THE DANISH
INGOLF-EXPEDITION.

VOL. VI. PART 3.

CONTENTS:

WILL. LUNDBECK: DESMACIDONIDÆ (PARS.).

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THE DANISH INGOLF-EXPEDITION.

VOLUME VI.

3.

PORIFERA.

(PART III.)

DESMACIDONIDÆ (PARS.).

BY

WILL. LUNDBECK.

WITH 11 PLATES.

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CONTENTS.

Desmacidonidæ.

Porifera.

III.

By

William Lundbeck.

(Fam. III. Desmacidonidæ.)

(Subfam. 1. Mycalinæ.)

(Group 2. Myxilleæ.)

Tedania Gray.

Of various shape, incrusting, massive, erect and leaf- or cup-shaped, or cylindrical, or finally more or less digitate and branched. The skeleton a more or less diffuse reticulation, generally multispicular, more rarely partly or quite unispicular. Spongin generally (or always) present, as a rule to a slight degree, sometimes more richly. The dermal skeleton as a rule formed of erect bundles of dermal spicules, sometimes also spicules lying horizontally in the dermis; it is sometimes strongly developed, sometimes weaker, with relatively few spicules. Oscula scattered, sometimes on the apex of tubes or papillæ; pores scattered or on the apex of papillæ or otherwise definitely localized. Spicula: megasclera: the skeletal spicules are smooth styli, the dermal spicules diactinal, tylota, tornota or strongyla, sometimes with slightly spined ends: microsclera only one form, rhaphides with unequal ends, finely spinulous, in dragmata or scattered.

1. T. suctoria O. Schmidt.

Pl. I, Figs. 1—5, Pl. IV, Fig. 1.

1870. *Tedania suctoria* O. Schmidt, Grundzüge einer Spongienf. des atlant. Gebiet. 43. Tab. V, Fig. 11.
1875. *Tedania increscens* O. Schmidt, Jahresb. d. Comm. zur wiss. Unters. deutsch. Meere in Kiel für 1872—73, 115.
1882. *Tedania suctoria*, Vosmaer, Niederl. Arch. f. Zool. Suppl. Band I, 42. Pl. I, fig. 24, Pl. III, figs. 83—88.
1885. — — , Vosmaer, Bijdr. tot. de Dierk. 12^te^ Afl. 3^die^ Gedeelt. 22.
1892. *Tedania conuligera* Topsent, Résultats des camp. sc. du Prince de Monaco, Fasc. II, 79, Pl. I, fig. 16.
1903. *Tedania increscens*, Thiele, Arch. für Naturgesch. 1903, I, 380. Taf. XXI, Fig. 9.
1904. *Tedania suctoria*, Topsent, l. c. Fasc. XXV, 176.
1909. — — , Lundbeck, Meddel. om Grønland, XXIX, 443.

Incrusting, massive, or more erect and sometimes somewhat branched. Surface more or less richly beset with papillæ and diffusely hispid. The dermal membrane somewhat solid, its skeleton weakly developed, consisting of bundles of dermal spicules, partly erect, partly more horizontal; also scattered

spicules. Oscula few, lying on special papillæ, pores on the summit of other papillæ. The skeleton a mainly polyspicular, diffuse and irregular reticulation. Spicula: megasclera: the skeletal spicules styli ·30—·68 *mm, the dermal spicules tylota* ·25—·47 *mm: microsclera one form, finely spinulous rhaphides with unequal ends* ·053—·50 *mm.*

Of this species we have a very rich material from the whole Ingolf territory. The individuals may have a very different aspect, but as a rule they are characterized by having a greater or smaller number of wart-shaped papillæ. In the typical and fully developed shape the species is massive, more or less roundish, lumpy and in greater or smaller extent attached to a substratum. From this roundish shape the species may show many variations, it may be elongated and assume a somewhat erect shape, and it may be club-shaped, lobate, compressed or more or less branched. The latter shape is no doubt due however, at all events partly, to the fact, that it incrusts, or originally has incrusted, branched Hydroids or Algæ, but in this case it seems to be able to continue its growth out in free, branched forms. The smallest and youngest specimens are incrusting and from this crust-shaped origin it may then by and by grow up to the massive shape, but it may also persevere as a crust and as such reach a considerable extent. In our material it is found growing on stones, various Bryozoa, worm-tubes, Algæ e. g. *Ptilota plumosa*, the specimen on this is branched, and finally on a crab. The largest specimen, which is of an elongated shape, has a length of about 40 mm; a massive, tuberous specimen is 30 mm in diameter; the incrusting specimens are generally small, but may, as said, reach a greater extent, up to 25 mm with a thickness not much over 1 mm. Topsent mentions and figures (l. c.) larger specimens, up to an extent of 9 cm, of typical massive shape. The colour (in spirit) is yellow or whitish yellow. The consistency is of medium firmness and somewhat elastic. The *surface* is more or less densely beset with papillæ, otherwise it is, when examined with a lens, somewhat diffusely hispid. In the larger, massive specimens the papillæ are generally present in great numbers, and the same is the case with the larger crusts; in the small incrustations the papillæ may be few or indistinct. The *dermal membrane* is a very solid and easily separable membrane; outermost it shows a thin, film-like layer, which under the microscope is seen to be curled or folded. It would seem that this layer in the living sponge is adhesive, as it generally shows adherent foreign particles such as diatoms in great multitude. *Oscula* and *pores:* as mentioned the surface is more or less richly beset with papillæ which are specially well developed in the larger specimens, while they are less developed in the small specimens. The papillæ are conical in their lower part, the upper part being cylindrical. They are seen from quite small warts up to a length of 4 mm; they are compressed and have a breadth up to 1·5 mm. These papillæ must be supposed to be partly oscular- and partly pore-papillæ, the fact is, that they show some difference. Some few of them are simply hollow and show an opening in the summit, their wall is thin and supported by dermal spicules which are more or less distinctly arranged as longitudinal bands; these papillæ must accordingly be taken to be oscular-papillæ. By far the most of the papillæ have another structure; they are hollow like the oscular-papillæ, but from the wall spicula fibres stretch into the lumen; these fibres may be branched upwards and terminate in the upper surface of the papillæ, which is thus supported by a number of spicular pillars. All the spicules in these fibres are dermal spicules. The papillæ show no opening at the summit. These papillæ must be supposed to be pore-papillæ, and probably the pores are found at their ends. The pores I have

not seen, but as the papillæ are nearly always somewhat contracted, it was also not to be expected, that the pores should be visible. The two kinds of papillæ are often recognisable already from their outer shape, the oscular papillæ being somewhat evenly conically pointed, while the pore-papillæ are more cylindrical in their outer part and have a stubby or cut end. Often, however, the papillæ are so strongly contracted, that it is not possible to distinguish them from each other so directly. In the dermal membrane outside the papillæ no pores were found. The structure mentioned of the papillæ has not been described hitherto, only Schmidt has some remarks about it, but he takes them all to be oscula. For the rest he speaks about the peculiarity of the dermal membrane, remarking that it consists of: "einer äusseren sarcodeartigen und einer inneren festen membranösen Schicht". From his description of the papillæ it is seen, that it is a pore-papilla he has examined, which are also by far the most numerous; the fact is that he says: "Das Ende der Wärzchen ist etwas verdickt, der Gipfel scheinbar geschlossen, allein eine mässige Vergrösserung zeigt, dass der Hauptcanal in einer Anzahl Haarcanälchen sich nach aussen öffnet". The "Haarcanälchen" Schmidt has seen are no doubt the inner cavity divided by the fibres, and his description is otherwise in the main correct, only he takes the papilla to be an oscular-papilla.

The *skeleton*. The *dermal skeleton:* the skeleton formed by the dermal spicules is not much developed, it consists of larger or smaller bundles of dermal spicules lying in the membrane, partly horizontally, partly more or less erect in the somewhat thick dermis; besides the bundles more scattered and single spicules may also occur, but they are on the whole scarce, and large parts of the membrane may be seen without dermal spicules. At the base of the papillæ they are present in greater numbers, and from here they stretch out in the wall of the papilla and form the skeleton of the papilla as mentioned above. The *main skeleton* is a rather diffuse and irregular, multispicular reticulation in which primary and secondary fibres cannot be discerned; also single spicules are in many places seen to contribute to the skeleton. In the points of union is seen a distinct and rather rich amount of spongin which may also sometimes be seen to continue along the fibres.

Spicula: a. *Megasclera.* 1. The skeletal spicules are styli, they have an even, generally slight curve, lying nearest to the rounded end. The apex may be somewhat different, partly in the same individual, but especially in different individuals; it is generally of moderate length, but it may be both shorter and longer, and it may be bounded by straight or curved lines; finally it may be marked off in different ways; in a single specimen the point is often rounded and thus stubby. The length of the styles may vary considerably, yet generally not much in the single individuals, but on the other hand in different individuals; in all it is in the species between 0·30 and 0·68 mm, but only when the sizes measured for all individuals are taken into consideration; as the common lengths may be given 0·42—0·53 mm. The diameter is on the whole 0·007 mm—0·014 mm, but here also some difference is present, in single specimens not reaching beyond 0·011—0·012 mm. 2. The dermal spicules are tylota, they are generally straight, sometimes slightly curved. They have a distinct, but often rather elongated swelling at each end as a rule passing evenly into the shaft; this latter is sometimes somewhat polytylote. Also with regard to this spicule the length varies somewhat from individual to individual and follows herein the variation of the styles; the length lies in all between 0·25 and 0·47 mm, generally it is 0·32—0·41 mm. The diameter is about 0·003—0·006 mm, but sometimes does not reach the latter size.

The fully developed tylotes have about equal ends, but single developmental stages were seen, distinctly showing, that the tylote originally is monactinal. b. *Microsclera;* there is only one form, rhaphides; they have the special shape which is probably common to all the rhaphides in the species of *Tedania.* One end is short and curiously, obliquely pointed, while the other end tapers into a long, very fine apex; otherwise they are spinulous which under a low magnification is only seen as an indistinct fine crenulation; under a greater magnifying power it is on the contrary seen, that they are distinctly spined, the spines being dentiform and strongly compressed in the longitudinal direction; the smaller rhaphides are the relatively most strongly spined (Pl. IV fig. 1 c.). The length varies to a very high degree in the single individual, and also somewhat from individual to individual; it is in all 0·053—0·50 mm, generally it is 0·060—0·32 mm. Whether these different sizes are developmental stages it is difficult to decide, but it is most probable, that they are, at all events for a great part, fully developed forms. To be sure all intermediate sizes are seen between the given sizes, but certain sizes seem to predominate and I am inclined to think, that three different, independent sizes are present (Pl. IV fig. 1 c.). When intermediate sizes are found between them, this may be due partly to the variation of the single sizes, but perhaps also partly to the fact, that a number of developmental stages are present among them. The thickness is, in relation to the length, about 0·0010—0·0028 mm; the latter thickness was only reached by the longest rhaphides and consequently not found in all individuals. The rhaphides occur in great multitude both in the dermis, and otherwise in the tissue of the sponge; they occur both in dragmata and singly and scattered; I have however only seen the large rhaphides in dragmata; all rhaphides in a bundle seem to have the equal ends turned in the same direction.

To show the variation in the length of the different spicules in various individuals and how the lengths with regard to all three forms of spicules are in the main related to each other I may give some measurements:

Styles	tylotes	rhapides
0·30—0·35 mm	0·25—0·32 mm	0·055—0·25 mm (small specimen).
0·35—0·47 mm	0·27—0·33 mm	0·053—0·29 mm
0·44—0·49 mm	0·31—0·38 mm	0·064—0·320 mm
0·43—0·53 mm	0·35—0·41 mm	0·064—0·329 mm
0·51—0·68 mm	0·35—0·47 mm	0·064—0·50 mm

Remarks: As Schmidt's type-specimen is found in my material, the identification is certain. I have also examined a type-specimen of *Tedania increscens* O. Schmidt, and have thus been able to decide with certainty, that this species is identical with *suctoria.* Thiele thinks l. c. that *increscens* might be a good species, because its styles are larger than the measurements given by Schmidt for *suctoria;* but the variations of the spicules given above show however, that from this no character can be drawn. Topsent himself (Rev. Suisse de Zool. IV, 1897, 454) has abolished *Tedania conuligera* as identical with *suctoria,* and his description also shows, that this is correct. The specific characters for the species of *Tedania* seem especially to lie in the shape of the dermal tylotes, and this is not astonishing, as the dermal spicules in other *Myxillæ* are also characteristic. Besides *T. suctoria* I have examined *T. digitata* O. Schmidt, *tenuicapitata* Ridl. and *massa* R. and D., and of these species I have examined specimens of *suctoria* from the whole Ingolf territory and from the Willem Barents

Expedition, and of *digitata* from Trieste, Senegal and the Antilles, and I have in these species found the dermal spicules characteristic and constant. *T. suctoria* has tylota with generally weak and elongated end-swellings, *T. digitata* has tylota with more or less weak end-swellings bearing some spines on the end, *T. tennicapitata* has tornota, and when Ridley and Dendy say (Chall. Rep. Monaxonida, 52), that the dermal spicules in this species may also have round end-swellings, but in a foot-note declare, that such spicules were only found in one specimen, in which also tornotes occurred, then no doubt a mistake or confusion must have taken place. Finally *T. massa* has dermal spicules which may best be termed strongyla but with a little mucro on the end, and the latter may be quite slightly swollen.

The rhaphides in the species of *Tedania* have been somewhat differently understood; Schmidt only mentions them as "feine umspitzige Nadeln", but does not mention, that they are spinulous; this fact is first stated by Ridley (Proc. Zool. Soc. 1881, 124) in the description of *T. tennicapitata* and in the same place the author explains, that such is also the case in a couple of Bowerbank's species (*aspera* and *rudis*) and in *suctoria* O. Schmidt; the author speakes of it as "roughness", and says that it is distinct from "spination" or "microspination". Later the fine spinulation of the rhaphides is mentioned by several authors as Carter, Ridley and Dendy, Lambe, Topsent, Lindgren and Thiele. In the four species I have examined, the rhaphides are mainly of the same shape, and they are always finely spinulous in all specimens; I take it therefore as very probable that the *Tedania*-rhaphides are always spinulous, and I consider it as certain, that smooth and spinulous rhaphides cannot occur in different individuals of the same species. Ridley describes originally the rhaphides in *T. tennicapitata* as "roughened almost imperceptibly", but in the Chall. Report it is declared, that the authors in the specimens which they then had for examination had only found spinulation of the rhaphides in one specimen and moreover only in a spiculum which was not fully developed; I have however examined specimens of *T. tennicapitata* from the Challenger Expedition and found the rhaphides spinulous; the spinulation is fine, but rather well distinguishable already by a magnifying power of 300; when the authors have seen the spinulation in a small spiculum, this is easily understood, as in the small rhaphides it is most distinct, and, as said above, it is also probable, that the small rhaphides are not developmental stages, but fully developed spicules. With regard to the rhaphides in *T. massa* the authors say: "they often exhibit a roughening of the surface..."; my examination of the species showed, that the rhaphides are always spinulous. About the rhaphides in *T. commixta*, *infundibuliformis* and *actiniiformis* Ridley and Dendy do not mention whether they are spinulous or not, but as spinulation is not mentioned, it has probably not been seen; it is yet undoubtedly present. Topsent records (Rev. Suisse de Zool. IV, 1897, 454) a *T. digitata* and says, that he refers it to this species, though it has spinulous rhaphides, which have not been described with regard to *T. digitata;* this however is not correct, as Carter already in 1886 (Ann. Mag. Nat. Hist. 5, XVII, 52) has declared, that the rhaphides in *T. digitata* are spinulous. Topsent is therefore of the opinion, that the rhaphides in *T. digitata*, and on account of the declaration of Ridley and Dendy, also in *massa* and *tennicapitata* and moreover in *suctoria*, are able to vary, being either smooth or spinulous; according to what has been said above it must be considered as certain, that they are always spinulous. A statement of Lindgren (Zool. Jahrb. XI, 1898, 299) about the variation in the species of *Tedania*

and which is based on the statement, that: "Topsent dargethan, dass die Raphides bei dieser Art sowohl glatt als auch stachelig sein können", therefore loses its relevancy. Thiele describes in 1903 (Abhandl. Senckenb. nat. Gesell. XXV, 945—947, Taf. XXVIII, Fig. 12—15) four new species of *Tedania;* about one of these is stated, that it has distinctly spinulous rhaphides, with regard to two others is said respectively "ziemlich glatt" and "kaum rauh"; only about the fourth it is said, that the rhaphides are smooth; I think that a sufficient magnifying power would show, that they all have spinulous rhaphides. In 1905 the same author further describes (Zool. Jahrb. VI, 430—33, Taf. 30, Fig. 50—53) four new species; these are declared to have spinulous rhaphides, only with regard to one this is not mentioned. With regard to the forms mentioned by Baer (Arch. für Naturgesch. 72, I, 1906, 17—19) as *T. digitata* varr. *sansibarensis, fragilis* and *conica* the rhaphides are only spoken of in a few words, and it is not said, that they are spinulous. Topsent describes (Bull. du Mus. d'hist. nat. 1907, 69, and Exp. Antarct. Fr. 1903—05, 30, Pl. V, fig. 6) a new species *T. Charcoti* and mentions, that the rhaphides are spinulous; they are present in two forms, of which one is shorter than the other and has a swelling near one end, a shape already noticed by Thiele for one of his species. — Finally I may note that the two species described by Kirkpatrick (Nat. Antarct. Exp. Nat. Hist. IV, 1908, 32—33) *variolosa* and *Coulmani*, and by the author referred to *Tedania*, are without rhaphides.

Still it must be noted, that Ridley and Dendy in the description of *T. actiniiformis* advance as probable the theory, that the rhaphides in this and in other species of *Tedania* are developmental stages of the dermal spicules; the special shape and the whole structure of the rhaphides, however, show with full certainty, that such cannot at all be the case, and besides the real developmental stages of the dermal spicules are not difficult to find.

Locality: Of this species we have a very large material from the whole Ingolf territory; station 27, 64° 54' Lat. N., 55° 10' Long. W., depth 393 fathoms; station 34, 65° 17' Lat. N., 54° 17' Long. W., depth 55 fathoms; station 46, 61° 32' Lat. N., 11° 36' Long. W., depth 720 fathoms; station 52, 63° 57' Lat. N., 13° 32' Long. W., depth 420 fathoms; station 54, 63° 08' Lat. N., 15° 40' Long. W., depth 691 fathoms; station 78, 60° 37' Lat. N., 27° 52' Long. W., depth 799 fathoms; station 87, 65° 02' Lat. N., 23° 56' Long. W., depth 110 fathoms; station 89, 64° 45' Lat. N., 27° 20' Long. W., depth 310 fathoms; station 94, 64° 56' Lat. N., 36° 19' Long. W., depth 204 fathoms; station 97, 65° 28' Lat. N., 27° 39' Long. W., depth 450 fathoms; station 127, 66° 33' Lat. N., 20° 05' Long. W., depth 44 fathoms; further it has been taken in the Davis Strait, depth 100 fathoms (Th. Holm), at East Greenland, depth 100 fathoms (Ryder), Axarfjord on Iceland, depth 20 fathoms, ("Beskytteren" Otterstrom), at the East coast of Iceland, depth 38 fathoms (Horring), Borgarfjord on Iceland, depth 85 fathoms, (Hallas, the type-specimen of Schmidt), on 64° 56' Lat. N., 11° 48' Long. W., depth 115 fathoms, East of the Faröe Islands, depth 220 fathoms, (Ad. Jensen, the cruise of "M. Sars" 1902), 64° 58' Lat. N., 12° 40' Long. W., depth 70 fathoms, (the fishery investigation steamer "Thor"); South-east of Nolso, depth about 70 fathoms, (Th. Mortensen), between the Faröe Islands and Shetland Islands, depth 255 fathoms (Wandel); in all about 25 larger and smaller specimens. The localities are situated in the Davis Strait, the Denmark Strait, North, East and South of Iceland, between Iceland and the Faröe Islands, at the latter and between these and the Shetland Islands.

Geogr. distr. The species has earlier been taken South-west of Bukenfjord, Norway, depth 106 fathoms (Schmidt), the Barents Sea, depths 112, 128 and 180 fathoms ("Willem Barent"), off New-

foundland, 46° 50' Lat. N., 50° 12' Long. W., depth 82 fathoms and at the Azores in depths of 318 and 664 fathoms (Topsent). The species is thus distributed between 74° 36' and 38° 35' Lat. N. and between 36° Long. E. and 56° Long. W. The bathymetrical range varies somewhat greatly, from 20 fathoms (Axarfjord, Iceland) to 799 fathoms (station 78, on the eastern slope of the Reykjanæs Ridge).

Histoderma Cart.

Sponges of more or less bladder-like consistence: the shape globular or roundish in the free, not attached forms, more flattened in the attached forms. The body provided with somewhat long tubular fistulæ, or with shorter or longer papillæ. An outer, solid dermal layer present, furnished with a skeleton of close-lying spicules. The skeleton of the inner body formed of partly regularly arranged, thin fibres, not forming a reticulation, or of more scattered spicules. Spongin not present. Spicula: megasclera only of one form, the same in the dermal layer and the inner body, they are diactinal, tylota, strongyla or tornota, sometimes the ends are unequal, the spicules then being tylostrongyla or tylotornata: microsclera: the characteristic microsclera are chelæ arcuatæ: to these sigmata are generally added, and further trichodragmata may occur: the sigmata may be of one or two sizes, and a peculiar small chela may occur (uaviculigerum).

1. **H. appendiculatum** Cart.

Pl. I Figs. 6—11, Pl. IV, Fig. 2.

1874. *Histoderma appendiculatum* Carter, Ann. Mag. Nat. Hist. 4. XIV, 220, Pl. XIV, figs. 23—25, Pl. XV, figs. 39 a—b.

Globular or more irregularly tuberous, provided with more or less numerous, tubular fistulæ: free, not attached. Surface smooth. The body surrounded by a solid, bladder-like dermal layer. Oscula in the apex of some of the fistulæ, pores in the apex of others. The dermal skeleton formed of close-lying, tangential spicules in several layers: the skeleton of the inner body consisting of thin fibres, running irregularly, being regular only at the surface and parallel with this: there are no transverse fibres. Spicula: megasclera tylota passing by intermediate stages into unequal-ended strongyla, 0·27—0·95^{mm}: microsclera two forms, chelæ arcuatæ 0·040—0·046^{mm}, sigmata 0·047—0·093^{mm}.

Of this curious and interesting species — the type on which Carter founded the genus — the Ingolf-Expedition has taken a somewhat rich material. The shape is in the whole as described by Carter; the sponge consists of a globular or tuberous body, from which some few shorter or longer tubular fistulæ issue. The body may be nearly quite globular, which especially seems to be the case with the smaller individuals, but generally it is of a more or less irregular shape, often somewhat flattened. The fistulæ are, in the specimens to hand, in most cases broken off, only some single ones are whole; they are cylindrical and straight or more or less curved, the sponge thus strongly reminds one of a potato with stolons; it grows freely, without attachment. The body has in the largest specimen a diameter of 20^{mm} and in the smallest of 8^{mm}; the length of the undamaged fistulæ is about 25^{mm}, they are of the same length in the small as in the large specimens, while on the other hand the

thickness is somewhat different, from 2 to 4^{mm} in proportion to the size of the specimen. The colour is (in spirit) yellowish white. The consistency is hard and firm, the dermal rind forming a very firm layer, the inner body on the contrary is soft; in most specimens the inner body has therefore contracted strongly under the influence of the alcohol and lies like a clump in one side of the firm capsule formed of the dermal layer. By exsiccation the tissue of the inner body contracts strongly, becomes hard and of a yellow colour, so that it resembles wax, just as is mentioned with regard to the tissue of the inner body in *Oceanapia robusta* (The Ingolf-Expedition VI, 1, Porifera, part I, 79). The *surface* is smooth, only showing such a slight roughness as may be caused by the spicules imbedded in the dermal layer and parallel to the surface. The sponge has outermost a very solid *dermal layer* of a thickness of about 0·25^{mm}; in places it may become thicker, up to 1^{mm}; it surrounds the inner body like a mail and is very easily loosened from it, and contains close-lying spicules in several layers. *Pores* and *oscula:* Carter says: "Pores and vents not distinctly seen, but probably situated at the extremities of the tubuli respectively". This is also the case, but I too cannot solve the question with full certainty, because most of the tubular appendages are broken off. The oscula are certainly situated at the end of some of the fistulæ; these latter are tubular, hollow and somewhat thin-walled; a couple of them give the impression of being undamaged, and these terminate with a simple opening which in consequence should be the osculum; a couple of the fistulæ terminate with a formation quite as described by Carter, it is with a conical spout, placed at the end of the fistula; whether this is possibly the normal, closed osculum I do not venture to decide. Of poriferous fistulæ there is in the material only one present, a loose tube which is broken off and has a length of 20^{mm}; this tube shows, that the fistulæ become more thin-walled outwards, and that the skeleton in the wall becomes more scattered. The end of the fistula is rounded and forms a slightly swollen knob of a length of about 2·5^{mm}; in this knob the skeleton of the wall is transformed and passes into the formation of a reticulation, in the meshes of which the pores are situated (Pl. I, fig. 11); the pores are oval or circular, of a diameter of 0·047—0·17^{mm}. In the dermal layer on the other parts of the body no pores are found. — As mentioned the inner body is inclined to get strongly contracted in alcohol and become hard and brittle, and there is then a large hollow space inside the dermal layer. But in single cases the inner body has on the contrary preserved its original shape and consistency; it then quite fills out the cavity formed by the dermal layer. When a section is made of such a well preserved specimen, the canal system is shown; some large canals are seen terminating in some of the tubes, and thus shown to be excurrent canals (Pl. I, fig. 8); besides, a multitude of smaller canals are seen. The inner body lies quite loose in the cavity within the dermal rind, and it seems only to be attached at the points where the fistulæ issue; thus there are extended spaces below the dermal layer. The lumen of the fistulæ is not directly continued into the canals of the inner body, as there is a diaphragm present at the origin of the fistulæ; this diaphragm has in some cases a circular opening in the centre, but it seemed in other cases to be quite closed. When the dermal rind is removed, the surface of the inner body is shown; this surface is then quite undamaged, and it has the netted appearance which is so often seen on the surface of species of *Reniera* (Pl. I, fig. 9); on examining a specimen which wanted the dermal layer, one might, therefore, think that it must be an entire and undamaged sponge. The netted appearance of the surface is due to the same cause as in the species of

Reniera, being caused by the close-lying, circular openings of the incurrent canals which shine through the thin, transparent outer layer, in which there are fine pores leading to the canals. The poriferous fistulæ probably do not lead into canals, but are in connection with the space below the dermal layer; perhaps it is these fistulæ whose diaphragm shows no opening in the centre. The course of the water-current will then probably be: it passes in through the poriferous fistulæ into the space below the dermal layer, from here through the pore-shaped openings on the surface of the inner body and into the canal system, then in due course passing into the larger canals and finally out through the oscular fistulæ.

The *skeleton*. The *dermal skeleton:* the outer rind is highly provided with spicules lying very closely and in several layers, parallel to the surface; the spicules are not scattered, but arranged somewhat circularly round the bases of the fistulæ, as is already distinctly visible with a lens; on the inner side of the rind there are some spicules which lie singly and rectangularly to the direction of the other spicules, and thus more or less radiating in relation to the circlets. In the fistulæ the ring-like arrangement of the spicules is retained, which is the cause why the fistulæ are very easily broken; some fine fibres, consisting of few spicules, run lengthwise out through the fistulæ, lying on the inside of the wall, and continue from the base to the end of the fistulæ in longitudinal direction; these fibres do not belong to the dermal skeleton, in so far as they are not found in the dermal layer of the body, on the contrary they issue from the inner body, and they are probably of importance in attaching it, and thus it is that the inner body, as said above, is attached only at the bases of the fistulæ. In the ends of the fistulæ the dermal skeleton gets more scattered, and in the oscular fistulæ the spicules are here irregularly scattered, crossing each other, while in the poriferous fistulæ the skeleton outwards first becomes somewhat scattered, but outermost forms a reticulation. The *main skeleton* or the skeleton of the inner body: In the inner body some fine fibres are found, but they have no regular course and form no reticulation; they seem mainly to run in directions parallel to the surface. At the very surface of the inner body such fibres are found numerously, running just below the surface and parallel with this, and they show a definite arrangement. They run together at the bases of the fistulæ and continue, as said before, out in the fistulæ; as they radiate from the base of the fistulæ out in the surface, they become in the larger part of this parallel with each other, but at places where the systems belonging to different fistulæ meet, the fibres run in different directions. Transverse fibres are not found, and thus there is no reticulation formed. The fibres are somewhat loose, they have an average thickness of 0·05^{mm}, and the distance between them is generally 0·15–0·25^{mm}. — It was said above, that the inner body lies loose in the cavity of the dermal layer; as the fibres mentioned continue from the fistulæ inwards and form a carpentry along the surface of the inner body, this latter is in reality kept in its place by this carpentry, otherwise lying freely in the cavity and only attached at the bases of the fistulæ. — Spongin was not observed, neither in the inner skeleton nor in the dermal skeleton. — Carter has not seen the construction of the skeleton of the inner body; in his material the inner body has probably been destroyed. Both in the dermal layer and in the inner body many foreign particles are imbedded, especially Globigerinae.

Spicula: a. *Megasclera:* these are only of one form, tylotes, but with some single intermediates

to strongyles. They are more or less curved, but rather slightly; the shaft is thickest at the middle and tapers somewhat towards the ends. The spicules vary very much in size, and at the same time somewhat in shape; the smaller and thinner they are, the more distinct are the end-swellings; these smaller spicules have equal or nearly equal ends; the larger and thicker the spicules are, the smaller are relatively the end-swellings, so that in the largest of the spicules they may be only slightly pronounced; in the largest spicules the ends are most often not equal, one has a somewhat roundish swelling the other an elongated swelling tapering slightly outwards; not rarely the swellings quite disappear, and then we get a strongyle with unequal ends, one rounded the other more tapering, nearly truncately pointed. The various sizes must be taken to be fully developed spicules, since fine developmental stages in various lengths are found; the developmental stages have unequal ends, the shaft being a little thicker in one end but a little thinner in the other, and here with a more marked swelling. Quite single very fine developmental stages were found, which had one end quite pointed. The length of the spicules is in all 0·27—0·95^{mm}, with a diameter of 0·005—0·021^{mm}. The length of the spicules is different in the different parts of the sponge; in the dermal layer the largest are found, while the smaller and smallest are found in the inner body, the separation is however not quite sharp. In the inner body they generally do not exceed 0·60^{mm}, and about at the same size also lies the lower limit for the spicules of the dermal layer. In the skeleton of the fistulæ large and small spicules are mingled. In the fibres running along the surface of the inner body the spicules belong for the most part to the larger forms of the group with the smaller spicules, and among them some of the largest spicules are found, and with this composition the fibres continue out through the fistulæ. Carter mentions and figures two forms of megasclera; to this result he arrives only by taking a pronounced tylote and a form without end-swellings, and in which one end is truncately pointed; a form such as his figure 39 a may be found, but not frequently, and there is, as said, only one kind of megasclera. b. *Microsclera:* there are two forms, chelæ arcuatæ and sigmata. 1. The chelæ arcuatæ have an evenly curved shaft, lobe-shaped alæ and an elliptical tooth; their length is 0·040—0·046^{mm} and the diameter of the shaft is 0·004^{mm}. 2. The sigmata are of common shape and more or less contorted; they are rather large, but they vary somewhat in size, the length is 0·047—0·093^{mm} and the thickness 0·0028—0·0057^{mm}. The microsclera are present through the whole sponge, they are scattered in the inner body and in the dermal layer strewn rather numerously among the megascleres, and they are specially numerous on the inside of the fistulæ; the sigmates are everywhere more numerous than the chelæ.

Embryos. In one of the specimens which was cut through an embryo was found, lying in a cavity in the inner body. It was globular and rather large, 3^{mm} in diameter. It was lying in the cavity distinctly surrounded by a membrane. It was richly provided with spicules, both megasclera and microsclera. The megasclera were fine tylotes of a greatest length of about 0·47^{mm}, many of them were very thin and had still one end pointed. They were scattered in the interior of the embryo, but they were already close-lying at the surface and parallel to this, thus forming a layer with however no boundary inwards. The microsclera were developmental forms of chelæ in various stages, they were of somewhat different sizes, but reached a length of up to 0·057^{mm}, thus to a greater size than in the fully developed sponge. Sigmates were not seen.

We have a specimen of this species which I at first thought was a distinct form on account of its smaller spicules, but which on closer examination proved to be a very young specimen of *appendiculatum*. The specimen is globular, with a single fistula, and very small, about 3 mm in diameter, and thus not larger than the examined embryo. It shows quite the same structure as the full-grown specimens; it has a distinct dermal layer with subdermal cavities below, and also distinctly shows the skeletal structure of the inner body. The specimen is interesting in showing, that such small specimens may have considerably smaller spicules than the grown specimens. It is yet no doubt only the very small specimens which show in this respect any difference worth mentioning, and it is certainly the case, that they very soon get spicules of the size normal to the species. The examined specimen has probably just left the mother-sponge. The megacleres do not reach beyond 0·41 mm, the chelæ are 0·050 mm, and the sigmates are of the same sizes as in the full grown sponge. It is interesting to notice, that the chelæ in this specimen are intermediate in size between the chelæ in the embryo and those in the grown sponge. The relatively long and fine megascleres in the embryo seem here to be replaced by shorter but thicker spicules.

Locality: Station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms, about 29 more or less damaged specimens; station 90, 64° 45′ Lat. N., 29° 06′ Long. W., depth 568 fathoms, two specimens and some loose fistulæ: further at 61° 15′ Lat. N., 9° 35′ Long. W., depth 478 fathoms, a very small specimen (The fishery investigation steamer "Thor"). The localities are situated on the eastern slope of the Reykjanæs Ridge, in the Denmark Strait and West of the Faröe Islands.

Geogr. distr.: Carter had the species from the west coast of Ireland, depths 808 and 109 fathoms. (Porcupine).

2. **H. physa** O. Schmidt.

Pl. I Figs. 12—13, Pl. IV, Fig. 3.

1875. *Desmacidon physa* O. Schmidt, Jahresber. der Comm. zur wissensch. Unters. deutsch. Meere in Kiel für 1872—73, 118, Taf. I. Fig. 8—9.
1887. *Cornultum ascidioides* Fristedt, Vega Exp. wetensk. Jakttag. IV, 495, Pl. 25, figs. 1—2, pl. 29, fig. 21.
1903. *Histoderma physa*, Arnesen, Berg. Mus. Aarbog 1903, 16, Taf. II, Fig. 5, Taf. III, Fig. 9.
1903. — — , Thiele, Arch. für Naturgesch. Jahrg. 1903, 385, Taf. XXI, Fig. 16 a—b.
1909. — — , Lundbeck, Meddel. om Grönland, XXIX, 443.

Roundish or more irregular, sometimes somewhat erect, attached with a broad base: provided with one or a couple of conical spouts. Surface smooth. The sponge surrounded by a solid, but not thick, bladdery dermal layer. Oscula at the summit of the conical spouts, the pores on the side of these. The dermal skeleton formed of close-lying spicules parallel to the surface. The skeleton of the inner body consisting of fine fibres and bundles of spicules, running irregularly, but at the surface parallel with this: without transverse fibres. Spicula: Megasclera strongyla with intermediates to subtylota, 0·50—0·89 mm; microsclera of two forms, chelæ arcuate 0·035—0·058 mm, trichodragmata 0·11—0·12 mm.

This species has a shape mainly as described by Schmidt. It consists (on account of contraction or destruction of the inner body) of a bladder, formed of the dermal layer. This bladder may

be more or less roundish or of a more irregular, sometimes somewhat erect shape. The largest specimen in my material has a greatest extent of fully 30^{mm}; it has two spout-shaped tubes and a height of 18^{mm} from the base to the end of the tubes; the smallest specimen has an extent of about 5^{mm}. My specimens are attached to stones with a broad base, one is growing on a crab. The consistency of the outer layer is firm and hard; the inner body is brittle; in all specimens the latter is contracted and forms only a clump at the base of the bladder, and the same can be seen to have been the case with the specimen figured by Schmidt. The colour (in spirit) is whitish. The *surface* is smooth. Outermost is found the *dermal layer*, it is constructed mainly in the same way as in the preceding species, and has a thickness of about 0·15^{mm}. *Pores* and *oscula:* My specimens are all in a rather bad condition, so that the examination of the arrangement of the pores and oscula, which would seem to be rather interesting, may be somewhat deficient, and as the inner body is destroyed, we get from this no information about the canal system. Only the largest specimen is in such a condition, that it gives some information about pores and oscula, and I think, that the structures shown by this specimen are typical for the species, especially as the figure given by Schmidt seems to show a quite similar structure. This specimen has, as said, two tubular or conical spouts, formed of the dermal layer; these spouts have a shape as shown on Pl. I figs. 12—13. The osculum is found as a simple opening at the summit of the conical end part of the spout; the spicules of the dermal layer lie parallel with each other here and with one end towards the oscular opening. On the side of the tube is found a circular opening, surrounded by a low, projecting wall; the opening is covered by the poriferous membrane. The skeleton of the dermal layer forms here a reticulation, as fibres go inwards from the edge of the wall and support the membrane. The pores are numerously present in the membrane, they are small, of an average diameter of 0·06^{mm}.

The *skeleton.* The *dermal skeleton:* as in the preceding species we find outermost a firm dermal rind which, however, in the present species is somewhat thinner and less solid than in *appendiculatum.* It is provided with close-lying spicules parallel to the surface, and the spicules lie in several layers; they are mainly more or less parallel to each other, but there are also, especially on both surfaces of the layer, spicules present, both in bundles and lying singly, which are scattered and cross the other spicules in all directions. The *main skeleton:* on account of the condition of the material I have only been able to examine the skeleton of the inner body somewhat incompletely, it seems however to be constructed quite as in *appendiculatum;* in the interior there are fibres and bundles, and at the surface there are parallel fibres without transverse fibres; the fibres were measured to a thickness of 0·08^{mm} with a distance between them of 0·29^{mm}. Spongin is not present in the skeleton.

Spicula. a. *Megasclera;* these are of one form, strongyles, sometimes approaching to subtylotes; they are slightly curved, generally irregularly and most frequently doubly. They are fusiform, tapering somewhat towards each end. The length when all examined specimens are considered is 0·50—0·89^{mm}, and the thickness 0·008—0·020^{mm}, but in the single individuals they do not vary so much, as examples may be given 0·50—0·74^{mm} with thickness of 0·008—0·015^{mm} and 0·62—0·89^{mm} with thickness of 0·010—0·020^{mm}. Fine developmental stages are seen singly, the finest are monactinal. b. *Microsclera:* these are of two forms, chelæ arcuatæ and trichodragmata. 1. The chelæ arcuatæ are of the common shape,

the shaft not much curved with the curvature mainly lying in the middle, the alæ and tooth are of the same length, the tooth narrowly elliptical with a long, narrow tuberculum. In all the length is between 0·035 and 0·058 mm with a diameter of the shaft of 0·0028—0·007 mm, but the chelæ also vary somewhat in different individuals, e. g. 0·035—0·043 mm, 0·045—0·054 mm and 0·050—0·058 mm, and the diameter of the shaft may be 0·0028—0·004 mm and 0·004—0·007 mm. 2. The trichodragmata; the single rhaphides are exceedingly, nearly immeasurably fine, less than 0·0006 mm, the bundles have a length of 0·11—0·12 mm and a thickness of about 0·021—0·035 mm, the single rhaphides were measured to a length of about 0·10 mm. The rhaphides seem not to occur singly, but only in bundles. The chelæ occur both in the dermal layer and in the inner body, here rather unmerously, the trichodragmata are mainly seen in the inner body at its surface.

The identification of this, otherwise rather characteristic species, is certain, as I have examined a piece of one of Schmidt's type-specimens. Also of the *Cornulum ascidioides* Fristedt I have examined a type-specimen and thus been able to decide, that this is the present species; Fristedt has overlooked the trichodragmates, and the length, 0·07 mm, he gives for the chelæ is erroneous, as in his type-specimen I found the chelæ to be of a length of 0·058 mm.

Locality. Station 6, 63° 43' Lat. N., 14° 34' Long. W., depth 90 fathoms; station 16, 65° 43' Lat. N., 26° 58' Long. W., depth 250 fathoms; station 89, 64° 45' Lat. N., 27° 20' Long. W., depth 310 fathoms; station 94, 64° 56' Lat. N., 39° 19' Long. W., depth 204 fathoms; station 97, 65° 28' Lat. N., 27° 39' Long. W., depth 450 fathoms; further the species has been taken at 62° 26' Lat. N., 4° 49' Long. W., depth 228 fathoms and 62° 53' Lat. N., 9° 06' Long. W., depth 245 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902); seven specimens or fragments in all. The localities are situated in the Denmark Strait and between Icelands and the Faröe Islands.

Geogr. distr. The species has earlier been taken South-west of Bukenfjord, Norway, depth 106 fathoms (Schmidt), Ostfjord at Bergen, depth 292 fathoms (Arnesen), and in Baffin Bay 68° 08' Lat. N., 58° 47' Long. W., depth 169—183 fathoms (Fristedt). The southern limit of the species is thus at 59° Lat. N.

Histodermella nov. gen.

Sponges which in appearance and structure are like Histoderma: the consistency more or less bladder-like. The shape varies from round or roundish forms through longish to tube-shaped, often slightly branched forms; the body provided with shorter or longer tube-shaped fistulæ, or with shorter papillæ. The sponge surrounded by an outer, very solid dermal layer with close-lying spicules parallel to the surface. The skeleton of the inner body consisting of scattered spicules or irregular fibres, sometimes more regular at the surface, but not forming a reticulation. Spongin not present. Spicula: megasclera of two forms, but these are intermingled so that the spicules are the same in the dermal layer and the inner body; the megasclera are diactinal, of the two forms one is smooth, the other spined; the smooth megasclera are tylota or strongyla, sometimes with the ends finely spined, the spined megasclera are acanthoxea or acanthostrongyla. Microsclera may vary somewhat in composition, the characteristic microsclera are chelæ arcuatæ, to these are added sigmata, and further trichodragmata may occur and besides (natalensis) curious spined bodies (transformed chelæ? or forcipes?). Microsclera may be quite absent.

1. **H. Ingolfi** n. sp.

Pl. II, Figs. 1—4, Pl. IV, Fig. 4.

Of somewhat various shape, more or less roundish with a number of tubiform fistulæ which may be branched; or of more irregular shape, showing several swellings or finally quite without swellings; growing freely without attachment. Surface smooth. Outermost a solid, bladder-like dermal layer. Oscula at the summit of some of the fistulæ, (pores at the summit of others?). The skeleton of the dermal layer formed of close-lying spicules parallel with the surface; the inner skeleton consisting of fine, irregularly running fibres, which are regularly arranged at the surface parallel with this, without transverse fibres. Spicula: megasclera of two forms, tylota 0·29—0·65 mm, acanthoxea 0·17—0·21 mm; microsclera two forms, chelæ arcuatæ 0·021—0·028 mm, sigmata 0·056—0·061 mm.

This species in its exterior shape somewhat recalls *Histoderma appendiculatum*, but it is generally less regular. Most frequently it consists of a more or less roundish body with a varying number of tube-shaped appendages. These appendages or fistulæ may vary much in length and thickness, and there are often, besides the larger, also some short and thin fistulæ; these may be branched in different ways, and they may be more or less curved; the appendages also may form swellings, the sponge in this case consisting of more than one roundish swollen part connected by the appendages. Finally there are specimens which have no pronounced swelling, or no swelling at all, the sponge then consisting of a somewhat sinuous, slightly branched tube of somewhat different thickness in different places. In the largest specimen the body has a diameter of fully 20 mm, the longest fistula has a length of 42 mm and its thickness is 4 mm; then we have specimens in all sizes down to quite small, the smallest one has a body with a diameter of 2·5 mm and a fistula of a length of 14 mm and a thickness of 1·7 mm. The sponge grows freely without any attachment. The colour (in spirit) is yellowish white. The consistency is somewhat bladder-like, the outer layer is hard and firm, the inner body brittle, the latter is as usually highly contracted, so that it only occupies a small part of the cavity within the dermal rind. The *surface* is mainly smooth, yet the ends of the tangential spicules of the dermal layer may sometimes be a little projecting. The sponge is outermost surrounded by a solid and hard *dermal layer*, formed of close-lying spicules, the layer has a thickness of about 0·2 mm. *Oscula* and *pores:* A part of the fistulæ are distinctly seen to be oscular fistulæ, they terminate with a simple opening, or they are in most cases more or less closed and terminate in a conically pointed part which is either quite closed or shows an opening at the summit. Pores I have not observed, but they are certainly placed at the end of some of the fistulæ; in my material however the outer part of these is often broken off; at all events pores are not found otherwise on the body. The inner body is in nearly all specimens strongly contracted or quite destroyed, yet in some single specimens it may be seen to have had a surface as in *Histoderma appendiculatum*, with pores leading into canals; the direction of the water-current therefore is probably the same as in that species.

The *skeleton*. The *dermal skeleton:* the skeleton of the dermal layer is constructed as in *H. appendiculatum:* it consists of close-lying tangential spicules in several layers, the spicules are more or less circularly arranged around the bases of the fistulæ, and here likewise, especially on the inside of the layer, we find spicules which lie at right angles to the others, these latter spicules

being for a great part spined oxea. The skeleton of the fistulæ is also here arranged ring-like, but outwards it soon becomes more irregular and scattered; fibres running through the fistulæ in longitudinal direction are not found here, or they are at all events only very little pronounced and soon dissolved into spicules lying more scattered in the longitudinal direction. The *skeleton of the inner body* is constructed quite as in *H. appendiculatum:* there are fine, parallel fibres running along the surface and without connecting transverse fibres, and they run together at the bases of the fistulæ, some of them may continue out in the fistulæ; in the interior of the inner body similar fibres are found, but they are scattered without observable order; besides there is found a number of single, scattered spicules, which for a great part are spined oxea. Spongin could not be observed in the skeleton.

Spicula: a. *Megasclera:* these are of two forms, tylota and acanthoxea. 1. The tylota are straight or slightly curved, they have a well developed swelling at either end, the shaft is thickest in the middle. The length varies much, from 0·29—0·65 mm, with a diameter of the shaft relatively of 0·007—0·017 mm. Some developmental stages are found down to quite fine, the thinnest of them are monactinal, the older show one end rounded or slightly swollen, while the other end has a pointed swelling which represents the original apex, and the shaft is thinnest at this end. There is no difference between the tylotes in the dermal layer and those in the inner body, but the developmental stages are found in the interior. 2. The spined oxea or acanthoxea are curious and characteristic spicules; they are straight or quite slightly curved, and relatively short and thick, the points are middle-long and sharp; the spicule is coarsely spined in the whole length, only the points are smooth to a greater or smaller extent. The length varies from 0·17—0·21 mm and the diameter from 0·008—0·014. Some single developmental stages were seen, the thinnest of them slightly spined, these had a thickness of 0·004 mm. The tylotes form the dermal layer and the fibres in the inner body are also found scattered singly in the interior; the spined oxea are seen scattered singly in the dermal layer, but are for the rest present, as said, on the inner side of the layer, lying at right angles to the other spicules, further they are found scattered in the inner body. b. *Microsclera;* these are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ are somewhat small, they have a slightly curved shaft, the alæ are incised below and drawn out in a point, the tooth is narrow. The length is 0·021—0·028 mm, and the thickness of the shaft about 0·002 mm. Chelæ of somewhat deformed shape were not infrequent. 2. The sigmata are rather fine, they are contorted generally about a quarter of a turn; the length is 0·056—0·061 mm and the thickness 0·002—0·0028 mm. The microscleres occur on the inside of the dermal layer and in the inner body, but they are on the whole not numerous.

"*Cellules spheruleuses*". In this species the so-called cellules spheruleuses occur, often in enormous numbers; they occur especially on the inside of the dermal layer and the fistulæ and in the inner body, chiefly at the surface of the latter. They are roundish or more elongate and filled with relatively large, refracting granules; their size is generally 0·011—0·017 mm. Sometimes they are somewhat confluent to larger heaps of granules.

Locality: The species has only been taken on station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms, on the eastern slope of the Reykjanæs Ridge; a somewhat large number of specimens.

2. **H. coriacea** n. sp.

Pl. II, Figs. 5–6, Pl. IV, Fig. 5.

Elongate, somewhat fusiform, sometimes cylindrical or more irregular and somewhat branched; provided with generally short, papilla-shaped fistulæ in greater or smaller number. Growing freely, without attachment. Surface somewhat rough, but without projecting spicules. The sponge is surrounded by a very solid dermal layer. Oscula and pores each at the summit of their own papillæ. The dermal skeleton formed of close-lying, tangential spicules. The skeleton of the inner body consisting of scattered spicules. Spicula: megasclera of two forms, strongyla with spinulous ends 0·24–1·02^{mm}, acanthostrongyla 0·12–0·238^{mm}. No microsclera.

This species has an exterior which certainly resembles that of the preceding species but however is somewhat different, and it is larger and more robust. It consists of a body with fistulæ, but the body is never globular but elongated, generally somewhat fusiform, thickest in the middle and somewhat tapering towards the ends; it is otherwise generally more or less irregular. Sometimes it is not fusiform, and the sponge is then nearly cylindrical; sometimes it is somewhat branched. The fistulæ are generally rather short, often nearly papilliform and they are for the rest very irregular both in shape and arrangement, and they may also be branched. When they are somewhat larger they appear as branches, so that the sponge then assumes the branched shape. Most of my specimens are somewhat damaged, but to judge from not damaged specimens the species is not attached, but grows freely, which is also by far the most probable. The largest specimen, which is not quite entire, has a length of about 100^{mm} and a greatest thickness of 17^{mm}; the other specimens are somewhat smaller, down to about 50^{mm} in length. The colour (in spirit) is in most specimens whitish grey or dirty greyish violet, the inner body is darker than the dermal layer and is obscurely reddish violet; some of the smallest specimens are nearly quite white, but also in these the inner body is somewhat darker. Whether the colour is original or due to the influence of alcohol has not been observed. The consistency is, on account of the very thick dermal rind, very firm, the inner body is also in its present condition rather firm, but brittle; it is strongly contracted and lies generally up to one side of the dermal layer. The *surface* cannot be termed smooth as the close-lying spicules cause it to be rough both to the sight and to the touch, but it has no projecting spicules. The sponge is outermost surrounded by a very solid and hard *dermal layer*, provided with close-lying spicules; this layer is very thick, from 0·4–0·8^{mm}. *Pores* and *oscula:* Some of the fistulæ or papillæ are oscular papillæ; they are distinguished by their conical shape, pointed towards the end, with an oscular opening at the summit. The papilliform ends of the sponge-body itself are oscular papillæ. From the oscular opening a canal, which is surrounded by a film-like membrane, leads down into the body. The other papillæ, which bear no oscula, are pore-papillæ. These fistulæ or papillæ are of a different shape from the oscular papillæ, they have rounded ends which are as a rule a little swollen; they are present in greater numbers than the oscular papillæ. The pores are only present in the outermost, rounded end-part of the papillæ. In the middle, through the interior tissue of the papilla, runs a canal which in the outer end-part of the papilla is divided into branches; these branches go to the surface and are the incurrent canals into which the pores lead; these latter are lying in an irregular reticulation

and they have a diameter of 0·036—0·10 mm. The circulation of the water-current is then the same, as was mentioned under *H. appendiculatum:* there is also here a space below the dermal rind, and in a section of the inner body parallel with the surface the small, round incurrent openings to the canals are, under the microscope, seen lying very closely.

The *skeleton.* The *dermal skeleton:* the skeleton of the dermal layer is formed of close-lying, tangential spicules, which lie in several layers and form a solid and protective rind. The greatest part of the spicules lie parallel to each other in a direction which goes more or less distinctly circularly round the sponge, thus the spicules lie at right angles to the longitudinal direction of the body of the sponge; at the same time they are, in the environs of the fistulæ, arranged ring-like around the bases of these. When the surface is undamaged, there is outermost a layer of more loose-lying spicules which lie crossing each other in all directions; between the regularly arranged spicules of the layer there are spicules placed at right angles to the others. A section through the layer parallel to the ring-like arranged spicules will thus show entire spicules lying parallel to each other on the inside, and cut, irregularly lying spicules on the outside. The spined strongyla occur especially at the outer side. The skeleton in the fistulæ is ring-like arranged at the base, but outwards it passes soon into an irregular skeleton with spicules intercrossing in all directions; in the oscular fistulæ the spicules are in the conical summit arranged parallel to the longitudinal direction and with one end towards the oscular opening; in the pore-fistulæ there is at the end an irregular reticulation, in the meshes of which the pores lie. The *skeleton of the inner body* is difficult to get a clear idea of on account of the brittleness and contracted condition of the tissue, and also on account of its very dark colour. It is however not regular as in the preceding species, but seems only to consist of scattered spicules; at the surface they are present in greatest numbers while they are much scattered in the interior, and they are on the whole not numerous. Spongin is not present in the skeleton.

