.
14.
17.
18.
16.
19.
15.
20.
21.

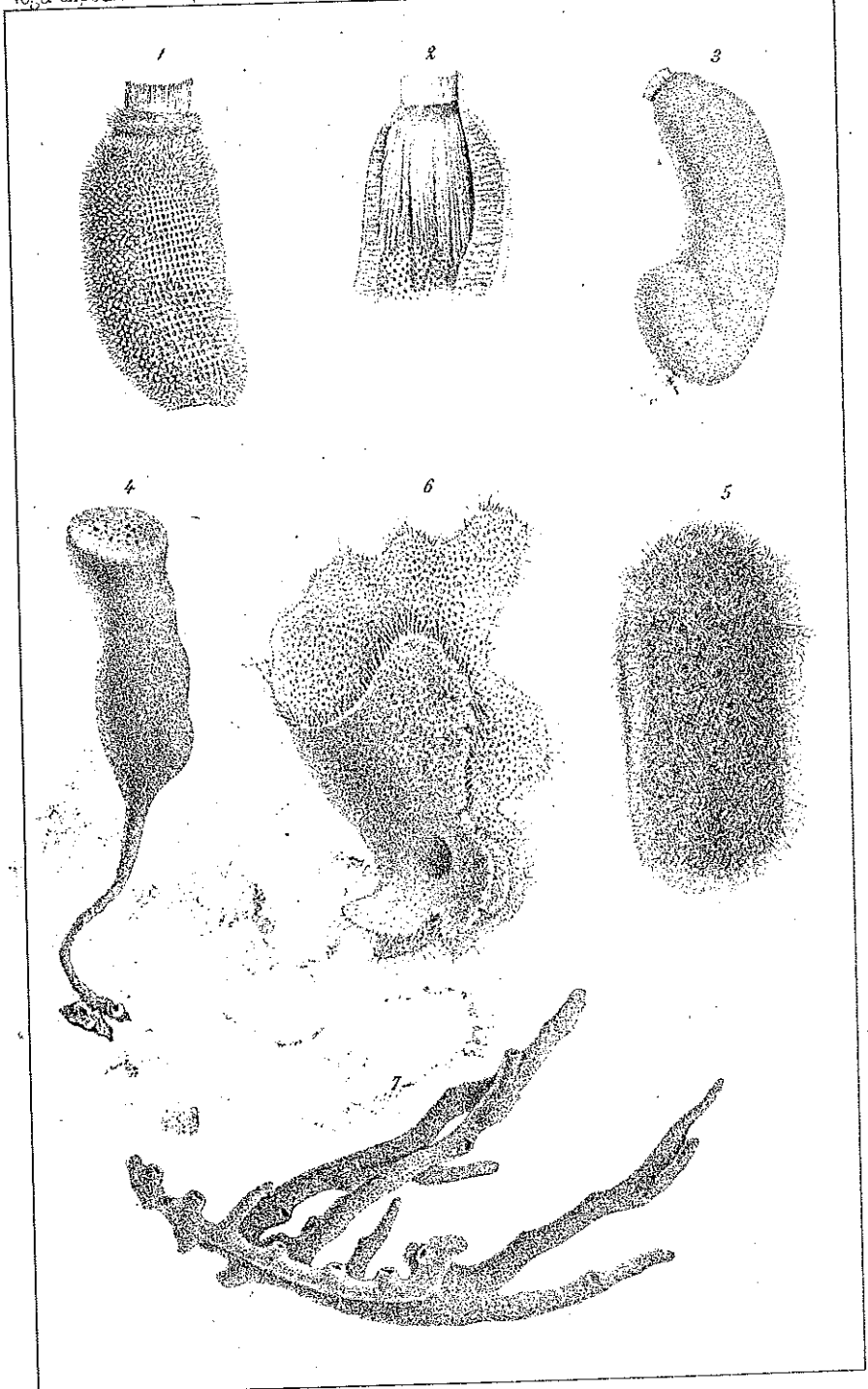

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.

