DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

PENNATULIDA,

VED

D. C. DANIELSSEN OG **JOHAN KOREN.**

MED 12 PLANCHER OG 1 KART.

CHRISTIANIA.

GRØNDAHL & SØNS BOGTRYKKERI.

—

1884.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

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ZOOLOGY.

PENNATULIDA,

BY

D. C. DANIELSSEN AND **JOHAN KOREN.**

WITH 12 PLATES AND 1 MAP.

CHRISTIANIA.
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Af *Pennatulider* blev der paa den norske Nordhavsexpedition fundet nedenstaaende 8 Slægter og 13 Arter, hvoraf 2 Slægter og 11 Arter ere nye for Videnskaben.

Pennatula distorta, varietas aculeata,[1] Koren & Danielssen.
Station 9.
Svava glacialis, n. g. et sp.
— — *varietas alba,* nob.
Dübenia borealis, n. sp.
*Kophobelemnon abyssorum,*n. sp.
— *Möbii,*[2] Koren & Danielssen.
Umbellula encrinus, (Linné), Cuvier.
Cladiscus Köllikeri, n. sp.
Gunneria borealis, n. g. et sp.
Protoptilum lofotense, n. sp.
— *Mohni,* n. sp.
— *carinatum,* n. sp.
— *armatum,* n. sp.

[1] Bergens Museum. Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna, ved J. Koren og D. C. Danielssen. Bergen 1883, pag. 24.

[2] Bergens Museum. Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna, ved J. Koren og D. C. Danielssen. Bergen 1883, pag. 25.

Received 9th June 1884.

During the Norwegian North-Atlantic Expedition, the following 8 genera and 13 species of *Pennatulida* were found. Of these, 2 genera and 11 species, are new to science.

Pennatula distorta, varietas aculeata,[1] Koren and Danielssen.
Station No. 9.
Svava glacialis, n. g. et sp.
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Zoologiske Stationer.
(Zoological Stations).