Spicula: a. *Megasclera:* these are of two forms, smooth strongyla and acanthostrongyla. 1. The smooth strongyla are straight, more rarely quite slightly curved, they are thickest in the middle and taper slightly towards the rounded ends, which latter sometimes may be quite slightly swollen. The ends are very finely spinulous on the rounded part; the spinulation may be very little apparent but is generally rather distinct, it is most obvious on the smaller spicules. The length varies much, from 0·24 mm and up to 1·02 mm, and the thickness is 0·008—0·021 mm. In the dermal layer strongyla of all sizes are found, the larger are present in greatest numbers, in the inner body on the contrary only the smaller forms are found, up to a length of 0·47 mm, but at the surface of the inner body they are somewhat larger up to 0·71 mm. 2. The acanthostrongyla or spined strongyla are relatively short and thick; they are generally sligtly curved, coarsely spined strongyla, sometimes each end terminates in a point, but as this is not, or only very slightly, larger than the other spines, it must be taken as such and the spicule must be termed a strongyle. The length is about 0·12—0·238 mm, the shortest forms occur most rarely, the thickness is 0·011—0·017 mm. The acanthostrongyla occur both in the dermal layer and the inner body scattered between the other spicules; in the dermal layer they are especially present towards the outer side. *Microsclera* are not present.

Locality: This is the same as for the preceding species, viz. station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms.

This species seems to be very like *Phlocodictyon hirotuliferum* Cart. (Ann. Mag. Nat. Hist. 5, XVIII, 447), to judge from Carter's figure and description. This resemblance however is probably only an analogy, without consequence in regard to affinity of the species (see below under the remarks about the species of the genera in question).

The two *Histodermella* species established here, *Ingolfi* and *coriacea*, are certainly rather nearly related to each other; the outer shape, the dermal rind and the arrangement of the canal system are in agreement; the differences lie mainly in the construction of the skeleton of the inner body and the shape of the spined megasclera as also in the absence of microsclera in one species.

Inflatella O. Schmidt.

(Joyeuxia Topsent.)

The shape roundish or the sponge more or less club-shaped, sometimes pedunculated. The consistency bladder-like. The body provided with more or less numerous papillæ. An outer, solid dermal layer present, with a skeleton of close-lying spicules; the skeleton in the inner body weak, consisting of thin fibres, not forming any reticulation. Spongin not present. Spicula: Megasclera of one form, diactinal, strongyla; microsclera not present.

1. **I. pellicula** O. Schmidt.

Pl. II, Figs. 7—9, Pl. IV, Fig. 6.

1875. *Inflatella pellicula* O. Schmidt, Jahresber. der Comm. zur wissensch. Unters. der deutsch. Meer. in Kiel für 1872—73, 117, Taf. I, Fig. 5.

1885. *Reniera inflata* Armauer Hansen, The Norwegian North-Atlant. Exp. XIII, Spongiadæ, 7, Pl. I, fig. 4.

1903. *Inflatella pellicula*, Thiele, Arch. für Naturgesch., 1903, 385, Taf. XXI, Fig. 17.

1904. *Joyeuxia viridis* Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 205, Pl. III, fig. 12.

Club- or pear-shaped, pedunculated, with some few conical papillæ above. The surface smooth. The sponge surrounded by a solid dermal layer. Oscula and pores at the summit of the papillæ. The dermal skeleton formed of close-lying, tangential spicules; the inner skeleton consisting of bundles or loose fibres. Spicula: Megasclera strongyla 0·42—0·64 mm.

The outer shape of this species is somewhat well known from the descriptions cited. It is elongate, pear-shaped and is attached below by a shorter or longer peduncle to a substratum. The peduncle may with regard to the manner of fixation be somewhat various; either it is only fixed by means of a little dilatation, or it emits stolons which may shoot out at various heights, and each of which has its own attachment. This is already mentioned by Schmidt l. c. Of the figures cited above that given by Schmidt shows stolons, while the others show a single peduncle; the figure by Topsent, however, shows a small projection above on the peduncle, evidently a beginning stolon, as is also mentioned by the author. Above, the peduncle passes into the pear-shaped body which bears one to four slender, conical papillæ above. The specimen described by Topsent shows an osculum without papilla. Of the specimens in my material the largest is 19 mm, the smallest 10 mm high;

the specimens previously described are of similar sizes. The papillæ vary in length from 1·5 to 4 mm. The colour (in spirit) is in one specimen green, but otherwise whitish, presumably on account of decolouration. The consistency is bladdery, the dermal layer being firm and solid, while the inner body is soft and strongly contracted. The *surface* is smooth. The *dermal layer* is a rather thin, firm membrane, provided with close-lying spicules. *Pores* and *oscula:* The pores are certainly found at the summit of certain papillæ, as in one of the papillæ I found a very distinct, sieve-like pore-membrane with close-lying, circular pores, but as my material is somewhat damaged and only shows few papillæ, I can say nothing further, but there are no pores found otherwise on the surface. Some others of the papillæ are oscular papillæ with a simple opening at the summit. That the papillæ are partly oscular, partly pore-papillæ is also confirmed by what is found in the following species *I. viridis*.

The *skeleton.* The *skeleton of the dermal layer* consists of close-lying, tangential spicules, intercrossing each other in all directions; they lie rather closely, but not more closely however than that the membrane may be seen everywhere between them. In the peduncle they lie quite closely and here they are all arranged parallel to the longitudinal direction; the layer is also here considerably thicker, and the spicules lie in several layers; the peduncle, however, is not compact, but the inner cavity continues down through it. In the wall of the papillæ the spicules likewise lie quite close to each other and all parallel to the longitudinal direction with one end towards the opening of the papilla. The *skeleton of the inner body* I have only been able to examine somewhat incompletely, as the specimens in my material for the most part want the inner body; it is however not at all devoid of a skeleton; there are bundles and loose fibres present which seem mainly to have a course along the surface, but whether there is otherwise any definite arrangement I have not been able to see. Spongin is not present in the skeleton.

Spicula: a. *Megasclera;* these are of one form, strongyla; they are slightly, generally somewhat irregularly curved; they are thickest in the middle and taper a little towards the ends; these latter are sometimes, either one or both, slightly swollen; there is often a little difference between the ends, one being slightly thinner than the other, but most frequently such a difference is not observable. The length is 0·42—0·64 mm, most frequently about intermediate between these sizes, the thickness is 0·010—0·0128 mm. Fine developmental stages were found singly, they are monactinal, and they are especially found in the inner body. *Microsclera* not present.

As I have examined the type-specimen of the *Reniera inflata* Arm. Hans. the identification of this with the present species is certain. — While the *Joyeuxia viridis* Tops. (l. c. 1904) must be the present species, the two specimens which this author described in 1892 for the first time (l. c. Fasc. II, 94.), and on which he founded the genus *Joyeuxia* and the species *viridis*, are on the contrary probably a distinct species and identical with the species described below.

Locality: The Ingolf-Expedition has taken three specimens of this species on the following localities: station 32, 66° 35′ Lat. N., 56° 38′ Long. W., depth 318 fathoms; station 81, 61° 44′ Lat. N., 27° 00′ Long. W., depth 485 fathoms, and station 97, 65° 28′ Lat. N., 27° 39′ Long. W., depth 450 fathoms. The localities lie in the Davis and the Denmark Straits.

Geogr. distr. The species has earlier been taken South-west of Bukenfjord, Norway, depth 106 fathoms (Schmidt l. c.) and at 38° 31′ Lat. N., 26° 50′ Long. W., depth 449 fathoms. The species is thus

distributed in the Atlantic Ocean together with the Denmark and Davis Straits between 66° 35' and 38° 31' Lat. N., and with a bathymetrical range from 106 to 485 fathoms. For the specimens from the Norwegian North-Atlantic Exp. no particular locality is known.

2. **I. viridis** Tops.

Pl. II, Figs. 11—12, Pl. IV, Fig. 7.

1892. *Joyeuxia viridis* Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. II, 94, Pl. II, fig. 8, Pl. X, fig. 19.

Erect, somewhat club-shaped, or of a lower and somewhat semiglobular shape; there are more or less numerous papillæ in the upper part. Surface smooth. Outermost there is a solid dermal layer. Oscula and pores each at the summit of their own papillæ. The dermal skeleton formed of close-lying tangential spicules in several layers; the inner skeleton consisting of bundles and thin fibres running parallel with the surface, without transverse fibres. Spicula: Megasclera strongyla 0·66—1·10 mm.

This species differs from the preceding one externally in being considerably larger and in having no peduncle. Of the specimens in my material only three are tolerably entire; of these the two are erect and somewhat club-shaped, being a little narrowed below, the third is lower and relatively broader. Above, the sponge has more or less numerous conical papillæ; below, it has been attached, and it would seem as if it had grown on the bottom itself, the base of attachment being beset with gravel and other small particles. The largest of the entire specimens has a height of 30 mm, and a breadth of about 18 mm, and at the base a breadth of fully 10 mm; another specimen of a similar shape is somewhat smaller; the lower and broader specimen has a height of about 20 mm with a breadth of about 15 mm. The colour is (in spirit) light brownish yellow or olive; the colour of the inner body is deeper than that of the dermal layer. The consistency is bladdery, the outer layer hard and firm, the inner body brittle and soft. The *surface* is smooth. The *dermal layer* is provided with tangential spicules in several layers, and it is somewhat thicker than in *I. pellicula* and reaches a thickness of about 0·5 mm, in places even more. *Oscula* and *pores:* the papillæ mentioned are partly oscular and partly pore-papillæ. The oscular papillæ are conical, of a height of 3 mm, but they may contract themselves and are then quite low. When they are open the osculum is a simple opening at the summit. In the wall of the papillæ the spicules are close-lying; they do not lie, however, in the longitudinal direction but in two directions crossing each other almost rectangularly and both obliquely to the longitudinal axis of the papilla; when the papilla is quite extended the two sets of spicules are arranged in rather distinct, but close-lying bands, but when the papilla is contracted and the osculum closed the spicules form a compact mass and when the papilla is then examined from the end the ends of the close-lying spicules are seen. The pore-papillæ are of another construction and easily distinguishable from the oscular papillæ; they are larger, especially broader, and they are not conical but cylindrical; they are generally placed on the sides of the upper part of the sponge, and they are not directed straight outwards but somewhat upwards so that their opening points upwards, they are at the same time somewhat adpressed in towards the sponge and hence elliptical in circumference; they have a breadth of 6—10 mm; on account of the manner in which they are attached, their

anterior wall is higher than the posterior, which is towards the sponge, e. g. 6 and 3 mm. respectively. The elliptical opening is covered by a somewhat immersed pore-membrane, with very close-lying pores, so that the membrane is sieve-like; the pores have an average diameter of 0·17 mm. The walls of the papillæ are provided with spicules which do not lie in the longitudinal direction, as is also the case in the oscular papillæ; they are here distinctly arranged in two sets of bands crossing each other more or less rectangularly, and placed more or less obliquely to the longitudinal axis of the papilla; this oblique direction shows for the rest a definite arrangement; while the bands on the hinder side of the papilla form an angle of 45° to the longitudinal axis, those on the anterior side are more erect and most so on the middle of the anterior side; the bands form by their arrangement a close reticulation with square or subquadrangular meshes. In the pore-membrane no spicules are found. The oscula are present in greatest number e. g. up to seven, of pore-papillæ on the contrary only one or two are found.[1] The surface of the inner body shows under the microscope an appearance almost as in *Histoderma appendiculatum*: through the surface shine the openings of close-standing incurrent canals; the course of the water-current will thus be through the pore-sieves into the extended subdermal spaces, from here through the fine pores in the surface of the inner body into the canal system, and then out through the oscula.

The *skeleton*. The *skeleton of the dermal layer* consists of tangential spicules in several layers; the spicules are rather close-lying, but yet the tissue may everywhere be seen between them; they intercross each other in all directions without any observable order, only a slight tendency towards collecting into bundles is seen, with only few spicules in the bundles. The skeleton of the oscular and pore-papillæ is described above. The *skeleton of the inner body*. As in *I. pellicula* a close examination shows that the inner body also in the present species is provided with a skeleton; in the interior this skeleton consists only of quite single scattered bundles, but on the other hand it forms distinct fibres at the surface, running parallel with this, and it is thus in the main constructed as in the species of *Histoderma*. As far as I could observe no spongin is found in the skeleton.

Spicula: a. *Megasclera* are of one form, strongyla, they are more or less, generally somewhat irregularly curved, more rarely straight; sometimes the curve is somewhat sharp; they are thickest in the middle and taper somewhat towards the ends but most frequently only to a slight degree. The length varies a deal, from 0·66—1·10 mm., they are rather slender, the thickness is in the middle 0·011—0·014 mm. Fine developmental stages, which are monactinal, are found in the inner body.

Embryos. In a couple of specimens embryos were found; they were lying in the inner body close to the dermal layer; they are globular, of a diameter of about 0·48 mm.; the examined embryos showed no spicules.

Whether this species is really identical with Topsent's *viridis* it is difficult to decide, but as the only difference is, that the spicules in Topsent's species are somewhat smaller, 0·76 mm., there is good reason to take them as identical. When Topsent declares, that the inner body is quite

[1] Since this was written the work of Kirkpatrick (Nat. Antarct. Exp. Nat. Hist. IV, 1908) has appeared; here the author describes a very interesting species I. Belli (*Joyeuxia*) (41, Pl. XVI. figs. 1—5 a); this beautiful *Inflatella* has on the surface numerous papillæ, easily seen to be ocular and pore-papillæ; the pore-papillæ are about 1 cm. long, trumpet-shaped, with a pore-sieve over the wide opening; the ocular papillæ are simple and smaller, about 4 mm. long. In this species the facts with regard to oscula and pores are thus principally the same as described above, but both kinds of papillæ are much more developed.

without spicules, these have surely only been overlooked. Topsent's specimen had lost the upper part, and oscula and pores therefore were unknown to him, and consequently it is incorrect, when he says, that pores pierce the dermal layer singly.

Locality: Station 92, 64° 44' Lat. N., 32° 52' Long. W., depth 976 fathoms; about five more or less damaged specimens.

Geogr. distr. The species has been taken 25° right south of the Ingolf locality between 38° and 39° Lat. N., at the Azores in depths of 241 and 391 fathoms (Topsent l. c.).

Remarks. Topsent says (l. c. 1904, 207) that still another species belongs to *Inflatella* (= *Joyeuxia*), viz. *ascidioides* Fristedt; this species, however, is identical with *Histoderma physa*, as mentioned above under this species. When Topsent says in his generic diagnosis, that chelæ may occur in the genus, this is therefore erroneous.

Inflatella sp. Vosmer (1885. Bijdr. tot. de Dierk. 12de Afl. 3de Gedeelt. 21, Pl. I, fig. 8, Pl. V, figs. 17—19) is a *Vosmaeria*.

Cornulum Cart.

The shape somewhat various, the sponges being erect and obconical or more roundish or semi-globular with a broad base. The consistency somewhat bladder-like. With or without fistulæ. Outermost a solid dermal layer with close-lying spicules. The skeleton somewhat solid, consisting of rather thick fibres, dendritical or reticulated. Spongin present. Spicula: Megasclera diactinal, oxea or strongyla, the latter sometimes with the ends finely spinulous: the megasclera are either of one form and equal through the whole sponge, or of two forms, oxea in the skeleton and strongyla in the dermal layer; microsclera: the characteristic microsclera are isochelæ palmatæ either solely, or (textile) together with toxa.

1. **C. textile** Cart.

Pl. II Figs. 13—14, Pl. V, Fig. 1.

1876. *Cornulum textile* Carter, Ann. Mag. Nat. Hist. 4, XVIII, 309, Pl. XII, fig. 9, Pl. XV, figs. 28 a—b.
1887. — — , Fristedt, Vega Exp. vetensk. Jakttag. IV, 446.
1909. — — , Lundbeck, Meddel. om Grønland, XXIX, 443.

Erect, obconical, with a flat upper surface. Outermost a thin but solid dermal layer. Surface smooth. Oscula lying to one side in the upper, flat plane, pores occupying the rest of the plane. The dermal skeleton formed of rather close-lying spicules in one layer. The inner skeleton strongly developed, regularly dendritical, consisting of fibres which go upwards from the base and bend out to the surface, they are connected by transverse fibres. Spicula: Megasclera one form, strongyla with finely spinulous ends, 0·32—0·536 mm; microsclera of two forms, chelæ palmatæ 0·014—0·017 mm, toxa, long and fine, 0·21—0·30 mm.

This curious and interesting species has on the whole a shape as described by Carter l. c. It is erect and has been attached with its lower, quite slightly dilated or swollen base to some object on the bottom; all the specimens in my material are, however, torn off, but the flat attachment is distinct. Carter also says: "attached to hard objects". From the base it rises upwards with a stalk-

shaped part, but it gradually increases evenly in thickness and reaches its greatest diameter at the upper end. To judge from a couple of specimens which have the upper end tolerably undamaged, the sponge is here suddenly and slightly obliquely cut, with a plane upper surface, which perhaps has had an oscular tube; it is thus of a slender obconical shape, and is generally quite slightly curved, so that it may very well be compared with a horn, as Carter says; further the sponge has some more or less distinct, ring-like contractions. The size is about the same in all the specimens in my material, the length 30—40^{mm}, the thickness above 6—10^{mm}. Carter's specimen had a similar size. The consistency is bladdery but, on account of the firmness of the outer layer, somewhat solid. The colour (in spirit) is yellowish white. The *surface* is smooth. The *dermal membrane* is a thin, but firm and solid membrane, provided with close-lying spicules arranged in one layer. *Oscula* and *pores:* Carter supposed that oscula and pores were placed in the upper end of the sponge, but his specimens were damaged here; my specimens also are more or less damaged in the upper end, yet a couple are so much undamaged, that they give some information with regard to the place and structure of the oscula and pores. The upper surface of the sponge is, as said, somewhat obliquely cut and is thus in the main plane; on this lie an osculum and the pores. The osculum is a nearly circular opening with a slightly projecting edge, it has a diameter of 1·5^{mm}; it is in both the examined specimens placed close to the margin of the upper surface and a wide canal leads from it down towards the base of the sponge. In the other part of the upper surface lie the pores, they are circular or oval and so close-lying that a sieve is formed; the incurrent openings to a number of canals are seen shining through the pore-membrane; the pores are of a size of 0·023—0·12^{mm}.

The *skeleton:* The *dermal skeleton.* The outer membrane is provided with spicules lying close to each other in one layer, but they are not closer than that the membrane may be seen everywhere between them; the spicules are parallel with the surface and mainly arranged in the longitudinal direction of the sponge; on the inside of the membrane some spicules are found which are arranged at right angles to the others and thus lying transversely, they lie singly or a few together. The membrane thus furnished is a little projecting above in the circumference of the sponge, and here the spicules also project; the pore-membrane, which covers the upper surface of the sponge, is provided with a skeletal reticulation, forming the meshes in which the pores lie; this reticulation is for a great part unispicular and irregular. In the part of the membrane surrounding the oscular aperture, there are some short fibres, directed towards the aperture. The *main skeleton* is of a regular, dendritical construction; from the base fibres go upwards through the sponge; in the centre they are most powerful, and from here fibres steadily bend outwards which, running obliquely upwards, go to the surface; these fibres have a somewhat regular course and are parallel with each other, and they are connected by transverse fibres, which, however, are placed more irregularly; the fibres are strong and consist of many spicules; they have an average thickness of 0·12^{mm}, those in the middle being still thicker; the transverse fibres are thinner. The distance between the longitudinal fibres is about 0·5^{mm}. Above, the fibres spread themselves out and support the membrane of the upper surface, and the spicules are here a little projecting. As will be seen the skeletal reticulation thus formed is rather regular, and the skeleton is intermediate between a dendritical and a reticulate skeleton. In the skeleton a distinct amount of spongin is found, which in most places may be seen to coat the fibres with a

layer; spongin is also present in the dermal membrane, and on examination the membrane gives the impression of being quite or partly a spongin-lamella; the spongin of the skeletal fibres continues directly over into the membrane. It is this consistency of the membrane about which Carter uses the expression "a horny sarcodic membrane". In the membrane there are found fine thickenings or slightly elevated lists running circularly round the sponge, they seem to be thickenings of the spongin, and are possibly phenomena of growth.

Spicula: a. *Megasclera* are somewhat curved strongyla, they are thickest in the middle and taper towards the ends, more towards one end than towards the other, and they are thus unequal-ended. The ends are quite slightly spinulous outermost on the rounded part, sometimes they may be smooth. The length is 0·32—0·536 mm and the thickness is 0·017—0·022 mm. Some finer to quite fine developmental stages were seen, the finest are monactinal and thus show that these unequally-ended strongyles originate from styles. b. *Microsclera:* these are of two forms, isochelæ palmatæ and toxæ. 1. The chelæ palmatæ are very small and of the typical shape, the tooth is of the same length as the alæ and of the same breadth as these together; the alæ seem to be only very slightly refolded laterally so far as I could see under a high magnifying power (× 1400). The length is 0·014—0·017 mm and the breadth about 0·0028 mm. 2. The toxa are long and fine, the curvature is most frequently very slight; sometimes they are only curved in the middle, but most frequently also the end parts are slightly recurved; sometimes they may be somewhat irregular, so that their shape as toxa is not distinct; they are of the same thickness in the whole length, only the ends are finely pointed. The length is 0·21—0·30 mm and the thickness about 0·0016 mm. Carter mentions and figures as "subskeleton spicules" some fine spicules, which he terms "acuate", but his figure shows two, of which one is a style, the other pointed at both ends; it is presumably a confusion of developmental stages of the strongyles and toxa which forms his "subskeleton spicules". I have not seen toxa quite so strongly curved as shown by Carter's figure, but no doubt they may vary a good deal in curvature. The microsclera occur everywhere in the soft tissue of the sponge, the chelæ are present in very great numbers.

Embryos. In one of the specimens an embryo was found; it was situated about in the middle of the sponge and had a size of about 0·6 mm. It contained numerous megascleres, but there seemed to be no microscleres present. The megascleres are similar to those in the grown sponge, only considerably smaller, of a length of about 0·20 mm.

Locality: Station 4, 64° 07′ Lat. N., 11° 12′ Long. W., depth 237 fathoms; station 143, 62° 58′ Lat. N., 7° 09′ Long. W., depth 388 fathoms, (bottom temperature + 0° 4 C.); further it has been taken at 62° 40′ Lat. N., 1° 56′ Long. W., depth 365 fathoms (bottom temperature + 0° 3 C.), 62° 29′ Lat. N., 4° 12′ Long. W., depth 283 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902); finally it has been taken at East-Greenland, 74° 17′ Lat. N., 15° 20′ Long. W., depth 127 fathoms (The East-Greenland Exp. 1891—92). Five specimens or fragments in all.

Geogr. distr. The species was earlier taken on the "Porcupine" Expedition, 61° 10′ Lat. N., 2° 21′ Long. W., depth 345 fathoms (bottom temperature + 1° 1 C) (Carter l. c.), and in the Baffin Bay, 72° 32′ Lat. N., 56° 05′ Long. W., depth 116 fathoms. The species is accordingly distributed between 1° 56′ and 56° 05′ Long. W., and between 61° 10′ and 74° 17′ Lat. N., in the Baffin Bay, at East-Greenland and around the Faröe Islands. The depths are from 116—388 fathoms. The species presumably belongs

mainly to the cold area, as the localities, as soon as they are deeper than 300 fathoms, show a negative temperature, but it may also go higher up and here occur in water with a positive temperature.

Remarks about the species of the genera Histoderma, Histodermella, Inflatella and Cornulum:

Of species which belong here, or have been supposed to belong here, there are at present described the following:

1874. *Histoderma appendiculatum* Cart. (cited above)	Tylota to strongyla — chelæ arcuatæ — sigmata.
1875. *Desmacidon physa* O. Schmidt (cited above)	Strongyla — chelæ arcuatæ — trichodragmata.
1875. *Inflatella pellicula* O. Schmidt (cited above)	Strongyla.
1876. *Halichondria phlyctenodes* Cart. (Ann. Mag. Nat. Hist. 4, XVIII, 314. Pl. XIII, fig. 17. Pl. XV, fig. 35)	Tornota — chelæ arcuatæ — sigmata.
1876. *Cornulum textile* Cart. (cited above)	Strongyla with spinulous ends — chelæ palmatæ — toxa.
1883. *Phlocodictyon singaporense* Cart. (Ann. Mag. Nat. Hist. 5, XII, 326, Pl. XIII, fig. 17 a—b)	Oxea — short strongyla — chelæ palmatæ.
1885. *Sideroderma navicelligerum* Ridley and Dendy, (Challeng. Rep. XX, Monaxonida, 115, Pl. VIII, fig. 9, Pl. IX, figs. 5, 8—9)	Tylota — small peculiar chelæ — sigmata of two sizes — trichodragmata.
1886. *Histioderma verrucosum* Cart. (Ann. Mag. Nat. Hist. 5, XVIII, 452)	Tylostrongyla — chelæ arcuatæ — sigmata.
1886. *Histioderma polymastrides* Cart. (Ann. Mag. Nat. Hist. 5, XVIII, 453)	Tylota to tylotornota — chelæ arcuatæ?
1886. *Pseudohalichondria clavilobata* Cart. (Ann. Mag. Nat. Hist. 5, XVIII, 454)	Tylotornota — chelæ arcuatæ, curious, spined.
1887. *Cornulum ascidioides* Frstdt. (cited above)	= *Histoderma physa*.
1887. *Cornulum cuteromorphoides* Frstdt. (Vega Exp. vetensk. Jakttag. 447, Pl. 25, figs. 3—6, Pl. 29, fig. 22)	se below.
1888. *Sideroderma Zitteli* Lendenf. (The Austral. Mus. Descrip. Catal. of Sponges, 211)	Styli — oxea — chelæ — rhaphides.
1892. *Joycuxia viridis* Tops. (cited above)	Strongyla.
1903. *Histoderma natalense* Kirkpatrick, (Marine Invertebr. in South Africa, III, 250, Pl. V, fig. 17, Pl. VI, figs. 18 a—e)	Tylota — acanthoxea — chelæ arcuatæ — sigmata — trichodragmata — curious spined bodies (transformed chelæ? or forcipes?).
1904. *Joycuxia tubulosa* Tops. (Résultats des camp. sc. du Prince de Monaco, Fasc. XXV, 206, Pl. V, fig. 5, Pl. XIV, fig. 16)	Strongyla.

1905. *Histoderma vesiculatum* Dendy (Rep. of the Pearl Oyster Fisheries of the Gulf of Manaar, Part III, 166, Pl. XI, figs. 8—9) ..... Oxea — strongyla — chelæ palmatæ.

1908. *Joyeuxia Belli* Kirkpatrick, (Nat. Antarct. Exp. Nat. Hist. IV, 41, Pl. XVI, figs. 1—5 a) ..... Strongyla.

Histodermella Ingolfi mihi ..... Tylota — acanthoxea — chelæ arcuatæ — sigmata.

Histodermella coriacea mihi ..... Strongyla with spinulous ends — acanthostrongyla.

Of these species *Cornulum ascidioides* Frstdt. is shown above to be identical with *Histoderma physa* O. Schmidt. I have also examined a piece of the type-specimen of *Cornulum enteromorphoides* Frstdt., and this species proved to be identical with — *Myxilla fimbriata* Bow., which for the rest may already very well be seen from the description. The specimen, which Fristedt had to examine, was of an elongated shape, and this in connection with the rather strong dermal membrane of this species has led him to refer this typical *Myxilla* species to *Cornulum*. Hereafter these two species of *Cornulum* must be dropped. — *Sideroderma Zitteli* Lendenfeld scarcely belongs to the group of sponges here in question.

The remaining species will have to be distributed in the four genera treated above, *Histoderma*, *Histodermella*, *Inflatella* and *Cornulum*. After Carter had established the genus *Cornulum* with the typical and sole species *textile*, this genus has hitherto only contained the same species, the two erroneous species of Fristedt excepted. With a generic diagnosis as given above, in which the distinguishing characters are first the palmate chelæ, and next the dendritical or reticulate skeleton, formed of strong fibres, two of the above enumerated species, viz. *singaporense*[1]) and *vesiculatum* must belong to this genus, and the genus seems very natural. *Histodermella*, which I have founded mainly on characters in the spiculation and for which the typical species is *Ingolfi*, also includes, besides the two species described here, the *Histoderma natalense* established by Kirkpatrick in 1903.

The above enumerated species will, according to the facts mentioned, have to be distributed in the following way:

Histoderma:	*Histodermella:*	*Inflatella:*	*Cornulum:*
appendiculatum Cart.	*natalensis* Kirkpatr.	*pellicula* O. Schmidt	*textile* Cart.
physa O. Schmidt	*Ingolfi* mihi	*viridis* Tops.	*singaporense* Cart.
phlyctenodes Cart. (*vide* remark on page 27)	*coriacea* mihi	*tubulosa* Tops.	*vesiculatum* Dendy.
		Belli Kirkpatr.	
naviculigerum Dendy			
verrucosum Cart.			
polymasteides Cart.			
clavilobatum Cart. (belongs perhaps not here but may be an *Esperiopsis*)			

Topsent has (l. c. 1904, 198) established a new genus *Phlyctaenopora* with one species, *historquis*,

[1]) Dendy (1905, l. c.) has shown, by examination of Carter's type specimen, that the species has chelæ.

which, according to the author, should be placed near to *Histoderma*; I cannot express myself more particularly about this species, but its relationship with the forms here in question seems to me somewhat doubtful.

The four genera mentioned are distinguished among the *Myxilleae* by the megascleres being the same in the dermal skeleton and in the skeleton of the inner body; this at all events holds quite good with regard to *Histoderma*, *Histodermella* and *Inflatella*; among the species of *Cornulum* it holds also good for *textile*; in *singaporense* and *vesiculatum* there are, to be sure, two forms of megascleres, but they are both diactinal, and they seem not to be sharply divided with regard to their occurrence in the sponge-body. The four genera are certainly nearly related to each other, and as their starting point I think we may take *Histoderma* as most probable, which shows the least deviating structures; as the genus nearest related to this I take *Inflatella*, which, especially in the skeletal structure, presents the greatest accordance, and on the whole mainly differs only in the want of microscleres, a difference which, when the other structures agree, is of very slight consequence, indeed even the right of *Inflatella* as a separate genus is perhaps doubtful, but at present I think, there is some reason to keep it. Also *Histodermella* must be nearly related to *Histoderma*, one species, *Ingolfi*, shows both in its exterior and in the skeletal structure great agreement; the curious, spined spicules which are present in this genus, are somewhat surprising, but I think they must probably be taken to have their origin from original special skeleton spicules. *Cornulum* stands a little more apart, distinguished by its palmate chelæ. — I thus take these four genera to be nearly related and to represent a type of *Myxilleae* in which the original skeleton spicules have disappeared. As said, *Histoderma* might be thought to form the starting point; the genus outside the group, nearest related to *Histoderma*, is perhaps *Hymedesmia* (= *Leptosia* Tops.); in several species of this genus we find a strong dermal skeleton formed of diactinal spicules, and at the same time the inner skeleton, consisting of the basal acanthostyles, may be very little developed; the acanthostyles may be present in so small numbers, that great care is necessary to avoid mistakes, just in *Hymedesmia*-species of this latter structure we find at the same time a strongly developed dermal skeleton which also has well developed fibres going from the dermal membrane inwards, and here consisting of the same diactinal spicules which form the dermal skeleton itself. Finally such species may have long, tubular papillæ (e. g. *Hymedesmia filifera* O. Schmidt, and several other species). — It is perhaps a question whether *Histoderma phlyctenodes* Cart. will not prove to be a *Hymedesmia*. — When now such species get quite roundish and grow without attachment, as e. g. *H. appendiculatum*, the elimination of the acanthostyles is easily understood, and the transition to the freely growing species is formed by such attached species as for instance *Histoderma physa*. The genus *Melonanchora* seems to me to form a beautiful and interesting instance of the opinions here advanced; one species of this genus has the spiculation and skeletal structure typical for the *Myxilleae*, with skeletal styles and diactinal dermal spicules; these latter, however, form a very dense dermal skeleton, and the species has ocular and pore-papillæ; the other species of the genus has a similar construction, but the skeleton spicules have disappeared and the whole skeleton is formed of dermal spicules.

Finally I may direct attention to the fact, that I have in the present work placed the genus *Hymedesmia* in the subfamily *Ectyoninae*, which perhaps might seem to go against the views given above about the relationship of this genus to the group treated here; yet this is not so, since firstly, the subfamilies *Mycalinae* and *Ectyoninae*, as I have already mentioned earlier, are scarcely quite natural, and even if so it was not impossible, that genera, which on account of their characters must now be placed in the *Mycalinae*, should be thought to have originally been derived from Ectyonine forms.

In the first part of this work I broke up Carter's *Phlocodictyinae* and placed its two genera *Phlocodictyon* and *Oceanapia* in the *Renierinae* and *Gelliinae* respectively. In a work published in 1905 (Rep. of the Pearl Oyster Fisheries of the Gulf of Manaar, Part III, 165) Dendy keeps the subfamily *Phlocodictyinae* under the family *Desmacidonidae*, and he refers to it the genera *Phlocodictyon*, *Oceanapia*, *Histoderma*, *Sideroderma* and *Amphiastrella*. His reasons for keeping these forms together are mainly the same as those of Carter on founding the group, viz. the hard dermal layer and the presence of fistulæ, but on account of the chelæ in *Histoderma* Dendy now removes the group to the *Desmacidonidae*. In Part I of this work pag. 56—57 I gave the reasons which seemed to me to necessitate the breaking up of the *Phlocodictyinae*, and the same reasons are still valid. While Dendy thus lays stress on the outer shape and the presence of a solid dermal layer as the distinguishing characters, but pays no attention to the spicules, I on the contrary follow the opposite way and take first, as the most important character, the spicules and what may be deduced from them with regard to the relationship of the forms. Dendy would also have difficulties in delimiting his subfamily; *Phlocodictyon* and *Petrosia* are, as I have already declared (Part I, l. c.), nearly related; Thiele says (Zoologica XXIV, 2, 1899, 19) that *Phlocodictyon (Rhizochalina) medium* is an intermediate form; *Melonanchora*, which has a solid dermal layer and papillæ should, I think, also be referred to the *Phlocodictyinae* and the same holds good with regard to several *Hymedesmia*-species; also some species of *Gellius* should be placed here according to the views of Dendy. On the other hand, I think that the spicules give good hints towards a natural grouping; the oxea present in *Phlocodictyon* are spicules typical for the *Homorrhapidae*: *Oceanapia* and the species of *Gellius*, which are provided with a solid dermal layer, have oxea of quite the same kind, and these together with their microscleres refer them to the *Heterorrhaphidae*. The facts are quite otherwise with regard to the spicules in the four genera in question; their spicules are diactinal (when fully developed), but of quite another type from those occurring in the *Homorrhaphidae* and *Heterorrhaphidae*. That this is the case is shown, and beyond doubt, by the development, since while the spicules in *Homorrhaphidae* and *Heterorrhaphidae* are really diactinal, and also originate in this form, the spicules in the four genera mentioned are on the contrary only secondary diactinal, but originate as monactinal; they have thus a development quite as the dermal spicules in other *Myxillcae*, as I have described in Part II of this work, pag. 125. I therefore take it to be quite certain, that these genera belong to the *Myxillcae*, and that their spicules answer to the dermal spicules in the more typical *Myxillcae*, but here form the whole skeleton, of which the interior skeleton however is generally weak. The facts present in *Melonanchora emphysema* seem to me in the highest degree to confirm this view. The occurrence of chelae also shows that these genera have nothing to do with *Phlocodictyon* or *Oceanapia*: that the chelæ may sometimes

disappear does not invalidate the value of this character. — Dendy has also in his subfamily *Phlocodictyinae* the genus *Amphiastrella* with the species *birotulifera* Cart.; this species has birotulæ for microscleres and otherwise a structure almost the same as a *Histoderma* — it shows especially a striking resemblance, both in outer shape and in structure, to *Histodermella coriacea* — : this species certainly belongs to *Ictrochota*, but is a species in which only the dermal spicules are present, and if we form a special genus for it, this genus must be placed near to *Ictrochota*.

After the manner in which I understand the classification of the above-mentioned forms, we will thus in the various families find the phenomenon, that certain forms have a specially developed dermal skeleton, as a rule together with a reduction of the inner skeleton and occurrence of longer or shorter papillæ, by which these forms, in spite of their belonging to different families, get a certain mutual resemblance. It is then an obvious conclusion, that a common factor must be of influence, but it seems not possible in our present state of knowledge to point out such a factor. It is easy enough to understand that all these sponges get provided with papillæ, since the hard dermal layer, furnished with close-lying spicules is not adapted to be pierced by pores and oscula and there must therefore be special contrivances for these, viz. the fistulæ or appendages, and somewhat similar reasons hold good with regard to the reduction of the inner skeleton. But the cause of the development of the hard dermal layer is therefore not explained, and the only thing, that can be said, is that it seems to be in some connection with the fact, that these forms show a tendency to get free, without attachment, or at all events without attachment by a fast-grown basis. The forms which are attached, either with a broad base as *Histoderma physa*, or by a peduncle as two of the *Inflatella*-species, have no specially strong dermal layer; in the quite free forms as most *Phlocodictyon*-species, *Oceanapia*, *Histodermella*, especially *coriacea*, and *Amphiastrella*, the dermal layer on the contrary gets very strong and solid.

Grayella Cart.

(*Vvesia* Topsent, 1892)

The external shape varying from thinner or thicker incrustations through massive or cushion-shaped forms to more or less erect and finally quite erect, club-shaped, stalked and sometimes branched forms. The skeleton consisting of, often rather thick but loose, fibres, formed of smooth spicules: in the incrusting and massive forms the fibres radiate from the base upwards and outwards, in the erect there is formed a central axis from which fibres radiate to the surface. The dermal skeleton consisting of tangential, generally very close-lying, spined spicules, making the dermal membrane very firm. Spongin present or wanting. Spicula: megasclera: the skeletal spicules are smooth, they are most frequently diactinal, tornota, strongyla or tylota, but they may be monactinal, styli: the dermal spicules are spined, monactinal or diactinal. Microsclera are chelæ arcuatæ, to which may be added sigmata: sometimes sigmata are found solely, and microsclera may be quite absent.

1. **G. pyrula** Cart.

Pl. II, Figs. 15—19, Pl. V, Fig. 2.

1876. *Cometella pyrula* Carter, Ann. Mag. Nat. Hist. 4, XVIII, 388, Pl. XIV, fig. 20, Pl. XV, fig. 38.

1885. *Sclerilla arctica* Armauer Hansen, The Norwegian North Atl. Exp. XIII, Spongiadæ, 12, Pl. II, fig. 4, Pl. IV, fig. 15.

1885. *Sclerilla dura* Armauer Hansen, ibid. 13, Pl. II, fig. 5.

1892. *Vvesia pedunculata* Topsent, Résultats des camp. sc. du Prince de Monaco, Fasc. II, 105, Pl. V, fig. 6, Pl. X, fig. 17.

1903. *Vvesia lobata* Arnesen, Bergens Mus. Aarb. 18, Taf. II, Fig. 7, Taf. V, Fig. 1, Taf. VI, Fig. 2.

1904. *Vvesia pertusa* Topsent (non *pertusa* Tops. 1892), l. c. Fasc. XXV, 196, Pl. XV, fig. 20.

1909. *Grayella pyrula*. Lundbeck, Meddel. om Gronland, XXIX, 443.

Erect, club-shaped, generally with a shorter or longer peduncle, above sometimes divided into a couple of branches, or somewhat lobate; sometimes it may be compressed. Surface smooth, densely beset with small, round or oval, more or less distinct pore-areas: the dermal membrane is stretched over the pore-areas as a thin membrane, between these it is not sharply marked, resting on the ends of the fibres of the main skeleton. The pores are found in the pore-areas; oscula spout-shaped, present in varying numbers on the upper part, or scattered. The dermal skeleton formed of close-lying, tangential acanthostyli; the pore-areas have only chelæ. The main skeleton consisting of a central axis from which fibres radiate to the surface more or less regularly; there are no transverse fibres, but between the fibres lie scattered acanthostyli. Spicula: megasclera: the skeletal spicules smooth tornota 0·357—0·58 mm, the dermal spicules acanthostyli 0·119—0·196 mm; microsclera chelæ arcuatæ 0·021—0·0257 mm.

Of this interesting species we have a somewhat considerable material of specimens of various sizes. The species is always erect and more or less distinctly club-shaped, and the deviations which may occur are easily traced back to the club-like shape. The small specimens are all regularly club-shaped with a shorter or longer peduncle; it is when the sponge grows larger that the shape may vary somewhat, thus the upper part of the body may be thicker or thinner in relation to the peduncle, the sponge may be high and slender or relatively short and thick, in the latter case it may be without any pronounced peduncle, only narrowed below; further it may be divided into a couple of branches in its upper part, or be more irregularly lobate, or finally it may instead of being round be rather strongly compressed. All previously described specimens are small, and they all have also a club-shaped exterior, only the specimen described by Armauer Hansen l. c. is larger and shows the branched and compressed shape. One of the smallest of my specimens has a height of 11 mm, the peduncle is 1·5 mm thick and the upper part about 5 mm thick; then we have specimens of all sizes upwards, the largest has a height of 50 mm of which the peduncle makes the half part; this latter, which is rather thin, has a diameter of about 2 mm, and the upper part is about 10 mm in thickness. The peduncle is slightly dilated below and shows here a surface of attachment, but most specimens are torn from the substratum, a single one sits on a fragment of a mussel-shell. The consistency is rather hard and somewhat elastic, but it may be different according to the degree of contraction; when the sponge is strongly contracted, as is often the case, the consistency gets very hard. The colour (in

spirit) is whitish yellow, sometimes somewhat greyish. The *surface* has, as commonly in the genus *Grayella*, a very characteristic aspect, being densely beset with pore-areas. These areas are circular or generally oval and have a slightly elevated edge which surrounds the somewhat immersed pore-membrane. Such is the structure in the specimens which are least contracted, but as a rule the sponge is more highly contracted, and then the pore-areas become indistinct or are only seen as small tubercles, and when the sponge is very strongly contracted they nearly quite disappear, and at the same time the surface becomes rugose or wrinkled. For the rest the surface is all but smooth, the spicules not being projecting or only to a very slight degree. The *dermal membrane* is in the pore-areas a thin membrane, between the areas it is not sharply bounded inwards, and it is here richly provided with spicules. *Pores* and *oscula:* The pores lie in the mentioned pore-areas in a number of about ten or more in each area, they are circular or oval and were measured from quite small up to 0·09^{mm} in largest diameter; the pore-areas have a greatest size of 0·5^{mm}. The oscula are spout-shaped, as the opening is surrounded by a conical collar, supported by spicules. The number of oscula is various, in the small specimens there is most frequently only one osculum, which is then placed at the upper end, but in the larger specimens there are several oscula, in a single specimen even eight. The *canal system* seems to be very lacunous; there are especially extended cavities somewhat below the surface, and they are extended somewhat parallel to the surface; they evidently belong to the excurrent system, as they are in direct connection with the oscula. If a piece of the skin is cut off, the openings of the incurrent canals, which are vertical to the surface, may be seen below the pore-areas by aid of the microscope. These structural features are tolerably observable, when the sponge is not too strongly contracted, but often the specimens are contracted to so high a degree, that these structures are quite indistinct, at the same time that the pore-areas on the surface are closed and disappearing. The sponge is evidently able to contract itself very strongly, and even the least contracted specimens in my material are certainly contracted to no slight degree; the structures seem to show that they are able to be considerably more distended, and the inner cavities, the pore-areas and the canals are in this state certainly considerably larger.

The *skeleton:* The *dermal skeleton* consists of close-lying, tangential acanthostyles, which lie in more than one layer: they are only found in the membrane between the pore-areas, while the membrane of the pore-areas themselves is quite devoid of them; they do not form any real reticulation but by their arrangement around the pore-areas a kind of network is however formed. In the pore-membrane, as said, no acanthostyles are found, but here chelæ occur in great numbers. The *main skeleton* is of a dendritical structure; upwards through the peduncle and up towards the upper end of the sponge goes a spicula-axis, and from this fibres issue which go out to the surface and at the same time branch somewhat; outermost they are spreading and support the dermal membrane, but do not project beyond the surface; as the outermost spicules in the fibres do not go to the pore-areas, but only to the membrane between them, they become partly arranged circularly around the pore-areas, as may be seen, when a piece of the skin is cut off and examined from above. A transverse section of the sponge shows the fibres radiating regularly from the axis to the surface. Between the fibres no connecting fibres are found, but some scattered spicules occur between them; these spicules are all acanthostyles, while the fibres are formed exclusively of tornotes. Downwards on the peduncle

the layer of tissue outside on the axis is thin, but the skeleton is of the same construction, with radiating fibres. The skeleton in the wall of the oscular cones is formed of a dense layer of tornotes all parallel to the longitudinal direction of the cone; they are partly divided into bands or fibres; this skeleton is formed in such a way that the fibres going to the surface continue out in the oscular cones at the places, where oscula are found. On the outer side of the oscular cone there is found a layer of acanthostyles, and further there are many chelæ in the wall. This structure of the oscular cone shows, that it is not formed of the dermal membrane solely. As a rule the spicular axis is very thick and strong, it is thus in one of the larger specimens 2^{mm} thick below in the peduncle, and above, at the upper end, 0·6^{mm} thick. The skeleton is constructed in the described way in the specimens where it is regular, but a good deal of irregularity may occur, I think partly caused by the presence of the inner cavities. Between the ordinary fibres some very thick ones may occur, which present themselves as branchings of the axis; the fibres going towards the surface may be curved in different ways, as they bend round about the cavities, and they may bend round to such a degree, that they do not go upwards but downwards. Some of these irregularities are certainly due to the contraction, and I think the skeleton would show more regularity, if it was examined in a sponge in a quite distended condition. — Spongin is found in the spicular axis, especially below, towards the base, but the amount is only slight, and I could not observe any spongin outside the axis.

Spicula: a. *Megasclera:* 1. The skeletal spicules are tornota, they are straight or slightly, and then as a rule somewhat irregularly, curved, they are slightly fusiform and have somewhat short, sharply pointed ends; the length may vary a little in various individuals, it is 0·357—0·58^{mm}, and the thickness may in all vary between 0·005 and 0·011^{mm}, by far most frequently it lies between 0·007 and 0·008^{mm}. The tornotes sometimes show a quite slight tendency to become polytylote. The fully developed tornotes have quite equal ends, but quite fine developmental stages were observed, and these were styles; when they have grown a little older, they have still unequal ends, but they get equal-ended already at an early stage. 2. The dermal spicules must be termed acanthostyli, as one end is pointed, but the apex is short; sometimes, but rarely, the apex is indistinct or quite wanting, so that the spicules are near to, or are really strongyles. They are more or less curved, and it is worthy of note, that the curvature nearly always lies nearest to the rounded end; the spicules are distinctly fusiform. The spinulation is dense and coarse, the spines have a length of about half the diameter of the spicule. The spinulation may vary somewhat with regard to density and the size of the spines and this is in relation to the variation of the spicule in size, in such a way, that the larger the spicule is the more densely it is generally spined, and the larger are the spines. To be sure these variations may generally be found in the same individual, but there may, however, be the difference between the individuals that in some the smaller, in others the larger spicules are by far the most numerous, in a single specimen the acanthostyles are on an average more diffusely spined than in the others. The length of the acanthostyles is 0·119—0·196^{mm} and the thickness in the middle, the spines not included, 0·005—0·014^{mm}. A number of developmental forms in different stages were present, the finest of them being already distinctly and somewhat strongly spinulous; the developmental stages are all distinctly monactinal. As said above the tornotes form the fibres, while the acanthostyles form the dermal skeleton, but are also found in the interior of the body, especially between the fibres.

b. *Microsclera:* these are of one form, chelæ arcuatæ, they have a curved shaft, the free middle part of which is more than one third of the length of the chela, the tooth is elliptical, of the same length as the pointed lobe-shaped alæ. The length is 0·021—0·0257 mm, the diameter of the shaft is 0·0028 mm. The chelæ occur richly especially in the pore-areas and the oscular wall, but they are also otherwise found round about in the tissue.

Embryos: In several specimens embryos were found round about in the tissue, and they are thus not only found innermost, close to the axis, as declared by Carter l. c. They are globular or oval, of an average diameter of about 0·29 mm. Most of the examined specimens contained no spicules, but some single were developed so far, that they contained spicules; these were dermal spicules, and they quite resembled the developmental stages of the dermal spicules in the grown sponge. It is worthy of notice, that the first occurring spicules here are the spined dermal spicules, while elsewhere in the *Myxillinæ* it is the skeletal spicules which occur first.

Remarks: As I have examined preparations of Carter's type-specimen, the identification is certain. For the rest the description given by Carter is by far the best of all the descriptions published, as he describes the skeleton and the inner cavities in somewhat detail. The species is also rather well recognizable after his description, when the curious, diagrammatic way in which Carter made figures of the exterior, is borne in mind. The points on the surface which Carter mentions and figures, are, of course, the closed pore-areas; he mentions that they form low conical projections, which are formed of acanthostyles "arranged in a whorl-like manner" and he figures this structure. Anything similar I have not found in my specimens, but I think, that by a certain degree of contraction the spicules around the pore-areas may very well present themselves in a way answering to Carter's expression. — Armauer Hansen's type-specimens of *Sclerilla arctica* and *dura* I have also examined, and they proved to be the present species; his figure of the acanthostyles as oxea is erroneous. Armauer Hansen concludes with a remark which shows, that he has well seen the conformity of his two species, and the remark at the same time is very curious as he says: "Probably it would be more correct to assign them to one species". I have also examined the type-specimen of Arnesen's *Trevia lobata*. — I also refer Topsent's *T. pedunculata* and the same authors *T. pertusa* from 1904 (but not *T. pertusa* 1892) to the present species; the first named species has relatively small and somewhat diffusely spined acanthostyles, but this is a character, which according to my observations may be found in *G. pyrula*, and otherwise the two species exactly conform. *T. pertusa* Tops. 1904 seems to me to be quite the same as the present species, and I really do not understand, why Topsent refers it to his *T. pertusa* established in 1892, which latter has typical acanthoxea as dermal spicules.

Locality: Station 4, 64° 07′ Lat. N., 11° 12′ Long. W., depth 237 fathoms; station 8, 63° 56′ Lat. N., 24° 40′ Long. W., depth 136 fathoms; station 27, 64° 54′ Lat. N., 55° 10′ Long. W., depth 393 fathoms; station 57, 63° 37′ Lat. N., 13° 02′ Long. W., depth 350 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 94, 64° 56′ Lat. N., 36° 19′ Long. W., depth 204 fathoms; station 95, 65° 14′ Lat. N., 30° 39′ Long. W., depth 752 fathoms; further it has been taken on 63° 15′ Lat. N., 9° 35′ Long. W., depth 270 fathoms and 61° 23′ Lat. N., 5° 04′ Long. W., depth 255 fathoms (Wandel), and East of the Faröe Islands, depth about 150 fathoms (Th. Mortensen). In all twelve specimens. The localities are situated in the Denmark Strait, between Iceland and the Faröe Islands and South of the Faröe Islands.

Geogr. distr. The species is earlier known from the following localities: 65 miles North North-West of the Orkneys, depth 290 fathoms ("Porcupine"); 61° 00' Lat. N., 4° 49' Long. E., depth 200 fathoms, Vestfjord, depth 341 fathoms, 74° 08' Lat. N., 31° 12' Long. E., depth 147 fathoms, (The Norwegian North Atlantic Exp.); in the Bergensfjord and at Trondhjem, depths 70 to 266 fathoms (Arnesen). If the interpretation of Topsent's two species is correct it has further been taken on 43° 47' Lat. N., 9° 27' Long. W., depth 160 fathoms, 38° 27' Lat. N., 28° 03' Long. W., depth 277 fathoms and 37° 57' Lat. N., 29° 15' Long. W., depth 106 fathoms. According to these localities the species is distributed between 74° and 38° Lat. N., and between 36° Long. W. and 31° Long. E. with a bathymetrical range from 70 to 752 fathoms.

2. **G. gelida** n. sp.

Pl. II, Fig. 20, Pl. V, Fig. 3.

Erect, club-shaped and pedunculated. Surface smooth, densely beset with more or less distinct pore-areas. The dermal membrane over the areas a thin membrane, supported by the ends of the fibres of the main skeleton. Pores situated in the pore-areas, osculum spout-shaped, at the summit of the sponge. The dermal skeleton formed of close-lying, tangential acanthostrongyla, in the pore-membrane there are only chelæ. The main skeleton consisting of a powerful median axis from which fibres radiate to the surface; there are no transverse fibres, but between the fibres lie acanthostrongyla. Spicula: megasclera; the skeletal spicules smooth tornota, more or less polytylote, 0·40—0·53 mm, the dermal spicules acanthostrongyla 0·11—0·19 mm; microsclera chelæ arcuatæ 0·024—0·028 mm.

This species, of which we have only one specimen, has an outer shape almost like the preceding; it is erect and slender club-shaped, the lower part forms a peduncle which is broken below. The thickened part of the body is bent rectangularly above, but this is certainly only due to contraction. The length of the sponge, when straightened out, is 50 mm of which the peduncle has 18 mm; the thickness is above 7 mm. The consistency is hard, and the sponge is evidently highly contracted. The colour (in spirit) is whitish yellow. The *surface* is in most places beset with warts or knobs, as the pore-areas, on account of the strong contraction, are closed and form in this state only small protuberances; only in a few places they are open and show here the ordinary, characteristic appearance. There are no projecting spicules. The *dermal membrane* is a thin membrane over the pore-areas, and between the areas it is richly provided with spicules. *Pores* and *oscula:* With regard to pores and oscula quite the same holds good, as was said about the preceding species. The pores lie in a similar way in the sieve-like pore-membranes on the pore-areas; they had a diameter of up to 0·06 mm. Of oscula only one is found on the specimen, it forms a somewhat high collar just at the top of the sponge.