1.
2.
3.
4.
23.
25.
21.
20.
18.
27.
28.
22.
24.
26.
37.
19.
36.
38.
29.
39.
40.
12.
8.
7.
6.
5.
11.
13.
15.
41.
34.
35.
10.
9.
14.
16.
30.
33.
43.
44.
31.
45.
17.

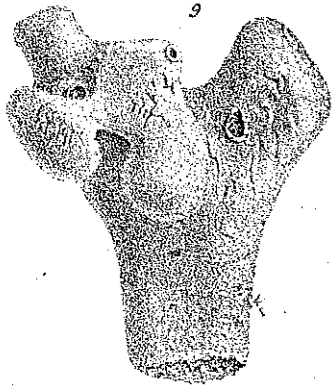


A. M. Westergren del.

Lith. & Schlaeridtz, Stockholm.


1
2
3
4
6
5
7

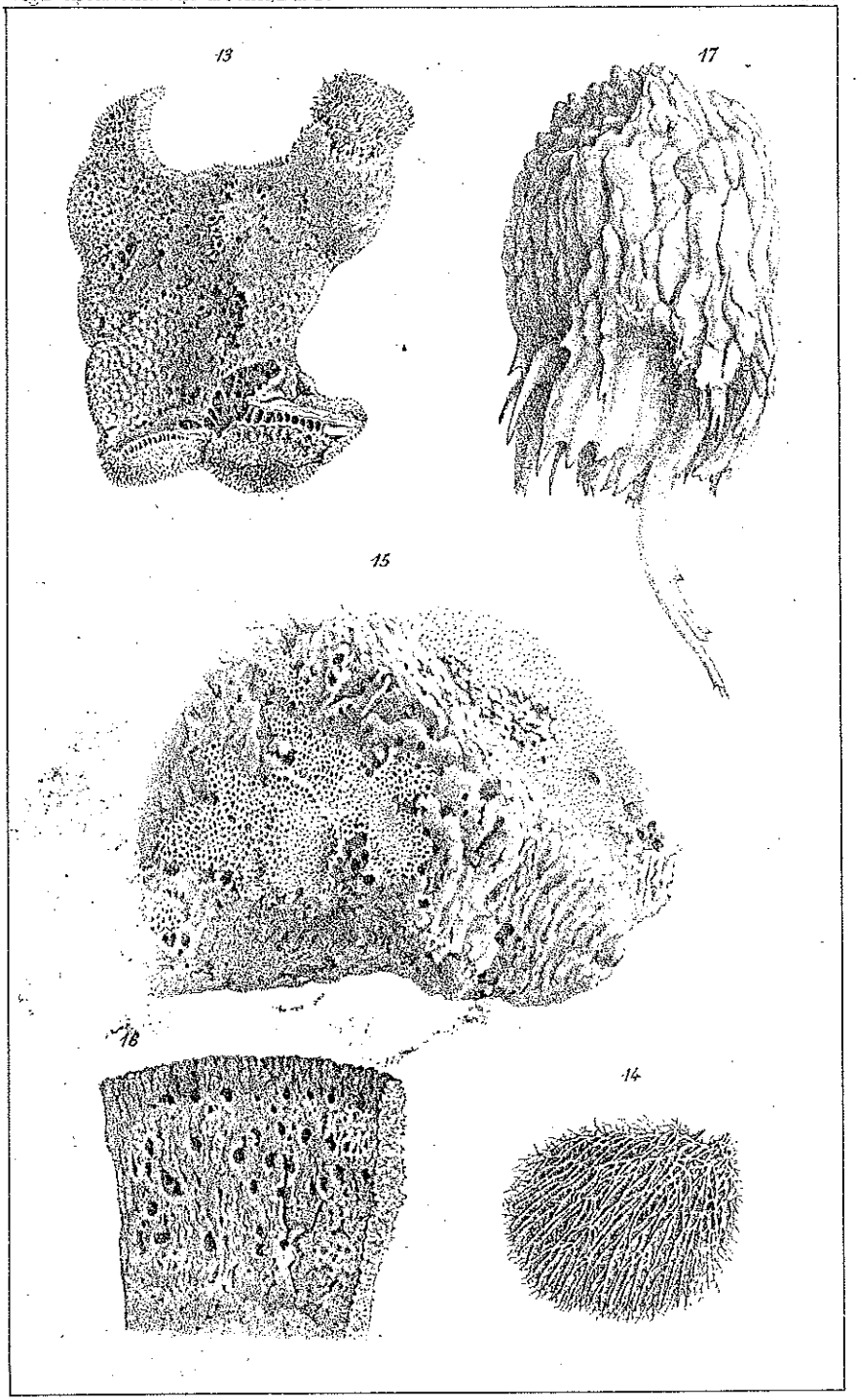

11

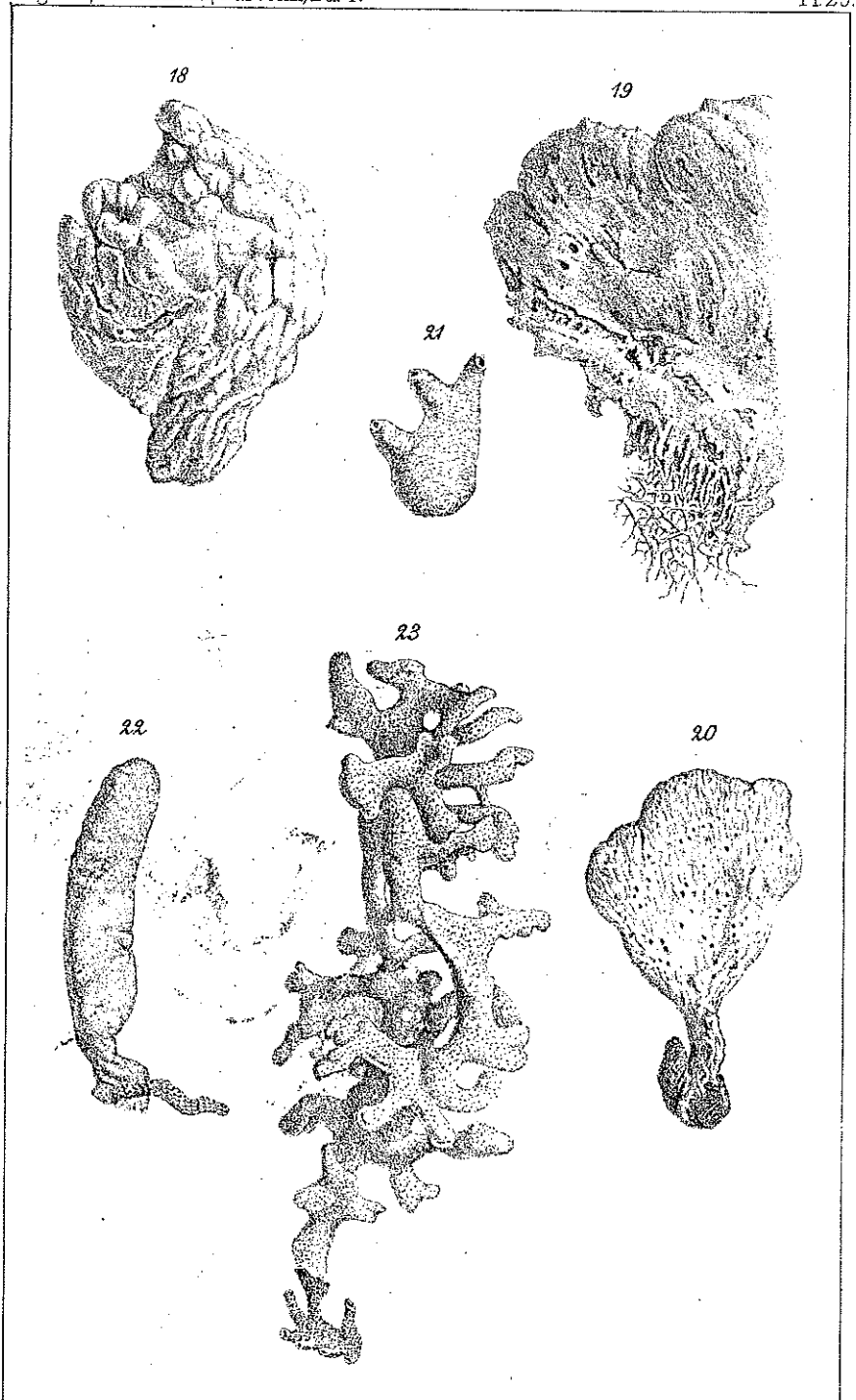

9


8

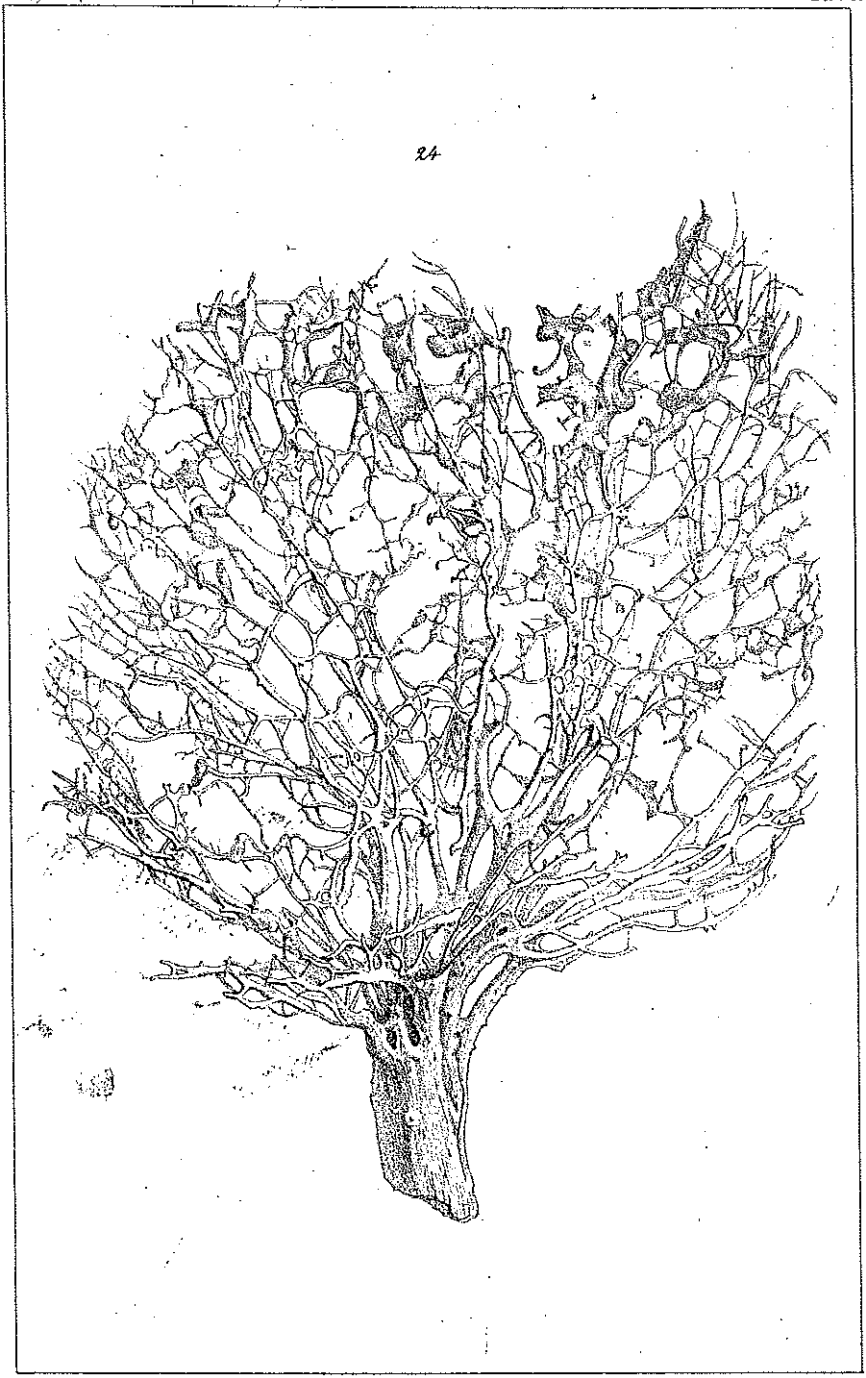