The *skeleton.* This is also constructed quite as in the preceding species. The *dermal skeleton* consists of close-lying, tangential acanthostrongyla, they seem mainly lying only in one layer; they are not present in the pore-membrane, but here chelæ are found. The *main skeleton* consists of a powerful axis and of fibres radiating out from it, which are divided outwards towards the surface and support the dermis; the outermost spicules in the fibres meet the dermis especially along the edges of the pore-areas; connecting fibres are not found, but acanthostrongyla are lying between the fibres;

the fibres are formed of the smooth tornota. The skeleton in the oscular cone is formed of parallel tornota, outwards it has acanthostrongyla. In the axis a distinctly observable amount of spongin is found.

Spicula: a. *Megasclera:* 1. The skeletal spicules are tornota, they are straight and slightly fusiform and slightly, but rather distinctly polytylote or show at all events an uneven contour; the ends are rather short and somewhat stubby. The length is 0·40—0·53^{mm}, and the thickness is 0·007—0·011^{mm}. 2. The dermal spicules are acanthostrongyla, they are slightly curved or sometimes straight and of the same or nearly the same thickness in the whole length; the spinulation is dense and coarse, and the spines are generally longer than half the diameter of the spicule; the spines are placed a little more densely at each end. The length is 0·11—0·19^{mm}, and the thickness 0·005—0·012^{mm}. Whether these spicules are really and primarily diactinal, I have not been able to decide, as no young developmental stages occurred; the shape of the spicule does not point towards a monactinal origin, as also the few older developmental stages, I have seen, are quite diactinal; also the curvature, which is not localized at one end, but nearly always goes evenly from the middle towards both ends, points towards a real diactinal spicule, as also does the fact, that the spines on both halves are somewhat recurved towards the middle, while those standing in the middle are directed straight out. On the other hand the dermal spicules occurring in the embryos are monactinal (see below under Embryos.) b. *Microsclera:* these are of one form, chelæ arcuatæ; they have an evenly curved shaft, lobe-shaped, somewhat pointed alæ and a pointed elliptical tooth of the same length as the alæ. The length of the chelæ is 0·024—0·028^{mm}, and the thickness of the shaft is 0·0021—0·0028^{mm}. The chelæ occur numerously in the pore-membranes and the oscular wall, but also otherwise round about in the tissue.

Embryos: Also in this species embryos were found round about in the tissue in great numbers; they are globular, of a diameter of about 0·29^{mm}. They were found both with and without spicules. The spicules are either only chelæ or chelæ and dermal spicules; the chelæ seem thus here to be the first occurring spicules, and next the dermal spicules; in single cases only developmental stages of chelæ were found and some few, thin developmental stages of dermal spicules. The dermal spicules were not, as is elsewhere generally the case, fine developmental stages, but on the contrary with regard to shape fully developed spicules; they were, however, smaller than in the grown sponge, viz. 0·085^{mm}; both these spicules and the developmental stages were monactinal with one end pointed.

This species is, as seen from the description, very nearly related to *G. pyrula;* the outer shape and the skeletal structures are the same, only in the spicules is a difference present, but this difference is constant; the differential character lies in the dermal spicules, these being in *gelida* always diactinal and of the same thickness in the whole length, and they are on the whole characteristically different from the acanthostyli in *pyrula:* if the difference had only consisted therein that the pointed end here was rounded, no stress would have been laid upon this fact; further the tornota are distinctly polytylote and have stubby ends, and finally the chelæ are larger. To be sure I have only had one specimen of the species, but as this also shows a special condition with regard to locality, being an inhabitant of the cold area, I have no doubt, that the species is certain and distinct.

Locality: Station 116, 70° 05′ Lat. N., 8° 26′ Long. W., South of Jan Mayen, depth 371 fathoms (bottom temperature + 0° 4 C.). One specimen.

3. G. carnosa Tops.

Pl. III, Figs. 20—21, Pl. V, Fig. 4.

1904. *Vvesia carnosa* Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 198, Pl. XV, fig. 19.

Plate-shaped and incrusting, or higher and more massive. Surface rugose and wrinkled, without projecting spicules. Oscula spout-shaped. The dermal membrane a thin film. The dermal skeleton formed of acanthoxea which are very scattered and often only found in the dermis in very small number. The main skeleton consisting of fibres which from the base or the middle radiate towards the surface; there are no transverse fibres, but the acanthoxea are scattered between the fibres. Spicula: megasclera: the skeletal spicules are polytylote tornota, 0·37—0·47 mm, the dermal spicules acanthoxea 0·137—0·178 mm; microsclera not present.

The Ingolf-Expedition has taken three specimens of this species; one grows as a plate on a specimen of *Bicuma rosea* and has a greatest extent of about 25 mm, and a greatest thickness of 3 mm, the second specimen grows on a shell of *Pecten aratus* as an incrustation with a greatest extent of 15 mm; these specimens have thus in outer shape a resemblance with the specimens described by Topsent, which latter, however, reached to a greatest extent of 55 mm. The third specimen is a small, oval body, of a length of 7 mm; it has two oscular cones in one end, the other end shows a somewhat broken surface and besides some adhering bottom material; the specimen has thus probably been attached with this end and has thus been erect. The colour (in spirit) is lighter or darker brown, in one specimen quite white; Topsent's specimens were blackish, one or the other of the colours is certainly due to the action of alcohol. The consistency is somewhat firm and elastic. The *surface* is somewhat wrinkled and folded, but otherwise smooth. The *dermal membrane* is thin but somewhat solid, it is not easily separable, and it is provided with spicules only to a very slight degree. *Pores* or pore-areas I have not seen, probably they are closed and must have disappeared in the folded and wrinkled dermal membrane. Of *oscula* as said two were found on one of the specimens, while the two others showed none.

The *skeleton*. The *dermal skeleton* is in this species almost not developed, as there are, at all events in by far the most places, only rather few, scattered acanthoxea in the dermis. The *main skeleton* has a somewhat similar structure as in the other species; it consists of fibres which radiate towards the surface, are branched and support the dermis, but do not pierce it; the outermost fibres are as a rule thin, but here and there also very thick fibres go to the surface; in the interior the fibres are very thick and strong. The fibres go in the plate-shaped specimens not parallel from the base to the surface, but they seem to have a more or less extended centre at the base, from which they radiate to the surface; in the erect specimen there are thick spicular parts at the base and in the middle, from which fibres radiate out. There are no transverse connecting fibres, but acanthoxea are scattered between the fibres. The fibres consist of tornotes; the skeleton in the oscular cones are formed of fibres of tornotes, but no acanthoxea were seen here. Spongin was not observed.

Spicula: a. *Megasclera:* 1. The skeletal spicules are tornota, they are straight, the ends are somewhat long-pointed, but outermost often a little stubby; they are distinctly polytylote. The length is 0·37—0·47 mm and the diameter is between 0·005 and 0·007 mm. The ends are generally not equal, but

one is a little shorter and a little more stubby, the other longer and more pointed; the fine developmental stages are quite monactinal, and the thinner spicules or developmental forms are generally more pronounced polytylote than the thicker. 2. The dermal spicules are acanthoxea, they are evenly curved, sometimes the curve forms an angle in the middle of the spicule; they are fusiform and long-pointed, tapering from the middle outwards. The spinulation is dense, the spines are largest in the middle but decrease in size outwards. The length is 0·137—0·178^{mm} and the diameter 0·004 – 0·007^{mm}. Some developmental stages were found, which were quite fine and more weakly spinulous. The tornotes form the fibres, the acanthoxea occur in the dermal membrane but much scattered, and besides they occur in the tissue, between the fibres. *Microsclera* are not present.

I think it quite certain that this species is identical with *carnosa* Tops., as the description answers precisely; the outer shape, the skeleton and the spicules agree, only the spicules are declared to be a little larger, the tornotes 0·53—0·60^{mm} with a thickness of 0·007—0·010^{mm} and the acanthoxea 0·16—0·18^{mm} with thickness 0·005—0·006^{mm}, but this difference is certainly of no consequence with regard to specific distinction; a fact which also contributes to the settlement that the species are identical is the communication by Topsent, that at the surface: "s'accumulent de large cellules sphéruleuses à sphérules dissociées, grosses, brillants...", since my specimens show the tissue at the surface filled with densely crowded, curious, rather large, elliptical granules[1]).

Locality: Station 9, 64° 18' Lat. N., 27° 00' Long. W., depth 295 fathoms; station 85, 63° 21' Lat. N., 25° 21' Long. W., depth 170 fathoms; station 89, 64° 45' Lat. N., 27° 20' Long. W., depth 310 fathoms. The localities lie near to each other in the Denmark Strait.

Geogr. distr. The species has earlier been taken at the Azores at 38° 46' Lat. N., 27° 17' Long. W., depth 543 fathoms and 38° 35' Lat. N., 28° 06' Long. W., depth 664 fathoms (Topsent. l. c.).

I shall here try to give a list of the *Grayella* species in the consecutive order in which they have been described, at the same time noting their spiculation and outer shape:

		Spicules:			
		skeletal.	dermal.	microsclera.	shape.
1862.	*G. rubiginosa* O. Schmidt (Spong. d. adriat. Meer. 72, Taf. VII, Fig. 5) *(Myxilla)*	tylota	styli	÷	crust.
1864.	— *albula* Bow. (Mon. Brit. Spong. II, 253, III, Pl. XLV, figs. 21—24) *(Halichondria)*	styli	styli	chelæ arcuatæ	crust.
1869.	— *cyatophora* Cart. (Ann. Mag. Nat. Hist. 4, IV, 190, Pl. VII)	strongylotornota	oxea	÷	massive crust.
1870.	— *papillosa* O. Schmidt (Grundzüge einer Spongienf. Atl. Meer. 57) *(Cribrella)*	strongyla	oxea	chelæ arcuatæ	tuberous.

[1]) What these granules may be I cannot say; whether they really have something to do with Topsent's cellules sphéruleuses is, I think, doubtful.

		Spicules: skeletal.	dermal.	microsclera.	shape.
1876.	*G. pyrula* Cart. (Ann. Mag. Nat. Hist. 4, XVIII, 388, Pl. XIV, fig. 20, Pl. XV, fig. 38) *(Cometella)*	tornota	styli	chelæ arcuatæ	club-shaped.
1882.	— *armigera* Bow.[1] (Mon. Brit. Spong. IV, 73, Pl. IV, figs. 10—17) *Hymeniacidon)*	oxea	styli	chelæ arcuatæ	crust.
1885.	— *dura* Arm. Haus. (Norw. North. Atl. Exp. XIII, 13, Pl. II, fig. 5) *(Sclerilla)*	oxea	oxea	chelæ arcuatæ	club-shaped.
"	— *arctica* Arm. Haus. (ibid. 12, Pl. II, fig. 4, Pl. VI, fig. 15 *(Sclerilla)*	oxea	oxea	chelæ arcuatæ	club-shaped.
"	— *membranacea* Arm. Haus.[2] (ibid. 4, Pl. I, fig. 11, Pl. VI, fig. 12.) *(Reniera)*	?	oxea	?	?
1892.	— *pedunculata* Tops. (Résultats des camp. sc. du Prince de Monaco, II, 105, Pl. V, fig. 6, Pl. X, fig. 17.) *(Ytesia)*	tornota	styli	chelæ arcuatæ	club-shaped.
"	— *fallax* Tops. (ibid., 106, Pl. VI, fig. 13, Pl. X, fig. 14.) *(Ytesia)*	tornota	styli	chelæ arcuatæ	massive.
"	— *Hanseni* Tops. (ibid., 106, Pl. VI, fig. 9a, Pl. X, fig. 13) *(Ytesia)*	tylota	styli	chelæ arcuatæ, sigmata	crust.
"	— *Richardi* Tops. (ibid., 107, Pl. X, fig. 15.) *(Ytesia)*	tylota	styli	chelæ arcuatæ, sigmata	crust.
"	— *Guernei* Tops. (ibid., 105, Pl. III, fig. 7, Pl. X, fig. 16) *(Ytesia)*	styli	styli	sigmata	thick crust.
"	— *Ridleyi* Tops. (ibid., 107, Pl. X, fig. 12) *(Ytesia)*	tylota with spinulous ends	tornostrongyla	÷	crust.
"	— *pertusa* Tops. (ibid., 107, Pl. IV, fig. 10, Pl. X, fig. 18.) *(Ytesia)* (nou *pertusa* Tops. 1904)	tornota	oxea	chelæ arcuatæ	crust.
"	— *linguifera* Tops. (ibid., 108, Pl. X, figs. 10—11) *(Ytesia)*	strongyla	oxea	chelæ arcuatæ	massive crust.
"	— *rosacea* Tops. (Arch. Zool. exp. et gén. 2, X, XXIII) *(Ytesia)*	tornota	styli	chelæ arcuatæ	thick crust.
1898.	— *alecto* Tops. (Mém. de la Soc. Zool. de Fr. XI 248, fig. 2 e—e") *(Ytesia)*.	strongyla	oxea, with large spinulous spines and transformations to asters	÷	massive.
1903.	— *polymastia* Thiele (Arch. für Naturgesch. 1903, 391, Taf. XXI, Fig. 24 a—c)	strongyla	styli	chelæ arcuatæ	semiglobular.
"	— *mammillata* Arnesen (Berg. Mus. Aarb. 1903, 17, Taf. II, Fig. 6, Taf. VII, Fig. 2.) *(Ytesia)*	tylota, single styli	styli to strongyla	chelæ arcuatæ	massive.

[1] Perhaps a *Cretla*. [2] This species might perhaps be a *Cretla*, but the point cannot be decided, only the dermal membrane being known.

		Spicules:			
		skeletal.	dermal.	microsclera.	shape.
1903.	*G. lobata* Arnesen (ibid. 18, Taf. II, Fig. 7, Taf. V, Fig. 1, Taf. VI, Fig. 2) *(Vvesia)*	oxea	styli	chelæ arcuatæ	club-shaped.
1904.	— *carnosa* Tops. (l. c. Fasc. XXV, 198, Pl. XV, fig. 19) *(Vvesia)*	tornota, polytylote	oxea	÷	massive.
	— *gelida* mihi	tornota, polytylote	strongyla	chelæ arcuatæ	club-shaped.

Of these species, four: *G. arctica* Arm. Hans., *dura* Arm. Hans., *pedunculata* Tops., and *lobata* Arnesen, disappear as identical with *G. pyrula* Cart. as shown above, (the shape of the spicules of these species is in the above list given as recorded by the authors); the total number of the species belonging at present to *Graycilla* is thus twenty, of which two, *G. armigera* Bow. and *membranacea* Arm. Hans. are doubtful.

Cribrella hospitalis O. Schmidt (Grundzüge einer Spongienf. des Atlant. Gebiet. 1870, 56, Taf. IV, Fig. 12) was by Topsent (l. c. 1892, 103) taken to be an *Vvesia*, and I thought the same (The Danish Ingolf Exp. VI, 2, 1905, 127); Topsent had also good reasons for his interpretation, but yet it seems not to be correct, and there is every reason to take this species to be a *Stylostichon*, as I have declared more particularly (Meddel. om Grönland, XXIX, 1909, 447). Schmidt also says nothing about the arrangement of the oxea and the acanthostyli in this species, whereas he does so with regard to his next species *C. papillosa*, and I think it rather sure, that Fristedt's and Carter's *hospitalis* are identical with Schmidt's species, and that the species is thus a *Stylostichon*; the figure by Carter (Ann. Mag. Nat. Hist. 4, XVIII, Pl. XIII, fig. 18) of the outer shape of the sponge also points in this direction.

Subfam. 2. **Ectyoninae**.

Hymedesmia Bow.

(*Leptosia* Topsent, 1892.)

Incrusting and generally very thin forms; sometimes, on account of the manner of growth, assuming a massive appearance, but also then in reality incrusting. The surface generally simple, sometimes with more or less developed papillæ to which oscula and pores are connected. The main skeleton consists of vertical acanthostyli with their heads based on the substratum; it may be more or less dense, sometimes rather diffuse and little developed. The dermal skeleton formed of bundles or fibres of dermal spicules, which generally stretch from the main skeleton, or quite from the base, upwards to the dermal membrane; it may be very differently developed, sometimes consisting of scattered bundles, sometimes of relatively long fibres, and it is not rarely by far the most developed part of the skeleton. The dermal membrane itself, which is supported by the outermost bundles of the dermal skeleton, may be with or without horizontal spicules; it is generally charged with dense-lying chelæ, often so dense, that they form a layer. At the base of the sponge there is a generally small amount of spongin, in which the heads of the acanthostyli are imbedded. Spicula: megasclera: the skeletal spicules are acanthostyli, the head is generally more or less swollen; they always vary greatly in size, and are often divided

into two groups of sizes, large and small: the dermal spicules are as a rule diactinal, generally strongyla, sometimes tylota, tornota or oxea; in a few cases they are monactinal, styli. Microsclera are chelæ arcuatæ, solely or together with sigmata, rarely sigmata alone, in a single case rhaphides alone; sometimes there are no microsclera.

The species of *Hymedesmia* are all incrusting forms, as it is a generic character, that the skeletal spicules are all based on the substratum; the species are therefore all of insignificant appearance, forming flat and generally very thin crusts; only rarely they may assume another appearance, showing a massive exterior, but this is then due to the manner of growing, such species more or less enclosing their substratum, which is in such cases loose bottom material, and getting thereby the massive outer shape, but being in reality incrusting and with all the skeletal spicules fixed on particles of the imbedded bottom material. The dermal skeleton may sometimes be strongly developed, giving the sponge some thickness, and this is also the case just in the species appearing massive, which also contributes to their massive appearance. The main skeleton is very uniformly constructed, all the acanthostyles having their heads placed on the substratum and being more or less vertical; only the density in which the spicules are placed may be somewhat different; generally the acanthostyles are placed uniformly scattered over the substratum, but in some cases this is not so, the acanthostyles being gathered in small bundles, from which then the fibres of the dermal skeleton issue, and in the species, which enclose their substratum, this is generally so. The dermal skeleton, which is less influenced by the incrusting growth, may be a little more varied, and is sometimes by far the most developed part of the sponge; in the thin, incrusting forms, however, it only consists of more or less scattered bundles or short fibres. In the species in which the microscleres are chelæ, which is by far the greatest number, these may be more or less numerously scattered in the dermal membrane, and not rarely they form a more or less dense, sometimes very dense, layer; this feature reaches, I think, its climax in *H. crux* where the spined chelæ form a very dense layer constituting a protective mail. When the chelæ are so strongly gathered in the dermis, I think this is to some degree due to contraction, a state which generally prevails in spirit material and therefore is so often present in the material for examination; when the sponge is living and expanded I think the chelæ would be found much less concentrated; if this is so, it would also be easily understood, that the chelæ, when the living sponge is disturbed and contracts, form a strong, protective layer.

The surface is generally simple, more rarely it bears papillæ, which may be very low, conical warts, or somewhat long papillæ, or they may finally be very long and thread-like; the papillæ as a rule bear the oscula and pores. I think that special adaptations for oscula and pores are also otherwise often present, but they are often so insignificant, that they are difficult to detect, e. g. the pore-sieves in *H. Dujardinii*, and when no special adaptations are seen I think the oscula are simple openings and the pores lie in more or less pronounced groups over the subdermal cavities.

The colours of the species are generally the ordinary yellow, greyish or brownish colours; more rarely other, more lively, colours are present, as reddish, green or blue.

As said above, some species grow on loose bottom material as sand, gravel, sponge-spicules and the like; otherwise the numerous species form incrustations on every kind of substratum present

on the bottom, as large and small stones, shells of every kind, corals, Bryozoa and hydroids, worm-tubes, other sponges etc. The shells and other objects are generally dead, but the sponges incrust also not rarely living Molluscs and Brachiopods. Often several different species grow together on the same object, and when their outer apperance, as generally, is the same, it may be a matter of no little difficulty to make out the borders for the different species.

The genus *Hymedesmia* in its present conception was established by Topsent in 1892 (Arch. de Zool. exp. et gén. 2. X, XXII) under the name of *Leptosia*, but Thiele has correctly shown (Abhandl. Senckenberg. naturf. Gesellsch. XXV, 1903, 955), that the genus must bear the name *Hymedesmia* Bow. as Topsent enumerates *H. zetlandica* as one of its species, and this species is the type of Bowerbank's *Hymedesmia*.

Topsent placed the species in his subfamily *Dendoricinae*, but I prefer to include it, together with the nearly related *Hymenancora* n. g. and *Leptolabis* Tops.[1]), in the subfamily *Ectyoninae*: the whole construction of the skeleton points towards the *Ectyoninae*, the acanthostyli are always much varying in size and often divided into two different groups; among the *Hyalinae* we have no genus with a similar skeleton; there is also no doubt that *Hymedesmia* is nearly related to the Ectyonine genera *Stylostichon* and *Plumohalichondria*.

To the genus *Hymedesmia* I refer only such species which are quite incrusting and in which the base of the main skeleton is in one plane, that is to say that all the skeletal styles have their heads based on the substratum. This character is then the main distinguishing character in contrast to *Stylostichon*, in which genus the main skeleton forms columns, and if we wish to have a sharp distinction it is necessary to make sure, that the main skeleton in *Hymedesmia* must be quite basally arranged; if the dividing line is not drawn in this way, we get no sharp distinction, and I am also inclined to think, that this division is somewhat natural. The group of genera which may here be taken into consideration are: *Hymedesmia*, *Plumohalichondria*, *Eurypon* (= *Hymeraphia*) and *Microciona*. These genera I understand in the following way: *Hymedesmia* and *Stylostichon* are nearly related, but are distinguished by the character mentioned; a character which is often found in *Hymedesmia* and which may also be found in *Stylostichon* is the above mentioned crowding of the chelæ in the dermal membrane, so that a more or less distinct layer is formed; *Plumohalichondria* stands a little more remote, distinguished by having smooth, diactinal spicules in the fibres; *Eurypon* and *Microciona* are still more remote, and nearer towards the *Clathria*-like forms; they are, so far as I know them, characterised in contrast to the three first-named genera by a greater difference between the skeletal and the accessory spicules and by (generally) monactinal dermal spicules, the chelæ are (always?) palmate chelæ, and toxa are very often present; I think these characters will prove valid in most cases; the two genera are distinguished from one another by the character that *Eurypon* has a basally arranged main skeleton, while *Microciona* has columns. Some single species of *Eurypon* without microscleres may perhaps be difficult to distinguish from some species of *Hymedesmia* likewise without microscleres, but as a rule I think that the mentioned characters from the megascleres will be sufficient.

The genus *Hymedesmia* is rather large, and it was therefore of some importance, if it could be divided; Topsent has already separated the species with forcipes, forming for them the genus

[1]) I think *Leptosastra* Tops. and perhaps also *Dragmatyle* Tops are likewise to be placed in the *Ectyoninae*.

Leptolabis: below I have separated off the species with ancoræ, forming for them my genus *Hymeancora:* though it is only a small number of species which are thus separated from *Hymedesmia*, the division is, however, of importance, making the remaining genus more uniform and natural. The possibility might also be suggested of dividing the remaining genus into two, containing respectively the species with and those without microscleres, but such a division I consider as not natural, as some species of both groups are nearly related; quite the same holds good with regard to the possibility of separating off the species which possess sigmates, e. g. *H. zetlandica* Bow. with sigmates is nearly related to *H. Bowerbanki* n. sp., *truncata* n. sp. and *latrunculioides* n. sp. all without sigmates.

1. **H. Koehleri** Tops.

Pl. V, Fig. 5.

1896. *Leptosia Koehleri* Topsent, Résultats scient. de la camp. du "Caudan", 284, Pl. VIII, fig. 7—9.
1904. — — Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 188.

Incrusting; oscula present as low and indistinct cones, with a dense skeleton of dermal spicules in the wall. Spicula: megasclera: the skeletal spicules acanthostyli with a somewhat distinct head, and spined in the whole or nearly the whole length, 0·09—0·33^{mm}, not divided into two groups: dermal spicules polytylote strongyla 0·196—0·30^{mm}; microsclera chelæ arcuatæ 0·028—0·050^{mm}.

Of this species, which I refer to *H. Koehleri* Tops. (see below under remarks), we have a rather large material. The specimens form thin incrustations on stones, some single ones grow on tubes of *Placostegus tridentatus*. The greatest extent to which my specimens reach is 24^{mm}; the thickness reaches scarcely 0·5^{mm}. The colour (in spirit) is generally white, sometimes a little darker and then greyish brown or light brown. The *surface* is in the undamaged specimens smooth, without projecting spicules, but under a good lens it appears finely gritty, which is caused by the styles. The *dermal membrane* is an easily separable, thin and transparent membrane; it is filled with microscleres and is supported by scattered bundles of dermal spicules. *Pores* I have only observed with certainty in a couple of specimens, and in these they were seen as scattered, circular openings of a diameter of about 0·047^{mm}; when the pores are normally open they probably lie in groups over the subdermal cavities. *Oscula* could in several specimens be observed with a good lens. They are scattered on the surface and appear as very weakly pronounced and low cones of a diameter of about 1^{mm}. In the centre an opening appears which is larger or smaller in relation to the degree of opening of the osculum; on account of the slight thickness of the sponge the opening only appears as a deepening; when the osculum is closed, the cone appears slightly stellately corrugated. The dermal spicules form an oscular skeleton, as they lie very close in the wall of the oscular cone and are arranged subparallel, so that they radiate stellately towards the oscular opening; above the dermal spicules, however, lies the dense layer of chelæ; this layer is only wanting just at the very summit of the oscular cone. Larger and smaller subdermal cavities or canals may be seen shining through the dermis, especially in the lighter coloured specimens.

The *skeleton*. The *dermal skeleton* may be said for the greater part to be formed of the chelæ, which form a very dense layer in the dermal membrane. Moreover, short and loose fibres or bundles

of dermal spicules stretch, generally in a more or less oblique direction, from the interior of the sponge out to the dermis; besides, they are also found in the dermis, below the layer of chelæ, as scattered bundles or single spicules; finally they form, as said, the skeleton of the oscular wall, also lying here below the layer of chelæ. The *main skeleton* is formed of the acanthostyli which all have the heads fixed on the substratum and are vertical; the largest acanthostyli reach with the point up to the dermal membrane, but in the undamaged sponges they scarcely project beyond it. The smaller styles are placed between the larger. Spongin was not observed with certainty.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are generally straight, sometimes slightly curved; they have a somewhat distinct head, and from this they taper evenly, thus forming a long apex which is often a little more abruptly pointed at the very point. The spinulation is somewhat dense in the lower part of the spicule, but becomes more scattered outwards, and the outermost part is generally smooth; the longer the spicules are the point is to a greater extent smooth, and in the smaller spicules the spines are found quite out to the point. The spines are somewhat reclined. The head is densely covered with spines, which are considerably larger than the others, and also have a different shape; they are not reclined but more or less straight radiating, and they are as a rule not pointed but obtuse at the end; this obtuse or cut end is not rarely somewhat jagged or crenulated. The styles vary much in size and as the intermediate forms occur somewhat sparingly, the styles would seem divided into two groups with regard to size, but there is certainly no principal division into two groups. The length varies in all between 0·09 and 0·33^{mm}, and the diameter at the head, including the spines, varies from 0·014—0·035^{mm}. With regard to the size of the styles there may be some difference in different individuals, in some the greatest length was thus 0·23^{mm} and the diameter 0·024^{mm}; when the spicules thus only reach a smaller length, the mentioned division into two groups is generally still less distinct. 2. The dermal spicules are rather slender, straight strongyla; the two ends are often a little different, one being slightly thicker than the other, and sometimes one or both ends are slightly swollen; in other cases the ends are somewhat narrowed. The strongyla are always polytylote with a row of swellings; this may be more or less pronounced, but is rarely or never quite wanting. The strongyla have a length of 0·196—0·30^{mm}, and a diameter in the middle of 0·005—0·007^{mm}. These spicules do not vary much in the various individuals. b. *Microsclera:* these are chelæ arcuatæ; they have a more or less, but always rather strongly, curved shaft, the alæ are lobe-shaped, the tooth is narrowly elliptical with the end rounded, and there is a long, narrow tuberculum. The shaft is not cylindrical but somewhat flattened, which may be present to a higher or lower degree. The chelæ may vary a little in shape and size in the various individuals, the shape, however, is chiefly the same. The length is, all variations concerned, 0·028—0·050^{mm}; as instances of variation in size in various individuals I may note the following: 0·028—0·038^{mm}, 0·035—0·042^{mm}, 0·037—0·045^{mm} and 0·032—0·050^{mm}; the diameter of the shaft is 0·004—0·010^{mm} in relation to the size of the chela, and to whether it is seen in front or side view. As said, the chelæ occur in the dermal membrane forming a dense layer; they are also seen singly through the whole body.

Remarks: I have determined the above species as *H. Kochleri* Tops., but not without hesitation. When Topsent in 1896 founded the species, he laid stress especially on the polytylote strongyles,

but this is not a very safe character, as strongyles more or less polytylote are of frequent occurrence in *Hymedesmia;* already when he founded the species, Topsent mentioned, that it varies somewhat with regard to the spicules, and in 1904 he again states that this variation takes place to a high degree, the three forms of spicules varying both in size and in shape; according to this I am not at all sure, that all the specimens mentioned by Topsent belong really to the same species. When I have determined my species as *Kochleri*, my reason is especially the somewhat robust, conical acanthostyli, generally with large, somewhat obtuse or crenulated spines at the head-swelling, the polytylote strongyla with unequal ends and also the shape of the chelæ. Now, as already stated, my specimens may also vary to a certain degree, and the acanthostyli are not always so robust, or with so large spines at the base as in the more typical specimens, and the possibility, that there may be more than one, very nearly related species in my material is not quite excluded.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 16, 65° 43′ Lat. N., 26° 58′ Long. W., depth 250 fathoms; station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 57, 63° 37′ Lat. N., 13° 02′ Long. W., depth 350 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; further it has been taken East and West of the Faröe Islands in depths of 250 and 180 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities are situated in the Denmark Strait, between Iceland and the Faröe Islands and East of the latter.

Geogr. distr. Topsent mentions the species from the Bay of Gascogne, depth 648 fathoms, and from the Azores in depths of 318 to 1350 fathoms. At present the species would thus be known from about 66° to 38° Lat. N., and between about 2° and 31° Long. W., with a bathymetrical range from 138 to 1350 fathoms.

2. **H. lacera** n. sp.

Pl. V, Fig. 6.

Incrusting; surface smooth. Spicula: megasclera; the skeletal spicules slender acanthostyli with a slightly marked head, spined only in the lower half part, 0·13—0·51 mm, not divided into two groups; dermal spicules large, generally slightly polytylote strongyla, 0·327—0·47 mm; microsclera chelæ arcuatæ 0·045—0·054 mm.

Of this species one specimen grows as an irregular incrustation on a worm-tube which is attached to a *Hornera lichenoides*, another specimen grows on a mussel-shell; the greatest extent of the specimens is about 15 mm, and the thickness is about 0·5 mm or a little more. The colour (in spirit) is whitish grey or dirty brownish grey, but it is stated to be light dirty green in the fresh state. The *surface* is smooth, without projecting spicules. The *dermal membrane* is a somewhat solid film.

The *skeleton*. The *dermal skeleton* is formed of bundles or short fibres, stretching from beneath up to the dermis, upwards they are somewhat penicillately spread; moreover, bundles or somewhat longer fibres are found lying horizontally in the dermal membrane, and finally there are scattered chelæ. The *main skeleton* is constructed in the ordinary way; the styli are very dispersed. So far as I could observe there is some spongin at the base.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, which are very slender and straight or quite slightly, rarely a little more, curved; the head is generally only very slightly

swollen, and the shaft tapers into a long, fine apex. The spinulation is both in the large and in the smaller styli restricted to about the lower half part; in the small styli there are, however, generally some scattered spines more apically. The spines are only somewhat large on the head, outwards they become small and still further outwards they are small grits, but generally more or fewer larger spines are found between them. The spines are directed straight out, not reclined. The length is 0·13—0·51 mm, and the diameter of the head is 0·014—0·025 mm. The styli are not divided into two separate groups, but the intermediate sizes are rare. 2. The dermal spicules are rather large, straight strongyla; one end is generally a little thicker than the other, but this feature is not always distinct; the thicker end, or both ends may be quite slightly swollen; the shaft is slightly polytylote, but sometimes this is hardly apparent. The length is 0·327—0·47 mm, and the diameter 0·007—0·011 mm. b. *Microsclera,* these are chelæ arcuatæ; they have an evenly, not specially strongly curved shaft; the tooth is narrow, lanceolate, the alæ are of the same length as the tooth, but they are relatively narrow, they may therefore, in a certain view be of a somewhat claw-shaped appearance, and the chela may remind one somewhat of an ancora. The length is 0·045—0·054 mm, the shaft is somewhat flattened, the diameter relatively from 0·0028 to 0·0057 mm. The chelæ occur rather numerously scattered in the dermal membrane.

The slender, often straight styli, generally showing some large spines among the small, are characteristic for this species together with the large dermal spicules and the large chelæ with relatively long, narrow alæ.

Locality: Station 113, 69° 31′ Lat. N., 7° 06′ Long. W., depth 1309 fathoms (bottom temperature ÷ 1° C.), one specimen; Forsblads Fjord in East-Greenland, 72° 28′ Lat. N., depth 50—90 fathoms (The Amdrup Expedition 1900), one specimen. The species must, according to these localities, be a native of the cold water.

3. **H. storea** n. sp.

Pl. V, Fig. 7.

Incrusting; surface smooth? Spicula: megasclera: the skeletal spicules somewhat densely spined acanthostyli with a globular head, the longer of them with a smooth apical part. 0·10—0·30 mm, not divided into two groups; the dermal spicules polytylote strongyla 0·29—0·37 mm; microsclera small chelæ arcuatæ recalling in shape the palmate chelæ, 0·033—0·038 mm.

This species grows as extended but thin incrustations on stones; it reaches a greatest extent of 65 mm, the thickness is very slight, below 0·5 mm. The colour (in spirit) is whitish grey. In the present state of the sponge the *surface* is densely and finely hispid, caused by the skeletal spicules, but this seems to be due to the fact, that the dermal membrane is wanting for the greatest part; where the membrane is present, the surface seems to be smooth. The *dermal membrane* is a thin membrane, resting on the skeleton below.

The *skeleton.* The *dermal skeleton:* the dermal spicules form a skeleton of bundles and fibres stretching from the basal skeleton up to the dermis; the fibres run more or less obliquely or bend horizontally under the membrane. The *main skeleton* is constructed in the ordinary way, consisting of vertical acanthostyli not placed specially densely. At the base an amount of spongin is present.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, they are straight, more rarely slightly curved, with a distinct, globular, but however only slightly swollen head. The spination is dense, consisting of large, more or less reclined spines; on the head, where the spines are largest, they radiate straight out, and also on the lowermost part of the shaft; the larger styli become dispersedly spined outwards and have a smooth apical part; the smaller ones are spined in the whole length, but they have often, however, the spines somewhat dispersed towards the apex. The length is 0·10—0·30^{mm}, and the diameter of the head is 0·014—0·028^{mm}; the styli are not divided into two groups of size. 2. The dermal spicules are straight strongyla; they are of the same thickness in the whole length and more or less polytylote; one end may be quite slightly swollen. The length is 0·29—0·37^{mm} and the diameter 0·005—0·007^{mm}. b. *Microsclera* are chelæ arcuatæ, they are rather small and slender, the tooth is narrowly elliptical, the alæ are connected with the shaft in their whole length, viewed from in front they are only slightly incised below, the chela thus approaches to the palmate chelæ; the shaft is slender and evenly but not much curved. The length is 0·033—0·038^{mm}, and the diameter of the shaft 0·002^{mm}. The chelæ occur in somewhat great numbers in the dermal membrane.

This species in its acanthostyli somewhat resembles *Kochleri*, but it has larger strongyla, and more slender chelæ of another shape; from *baculifera* Tops. it is distinguished by the chelæ.

Locality: Station 105, 65° 34′ Lat. N., 7° 31′ Long. W., depth 762 fathoms (bottom temperature + 0° 8 C.); station 125, 68° 08′ Lat. N., 16° 02′ Long. W., depth 729 fathoms (bottom temperature + 0° 8 C.); the species is thus limited to the cold area. The localities lie North and North-east of Iceland.

4. **H. lamina** n. sp.

Pl. V, Fig. 8.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a rather small, globular head, spined in the whole length, but the spines in the longer spicules very dispersed towards the point, 0·12—0·33^{mm}, not divided into two groups: the dermal spicules strongyla, 0·22—0·36^{mm}; microsclera small chelæ arcuatæ of a shape reminding one somewhat of palmate chelæ, 0·028^{mm}.

Of this species we have five specimens, three growing on two different Bryozoa, one on a stone and one on a living Brachiopod; it has a greatest extent of 10—17^{mm}, the thickness is about 0·5^{mm}. The colour (in spirit) is greyish white. The *surface* is smooth, without projecting spicules. The *dermal membrane* is a rather thin, but somewhat solid membrane, resting on the skeleton below. Some canals were seen shining through the membrane.

The *skeleton.* The *dermal skeleton* consists of bundles and fibres of dermal spicules, stretching from the lower part of the sponge up to the membrane; they have a more or less oblique direction, and below the dermal membrane they may run as horizontal or nearly horizontal fibres, but there is no skeleton in the dermal membrane itself; the fibres have many spicules alongside, but they are however not specially thick. The *main skeleton* is formed in the ordinary way, it is somewhat dispersed. At the base an amount of spongin is found in which the heads of the acanthostyli are imbedded.

Spicula: a. *Megasclera.* 1. The skeletal spicules are straight or very slightly curved acanthostyli; the head is globular, but not however much swollen, the apex is long and evenly tapering; the spines are distinct also in the larger styli; the small styli are entirely spined, in the larger the spines are very dispersed towards the point, but they are most often present out to the point, or only a small part of the apex is smooth; more rarely the styli may be smooth for a longer distance. The length is 0·12—0·33^{mm}, and the diameter of the head is 0·012—0·022^{mm}. 2. The dermal spicules are straight strongyla; they are of the same thickness in the whole length and slightly polytylote; the length is 0·22—0·36^{mm} and the diameter about 0·005^{mm}. The size of the megascleres may vary a little in various individuals. b. *Microsclera:* these are chelæ arcuatæ; they are small and of a particular shape, by which they approach somewhat to the chelæ palmatæ; the shaft is evenly curved, the tooth is lanceolate, and the alæ are connected with the shaft in their whole length, it is therefore chiefly only the curved shaft which distinguishes them from the palmate chelæ. The length is 0·028^{mm} and the diameter of the shaft about 0·002^{mm}. The chelæ occur scattered in the dermal membrane.

This species is characterised already by its chelæ.

Locality: Station 1, 62° 30′ Lat. N., 8° 21′ Long. W., depth 132 fathoms; station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms; at Angmagsalik on the East coast of Greenland, depth 140 fathoms (The Amdrup-Expedition 1900); 61° 40′ Lat. N., 7° 40′ Long. W., depth 135 fathoms (Ditlevsen); East of the Faröe Islands, depth 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities are situated in the Davis Strait, at East-Greenland and at the Faröe Islands.

5. **H. mollis** n. sp.

Pl. VI, Fig. 1.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a small head, the larger slightly spined and smooth outwards, the smaller spined in the whole length, 0·119—0·53^{mm}, not divided into two groups: the dermal spicules strongyla 0·24—0·357^{mm}; microsclera chelæ arcuatæ 0·027—0·040^{mm}.

Most specimens of this species grow incrusting on Brachiopods, as well on living as on dead specimens, one grows on a shell of a *Buccinum*, one on a mussel-shell and finally one on an *Oculina*. The greatest extent measured is about 20^{mm}; the thickness generally does not exceed 0·5^{mm}. Two specimens grow in a remarkable manner; they are not attached to a definite substratum but grow on sand, gravel and small particles of very different kinds, especially sponge-spicules; they then envelop the substratum, so that the sponge together with the substratum forms irregular, wrinkled masses which seem rather thick, but the real thickness is not greater than given above. The colour (in spirit) is greyish brown. The *surface* is smooth or nearly so. The *dermal membrane* is a thin film, but it is for the greater part wanting on the specimens. *Oscula* and *pores* were not to be observed on account of the bad condition of the dermal membrane.

The *skeleton*. The *dermal skeleton:* the skeleton formed of the dermal spicules is strongly developed. Quite down at the base of the sponge the dermal spicules form fibres or fibre-like bands

running parallel with the underlayer; further there are bundles stretching obliquely up to the surface, and at the surface there are again bundles or fibres present running more or less parallel with it; besides, there are also found scattered spicules at the surface. The bundles are often rather thick. The dermal spicules form thus the greatest part of the whole skeleton. The *main skeleton* consists of acanthostyli with their head-ends on the substratum; they do not reach beyond the surface. Spongin seems to be found at the base, but only to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or slightly curved and have a rather small head-swelling; the apex is even and long. The spinulation is somewhat slight, as commonly the largest spines are found at the head-end; in the longer styli the spines become very small outwards, and the outer part of the spicules is smooth; the smaller styli are spined in the whole length, and the spines are generally larger. The styli vary much in size, but they are not divided into two groups. The length is 0·119—0·53 mm and the diameter of the head 0·014—0·027 mm. 2. The dermal spicules are strongyla, they are straight or, more rarely, slightly curved, and they are slightly fusiform. The ends are not uniform, one end is rounded and sometimes slightly swollen, the other end is thinner and rounded or with a stubby point. The length is 0·24—0·357 mm and the diameter about 0·004—0·0057 mm. The strongyla may be slightly polytylote on the middle part. b. *Microsclera:* these are chelæ arcuatæ; they have a curved shaft, the curvature of which is distinctly situated in the middle of the shaft; the end-parts occupy nearly always less than a third part of the length of the chela; the tooth is broadly elliptical, the alæ are lobe-shaped, of the same length as the tooth. The length may vary somewhat in the same individual and still more in various individuals, it is in all 0·027—0·040 mm, and the diameter of the shaft is 0·0028—0·004 mm. The chelæ occur rather numerously in the dermal membrane, and they seem exclusively or at all events chiefly confined to it.

Locality: Station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms; station 28, 65° 14′ Lat. N., 55° 42′ Long. W., depth 420 fathoms; station 83, 62° 25′ Lat. N., 28° 30′ Long. W., depth 912 fathoms; station 97, 65° 28′ Lat. N., 27° 39′ Long. W., depth 450 fathoms; further it has been taken at 64° 42′ Lat. N., 27° 43′ Long. W., depth 426 fathoms (Wandel), 62° 29′ Lat. N., 5° 17′ Long. W., depth 160 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902) and 63° 05′ Lat. N., 20° 07′ Long. W., depth 295 fathoms (The Fishery investigation steamer "Thor"). Nine specimens in all. The localities are situated in the Davis Strait, the Denmark Strait, South of Iceland and West of the Faröe Islands.

6. **H. curvichela** n. sp.

Pl. VI, Fig. 2.

Incrusting: surface diffusely hispid. The main skeleton not dense. Spicula: megasclera: the skeletal spicules acanthostyli with no distinct or only a slight head: the small spined in the whole length, the larger less spined until only spined at the base: the styli divided into two groups, large 0·53—0·80 mm, small 0·107—0·30 mm: the dermal spicules strongyla, slightly polytylote, 0·32—0·40 mm: microsclera chelæ arcuatæ, strongly curved, 0·031—0·037 mm.

Of the specimens of this species one grows on a stone together with *H. Kochleri, baculifera*

Tops., *dubia* n. sp. (to be described hereafter), a *Plocamia*, an *Eurypon* and a *Polymastia;* another specimen is sitting on a *Pecten*-shell, likewise covered with several other species, a third specimen grows on a Brachiopod-shell and finally a fourth on an erect Bryozoon. The species forms incrustations of a greatest extent of 25^{mm} with a thickness of about 0·5^{mm}. The colour (in spirit) is white or whitish, but with regard to two of the specimens it is stated, that they were deep blue in the living state. The *surface* is diffusely hispid from rather long projecting spicules. The *dermal membrane* is a thin and transparent film. *Pores* and *oscula* were not observed; some canals or canalicular cavities were seen to shine through the membrane.

The *skeleton*. The *dermal skeleton:* in the dermal membrane there are numerous, but somewhat scattered chelæ. The dermal spicules form fibres or bundles stretching far down in the skeleton and seen quite down at the base; they stretch in an oblique direction up to the dermal membrane, and above, at the membrane the direction becomes nearly quite horizontal; some spicules are also lying singly, quite horizontally in the membrane. Above, at the membrane the bundles are generally rather strong with numerous spicules. The *main skeleton* is of the typical construction and consists of basal acanthostyli with the head ends attached to the substratum, the longest styli pierce the dermal membrane and project beyond it. The skeleton is distinguished by the fact that the styli stand somewhat scattered, considerably more scattered than is commonly the case. At the base there is a distinct amount of spongin, in which the heads of the styli are imbedded; the spongin seems to form a continuous lamella at the base of the sponge.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are straight or, especially the larger ones, slightly curved; they have generally no distinct head marked off, or this is only the case to a slight degree, but the dense spinulation at the base gives however the impression of a swelling; they taper evenly into a somewhat fine apex. The spinulation is as usual, the spines being largest at the head-end and radiating, while they are generally reclined on the shaft in the smaller styles. The smallest styles are spined in the whole length, the longer the styles are, the longer a part of the apex is smooth, in the longest styles only the lowermost part is spined, and the spines are here generally small, nearly gritty, and not reclined. The size of the styles varies greatly, the length from 0·107 to about 0·80^{mm} [1] and the diameter of the head is from 0·018—0·034^{mm}. To be sure there is no principal difference between the styles, but there is a break in size between the longest and those coming next in length, such that the longest do not go below 0·53^{mm} and the small not beyond 0·30^{mm}. 2. The dermal spicules are rather long, straight, slightly polytylote strongyla; they have always one end thinner than the other; the length is 0·32—0·40^{mm}, and the diameter in the middle is about 0·005—0·007^{mm}. b. *Microsclera;* these are chelæ arcuatæ; they are distinguished by the shaft being strongly, nearly semicircularly curved; there may in this respect be some difference, the chelæ may be both more or less curved, but the typical form is near the semicircular curvature; the end parts are relatively small, the tooth and the alæ are short and rounded. The length is 0·031—0·037^{mm}; the shaft is somewhat flattened and about elliptical in section, its diameter is, as seen from in front or from the side respectively 0·005—0·010^{mm}. The chelæ occur, as mentioned, numerously in the dermal membrane, but, however, somewhat scattered; they were not observed otherwise in the body.

[1] The greatest length cannot be given exactly, as these styles generally have the apex broken.

This chela bears, in its mostly curved forms, strange to say, great resemblance to the chela found in a species standing rather remote, viz. the chela figured by Carter (Ann. Mag. Nat. Hist. 5. XV, Pl. IV, figs. 3 e, f.). Carter figures also a developmental stage (d), but considers this as an "ill-developed" spiculum.

Locality: Station 15, 66° 18′ Lat. N., 25° 29′ Long. W., depth 330 fathoms (bottom temperature + 0° 75 C.); station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; both these localities lie in the Denmark Strait; further it was taken East of the Faröe Islands, depth about 250 fathoms, and West of the Faröe Islands, depth 160 fathoms, (Ad. Jensen, the cruise of "M. Sars" 1902). Four specimens in all. It is curious that one of the localities, station 15, shows a negative bottom temperature, while the other localities are positive, but it is to be remarked, that this station lies just at the border between the cold and the warm areas.

7. **H. rugosa** n. sp.

Pl. III, Fig. 1, Pl. VI, Fig. 3.

Incrusting; surface somewhat wrinkled, smooth; oscula present as very low cones, with a dense skeleton of dermal spicules in the wall. Spicula: megasclera; the skeletal spicules acanthostyli with a slight head, spined in the whole length, divided into two groups, large 0·30—0·429 mm, small 0·15—0·19 mm; the dermal spicules polytylote strongyla 0·31—0·417 mm; microsclera large, chelæ arcuatæ with the ends a little recurved, 0·052—0·064 mm.

Of this species we have two specimens, one growing on a Brachiopod-shell, the other on a worm-tube. The sponge forms thin incrustations, which reach a greatest extent of 17 mm, with a thickness not exceeding 0·5 mm. The colour (in spirit) is yellow or light brownish. The *surface* is strongly wrinkled and rugose, the dermal membrane being folded, thus giving rise to the formation of irregular, sinuous furrows; this appearance is probably owing to contraction; for the rest the surface is smooth without projecting spicules. The *dermal membrane* is a somewhat solid, easily separable membrane, richly crowded with chelæ. On one of the specimens two *oscula* are seen; these have a structure similar to that of the oscula in *H. Kochleri*, they show in the centre a circular or oval impression, around which the dermal membrane forms stellately radiating folds; the dermal spicules form here a special skeleton, lying close together in the oscular wall with one end towards the opening, and from this radiating out in the membrane. The diameter of that part of the membrane which may be termed osculum is 1·5—2 mm. *Pores* were not to be seen in the membrane which is so densely charged with chelæ.

The *skeleton*. The *dermal skeleton:* the dermal skeleton proper is formed of the chelæ which are extremely close-lying in the membrane; when they are so close-lying, this is perhaps due to contraction. The dermal spicules partly contribute to the formation of the other skeleton of the sponge, as they form bundles or fibres, stretching from the very base up to the dermal membrane, generally in a very oblique direction; in many places they also form horizontal fibres just below the membrane; finally they form, as mentioned, the skeleton in the oscular wall. The fibres and bundles formed of the dermal spicules are rather thick. The *main skeleton* is of the typical construction, and

consists of vertical acanthostyli with their heads based on the substratum; the longest of them reach the dermal membrane, but do not pierce it. Just at the base of the sponge there is, I believe, a slight amount of spongin, but I was not able to see it with absolute certainty.

Spicula: a. *Megasclera:* 1. The skeletal spicules are straight or slightly curved acanthostyli; they have a slightly swollen head and taper evenly into a long apex which outermost is a little more abruptly pointed. The spines on the head are large, they are not pointed but truncate and not rarely somewhat hook-shaped. The spines on the shaft are somewhat dense and continue out to the point, but they are more scattered in the outermost part; the spines are reclined and compressed, so that they get the shape of a tooth of a saw. The styli vary greatly in size, and as intermediate forms are very scarce they are divided into two groups, which are, however, not quite sharply limited. The length lies in all between 0·15 and 0·429^{mm}, and the diameter of the head is 0·025—0·040^{mm}. When the single intermediate sizes are not considered the two sizes will be about 0·15—0·19^{mm} and 0·30—0·429^{mm}. 2. The dermal spicules are slender, straight, or more rarely slightly curved, polytylote strongyla, the ends are generally slightly swollen, so that the spicules approach to subtylota; one end is as a rule a little thicker than the other, and the thinner end has the largest swelling; the swellings are the more distinct the thinner the spicule is, in the thickest strongyla they are very slight or quite wanting. The strongyla vary somewhat in size, the length is between 0·31 and 0·417^{mm}, and the diameter is 0·005—0·008^{mm}. b. *Microsclera* are chelæ arcuatæ; they have a curved shaft and the ends are somewhat recurved; the tooth is lanceolate, with a long tuberculum, and the alæ are of the same length as the tooth; the shaft is somewhat flat, and nearly always slightly dilated in the middle. The chela is rather large, and the size is somewhat constant, the length is 0·052—0·064^{mm}, and the diameter of the shaft varies from about 0·005—0·011^{mm} in relation to the chela being seen in front or in side view, and to the dilatation in the middle of the shaft being larger or smaller. Single developmental stages were seen. The chelæ occur, as said, in enormous numbers and densely crowded in the dermal membrane, and they do not seem to occur otherwise in the body of the sponge.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms. Two specimens. The locality lies in the Denmark Strait.

8. **H. splenium** n. sp.

Pl. VI, Fig. 4.

Incrusting; surface hispid. Spicula: megasclera; the skeletal spicules densely and entirely spined acanthostyli with a very slightly marked head, divided into two groups, large 0·23—0·27^{mm}, small 0·09—0·12^{mm}; the dermal spicules strongyla 0·25—0·31^{mm}; microsclera chelæ arcuatæ 0·041—0·047^{mm}.

This species grows as rather extended incrustations on a somewhat large stone; it has a greatest extent of about 16^{mm}, the thickness is small, below 0·5^{mm}. The colour (in spirit) is whitish grey. The *surface* is dispersedly hispid from projecting skeletal styles, and it seems to be so also when the dermal membrane is undamaged. The *dermal membrane* is a thin film, resting on the skeleton below. Here and there larger and smaller openings for the canal system were observed, partly placed in groups; they are probably both *pores* and *oscula*.

The *skeleton.* The *dermal skeleton:* the dermal spicules form partly bundles, partly they are also seen lying scattered; they lie horizontally or stretch obliquely upwards between the ends of the skeletal styli, without any regularity; they lie horizontally especially just below the dermal membrane, and when the sponge is viewed from above, the spicules are seen lying irregularly below the membrane. The *main skeleton* consists of vertical, somewhat densely placed acanthostyli, the longest of which project beyond the surface. At the base a slight amount of spongin is found.

Spicula: a. *Megasclera.* 1. The skeletal spicules are straight acanthostyli; the head-end is only pronounced to a very slight degree, and the styli are therefore somewhat club-shaped. The spinulation is dense and is both in the small and the large forms continued quite to the point, or the spines are at most a little more dispersed towards the point; the spines are directed downwards; they are distinct but not large. The length of the styli is 0·09—0·27 mm and the diameter of the head 0·015—0·024 mm. Though the styli do not vary much in length in all, they are divided however into two groups, the larger ones not going below 0·23 mm and the small not beyond 0·12 mm. 2. The dermal spicules are straight strongyla, they are always a little thicker at one end than at the other, but they are otherwise of the same thickness in the whole length; sometimes they are very slightly polytylote. The length is 0·25—0·31 mm and the diameter 0·005—0·007 mm. b. *Microsclera:* these are chelæ arcuatæ; they are of ordinary shape, the shaft is evenly curved, the tooth elliptical, the alæ lobe-shaped and broadly cut below. The length is 0·041—0·047 mm and the diameter of the shaft is 0·003—0·004 mm. The chelæ occur numerously in the dermal membrane, but not, however, forming a layer.

This species is somewhat related to *H. storea,* but it is characterised by the styli being more densely spined, and spined to the very point, and the spines are smaller; besides, the styli are divided into two groups; the chelæ are of another shape, and finally also the dermal spicules show a difference.

Locality: Station 125, 68° 08′ Lat. N., 16° 02′ Long. W., depth 729 fathoms (bottom temperature + 0° 8 C.); the locality lies North of Iceland.

9. **H. tenuicula** n. sp.

Pl. VI, Fig. 5.

Incrusting; surface somewhat hispid. Spicula: megasclera; the skeletal spicules acanthostyli with a slightly swollen head and divided into two groups, large, with the apical part slightly spined or smooth, 0·286—0·47 mm, small, spined in the whole length, 0·12—0·15 mm; dermal spicules strongyla 0·238—0·31 mm; microsclera chelæ arcuatæ 0·032—0·037 mm.

Of this species we have four specimens growing as thin incrustations on a *Hamacantha implicans,* on a Brachiopod-shell, on a tube of *Placostegus tridentatus* and finally on a stone, bearing a specimen of *Petrosia crassa;* the largest specimen grows on the Brachiopod-shell, and it reaches the same extent as this, viz. 25 mm, but for the rest it grows on both sides of the shell which it thus quite covers. The sponge is very thin, scarcely reaching more than 0·25 mm in thickness; this is, as will be seen below, less than the length of the largest styli, which consequently project beyond the surface. The colour (in spirit) is slightly yellowish. The *surface* is distinctly hispid on account of the projecting of the longest styli. The *dermal membrane* may be traced as a thin film, supported by the dermal spicules. *Pores* and *oscula* were not to be seen.

The *skeleton.* The *dermal skeleton* consists partly of bundles of dermal spicules which stretch up to the membrane from the skeleton below, partly and chiefly of spicules lying horizontally in the membrane; the latter spicules are partly scattered, partly collected into bundles or short fibres. The *main skeleton* is formed of vertical acanthostyli, the shorter of which reach to the surface, while the longer project through it. At the base of the acanthostyli there is found an amount of spongin, but it is difficult to observe.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, they have the head-end slightly swollen and taper from here into a long apex. The styli are divided into two sizes which are to be sure not connected by transitional forms, but do not show, however, any principal difference in shape. The larger styli are straight or slightly curved; they have a densely spined head, the spines are here not pointed, but truncate or irregularly cut at the apex; on the lower part of the shaft the spines are still somewhat dense, but they are small, outwards they become more scattered, and the outermost part is smooth or has only some single spines; the spines on the shaft are reclined. The small styli are likewise straight or very slightly curved, they are spined in the whole length, and the spines are reclined; the head is most densely spined. The length of the large styli is 0·286—0·47 mm with a diameter at the head of 0·028 mm; the greatest length is only rarely seen; the small styli are 0·12—0·15 mm long and 0·020 mm thick at the head. 2. The dermal spicules are straight strongyla, one end is a little thinner than the other, and this thinner end is often slightly swollen; the length is 0·238—0·31 mm and the diameter about 0·004 mm. b. *Microsclera:* these are chelæ arcuatæ; they have an evenly curved shaft, an elliptical tooth and lobe-shaped alæ of the same length as the tooth; the free middle part of the shaft is not much more than the third part of the total length of the chelæ. The length is 0·032—0·037 mm, and the diameter of the shaft is about 0·004 mm. The chelæ are found in the dermal membrane, generally they are scattered, sometimes lying more densely.

This species is distinguished from *H. storea* by its more slightly spinulous acanthostyli which are divided into two groups, and by a different shape of the chelæ.

Locality: Station 1, 62° 30′ Lat. N., 8° 21′ Long. W., depth 132 fathoms; station 35, 65° 16′ Lat. N., 55° 05′ Long. W., depth 362 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; and East of the Faröe Islands, depth 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities are situated in the Davis Strait, the Denmark Strait and East and West of the Faröe Islands.

10. **H. similis** n. sp.

Pl. VI, Fig. 6.

Incrusting; surface smooth. Spicula: megasclera; the skeletal spicules acanthostyli with a small but distinct head, the spinulation slight, the larger styli smooth in a long apical part, the styli divided into two groups, large 0·41—0·65 mm, small 0·149—0·238 mm; the dermal spicules strongyla 0·298—0·35 mm; microsclera strongly curved chelæ arcuatæ 0·035—0·044 mm.

This species forms small incrustations on shells of Brachiopods, mussels and Gasteropods, and on small stones; one specimen grows on a dead *Oculina* and another on a specimen of *Iotrochota*

excata; the greatest extent to which it reaches is 16^{mm}. The colour (in spirit) is whitish to light yellowish. The *surface* seems, in the places where the sponge is undamaged, to be without projecting spicules. The *dermal membrane* is a thin film with close-lying chelæ.

The *skeleton*. The *dermal skeleton;* the dermal spicules form fibres or bundles, which under various arrangements stretch more or less obliquely from the interior of the sponge out to the dermis; they may also be found in or below the membrane as horizontal bundles; the fibres may be of a considerable thickness; besides, the membrane has close-lying chelæ. The *main skeleton* consists in the ordinary way of more or less vertical acanthostyli with their heads attached to the substratum; the styli are placed somewhat dispersedly. Spongin was not observed.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli with a more or less marked, but small head and they taper into a long, fine apex; they are curved, and the curvature lies nearest to the head, it is found both in the large and small styli, for which latter it is especially characteristic. The spinulation is not strong; in the longer styli there are larger spines only on the head-end, the lower part of the shaft is grittily spinulous and the larger outer part, sometimes the whole shaft, is smooth; the smaller styli are a little more strongly spined and in the whole or nearly the whole length. The length is in all 0·149—0·65^{mm}; the styli are rather distinctly divided into two groups, the large not going below 0·41^{mm} and the small not beyond 0·238^{mm}; the diameter of the head is 0·014—0·025^{mm}. 2. The dermal spicules are straight strongyla, they are only very slightly thicker in the middle than towards the ends, one end is a little thicker than the other. The length is 0·298—0·35^{mm} and the diameter is between 0·004 and 0·005^{mm}. b. *Microsclera;* these are chelæ arcuatæ; they have an evenly but strongly, up to nearly semicircularly curved shaft, the end-parts are relatively small, the alæ lobe-shaped; the shaft is somewhat flattened. The length is 0·035—0·044^{mm}, and the diameter of the shaft 0·004—0·011^{mm} according as it is seen in profile or in front view. The chelæ occur numerously in the dermal membrane and sparingly otherwise in the tissue.

This species stands near to *H. longistylus* n. sp. (to be described hereafter), but it is distinguished by the more strongly curved small styli and by other dermal spicules and chelæ; it is also related to *H. curvichela*, but also from this it is distinguished by the characteristic, curved small styli. The species must moreover be allied to *H. (Hymeniacidon) paupertas* Bow. but the small styli figured for this species, and also the figure of the chelæ seem to prevent identification.

Locality: Station 1, 62° 30′ Lat. N., 8° 21′ Long. W., depth 132 fathoms; station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 10, 64° 24′ Lat. N., 28° 50′ Long. W., depth 788 fathoms; station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; station 94, 64° 56′ Lat. N., 36° 19′ Long. W., depth 204 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; further it has been taken at 63° 12′ Lat. N., 20° 06′ Long. W., depth 270 fathoms (The Fishery investigation steamer "Thor"); and East of the Faröe Islands, depth 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902); in all about nine specimens. The localities lie in the Denmark Strait, South of Iceland and East of the Faröe Islands.

11. **H. nummulus** n. sp.

Pl. III, Fig. 11, Pl. VI, Fig. 7.

Incrusting; surface hispid? Spicula: megasclera; the skeletal spicules acanthostyli with no real head, divided into two groups, large, only spined below, 0·51—0·95 mm, small, entirely spined, 0·12—0·14 mm; the dermal spicules strongyla, somewhat tending towards tornota, 0·35—0·46 mm; microsclera chelæ arcuatæ, strongly curved with the ends somewhat recurved, 0·028—0·054 mm.

Two specimens of this species grow as small incrustations on stones, both of which are richly overgrown with several other sponges, a third specimen coats the broken base of a *Hornera* sitting on a stone. The greatest extent reached is only 10 mm. The colour (in spirit) is white. Beyond the *surface* project the long styli, but whether this is so in the undamaged sponge I cannot say, as the surface is in nearly all places not intact. The *dermal membrane* is a thin film and seems to have no proper skeleton, but it is for the greater part wanting. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton*; the dermal spicules form bundles stretching more or less obliquely from the lower part of the sponge to the dermal membrane; the bundles are often rather thick. The *main skeleton* consists in the ordinary way of acanthostyli with their heads placed on the substratum; the long styli reach through the whole sponge; the small styli are by far the most numerous, so that each of the large styli is placed in a group of small ones. Spongin is found at the base of the styli.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are divided into two very distinct groups, large and small; the large styli have the base a little thickened but not forming a real head, from here the style tapers evenly to the point; the base bears distinct, but not large spines, outwards they soon nearly disappear so that about the lower half part is only slightly gritty, the rest is smooth; the styli are generally somewhat curved near the base. The small styli also have the head but little pronounced, but it is beset with somewhat large spines, and for the rest the style is spined in its whole length, with somewhat reclined spines. The length of the large styli is 0·51—0·95 mm with a thickness at the base of 0·035—0·040 mm, the small styli are 0·12—0·14 mm long and at the base about 0·021 mm thick. 2. The dermal spicules are strongyla with some tendency towards tornota; they are straight and generally one end is a little more pointed than the other; they are of the same thickness in the whole length; their length is 0·35—0·46 mm, and the diameter 0·005—0·008 mm. *Microsclera* are chelæ arcuatæ; they have a strongly curved shaft, with the end-parts somewhat recurved, the alæ are lobe-shaped and the tooth elliptical; the chelæ vary somewhat in size, the length is 0·028—0·054 mm and the diameter of the shaft is 0·004—0·006 mm. The mentioned recurvation of the end-parts is very slight or quite disappears in the smallest chelæ.

This species bears some resemblance in spiculation to *H. rugosa*, but it has larger and much smoother styli, smaller chelæ of a different shape, and the strongyla are not polytylote; it is also allied to *H. stylata* n. sp. (to be described hereafter), but differs by the longer and thicker acanthostyli, and a different shape of the chelæ which in *stylata* have the end-parts not recurved.

Locality: Station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; and at 65° 50′ Lat. N., 26° 53′ Long. W., depth

208 fathoms (The Fishery investigation steamer "Thor"). The localities are in the Denmark Strait.

12. **H. dubia** n. sp.

Pl. VI, Fig. 8.

Incrusting; surface finely hispid. Spicula: megasclera; the skeletal spicules acanthostyli with a small head, divided into two groups, large, only spined below, 0·34—0·38 mm, small, entirely spined, 0·10—0·23 mm; the dermal spicules strongyla 0·26—0·32 mm; microsclera chelæ arcuatæ 0·040—0·051 mm.

Of this species we have a specimen growing on a stone together with specimens of *H. Kochleri, baculifera* Tops., *curvichela, Eurypon* sp. and *Plocamia* sp. The specimen has a greatest extent of only 10 mm, and it is very thin. The colour (in spirit) is whitish. The *surface* is finely hispid. The *dermal membrane* is thin, somewhat richly charged with chelæ. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules, stretching obliquely from the skeleton below up to the surface; the bundles may vary with regard to the number of spicules contained, but it is generally not great. The *main skeleton* is constructed in the typical way and consists of erect acanthostyli with their heads based on the substratum, the longest of them reach to the dermal membrane, and it would seem that they penetrate through it. Spongin seems to be present at the base, but to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are divided into two rather well separated groups; the larger styli are straight, or most frequently slightly curved, they have a small head-swelling and they taper evenly out into a long apex; on the head-swelling there are somewhat large spines, but for the rest the styli are nearly smooth, only on the lower part, near the swelling, they are slightly gritty; the small styli are similarly shaped, but they are straight, the shaft is totally spined, but the spines are sometimes somewhat dispersed. The length of the large styli is 0·34—0·38 mm and the thickness at the base 0·035 mm; the length of the small styli is 0·10—0·33 mm with a thickness at the base of 0·02—0·028 mm, the greatest of these sizes, which form transitions to the large styli, are of rare occurrence. 2. The dermal spicules are strongyla; they are straight and cylindrical, not thicker in the middle; their shape is in so far characteristic as they grow evenly thinner from one end to the other, so that one end is always distinctly thicker than the other. The length is 0·26—0·32 mm, and the diameter in the middle about 0·005 mm. b. *Microsclera* are chelæ arcuatæ; they have an evenly curved shaft, the alæ are lobe-shaped, slightly triangular and the tooth elliptical with a long, narrow tuberculum; generally the teeth have such a direction that they lie in a straight line connecting the two ends of the chela; the most characteristic feature in the chela is, that the shaft is flattened to a high degree and in such a way, that the front side is nearly flat, the hinder side on the other hand somewhat rounded. The length of the chela is 0·040—0·051 mm, the thickness of the shaft is 0·003 mm and its breadth 0·011 mm. The chelæ occur abundantly and somewhat close-lying in the dermal membrane.

The species is related to *H. Kochleri*, but is distinguished by the large styli, which are nearly smooth and by the strongyla being not polytylote; it is also related to *H. nummulus*, but from this it is distinguished by the chelæ with the flattened shaft and not recurved end-parts.

Locality: East of the Faröe Islands, depth 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902).

13. **H. stylata** n. sp.

Pl. III, Fig. 2, Pl. VI, Fig. 9.

Incrusting, of a thickness up to 2^{mm}; surface smooth, with some small, conical papillæ, bearing oscula (and pores), and with a dense skeleton of dermal spicules in the wall. The dermal skeleton strongly developed, the main skeleton weak. Spicula: megasclera: the skeletal spicules acanthostyli with a small, or nearly no head, divided into two groups: large, only spined below, and with the apex short pointed, 0·35—0·63^{mm}; small, entirely spined, longer pointed, 0·13—0·178^{mm}; the dermal spicules long strongyla 0·35—0·52^{mm}; microsclera chelæ arcuatæ 0·038—0·050^{mm}.

This species grows exclusively on loose bottom material as gravel, sand and the like; it may then sometimes grow all round the material and quite imbed it, so that the substratum in this case comes to lie in the interior of the sponge; this manner of growing recalls to some degree that of *Hamacantha implicans* described in the first part of this work. The thickness of the incrustation varies a good deal on account of the manner of growing, from 0·5 to about 2^{mm}; moreover parts of the sponge-tissue may reach in between the particles of the substratum. The specimens in hand form, together with their more or less imbedded substratum, roundish or elongate bodies of a greatest length of 14^{mm} and a thickness of 4—5^{mm}. The colour (in spirit) is whitish or yellowish grey. The *surface* bears some conical papillæ, which are generally more or less depressed; they may reach a length of 2^{mm}. The surface is otherwise smooth or at all events only slightly hispid from projecting dermal spicules. The *dermal membrane* is somewhat solid and not specially thin; it is densely filled with chelæ and rests on the skeleton below, but it has no proper skeleton. *Oscula* and *pores:* The above-mentioned papillæ bear the oscula, and I think also the pores; I have not observed pores, but there seems to be some difference between the papillæ, some being higher and with a distinct opening, others being lower, and, as it were, closed at the apex; the latter perhaps are pore-bearing, the case being as in the following species, *H. verrucosa*.

The *skeleton* is on account of the mode of growth of the sponge, irregular, especially in the deeper parts. The *dermal skeleton:* the skeleton formed of the dermal spicules is by far the most predominant, the other skeleton being only weakly developed. The dermal spicules form bundles or fibres stretching from the substratum and occupying nearly all the thickness of the sponge; they are somewhat irregularly arranged, but at the surface they form distinct fibres, running somewhat horizontally under the dermal membrane, but reaching it with the ends which have the spicules spread in a penicillate way and bear the membrane. Fibres from the skeleton stretch up in the wall of the papillæ and form here a layer of parallel and densely arranged spicules. The dermal membrane is moreover filled with chelæ. In the parts of the sponge found between the particles of the substratum, dermal spicules are also seen. The *main skeleton* is as said rather feeble in proportion to the whole skeleton; it is formed in the ordinary way and consists of acanthostyli with the heads inserted on the substratum, but the acanthostyli are rather scattered; they are turned in very different directions, and they are found in greatest numbers in the parts of the sponge which are distributed between the

particles of the substratum; the spicules situated here may be directed in any direction. At the substratum there is a small amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are divided into two groups, large and small; the large styli are rather long and slender, they are straight or slightly and evenly curved; the head is weakly or not at all developed; they taper only a little outwards, and they are short and abruptly pointed. The spinulation is only present in the lower part of the style, at most stretching half the way out, but very dispersed in the outer part; the spines are somewhat robust, generally there are some larger spines among them, especially at or near the base, thus marking the otherwise weakly marked head. The small styli do not reach more than one fourth in length of the large, they are straight and longer pointed than the large; their spinulation resembles that on the base of the large, but they are spined in their whole length. The large styli are 0·35—0·63 mm long, and the diameter at the base is 0·020—0·028 mm. The small styli are of a length of 0·13—0·178 mm and a diameter at the base of about 0·014 mm. No intermediate forms between the two sizes of the styli are found. 2. The dermal spicules are long and straight strongyla; one end is generally a little thinner than the other, but otherwise they are nearly of the same thickness throughout their whole length. The length is 0·35—0·52 mm and the diameter 0·006—0·008 mm. b. *Microsclera.* These are chelæ arcuatæ, they have an evenly curved shaft, the alæ are strongly incised in the lower edge, and hence somewhat claw-shaped when viewed laterally, the tooth is pointed lanceolate. The length of the chelæ is 0·038 0·050 mm; the shaft is somewhat flat, the thickness is in relation to this 0·004—0·007 mm. The chelæ are seen in small numbers through the whole sponge and densely filling the dermal membrane.

This species is somewhat related to *H. nummulus,* but it is, as mentioned under this species, distinguished by smaller acanthostyli and a different shape of the chelæ.

Locality: Station 113, 69° 31′ Lat. N., 7° 06′ Long. W., between Iceland and Jan Mayen, depth 1309 fathoms (bottom temperature + 1° 0 C.); about ten specimens.

14. **H. verrucosa** n. sp.

Pl. III, Fig. 3. Pl. VII, Fig. 1.

Incrusting; thickness about 2 mm; surface smooth, covered with wart-shaped papillæ with a dense skeleton of dermal spicules in the wall, bearing oscula (and pores). Dermal skeleton strongly developed, the main skeleton weak. Spicula: megasclera; the skeletal spicules acanthostyli with a generally small head, the longer only spined below, the smaller spined in the whole length, 0·095—0·62 mm, not divided into two groups; the dermal spicules long strongyla 0·37—0·52 mm; microsclera chelæ arcuatæ 0·035—0·044 mm.

Of this species we have four specimens, one has grown as an incrustation on a stone from which it has been peeled, in the basal part of it much gravel and the like is imbedded; the specimen is now separated into two pieces of a largest extent of about 25 mm, but they have certainly formed a single incrustation. Of the other specimens one forms an incrustation on a basalt-block, it has a greatest extent of 22 mm; two others cover *Astarte*-shells and are of similar dimensions. The thickness is about 2 mm. The colour is in the present state (in spirit) greenish white, but for one of the specimens it is stated to have been deep blue in the fresh state of the sponge. The *surface* is smooth,

without projecting spicules, but it is densely beset with low wart-shaped papillæ, which may vary somewhat in height and therefore be more or less conspicuous. The *dermal membrane* is a thin, but somewhat solid membrane; it is densely charged with chelæ. *Oscula* and *pores:* The mentioned papillæ are, I suppose, both oscular and pore-papillæ, the fact is that there seems to be some difference in their structure; some of them are relatively pointed and have an opening above, while most of them are broader above and have here a prominent edge, but inside this are closed by a membrane; in this membrane I have not observed pores, but probably they are closed; in both cases there are large, hollow spaces below the papillæ.

The *skeleton.* The *dermal skeleton:* as the skeleton formed of the acanthostyli is quite inconsiderable, it is the skeleton consisting of the dermal spicules which forms by far the greatest part of the whole skeleton; it consists of fibres which stretch quite from the base of the sponge upwards and support the dermal membrane; the fibres run more or less vertical, outermost, at the surface, the spicules are somewhat penicillately spread, or the fibres bend off below the membrane and run under it as horizontal fibres. The fibres may have a rather variable thickness, but they are always relatively thick and consist of many spicules; the thickness was e. g. measured to 0·06—0·24 mm. Under their course outwards the fibres may be more or less branched. In the wall of the papillæ the dermal spicules form a dense skeleton, lying parallel with one end towards the edge of the papilla and here they are somewhat projecting. The dermal membrane itself is densely charged with chelæ, forming a dense layer. The *main skeleton* consists as commonly of acanthostyli with their head-ends attached to the substratum; the skeleton is much dispersed as there is only found a bundle of styles in each place where the fibres, formed of the dermal spicules, go down to the substratum, the styli thus forming the lowermost part of these fibres, just at the substratum. At the base a somewhat rich amount of spongin is found, in which the heads of the acanthostyli are imbedded.

Spicula: a. *Megasclera.* 1. The skeletal spicules are straight or, especially the larger ones, slightly curved acanthostyli; they taper into a long apex, which in the larger of them is a little more abruptly pointed outermost. The head may be somewhat various, it is generally not much swollen, but however somewhat pronounced on account of its spinulation. The spines are largest on the head; the larger styli are only spined below, when they are shorter the spinulation goes further out, and the smallest styli are entirely spined; in these latter the spines are rather large and they are reclined, in the larger styli the spines are most often smaller and less distinctly reclined. The length varies much, from 0·095—0·62 mm, and the diameter of the head from 0·014—0·039 mm. All transitions in size are found, but the intermediate sizes are rare. 2. The dermal spicules are long, straight or very slightly curved strongyla which are of the same or about the same thickness in the whole length; one end is short and rounded, the other is a little longer, nearly truncately pointed, this latter end is generally slightly swollen, not so much however that the spicule may be termed a tylostrongyle; the swollen end corresponds to the original end of the spicule; sometimes both ends may be very slightly swollen, the spicule thus approaching a tylote; the strongyla may be quite slightly polytylote. The length is 0·37—0·52 mm and the diameter about 0·004—0·008 mm. Quite monactinal developmental stages were found. b. *Microsclera:* these are chelæ arcuatæ, they are of ordinary shape, with a regularly and evenly curved shaft, the tooth is elliptical and the alæ lobe-shaped, short and rounded, and of the

same length as the tooth. The length is 0·035—0·044 mm, the shaft is flattened, its thickness is in relation to this 0·003—0·007 mm. The chelæ occur through the whole sponge and in a dense layer in the dermal membrane.

This species is somewhat characteristic, besides from its exterior, from the small acanthostyli being straight and slender and with large, distinctly reclined spines, and from the large strongyla; it is to be noted that it is not the smallest styli, but those a little longer which especially have large spines. The species is nearly related to the preceding *H. stylata*, but it is distinguished by the small acanthostyli with their large, reclined spines and distinct heads; also the strongyla are different, and the alæ of the chelæ are longer and more pointed in *H. stylata*.

Locality: Station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; and at 64° 42′ Lat. N., 27° 43′ Long. W., depth 426 fathoms (Wandel). In all four specimens. The localities lie in the Denmark Strait and south of Iceland.

15. **H. procumbens** n. sp.

Pl. VII, Fig. 2.

Incrusting; surface slightly hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a small head, spined in the whole or nearly the whole length, the longer only very slightly spined outwards, 0·089—0·35 mm, not divided into two distinct groups; the dermal spicules tornota 0·23—0·327 mm; microsclera chelæ arcuate, often strongly curved, 0·024—0·038 mm.

This species grows as small incrustations on pebbles, one specimen grows on the shell of an *Area*, and one on a dead *Oculina*; it has a greatest extent of about 12 mm, and the thickness is exceedingly small. The colour (in spirit) is nearest whitish or whitish grey. The *surface* is very slightly hispid on account of the generally only to a slight degree projecting spicules. The *dermal membrane* is a thin film, supported by bundles of dermal spicules; it has somewhat densely lying chelæ.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules which are generally somewhat fan-like spread; the bundles stretch out to the surface, but they are for the greatest part strongly decumbent in the membrane. The *main skeleton* has the typical construction; it is rather dispersed, the single styli standing somewhat scattered. Spongin I could not observe.

Spicula: a. *Megasclera*. 1. The skeletal spicules are straight or nearly straight acanthostyli with the head-end most frequently rather weakly marked; the longest styli are often somewhat curved near the base; the spines are large on the head-end, but decrease rapidly outwards both with regard to size and to number, and the largest styli have thus the spines on the outer part much dispersed, and the spines are here weak. The small styli are entirely spined, and the spines are larger, but there does not seem to be sharply divided groups. The length is 0·089—0·35 mm and the diameter of the head is 0·011—0·027 mm. 2. The dermal spicules are tornota which are straight, or sometimes a little irregularly curved; one end is generally slightly thinner than the other; they are fusiform, being somewhat thicker in the middle, and some few are seen reaching a considerable thickness. The length varies much, from 0·23—0·327 mm, and the diameter is 0·004—0·0075 mm. b. *Microsclera:* these are

chelæ arcuatæ; they have a more or less, sometimes very strongly, curved shaft, the end-parts are relatively small. The length is 0·024—0·038 mm, and the diameter of the shaft 0·003—0·005 mm. The chelæ occur numerously and rather densely in the dermal membrane.

This species may vary somewhat, especially with regard to the size and shape of the chelæ; it is most characterised by the fusiform tornota, and this character in conjunction with the shape of the acanthostyli distinguishes the species with certainty.

Locality: Station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms. The localities are situated in the Denmark Strait and South of Iceland.

16. **H. perforata** n. sp.

Pl. III, Fig. 4, Pl. VII, Fig. 3.

Incrusting; surface somewhat hispid: main skeleton rather dense. Spicula: megasclera: the skeletal spicules acanthostyli with a very small or no head, entirely spined, or the longer with a smooth apical part, 0·080—0·53, not divided into two groups; the dermal spicules slender tornota 0·178—0·22 mm; microsclera chelæ arcuatæ, very varying in size, 0·021—0·054 mm.

This species grows chiefly on Brachiopods, as well on dead shells as on living specimens; we have in all sixteen specimens, thirteen of which grow on Brachiopods; the other three grow respectively on a Bryozoon, a worm-tube and a *Pecten*-shell. The greatest extent to which the species reaches is about 16 mm, and the thickness is not beyond 0·5 mm. The colour (in spirit) is brownish yellow to dark greyish brown. The *surface* is hispid on account of the longer styli projecting beyond it. The *dermal membrane* is a thin and transparent film. In the membrane larger and smaller, circular or oval openings are found, which are *oscula* and *pores;* they were measured of sizes from about 0·05 to 0·3 mm, but there seem to be all intermediate sizes, so that it is often not possible to decide whether we have to do with incurrent or excurrent openings; the smaller openings, however, were most frequently collected in groups over the subdermal cavities, but the dermal membrane was much damaged and therefore the whole structure was not to be decided with certainty; probably there is the difference, that the pores form sieves while the oscula are larger, single openings. The somewhat close-lying, circular subdermal cavities or openings of the canals shine through the membrane, but they are only visible by the aid of a lens.

The *skeleton.* The *dermal skeleton:* in the dermal membrane occur the chelæ numerously, but somewhat scattered. The dermal spicules form bundles which stretch in an oblique direction from the skeleton out to the membrane; besides, both bundles and scattered spicules are found lying horizontally in the membrane. The *main skeleton* consists in the ordinary way of acanthostyli which have their heads attached to the substratum; the longest of the styli pierce the membrane, the surface thus getting strongly hispid, but as the largest styli are not numerous, the sponge is somewhat dispersedly hispid; on the other hand the styli are in this species very dense at the base, so that whether the sponge is seen in a vertical section, or the surface of attachment is seen from below, the styli are seen standing nearly head by head, only here and there divided by the cavities of the

canal system. At the base of the sponge there is found a somewhat rich amount of spongin in which the heads of the styli are imbedded.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or generally slightly curved; they have no head-swelling marked off or this is only weakly pronounced, and they taper evenly into a long, rather fine apex, and accordingly they are of a more or less club-like shape. The size varies to a high degree, and in relation to the size the spinulation also varies, but separate groups of size do not exist. The smaller the styli are the relatively stronger they are spined, and the spines are on the small styli continued out to the very point; the longer the styli, the longer a part of the apex remains smooth; in the large styli also the close-standing, somewhat large spines on the head-end are relatively smaller than in the small styli, and the spines placed on the shaft are very small. The spines are in this species only slightly, or not at all reclined. The length varies from 0·080—0·53 mm, and the diameter at the head is about 0·011—0·031 mm. 2. The dermal spicules are thin tornota; they are straight, of the same thickness in the whole length or quite slightly thicker in the middle; the points are typical tornote points, short and bounded by straight lines, and they are very sharply pointed. The fully developed tornota have the two points uniform or nearly uniform. The length is 0·178—0·22 mm, and the diameter about 0·0028—0·0040 mm. b. *Microsclera* are chelæ arcuatæ; they have an evenly curved shaft, an elliptical tooth with a long tuberculum, and alæ of the same length as the tooth. The size varies very much, the length from 0·021—0·054 mm and the diameter of the shaft is in relation to the size 0·002—0·007 mm. Some single developmental stages were seen. The chelæ occur numerously in the dermal membrane, and are also seen singly lower down in the sponge.

Locality: Station 4, 64° 07′ Lat. N., 11° 12′ Long. W., depth 237 fathoms; station 6, 63° 43′ Lat. N., 14° 34′ Long. W., depth 90 fathoms; station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 16, 65° 43′ Lat. N., 26° 58′ Long. W., depth 250 fathoms; station 27, 64° 54′ Lat. N., 55° 10′ Long. W., depth 393 fathoms; station 28, 65° 14′ Lat. N., 55° 42′ Long. W., depth 420 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; further, it has been taken at 63° 05′ Lat. N., 22° 23′ Long. W., depth 115 fathoms and 63° 21′ Lat. N., 16° 22′ Long. W., depth 296 fathoms. The localities lie in the Davis Strait, the Denmark Strait, South of Iceland and between Iceland and the Faröe Islands.

17. **H. clavigera** n. sp.

Pl. III, Fig. 8 b, Pl. VII, Fig. 4.

Incrusting, thin; surface hispid. Spicula: megasclera; the skeletal spicules club-shaped acanthostyli, divided into two groups, both entirely spined, large 0·25—0·298 mm, small 0·095—0·12 mm; the dermal spicules tornota 0·16—0·178 mm; microsclera chelæ arcuatæ 0·041—0·052 mm.

This species grows incrusting on a stone, which bears several other small sponges, and it grows quite close to a specimen of *H. Bowerbanki* n. sp. to be described hereafter; it has a greatest extent of 12 mm, and it is exceedingly thin and delicate. It is of a whitish colour (in spirit). The *surface* is very hispid on account of the erect styli being protruding. The *dermal membrane* is imperceptible and not separable, but it appears to be a very delicate membrane, richly provided,

however, with chelæ. *Oscula* and *pores* were not seen, but the sponge is perforated by close-standing, vertical canals which shine through the dermal membrane and are seen on the surface as dark, round points; it would seem that the oscula are simple openings in the membrane, and the pores lie several together over the openings of the incurrent canals.

The *skeleton.* The *dermal skeleton* consists of dermal spicules stretching from the skeleton below and out to the dermal membrane; it is very weakly developed and seems only to consist of single spicules, not forming bundles, and the spicules are not numerous. The *main skeleton* is formed in the ordinary way of erect acanthostyli with the head-ends based on the substratum, the longer of them protrude far beyond the surface; a very faint amount of spongin is present at the base.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, and they are rather characteristic; though the basal end is the thickest part of the spicule there is however no head-swelling developed at all; from the basal end the spicule becomes only slightly thinner outwards, and the point is somewhat short; the spicule thus has a somewhat club-like shape; they are generally slightly curved. The styli are divided into two well defined groups, large and small. The large styli have a somewhat slight spinulation, only at the base there are some stronger, but however rather small spines, they are blunt and generally curved somewhat upwards towards the apex of the style; on the other part of the style the spines are small, but they are present to or near to the point, and they are reclined. The small styli have quite the same shape as the large, only they are generally not curved and the spines are relatively larger. The length of the large styli is 0·25—0·298 mm, with a thickness at the base of 0·021 mm, and of the small styli 0·095—0·12 mm with a thickness of about 0·013 mm; as is seen the two groups are fairly distinct in size, and the variation in each group is only slight. 2. The dermal spicules are tornota; they are straight, rather thin and of equal thickness in the whole length; the points are short and sharp; the length is 0·16—0·178 mm, and the diameter 0·002 mm. b. *Microsclera* are chelæ arcuatæ; they have an evenly curved shaft, the alæ are lobe-shaped with the lower edge broad and straightly cut off, and the tooth is elliptical. The length is 0·041—0·052 mm and the thickness of the shaft 0·005—0·007 mm. The chelæ are abundantly present in the dermal membrane.

This species is nearly related to *H. perforata*, but it is distinguished by several characters; the main skeleton is less dense, the acanthostyli not being so densely crowded, the two distinct groups of acanthostyli are not present in *perforata*, and the acanthostyli are in the present species much less spined and in their whole length, while in *perforata* they are more strongly spined, but with the apical part smooth; also in the shape of the tornota and the chelæ there are small differences, and finally the sizes of the spicules are different.

Locality: The Denmark Strait, 65° 50′ Lat. N., 26° 53′ Long. W., depth 208 fathoms (The Fishery investigation steamer "Thor").

18. **H. platychela** n. sp.

Pl. VII, Fig. 5.

Incrusting; surface hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a small head, somewhat strongly spined in the whole or nearly the whole length, 0·13—0·45 mm, not divided into

two groups: the dermal spicules tornota 0·327—0·53^{mm}; microsclera chelæ arcuatæ of a curious, broad and flat shape, 0·032—0·035^{mm}.

Of this species we have one specimen, growing on a shell-fragment of a *Pecten;* the specimen grows on both sides of the shell having grown round the edge from one side to the other; the largest extent of the specimen is 15^{mm}, and the thickness about 0·5^{mm}. The colour (in spirit) is brownish yellow. The *surface* is hispid from projecting dermal spicules. The *dermal membrane* is a thin film, but it is wanting to a great extent on the specimen. *Oscula* and *pores* were not observed.

The *skeleton.* The *dermal skeleton:* the dermal spicules form bundles or fibres which stretch from the main skeleton, often from the lower part of this or quite from the base, in an oblique direction up to the surface, and project beyond this, and it is thus chiefly these spicules which cause the hispidity of the surface; outermost the spicules in the bundles are spread out somewhat fan-like. When the sponge is examined from above with a good lens, therefore, the fan-like bundles of dermal spicules are seen. In the membrane chelæ are found, but they are very scattered. The *main skeleton* is of the typical construction, consisting of vertical acanthostyli with their heads fixed on the substratum; the longest of them project beyond the surface and contribute to the hispidity of the sponge. At the base spongin is found, but only to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or somewhat curved; the head-end is a little swollen, and they taper evenly into a long, fine apex. The spinulation is somewhat strong, the spines on the shaft are compressed and reclined downwards; the spines on the head-swelling are considerably longer, they are not compressed, and radiate straight out; these spines are truncate at the end and sometimes somewhat curved and hook-shaped, the small and intermediate styli are spined in their whole length, the longest styli, on the contrary, have a generally rather short part of the apex smooth. The styli vary much in size, but they are not divided into groups. The length is 0·13—0·45^{mm}, and the diameter of the head 0·018—0·035^{mm}. 2. The dermal spicules are long, straight tornota, they are slightly fusiform; the ends are short pointed, and the points are bounded by straight or concave lines. The fully developed tornota have equal ends, but the developmental stages are monactinal. The length is 0·327—0·53^{mm}, and the diameter in the middle about 0·005—0·008^{mm}. b. *Microsclera:* these are chelæ arcuatæ; they are of a curious, short and flat shape; the shaft is slightly curved, and is not flattened; the alæ are broad and lobe-shaped, and the tooth is rather broad and a little shorter than the alæ. The angle between the axis and the tooth, and the curvature of the alæ are such, that a transverse section of the chela through alæ and tooth would form a transverse ellipse. For the rest the chelæ are not rarely of a more or less irregular shape, and some monstrosities are also found. The length of the chelæ is 0·032—0·035^{mm}, and the diameter of the shaft about 0·004^{mm}. The chelæ occur only in the dermis, but also here only in small numbers.

Locality: Station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; the station lies in the Denmark Strait.

19. **H. basispinosa** n. sp.

Pl. III, Fig. 5, Pl. VII, Fig. 6.

Incrusting; surface smooth, bearing some small, conical oscular cones with a dense skeleton of dermal spicules in the wall. Spicula: megasclera: the skeletal spicules acanthostyli with a small head.

divided into two groups, large, only spined at the base, 0·42—0·59 mm, small, entirely spined, 0·09—0·23 mm; the dermal spicules large tornota, 0·32—0·50 mm; microsclera small chelæ arcuatæ, resembling palmate chelæ, 0·025—0·030 mm.

The only specimen of this species forms an incrustation on a shell of a Brachiopod; it has a greatest extent of about 15 mm; the thickness is 0·5 mm or a little more. The colour (in spirit) is dark brownish. The *surface* is smooth or nearly so, without projecting spicules; it bears some conical papillæ of a length of about 1 mm; in the present state of the sponge the papillæ are lying down towards the surface. The *dermal membrane* is thin, resting on the skeleton beneath and provided with some spicules, more or less scattered or bundle-like collected. *Oscula* and *pores:* the mentioned papillæ are oscular papillæ with the oscular opening at their apex; the fibres of dermal spicules continue into the wall of the papillæ and form here a dense skeleton of spicules lying parallel to the longitudinal axis of the papilla; pores were not observed with certainty; some few, small openings in the dermal membrane may perhaps be pores.

The *skeleton.* The *dermal skeleton.* The skeleton formed of the dermal spicules consists of bundles or short fibres, which stretch from the lower part of the sponge up to the dermal membrane; the fibres are for the greatest part more or less horizontal; some single spicules or bundles lie in the membrane or just below it. The *main skeleton* is in the ordinary way constructed of perpendicular acanthostyli with the heads against the substratum; they are not close-standing but somewhat scattered. A very slight amount of spongin is present at the heads of the acanthostyli.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or slightly curved near the base, and long pointed; the head is more or less pronounced, but generally only to a slight degree. The longer styli are only spined at the base, on the head and a little way out; the small styli are entirely spined, but the spines become scattered towards the point; the spines are small, only at the base some few spines a little larger may be found. The styli are divided into two distinctly separated groups, large and small; the large has a length of 0·42—0·59 mm and a diameter of the head of 0·021—0·025 mm; the small styli are 0·09—0·23 mm long, and the diameter of the head is 0·014—0·021 mm. 2. The dermal spicules are rather large tornota, they are straight or nearly so, slightly tapering towards the ends and sometimes slightly polytylote; the points are short and sharp, sometimes the ends are a little swollen; the length is 0·32—0·50 mm and the diameter is 0·004—0·007 mm. b. *Microsclera:* these are chelæ arcuatæ; they are small and slender, the shaft is only slightly curved, the tooth is elliptical; the alæ are connected with the shaft for about their whole length and the chela thus greatly resembles a palmate chela, or might perhaps even be termed so; the length of the chela is 0·025—0·030 mm and the thickness of the shaft 0·002 mm. The chelæ are seen singly in the tissue, and they occur in rather great numbers in the dermal membrane, but they form no layer.

This species is nearly related to *H. platychela* and has similar large dermal tornota, but it differs by the much less spined styli and the small chelæ, which are quite different in shape, and finally also by the oscular papillæ.

Locality: Station 28, the Davis Strait 65° 14′ Lat. N., 55° 42′ Long. W., depth 420 fathoms. One specimen.

20. **H. longistylus** n. sp.

Pl. VII, Fig. 7.

Incrusting: surface somewhat hispid. Spicula: megasclera: the skeletal spicules acanthostyli with the base thickened, but not forming a real head, the longer only spined at the base, the smaller in the whole length, 0·10—0·92 mm, not divided into two groups: the dermal spicules subtornota to tornostrongyla 0·238—0·28 mm: microsclera chelæ arcuatæ 0·025—0·045 mm.

Of this species one specimen grows incrusting on a *Retepora:* it grows in several places on both sides of the *Retepora* and through the holes of this, so that by looking through the holes the projecting spicules of the sponge are seen bordering the holes; another specimen grows on a stone. Its greatest extent is 14 mm, and the thickness does not go beyond 0·5 mm. The colour (in spirit) is greyish white or white. The *surface* is in the present state of the sponge strongly hispid from the long projecting spicules, but the *dermal membrane* is in most places damaged; only in some single places it is seen; it is a thin film, which seems to be in a somewhat loose connection with the other body; the membrane is provided with scattered dermal spicules. In the places where the membrane is present, the sponge seems to be somewhat hispid, the longest skeletal spicules being somewhat projecting.

The *skeleton.* The *dermal skeleton* consists of loose fibres and scattered spicules which are placed between the longest of the skeletal spicules; in the membrane itself there are found horizontal, scattered spicules. The fibres or bundles may in places be somewhat thick. The *main skeleton* is formed in the ordinary way of vertical acanthostyli; the longest of them project beyond the surface, thus making the sponge strongly, but somewhat dispersedly hispid; the styli are not placed densely. There seems to be some spongin at the base, but I could not observe it with certainty.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; the longest are slightly curved, the small are straight. In the large styli the head end is thickened, but a real head is not marked off, in the small styli the head is more distinctly marked; the styli taper into a long, fine apex; the largest ones are only spined at the base, the small in the whole length, and the spines are relatively largest in the small styli. The length varies exceedingly, but all intermediate sizes are found, the smallest are present in greatest numbers. The length is 0·10—0·92 mm and the diameter of the head 0·014—0·028 mm. 2. The dermal spicules may best be termed tornota, the ends may be slightly swollen, most frequently this is only the case with one end which then has a distinct, short point, while the other end sometimes is somewhat rounded, so that the spicule might be termed a tornostrongyle; the spicules are straight and not thickened in the middle. The length is 0·238—0·28 mm and the diameter 0·0028—0·005 mm. b. *Microsclera:* these are chelæ arcuatæ, they are of common shape with an elliptical tooth and lobe-shaped alæ; the shaft is evenly curved and somewhat flattened. The length is 0·025—0·045 mm and the diameter of the shaft 0·0028—0·007 mm in relation to the size and to whether the chela is seen in side or in front view. The chelæ are found scattered in the tissue, but not, or only singly, in the dermal membrane.

This species shows some resemblance to *H. perforata* and *curvichela*, but *perforata* has shorter styli and pure tornota, and also the main skeleton is much more dense; *curvichela* has similar styli,

but the dermal spicules are polytylote strongyla and the chelæ are very strongly curved; it is also related to *H. similis*, but it is, as mentioned under this species, distinguished by the small styli being straight, and by differences in the dermal spicules and the chelæ; also the styli in *similis* are distinctly divided into two groups.

Locality: Station 7, 63° 13′ Lat. N., 15° 41′ Long. W., depth 600 fathoms, and at 61° 09′ Lat. N., 7° 54′ Long. W., depth 180 fathoms, (Ad. Jensen, the cruise of "M. Sars" 1902). Two specimens in all. The localities lie South of Iceland and West of the Faröe Islands.

21. **H. occulta** Bow.

Pl. III, Fig. 6, Pl. VII, Fig. 8.

1874. *Hymedesmia occulta* Bowerbank, Mon. Brit. Spong. II, 250, III, Pl. LXXIX, figs. 9—11.
1894. *Desmacidon occultum*. Hanitsch, Trans. Liverp. Biol. Soc. VIII, 180.
1894. *Hymeraphia occulta*. Topsent, Rev. Biol. du Nord de la Fr. VII, 12 et 21.
1904. *Leptosia occulta*. Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 186, Pl. XV, fig. 1.

Incrusting: surface smooth, generally with a number of papillæ, bearing oscula and pores, and with a dense skeleton of dermal spicules in the wall. Spicula: megasclera: the skeletal spicules acanthostyli with a small, but distinct head, divided into two groups, larger, only spined below, 0·47—1·19 mm, smaller, entirely spined, 0·119—0·26 mm: the dermal spicules tornota to oxea 0·34—0·50 mm: microsclera chelæ arcuatæ with relatively small end parts, 0·034—0·040 mm.

Of this species we have some specimens growing on stones, pebbles, small shells and one on a tube of *Placostegus tridentatus*. Most specimens are rather small, only reaching to an extent of 12 mm; only two specimens, growing on larger stones, have a greatest extent of 18 and of 20 mm; the thickness reaches at most 1 mm. The colour (in spirit) is whitish grey or brownish. The *surface* is nearly smooth, but seen with a lens it shows small, punctiform projections, caused by the skeletal spicules reaching the dermal membrane, but not piercing it. The surface may otherwise have a different aspect; in some specimens, especially the small ones, it shows no or only few and imperceptible papillæ, but in the larger and best developed specimens the surface bears a number of papillæ, often rather close-standing; the papillæ are conical or nearly cylindrical, and may reach to a height of about 1·5 mm, but the exact length cannot be given, as one side of the wall is generally shorter than the other, the papillæ lying somewhat down towards the surface. The *dermal membrane* is a transparent, somewhat solid and easily separable membrane; it has an irregular skeleton of horizontal spicules and is more or less densely filled with chelæ, which form, however, no layer. *Oscula* and *pores:* the papillæ mentioned are both oscular and pore-papillæ. The oscular papillæ are more conical and tapering than the others and have a simple oscular opening at the summit; the pore-papillæ are broader at the tip and have here a membrane with pores. Bowerbank, who had only one small specimen, does not mention papillæ; Topsent, on the other hand, has perhaps seen something of the kind, as he says (l. c. 186) that the sponge somewhat resembles a small *Hamacantha*.

The *skeleton*. The *dermal skeleton*: the dermal spicules form bundles which stretch almost from the base of the sponge and upwards, thus occupying the whole space between the base and the dermal membrane, lying in different directions between the erect styli of the skeleton. In the dermal membrane the spicules lie horizontally, more or less densely, but quite irregularly, they lie singly or here and there a couple together; the membrane is thus provided with a proper skeleton. The skeleton in the wall of the papillæ is formed of spicules lying parallel to the longitudinal axis of the papillæ and very densely, and it is formed both of the spicules lying in the membrane, and of those stretching from the underlying skeleton up in the wall. Besides the mentioned skeleton the membrane is somewhat densely charged with chelæ which are specially numerous in the pore-membrane in the papillæ. The *main skeleton* consists of erect acanthostyli with the heads placed on the substratum; the longest of them reach through the whole thickness of the sponge up to the dermal membrane. At the base there is a not very conspicuous amount of spongin.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli; they are divided into two well defined groups; the large ones are long and evenly tapering; they are slightly curved, the curvature as a rule placed more or less near the base; the head is only slightly swollen, but, however, somewhat distinct, it is densely beset with spines which are blunt; from the head and a little way out there are spines, decreasing in size outwards, the remainder of the shaft is smooth, or has only scarcely perceptible and scattered grains. The small acanthostyli are straight or nearly so; they have a small head which, however, seems larger on account of its somewhat long, radiating spines; they are spined in their whole length, the spines on the shaft are reclined. The length of the long acanthostyli is 0·47—1·19^{mm}, and the diameter of the head 0·025—0·037^{mm}, the small styli are 0·119—0·26^{mm} long, with a diameter of the head of 0·020—0·025^{mm}. Small individual variations in size may occur. Developmental stages of both sizes of the styli were seen in small numbers, showing that the two sizes are essentially different from the beginning. 2. The dermal spicules are tornota with intermediates to oxea; they are straight and long tapering; they vary a good deal in thickness, when they are thin they may be termed tornota, but often they are more fusiform and are then oxea; their length is 0·34—0·44^{mm} with a thickness of 0·008—0·013^{mm}. Besides these spicules there are some stronger, especially thicker, and fusiform oxea of a length of 0·38—0·50^{mm} and with a thickness in the middle of 0·017—0·028^{mm}. — With regard to these latter spicules the facts are somewhat curious; they are mentioned both by Bowerbank and by Topsent, and both authors say, that they are present only in small numbers. But they seem to be subjected to great variations with regard to the number in which they are present; generally they are only found in very small numbers, and such is the case in most of my specimens; but in one specimen they are very numerous; whether they are few or many they are always only present in the dermal membrane, and lying horizontally, but they are not found in the bundles which stretch down into the sponge; in the specimen mentioned, with numerous thick oxea, the horizontal spicules in the dermal membrane are almost all of this kind; as the skeleton in the wall of the papillæ is formed both of the spicules lying in the membrane itself, and of those belonging to the fibres stretching up into the wall, the skeleton of this latter consists consequently outwards of thick oxea, but inwards of thin ones. In the specimen with numerous thick oxea these are at the same time thicker and upon the whole larger than in the other specimens. — Develop-

mental stages of the dermal spicules were seen in small numbers, they show that these spicules are diactinal from the first beginning. b. *Microsclera:* these are chelæ arcuatæ; they have an evenly curved shaft, the terminal parts are relatively small, and the alæ are somewhat triangular: the length is 0·034—0·040^{mm}; the shaft is not cylindrical but a little flattened, the thickness is in relation to this 0·003—0·005^{mm}. The chelæ occur through the whole sponge and outermost in the dermal membrane; they are especially numerous in the pore-membranes.

Locality: Station 18, 61° 44′ Lat. N., 30° 29′ Long. W., depth 1135 fathoms; station 46, 61° 32′ Lat. N., 11° 36′ Long. W., depth 720 fathoms; station 64, 62° 06′ Lat. N., 19° 00′ Long. W., depth 1041 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms. The localities are situated in the southern part of the Denmark Strait, South of Iceland and between Iceland and Faröe Islands.

Geogr. distr. The species was described by Bowerbank from Scotland, depth 96 fathoms; Topsent l. c. records it from the Azores in depths of 448, 620, 756 and 1200 fathoms. It seems thus to have a very wide bathymetrical range, from 96 to 1200 fathoms.

22. **H. simillima** n. sp.

Pl. III, Fig. 7, Pl. VII, Fig. 9.

Incrusting: surface smooth, bearing small oscular papillæ and very low, poriferous warts, both with a dense skeleton of dermal spicules in the wall. Spicula: megasclera: the skeletal spicules acanthostyli with a small or no marked head, divided into two groups, large, only spined at the base, 0·41—0·65^{mm}, small, nearly spined in the whole length, 0·16—0·19^{mm}; the dermal spicules oxea with intermediates to tornota, 0·32—0·47^{mm}: microsclera strongly curved chelæ arcuatæ 0·028—0·037^{mm}.

Of this species we have several specimens of various sizes, growing on larger and smaller pebbles, shells, Brachiopods and tubes of *Placostegus tridentatus*. They are present in the material in all sizes from quite small up to an extent of 30^{mm}; the thickness is at most 0·7^{mm}. The colour (in spirit) is white to greyish white. The *surface* is smooth, without projecting spicules; otherwise it may have a somewhat wrinkled appearance on account of the papillæ and impressed areas to be mentioned hereafter. The *dermal membrane* is a thin, but distinct and separable membrane; it rests on the skeleton below and is densely filled with chelæ, but has no proper skeleton of horizontal dermal spicules. *Oscula* and *pores:* in the somewhat large and well developed specimens oscula are always found, they are conical papillæ with a simple opening at the summit. The pores are also limited to certain areas, which may be described as very low, broad warts, somewhat recalling the structures in *Inflatella viridis*. They are bounded by a low wall, being generally lower on one side than on the other, the wart lying down towards the surface; the pore-membrane closes the opening and forms a sieve, it is densely filled with chelæ. The pore-areas may be of various, generally relatively large diameters, up to 3^{mm}. When the sponge is examined with a lens, the pore-areas are only seen with difficulty; as they are so very low the pore-membrane is always sunk down on the tissue below and the pores not to be seen, and therefore the only thing seen is a circular, depressed area, surrounded by a sharp edge.