12


10

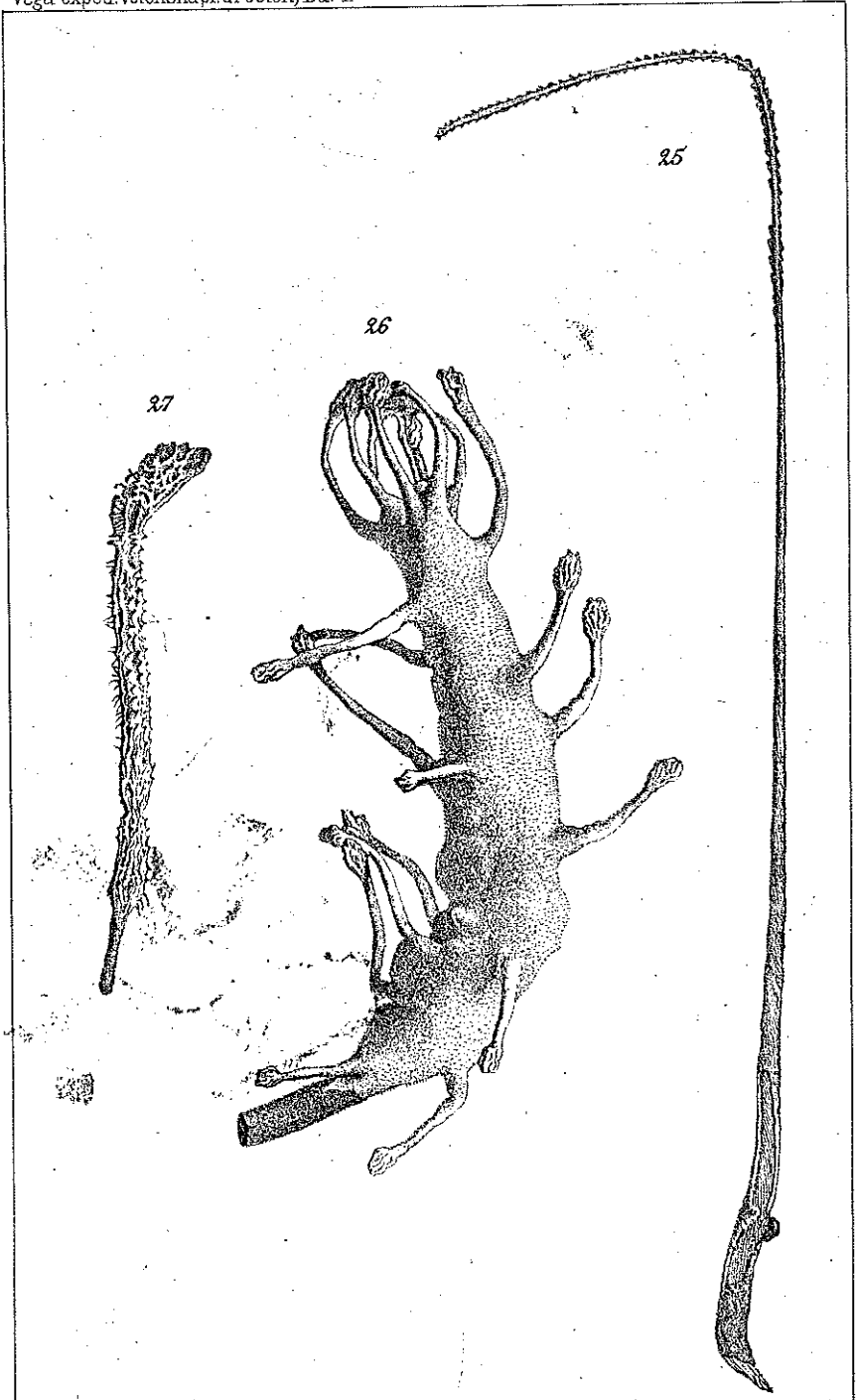

13
17
15
18
14



A.M. Westergren del. & lith.



A. M. Westergren del. & lith.


25
26
27