The *skeleton.* The *dermal skeleton:* the dermal spicules form bundles and short fibres stretching

from the main skeleton, often almost from the base, upwards to the dermal membrane which rests on them; above they are more or less penicillately spread; they are somewhat perpendicular or more oblique and often somewhat decumbent. The skeleton in the wall of the oscular and pore-papillæ is formed by fibres stretching up in the wall and here forming a skeleton of close-lying, parallel spicules. There is no skeleton of horizontal spicules in the membrane, but this is provided with dense-lying chelæ. The *main skeleton* is of the typical construction formed by vertical acanthostyli with their heads placed on the substratum; the longest of the styli may reach to or near to the surface. Spongin is present at the base, but only to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are divided into two rather well defined groups of sizes. The large styli are straight or generally slightly curved near the head, this latter is small or not at all pronounced; the spines are only present on the head and a little way out, being here smaller and soon quite disappearing. The small styli are straight, the head is very small and for the greatest part due to the somewhat longish, radiating spines; the style is spined nearly in the whole length, only a small apical part being smooth; the spines are often reclined; they are of moderate size or small, and in this respect there may be some difference in different specimens. The length of the large styli is 0·41—0·65 mm with a diameter of the head of 0·020—0·028 mm, and of the small styli 0·16—0·19 mm and the thickness of the head about 0·021 mm. 2. The dermal spicules are oxea with transitions to tornota; they are straight and generally more or less fusiform and somewhat long tapering and in this case they are oxea, the thinner ones are more cylindrical with shorter points and must be termed tornota. The length, which may vary a little in various specimens, is on the whole 0·32—0·47 mm with a diameter in the middle of 0·006—0·014 mm. The spicules have generally not quite equal ends, but one end is slightly thinner than the other; the thinner the spicule is the more pronounced is this difference, and some few very fine developmental stages were quite monactinal, thus showing that the spicule begins as monactinal. Besides the mentioned dermal spicules there are also in this species, as in the preceding one, some thicker, fusiform oxea, they have a length of 0·29—0·35 mm with a thickness in the middle of 0·015—0·017 mm; they are very scarce, and as the measurements show, they seem to be connected in size with the ordinary spicules, only being specially short and thick, and in contrast to the case in the preceding species they are here shorter than the ordinary dermal spicules. So far as I have seen, these thicker spicules are found in the outer part of the fibres, just at the dermal membrane. b. *Microsclera:* these are chelæ arcuatæ; they have a strongly, sometimes semicircularly curved shaft, the alæ are lobe-shaped, and short and round; the length is 0·028—0·037 mm, the most strongly curved may sometimes be a little shorter; the shaft is somewhat flattened, its thickness is in accordance herewith 0·004—0·007 mm; developmental stages were seen in small numbers. The chelæ are seen through the whole sponge, but only in small numbers, in the dermal membrane they form on the other hand a more or less dense layer, and they are numerous in the pore-membrane.

This species is rather similar to and seems also nearly related to *H. occulta*, but it is characteristically distinct; as to the skeleton it is distinguished by the absence of a proper dermal skeleton, and with regard to the spicules the chelæ have a different shape and are much more curved; also the difference in the development of the dermal spicules with diactinal beginning in one and monactinal

beginning in the other species is to be noticed. — I think it very probable, that the specimens mentioned by Topsent (l. c.) from stations 600 and 899, and which the author refers with some doubt to *H. occulta*, belong to the present species, as he declares the spicules to be somewhat smaller, and especially as he observes, that the chelæ are more curved than in the typical *occulta:* his figures belong on the contrary certainly to *occulta*.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; further it has been taken East of the Farõe Islands, depth 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902), at 66° 20′ Lat. N., 25° 12′ Long. W., depth 96 fathoms (Wandel), and at Angmagsalik in East Greenland, depth 140 fathoms (The Amdrup Expedition 1900). The localities are situated at East Greenland, West and South of Iceland and East of the Farõe Islands; the bathymetrical range goes from 96 to 691 fathoms.

If the species mentioned by Topsent with more curved chelæ and smaller spicules should prove to be the present species, it has also been taken at the Azores in depths of 185 and 106 fathoms.

Remarks: The two species *H. occulta* and *similima* show great resemblance, and they might be thought nearly related if it were not for the difference in the manner of development of the dermal spicules. The existence of this difference is very interesting, but it is not, however, possible to decide for the present its real importance. — The occurrence of special dermal spicules besides the ordinary ones is also an interesting fact; these spicules seem to be only extreme variations of the ordinary form, and we have then here again a fact, showing that the spicules placed outermost in the sponge may be liable to special variations, such as I have pointed out more particularly in Part II of this work (p. 32—33); also the difference in the abundance of these spicules in different specimens of the same species, as shown by *occulta*, has its parallel, as mentioned at the place cited.

23. **H. baculifera** Tops.

Pl. VIII, Fig. 1.

1901. *Leptosia baculifera* Topsent, Arch. de zool. exp. et gén. 3, IX, 354.

1904. — — Topsent, Résultats des camp. sc. du Prince de Monaco, Fasc. XXV, 191, Pl. XV, fig. 2.

Incrusting; surface without projecting spicules. Spicula: megasclera: the skeletal spicules acanthostyli with a distinct head-swelling, spined in the whole or nearly the whole length, 0·077—0·214 mm, not divided into two groups: the dermal spicules strongyla varying to subtylota 0·15—0·238 mm; microsclera small chelæ arcuatæ 0·021—0·025 mm.

This species forms very thin incrustations on stones and on tubes of *Placostegus tridentatus* and other serpulid tubes. The greatest extent to which any of the specimens reach is 38 mm, and the thickness is about 0·3 mm. The colour (in spirit) is whitish to brown. The *surface* has no projecting spicules, but seen with a lens it is finely gritty, caused by the skeletal styli. The *dermal membrane* is a thin film, it is filled with microscleres and supported by dermal spicules. *Oscula* and *pores* I was not able to detect.

The *skeleton*. The *dermal skeleton*. Besides the chelæ filling the dermal membrane, this is supported by bundles of dermal spicules, which stretch upwards from the main skeleton; further some scattered spicules are present in the membrane. The *main skeleton* consists as usual of vertical acanthostyli with their head-ends fixed on the substratum. The longest of the styli reach to the dermal membrane, but without projecting through it. A slight amount of spongin seems to be found just at the substratum, but it is at all events difficult to observe.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli; they are straight or slightly and evenly curved; they have generally a somewhat distinct head-swelling, and they taper from the head into a long apex, which may be more shortly pointed outermost. The spinulation is dense in the lower part of the style, but it is more dispersed outwards; in the longer spicules an apical part is smooth, while the shorter ones are spined to the point. The spines on the shaft are reclined, on the head they are placed more densely and are longer, radiating straight out and generally truncate. The acanthostyli vary much in size, but they are not divided into two groups. The length is 0·077—0·214 mm, and the diameter at the base is 0·011—0·028 mm. In some specimens the styli did not reach beyond 0·178 mm. 2. The dermal spicules are strongyla varying to subtylota; they are straight, sometimes a little polytylote but only to a slight degree. The ends may be simply rounded but they are most frequently slightly swollen; they are not equal, one being a little thinner than the other, and this thinner end shows the most distinct swelling. The length varies in all between 0·15 and 0·238 mm; in the single specimens the variation is only slight. The thickness is about 0·002—0·004 mm. b. *Microsclera:* these are chelæ arcuatæ; they are rather small, they have an evenly, generally somewhat strongly curved shaft, but with regard to this curvature there may be some little variation; the tooth is lancet-like, and the alæ of the same length as the tooth. The teeth have such a direction, that they lie in a straight line drawn from one end of the chela to the other. The length of the chelæ is 0·021—0·025 mm, and the diameter of the shaft 0·002—0·028 mm. The chelæ occur in great numbers in the dermal membrane, sometimes somewhat scattered and sometimes quite close-lying; this difference is probably due to the greater or less contraction of the membrane.

As I find no characters separating this species from *H. baculifera* Tops., I have referred it to the latter; especially the figures cited appear to me very like the spicules in the present species.

Locality: Station 1, 62° 30′ Lat. N., 8° 21′ Long. W., depth 132 fathoms; station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 86, 65° 03′ Lat. N., 23° 47′ Long. W., depth 76 fathoms; station 94, 64° 56′ Lat. N., 36° 19′ Long. W., depth 204 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; further it has been taken at 63° 12′ Lat. N., 20° 06′ Long. W., depth 270 fathoms (The fishery investigation steamer "Thor"), and East of the Faröe Islands, depths 220 and 250 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902); in all about 14 specimens. The station on which most specimens were collected was station 85, the sponge here growing on tubes of *Placostegus*. The enumerated localities are situated in the Denmark Strait, South of Iceland and East of the Faröe Islands.

Geogr. distr. Topsent records the species from the Mediterranean North of Algiers, and at 38° 35′ 30″ Lat. N., 28° 05′ 45″ Long. W., depth about 660 fathoms.

24. H. levis n. sp.

Pl. VIII, Fig. 2.

Incrusting and very thin: surface finely hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a somewhat swollen head and small spines, 0·08—0·25 mm, not divided into two groups: the dermal spicules polytylote tylota or subtylota 0·16—0·21 mm: microsclera small chelæ arcuate 0·021—0·024 mm.

The specimens of this species grow on Brachiopods, shells of *Astarte* and other mussels and on *Placostegus tridentatus*. The greatest extent, to which the species reaches, is 19 mm; the sponge forms an exceedingly thin incrustation, the thickness is scarcely above 0·10 mm. The colour (in spirit) is light brownish yellow. The *surface* is finely and densely hispid from projecting skeletal spicules. The *dermal membrane* is a thin film. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton:* the dermal spicules form bundles which go to the surface in an oblique, often very decumbent direction; these bundles are rather scattered. In the membrane the chelæ are found sometimes rather numerously, at other times more scattered. The *main skeleton* consists in the ordinary way of acanthostyli with the head-ends on the substratum; the larger of them project beyond the surface, making this hispid. A small amount of spongin is found at the base.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which have a somewhat characteristic shape; they are straight or generally somewhat curved; the head-end is somewhat swollen, and they taper into a long apex; as they are rather thick at the head-end and are not especially long, they become slightly club-shaped. The head-end has strong spines, in the small styli the other spines are also rather pronounced, but in the larger ones the spines on the shaft are small, the shaft thus almost being merely gritty; in the longer styli the spines are scattered towards the point, but there is generally no long, smooth apical part. The size varies much, but the styli are not divided into two groups. The length is 0·08—0·25 mm, the styli thus being rather short; the diameter of the head is about 0·014—0·03 mm. 2. The dermal spicules are slender, straight tylota or subtylota which are distinctly polytylote; they have a generally rather distinct, longish swelling at each end, the shaft is a little thinner in one end, and the swelling in this end is therefore more marked than in the other. The length is 0·16—0·21 mm, and the diameter about 0·0028—0·004 mm. b. *Microsclera:* these are chelæ arcuatæ; they are rather small, the shaft is somewhat strongly curved, the alæ are nearly triangular and the tooth elliptical and of the same length as the alæ. The length of the chela is 0·021—0·024 mm, and the diameter of the shaft about 0·0028 mm. The chelæ seem to be confined to the dermal membrane.

This species stands very near to *baculifera*, but I consider it as distinct; it is especially the slightly spined acanthostyli which distingush it, and the dermal spicules are also more distinctly polytylote.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; further it has been taken at 62° 29′ Lat. N., 5° 17′ Long. W., depth 160 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). In all seven specimens. The localities are situated in the Davis Strait, the Denmark Strait and East of the Faröe Islands.

25. **H. bractea** n. sp.

Pl., VIII, Fig. 3.

Incrusting; surface hispid. Spicula: megasclera; the skeletal spicules acanthostyli, divided into two groups, large, with a small head, only spined in the lower part, 0·28—0·36 mm, small, without head, entirely spined, 0·12—0·15 mm; the dermal spicules tylota 0·27—0·50 mm; microsclera chelæ arcuatæ 0·028—0·034 mm.

Of this species we have only a very small specimen, and the description will therefore in some respects not be quite satisfactory. The specimen grows on a Brachiopod-shell together with a specimen of *Hymenancora duplicata* n. g. et sp. (to be described hereafter), and a small specimen of *Melonanchora emphysema*. It forms a very small, almost circular incrustation, scarcely two millimeters in diameter and very thin; it bears about in the middle a low, cylindrical papilla. The colour (in spirit) is greyish, and the sponge is somewhat transparent. The *surface* is in the present state hispid from projecting skeletal styli. About the *dermal membrane* I can say nothing, and also nothing about *pores* and *oscula;* probably the papilla mentioned is an osculum, but I could not observe it.

The *skeleton*. The *dermal skeleton* seems to consist of scattered bundles of dermal spicules, and it is, so far as I could observe, relatively weakly developed. The *main skeleton* is constructed in the ordinary way and consists of vertical acanthostyli with their heads on the substratum, and it is somewhat dense; the longest of the acanthostyli project beyond the surface, and it seems to be so also in the undamaged sponge.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are divided into two groups, large and small. The large acanthostyli are straight, they have a small head-swelling and taper evenly into a long apex which is a little more abruptly pointed outermost; they are spined only on the basal part, at most on the half part; the spines are of medium size, largest below; they are placed most densely on the head-swelling, but more dispersed outwards. The small styli have no head-swelling; the base is the thickest part and from here they taper evenly to the point, thus assuming a club-like shape; these styli are spined in their whole length, the spines at the base radiate straight out, those on the shaft are reclined. The length of the large styli is 0·28—0·36 mm, and the diameter of the head is about 0·02 mm; the length of the small styli is 0·12—0·15 mm with a diameter at the base of 0·014 mm. 2. The dermal spicules are straight and somewhat slender tylota, the end-swellings are distinct but not large; the length varies rather considerably, from 0·27—0·50 mm, and the diameter of the shaft is 0·004—0·007 mm. b. *Microsclera:* these are chelæ arcuatæ, they have a curved shaft, elliptical teeth and lobe-shaped but somewhat narrow alæ. The length of the chela is 0·028—0·034 mm, and the diameter of the shaft 0·004—0·005 mm. The chelæ seem to occur through the whole tissue, but are seen especially at the surface.

Locality: Station 89, The Denmark Strait, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms.

26. **H. lævistylus** n. sp.

Pl. VIII, Fig. 4.

Incrusting. Spicula: megasclera: the skeletal spicules acanthostyli with a very small head, only spined on and just at the head, for the rest smooth, very uniform in size, 0·44—0·48 mm; the dermal spicules tylota varying to strongyla, 0·27—0·34 mm; microsclera chelæ arcuatæ 0·045—0·052 mm.

Of this species only one very small specimen is present, growing as an incrustation on the inside of a *Pecten*-shell; it is longish and has a greatest extent of only 3·5 mm. The colour (in spirit) is whitish. The *dermal membrane* is thin and densely filled with chelæ. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of bundles and spicules, which are scattered in different ways from near the base to the dermal membrane; it seems to be rather diffuse; there is no skeleton of dermal spicules lying horizontally in the dermal membrane, but this latter is densely filled with chelæ. The *main skeleton* seems to be somewhat slightly developed, it consists of acanthostyli which are all of the same size, and have the heads based on the substratum. I could detect no spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are very slightly spined, almost smooth acanthostyli; they are straight or slightly curved and have a slightly inflated head; this latter bears more or fewer, but generally only few small spines; near the head the style may be very finely gritty, but for the rest it is quite smooth. The styli are only of one form and very slightly varying in size, so that small forms do not occur. The length is about 0·44—0·48 mm, and the thickness of the head is about 0·017 mm. 2. The dermal spicules are tylota, which are straight, slightly thickened in the middle and with small end-swellings; these latter may be very small or absent, the spicules thus becoming strongyla; the length is 0·27—0·34 mm and the thickness in the middle 0·005—0·007 mm. b. *Microsclera:* these are chelæ arcuatæ; they have a rather curved shaft which is a little recurved at the outermost extremities, the alæ are lobe-shaped and the tooth narrowly elliptical; the length of the chelæ is 0·045—0·052 mm, and the thickness of the somewhat flattened shaft is 0·005—0·008 mm. The chelæ occur in specially large numbers in the dermal membrane.

This species is easily distinguished and stands somewhat apart on account of its almost smooth styli, which are all of nearly the same length.

Remarks: It might be thought, that this species represented only a young stage of some other sponge (a *Lissodendoryx*), but I do not think this possible. To be sure we have no investigations on the skeleton of the youngest fixed stages of the sponges which may come into consideration here, and it is therefore not known, what the first beginning of the skeleton is in species with a reticulate or dendritical skeleton, and it is not impossible, that the styli may at first be placed vertically. The structure of the present species seems so fully to conform with that of *Hymedesmia*, however, that I think it must be in reality a *Hymedesmia;* the styli with a somewhat distinct head, and especially the chelæ being crowded in the dermal membrane are good characters of *Hymedesmia*.

Locality: Station 89, the Denmark Strait, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms.

27. **H. Bowerbanki** n. sp.

Pl. III, Fig. 8 a, Pl. VIII, Fig. 5.

Incrusting, thin: surface smooth. Spicula: megasclera; the skeletal spicules short, club-shaped, strongly and entirely spined acanthostyli of one size 0·09—0·13 mm; the dermal spicules tylota 0·19—0·238 mm; microsclera chelæ arcuatæ 0·020—0·034 mm.

Of this species one specimen grows on a stone together with *H. clavigera;* on the stone besides grow a *Polymastia* and a *Mesapos;* another specimen is growing on a worm-tube. The sponge has a greatest extent of 12^{mm}; it is exceedingly thin, not over 0·2^{mm}, and its thickness is not or only slightly greater than the length of the skeletal styli. The colour (in spirit) is whitish, somewhat milky. The *surface* is smooth, without projecting spicules. The *dermal membrane* is very thin, transparent and not separable; it has no proper skeleton. *Oscula* and *pores* were not observed.

The *skeleton.* The *dermal skeleton:* the skeleton formed by the dermal spicules consists of bundles lying irregularly between the erect acanthostyli; they are more or less horizontal, but stretch up to the membrane; also some single scattered spicules are seen, but there is no dermal reticulation. The *main skeleton* is of the ordinary structure, consisting of erect acanthostyli with the heads based on the substratum; as they are of about the same length, they all reach just to the dermal membrane but none of them project beyond it. I could detect no spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are of a very characteristic shape and to a high degree recall the styli figured by Bowerbank for *H. zetlandica;* they are short and robust, conically tapering and without any head-swelling; they are strongly spined in their whole length; the spines at the base are radiating straight out, while the other spines are directed somewhat downwards; the styli are only of one size and not much varying in length; this is 0·09—0·013^{mm} and the thickness at the base (the spines, as always, included) 0·021^{mm}. 2. The dermal spicules are tylota; they are straight, somewhat thickened in the middle, and the end-swellings are small; they have a length of 0·19—0·238^{mm}, and a diameter in the middle of 0·007—0·009^{mm}. b. *Microsclera:* these are chelæ arcuatæ which have a somewhat curved shaft and small end-parts, the alæ are somewhat lobe-shaped, rounded downwards, the tooth is elliptical. The chelæ have a length of 0·020—0·034^{mm} and a thickness of the shaft of 0·0028—0·005^{mm} respectively; the larger sizes are by far the most numerous. The chelæ are present in the dermal membrane in somewhat considerable numbers, but not at all forming a layer.

This species is evidently nearly allied to *H. zetlandica;* it has the same outer appearance and skeletal structure, and the shape and dimensions of both megasclera and chelæ are in close agreement as also the fact that the styli are of only one form; but *H. zetlandica* has sigmates, while the present species has only chelæ for microsclera.

Locality: Station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; further at 65° 50′ Lat. N., 26° 53′ Long. W., depth 208 fathoms (The Fishery investigation steamer "Thor"). The localities lie in the Denmark Strait. — As said above, one of the specimens grows on a stone together with several other sponges and among these a specimen of *H. clavigera* (Pl. III, Fig. 8 a and b.). These two *Hymedesmia* species grow side by side and quite uniting, but they are easily distinguished from one another by their characteristically different aspects, *clavigera* is whitish, but appears somewhat darkened on account of the black stone shining through it; it is hispid and shows the canals as darker points; *Bowerbanki* on the contrary is of a milky colour, it has a smooth surface of a quite uniform aspect, not showing canals.

28. **H. truncata** n. sp.

Pl. III, Fig. 9, Pl. VIII, Fig. 6.

Incrusting, thin; surface smooth, bearing some small cylindrical or conical oscular papillæ with a dense skeleton of dermal spicules in the wall. Spicula: megasclera; the skeletal spicules short, somewhat club-shaped, strongly and entirely spined acanthostyli, truncate at the apex and with a neck-shaped constriction above the base; they are of one size 0·065—0·077 mm; the dermal spicules tylota 0·28—0·369 mm; microsclera chelæ arcuatæ 0·021—0·023 mm.

Most specimens of this species grow incrusting on stones, one specimen on a Brachiopod-shell and one on a fragment of a mussel-shell; the specimens are of different sizes, the largest reaches an extent of 40 mm; the thickness is very small, generally scarcely exceeding 0·2 mm. The colour (in spirit) is light bluish white, somewhat milky. The *surface* is entirely smooth without projecting spicules. The *dermal membrane* is thin and transparent, it is generally easily separable, and seems to be without spicules, resting on the skeleton beneath, but the facts with regard to the dermal membrane are not easily understood; the membrane has a curious, skin-like appearance and consistency, and it is generally filled with cells containing somewhat refringent granules ("cellules sphéruleuses"?), and I think the mentioned state of the membrane is due to the influence of alcohol; in most of the specimens there is moreover outermost a thin, brownish film, more or less easily separable, which is, I think, formed by influence of the alcohol on some sort of mucus. *Oscula* and *pores:* In most of the specimens there are some cylindrical or slightly conical papillæ on the surface; they may reach to a length of 3 mm; these papillæ are oscular tubes with the oscular opening at the summit, though in the present state they are generally closed. The number of papillæ present in the various specimens varies from two to eleven. The two smallest specimens showed no papillæ. Pores were not observed.

The *skeleton.* The *dermal skeleton* consists of bundles of dermal spicules, which stretch from the main skeleton, or almost from the base, and up towards the dermal membrane; they are thus lying obliquely or more or less horizontally. In some places the bundles are more numerous than in others, but most frequently they are scattered and not at all numerous; the bundles are rather thick, consisting of numerous spicules. Near the oscular tubes the bundles form fibres which run from various sides into the oscular papilla and form in the wall of the papilla a dense layer of spicules lying parallel to the longitudinal axis of the papilla. The *main skeleton:* In most places the main skeleton is constructed in the ordinary way, the acanthostyli are erect, with their heads based on the substratum; they reach from the base to the dermal membrane, but do not project beyond it; they are, at all events in most places, rather close-standing. I could not detect any spongin. Such is, as said, the structure of the skeleton in most places, and I think these are the places where the sponge is quite undisturbed; but in many other places this is not so, the acanthostyli may here be lying down and crossing each other in all directions, and, what is the most remarkable fact, they may be lying more or less horizontally in or near the dermal membrane; in most places they are then crowded together, in others they are much more scattered. Whether this condition is normal or not, I am not able to say with certainty, but I think it is due to contraction, especially as the normal *Hymedesmia*-arrangement of the skeleton is seen in many places. It was stated above, that the dermal membrane

appeared to be somewhat transformed by the preservation in alcohol, but the whole sponge is also evidently highly influenced by the alcohol, the surface being wrinkled to a high degree. I am inclined to think that the exceedingly thin sponge is somewhat mucous in the fresh state, and then is highly contracted by the influence of the alcohol, and this would fully explain the remarkable condition seen in the skeleton.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli of a very characteristic shape; they are short and straight, slightly tapering towards the point, this latter is broadly truncate, so that the spicule is nearly cylindrical; they are strongly spined in the whole length, only a little above the base there is an unspined part, and this part is also a little thinner than the rest of the spicule, thus forming a characteristic, neck-shaped constriction; though there is no real head-swelling, the shape mentioned gives the base of the spicule the appearance of a head. Only very rarely the neck-formed constriction is less obvious. The length of the acanthostyli is very uniform, 0·065—0·077 mm, and the diameter at the base is 0·017—0·024 mm. 2. The dermal spicules are tylota; they are straight and rather robust, and they are of the same or nearly the same thickness in the whole length, but just before the ends they are somewhat narrowed, and this narrowing gives rise to the rather slight end-swellings. The shaft is often slightly polytylote. The length is 0·28—0·369 mm, and the diameter 0·009—0·012 mm. b. *Microsclera:* these are chelæ arcuatæ; they have a curved shaft, the teeth are so directed that they are lying in a straight line drawn between the ends of the chela; the alæ are somewhat narrow and rather incised in the lower margin when seen in front view; the tooth is narrowly elliptical. The chelæ are small, the length is 0·021—0·023 mm and the thickness of the shaft about 0·0028 mm. Not rarely chelæ occur which are thicker and more robust in all parts, but these give the impression of not being quite normal. The chelæ are seen in the dermal membrane and in the other parts of the sponge, but generally not in great numbers, on the other hand they are very numerous on the oscular papillæ.

This species is nearly related to *H. Bowerbanki*, but it is easily distinguished by the characteristic acanthostyli as also by several other more minute characters.

Locality: Station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; further it has been taken in Forsblads Fjord in East Greenland, depth 50—90 fathoms (The East Greenland Expedition 1900), at 66° 54′ Lat. N., 15° 38′ Long. W., depth 58 fathoms ("Beskytteren"), South-west of Sudero, depth 180 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities are situated on the East coast of Greenland, in the Denmark Strait, North of Iceland and at the Faröe Islands.

29. **H. latrunculioides** n. sp.

Pl. III, Fig. 10, Pl. VIII, Fig. 7.

Incrusting; surface smooth, bearing some oscular papillæ with a dense skeleton of dermal spicules in the wall. Spicula: megasclera; the skeletal spicules short, conical, very strongly spined acanthostyli with a neck-shaped constriction above the base; they are of one size 0·065—0·071 mm; the dermal spicules tylota, but often with such small swellings, that they approach nearly to strongyla, 0·30—0·40 mm; microsclera chelæ arcuatæ 0·023—0·028 mm.

This species greatly resembles the preceding one in external appearance. One specimen is growing on a stone, which it has nearly quite overgrown, its greatest extent may be estimated to 22^{mm}; three other specimens grow on a stone together with specimens of *Histoderma physa*, *Hymedesmia mammulus*, *H. filifera* and *Plocamia* sp.; the largest of these specimens is 12^{mm} in greatest extent. The thickness of the sponge is about 0·5^{mm}. The colour (in spirit) is whitish with a slightly bluish, somewhat milky tint, but in places it may be shaded brownish on account of a film-like covering, such as mentioned in the preceding species. The *surface* is smooth. The *dermal membrane* is thin and has no proper skeleton; it is of the same curious, skin-like consistency and appearance as in *truncata*, and it has very probably been mucous in the living state of the sponge. *Oscula* and *pores:* with regard to the oscula the facts are quite as in *truncata;* on the largest specimen there is a cylindrical, rather large oscular papilla about in the middle, it has a length of 6^{mm}. Pores were not observed.

The *skeleton* is constructed quite as in *truncata*. The *dermal skeleton* consists of somewhat scattered bundles of spicules, the bundles generally consisting of rather many spicules; at the base of the oscular papilla the bundles form fibres which stretch up in the wall of the papilla, here forming a dense spiculation of close-lying, parallel spicules. The *main skeleton* consists in the ordinary way of erect acanthostyli placed with the heads on the substratum; the spicules are rather close-standing. So far as I could observe there is no spongin present. For the rest the skeleton in most places shows all the same conditions and alterations as described above under *truncata*, and I think these conditions are due to the same factors as suggested for this species. Thus the present species also gives the impression of being strongly contracted, and the dermal membrane is obviously wrinkled and folded, and moreover it also shows numerous cells with refringent granules.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli of a very characteristic shape; they may to some slight degree remind one of the discasters in *Latrunculia*. They are short, thick and regularly conical; they are strongly spined, and the spines are large, radiating horizontally, not reclined; there is no head-swelling, but there is a slightly thinner and unspined part above the base, forming, as in *truncata*, a neck-shaped constriction, and this constriction makes it seem as if a head-swelling were present; the constriction mentioned and the outermost point are the only smooth parts. The length is very uniform, 0·065—0·071^{mm} and the diameter at the base is 0·022—0·027^{mm}. 2. The dermal spicules are tylota, but the swellings are often so small that they are nearly strongyla; they are straight with a cylindrical shaft of equal thickness in the whole length; sometimes they are very slightly polytylote. The length is 0·30—0·40^{mm}, and the diameter is 0·008—0·013^{mm}. b. *Microsclera:* these are chelæ arcuatæ; they have a slightly curved shaft, the alæ are lobe-shaped and the tooth elliptical; the lower edge of the alæ is somewhat incised when the chelæ are seen in front view. The length is 0·023—0·028^{mm} and the diameter of the shaft 0·003—0·005^{mm}. The chelæ may vary somewhat, being more slender or more robust, and some of them are found showing a very robust shape, giving the impression of being not normal but influenced by abnormal deposition of silica. The chelæ occur especially in the dermal membrane, and on the oscular papilla they are present in great numbers.

This species is related to the two preceding, but it is characteristically distinguished, especially by its acanthostyli, but also by several other characters.

Locality: Station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; both localities lie in the Denmark Strait.

Remarks: The three species *Bowerbanki, truncata* and *latruncul*ioides form together with *zetlandica* Bow. a group of related species; *zetlandica* is however distinguished from the three others by possessing sigmata; *truncata* and *latruncul*ioides are the two most nearly related species. A fifth species which seems also to belong here on account of its uniform acanthostyli and dermal tylota is the *H. tenuissima* Dendy (established by the author under the generic name of *Myxilla*), and perhaps also a sixth species must be referred to this group, viz. *H. obtusata* Tops., but this latter species has no microsclera; its curious, obtuse acanthostyli with a little knob at the apex vary a little more than the acanthostyli in the other species, from 0·13 to 0·23 mm.

If the views about the relationship of these species are correct, and they are certainly so at all events with regard to the first four species, we have an interesting example which shows, that in a group of nearly related species we may have forms with chelæ and sigmata, with chelæ alone, and with no microsclera at all. This confirms the view advanced in the introduction to the genus, that it is not possible to create genera here according to the presence or non-presence of the mentioned forms of microsclera.

30. **H. irregularis** n. sp.

Pl. VIII, Fig. 8.

Incrusting; surface partly smooth partly hispid. Spicula: megasclera; the skeletal spicules acanthostyli with a distinct head, the smaller spined in the whole length, the larger with a smooth apical part, 0·12—0·50 mm, not divided into two groups; the dermal spicules polytylote styli 0·298—0·39 mm; microsclera chelæ arcuatæ 0·040—0·050 mm.

This species generally forms incrustations on small stones, a couple of specimens grow on shells of *Astarte sulcata;* the greatest extent to which the sponge reaches is about 20 mm, but most specimens are smaller; three of them, which grow together on a pebble are quite small, the smallest only 4 mm. The thickness is scarcely more than 0·5 mm. The species is of a somewhat irregular appearance, because it, at all events generally, does not grow flat on the substratum but has imbedded in its base some small particles and gravel. The colour (in spirit) is yellowish grey to whitish. The *surface* is in some places smooth, in other places densely hispid from projecting dermal spicules. The *dermal membrane* is a somewhat solid membrane, densely charged with chelæ. *Oscula* and *pores* were not observed.

The *skeleton.* The *dermal skeleton;* in the dermal membrane the chelæ are close-lying, forming a layer; the skeleton formed by the dermal spicules is strongly developed; it consists of spicula-bundles or fibres which stretch from the main skeleton or quite from the base up towards the surface, outermost the bundles are penicillately spread and support the membrane; the spicules sometimes terminate just in the membrane, sometimes they pierce it more or less. When the sponge is examined from above under the microscope, fan-shaped, more or less decumbent bundles of dermal spicules are therefore seen. The dermal spicules all have the pointed end turned outwards. The *main skeleton* consists in the ordinary way of acanthostyli with the head-ends based on the substratum; on account

of the irregularity of the substratum on which the sponge grows, the styli may show some irregularity with regard to direction. On the same account there may be great difference with regard to the relation of the main and the dermal skeleton to one another; when the sponge grows directly on the shell or the stone the construction is the common one, and the larger styli reach to the surface; but when the substratum is irregular, and the sponge therefore grows thicker in places, the skeleton formed of the dermal spicules increases in extent and forms fibres going up to the surface; this skeleton forms in such places the greatest part of the whole skeleton of the sponge, the main skeleton always remaining formed of the vertical styli attached to the substratum. A small amount of spongin seems to be found at the base, but at all events only to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or generally somewhat curved near the base; the curvature is present especially in the longer styli. The styli have a distinctly marked, globular head, and they taper into a long, fine apex. As commonly the small styli are entirely spined, the longer the styli are the more dispersed are the spines, and the longer a part of the apex is smooth. The spines on the head are densely placed, and they are the largest; on the shaft they are compressed and reclined. The styli vary much in size; even if the intermediate forms are rare, there are however not two separate groups of size. The length is 0·12—0·50 mm, and the diameter of the head is 0·021—0·030 mm. 2. The dermal spicules are of a very characteristic shape and must be termed styli; they are straight, one end is rounded, the other tapers evenly into a long apex which is more abruptly pointed outermost; the spicules are thickest in the middle, and they are polytylote, showing on the middle part a series of swellings; near the rounded end there is a somewhat sudden narrowing which forms a handle-like part. The length of the dermal spicules is 0·298—0·39 mm and the diameter in the middle 0·006—0·010 mm. b. *Microsclera:* these are chelæ arcuatæ; they are of ordinary shape with an evenly curved shaft, an elliptical tooth and alæ of the same length as the tooth. The length of the chelæ is 0·040—0·050 mm; the shaft is somewhat flattened, its diameter is in front and side view about 0·004—0·008 mm respectively. The chelæ are found, as mentioned, in the dermal membrane forming a dense layer.

Locality: Station 10, 64° 24′ Lat. N., 28° 50′ Long. W., depth 788 fathoms; station 16, 65° 43′ Lat. N., 26° 58′ Long. W., depth 250 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; further it has been taken in the Denmark Strait at about 65° Lat. N., depth unknown, at 62° 29′ Lat. N., 5° 17′ Long. W., depth 160 fathoms and South-west of Sudero, depth 180 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). About ten specimens in all. The localities lie in the Denmark Strait and at the Faröe Islands.

31. **H. proxima** n. sp.

Tab. VIII, Fig. 9.

Incrusting; surface hispid. Spicula: megasclera; the skeletal spicules acanthostyli without a real head, divided into two groups, large, only spined below, 0·43—0·62 mm, small, entirely spined, 0·14—0·18 mm; the dermal spicules styli 0·28—0·33 mm; microsclera chelæ arcuatæ, 0·023—0·035 mm.

Of this species we have two specimens growing as thin, but rather extended incrustations on tubes of *Placostegus tridentatus*. The greatest extent of the sponge, which, of course, follows the

longitudinal direction of the worm-tube, is about 30^{mm}; the incrustation is very thin and reaches where it is thickest scarcely 0·5^{mm}. The colour (in spirit) is light greyish brown. The *surface* is somewhat strongly hispid from projecting skeletal spicules. The *dermal membrane* is a thin, transparent film. *Pores* and *oscula:* some circular openings are found in the membrane, scattered on the surface, they were measured to a diameter of 0·023—0·15^{mm}; probably the smaller openings are incurrent and the larger excurrent, but no separation into two divided sizes could be observed. When the sponge is examined with a lens a multitude of canals and cavities are seen in the tissue; they are especially visible, when the sponge is somewhat dry.

The *skeleton.* The *dermal skeleton;* in the dermal membrane the chelæ occur numerously, in some places lying rather densely, in others more scattered. The skeleton formed of the dermal spicules is somewhat strongly developed; it consists of bundles or fibres stretching from the main skeleton, often quite from the base upwards and supporting the dermal membrane; the spicules in the bundles are outermost spread penicillately, and they may project a little through the membrane. The fibres have often a very oblique or decumbent direction, thereby being longer, and thus, when the membrane is viewed from above, one may get the impression, that the dermal membrane has a reticulation. All the dermal spicules have the pointed end turned outwards. The *main skeleton* is formed of acanthostyli with their head-ends based on the substratum, the longest of them project considerably beyond the surface. There is an amount of spongin at the base, in which the head-ends of the styli are imbedded, but it is, however, only slightly pronounced.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or generally somewhat curved; the basal end is the thickest part of the spicule, but there is no head developed; they taper evenly into a long apex. The small styli are spined in the whole length, and the spines are more or less reclined. In the large styli the spines are relatively smaller, they are present only on the lower part of the spicule and upwards they become small and gritty. The spines on the lowermost part are both in the small and the large styli not specially larger than those a little more upwards. The size of the styli varies greatly, and they are divided into two groups, which show however no other principal differences than the size. The length of the large styli is 0·43—0·62^{mm} and of the small 0·14—0·18^{mm}, the diameter at the base is 0·017 and 0·011^{mm} respectively. 2. The dermal spicules are of a characteristic shape; they are styli and have a shape like those in *irregularis* with the rounded end narrowed and handle-like, but they are not polytylote; they are straight or slightly curved and they have an even, middle-long apex. The length is 0·28—0·33^{mm} and the diameter in the middle 0·008—0·012^{mm}. b. *Microsclera:* these are chelæ arcuatæ; they have an evenly, rather strongly curved shaft, the end-parts are relatively small, the tooth is lanceolate with a long tuberculum; the alæ are of the same length as the tooth, strongly incised in the lower edge and somewhat tooth-shaped; the shaft is not flattened. The length is 0·023—0·035^{mm}, and the diameter of the shaft about 0·0038—0·005^{mm}. The chelæ occur, as mentioned, in the dermal membrane, but they are also otherwise seen in the body of the sponge.

This species is nearly related to the preceding one, *H. irregularis,* it is however distinguished from this by characteristic differences; thus in contrast to *irregularis* it is hispid from projecting skeletal spicules, and the chelæ do not form a dense layer in the dermal membrane. But the most

characteristic differences lie in the spicules, the acanthostyli have no pronounced head, they are more slender and are divided into two groups; the dermal spicules are not polytylote, and the chelæ have a diffreent shape and are smaller.

Locality: Station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; the station lies in the Denmark Strait.

32. H. crux O. Schmidt.

Pl. III, Fig. 11, Pl. VIII, Fig. 10.

1875. *Desmacidon crux* O. Schmidt, Jahresber. der Comm. zur wissensch. Unters. der deutsche Meere in Kiel für 1872—73, 1875, 118, Taf. I, Fig. 10—11.

1903. *Hymedesmia crux*, Thiele, Arch. für Naturgesch. Jahrg. 1903, I, 392, Taf. XXI, Fig. 26 a—d.

Incrusting; surface smooth, generally with low, oscula-bearing, conical warts with a skeleton of dermal spicules in the wall. Spicula: megasclera; the skeletal spicules acanthostyli with a well-marked head, spined in the whole length, 0·12—0·38 mm, not divided into two groups; the dermal spicules subtornota varying through tornostrongyla to strongyla, they are polytylote, 0·27—0·38 mm; microsclera chelæ arcuatæ with a spined shaft, 0·031—0·043 mm.

Of this remarkable and very interesting species we have about ten specimens; they form small or more extended incrustations on stones and worm-tubes, one grows on a *Pecten*-shell; the greatest extent it reaches is about 35 mm, and the thickness lies between 0·5 and 1 mm. The colour (in spirit) is yellowish red, brownish red or reddish, the sponge may thus vary somewhat in colour, but it always tends towards reddish. Schmidt l. c. says about the colour "braungelb", and one of the Ingolf specimens is stated to have been yellow in the fresh state. The *surface* is smooth in so far as there are no projecting spicules, but it is often wrinkled and folded to a higher or lower degree; this latter fact is probably only due to contraction. The *dermal membrane* is rather thick and solid, and it is easily separable; it is very densely charged with chelæ, more densely than in any other species of *Hymedesmia;* the chelæ form a dense and solid layer. *Oscula* and *pores:* oscula are found as low, conical warts scattered on the surface; they have an opening or a depression in the summit, and around this the surface may be a little stellately rugose. In my specimens the warts are, as said, quite low, sometimes scarcely elevated above the surface; Schmidt says on the other hand "Oscula auf unregelmässigen Papillen"; according to this it would seem, that the oscular cones may sometimes be higher, if it is not irregular folds of the surface, that Schmidt has mistaken for cones. In some specimens the warts are easily discernible, in others they are more or less indistinct, and they may be quite absent. Pores I have not seen and cannot say whether they are scattered or perhaps collected in definite areas; sometimes some larger, dendritically branched canals may be seen through the dermal membrane.

The *skeleton*. The *dermal skeleton:* the most protective skeleton of the dermal membrane is formed by the mentioned dense layer of chelæ; the dermal spicules form bundles stretching from the main skeleton, often almost from the base, up to the dermal membrane; in the membrane itself no dermal spicules are found. Around the oscula the dermal spicules form a special oscular skeleton, the

spicules here forming fibres which run stellately to the top or the middle of the cone, but also here the fibres run below the dermal membrane and not in it, and the dense layer of chelæ continues just to the centre of the cone. The *main skeleton* consists in the ordinary way of perpendicular acanthostyli with their heads on the substratum; the longest styli reach up to the dermal membrane. At the base a small amount of spongin is present.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are slightly curved, generally nearest the base, and they are somewhat densely spined in their whole length; the head is round and generally well marked; the spines on the head are straightly radiating, on the shaft they are reclined. The spicules vary much in length, but as all intermediate sizes are present they are not divided into two groups: the length is 0·12—0·38 mm and the diameter of the head 0·02—0·03 mm. 2. The dermal spicules are straight and very slightly fusiform; they may be termed subtornota, but generally one end is rounded so that they are tornostrongyla and also both ends may be rounded, the spicules thus being strongyla: they are distinctly polytylote. The length is 0·27—0·38 mm and the diameter 0·006—0·008 mm. b. *Microsclera* are chelæ arcuatæ of a very characteristic and remarkable shape; the shaft is very strongly curved, sometimes to so high a degree that its end-parts form two nearly parallel arms; on the middle of the hinder side of the shaft there are a number of strong spines. Also the shape of the end-parts of the chela affords great interest; the tooth is protruding greatly forwards, but it is formed almost entirely of the strongly developed falx, while there is nearly no plate, the falx only being somewhat thickened at the front edge; the alæ are also very interesting, they quite resemble the falx in shape and they are of the same size, further they are directed straight out to each side, so that they form right angles with the falx, on the other hand they are not or almost not bent forwards. The whole construction of the end-parts recalls the construction characteristic for the ancoræ, but I shall otherwise draw no conclusion from this fact at present. The chelæ are nearly always somewhat contorted. Some few developmental stages were seen, they show spines on the shaft already when rather thin. The length of the chela, which is somewhat dependent on the degree of the curvature, is 0·031—0·043 mm, and the diameter of the shaft, the spines not included, is 0·005—0·007 mm. As mentioned the chelæ form a dense layer in the dermal membrane, but they are also seen in the other parts of the sponge.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 81, 61° 44′ Lat. N., 27° 00′ Long. W., depth 485 fathoms; station 85, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms; further it has been taken at 65° 50′ Lat. N., 26° 53′ Long. W., depth 208 fathoms (The Fishery investigation steamer "Thor"), and West of the Faröe Islands in depths of 160 and 180 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). In all about ten specimens. The localities lie in the Denmark Strait and West of the Faröe Islands.

Geogr. distr. Schmidt had the species from South-west of Bukenfjord, Norway, depth 106 fathoms.

33. **H. aenigma** n. sp.

Pl. IX, Fig. 1.

Incrusting; surface for the most part hispid, with some conical projections, bearing oscula. Spicula: megasclera: the skeletal spicules acanthostyli with no real head-swelling, they are entirely

spined, 0·13—0·34 mm, not distinctly divided into two groups; the dermal spicules somewhat fusiform, polytylote tornota, 0·32—0·43 mm; microsclera curious asteroid chelæ 0·028—0·035 mm.

This species grows incrusting on a Brachiopod-shell together with some other incrusting sponges; it has a greatest extent of 20 mm and a thickness of about 0·5 mm. The colour (in spirit) is greyish brown. The *surface* is for the greatest part densely hispid from projecting dermal spicules, but in one end it is smooth, and here there are a couple of conical projections, forming oscular cones. As I have only one specimen, I cannot say, whether it is characteristic for the species that the oscular cones are thus restricted to a special part of the surface. The *dermal membrane* is thin and not separable; it is densely charged with the curious chelæ.

The *skeleton*. The *dermal skeleton:* as said the microscleres form a dense layer in the dermal membrane; the dermal spicules form fibres and bundles stretching in various ways from the main skeleton or quite from the base up to the dermal membrane; the direction of the fibres is generally almost horizontal, and they reach therefore some length; they are also rather strong, of an average thickness of 0·042 mm; they terminate in the dermal membrane. The membrane is pierced by spicules which seem to be more or less scattered or forming penicillately spread bundles. As far as I could observe these projecting spicules rise from the underlying fibres, probably from the ends of these; they seem to be wanting or are at all events few in number on the smooth part of the surface, where the oscular cones are found. The fibres formed of the dermal spicules run into the oscular cones, forming in the wall of the cone a dense skeleton of parallel spicules with the ends towards the summit of the cone; above this skeleton the layer of microscleres lies. Quite down at the base of the sponge there is found a number of dermal spicules lying singly and horizontally and thus not taking part in the formation of the fibres. The *main skeleton* is constructed in the ordinary way and consists of vertical acanthostyli with their heads based on the substratum; the skeleton is not dense, the styli being somewhat scattered. At the base a scarcely perceptible amount of spongin is found.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or slightly curved, the basal end is the thickest part, but there is no real head-swelling or only a slight one. The styli are spined in the whole length, the spines are of small or medium size and reclined; on the head-end they are larger and straightly radiating. The length is 0·13–0·34 mm, and the diameter at the base is 0·014—0·021 mm. The styli cannot be said to be divided into two groups but the middle sizes are however rare. 2. The dermal spicules are tornota, they are straight or slightly curved and somewhat fusiform, and they are more or less polytylote. The length is 0·32—0·43 mm and the diameter in the middle 0·006—0·007 mm. b. *Microsclera*; these are bodies of a very curious shape, I may term them asteroid chelæ. Roughly speaking they present a cylindrical shaft which at each end divides into three branches, each bearing at the end four compressed, two-pointed teeth, placed in a square; the shaft is more or less curved. On closer examination it becomes evident that this curious body is a chela. It is as a rule possible to trace the shaft or main axis (Pl. IX, Fig. 9 c), and one of the three branches at each end is the direct continuation of the axis; this axis answers to the shaft and the teeth in an ordinary chela; the two other branches at each end, which are generally a little thinner than the axis, answer to the alæ; they issue from the hinder side of the shaft; but the ends of the shaft itself and of the alar branches are all developed in the same way, splitting into four compressed,

two-pointed teeth, the exact shape of which may be seen in the figures. Such are the facts generally, but it is however not always possible to decide, which of the branches belong to the axis, the branches often being so uniformly developed that they all seem alike. The chela is somewhat contorted, so that when seen from the end all six branches become visible, and we get a figure almost like a six-rayed aster. (Pl. IX, fig. 1f). The length of the chela from one end of the shaft to the other is 0·028—0·035 mm and the thickness of the shaft is 0·004—0·005 mm. That these bodies are transformed chelæ is seen also from the developmental stages, of which some were found (Pl. IX, fig. 1g); these consist of a curved axis with two lateral dilatations near each end, and they resemble to some degree developmental stages of other chelæ, only that the tooth is here not curved forwards. — These chelæ remind one somewhat of the chelæ in *H. Schmidti* Tops., but are different in many respects; they are very interesting and take an intermediate position between the previously described, more or less transformed chelæ; *H. crux* has normally shaped, but spined chelæ, *H. Schmidti* has likewise spined chelæ, but much more transformed, in *H. aenigma* they are still more transformed, and finally we find in *H. vidua* the chelæ transformed almost to spined staves. — The chelæ occur in the dermal membrane forming a dense layer, and they are also found scattered in the tissue lower down in the sponge.

Locality: Station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms. The station lies in the Denmark Strait.

Remarks: While at present only few species are known with spined chelæ — I think only the above mentioned and *Pseudohalichondria clavilobata* Cart. (Ann. Mag. Nat. Hist. 5, XVIII, 1886, 454, Pl. X, fig. 8) — there are on the other hand some fossil forms, described by Hinde and Holmes (Journ. of the Linn. Soc. XIV, 1894, 214, Pl. XI, figs. 8—14); the authors figure seven chelæ, which they think belong to four species, two of which are named as *Pseudohalichondria deformis* and *oamaruensis*. The forms are all referred to the genus *Pseudohalichondria* Cart. evidently only on account of the spined chelæ. As already mentioned by Topsent in his work from 1904, there may be some reason to think, that the described chelæ belong to species of *Hymedesmia*. The chelæ were found in lower Tertiary strata in New Zealand. It is somewhat curious, that such chelæ are known as fossil, since the spination and higher or lower transformation of the chelæ must certainly be considered as a feature of recent origin. Probably therefore the genus *Hymedesmia*, containing only incrusting forms of a simple structure, is an old genus.

34. **H. filifera** O. Schmidt.

Pl. III, Fig. 12, Pl. IX, Fig. 2.

1875. *Desmacidon filiferum* O. Schmidt, Jahresber. der Comm. zur wissensch. Unters. der deutsche Meere in Kiel für 1872—73, 1875, 117, Taf. I, Fig. 6.

1903. *Hymedesmia filifera*, Thiele, Arch. für Naturgesch., Jahrg. 1903, I, 391, Taf. XXI, Fig. 25 a—c.

Incrusting, but not thin; surface smooth, bearing a number of thin, cylindrical oscular and pore-papillæ. The dermal membrane solid, with horizontal spicules. The skeleton formed of dermal spicules strongly developed, the main skeleton rather weak. Spicula: megasclera; the skeletal spicules entirely spined acanthostyli with the basal end not or slightly thickened, 0·13—0·27 mm, not divided into two

groups; the dermal spicules strongyla with a slight, double curvature, 0·27—0·45^{mm}; microsclera chelæ arcuatæ 0·030—0·035^{mm}.

This species forms thinner or a little thicker incrustations on stones; the surface bears a number (in the specimens to hand some few to about a dozen) of long papillæ, which generally reach a length of 6^{mm} or a little more; they are cylindrical, generally a little thickened towards the apex, and they may vary in thickness from quite thin and thread-like to a diameter of about 0·5^{mm}. The largest of our specimens has a greatest extent of 25^{mm}; the specimen figured by Schmidt l. c. is 35^{mm} long. The colour (in spirit) is greyish or dirty yellowish. The *surface* is smooth without projecting spicules. The *dermal membrane* is a tough and solid, easily separable membrane which is provided with horizontal spicules. *Oscula* and *pores:* the mentioned appendages are by Thiele (l. c.) declared to be oscular papillæ, and this is also the case with some of them, but the greater part are pore-papillæ; the oscular papillæ have a simple opening in the summit, while the pore-papillæ have here a pore-sieve stretched over the opening. So far as I could see on my somewhat damaged material there is also some difference in the shape of the papillæ, the oscular papillæ being more conical and the pore-papillæ cylindrical and somewhat widened towards the apex.

The *skeleton.* The *dermal skeleton:* the skeleton formed by the dermal spicules is by far the largest part of the whole skeleton. The spicules form fibres which run in different directions quite from the base up to the dermal membrane; these fibres consist of many spicules and are generally rather thick, they may f. inst. reach to a diameter of 0·36^{mm}. In the skin the spicules lie horizontally and in more than one layer, thus forming a close skeleton; they lie in all directions, but however somewhat bundle-like; the bundles in the different layers generally cross each other. Finally the dermal spicules form the skeleton in the wall of the papillæ; they lie here in the longitudinal direction, but the spicules in the different layers crossing each other under acute angles and rather regularly. The *main skeleton* is formed mainly in the ordinary way of acanthostyli with their heads on the substratum; they do not reach to the dermal membrane. Where the fibres of dermal spicules rise from the base, they are seen to have just their basal end formed by acanthostyli. Spongin is found at the base.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight or very slightly curved; the basal end is not or only slightly thickened; they taper evenly into the apex, but the outermost point is not long. They are spined in the whole length, on the base the spines are large and radiating, giving thus to some degree the impression of a head-swelling; the spines on the shaft are reclined. The styles vary much in length, but there are no groups. The length is 0·13—0·27^{mm} and the diameter at the base 0·017—0·028^{mm}. 2. The dermal spicules are strongyla; they are slightly fusiform and have nearly always a curious and characteristic double curvature, more rarely they are somewhat irregularly curved or nearly straight; the length is 0·27—0·45^{mm}, varying a little in different individuals, and the diameter in the middle is 0·007—0·012^{mm}. b. *Microsclera* are chelæ arcuatæ; they have a regularly curved shaft, the end-parts are not large, the tooth is elliptical, the alæ have generally the lower edge but slightly incised and are more or less triangularly lobe-shaped in side view. The length is 0·030—0·035^{mm} and the thickness of the shaft about 0·003^{mm}. The chelæ are found rather richly in the tissue quite down to the base, they are often abundantly present along

the fibres; in the dermal membrane they are much less frequent, but in the papillæ they are more frequent on the inside, and they are very numerous in the pore-sieves.

The identification of this species leaves no doubt according to the description and figures by Thiele; e. g. his figure of the strongyle with the characteristic curvature is quite in agreement. Schmidt mentions "Spangen", and Thiele has also found some single sigmates, but he thinks, that they do not belong to the species; now it is curious enough that I also found sigmates, but quite singly, and I think too, that they do not belong to this species; they are very scarce, and as the species always envelops some incrusted material, it is easily understood, that foreign sigmates may occur in it.

Locality: Station 2, 63° 04′ Lat. N., 9° 22′ Long. W., depth 262 fathoms; station 15, 66° 18′ Lat. N., 25° 59′ Long. W., depth 330 fathoms, (bottom temperature ÷ 0° 75 C.); station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; further it has been taken at 62° 26′ Lat. N., 4° 49′ Long. W., depth 220 fathoms, and 62° 29′ Lat. N., 4° 12′ Long. W., depth 283 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities lie in the Davis Strait, the Denmark Strait and at the Faröe Islands. The species is certainly an inhabitant of the warm area; to be sure station 15 has a negative bottom temperature, but this station is situated at the very border between the cold and the warm areas.

Geogr. distr. The species was hitherto only known from Norway, South-west of Bukenfjord, depth 106 fathoms (Schmidt l. c.).

35. **H. grandis** n. sp.

Pl. III, Figs. 13—14, Pl. IX, Fig. 3.

Incrusting, but of massive appearance; surface smooth, bearing a number of thin, cylindrical oscular and pore-papillæ. The dermal membrane solid, with horizontal spicules. The skeleton formed of dermal spicules strongly developed, the main skeleton weak, chiefly consisting of bundles of spicules, forming the lowermost part of the fibres of dermal spicules. Spicula: megasclera; the skeletal spicules acanthostyli with a very slight or no head, spined almost in the whole length, 0·41—0·75^{mm} (not divided into two groups?); the dermal spicules long strongyla 0·48—0·80^{mm}; microsclera two forms, chelæ arcuatæ 0·042—0·048^{mm}, sigmata 0·031—0·096^{mm}.

The specimens to hand of this species all grow on aggregated, large sponge-spicules; these spicules are then overgrown, enveloped or more or less imbedded by the sponge; although the species must thus in reality certainly be considered as incrusting, it has however an outer appearance of being more or less massive; the upper part of the sponge has at the same time a somewhat bladder-like consistency which also contributes to its massive outer appearance. The surface bears a generally great number of long, thin papillæ or appendages which may reach to a length of 12^{mm} with a diameter of 0·5—1·5^{mm}. The appendages may be more or less erect or decumbent, and they are generally more or less curved. The whole sponge is generally folded and wrinkled in different ways. The species may reach a considerable size, the largest specimen is about 50^{mm} long and has an apparent height of 15^{mm}. The colour (in spirit) is dirty yellowish or greyish white. The *surface* is smooth without projecting spicules. The *dermal membrane* is solid and easily separable, and it is provided

with horizontal spicules. *Oscula* and *pores:* the mentioned papillæ are oscular and pore-papillæ; in outer appearance there is almost no difference between the two kinds, only the oscular papillæ are generally more conically pointed at the apex, while the pore-papillæ are more broad here; the latter are closed by a pore-sieve, while the oscular papillæ have a simple opening in the summit. The pore-papillæ are more numerous than the oscular papillæ.

The *skeleton.* The *dermal skeleton;* the skeleton consisting of the dermal spicules forms the greatest part of the whole skeleton; it consists of fibres and bundles which stretch in an irregular way from or nearly from the substratum up to the dermal membrane; the course of the fibres is, as said, irregular, and they are often more or less curved, and may thus be seen running somewhat parallel with the surface; the fibres may be of very different strength, but often rather thick, up to 0·3 mm, and consisting of many spicules. In the dermal membrane the spicules lie horizontally, but irregularly, crossing each other in all directions; they lie somewhat scattered, and the membrane is to be seen everywhere between them; they lie thus much more scattered than in *filifera*, and not bundle-like collected. The skeleton of the papillæ is constructed quite as in *filifera*, and also here the spicules cross each other regularly and under acute angles. The *main skeleton* is quite irregular and scattered on account of the way in which the sponge grows on the substratum; it forms thick bundles scattered everywhere between the foreign sponge-spicules and other particles of the substratum, and always forming the lowermost part of a fibre of dermal spicules; the acanthostyli are thus not at all evenly distributed at the base of the sponge, but very scattered and only present as bundles, from which fibres of dermal spicules proceed. The bundles are generally large and consist of many spicules, they may have a thickness of 0·5 mm. At the base of the bundles there is a distinct mass of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are long and slender acanthostyli; they are straight or nearly so and evenly tapering, but the outermost point is short; they have no or only a very slight head-swelling and are somewhat densely spined at the base and some way out, but on the largest part of the shaft the spines are somewhat scattered; at the base and especially a little above it the spines are somewhat large, but for the rest they are small. The styli do not generally vary much in length, from 0·41—0·75 mm with a diameter at the base of 0·021—0·026 mm; it will be seen that there is thus no very great difference in size between the styli; some smaller ones may however be found, reaching only 0·18 mm in length, but these are very scarce and perhaps not always present. 2. The dermal spicules are long strongyla; they are straight, sometimes slightly, irregularly curved, and they may be slightly polytylote; the ends may be very slightly swollen. The length is 0·48—0·80 mm, and the diameter in the middle 0·007—0·013 mm. *Microsclera;* these are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ have a curved shaft, the free middle part of which is about one third of the length of the chela, the alæ are lobe-shaped, the tooth elliptical, pointed. The length is 0·042—0·048 mm, and the diameter of the shaft 0·005—0·007 mm. 2. The sigmata are of common shape, more or less contorted up to a quarter of a turn; they vary considerably in size, the length is 0·031—0·096 mm and the thickness relatively 0·002—0·006 mm; the larger forms are the most common. The two forms of microsclera occur at definite places in the sponge; in the dermal membrane both chelæ and sigmata are present in equal numbers; the chelæ occur moreover in the wall of the papillæ.

especially outwards, and in rather great numbers in the membrane forming the pore-sieves, and in these places no sigmata occur; on the other hand, the chelæ do not occur in the inner body, while the sigmata are present here in enormous numbers, filling the tissue and also occurring everywhere in the basal parts among the particles of the substratum. The consequence of this distribution of the microscleres is that the sigmata are far more numerous than the chelæ.

Embryos. In one of the specimens, which was cut through, some embryos were found; they reached to a diameter of 0·65^{mm}; they smallest of them had no spicules, but the larger were richly provided with microsclera, both chelæ and sigmata; both forms were smaller than in the grown sponge, the chelæ 0·031^{mm} and the sigmata not surpassing 0·040^{mm}; also in the embryo the sigmata were far more numerous than the chelæ. No megascleres were present.

Locality: Station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms; station 84, 62° 58′ Lat. N., 25° 24′ Long. W., depth 633 fathoms; station 90, 64° 45′ Lat. N., 29° 06′ Long. W., depth 568 fathoms. In all five specimens. The localities lie in the Denmark Strait and on the eastern slope of the Reykjanæs Ridge.

36. **H. digitata** n. sp.

Pl. III, Fig. 15, Pl. IX, Fig. 4.

Incrusting or of somewhat massive appearance; surface smooth, bearing some thin ocular and pore-papillæ; the dermal membrane with horizontal spicules. Spicula: megasclera: the skeletal spicules acanthostyli, divided into two groups, large, without a distinct head and not entirely spined, 0·25—0·31^{mm}, small, with a distinct head and entirely spined, 0·11—0·14^{mm}; the dermal spicules tylota 0·26—0·417^{mm}; microsclera two forms, chelæ arcuatæ 0·034—0·038^{mm}, sigmata 0·028—0·050^{mm}.

This species resembles the preceding in outer appearance, but the specimens present are small; we have only two specimens, growing on stones together with other species of *Hymedesmia* and some other incrusting sponges. The sponge forms a basal, incrusting or more massive part, from which a number of long, thin papillæ issue; in the present specimens the number of papillæ does not exceed three; they are of the common shape and reach to a length of 7^{mm}. As said the specimens are small, the basal part has a greatest extent of about 5^{mm}. The colour (in spirit) is yellowish or whitish. The *surface* is smooth, and the *dermal membrane* constructed as in the preceding species. *Oscula* and *pores* are connected with the papillæ quite as in the preceding species.

The *skeleton.* The *dermal skeleton;* the skeleton formed of the dermal spicules consists of more or less distinct fibres going from the basal skeleton towards the dermal membrane; in the membrane the spicules lie horizontally, and they are as usual lying close in the wall of the papillæ in the longitudinal direction, intercrossing at acute angles. The *main skeleton* consists of basal acanthostyli with their heads on the substratum. Spongin is present, but only to a very slight degree.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are divided into two rather distinct groups, large and small; the large styli are slightly curved, they are thickest at the base but without any real head-swelling; they taper evenly but the outermost point is short, and they are spined in somewhat more than the basal half; the spines are small, only at the base a little larger. The small styli are straight and have a distinct head, the shaft is beset with relatively large

spines in the whole length, the spines are directed downwards; on the head there are rather long, radiating spines. The length of the large styli is 0·25—0·31 mm, and the diameter at the base 0·021 mm; the small styli are 0·11—0·14 mm long with a diameter of the head of 0·021 mm. 2. The dermal spicules are tylota which are cylindrical and straight or slightly, irregularly curved; the end-swellings are not large but distinct; the length is 0·26—0·417 mm and the diameter in the middle 0·005—0·008 mm. b. *Microsclera* are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ have an evenly curved shaft, the free middle part of which is a little more than the third part of the length; the alæ are lobe-shaped and the tooth elliptical, rounded at the end. The length is 0·034—0·038 mm and the diameter of the shaft 0·005 mm. 2. The sigmata are of ordinary shape, more or less contorted up to a quarter of a turn. The length is 0·028—0·050 mm and the thickness between 0·002 and 0·003 mm. The chelæ and sigmata seem to be present in about equal numbers; the chelæ occur in the wall of the papillæ, and for the rest both forms of microscleres seem to occur, so far as I could ascertain, through the whole body.

This species is distinguished from the preceding in regard to the spicules by the smaller acanthostyli, the tylote dermal spicules and the much smaller sigmata; also the chelæ are slightly different.

Locality: Station 89, the Denmark Strait, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms. Two specimens.

37. **H. trichoma** n. sp.

Pl. III, Fig. 16, Pl. IX, Fig. 5.

Incrusting; surface smooth, bearing thin papillæ. The dermal membrane with horizontal spicules. Spicula: megasclera; the skeletal spicules acanthostyli with a small head, spined in the whole length, they are divided into two groups, large, 0·20—0·24 mm, small, 0·11—0·13 mm; the dermal spicules tylota 0·29—0·38 mm; microsclera two forms, chelæ arcuatæ 0·034—0·042 mm, plane sigmata 0·058—0·075 mm.

Of this species we have only one specimen growing on a shell of an *Astarte;* it forms a thin incrustation of a greatest extent of only 6 mm, and it bears one long and thin papilla. The colour (in spirit) is light brownish. The *surface* is smooth. The *dermal membrane* is thin and not easily separated. About *oscula* and *pores* I can say nothing, as said, only one papilla is present.

The *skeleton.* The *dermal skeleton;* the skeleton formed of the dermal spicules consists of bundles stretching from near the base to the dermal membrane; in the membrane there are horizontal spicules, but they are scattered and not at all dense-lying. The *main skeleton* is arranged quite in the ordinary way, consisting of erect acanthostyli with their head on the substratum and evenly distributed over it; the largest of them reach to the surface. A small amount of spongin seems to be present.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are straight or nearly so, the head-swelling is small, and they taper slightly towards the point, which is short; they are rather densely spined in the whole length, but the spines are small, only longer at the base; though they do not vary much in length they are yet divided into two distinct groups; the length of the large styli is 0·20—0·24 mm, and of the small 0·11—0·13 mm; the diameter of the head is about 0·021 mm, and it is nearly the same in the large and the small styli on account of the basal spines being larger

in the small than in the large styli. 2. The dermal spicules are tylota, they are straight or generally slightly and somewhat irregularly curved, often with a curvature recalling to some degree that found in the dermal spicules of *H. filifera;* the end-swellings are small, sometimes almost disappearing; the length is 0·29—0·38^{mm} and the diameter 0·004—0·007^{mm}. b. *Microsclera* are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ have a curved shaft the free middle part of which is more than one third of the length, the alæ are lobe-shaped, their lower margin not much incised; the tooth is narrowly elliptical; the length is 0·034—0·042^{mm} and the diameter of the shaft about 0·003^{mm}. 2. The sigmata are of common shape, but they are quite or nearly quite plane; the length is not very variable 0·58—0·75^{mm}, generally nearest the latter size; they are relatively thin, the thickness being 0.0028^{mm}. As far as I have been able to ascertain, both chelæ and sigmata occur through the tissue, while in the dermal membrane only the chelæ occur, but here in great numbers, and in places lying densely. Of the microsclera the chelæ are the most numerous.

This species is distinguished from *grandis* and *digitata* by its plane, thin sigmata and besides by characters in the other spicules.

Locality: Station 85, the Denmark Strait, 63° 21′ Lat. N., 25° 21′ Long. W., depth 170 fathoms. One specimen.

38. **H. macrosigma** n. sp.

Pl. IX, Fig. 6.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a small head-swelling, spined in the whole length, but the spines much dispersed outwards, 0·13—0·28^{mm}, not divided into two groups; the dermal spicules strongyla or subtylota 0·23—0·28^{mm}; microsclera three forms, chelæ arcuatæ 0·020—0·032^{mm}, sigmata of two forms, large 0·18—0·208, small 0·06—0·089^{mm}.

We have three specimens of this species, one of them grows on aggregated sponge-spicules; it incrusts these all round, so that they are chiefly situated in the interior of the sponge, but stretching out here and there. Of the other two specimens one grows on a Brachiopod-shell, the other on a basalt block. The specimens are rather small, one only about 8^{mm}, the others 12^{mm} in greatest extent. The colour (in spirit) is yellowish white or yellow. The *surface* is smooth without projecting spicules. The *dermal membrane* is thin, it is densely charged with chelæ and sigmata; some small, circular openings could be observed in it.

The *skeleton* is highly irregular and confused in the first examined specimen, viz. that imbedding sponge-spicules, on account of the manner in which the sponge envelops the substratum. The *dermal skeleton* is represented by dermal spicules which are found scattered through the whole sponge; in single places they may form a bundle stretching towards the surface; in the dermal membrane they are not seen, or at all events only some few, while, as said, the membrane is filled with microscleres. In one place the dermal spicules were lying parallel and forming something like a conical projection — perhaps an ocular cone — but the state of the specimen did not allow this to be decided. The *main skeleton* is still less developed, and the acanthostyli are only present in small numbers; they are seen here and there with the head based on the substratum but otherwise quite confused and pointing in all directions. While the skeleton is thus on the whole little developed, the sponge is on

the other hand densely filled with microscleres. When a vertical section is examined, the view is therefore somewhat curious; in the interior foreign sponge-spicules are seen, and for the rest the microscleres are predominant, filling the other space, the dermal spicules being only seen scattered between the other elements, and it is only by close examination that an acanthostyle can be observed here and there. The condition of the skeleton is, as seen below, due to the way in which the sponge grows, and the principle of the construction is evidently the same as in the other species of *Hymedesmia*. There seems to be a little spongin at the base of the acanthostyli. — On examining the other specimens, which only came into my hands later, it proved, that the skeleton was here of the ordinary construction and the styli were as usually placed on the substratum; otherwise it agreed with the above description, the other space being occupied by dermal spicules and densely charged with microscleres. Here also the styli of the skeleton were somewhat scarce and arranged very dispersedly. — It is of some importance to notice the facts with regard to these different specimens, as we see it clearly proved here, that specimens of *Hymedesmia* may, when growing on loose material, assume a shape and a manner of growth which may give rise to mistakes by influencing the arrangement of the skeleton, though the construction of this latter is principally the same as in species of *Hymedesmia* growing on a flat and firm substratum.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight and the head-swelling is small or wanting; the spines on the basal part are somewhat large and close-standing, on the rest they are small, reclined and few in number; the smallest styli are somewhat more spined. The length is 0·13—0·28 mm and the diameter at the head about 0·020 mm. 2. The dermal spicules are straight, cylindrical strongyla or subtylota; the ends are generally swollen, but only to a very slight degree. The length is 0·23—0·38 mm and the diameter is 0·0057—0·007 mm. b. *Microsclera* are three forms, chelæ arcuatæ and sigmata of two sizes. 1. The chelæ are of the common shape, the shaft is curved, the tooth elliptical and the alæ lobe-shaped; they vary somewhat in size, the length is 0·020—0·032 mm and the diameter of the shaft 0·0015—0·0028 mm. 2. The large sigmata are of ordinary form, but somewhat elongated and generally only slightly contorted; they are of a considerable and very uniform size, the length is 0·18—0·208 mm and the thickness 0·010—0·011 mm. 3. The small sigmata are of a less regular shape and they are contorted, generally a quarter of a turn or nearly so; their length is 0·06—0·089 mm and the thickness 0·003 mm. As said the microscleres occur in great numbers all through the tissue; in the dermal membrane all three forms occur, but the chelæ are here present in greatest number and very close-lying.

This species shows, in one specimen, a manner of growth quite as is found in *grandis*, and it also shows resemblances to this species otherwise, but it is easily distingnished from it and from the related species by the presence of two forms of sigmata. As seen from the description I have not been able to decide whether the species in a more perfect state may be provided with papillæ.

Locality: Station 54, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms. The localities lie in the Denmark Strait and South of Iceland.

39. **H. pugio** n. sp.

Pl. IX, Fig. 7.

Incrusting: surface somewhat hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a distinct head, only spined on the lower part, they are divided into two groups, large 0·38—0·54 mm, small 0·12—0·20 mm; the dermal spicules thin styli 0·27—0·31 mm; microsclera two forms, chelæ arcuatæ 0·021—0·040 mm, sigmata, small and curved in a somewhat circular way, plane or nearly plane, 0·014 —0·017 mm.

Of this species we have one specimen, growing on a stone; it forms a thin incrustation of a greatest extent of about 20 mm, and the thickness does not exceed 0·5 mm. The colour (in spirit) is white. The *surface* is somewhat hispid from the projecting acanthostyli. The *dermal membrane* is thin and not separable, sparingly provided with dermal spicules, but somewhat more richly with chelæ. A number of circular openings of canals are seen shining through the membrane.

The *skeleton*. The *dermal skeleton* is not much developed; it consists of dermal spicules which are, so far as I could ascertain, lying partly more or less horizontal in the membrane, but for the greatest part projecting. The *main skeleton* consists of acanthostyli with the heads placed on the substratum; it is rather dense with the spicules close-standing; the longest of the styli project through the dermal membrane. The heads of the styli are at the base inserted in a somewhat slight mass of spongin.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are straight or only very slightly curved and taper evenly into a long apex; the head is round and not large but distinct. They are spined at the base and some way out, but the larger apical part is smooth; the spines are small. With regard to size the styli are divided into two groups, but otherwise they are quite similar. The large styli have a length of 0·38—0·54 mm with a diameter at the head of 0·021—0·028 mm; the small styli are 0·12—0·20 mm long and the head 0·015—0·021 mm thick. The small styli are the most numerous. 2. The dermal spicules are rather thin styli which are cylindrical, straight or slightly curved and taper into a long and fine point. The length is 0·27—0·31 mm with a diameter of about 0·003 mm. b. *Microsclera* are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ have a sometimes rather strongly curved shaft and relatively small end-parts; the alæ are lobe-shaped but somewhat narrow, the tooth is elliptical. The size of the chelæ is somewhat variable, the length being 0·021—0·040 mm and the thickness of the shaft 0·004—0·006 mm. 2. The sigmata are very small and fine and they are somewhat circularly curved, so that the length is not much greater than the breadth; they are plane or almost plane; the length is 0·014—0·017 mm and the thickness 0·001 mm or still finer. Both forms of microsclera are seen especially in or near the dermal membrane.

Embryos. The specimen contained a great number of embryos; they are globular or lentiform and they were easily seen in the thin sponge on account of their white colour. They have an average diameter of 0·35 mm. They contained either no spicules or also developmental forms of the chelæ but no megascleres.

Locality: Station 15, the Denmark Strait, 66° 18′ Lat. N., 25° 59′ Long. W., depth 330 fathoms (bottom temperature + 0° 75 C.). Only one specimen.

40. **H. consanguinea** n. sp.

Pl. IX, Fig. 8.

Incrusting: surface finely hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a small or no head-swelling, they are divided into two groups, large, with a smooth apical part, 0·21—0·29 mm, small, entirely spined, 0·10—0·13 mm; the dermal spicules tornota, 0·15—0·19 mm; microsclera two forms, chelæ arcuatæ 0·028—0·057 mm, contorted sigmata 0·014—0·017 mm.

This species grows as thin incrustations on living Brachiopods and one on a *Retepora:* the sponge covers generally the whole shell and may thus reach a greatest extent of 16 mm; it is exceedingly thin, not reaching 0·5 mm in thickness. The colour (in spirit) is whitish. The *surface* is short and finely hispid. The *dermal membrane* is very thin and hardly observable.

The *skeleton.* The *dermal skeleton* is not much developed and somewhat diffuse; it consists of small bundles formed by a few spicules; the bundles stretch from the skeleton below up to the dermal membrane. The *main skeleton* is constructed in the ordinary way and consists of acanthostyli with the heads based on the substratum; the styli are not densely placed. The longer styli stretch beyond the dermal membrane, thus giving rise to the hispidity of the surface. So far as I could observe there is a very small amount of spongin at the base of the skeleton.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are divided into two well separated groups, large and small. The large styli are straight or generally slightly curved near the base; they are thickest at the base but have no or only a small head-swelling; they taper evenly from the base, but the apex itself is not long-pointed; the styli are somewhat densely spined in almost the lower two thirds, the spines being less dense outwards; at the base the spines are somewhat large and blunt, for the rest they are small. The small styli have a similar shape as the large, but they are spined in the whole length. The large styli have a length of 0·21—0·29 mm and a diameter at the base of 0·018—0·025 mm. The small styli are 0·10—0·13 mm long with a diameter at the base of about 0·014 mm. 2. The dermal spicules are tornota which are somewhat thin, straight and cylindrical; the ends have short points; they are not of a simple tornote shape in so far as one end has a generally slight swelling; sometimes also the other end may show an indication of a swelling. The length of the tornota is 0·15—0·19 mm and the diameter about 0·0025 mm. b. *Microsclera* are of two forms, chelæ arcuatæ and sigmata. 1. The chelæ have a slightly curved shaft and relatively small end-parts, the alæ are lobe-shaped and the tooth elliptical. The length of the chela is 0·028—0·057 mm and the diameter of the shaft 0·003—0·006 mm. 2. The sigmata are thin and contorted, generally a quarter of a turn; their length is 0·014—0·017 and the thickness 0·0008 mm. The microscleres are seen through the whole tissue of the sponge.

This species shows some resemblance to *H. (Hymeraphia) mucronata* Tops. with regard to the different categories of spicules, but the size of these is different for all forms and especially for the tornota, and there is only one form of chelæ in the present species. The species is easily distinguished from the preceding by the sigmata and the tornote dermal spicules.

Locality: Station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms, and at 70° 32′ Lat. N., 8° 10′ Long. W., depth 470 fathoms (The Ryder Expedition 1891—92). In all five specimens. The localities lie in the Davis Strait and the Denmark Strait.

41. **H. planca** n. sp.

Pl. X, Fig. 1.

Incrusting: surface densely hispid. Spicula: megasclera: the skeletal spicules acanthostyli without a distinct head, divided into two groups, large, only spined at the base, 0·35—0·65 mm, small, spined about in the lower half, 0·16—0·27 mm; the dermal spicules tylotornota 0·21—0·29 mm; microsclera three forms, chelæ arcuatæ 0·018—0·057 mm, sigmata of two forms, large, contorted, 0·021—0·028 mm, small, plane, somewhat circularly curved, 0·014 mm.

This species forms incrustations on Brachiopods, shells, Bryozoa and small stones; it reaches a greatest extent of about 15 mm, with a thickness of about 0·5 mm. The colour (in spirit) is white in all specimens. The *surface* is distinctly and densely hispid. The *dermal membrane* is very thin and transparent; it is perforated by a multitude of close-lying circular openings of different sizes, which are *oscula* and *pores*, but there is no such difference in size between them, that it can be decided therefrom which of them are incurrent and which excurrent openings; the openings are seen only when the sponge is somewhat dried; when lying in spirit close-standing openings of canals are seen to shine through the membrane.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules, which stretch obliquely from the lower part of the main skeleton up to the dermal membrane; the bundles are small, each not consisting of many spicules; the spicules all have the rounded ends inwards and the points outwards; the spicules in the bundles are a little divergent outwards and bear the dermal membrane, but they do not penetrate through it or only very slightly; as the longest skeletal styli reach the dermal membrane and project through it, the bundles of dermal spicules are thus lying between the ends of the long skeletal styli. The *main skeleton* is constructed in the ordinary way of vertical acanthostyli with the heads based on the substratum; it is somewhat dense, and the longer spicules reach as said to the dermal membrane and project beyond it. At the base of the skeleton there is a distinctly visible sponginous substance.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli; they are divided into two distinct groups, large and small; the large styli are more or less curved near the base, this latter is the thickest part of the style but there is no distinct head; they taper evenly into a long apex which is a little more abruptly pointed outermost. They are only spined on a short basal part and the spines are somewhat large. The small acanthostyli are straight and relatively more spined than the large, the spines are continued to or near to the middle; the spines are also relatively more robust than in the large styli. The length of the large styli is 0·35—0·65 mm with a diameter at the base of 0·021—0·028 mm, and of the small 0·16—0·27 mm with a basal diameter of 0·017—0·022 mm. 2. The dermal spicules may be termed tylotornota; they are cylindrical and straight, one end is more or less thickened or has an oblong swelling which goes however evenly over into the shaft, the other end has a shorter or longer sharp point. The length is 0·21—0·29 mm and the diameter in the middle 0·003 mm. b. *Microsclera* are of three forms, chelæ arcuatæ and sigmata of two forms. 1. The chelæ have a somewhat strongly curved shaft, the end-parts are relatively short, the alæ are lobe-shaped and the tooth elliptical. The length is very variable, from 0·018 to 0·057 mm, but the shape remains the same.

The shaft is not cylindrical but somewhat flattened and therefore of different thickness in side and front view, the thickness is in relation to this and to the size of the chela 0·003 and 0·006 mm to 0·007 and 0·011 mm; the larger chelæ are the most numerous. Sometimes the chelæ have the shaft less strongly curved. 2. The sigmata of the larger form are somewhat irregularly curved and they are contorted, always a quarter of a turn or nearly so; their length is rather constant, about 0·021—0·028 mm and the thickness about 0·001 mm. 3. The small sigmata quite resemble the sigmata in *H. pugio;* they are likewise strongly curved, and they are plane; their length is about 0·014 mm and the thickness scarcely goes beyond 0·0008 mm. The microsclera occur through the whole tissue and the chelæ are seen in great numbers in the dermal membrane.

Locality: Station 15, 66° 18′ Lat. N., 25° 59′ Long. W., depth 330 fathoms (bottom temperature + 0° 75 C.); station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms, and East of the Faröe Islands, depth 230 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities are situated in the Davis Strait, the Denmark Strait and East of the Faröe Islands. The species must be an inhabitant of the warm area; it is true that station 15 shows a negative bottom temperature, but this station lies just at the very border between the cold and the warm areas.

The three species just described must be somewhat nearly related, but besides by other characters they may be distinguished by their sigmata alone; *H. pugio* has only small, plane, circularly curved sigmata, *consanguinea* only contorted sigmata and *planca* two forms, contorted and plane.

42. **H. cultrisigma** n. sp.

Pl. X, Fig. 2.

Incrusting; surface hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a very slight or no head, they are divided into two groups, large, only spined below, 0·56—0·80 mm, small, spined in the basal half, 0·21—0·30 mm; the dermal spicules tylota 0·25—0·32 mm; microsclera three forms, chelæ arcuatæ 0·026—0·042 mm, sigmata of two forms, large, peculiar, somewhat band-shaped, 0·028—0·035 mm, small, plane, 0·014—0·020 mm.

This species grows as very thin incrustations on different bottom material as pebbles and shell-fragments and in one case on a Hexactinellid skeleton. The greatest extent it reaches is 16 mm; it may vary a little in thickness, but it is however always very thin, not reaching 0·5 mm. The colour (in spirit) is whitish. The *surface* is in the present condition of the sponge very hispid with long projecting spicules. The *dermal membrane* is a thin film. *Oscula* and *pores* were not seen, but some circular canals could be seen through the dermal membrane.

The *skeleton.* The *dermal skeleton* is formed by bundles of dermal spicules stretching from or almost from the base to the surface; the bundles have a more or less oblique direction and are often almost horizontal for a distance; they do not project beyond the surface, and there are no spicules lying in the membrane itself. The bundles are generally weak, consisting of only few spicules. The *main skeleton* has quite the ordinary construction and consists of acanthostyli with the heads placed on the substratum; the long styli project beyond the surface. At the base there is a small amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are divided into two sizes, large and small; the large styli are slightly curved near the head which is only slightly thickened, while the other end forms a long-pointed apex; the head and a short space above it are spined, while the whole of the rest of the shaft and apex is smooth. The small acanthostyli are generally straight and with the head still less thickened; they are more spined than the large, the spines covering the basal half part or more, and the spines are relatively larger. The length of the large styli is 0·56—0·80^{mm}, and the diameter of the head about 0·028^{mm}, of the small styli 0·21—0·30^{mm} with a diameter of 0·021—0·025^{mm}. 2. The dermal spicules are tylota; they are straight and the shaft is slender, the end-swellings are distinct, but they are not formed abruptly but pass gradually into the shaft. The length is 0·25—0·32^{mm} and the diameter of the shaft is 0·003^{mm}. Some few developmental forms were found, the thinnest of them being monactinal. b. *Microsclera* are of three forms, chelæ arcuatæ and sigmata of two forms and sizes, large, peculiar, and small. 1. The chelæ are of ordinary shape, the shaft is evenly curved and the end-parts are relatively small; the tooth is elliptical and the alæ lobe-shaped; the shaft is flattened, elliptical in section. The chelæ vary somewhat in size, the length is 0·026—0·042^{mm} and the thickness of the shaft 0·004—0·010^{mm}; with regard to the latter measurement it must be remembered, that the shaft is about twice as thick when seen in front as when seen in side view. The intermediate sizes of the chelæ are scarce and hence they could be said to be present in two groups of sizes. 2. The large peculiar sigmata are of a curious shape; they may be described as having the curved end-parts somewhat long and terminating in a hook; they are contorted generally a quarter of a turn, and the hooks are again bent a little out of the plane; but the most interesting feature is that the rod forming the sigma is not cylindrical but compressed and thus somewhat band-shaped. The size of the sigma from one curve to the other is 0·028—0·035^{mm}, and the thickness is 0·001 and 0·003^{mm} for the small and the large diameter respectively. 3. The small sigmata are of ordinary shape and they are plane; the length is 0·014—0·020^{mm} and the thickness about 0·001^{mm}. The chelæ are present especially in the dermal membrane and rather numerous; the two forms of sigmata are seen through the whole body.

Locality: Station 78, 60° 37′ Lat. N., 27° 52′ Long. W., depth 799 fathoms; station 81, 61° 44′ Lat. N., 27° 00′ Long. W., depth 485 fathoms. In all three specimens. The localities are situated on the Reykjanes Ridge South-west of Iceland.

43. **H. mucronata** Tops.

Pl. X, Fig. 3.

1904. *Hymeraphia mucronata* Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 165, Pl. XIV, fig. 4 a—d.

Incrusting; surface hispid. Spicula: megasclera: the skeletal spicules acanthostyli with no distinct head, the larger spined at the base, the small entirely spined, 0·12—0·65^{mm}, not divided into two groups; the dermal spicules fusiform oxytornota 0·22—0·268^{mm}; microsclera three forms, chelæ of two forms, ordinary 0·021—0·025^{mm}, peculiar, with some processes at each end, 0·021—0·026^{mm}, sigmata, large and fine, 0·028—0·051^{mm}.

Of this interesting species we have one specimen growing as a small incrustation on an *Onychocella*; its greatest extent is 8^{mm}, and it scarcely reaches 0·5^{mm} in thickness. The colour (in spirit) is greyish. The *surface* is hispid on account of the projecting skeletal styli. The *dermal membrane* is a thin film, it shows a multitude of larger and smaller circular openings representing I think both *oscula* and *pores*.

The *skeleton*. The *dermal skeleton* consists of single dermal spicules or of small bundles of these, stretching from the main skeleton to the surface in a more or less oblique direction. In the membrane itself there are no horizontal spicules. The *main skeleton* has the common construction, consisting of vertical acanthostyli with the heads placed on the substratum; the longest of the styli project beyond the surface, thus causing the hispidity of this; the skeleton is somewhat dense. At the base there is an amount of spongin, which is only slight but forms however a continuous basal lamella.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are more or less, generally only slightly, curved; they are thickest at the base but have no distinct head, and they taper into a long apex. The larger styli are spined at the base, but the spines are not large and outwards they become smaller and gritty, and they soon disappear; the small styli are generally straight, they are spined in the whole length, and the spines are relatively larger than in the long styli. The styli vary much in size, but there are no separated groups. The length is 0·12—0·65^{mm} and the thickness at the base 0·01—0·024^{mm}. 2. The dermal spicules are of a characteristic shape and may best be termed oxytornota; they are rather thick and much thickened about the middle, so that they are strongly fusiform; they taper towards each end, one end is tornote-shaped, or sometimes more rounded, and terminates in a little mucro, the other end is of an oxeote shape, tapering somewhat evenly, but the outermost point is generally short; in some cases this latter end is so short pointed and has such a shape that the spicule might be termed a tornote. The spicules are often somewhat curved near the short pointed end. The length is 0·22—0·268^{mm}, and the diameter in the middle is 0·008—0·017^{mm}. b. *Microsclera* are of three forms, chelæ of two forms and sigmata; the chelæ are ordinary chelæ arcuatæ and peculiar chelæ. 1. The ordinary chelæ arcuatæ have an evenly curved shaft, the alæ are somewhat claw-shaped triangular, the tooth elliptical; the length is 0·021—0·025^{mm} and the thickness of the shaft about 0·002^{mm}. 2. The peculiar chelæ are spicules, which are somewhat difficult to understand; they consist of a curved shaft the ends of which are a little dilated and from this dilatation a few processes are produced; the processes may be of different number and differently, often quite irregularly arranged, but generally there are two larger processes at the end of the dilated part, and behind these two others, generally smaller processes; it is probable that the two larger processes answer to a cleft tooth, and the other small processes to alæ, but this it is for the present not possible to decide with certainty; on the other hand I consider it as certain, that the spicule is a chela and not a sigma. In spite of the number of processes at each end I think however, that it cannot at all be considered as an ancora; the whole shape of the dilated end-parts seems to me to point towards a chela. The length of this spicule is 0·021—0·026^{mm} and the thickness of the shaft is about 0·0028^{mm}. 3. The sigmata are of a very characteristic shape, they are rather large but exceedingly fine, generally they are strongly curved in the middle and the arms have a hook-formed bend at the end; sometimes they are more evenly curved; they are more or less contorted.

They vary somewhat in size, the length from one hook to the other is 0·028—0·051 mm and the thickness about 0·0010 mm. The microsclera are especially found in the dermal membrane, the ordinary chelae and the sigmata are however also seen throughout the tissue.

As I have seen a preparation of the type-specimen, kindly sent to me from Professor Topsent, the determination is certain; as will be seen the shape and measurements of the spicules agree very well, only the dermal spicules are different, but I think that Topsent's figure and measurements are taken from non-typical spicules; the few dermal spicules present in the preparation sent to me quite agreed with my figure (Pl. X, fig. 3 b) and were measured to 0·26 mm in length with a diameter of 0·017 mm.

Locality: Station 25, the Davis Strait 63° 30' Lat. N., 54° 25' Long. W., depth 582 fathoms. One specimen.

Geogr. distr. Topsent (l. c.) has the species from 37° 55' Lat. N., 25° 24' Long. W., depth 465 fathoms.

44. **H. tenuisigma** n. sp.

Pl. X, Fig. 4.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a round head, divided into two groups, large, only spined below, 0·30—0·83 mm, small, entirely spined, 0·119—0·16 mm; the dermal spicules long strongyla 0·32—0·42 mm; microsclera only sigmata which are large, but thin, 0·084—0·12 mm.

Of this interesting species we have two specimens, one growing on an *Astarte*-shell together with *H. levis*, the other growing on a small *Saxicava* together with *H. Kochleri* and *H. procumbens*. The greatest extent to which the species reaches is about 10 mm, and the thickness is at most 0·6 mm. The colour (in spirit) is brownish red. The *surface* seems, when the sponge is undamaged, to be smooth. The *dermal membrane* is a thin film. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules which stretch from the skeleton below to the surface, they thus lie between the apical parts of the long skeletal spicules; the spicules in the bundles are more or less penicillately spread outwards; the bundles are sometimes rather large, consisting of many spicules. The *main skeleton* is arranged as usual and consists of vertical acanthostyli, the longest of which stretch to the surface; at the base there is a small amount of spongin.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are divided into two groups, large and small; the large styli are straight or, generally, slightly curved near the base; they have a round, more or less swollen head and taper into a long and fine apex which generally is a little more abruptly pointed outermost; the head-swelling is beset with medium sized, blunt spines, and a short basal part has small spines, the rest of the style is smooth. The small styli are generally straight, they have a round head-swelling which is however less distinct than in the large styli, it is likewise beset with blunt spines, and the styli are spined in the whole or nearly the whole length, but the spines are dispersed outwards. The length of the large acanthostyli is about 0·30—0·83 mm; they vary considerably in thickness from 0·020—0·029 mm and this has no relation to their length, the

longest being often thin; the small styli have a length of 0·119—0·16^{mm} and a diameter at the head of 0·021^{mm}. The large styli are generally in size nearest the greatest length, the shorter of them, which are nearly intermediate between the large and the small, being rare. 2. The dermal spicules are long and straight strongyla, sometimes one end, and sometimes both may be slightly swollen, in the latter case the spicule approaching to a tylote; they are as a rule slightly polytylote. The length is 0·32—0·42^{mm} and the diameter 0·005—0·007^{mm}. Some fine developmental stages were found which were monactinal. b. *Microsclera* are of one form, sigmata, which are rather curious; they are large but exceedingly thin, and they are more or less contorted up to a quarter of a turn, otherwise they are of the common shape. The length is 0·084—0·12^{mm} and the thickness 0·001$_4^{mm}$. The sigmata occur through the whole tissue but are especially numerous at the surface.

Locality: Station 9, 64° 18′ Lat. N., 27° 00′ Long. W., depth 295 fathoms; station 98, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms. Both localities lie in the Denmark Strait.

45. **H. Dujardinii** Bow.

Pl. X, Fig. 5.

1866. *Hymeniacidon Dujardinii* Bowerbank, Mon. Brit. Spong. II, 224, 38.
1867. *Halisarca Dujardinii*, Gray, Proc. Zool. Soc. 1867, 520.
1874. *Hymeniacidon Dujardinii* Bowerbank, l. c. III, 95. Pl. XXXVIII, figs. 1—4.
1882. — — Bowerbank, Norman, ibid. IV, 92, 48.
1888. *Dendoryx Dujardini*, Topsent, Arch. de Zool. exp. et gén. 2, V bis, 115, Pl. VI, fig. 3, 12, 13 c.
1890. — — , Topsent, Mém. de la Soc. Zool. de Fr. III, 201.
1891. — — , Topsent, Arch. de Zool. exp. et gén. 2, IX, 528.
1892. — — , Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. II, 99.
1892. *Myxilla radiata* Bow. Topsent, (partim, the last passage), ibid. 109.
1894. *Leptosia Dujardini*, Topsent, Mém. de la Soc. Zool. de Fr., VII, 37.
1896. — — , Topsent, ibid. IX, 123.
1896. — — , Topsent, Résultats scient. de la camp. du "Candan", 275.
1901. — — , Topsent, Arch. de Zool. exp. et gén. 3, IX, 353.
1904. — — , Topsent, Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 185, Pl. I, fig. 5.
1909. *Hymedesmia Dujardinii*, Lundbeck, Meddel. om Grönl. XXIX, 444.

Incrusting; surface smooth; pore-sieves scattered on the surface. Spicula: megasclera: the skeletal spicules acanthostyli with a globular, more or less marked head, spined in the whole length, 0·083—0·22^{mm}, not divided into two groups; the dermal spicules subtylota to strongyla 0·149—0·28^{mm}. No microsclera.

Nearly all the specimens in my material of this species, and they are rather numerous, grow as thin incrustations on the shells of a species of *Valdheimia*, and the specimens of the *Valdheimia* were all living; one specimen grows on a mussel-shell, one on a Bryozoa, one on a stone with a specimen of *Petrosia crassa* and finally one on a *Voeringia*. Otherwise it is recorded as growing on stones,

shells of Bivalves, Hydroids, and once it is recorded (Topsent 1892) as on an *Inachus*. The greatest extent to which the sponges in my material ordinarily reach is determined by the size of the *Valdheimia*, and is thus about 20 mm, and the incrustations are as a rule very thin, scarcely reaching 0·5 mm. The specimen on the stone has an extent of 25 mm. The colour (in spirit) is generally pale yellow, sometimes deeper yellow or brownish. Topsent records (l. c. 1888) that it may sometimes be violet. The *surface* is smooth. The *dermal membrane* is delicate and transparent and without spicules; it is thin, but when it remains on the sponge in its normal position it is not at all fragile, and is easily separable; but in most cases the membrane is more or less destroyed, either quite wanting or remaining only as patches or rags; probably the membrane is in the living sponge soft and hence easily torn, but on hardening in alcohol it becomes much tougher. Topsent (l. c. 1888) speaks of "La peau épaisse" but he is here evidently thinking of the whole tissue occupied by the dermal spicules; in 1892, on the other hand, in the description of the specimens of *Myxilla radiata* which in 1904 he declares belong in reality to *H. Dujardinii*, he describes a thin dermal membrane. *Oscula* and *pores:* Bowerbank says: "Oscula and pores inconspicuous", and Topsent (l. c. 1888) says: "Les orifices aquifères sont petits". Oscula I have not observed, but pores I observed on the other hand in those specimens in which the dermal membrane was in good condition; the pores are somewhat interesting; they are gathered in beautiful sieves which may be present in rather great numbers; the sieves are generally oval and are seen as slight, somewhat sharp-bordered impressions inclosing a sieve-like membrane; they are not very conspicuous and require a close examination to be detected, and they are best rendered visible when the sponge is a little dried. The sieves have generally a largest diameter of 0·8—2 mm; the pores are dense-lying, more or less oval and of a diameter of 0·028—0·08 mm.

The *skeleton*. The *dermal skeleton* consists of fibres, bundles or more loosely scattered spicules which stretch from near the base and up to the dermal membrane; it may be somewhat differently developed in different places, in some places it consists only of scattered spicules together with some few bundles, while in other places the spicules and bundles are much more crowded; sometimes also the spicules may form rather long fibres running horizontally below the dermal membrane; finally, as already pointed out by Topsent, the dermal skeleton is naturally most developed in the thickest specimens, as it alone occupies the space between the basal skeleton and the surface. The *main skeleton* consists of vertical acanthostyli with their heads placed on the substratum; they are somewhat distantly arranged; at the base there is a distinct amount of spongin forming a more or less distinct basal lamella, and the spongin also stretches somewhat up along each acanthostyle, thus imbedding the lower part of it and forming a distinct coat.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are straight, only rarely slightly curved; the head is globular, sometimes distinctly marked off, at other times less so on account of the shaft being rather thick below, but also in this latter case of a globular appearance; the shaft tapers evenly from the head to the point. The styli are spined in their whole length, only the spines are sometimes few and dispersed towards the point, and a short outermost part may then be smooth. The spinulation may vary much in different specimens being more or less dense; the spines are medium sized and reclined on the shaft, but radiating straight out or curved somewhat

upwards on the head, and they may here vary somewhat in length. The size of the styli varies somewhat, but there are no groups; the length is 0·083—0·22^{mm} and the diameter of the head is 0·012—0·02^{mm}. The size may be somewhat different in various individuals, the styli sometimes not reaching over 0·15^{mm} in length. 2. The dermal spicules are subtylota varying to strongyla; they are straight and slender; when they are of tylote shape one end of the shaft is thinner than the other, and this thinner end has a distinct end-swelling, while the other end is more evenly and but slightly thickened; the shaft is generally of the same thickness in the whole length, but sometimes somewhat thickened in the middle. The length of the dermal spicules varies in all from 0·149—0·28^{mm}, and the diameter from 0·002—0·005^{mm}, but the difference is not so great in the single specimens, as these spicules may vary to a rather considerable degree in different specimens; thus the following measurements were taken from different specimens: 0·149—0·19^{mm}, 0·16—0·20^{mm}, 0·19—0·24^{mm}, 0·18—0·28^{mm} and 0·20—0·28^{mm}. Very often the larger spicules are strongyla or slightly tylote, while the smaller are more distinct tylota. *Microsclera* are not present.

Embryos. In many of the specimens embryos were found. They are globular and of an average diameter of 0·23^{mm}; they are often present in great numbers. Nearly all the specimens examined had spicules, only a single one without spicules was seen. The spicules are styli considerably smaller than those of the grown sponge; they were measured from 0·028—0·078^{mm} in length and from exceedingly fine to 0·008^{mm} in diameter at the head; otherwise they are acanthostyli chiefly of the same shape as in the grown sponge, only the spines are less developed, in such a way, that the spicules may be termed coarsely and rather densely gritty.

It will thus be seen, that the spicules first appearing in the embryo are the skeletal spicules; this was also to be expected, the same being the case in the *Myxillae*, as I have shown in the second part of this work in several instances, in the genera *Myxilla*, *Iophon* and *Forcepia*, in the embryos of which the skeletal spicules are also the megasclera first appearing. Topsent declares on the contrary (l. c. 1888, 110), just with regard to the present species, that the first developed spicules are the dermal, and he says further that this also holds good with regard to *Myxilla incrustans*. It is somewhat strange to me how he has got to this result; I can only imagine that he has examined embryos with very young and fine spicules, in which case these may perhaps be mistaken for dermal spicules.

Locality: This species has been collected in rather great numbers; station 1, 62° 30′ Lat. N., 8° 21′ Long. W., depth 132 fathoms; station 6, 63° 43′ Lat. N., 14° 34′ Long. W., depth 90 fathoms; station 25, 63° 30′ Lat. N., 54° 25′ Long. W., depth 582 fathoms; station 27, 64° 54′ Lat. N., 55° 10′ Long. W., depth 393 fathoms; station 28, 65° 14′ Lat. N., 55° 42′ Long. W., depth 420 fathoms; station 35, 65° 16′ Lat. N., 55° 05′ Long. W., depth 362 fathoms; further it has been taken at East Greenland, Forsblads Fjord, depth 50—90 fathoms (The Amdrup-Expedition 1900), and at the Faröe Islands, depth 30 fathoms (Th. Mortensen). The localities are situated in the Davis Strait, at East Greenland, the Eastern coast of Iceland and the Faröe Islands.

Geogr. distr. H. Dujardinii was hitherto recorded from the Eastern coasts of Britain and Ireland (Bowerbank); from the French coast of the Channel (Luc, Roscoff, Calvados) (Topsent), the Bay of Gascogne, depth 95 fathoms (Topsent), the coast of Provence at Ciotat (Topsent), at the Azores in depths of 69 and 28 fathoms, at 46° 47′ Lat. N., 60° 12′ Long. W., depth 72 fathoms (Topsent), finally at

the coasts of North Africa, in the Bay of Gabes and at la Calle (Topsent). The species is thus hitherto known from 65° to 34° Lat. N., and between 60° Long. W. and 10° Long. E. As to the depth some of the specimens of the Ingolf Expedition are taken in considerably greater depths than those from which it was known hitherto; the greatest depth recorded was 95 fathoms, while it was taken by the Ingolf Expedition in depths down to 582 fathoms. Its bathymetrical range as known now is in all from the very coast even above low-water mark (Bowerbank) down to 582 fathoms.

Remarks: If the rules of nomenclature were adhered to strictly, the present species should have a new name, as it is not identical with the well known *Halisarca Dujardinii* Johnst. Bowerbank thought, when he examined the present species, that Johnston had overlooked the spicules, and he identified it therefore with *Dujardinii*. Already Schmidt has noted (Zweites Suppl. zu den Spongien des adriat. Meer. 1866, 16) that this must be erroneous. Gray however in 1867 followed (l. c.) Bowerbank. Topsent in 1888 (l. c.) placed the species in the genus *Dendoryx*, and referred it later correctly to his genus *Leptosia*, but he did not alter its name, which should properly have been done, since Bowerbank's determination was erroneous. As the species is well known now under the name *Dujardinii* I shall however make no change.

46. **H. primitiva** n. sp.

Pl. X, Fig. 6.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a slight head-swelling, entirely spined or the larger with a smooth apical part, 0·119—0·35 mm. not divided into two groups; the dermal spicules strongyla, slightly polytylote, 0·196—0·28 mm. No microsclera.

This species grows incrusting on shells of Brachiopods, mussels and barnacles; it has a greatest extent of about 20 mm, the thickness is about 0·5 mm. The colour (in spirit) varies between dark yellowish and brown. The *surface* is smooth. The *dermal membrane* is a distinct but thin film; it was on my specimens often destroyed to a high degree. Some canals are seen shining through the membrane, and some *oscula* are present as circular openings not elevated over the level of the surface.

The *skeleton*. The *dermal skeleton* consists of bundles or quite short fibres stretching from the main skeleton, often almost from the base, to the dermal membrane; the spicules in the bundles are penicillately spread towards the membrane and support it, but they do not pierce it. The membrane itself is not provided with spicules or at all events only with some few, lying singly and scattered; only around the oscula the structure is different; short fibres appear here in the membrane, stellately arranged all round the opening, towards which they unite in such a way, that the opening is surrounded by radiately arranged, but not dense-lying single spicules. The *main skeleton* is of the ordinary arrangement, the vertical acanthostyli are somewhat densely placed; the longest of them reach just to the dermal membrane. There is a considerable amount of spongin at the base, forming a more or less continuous basal layer.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, which have only a slight head-swelling; they are straight or, when longer, slightly curved near the base; they are somewhat densely spined with spines of medium size; in the longer spicules the spines are small and scattered

towards the apex, and a shorter or longer part may be smooth. The styli vary much in size but they are not divided into two groups. The length is 0·119—0·35 mm and the diameter at the base is 0·014—0·027 mm. The styli may vary somewhat in different individuals, in some they are more robust and more coarsely spined than in others, and at the same time the smooth part towards the point is wanting or small. Also with regard to the size there is some variation, the greatest length being in some individuals 0·27 mm. 2. The dermal spicules are straight or slightly curved, cylindrical strongyla; they are slightly but distinctly polytylote and the ends are generally very slightly swollen, the swellings being as a rule scarcely perceptible. The length is in all 0·196—0·28 mm, but there may be some variation between the individuals; the diameter is 0·0028—0·005 mm. b. *Microsclera* are not present.

This species is characterised towards *H. Dujardinii* by the size and shape of the acanthostyli and by the polytylote dermal strongyla.

Locality: Station 6, 63° 43′ Lat. N., 14° 34′ Long. W., depth 90 fathoms; station 28, 65° 14′ Lat. N., 55° 42′ Long. W., depth 420 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; further it has been taken at Iceland, depth 54 fathoms; East of the Faröe Islands, depth 160 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). The localities lie in the Davis Strait, the Denmark Strait, between Iceland and the Faröe Islands and East of the latter.

47. **H. longurius** n. sp.

Pl. X, Fig. 7.

Incrusting; surface smooth or nearly so, with scattered pore-sieves. Spicula: megasclera; the skeletal spicules acanthostyli with a small or no head, entirely spined or with a smooth apical part, 0·10—0·50 mm, not divided into two groups; the dermal spicules strongyla 0·22—0·298 mm. No microsclera.

This species grows as thin but very extended incrustations on large Balani, on Brachiopods and one specimen on a *Pecten;* both the Balani, the Brachiopods and the *Pecten* were living specimens. As the species grows along and round the Balani, it may reach to a greatest extent of not less than 75 mm; the thickness does not reach 0·5 mm. The colour (in spirit) is yellowish or greyish yellow, in some specimens dark brown or even blackish brown, but probably this latter colour is due to a change produced later. The *surface* is smooth or at all events only with a few projecting spicules. The *dermal membrane* is a thin film resting on the skeleton below. *Oscula* I have not seen, but the *pores* are arranged in a somewhat interesting way; they are lying in pore-sieves which are generally circular; the sieves are surrounded by a very low wall and they are thus seen as slight, circular, sharply bordered impressions, the borders of which are only a little elevated over the surface; the whole formation is only little conspicuous, and is generally only to be seen when the sponge is half dried; in some specimens I could not detect pore-sieves. The pores are close-lying in the sieve and of an average diameter of 0·04 mm.

The *skeleton.* The *dermal skeleton* is well developed; it consists of bundles and fibres of dermal spicules stretching from the main skeleton to the dermal membrane, the outermost spicules in the fibres are more or less penicillately spread; sometimes the fibres may stretch horizontally below the membrane for some distance. Around the pore-areas the spicules are radiately arranged and they

stretch into the wall bordering the areas and are here arranged densely and parallel, forming thus a dense skeleton in the wall. In the membrane itself there are otherwise no spicules, or at all events only some single, scattered ones. The *main skeleton* is of the common construction consisting of vertical acanthostyli with the heads based on the substratum; the longest of them reach to the dermal membrane or even pierce it. At the base there is a slight amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are straight or slightly curved near the base; the head is small but however generally somewhat distinctly swollen; in the small spicules it is as a rule not swollen; the styli taper into a long and fine apex. The spinulation is dense but the spines are somewhat small; in the longer spicules the spinulation is less dense, the spines become very small and scattered outwards, and in the longest a larger or smaller apical part, sometimes almost the half part, is smooth. The styli vary very much in size, but are not divided into groups. The length is 0·10—0·50^{mm} and the diameter of the head 0·014—0·025^{mm}. 2. The dermal spicules are straight or only slightly and somewhat irregularly curved strongyla; they are often more or less polytylote, but they may also be quite smooth; one end is a little thicker than the other, the thinner end has sometimes an elongate, more or less pronounced swelling, which is the more distinct the thinner the spicules are. The strongyla may vary somewhat in the different individuals, being in some considerably thicker and less slender than in others; in these thicker strongyla there is no end-swelling. Some very fine developmental stages were seen which were monactinal. The length is 0·22—0·298^{mm} and the diameter 0·003—0·007^{mm}. *Microsclera* are not present.

Locality: Station 32, the Davis Strait, 66° 35′ Lat. N., 56° 38′ Long. W., depth 318 fathoms; Iceland in Ofjord on the Northern coast, depth 18 fathoms (Ditlewsen) and at Hornsvig on the South-east coast, depth 84 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902).

48. **H. aequata** n. sp.

Pl. X, Fig. 8.

Incrusting; surface smooth. Spicula: megasclera: the skeletal spicules acanthostyli with a small or no head, entirely spined, 0·10—0·30^{mm}, not divided into two groups: the dermal spicules strongyla 0·21—0·298^{mm}. No microsclera.

This species grows as a thin but extended incrustation on the lower side of a *Lithothamnion.* Its greatest extent may be estimated to about 40^{mm} but is in reality more, as the sponge follows the irregularities on the underside of the *Lithothamnion;* the thickness is about 0·25^{mm}. The colour (in spirit) is whitish brown. The *surface* is smooth without projecting spicules. The *dermal membrane* is thin and not separable. *Oscula* and *pores* were not observed.

The *skeleton.* The *dermal skeleton* consists of bundles or fibres stretching from the main skeleton, generally quite from the base up to the dermal membrane, at which the bundles are spread in a penicillate way. The fibres have a more or less oblique direction, and when they are of some length they stretch horizontally below the dermal membrane. The *main skeleton* is of the ordinary arrangement consisting of erect acanthostyli with their heads on the substratum; the styli are somewhat distantly placed. At the base there is a distinct though not copious amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are somewhat slender acanthostyli; they are straight or, the longer of them, slightly curved and these latter have a small head-swelling; the small styli have a very slight head-swelling or often no swelling at all. The styli are somewhat densely spined with small spines, and they are all, both the large and the small, spined in the whole length; the spines are relatively largest in the small styli. The length is 0·10—0·30^{mm} and the diameter at the base 0·012—0·017^{mm}. The styles are not divided into two groups. 2. The dermal spicules are strongyla which have one end a little thicker than the other, and they are slightly fusiform, being a little thicker in the middle than towards the ends; they may sometimes be slightly polytylote, which is especially the case with the thinner (not fully developed) forms. The length is 0·21—0·298^{mm} and the diameter in the middle 0·004—0·007^{mm}. *Microsclera* are not present.

This species is very difficult to characterise towards the three preceding ones, but it is no doubt distinct. From *Dujardinii* it is distinguished already by the dermal strongyla, as in *Dujardinii* there are always at all events some tylota among the dermal spicules; *primitiva* has longer, somewhat more robust styli with somewhat stronger spines, and distinctly polytylote dermal spicules; *longurius* finally is easily distinguished by the long styli which are smooth in a shorter or longer apical part. Also the small styli without heads are characteristic for the present species.

Locality: At Ikamiut in North Greenland. One specimen.

49. **H. dermata** n. sp

Pl. III, Fig. 17, Pl. XI, Fig. 1.

Incrusting: surface smooth, bearing a number of conical, compressed ocular and pore-papillæ. The dermal skeleton much developed, the main skeleton rather weak. Spicula: megasclera: the skeletal spicules acanthostyli with a small or no head, divided into two groups, large, only spined below, 0·30—0·417^{mm}, small, spined in the whole length 0·107—0·13^{mm}; the dermal spicules long strongyla 0·33—0·45^{mm}. No microsclera.

Of this species we have a couple of specimens growing on a branching Bryozoon, and one growing on a stone; the latter specimen is incrusting in the common way, but the specimens growing on the Bryozoon quite envelop the branches of this, and they also extend between the branches, filling the interspaces with their body, which however in these places is thin and plate-shaped. The greatest extent of the species is about 35^{mm}, and the thickness of the incrustation may reach 1·5^{mm}. The colour (in spirit) is whitish or yellowish white. The *surface* is smooth, without projecting spicules, it bears a number, smaller or greater, of conical papillæ; these papillæ are highly compressed and are generally lying quite down towards the surface with a flat side turned upwards, and the arrangement is then such, that the opening, which lies in reality in the summit, comes to lie at the summit of the side of the papilla, which is turned upwards. The *dermal membrane* is a thin and separable film; it has no skeleton proper, but the tissue lying below it, and which has horizontal fibres, is liable to be separated off together with the membrane, the whole thus giving the impression of a thick and solid membrane. *Oscula* and *pores* are certainly situated on the papillæ mentioned; most of these show a rather large opening at the summit, while some others are more pointed and conical with a small

opening; I have not seen pore-sieves but the papillæ with the large opening are in all probability pore-papillæ, the others being oscular papillæ, the facts being thus as in *H. verrucosa*.

The *skeleton*. The *dermal skeleton:* the skeleton formed by the dermal spicules is by far the most developed and it occupies nearly the whole body of the sponge; it consists of fibres which stretch from the main skeleton or quite from the base and obliquely towards the surface, but they run generally so obliquely, that they are for long distances more or less parallel with the surface, and the skeleton is on the whole rather irregular on account of the manner in which the sponge grows; the fibres are somewhat numerous and they are also rather strong, of a thickness up to 0·12 mm. The fibres stretch horizontally just below the dermal membrane and terminate in it, but there are no spicules proper to the membrane. The fibres lying below the membrane run together at the base of the oscular and pore-cones and continue up in the wall of these, forming thus a skeleton which consists of densely placed parallel spicules with the ends towards the opening of the cone. The *main skeleton* is somewhat weakly developed and consists as usual of acanthostyli with the heads based on the substratum, but the styli are much scattered and not numerous. At the heads of the acanthostyli there is a very small amount of spongin.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are divided into two well separated groups, large and small. The large styli are straight or slightly curved, the head is small or not at all developed; they taper evenly outwards but at the end they are abruptly pointed with a short point; they are spined only on the basal part at most in the lower half part; most of the spines, especially those on the head, are somewhat strong. The length is 0·30—0·417 mm and the diameter of the head 0·018—0·022 mm. The small styli are straight and spined in the whole length, but the spines are small and scattered in the outer part, otherwise they are relatively robust; these styli are somewhat uniform in size, the length being 0·107—0·13 mm and the diameter of the head 0·014—0·019 mm. 2. The dermal spicules are long and straight strongyla with one end thicker than the other; they may be slightly polytylote; the ends may sometimes be very slightly swollen, especially in the thinner strongyla. The length is 0·33—0·45 mm and the diameter 0·006—0·010 mm. *Microsclera* are not present.

This species is interesting in a certain respect; it resembles to a very high degree one of the species with chelæ, viz. *H. stylata:* the only differences, besides the want of the chelæ, are that both the styli and the dermal spicules are slightly smaller in the present species than in *stylata*, but this is of no specific value; otherwise the growth, the surface with its papillæ, the structure of the dermal membrane, the arrangement of the skeleton and the shape of both kinds of spicules agree very well in the two species, and if it were not for the difference in the possession and non-possession of chelæ, and the difference in the structure of the dermal membrane, to which the want of the chelæ seems to give rise, I should not hesitate in uniting them. As however I have otherwise never found, that the same species may be with or without chelæ, I think it necessary to consider the present species as specifically distinct from *H. stylata*.[1]) It is to be remarked, that the specimens of both species are

[1]) To be sure Topsent has described (Résultats du Voy. du S. Y. Belgica, Spongiaires, 1901, 18.) a species without sigmata as *Lissodendoryx spongiosa* R. and D. var. *asigmata*, and in the same place the author strongly advocates the view that sponge-species are capable of varying in such a way, that they may want a form of microsclera otherwise present in the species; I cannot at all agree with Topsent in this view, and with regard to the examples he mentions *(Hamacantha Johnsoni, Desmacella Peachii)* I have proved (The Ingolf Exp. VI. 1. 1902) that the supposed varieties are distinct species, and with regard to *H. Johnsoni* Topsent has himself in his work from 1904 admitted the specific validity of his former varieties.

in a good state, and they have especially the dermal membrane undamaged, and further it must be noted, that the chelæ in *stylata* are numerous and form a layer in the dermal membrane. Should the two species be considered as identical, it must be from the point of view, that the specimens of *dermata* were abnormal, but there is otherwise nothing to indicate such a state. Now one fact is very interesting, and it is that *H. stylata* is from the cold area (station 113, bottom temperature ÷ 1° C.), while the present species is from bottom with positive temperature. It is not for the first time that very nearly related, but distinct species are found one on negative the other on positive bottom (e. g. *Gelliodes plexa* and *consimilis*, The Danish Ingolf Exp. VI, 1; *Asbestopluma pennatula* and *bihamatifera*, *Cladorhiza abyssicola* and *gelida*, *Lissodendoryx complicata* and *vicina*; ibid. VI, 2.).

Locality: Station 2, 63° 04′ Lat. N., 9° 22′ Long. W., depth 262 fathoms; Forsblads Fjord in East Greenland, depth 50—90 fathoms (The Amdrup Expedition 1900). The localities lie at East Greenland and West of the Faröe Islands.

50. **H. tornotata** n. sp.

Pl. III, Fig. 18, Pl. XI, Fig. 2.

Incrusting; surface hispid. Spicula: megasclera: the skeletal spicules acanthostyli with a more or less pronounced head, entirely spined but in the longer the spines very small outwards, 0·107—0·31 mm, not distinctly divided into two groups: the dermal spicules long tornota, generally with microspined end-parts, 0·32—0·47 mm. No microsclera.

This species is represented by four specimens, three growing on shell-fragments, the fourth on a Brachiopod; the former are rather small crusts while the latter covers the greatest part of the Brachiopod shell and has thus an extent of 20 mm. The small specimens are about 0·7 mm thick while the larger one reaches to a thickness of about 1 mm; this comparatively great thickness is reached on account of a special development of the dermal skeleton as mentioned below. The colour (in spirit) is light brown to brown. The *surface* is densely hispid from projecting dermal spicules; the small specimens are much more hispid than the large. The *dermal membrane* is inconspicuous and not separable. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of large bundles of dermal spicules which stretch from the main skeleton to the surface, the spicules in the bundles are penicillately spread outwards and project beyond the surface for a rather long distance; seen from above the projecting spicules are almost stellately arranged. Such is the construction of the dermal skeleton in the small specimens, but in the large specimen the facts are somewhat otherwise; the dermal spicules are here more numerous and they are somewhat strongly interwoven, forming a dense and thick layer, and apparently lying without any order; only outermost they are arranged somewhat parallel, with the points projecting outwards; this layer may reach to a thickness of 0·8 mm. The difference in the development of the dermal skeleton in this species is, as will be seen, about the same as may also occur in *H. Dujardinii*. The *main skeleton* is of typical construction, consisting of vertical acanthostyli with the heads on the substratum; they are placed rather densely. At the base there is an amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are not divided into two groups, in so far as intermediate forms occur, but as these are somewhat rare, the styli give the impression of falling into two groups; the large styli are straight or very slightly curved, they have a roundish head with moderately sized spines, the shaft has small spines which become quite gritty outwards; the small styli are generally straight, the head is less pronounced than in the large, the spines are larger and often distinctly reclined. The length of the styli is in all 0·107—0·31 mm and the diameter at the head 0·014—0·021 mm. 2. The dermal spicules are long, straight, or somewhat, often irregularly, curved tornota; they are thickest in the middle and thus more or less fusiform; they show a curious feature, the end-parts being generally, but not always, somewhat roughened or micro-spined. The length is 0·32—0·47 mm and the diameter in the middle 0·004—0·007 mm. *Microsclera* are not present.

Locality: Station 81, 61° 44′ Lat. N., 27° 00′ Long. W., depth 485 fathoms; station 89, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; East of the Faröe Islands, depth 160 fathoms. The localities lie in the Denmark Strait, South-west of Iceland and at the Faröe Islands.

51. **H. mucronella** n. sp.

Pl. III, Fig. 19, Pl. XI, Fig. 3.

Incrusting, but of somewhat massive appearance; surface hispid. The dermal skeleton strongly developed, the main skeleton weak. Spicula: megasclera; the skeletal spicules acanthostyli divided into two groups, large with a very small head, only spined below, 0·40—0·65 mm, small, with a more distinct head, and entirely spined, 0·14—0·178 mm; the dermal spicules tornota with one end with a mucro, 0·38—0·596 mm. No microsclera.

Of this species we have only one specimen which grows on a fragment of a *Sipho;* the sponge is of a somewhat massive shape as it does not incrust the shell-fragment but is only fixed on it and is for the rest somewhat filled with bottom material; it thus shows a growth similar to that in *H. grandis,* though it is much less filled with foreign particles. On account of large cavities in the sponge the consistency is somewhat bladder-like. The specimen has an extent of 17 mm and a height of about 9 mm. The colour (in spirit) is dark greyish brown. The *surface* is strongly and densely hispid from projecting dermal spicules. *Oscula* and *pores* were not observed.

The *skeleton.* The *dermal skeleton:* the skeleton formed of the dermal spicules is strongly developed and occupies the greatest part of the sponge; it consists of fibres running everywhere but chiefly in the direction from the base, or else from some part of the main skeleton, towards the surface, the fibres may thus attain a relatively great length; in the dermal membrane the spicules form penicillately spread bundles, the spicules of which pierce the membrane; seen from above the spicules in the bundles appear almost stellately arranged; in places where the membrane stretches over the large cavities, fibres pass horizontally just below it, and the bundles seem here to originate from these fibres. The sponge-body has, as said, many large cavities and the fibres are found therefore in the parts of the tissue separating these cavities. The *main skeleton* is not much developed; it consists of acanthostyli based with their heads partly on the shell at the base of the

sponge and partly on the imbedded foreign particles, such as large sponge-spicules, gravel and the like, which particles must be considered therefore also as substratum for the sponge; the acanthostyli placed on the imbedded material may point in every direction, and the main skeleton is, according to the manner of growth of the sponge, quite irregular. At the head of each acanthostyle there is a small, but distinctly observable amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli, divided into two groups, large and small; the large styli are straight or slightly curved near the base; the head is very small or almost quite absent, the basal part has some small or moderately sized spines, but only for a short distance, the remainder of the shaft being smooth or slightly and imperceptibly gritty. The length is 0·40—0·65^{mm} and the diameter at the base 0·017—0·021^{mm}. The small acanthostyli are generally straight with a slight but distinct head-swelling; they are densely spined in the whole length, the spines on the head being the largest. The length is 0·14—0·178^{mm} and the diameter of the head is 0·017^{mm}. 2. The dermal spicules are tornota but of a characteristic shape; one end is pointed in the way common for tornota and not very short, the other end is shorter and more roundish pointed and has a very distinct mucro; the latter end is somewhat thicker than the former; the tornota are long, straight or nearly so and slightly thicker in the middle than towards the ends. The length is 0·38—0·596^{mm} and the diameter in the middle 0·005—0·011^{mm}; the intermediate sizes are by far the most common. *Microsclera* are not present.

Locality: At East Greenland, 70° 32′ Lat. N., 8° 10′ Long. W., depth 470 fathoms (The Ryder Expedition 1891—92).

Above I have described 51 species of *Hymedesmia* of which only seven are determined as previously described species; these are: *H. Kochleri* Tops., *occulta* Bow., *baculifera* Tops., *crux* O. Schmidt, *filifera* O. Schmidt, *mucronata* Tops., and *Dujardinii* Bow. I have tried to find out the other previously described species, and I think that at all events most of them are enumerated in the following list:

1866. *H. zetlandica* Bow. Mon. Brit. Spong. II, 152, III, Pl. XXI. figs. 1—7.
» — *paupertas* Bow. ibid., II, 223, III, Pl. XXXV, fig. 4—8 (*Hymeniacidon*).
1875. — *vidua* O. Schmidt. Jahresber. der Comm. zur wissensch. Unters. der deutsch. Meere in Kiel für 1872—73, 120. (*Spirastrella*); Thiele, Arch. für Naturgesch. 1903, I, 393, Taf. XXI, Fig. 27.
1882. — *Peachii* Bow. l. c. IV, 64. Pl. XIII, figs. 5—12.
1885. — *mammilaris* Frstdt. Kgl. Sv. Vetensk. Akad. Handl. 21, 6, 32, Tav. III, Fig. 3 a—h. (*Hastatus*); Thiele, Arch. für Naturgesch. 1903, I, 389, Taf. XXI, Fig. 22 a—d.
1887. — *pustula* Frstdt. Öfvers. Kgl. Vet. Akad. Förh. 1887, No. 1, 27, (*Esperia*).
1903. — *prostrata* Thiele, Abhandl. Senckenb. nat. Gesell. XXV, 955, Taf. XXVIII, Fig. 20.
» — *norvegica* Thiele, Arch. für Naturgesch. 1903, I, 390, Taf. XXI, Fig. 23 a—c. (perhaps a *Stylostichon*).
1904. — *mutabilis* Tops. Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 166, Pl. XIV, fig. 3. (*Hymeraphia*).
» — *Schmidti* Tops. ibid., 189, Pl. XV, fig. 9. (*Leptosia*).

1904. *H. raphigena* Tops. Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 192, Pl. XV, fig. 7. (*Leptosia*).

— *obtusata* Tops. ibid., 193, Pl. XV, fig. 6. (*Leptosia*).

— *acerata* Tops. ibid., 193, Pl. XV, fig. 5. (*Leptosia*).

1905. — *tenuissima* Dendy, Rep. on the Pearl Oyster Fishery of the Gulf of Manaar, III, 169, Pl. XI, fig. 5. (*Myxilla*).

— *areolata* Thiele, Zool. Jahrb. 1905, 452, Taf. 31, Fig. 23, 68 a—d.

1906. — *lancifera* Tops. Bull. du Mus. d'hist. nat. 560. (*Leptosia*).

The number of species seems thus at present to be about seventy; this is already a large number and there is reason to believe, that many more species will be described in the future. Earlier Expeditions paid often but little attention to the insignificant crusts, which is the shape of most *Hymedesmia* species; it is first in the work of Topsent from 1904 that a greater number of incrusting species of various genera is recorded, and the author says expressly, that this fact is due to the care with which he examined stones, corals etc. brought home. The Ingolf Expedition laid the greatest stress on procuring all small and incrusting sponges, and hence our material is very rich. Under these circumstances when the number of species must be expected to increase in the future to some degree, it is of the greatest importance, that the new species are described thoroughly, and the spicules ought always to be figured, so that the affinities of the species can be judged. I shall therefore try to give here an analytical table of all the above enumerated species; this table is of course only an attempt, and I do not think that a species can be definitely determined only by its aid, but I think however it may be useful.

Table of the Species of *Hymedesmia*.

1.	Microsclera present	2.
—	No microsclera	59.
2.	Microsclera only chelæ arcuatæ (sometimes transformed to spined rods)	3.
—	Microsclera chelæ arcuatæ together with sigmata, or sigmata alone or rhaphides	45.
3.	The chelæ of common shape	4.
—	The chelæ spined or quite transformed	43.
4.	The dermal spicules genuine strongyla	5.
—	The dermal spicules of other forms, at all events not quite genuine strongyla	21.
5.	The acanthostyli not divided into two groups	6.
—	The acanthostyli somewhat distinctly divided into two groups	13.
6.	The dermal strongyla more or less distinctly polytylote	7.
—	The dermal strongyla not, or not distinctly, polytylote	10.
7.	The chelæ somewhat strongly curved, 0·028—0·050 mm, the acanthostyli with blunt spines on the head	*Koehleri* Tops.
—	The chelæ less strongly curved	8.
8.	The chelæ with somewhat long, free alæ, 0·045—0·054 mm	*lacera*
—	The chelæ smaller, somewhat like palmate chelæ	9.
9.	The acanthostyli strongly spined, especially at the head, chelæ 0·033—0·038 mm	*storea*
—	The acanthostyli less strongly spined, chelæ 0·028 mm	*lamina*

10.	Surface with low warts or long papillæ	11.
—	Surface simple	12.
11.	Surface with low warts, dermal strongyla long and straight	*verrucosa*
—	Surface with long papillæ, dermal strongyla robust with a double curvature	*filifera* Schmidt.
12.	The acanthostyli only spined on the head	*norvegica* Thiele.
—	The acanthostyli spined in the lower half part	*mollis*
13.	The chelæ strongly, nearly semicircularly curved	*curvichela*
—	The chelæ less strongly curved	14.
14.	The dermal spicules polytylote, chelæ large, 0·052—0·064 mm, the end-parts somewhat recurved	*rugosa*
—	The dermal spicules not polytylote, chelæ smaller	15.
15.	The acanthostyli strongly spined in the whole length	*splenium*
—	The acanthostyli not entirely spined	16.
16.	The large acanthostyli spined towards the apex, chelæ 0·032—0·037 mm, the free part of the shaft about one third of the length	*tenuicula*
—	The large acanthostyli at most spined in the lower half part	17.
17.	The small acanthostyli distinctly curved	18.
—	The small acanthostyli straight	19.
18.	The acanthostyli reaching to 0·65 mm, chelæ somewhat strongly curved, 0·035—0·044 mm	*similis*
—	The acanthostyli reaching to 0·42 mm, chelæ less curved, 0·037 mm	*paupertas* Bow.
19.	The acanthostyli long, reaching to 0·95 mm, the dermal spicules slightly tending towards tornota	*nummulus*
—	The acanthostyli shorter, the dermal spicules pure strongyla	20.
20.	The acanthostyli reaching to 0·63 mm, the dermal strongyla 0·35—0·52 mm, surface with papillæ	*stylata*
—	The acanthostyli reaching to 0·38 mm, the dermal strongyla 0·26—0·32 mm, surface simple	*dubia*
21.	The dermal spicules diactinal (at all events not distinctly monactinal)	22.
—	The dermal spicules monactinal	42.
22.	The dermal spicules tornota	23.
—	The dermal spicules oxea or tylota	32.
23.	The dermal spicules centrotylote tornota	*lancifera* Tops.
—	The dermal spicules not centrotylote	24.
24.	The tornota with unequal ends	25.
—	The tornote with equal ends	26.
25.	The large acanthostyli only spined at the base, 0·24 mm, chelæ 0·018 mm	*prostrata* Thiele.
—	The large acanthostyli a little more spined, 0·45 mm, chelæ 0·03 mm	*Peachii* Bow.
26.	The large acanthostyli spined in about the whole length	27.
—	The large acanthostyli spined only near the base	31.
27.	The chelæ of ordinary shape	28.
—	The chelæ extraordinarily flat	*platychela*
28.	Surface with papillæ, tornota 0·36 mm, chelæ 0·024 mm	*mammillaris* Frstdt.
—	Surface simple	29.
29.	The acanthostyli reaching to 0·53 mm, the tornota 0·17—0·22 mm, chelæ with slightly recurved end-parts 0·021—0·054 mm	*perforata*
—	The acanthostyli not reaching over 0·35 mm	30.

30. The acanthostyli reaching to 0·35 mm, tornota 0·22—0·32 mm, chelæ somewhat strongly curved 0·024—0·038 mm ..... *procumbens*
— The acanthostyli reaching to 0·298 mm, tornota 0·16—0·17 mm, chelæ less strongly curved, 0·041—0·052 mm ..... *clavigera*
31. Surface with papillæ, acanthostyli reaching to 0·59 mm, tornota 0·32—0·50 mm, chelæ somewhat palmate-like, 0·025—0·030 mm ..... *basispinosa*
— Surface simple, acanthostyli reaching to 0·92 mm, tornota 0·23—0·28 mm, chelæ of ordinary shape, 0·025—0·045 mm ..... *longistylus*
32. Dermal spicules oxea ..... 33.
— Dermal spicules tylota ..... 35.
33. The acanthostyli almost entirely spined, chelæ 0·025 mm ..... *arcolata* Thiele.
— The acanthostyli only spined near the base ..... 34.
34. The acanthostyli reaching to 1·19 mm, chelæ 0·034—0·040 mm ..... *occulta* Bow.
— The acanthostyli reaching to 0·65 mm, chelæ strongly curved, 0·028—0·037 mm .... *simillima*
35. The acanthostyli almost smooth, only slightly spined at the base, chelæ 0·045—0·052 mm ..... *lævistylus*
— The acanthostyli more spined, often entirely ..... 36.
36. The acanthostyli divided into two groups ..... *bractea.*
— The acanthostyli not divided into two groups ..... 37.
37. The acanthostyli varying in size, reaching to 0·25 mm ..... 38.
— The acanthostyli rather uniform in size, not reaching over 0·13 mm ..... 39.
38. The acanthostyli somewhat robustly spined, dermal tylota not or only slightly polytylote ..... *baculifera* Tops.
— The acanthostyli more finely spined, dermal tylota polytylote ..... *levis*
39. The acanthostyli truncate at the point ..... *truncata*
— The acanthostyli not truncate at the point ..... 40.
40. The tylota distinctly polytylote, 0·148 mm ..... *tenuissima* Dend.
— The tylota not, or not conspicuously polytylote, length 0·19 mm or more ..... 41.
41. The acanthostyli without any neck-shaped constriction at the base, the tylota 0·19—0·23 mm ..... *Bowerbanki*
— The acanthostyli with a neck-shaped constriction at the base, the tylota 0·30—0·40 mm *latrunculioides*
42. The dermal styli polytylote, the acanthostyli not divided into two groups, chelæ 0·040—0·050 mm ..... *irregularis*
— The dermal styli not polytylote, the acanthostyli divided into two groups, chelæ 0·023—0·035 mm ..... *proxima*
43. The chelæ transformed to spined rods ..... *vidua* Schmidt.
— The chelæ less transformed, more chel-shaped, or only spined ..... 44.
44. The chelæ of normal shape but spined ..... *crux* Schmidt.
— The chelæ more transformed, somewhat asteriform ..... *aenigma*
45. Microsclera chelæ and sigmata ..... 46.
— Among the microsclera no chelæ ..... 58.
46. Sigmata only of one form ..... 47.
— Sigmata of two forms ..... 56.
47. The acanthostyli of uniform size, about 0·13 mm, strongly spined, sigmata in bundles ..... *zetlandica* Bow.
— The acanthostyli longer, sigmata not in bundles ..... 48.

48. The chelæ spined and transformed ..... *Schmidti* Tops.
— The chelæ not spined ..... 49.
49. The chelæ of two forms, ordinary and peculiar ..... *mucronata* Tops.
— The chelæ only of one form ..... 50.
50. Sigmata rather large, not below 0·028 mm and generally much larger, surface with papillæ or warts ..... 51.
— Sigmata small, not above 0·020 mm, surface simple ..... 54.
51. Surface with warts, sigmata about 0·1 mm, chelæ of two forms, large 0·025 mm, small 0·012 mm ..... *pustula* Frstdt.
— Surface with long, cylindrical papillæ, chelæ of one form ..... 52.
52. Sigmata nearly plane, dermal tylota 0·29—0·38 mm, sigmata 0·058—0·075 mm ..... *trichoma*
— Sigmata not plane ..... 53.
53. The acanthostyli 0·41—0·75 mm, dermal tylota 0·48—0·80 mm, sigmata 0·031—0·096 mm *grandis*
— The acanthostyli 0·11—0·31 mm, dermal tylota 0·26—0·41 mm, sigmata 0·028—0·050 mm *digitata*
54. The dermal spicules thin styli, sigmata circularly curved, nearly plane, 0·014—0·017 mm *pugio*
— The dermal spicules not styli ..... 55.
55. The dermal spicules tornota 0·15—0·19 mm, sigmata 0·014—0·017 mm ..... *consanguinea*
— The dermal spicules tylota 0·23—0·28 mm, sigmata 0·020 mm ..... *mutabilis* Tops.
56. The large sigmata somewhat band-shaped, peculiarly curved, the small sigmata plane *cultrisigma*
— Both the large and small sigmata of ordinary shape ..... 57.
57. The large sigmata 0·18—0·208 mm, the small 0·06—0·089 mm ..... *macrosigma*
— The large sigmata contorted, 0·021—0·028 mm, the small sigmata plane 0·014 mm .. *planca*
58. Microsclera only sigmata ..... *tenuisigma*
— Microsclera only rhaphides ..... *rhaphigena* Tops.
59. Dermal spicules strongyla or tylota ..... 60.
— Dermal spicules tornota ..... 65.
60. The acanthostyli truncate at the point ..... *obtusata* Tops.
— The acanthostyli not truncate at the point ..... 61.
61. The acanthostyli generally with a globular head, 0·083—0·22 mm, the dermal spicules strongyla to subtylota and there are always subtylota present ..... *Dujardinii* Bow.
— Dermal spicules strongyla ..... 62.
62. The acanthostyli not divided into two groups ..... 63.
— The acanthostyli divided into two groups, the dermal spicules long, 0·33—0·45 mm *dermata*
63. The acanthostyli entirely spined ..... *aequata*
— The acanthostyli with a smooth apical part ..... 64.
64. The acanthostyli 0·11—0·35 mm, dermal strongyla polytylote, 0·149—0·28 mm ..... *primitiva*
— The acanthostyli 0·10—0·50 mm, dermal strongyla smooth or polytylote, 0·22—0·298 mm *longurius*
65. The dermal tornota not polytylote, generally microspined at the end-parts .... *tornotata*
— The dermal tornota not with spined ends ..... 66.
66. The acanthostyli 0·14—0·38 mm, the tornota slightly polytylote ..... *accrata* Tops.
— The acanthostyli 0·14—0·65 mm, divided into two groups, the tornota with a mucro at one end ..... *mucronella*

Four species in Bowerbank's Monograph could perhaps also be taken into consideration, viz. *Hymeniacidon perarmatus* (III, Pl. XXXI, figs. 11—16) which would in such a case perhaps be related to *H. occulta* and *simillima;* but it is possible that the species is an *Ectyodoryx*. *Hymedesmia pansa*

(IV, Pl. I, figs. 1—4) has long, monactinal dermal spicules; it seems to be a *Hymedesmia* or an *Eurypon*. *Hymedesmia pilata* (IV, 59, Pl. II, figs. 1—4), which seems to have no dermal spicules and only sigmata for microsclera, is I think an *Eurypon*. Finally *Hymedesmia pulchella* (IV, 61, Pl. II, figs. 5—8) seems to be likewise an *Eurypon*.

Hymeniacidon paupertas Bow. (III, Pl. XXXVII, figs. 4—8) I have included in the above table as I take it to be a *Hymedesmia*, and I think the *Myxilla paupertas* recorded by Topsent (1904, Fasc. XXV, 168) is another species. The *Hymedesmia areolata* Thiele mentioned by Kirkpatrick (Nat. Antarc. Exp. Nat. Hist. IV, Pl. 22, figs. 3—3 c) cannot I think be a *Hymedesmia* and must accordingly be another species. Thiele (Abhandl. Senckenb. nat. Gesell. XXV, 1903, 955) thinks that *Myxilla veneta* O. Schmidt is identical with *fasciculata* Lieberk., and is a *Hymedesmia:* I have examined a specimen of *Myxilla fasciculata* send from Professor von Marenzeller; it is correct that the species incrusts the chitinuous tubes of *Stephanoscyphus*, but it has otherwise a reticulate skeleton and is no *Hymedesmia; M. veneta* I do not know. *Hymedesmia norvegica* Thiele, which I have included in the above table, is perhaps not a *Hymedesmia* as it has short skeleton columns; it would thus be a *Stylostichon*.

Hymenancora n. g.

Incrusting, thin forms. The external appearance, the skeleton and the megasclera quite as in Hymedesmia; the microsclera are ancoræ which may be either ancoræ spatuliferæ or unguiferæ; sometimes two forms of ancoræ occur; to the ancoræ sigmata are sometimes added.

In the introduction to the second part of this work I have, in accordance with the opinions of Levinsen, advanced the view, that species with ancoræ and species with chelæ should not remain in the same genus, and in accordance herewith I emended the genera *Desmacidon* and *Homocodietya*, *Myxilla* and *Lissodendoryx*, and according to the same view I have created the genera *Ectyodoryx* and *Ectyomyxilla* (Meddel. om Grønland, XXIX, 1909, 444), the first with chelæ, the latter with ancoræ. Also the genus *Hymedesmia* has hitherto included species with chelæ and species with ancoræ, and it is to comprise these latter species that I create the genus *Hymenancora* which is in all other respects similar to *Hymedesmia*.

So far as I am avare the genus comprises at present the following species:

1892. *H. Pecqueryi* Tops. Résultats des camp. scient. du Prince de Monaco, Fasc. II, 110, Pl. XI, fig. 8 (*Myxilla*).

« *H. minima* Tops. ibid., 114, Pl. XI, fig. 2—3. (*Hymeraphia*).

1904. *H. biscutella* Tops. ibid., Fasc. XXV, 191, Pl. XV, fig. 3. (*Leptosia*).

H. umbellifera Tops. ibid. 192, Pl. XV, fig. 4. (*Leptosia*).

1905. *H. laevis* Thiele, Zool. Jahrbücher, 1905, 453, Taf. 31, Fig. 69 a—f. (*Hymedesmia*).

« *H. tenuissima* Thiele, ibid. 454, Taf. 31, Fig. 70 a—f. (*Hymedesmia*).

1907. *H. exigua* Kirkpatr. Ann. Mag. Nat. Hist. 7, XX, 273, and 1909, Nat. Antarct. Exp. IV, Pl. XXII, fig. 4, Pl. XXVI, figs. 2 a—f. (*Hymedesmia*).

1907. *H. rufa* Kirkpatr. Ann. Mag. Nat. Hist. 7, XX, 274, and 1909, Nat. Antarct. Exp. IV, Pl. XXII, fig. 5, Pl. XXVI, figs. 3 a—e. (*Hymeraphia*).

H. interjecta mihi

H. conjungens mihi

H. tenuisclera mihi

H. duplicata mihi.

I do not see the slightest reason why *H. minima* Tops. and *H. rufa* Kirkpatr., both placed by the authors in *Hymeraphia*, should not belong to *Hymenancora*.

1. H. interjecta n. sp.

Pl. XI, Fig. 4.

Incrusting; surface slightly hispid. Spicula: megasclera; the skeletal spicules acanthostyli without a real head-swelling, spined in the whole length, they are divided into two groups, large 0·37—0·47 mm, small 0·14—0·16 mm; the dermal spicules tylota or subtylota 0·30—0·47 mm; microsclera two forms, ancoræ spatulifera with three teeth, 0·025—0·045 mm, sigmata 0·06—0·128 mm.

Of this species we have two specimens; one grows on a dead branch of an *Oculina* together with *H. procumbens* and specimens of *Tedania*, *Eurypon* and *Latrunculia*; the other specimen, which is very small, grows on a pebble. The largest specimen is extended along the *Oculina*-branch and is therefore of a lengthy shape and has a greatest extent of 22 mm; it is exceedingly thin. The colour (in spirit) is greyish or brownish. The *surface* is in the present state of the sponge slightly hispid. About the *dermal membrane*, *pores* and *oscula* I can say nothing.

The *skeleton*. The *dermal skeleton* seems to consist of bundles and scattered spicules. The *main skeleton* is, so far as I could observe, constructed in the ordinary way of vertical acanthostyli placed on the substratum, but the styli are somewhat scattered and the dermal skeleton is therefore the most developed part of the whole skeleton.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are somewhat distinctly divided into two groups. The large styli are straight or generally somewhat curved near the base; the base is a little thickened, but there is no head-swelling present, and they taper into a long and fine apex; the styli are spined in their whole length, but the spines are only at the base of larger size, they decrease in size outwards, and the shaft and apex are only gritty; the larger spines at the base are generally curved upwards in a somewhat characteristic way. The small styli are principally of the same shape as the large, but they are often straight, and the spines are relatively larger, the head also is still less developed than in the large. The length of the large styli is 0·37—0·47 mm with a diameter at the base of 0·020—0·023 mm. The small styli have a length of 0·14—0·16 mm and a diameter at the base of 0·020 mm. 2. The dermal spicules may best be termed tylota; they are straight or very slightly curved and somewhat robust, the end-swellings are very small but however always perceptible. The length is 0·30—0·47 mm, and the diameter of the shaft 0·007—0·010 mm. b. *Microsclera* are of two forms, ancoræ spatuliferæ and sigmata. 1. The ancoræ have a curved shaft and three elliptical teeth at each end, but the most remarkable feature is, that they have only very

narrow alæ or these may be quite absent; by this fact these ancoræ get some resemblance to arcuate chelæ and it seems that they also in reality must be nearly related to these. The length of the ancoræ varies much, it is 0·025—0·045 mm, and the thickness of the shaft is about 0·002—0·005 mm. 2. The sigmata are of ordinary shape and more or less contorted; they have a length of 0·06—0·128 mm and a thickness of 0·004—0·0065 mm. The microsclera seem to occur through the whole tissue.

Locality: Station 54, South of Iceland, 63° 08′ Lat. N., 15° 40′ Long. W., depth 691 fathoms; station 98, in the Denmark Strait, 65° 38′ Lat. N., 26° 27′ Long. W., depth 138 fathoms.

Remarks: As said the ancoræ in this species seem to be nearly related to the chelæ arcuatæ on account of the very narrow and, so far as I could see, sometimes quite wanting alæ, but they are however true ancoræ. In Part II of this work p. 3 I have stated that I consider the ancoræ and chelæ arcuatæ as nearly related spicula and as having been derived from a common original form of spicule. It is well known, that the chelæ arcuatæ may be more or less ancora-like, but being at the same time true chelæ, and many examples of this are given in the preceding descriptions. As one of the most ancora-like chelæ I have examined I may note the chela in *Hymedesmia Bowerbanki*. The alæ do not go here evenly over into the hinder side of the shaft but are somewhat incurved at the shaft, so that in a side view the "tuberculum" is seen quite surrounded by the outer contour of the ala; and so far as I could see the shaft is a little edge-like dilated towards the ends; these spicules are however true chelæ. Should there be found in the genus *Hymedesmia* forms of microsclera which were intermediate between ancoræ and chelæ arcuatæ, and this seems not impossible, it would be of great interest, and it would seem to indicate at the same time, that *Hymedesmia* is a genus of old origin, as already alluded to from other reasons under *H. aenigma*.

2. **H. conjungens** n. sp.

Pl. XI, Fig. 5.

Incrusting; surface somewhat hispid. Spicula: megasclera; the skeletal spicules acanthostyli without head-swelling, they are divided into two groups, large, spined nearly in the whole length or only with a small apical part smooth, 0·29—0·41 mm, small, entirely spined, 0·11—0·13 mm; the dermal spicules tylota with pointed end-swellings, 0·16—0·22 mm; microsclera two forms, ancoræ spatuliferæ with three teeth, 0·022—0·042 mm, sigmata 0·035—0·045 mm.

We have one specimen of this species growing on a living *Pecten* together with specimens of *Melonanchora emphysema*, *Hymedesmia perforata* and *procumbens*, a *Crella*, an *Eurypon* and a *Plocamia*. It forms an incrustation of an extent of about 15 mm, and it is very thin, not reaching 0·5 mm. The colour (in spirit) is light brownish grey. The *surface* is somewhat hispid from projecting spicules. The *dermal membrane* is a thin, transparent film, resting on the skeleton below. *Oscula* and *pores:* larger and smaller, simple circular openings are seen in the dermal membrane representing I think both oscula and pores.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules stretching up to the dermal membrane and supporting it, the spicules in the bundles being somewhat penicillately spread outwards; the bundles are generally not large, consisting only of relatively few spicules. There are

no horizontal spicules in the membrane itself. The *main skeleton* is constructed as usual of acanthostyli with their heads placed on the shell, the longest of them reach to the dermal membrane and project beyond it. At the base there is a small amount of spongin.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli which are divided into two groups, large and small; the large styli are generally slightly curved, they are a little thickened at the base, but there is no head-swelling, they taper only slightly outwards and the point is somewhat short; the styli are spined in almost the whole length, only a small part of the apex being smooth or nearly smooth; at the base the spines are of medium size and numerous, outwards they are small, nearly gritty, and more scattered. The small styli are mainly of the same shape as the large, they are straight or slightly curved and have likewise no head-swelling, but they are spined in the whole length. The length of the large styli is 0·29—0·41 mm with a thickness at the base of 0·016—0·021 mm, the small styli are 0·11—0·13 mm long with a diameter at the base of 0·011—0·014 mm. 2. The dermal spicules are tylota with the swollen ends pointed like tornotes; the shaft is slender and generally straight, sometimes it is very slightly polytylote; the ends are distinctly but not much swollen, and they are pointed in such a way that the spicule might be termed a tornote were it not for the swellings. The length is 0·16—0·22 mm, and the diameter of the shaft is 0·0028—0·004 mm. b. *Microsclera* are of two forms, ancoræ spatuliferæ and sigmata. 1. The ancoræ resemble those in *interjecta,* but they are a little less curved or the curve is distinctly localized in the middle of the shaft; they have three elliptical teeth at each end, the alæ are not large but distinct and always present. This ancora is thus evidently related to that in *interjecta,* but it is less chel-like. The length is 0·022—0·042 mm and the thickness of the shaft is 0·002—0·004 mm; the large ancoræ are by far the most numerous while the smaller are seen only rarely. 2. The sigmata are of ordinary shape and they are contorted, generally a quarter of a turn. The length is 0·035—0·045 mm and the thickness about 0·0028 mm. The sigmata occur in the tissue of the sponge but not in the dermal membrane, the ancoræ occur also in the tissue but especially in the dermal membrane and here rather numerously.

This and the preceding species are nearly related, but they are characteristically different in the shape of the dermal spicules, the size of the sigmata and also in the shape of the ancoræ.

Locality: South of Iceland, 63° 21′ Lat. N., 16° 22′ Long. W., depth 296 fathoms (The Fishery investigation steamer "Thor").

3. **H. duplicata** n. sp.

Pl. XI, Fig. 6.

Incrusting; surface hispid? Spicula: megasclera; the skeletal spicules acanthostyli with a small but distinct head-swelling, the largest only spined at the base, the shorter they are the longer a part is spined, and the shortest are spined in the whole length, 0·12—0·47 mm, not divided into two groups; the dermal spicules tornota 0·238—0·31 mm; microsclera ancoræ spatuliferæ of two forms, large, with 5—6 teeth, 0·062—0·071 mm, small, with 8—11 teeth, 0·032—0·038 mm.

This interesting species grows as thin incrustations on Brachiopod-shells; its greatest extent is 11 mm and the thickness is about 0·25 mm. The colour (in spirit) is whitish or light yellowish. The *surface* is in the present condition of the sponge strongly hispid from projecting acanthostyli, but it

is probably not so in the fresh state. The *dermal membrane* seems to be quite wanting in the specimens, so that I can say nothing about it or about pores and oscula.

The *skeleton*. The *dermal skeleton;* as the dermal membrane is quite or nearly quite wanting I can say only little about the dermal skeleton; it seems to be of a construction like that found in the preceding species and thus consists of bundles of spicules stretching from the main skeleton to the dermal membrane. The *main skeleton* is quite of the common construction, the acanthostyli reach to the surface and they project as said beyond it. A small amount of spongin is visible at the substratum around the heads of the acanthostyli.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli of a somewhat characteristic shape; they have a head-swelling which is not large, but generally distinct, they taper evenly into the apex, but the point is a little more abrupt. The largest styli have only spines below; the head is beset with somewhat robust spines, and there are very small spines on the part just above the head; the shorter the styli are the more spined they are and the smallest styli are spined near to the point. The spines on the head are blunt, giving the head in the large styli a characteristic appearance; the spines of the shaft are relatively largest in the small styli. The styli vary much in length, but they are not divided into two distinct groups. The length is 0·12—0·47 mm, and the diameter of the head 0·017—0·037 mm. The smallest styli are the most numerous. 2. The dermal spicules are slender and straight, or very slightly curved tornota, they are of the same thickness in the whole length; the ends generally form typical tornotal points, only sometimes the shape is less pronounced. The length is 0·238—0·31 mm and the diameter is 0·0028—0·004 mm. b. *Microsclera:* these are ancoræ spatuliferæ of two forms and sizes, large and small; they are both very beautiful spicules. 1. The large ancoræ have a very slightly curved shaft and five to six elliptical teeth at each end; there are somewhat narrow alæ on the shaft, reaching a little longer towards the middle than the teeth. Sometimes the number of teeth at each end is not equal, but may be five at one and six at the other end; also some irregularity may be found, and when there are six teeth, generally one or two are a little smaller than the others. The length is 0·062—0·071 mm, and the diameter of the shaft is 0·004—0·007 mm. 2. The small ancoræ have a shape somewhat similar to that of the large, but they have eight to eleven teeth at each end; the number of teeth may also here be different at the two ends; there are small alæ on the shaft, but they are not directed to the sides but backwards, they are thus not or almost not seen when the ancora is viewed from in front, and they are on the whole difficult to see; from the fact that they are directed backwards they get a position similar to the falxes of the teeth, and teeth seem in reality sometimes to be formed here, so that there is a circlet of teeth all round; the construction recalling what is found in the ancoræ of some of the *Iotrochota* species, e. g. *I. rotulancora* (The Danish Ingolf Exp. VI, 2, Porifera, Part. II, 191, Pl. XVIII, fig. 6 c—e). The length is 0·032—0·038 mm, and the thickness of the shaft 0·003 mm. Of this ancora some developmental stages were seen; they showed a dilatation with beginning teeth at each end, and they thus resemble the developmental stages of the ancora in the mentioned *Iotrochota* species. The microsclera occur in the tissue of the sponge, and to judge from a single place on one of the specimens they also occur in the dermal membrane in somewhat great numbers; the small ancoræ are by far the most numerous.

This species is related to *H. umbellifera* Tops., but besides other characters this latter species has only one form of ancoræ.

Locality: Station 89, the Denmark Strait, 64° 45′ Lat. N., 27° 20′ Long. W., depth 310 fathoms; two specimens.

4. **H. tenuisclera** n. sp.

Pl. XI, Fig. 7.

Incrusting; surface smooth. Spicula: megasclera; the skeletal spicules acanthostyli with a small but generally distinct head, somewhat densely spined in the whole length, 0·083—0·19 mm, not divided into two groups; the dermal spicules strongyla 0·15—0·21 mm; microsclera small isancoræ unguiferæ with 5—8 teeth at each end, 0·016—0·020 mm.

This species forms incrustations on Bryozoa (*Retepora* and *Cellepora*), on Brachiopods and on tubes of *Placostegus tridentatus*. Its greatest extent is about 15 mm, and it is very thin, not reaching 0·5 mm. The colour (in spirit) is whitish. The *surface* is smooth or it may be finely hispid from projecting acanthostyli, but this latter condition is certainly due to some damage. The *dermal membrane* is a thin and transparent film. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of bundles of dermal spicules stretching from the skeleton below to the dermal membrane, the spicules are somewhat penicillately spread outwards; besides these bundles some more irregularly scattered spicules are seen; the bundles and spicules are not at all densely placed, and the dermal skeleton is somewhat weakly developed. The *main skeleton* is of typical construction, and it is rather regular, consisting of vertical acanthostyli. At the base there is a very small amount of spongin, only observable with difficulty.

Spicula: a. *Megasclera.* 1. The skeletal spicules are acanthostyli; they are generally straight, only rarely very slightly curved; the head is not large but as a rule distinct, and the shaft tapers evenly from the head to the point. The styli are somewhat densely spined in their whole length, sometimes the spines may be a little more dispersed towards the point; the spines are medium sized and reclined, on the head they are somewhat long, blunt and radiating straight out. The styli vary somewhat in length, but they are not divided into groups; the length is 0·083—0·19 mm and the diameter of the head 0·011—0·024 mm. 2. The dermal spicules are straight and slender strongyla; they are of the same thickness in the whole length and sometimes they are a little polytylote; the ends may be slightly swollen. The length is 0·15—0·21 mm and the diameter 0·0028—0·004 mm. b. *Microsclera:* these are isancoræ anguiferæ; they are small and have a slender, curved shaft and five to eight narrow teeth at each end; there may be some irregularity present, the teeth sometimes being of different length and breadth and often the number of the teeth is different at the two ends; there are very narrow alæ on the shaft, but they are difficult to observe. The curvature of the shaft is generally very strong, but there is some variation on this point, especially in different individuals. The length of the ancoræ, which is somewhat dependent on the curvature, is 0·016—0·020 mm, and the diameter of the shaft is about 0·001 mm. The ancoræ are present in great numbers in the dermal membrane but occur also otherwise in the tissue.

This species is very nearly related to *H. biscutella* Tops., but it is distinguished by several

characters, the acanthostyli are smaller and the ancoræ in *biscutella* are described as having ten or about ten teeth ("une dizaine"), and they are larger, 0·027—0·030 mm; finally the present species does not show the "cellules sphéruleuses" mentioned by Topsent for *biscutella*.

Locality: Station 6, 63° 43' Lat. N., 14° 34' Long. W., depth 90 fathoms; station 32, 66° 35' Lat. N., 56° 38' Long. W., depth 318 fathoms; further it has been taken at 63° 18' Lat. N., 21° 30' Long. W., depth 94 fathoms (The Fishery investigation steamer "Thor"); 61° 40' Lat. N., 7° 40' Long. W., depth 135 fathoms (Ditlevsen); 62° 23' Lat. N., 2° 35' Long. E., depth 217 fathoms (Ad. Jensen, the cruise of "M. Sars" 1902). In all six specimens. The localities are situated in the Davis Strait, South and East of Iceland, West of the Faröe Islands and between the latter and Norway.

Leptolabis Tops.

Incrusting forms; external appearance, skeleton and megasclera as in Hymedesmia; the dermal spicules tylota; the characteristic microsclera are forcipes of one or two forms, to these are added chelæ arcuatæ and sigmata.

Topsent founded this genus in 1904 (Résultats des camp. scient. du Prince de Monaco, Fasc. XXV. 181) and I think he was right, the presence of forcipes being here, as in the genus *Forcepia*, of sufficient importance for the creating of a genus; moreover the dermal tylota seem to be characteristic for the genus.

The genus *Leptolabis* comprises at present the following species:

1888. *L. luciensis* Tops. Arch. de Zool. exp. et gén. 2. VI, XXXVII, (*Dendoryx*).
1892. *L. exilis* Tops. ibid. 2, X, XXII, (*Leptosia*).
1904. *L. forcipula* Tops. Résultats des camp. scient. du Prince de Monaco, Fasc. XXV, 182, Pl. XV, fig. 11.
" *L. forcipula* var. *brunnea* Tops. ibid. 182, Pl. XV, fig. 12.
" *L. arcuata* Tops. ibid. 183, Pl. XV, fig. 18.
1905. *L. irritans* Thiele, Zool. Jahrbücher, 1905, 455, Taf. 31, Fig. 71 a—e (*Hymedesmia*).
L. assimilis mihi.

I have remarked below, that I consider *L. forcipula* var. *brunnea* as a definite and separate species; the same may I think be said with certainty about *L. luciensis* and *exilis*: on reading the description of *luciensis* of 1904 I got the impression that besides *exilis* perhaps still a third species may be hidden here.

1. **L. assimilis** n. sp.

Pl. XI, Fig. 8.

Incrusting; surface smooth. The main skeleton weak. Spicula: megasclera: the skeletal spicules acanthostyli divided into two groups, large and small; the large without head, somewhat densely spined in almost the whole length, 0·42—0·53 mm; the small with a slight head, spined in about the lower half, 0·089—0·21 mm; the dermal spicules tylota with small swellings, 0·38—0·50 mm; microsclera four forms; chelæ arcuatæ 0·014—0·038 mm, sigmata 0·077—0·16 mm, spinulous forcipes of two forms, large, with legs of equal length, 0·024—0·034 mm, small, with unequal legs, 0·014—0·018 mm.

This species grows on a large stone together with a *Sarcophyton* and various sponges of the genera *Tedania*, *Hymedesmia* and *Crella*. It forms an incrustation of a greatest extent of 30^{mm}, the thickness being scarcely 0·5^{mm}. The colour (in spirit) is greyish. The *surface* is smooth without projecting spicules. The *dermal membrane* is not especially thin and it is somewhat solid; it is charged with microsclera, especially sigmata, and there are fibres of dermal spicules in it or just below it. *Oscula* and *pores* were not observed.

The *skeleton*. The *dermal skeleton* consists of bundles and fibres stretching up to the dermal membrane, but in a very horizontal direction, and especially there are fibres running almost or quite horizontally in or just below the membrane; the dermal skeleton is thus chiefly constructed of horizontal fibres, and the fibres may reach some length; otherwise they have a more or less irregular course, and they are often curved; they may be of different thickness but are often rather thick, e. g. 0·10^{mm}. The *main skeleton* consists of acanthostyli placed with the heads on the substratum and directed vertically, or generally more or less obliquely upwards; they are much scattered and present only in somewhat small number; the main skeleton is thus diffuse and irregular and on the whole somewhat weakly developed. The acanthostyli are not evenly scattered over the surface of the substratum, but they are to some degree collected in bundles with a few spicules in each. There seems to be a small amount of spongin at the base of the acanthostyli.

Spicula: a. *Megasclera*. 1. The skeletal spicules are acanthostyli which are divided into two groups, large and small; the large styli are straight or a little curved; the basal end is rounded, without any head-swelling or with this only very weakly developed, the other end tapers into a middle-long apex. The styli are somewhat densely spined in almost their whole length, only a short apical part being smooth; the spines are of medium size or small, and they are not reclined but radiating straight out; on the basal part there may sometimes be some stronger spines. The length of the large styli is 0·42—0·53^{mm} and the diameter at the base 0·017—0·024^{mm}. The small styli are straight; they have generally a somewhat distinct but small head, and the point is somewhat short; the spinulation is continued somewhat beyond the middle so that the apical part is smooth. The length is 0·089—0·21^{mm} and the diameter at the base 0·010—0·014^{mm}. The small acanthostyli are of rather scarce occurrence. 2. The dermal spicules are tylota; they are straight or sometimes slightly curved, the shaft is cylindrical, not thickened in the middle; the ends have small but somewhat distinct swellings; one end is a little thinner than the other and has the swelling more suddenly marked, but this feature is only slightly pronounced and only noticed by close examination. The length of the tylota is 0·38 0·50^{mm} and the diameter of the shaft 0·0046—0·007^{mm}. b. *Microsclera* are of four forms, chelæ arcuata, sigmata and forcipes of two forms. 1. The chelæ have an evenly curved shaft, the alæ are lobe-shaped, somewhat narrow and deeply incised below, the tooth is elliptical, of the same length as the alæ. The chela varies much in size, the length is 0·014—0·038^{mm} and the diameter of the shaft 0·001—0·004^{mm}. The intermediate sizes are not numerous and hence the chelæ give the impression of being divided into two groups. 2. The sigmata are large, of common shape and more or less contorted; they vary somewhat in size, the length is 0·077—0·16^{mm}, and the thickness is 0·0040—0·008^{mm}. 3. The large forceps is of the ordinary hair-pin-like shape with legs of equal or about equal length; they have a round curve above, and the legs are somewhat divergent;

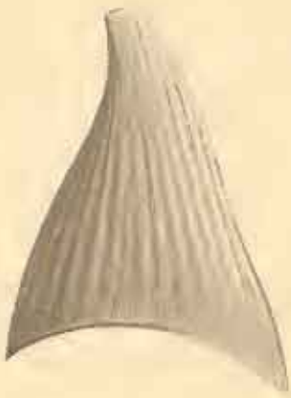
sometimes the legs are curved slightly outwards and then a little more divergent below; these forcipes have thus a shape about as the large forcipes in *Forcepia Topsentii* (The Danish Ingolf Exp. VI, 2, 1905, Pl. XIX, fig. 4 d). The forcipes are grittily or rugosely spinulous, and the legs are irregularly rounded or somewhat pointed at the apex, without any knob; they are smooth on the inside of the upper curve. The length of the forceps is 0·024—0·034 mm, and the thickness of the rod is above in the curve 0·0035—0·0056 mm. In single cases the forceps has the legs extraordinarily divergent, so that the angle is obtuse; this feature is thus parallel to what is likewise the case with the forceps in *Forcepia Topsentii*, (l. c. fig. 4 e). 4. The small forceps has the legs parallel or slightly divergent, and one leg is longer than the other; this longer leg is curved slightly inwards; the legs terminate with a little knob. This forceps recalls thus the forceps in *Forcepia Thielei* and *F. groenlandica* (The Danish Ingolf Exp. VI, 2, Pl. XIX, fig. 5 d, Pl. XX, fig. 3 d.); it is inconspicuously spinulous. This forceps is very small, the total length from the curvature to the end of the long leg is 0·014—0·018 mm, and the thickness above in the curve is about 0·0007 mm. Of the microsclera the chelæ and sigmata are numerous, they are seen especially in the dermal membrane, but occur also through the whole sponge; the forcipes are not numerous but of somewhat rare occurrence, and they are not seen in the dermal membrane; otherwise it must be remarked, that the small forceps is difficult to detect on account of its very small size, and it is therefore very liable to be overlooked.

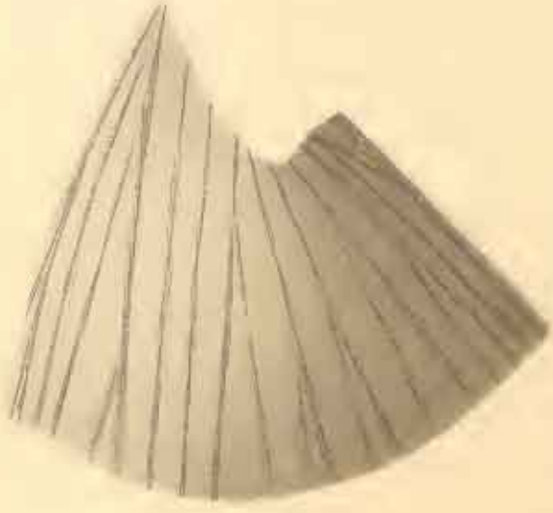
This species is evidently nearly related to *L. forcipula* var. *brunnea* Tops. which I take to be certainly a distinct species, not specifically identical with *forcipula;* but the present species differs from *brunnea* with regard to the size of both megasclera and microsclera; thus Topsent gives the size of the chela to 0·033 mm, and he does not speak of variation in size; the large forceps in *brunnea* has also a different shape, the legs being more divergent in their outer part; finally the acanthostyli in *assimilis* have no specially strong spines at the base and have not the spines on the shaft reclined, both these features being found in *brunnea.* I may also note, that in *assimilis* I have found no "cellules sphéruleuses" which are mentioned by Topsent for *brunnea.* Topsent mentions, besides the larger forcipes, some small ones of a length of 0·013 mm and very thin, but he does not describe them more particularly; he thinks that they "représentent soit la form jeune soit une état athrophique de cette sort de microsclères". Developmental stages they cannot be, according to what we know about the development of the spicules, the growth taking place only by apposition; there is on the other hand also no reason to believe them to be atrophied forms. It is no doubt a special, small forceps, so that *brunnea,* like *arcuatæ* and the present species, has also two forms of forcipes, large and small.

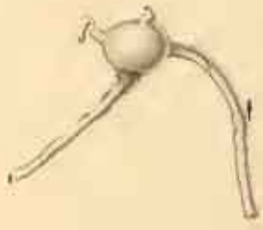
Locality: Station 46, West of the Faröe Islands, 61° 32′ Lat. N., 11° 36′ Long. W., depth 730 fathoms. One specimen.

Plate I.

Plate I.







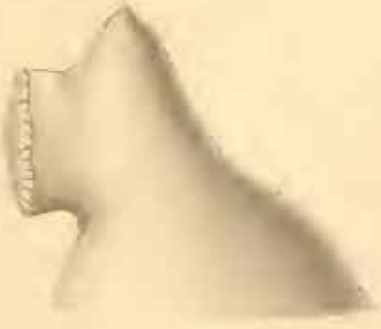


Plate II.

Plate II.

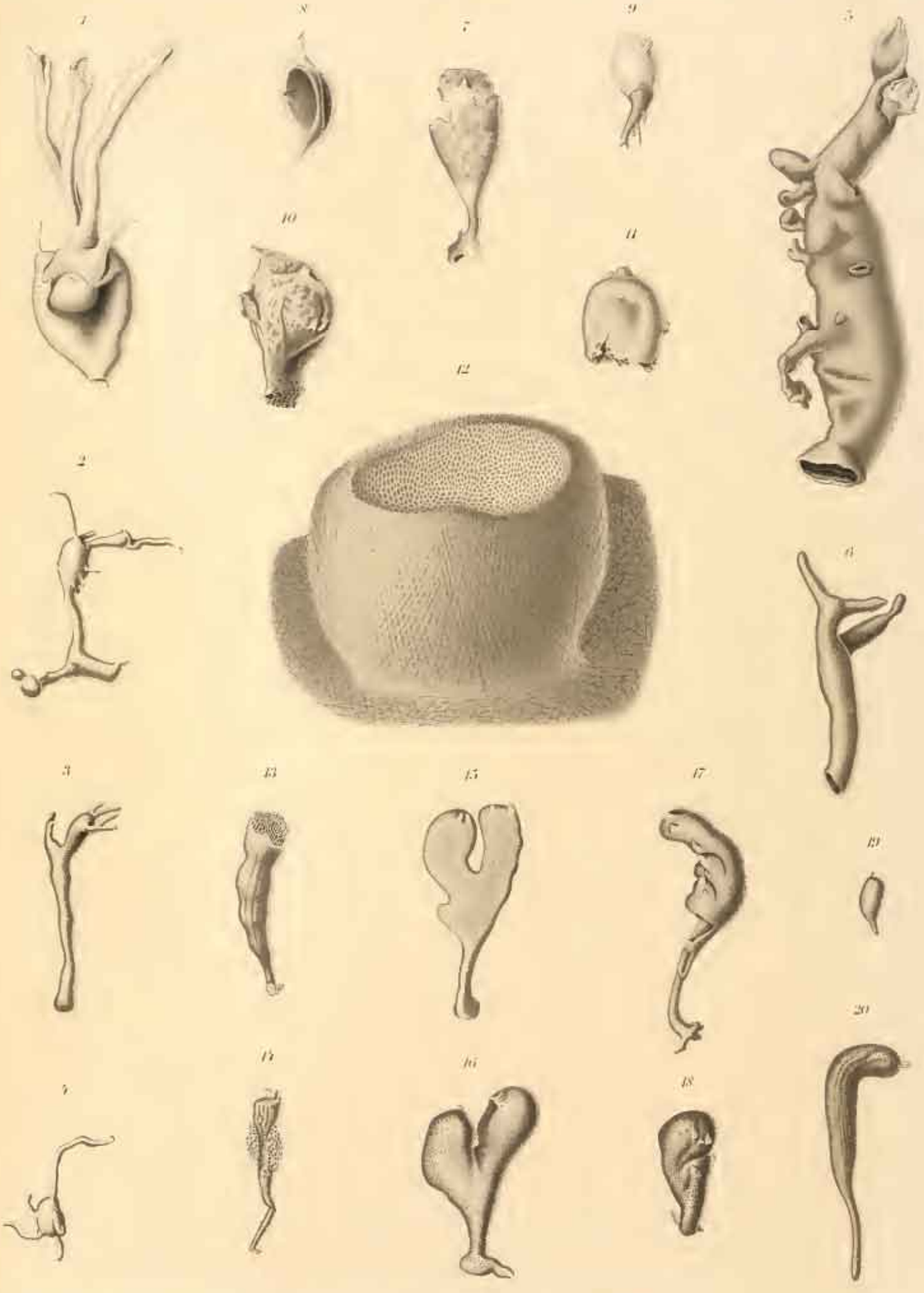


Plate III.

Plate III.

Page

Fig. 1. *Hymedesmia rugosa* n. sp. Two oscula are seen. $^2/_1$ 50

— 2. *Hymedesmia stylata* n. sp. Two ocular papillæ are seen. $^1/_1$ 57

— 3. *Hymedesmia verrucosa* n. sp. A fragment. $^1/_1$ 58

— 4. *Hymedesmia perforata* n. sp. $^1/_1$ 61

— 5. *Hymedesmia basispinosa* n. sp. $^1/_1$ 64

— 6. *Hymedesmia occulta* Bow., with distinct papillæ. $^1/_1$ 67

— 7. *Hymedesmia simillima* n. sp. (*a*) on a stone together with a *Hymeraphia* (*b*); one ocular and two pore-papillæ are seen. $^1/_1$ 69

— 8. *Hymedesmia Bowerbanki* n. sp. (*a*) and *H. clavigera* n. sp. (*b*) growing together on a stone; below them is a *Polymastia*; *c.* is a *Mesapos*, and to the left of it grows a Bryozoon. $^1/_1$ .. 62, 75

— 9. *Hymedesmia truncata* n. sp. on a stone; six papillæ are seen. $^1/_1$ 77

— 10. *Hymedesmia latrunculioides* n. sp., in the middle the ocular papilla. $^1/_1$ 78

— 11. *Hymedesmia crux* O. Schmidt and *H. nummulus* n. sp.; the large sponge is *H. crux*, oscula are distinctly seen; the circular, white spot is the base of a *Hornera*, on the left side of it grows *H. nummulus*; *a.* is a *Mesapos*. $^1/_1$ 55, 83

— 12. *Hymedesmia filifera* O. Schmidt; peeled from its substratum. $^1/_1$ 86

— 13. *Hymedesmia grandis* n. sp. A large, somewhat folded specimen, seen from above; on two places the substratum of large sponge-spicules is seen. $^1/_1$ 88

— 14. *Hymedesmia grandis* n. sp. A specimen cut through, showing the substratum of large sponge-spicules; the bordering line of the sponge-tissue downwards is distinctly seen. $^1/_1$ —

— 15. *Hymedesmia digitata* n. sp. $^1/_1$ 90

— 16. *Hymedesmia trichoma* n. sp., growing on an *Astarte*-shell. $^1/_1$ 91

— 17. *Hymedesmia dermata* n. sp. Ocular cones are seen. $^1/_1$ 107

— 18. *Hymedesmia tornotata* n. sp., on a Brachiopod. $^1/_1$ 109

— 19. *Hymedesmia mucronella* n. sp., on a fragment of a *Sipho*. $^1/_1$ 110

— 20. *Grayella carnosa* Tops. Cushion-shaped specimen, growing on a piece of *Biemna rosea*. $^1/_1$ 36

— 21. *Grayella carnosa* Tops. Erect specimen with two oscula at the summit; at the base some adhering bottom material. $^2/_1$ 36

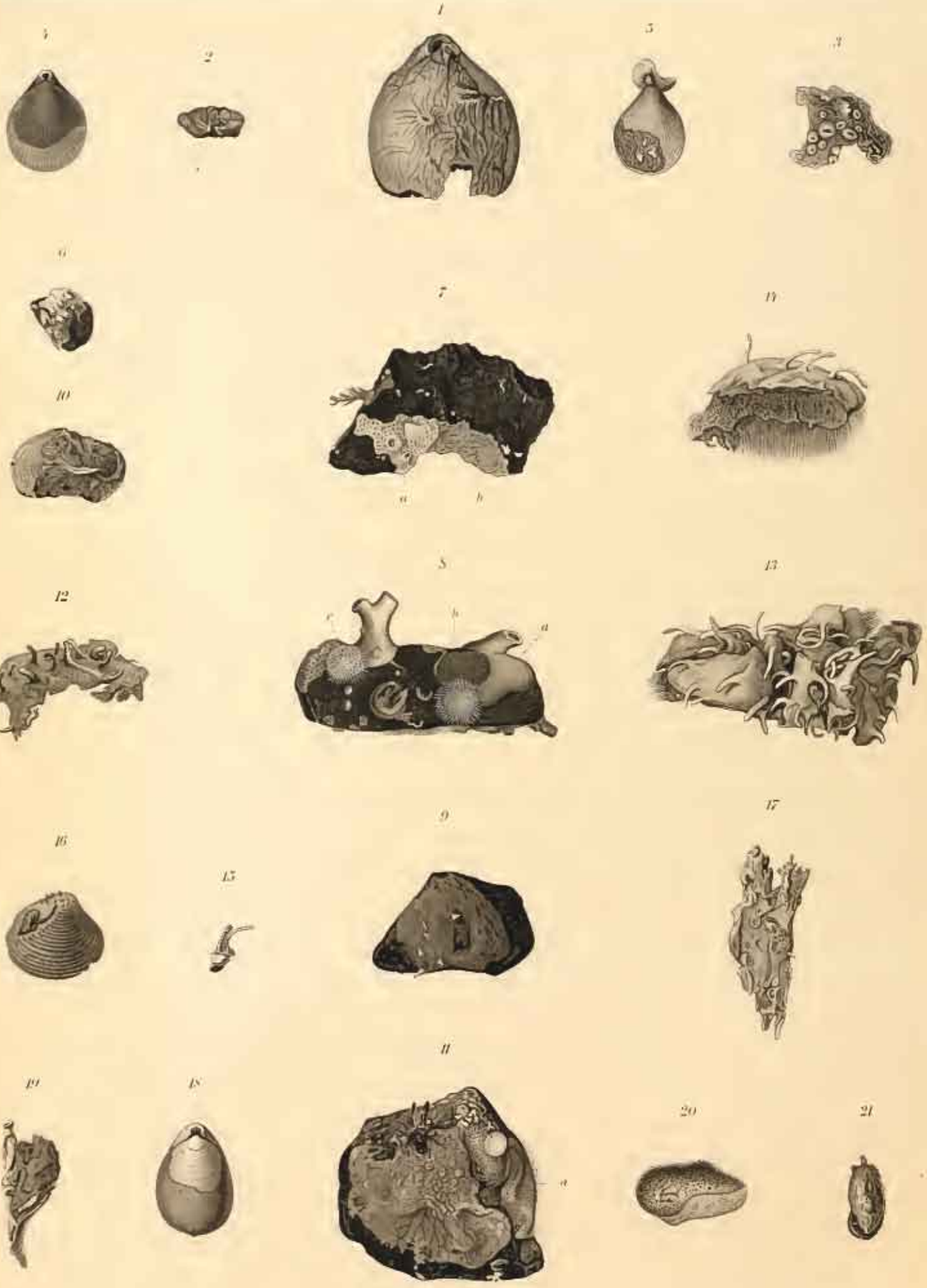

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Plate IV.

Plate IV.

Page

Fig. 1. *Tedania suctoria* O. Schmidt, *a* styli of various sizes, *b* tylota × 200, *c* rhaphides of the three different sizes, all from one specimen × 380, *d* the upper end of one of the largest and one of the smallest rhaphides × 1400 1

— 2. *Histoderma appendiculatum* Cart. *a* tylota with intermediates to strongyla from the dermal layer and the inner body × 165, *b* chelæ arcuatæ, side and front view × 1000, *c* sigmata × 460 7

— 3. *Histoderma physa* O. Schmidt, *a* strongyla of various sizes × 165, *b* chelæ arcuatæ, front and side view × 1000, *c* trichodragma × 380 11

— 4. *Histodermella Ingolfi* n. sp. *a* tylota of various sizes, *b* a young and an older developmental stage, *c* acanthoxea, *d* a not quite young developmental stage × 200, *e* chelæ arcuatæ side view, a little from behind, and front view × 1000, *f* sigmata × 460.... 14

— 5. *Histodermella coriacea* n. sp. *a* strongyla of various sizes from the dermal layer and the inner body; with the magnification used the spinulation of the ends is not seen, *b* acanthostrongyla × 165, *c* ends of two strongyla, showing the minute spinulation × 700 ... 16

— 6. *Inflatella pellicula* O. Schmidt, *a* strongyla of various sizes, *b* a developmental stage × 200 18

— 7. *Inflatella viridis* Tops. *a* strongyla of various sizes, *b* a developmental stage × 165..... 20

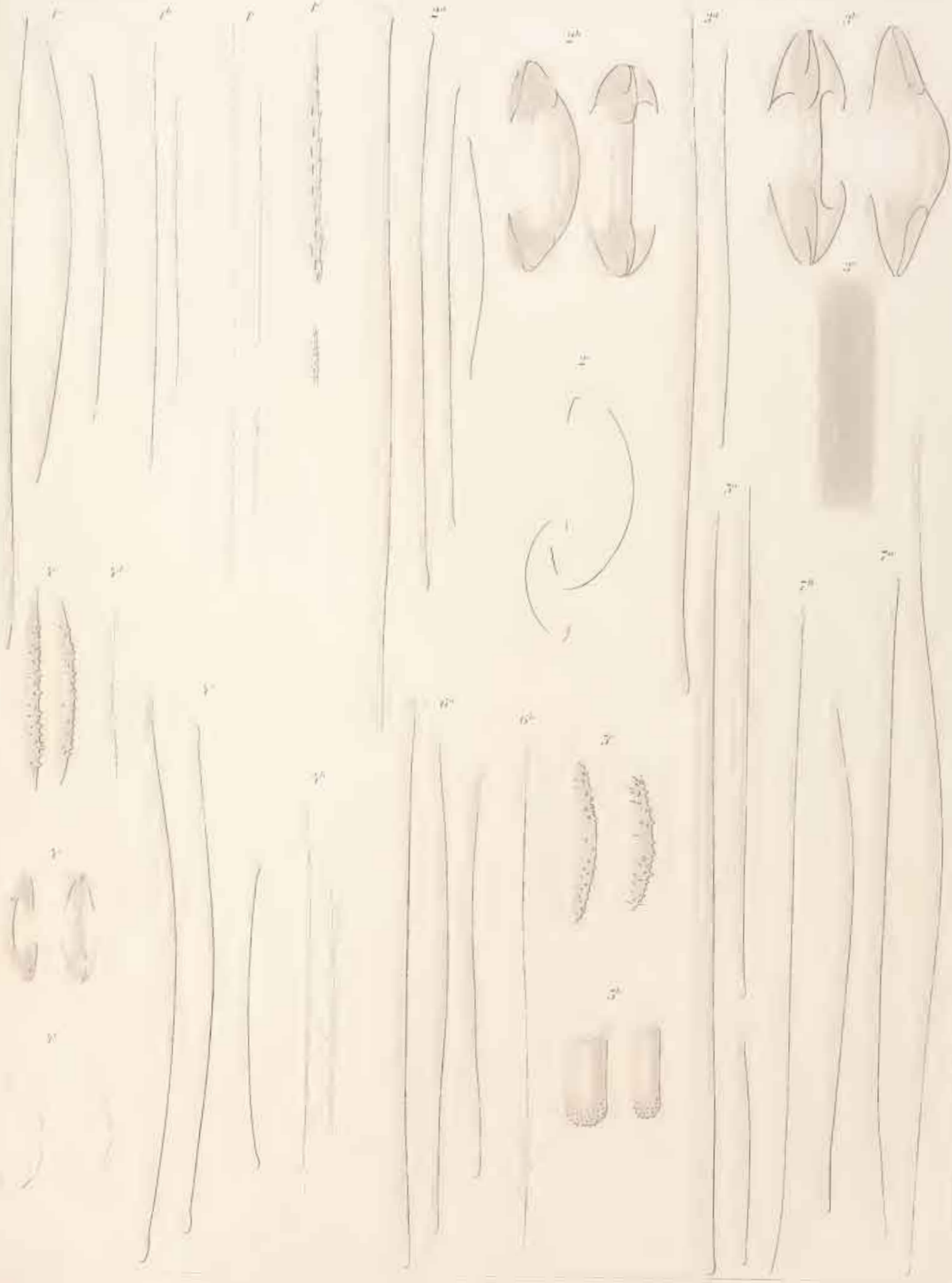

Plate V.

Plate V.

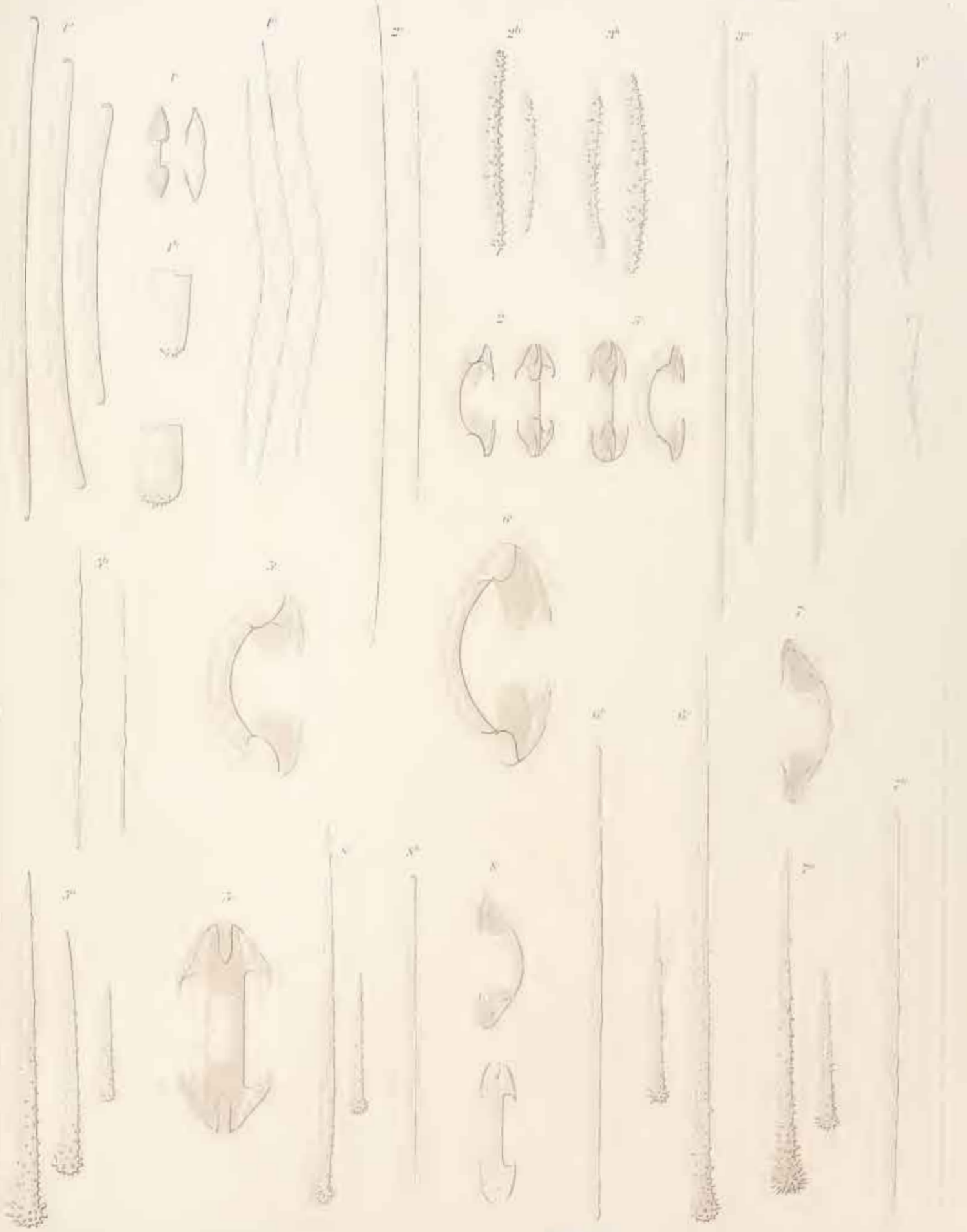

Plate VI.

Plate VI.

Page

Fig. 1. *Hymedesmia mollis* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 255, *c* chelæ arcuatæ, side view × 1000 47

— 2. *Hymedesmia curvichela* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 165, *c* chela arcuata, side view × 1000 48

— 3. *Hymedesmia rugosa* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chelæ arcuatæ, front and side view × 700 50

— 4. *Hymedesmia splenium* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chela arcuata, side view × 1000 51

— 5. *Hymedesmia tenuicula* n. sp. *a* acanthostyli, large and small, *b* strongyla × 255, *c* chela arcuata, side view × 1000 52

— 6. *Hymedesmia similis* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chela arcuata, side view × 1000 53

— 7. *Hymedesmia nummulus* n. sp. *a* acanthostyli, large and small, *b* strongylum × 165, *c* chela arcuata, side view × 1000 55

— 8. *Hymedesmia dubia* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chela arcuata, side view, a little from the front so that the flat front side of the shaft is seen × 1000 56

— 9. *Hymedesmia stylata* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chela arcuata, side view, a little from the front × 1000; when seen accurately in side view, the alæ would be more claw-shaped 57

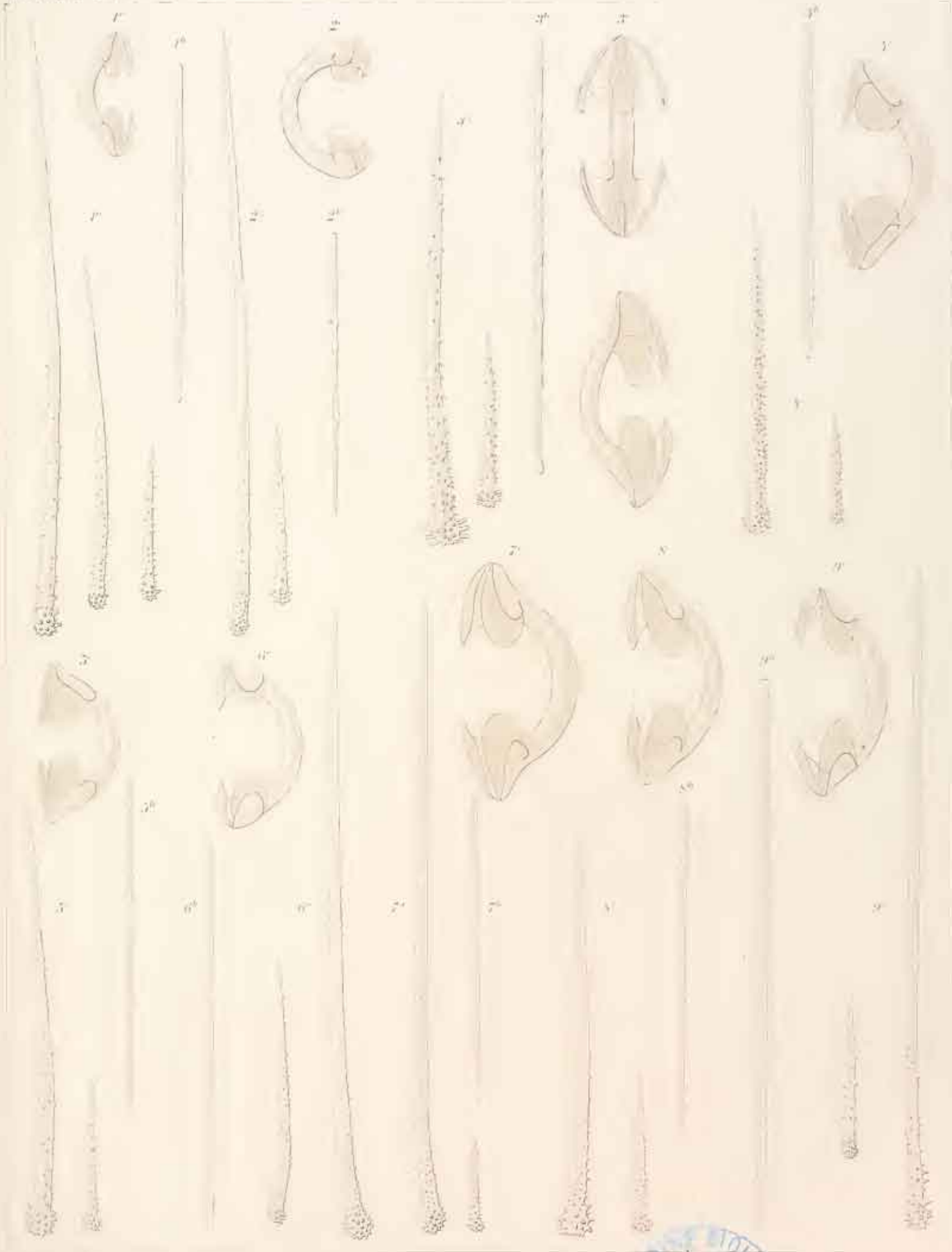

Plate VII.

Plate VII.

Page

Fig. 1. *Hymedesmia verrucosa* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 255, *c* chelæ arcuatæ, oblique front view and side view × 1000 58

— 2. *Hymedesmia procumbens* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 255, *c* chela arcuata, side view × 1000 60

— 3. *Hymedesmia perforata* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 255, *c* chelæ arcuatæ of various sizes, side view × 1000 61

— 4. *Hymedesmia clavigera* n. sp. *a* acanthostyli, large and small, *b* tornotum × 255, *c* chela arcuata, side view × 1000 62

— 5. *Hymedesmia platychela* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 255, *c* chela arcuata, front view × 1000; one tooth is cleft 63

— 6. *Hymedesmia basispinosa* n. sp. *a* acanthostyli, large and small, *b* tornotum × 255, *c* chela arcuata, side view × 1000 64

— 7. *Hymedesmia longistylus* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 165, *c* chela arcuata, side view × 1000 66

— 8. *Hymedesmia occulta* Bow. *a* acanthostyli, large and small, *b* one of the tornota, *c* one of the oxea from the dermal skeleton, *d* one of the thicker oxea from the dermal membrane, *e* one of the specially thick dermal oxea from the specimen mentioned in the text × 165, *f* chelæ arcuatæ, side and front view × 1000 67

— 9. *Hymedesmia simillima* n. sp. *a* acanthostyli, large and small, *b* dermal oxeum, *c* one of the thick dermal oxea × 165, *d* chela arcuata, side view × 1000 69

Plate VIII.

Plate VIII.

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Fig. 1. *Hymedesmia baculifera* Tops. *a* acanthostyli of various sizes (from a specimen with large styli), *b* tylotum × 255, *c* chela arcuata, side view × 1000 71

— 2. *Hymedesmia levis* n. sp. *a* acanthostyli of various sizes, *b* polytylote tylotum × 255, *c* chela arcuata, side view × 1000 73

— 3. *Hymedesmia bractea* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* chela arcuata, side view, a little from in front × 1000 74

— 4. *Hymedesmia lævistylus* n. sp. *a* acanthostylus, *b* tylotum × 255, *c* chela arcuata, side view, a little from in front × 1000 74

— 5. *Hymedesmia Bowerbanki* n. sp. *a* acanthostyli, *b* tylotum × 340, *c* chela arcuata, side view × 1000 75

— 6. *Hymedesmia truncata* n. sp. *a* acanthostyli, *b* tylotum × 340, *c* chela arcuata, side view × 1000 77

— 7. *Hymedesmia latruncultoides* n. sp. *a* acanthostyli, *b* tylotum × 340, *c* chela arcuata, side view, a little from in front × 1000 78

— 8. *Hymedesmia irregularis* n. sp. *a* acanthostyli of various sizes, *b* polytylote dermal stylus × 255, *c* chelæ arcuatæ, front and side view × 1000 80

— 9. *Hymedesmia proxima* n. sp. *a* acanthostyli, large and small, *b* dermal stylus × 255, *c* chelæ arcuatæ, front and side view × 1000 81

— 10. *Hymedesmia crux* O. Schmidt, *a* acanthostyli of various sizes, *b* subtornotum × 255, *c* chelæ arcuatæ, front view (the spines on the back of the shaft are seen shining through) and side view, *d* seen from the end × 1000 83

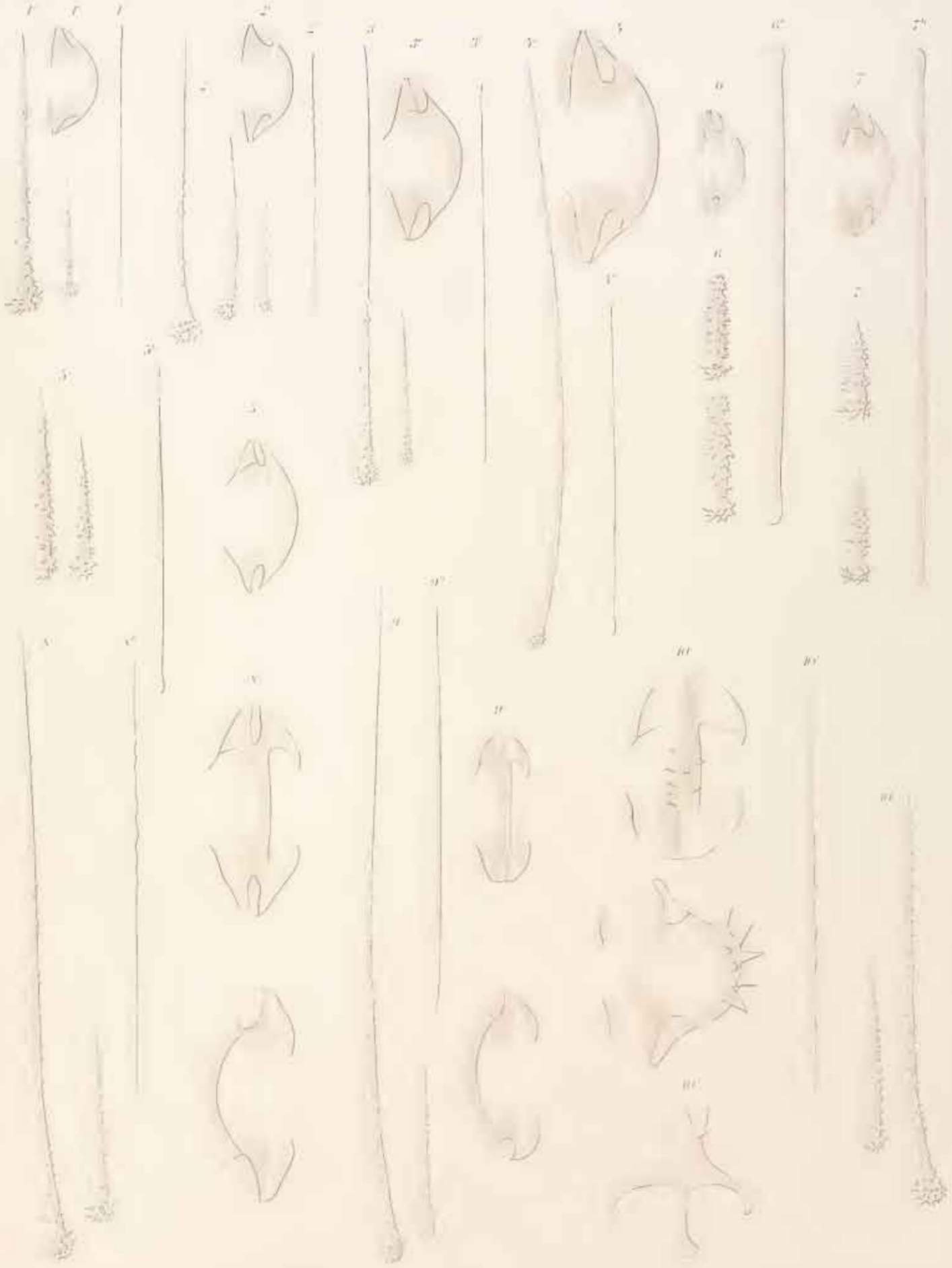

Plate IX.

Plate IX.

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Fig. 1. *Hymedesmia acuigma* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 255, *c—f* asteroid chelæ in various views, *c* the axis distinct, with the convex side to the right, *d* the axis cannot be pointed out, *e* front view, the axis in the middle, *f* seen from the end, *g* a developmental stage × 1000 84

— 2. *Hymedesmia filifera* O. Schmidt, *a* acanthostyli of various sizes, *b* strongylum × 255, *c* chela arcuata, side view × 1000 86

— 3. *Hymedesmia grandis* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255, *c* chelæ arcuatæ, front and side view × 1000, *d* sigmata of various sizes × 460 88

— 4. *Hymedesmia digitata* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* chela arcuata, side view × 1000, *d* sigmata × 460 90

— 5. *Hymedesmia trichoma* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* chela arcuata, side view × 1000, *d* sigmata × 460 91

— 6. *Hymedesmia macrosigma* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 255, *c* chelæ arcuatæ of various sizes, side view × 1000, *d* sigmata, large and small × 340 92

— 7. *Hymedesmia pugio* n. sp. *a* acanthostyli, large and small, *b* dermal stylus × 255, *c* chela arcuata, side view × 1000, *d* sigmata × 585 94

— 8. *Hymedesmia consanguinea* n. sp. *a* acanthostyli, large and small, *b* tornotum × 255, *c* chela arcuata, side view × 1000, *d* sigmata × 585 95

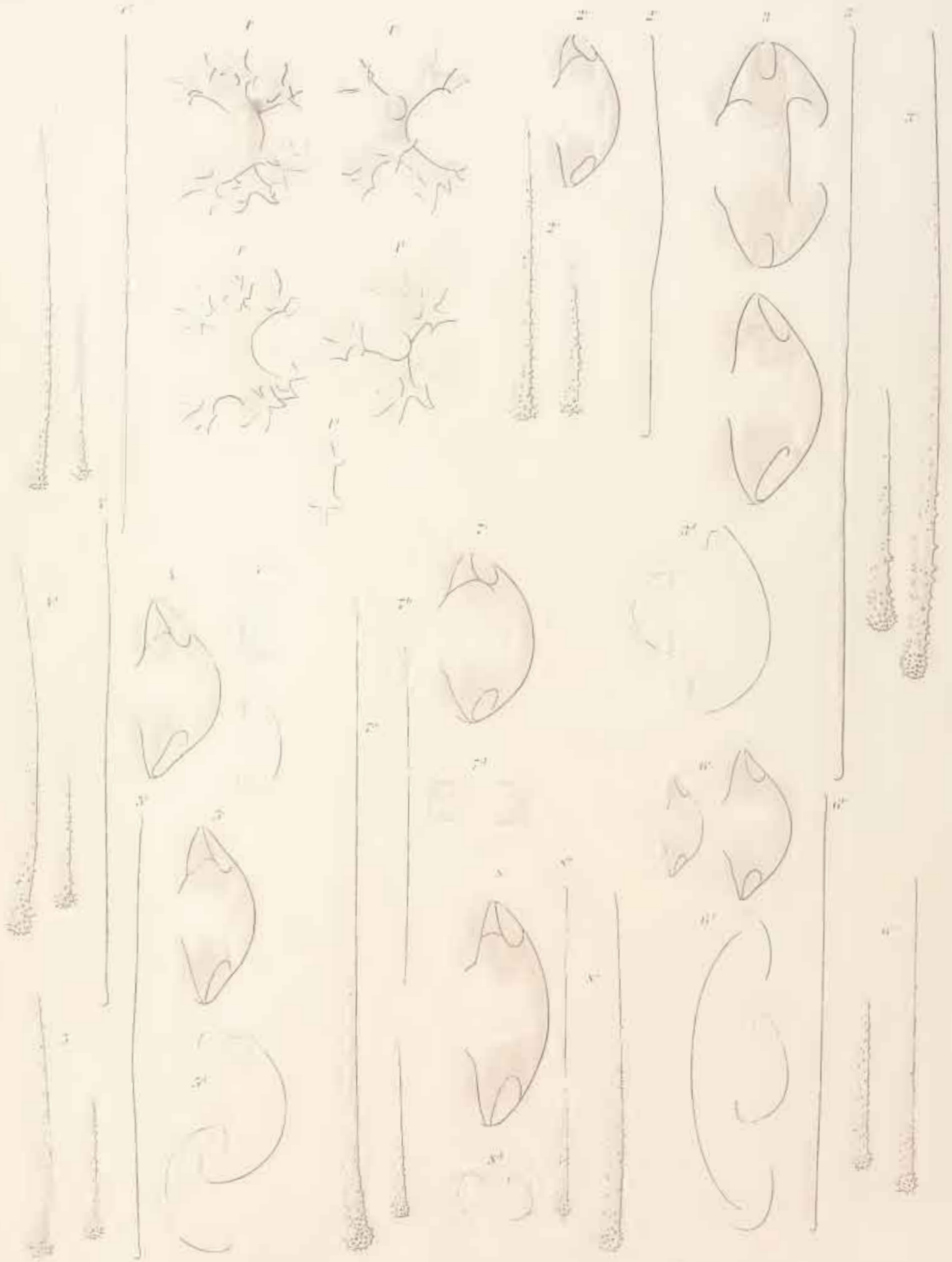

Plate X.

Plate X.

Page

Fig. 1. *Hymedesmia planca* n. sp. *a* acanthostyli, large and small, *b* tylotornotum × 255, *c* chelæ arcuatæ of various sizes, front and side view × 1000, *d* large sigmata, *e* small, circularly curved sigmata × 585 96

— 2. *Hymedesmia cultrisigma* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* chela arcuata, side view × 1000, *d* sigmata of the large, peculiar form, *e* sigmata of the ordinary form × 585 97

— 3. *Hymedesmia mucronata* Tops. *a* acanthostyli of various sizes, *b* oxytornota × 255, *c* chela arcuata, side view, *d—e* the peculiar chela, *d* side view, *e* seen in oblique front view and somewhat from the end, in this view the points of the processes are not seen and the processes appear therefore rounded at the ends × 1000, *f* sigmata × 585 ... 98

— 4. *Hymedesmia tenuisigma* n. sp. *a* acanthostyli, large and small, *b* polytylote strongylum × 255, *c* sigmata × 460 100

— 5. *Hymedesmia Dujardinii* Bow. *a* acanthostyli of various sizes, the middle one with a slight head-swelling on account of the shaft being thick below, *b* strongylum and tylotum × 255 101

— 6. *Hymedesmia primitiva* n. sp. *a* acanthostyli of various sizes, *b* polytylote strongylum × 255 104

— 7. *Hymedesmia longurius* n. sp. *a* acanthostyli of various sizes, *b* a thinner and a thicker strongylum × 255 105

— 8. *Hymedesmia æquata* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 255 106

Plate XI.

Plate XI.

Page

Fig. 1. *Hymedesmia dermata* n. sp. *a* acanthostyli, large and small, *b* strongylum × 255 107

— 2. *Hymedesmia tornotata* n. sp. *a* acanthostyli of various sizes, *b* tornota with microspined ends × 255 109

— 3. *Hymedesmia mucronella* n. sp. *a* acanthostyli, large and small, *b* tornotum, the upper end with a mucro × 255 110

— 4. *Hymenancora interjecta* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* ancoræ, front and side view × 1000, *d* sigmata × 460 117

— 5. *Hymenancora conjungens* n. sp. *a* acanthostyli, large and small, *b* tylotum with somewhat swollen ends × 255, *c* ancoræ, side view and oblique front view, × 1000, *d* sigmata × 460 118

— 6. *Hymenancora duplicata* n. sp. *a* acanthostyli of various sizes, *b* tornotum × 255, *c* ancoræ spatuliferæ of the large form, oblique front view and side view, *d* ancoræ spatuliferæ of the small form, front view and side view, the latter shows two smaller teeth at the upper end × 1000 119

— 7. *Hymenancora tenuisclera* n. sp. *a* acanthostyli of various sizes, *b* strongylum × 255, *c* ancoræ unguiferæ, side view, with more and less curved shaft × 1000 121

— 8. *Leptolabis assimilis* n. sp. *a* acanthostyli, large and small, *b* tylotum × 255, *c* chelæ arcuatæ of various sizes, side view × 1000, *d* large forcipes × 1000, *e* small forcipes × 1400, *f* sigmata × 340 122

INGOLF-EXPEDITIONEN

1895—1896.

STATIONERNES PLADS, DYBDE OG BUNDTEMPERATUR.

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2	63° 04'	9° 22'	262	5°3	25	63° 30'	54° 25'	582	3°3	46	61° 32'	11° 36'	720	2°40
3	63° 35'	10° 21'	272	0°5		63° 51'	53° 03'	136		47	61° 32'	13° 40'	950	3°23
4	64° 07'	11° 12'	237	2°5	26	63° 57'	52° 41'	34	0°6	48	61° 32'	15° 11'	1150	3°17
5	64° 40'	12° 09'	155			64° 37'	54° 24'	109		49	62° 07'	15° 07'	1120	2°91
6	63° 43'	14° 34	90	7°0	27	64° 54'	55° 10'	393	3°8	50	62° 43'	15° 07'	1020	3°13
7	63° 13'	15° 41'	600	4°5	28	65° 14'	55° 42'	420	3°5	51	64° 15'	14° 22'	68	7°32
8	63° 56	24° 40'	136	6°0	29	65° 34'	54° 31'	68	0°2	52	63° 57'	13° 32'	420	7°87
9	64° 18'	27° 00'	295	5°8	30	66° 30'	54° 28'	22	1°05	53	63° 15'	15° 07'	795	3°08
10	64° 24'	28° 30'	788	3°5	31	66° 35'	55° 54'	88	1°6	54	63° 08'	15° 40'	691	3°9
11	64° 34'	31° 12'	1300	1°6	32	66° 35'	56° 38'	318	3°9	55	63° 33'	15° 02'	316	5°9
12	64° 38'	32° 37'	1040	0°3	33	67° 57'	55° 30'	35	0°8	56	64° 00'	15° 09'	68	7°57
13	64° 47'	34° 35'	622	3°0	34	65° 17'	54° 17'	55		57	63° 37'	13° 02'	350	3°4
14	64° 45'	35° 05'	176	4°1	35	65° 16'	55° 05'	362	3°6	58	64° 25'	12° 09'	211	0°8
15	66° 18'	25° 59'	330	—0°75	36	61° 59'	56° 21'	1435	1°5	59	65° 00'	11° 16'	310	—0°1
16	65° 13'	26° 58'	250	6°1	37	60° 17'	54° 05	1715	1°4	60	65° 09'	12° 27'	124	0°9
17	62° 49'	26° 55'	745	5°4	38	59° 12	51° 05'	1870	1°3	61	65° 03'	13° 06'	55	6°4
18	61° 44'	30° 29'	1135	5°0	39	62° 00'	22° 38'	865	2°9	62	63° 18'	19° 12	72	7°92
19	60° 29'	34° 14	1566	2°4	40	62° 00'	21° 36'	845	3°3	63	62° 40'	19° 05'	800	4°0
20	58° 20'	40° 28'	1695	1°5	41	61° 39'	17° 10'	1245	2°0	64	62° 06'	19° 00'	1041	3°1
21	58° 01'	44° 45'	1330	2°4	42	61° 41'	10° 17'	625	0°4	65	61° 33'	19° 00'	1089	3°0
22	58° 10'	48° 25'	1845	1°4	43	61° 42	10° 11'	645	0°05	66	61° 33'	20° 43'	1128	3°3
23	60° 43'	56° 00'	Kun Plankton undersøgelse		44	61° 42'	9° 36'	545	4°8	67	61° 30'	22° 30'	975	3°0

Station Nr.	N. Brd.	V. Lgd.	Dybde i danske Fvn.	Bund-tempe-ratur	Station Nr.	N. Brd.	V. Lgd.	Dybde i danske Fvn.	Bund-tempe-ratur	Station Nr.	N. Brd.	V. Lgd.	Dybde i danske Fvn.	Bund-tempe-ratur
68	62° 06′	22° 30′	843	3°4	92	64° 44′	32° 52′	976	1°4	118	68° 27	8° 20′	1060	−1°0
69	62° 40′	22° 17′	589	3°9	93	64° 24′	35° 14′	767	1°46	119	67° 53′	10° 19′	1010	−1°0
70	63° 09′	22° 05′	134	7°0	94	64° 56′	36° 19′	204	4°1	120	67° 29′	11° 32′	885	−1°0
71	63° 46′	22° 03′	46			65° 31′	30° 45′	213		121	66° 59′	13° 11′	529	−0°7
72	63° 12′	23° 04′	197	6°7	95	65° 14′	30° 39′	752	2°1	122	66° 42′	14° 44′	115	1°8
73	62° 58′	23° 28′	486	5°5	96	65° 24′	29° 00′	735	1°2	123	66° 52′	15° 40′	145	2°0
74	62° 17′	24° 36′	695	4°2	97	65° 28′	27° 39′	450	5°5	124	67° 40′	15° 40′	495	−0°6
	61° 57′	25° 35′	761		98	65° 38′	26° 27′	138	5°9	125	68° 08′	16° 02′	729	−0°8
	61° 28′	25° 06′	829		99	66° 13′	25° 53′	187	6°1	126	67° 19′	15° 52′	293	0°5
75	61° 28′	26° 25′	780	4°3	100	66° 23′	14° 02′	59	0°4	127	66° 33′	20° 05′	44	5°6
76	60° 50′	26° 30′	806	4°1	101	66° 23′	12° 05′	537	−0°7	128	66° 50′	20° 02′	194	0°6
77	60° 10′	26° 59′	951	3°6	102	66° 23′	10° 26′	750	−0°9	129	66° 35′	23° 47′	117	6°5
78	60° 37′	27° 52′	799	4°5	103	66° 23′	8° 52′	579	−0°6	130	63° 00′	20° 40′	338	6°55
79	60° 52′	28° 58′	653	4°4	104	66° 23′	7° 25′	957	−1°1	131	63° 00′	19° 09′	698	4°7
80	61° 02′	29° 32′	935	4°0	105	65° 34′	7° 31′	762	−0°8	132	63° 00′	17° 04′	747	4°6
81	61° 44′	27° 00′	485	6°1	106	65° 34′	8° 54′	447	−0°6	133	63° 14′	11° 24′	230	2°2
82	61° 55′	27° 28′	824	4°1		65° 29′	8° 40′	466		134	62° 34′	10° 26′	299	4°1
83	62° 25′	28° 30′	912	3°5	107	65° 33′	10° 28′	492	−0°3	135	62° 48′	9° 48′	270	0°4
	62° 36′	26° 01′	472		108	65° 30′	12° 00′	97	1°1	136	63° 01′	9° 11′	256	4°8
	62° 36′	25° 30′	401		109	65° 29′	13° 25′	38	1°5	137	63° 14′	8° 31′	297	−0°6
84	62° 58′	25° 24′	633	4°8	110	66° 44′	11° 33′	781	−0°8	138	63° 26′	7° 56′	471	−0°6
85	63° 21′	25° 21′	170		111	67° 14′	8° 48′	860	−0°9	139	63° 36′	7° 30′	702	−0°6
86	65° 03′ 0	23° 47′ 0	76		112	67° 57′	6° 44′	1267	−1°1	140	63° 29′	6° 57′	780	0°9
87	65° 02′ 3	23° 56′ 2	110		113	69° 31′	7° 06′	1309	−1°0	141	63° 22′	6° 58′	679	−0°6
88	64° 58′	24° 25′	76	6°9	114	70° 36′	7° 29′	773	−1°0	142	63° 07′	7° 05′	587	−0°6
89	64° 45′	27° 20′	310	8°4	115	70° 50′	8° 29′	86	0°1	143	62° 58′	7° 09′	388	−0°4
90	64° 45′	29° 06′	568	4°4	116	70° 05′	8° 26′	371	−0°4	144	62° 49′	7° 12′	276	1°6
91	64° 44′	31° 00′	1236	3°1	117	69° 13′	8° 23′	1003	−1°0					

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