Station No.	Datum. *(Date).*	Nordlig Bredde. *(North Latitude).*	Længde fra Greenwich. *(Longitude).*	Dybde. *(Depth).* Engl. Favne. *(Fathoms).*	Dybde. *(Depth).* Meter. *(Metres).*	Bundens Temperatur. *(Temperature at Bottom).* C.	Bunden.	Bottom.	Apparat. *(Apparatus).* S. Skrabe. *(Dredge).* T. Trawl. s. Svabere. *(Swabs).*
	1876								
1	Juni 3	61° 13′	6° 36′ E.	650	1189	6.°6	Sandler.	Sabulous Clay.	S.
2	*(June)* 3	61 10	6 32 E.	672	1229	6. 7	Sandler.	Sabulous Clay.	T.
4	„ 8	61 5	5 14 E.	566	1035	6. 6	Sandler, Grus, Singel.	SabulousClay, Pebbles.	T.
8	„ 9	61 0	4 49 E.	200	366	6. 6	Ler, Sand, Sten.	Clay, Sand, Stones.	S.
9	„ 20	61 30	3 37 E.	206	377	5. 9	Ler.	Clay.	T.
10	„ 21	61 41	3 19 E.	220	402	6. 0	Slik, Ler.	Ooze, Clay.	T.
18	„ 21	62 44	1 48 E.	412	753	—1. 0	Ler.	Clay.	S. T.
23	„ 23	62 52	5 50 E.						T.
25	„ 28	63 10	5 25 E.	98	179	6. 9	Sandler.	Sabulous Clay.	T. S.
26	„ 28	63 10	5 16 E.	237	433	7. 1	Sandler.	Sabulous Clay.	S.
31	„ 29	63 10	5 0 E.	417	763	—1. 0	Sandler.	Sabulous Clay.	S. T.
33	„ 30	63 5	3 0 E.	525	960	—1. 1	Ler.	Clay.	T. S.
34	Juli 1	63 5	0 53 E.	587	1073	—1. 0	Ler.	Clay.	T.
35	*(July)* 5	63 17	1 27 W.	1081	1977	—1. 0	Biloculinler.	Biloculina Clay.	S.
40	„ 18	63 22	5 29 W.	1215	2222	—1. 2	Biloculinler.	Biloculina Clay.	S. T.
48	Aug. 6	64 36	10 22 W.	299	547	—0. 3	Mørkgraat Ler.	Dark-grey Clay.	s.
51	„ 7	65 53	7 18 W.	1163	2127	—1. 1	Biloculinler.	Biloculina Clay.	S.
52	„ 8	65 47	3 7 W.	1861	3403	—1. 2	Biloculinler.	Biloculina Clay.	T.
53	„ 10	65 13	0 33 E.	1539	2814	—1. 3	Biloculinler.	Biloculina Clay.	S & T.
54	„ 12	64 47	4 24 E.	601	1099	—1. 2	Biloculinler.	Biloculina Clay.	S & T.
79	„ 21	64 48	6 32 E.	155	283	6. 9	Sandler.	Sabulous Clay.	S.
87	„ 22	64 2	5 35 E.	498	911	—1. 1	Ler.	Clay.	S.
92	„ 22	64 0	6 42 E.	178	326	7. 2	Sandholdigt Ler.	Sabulous Clay.	T.
93	„ 24	62 41	7 8 E.	158	289	6. 4	Blød Ler.	Soft Clay.	T.
		(Romsdalsfjord).							
	1877								
96	Juni 16	66 8	3 0 E.	805	1472	—1. 1	Biloculinler.	Biloculina Clay.	S.
101	*(June)* 17	65 36	8 32 E.	223	408	6. 0	Sandler.	Sabulous Clay.	S.
124	„ 19	66 41	6 59 E.	350	640	—0. 9	Grovkornet Ler.	Coarse Clay.	S. T.
137	„ 21	67 24	8 58 E.	452	827	—1. 0	Ler.	Clay.	S. T.
147	„ 22	66 49	12 8 E.	142	260	6. 2	Graat Ler.	Grey Clay.	S.
149	„ 23	67 52	13 58 E.	135	247	4. 9	Ler.	Clay.	T. S.
		(Vestfjord).							
164	„ 29	68 21	10 40 E.	457	836	—0. 7	Sandler.	Sabulous Clay.	S. T.
175	Juli 2	69 17	14 35 E.	415	759	3. 0	Ler, Smaasten.	Clay, Pebbles.	S.
176	*(July)* 3	69 18	14 33 E.	536	980	—0. 2	Ler.	Clay.	S.
177	„ 3	69 25	13 49 E.	1443	2639	—1. 2	Biloculinler.	Biloculina Clay.	S & T.
183	„ 5	69 59	6 15 E.	1710	3127	—1. 3	Biloculinler.	Biloculina Clay.	S & T.
190	„ 7	69 41	15 51 E.	870	1591	—1. 2	Sandholdig Ler.	Sabulous Clay.	T.
192	„ 7	69 46	16 15 E.	649	1187	—0. 7	Sandler.	Sabulous Clay.	S.
195	„ 16	70 55	18 38 E.	107	196	5. 1	Sten, Ler.	Stones, Clay.	S.
200	„ 17	71 25	15 41 E.	620	1134	—1. 0	Ler.	Clay.	S. T.
205	„ 18	70 51	13 3 E.	1287	2354	—1. 2	Biloculinler.	Biloculina Clay.	S.
213	„ 26	70 23	2 30 E.	1760	3219	—1. 2	Biloculinler.	Biloculina Clay.	S.
223	Aug. 1	70 54	8 24 W.	70	128	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
		(Jan Mayen).							
224	„ 1	70 51	8 20 W.	95	174	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
225	„ 2	70 58	8 4 W.	195	357	—0. 6	Graasort Sandler.	Dark-grey sabulousClay	S.
237	„ 3	70 41	10 10 W.	263	481	—0. 3	Brunt Ler, Stene.	Brown Clay, Stones.	S.
240	„ 4	69 2	11 26 W.	1004	1836	—1. 1	Biloculinler.	Biloculina Clay.	S.
248	„ 8	67 56	4 11 E.	778	1423	—1. 4	Biloculinler.	Biloculina Clay.	S.
251	„ 9	68 6	9 44 E.	634	1159	—1. 3	Ler.	Clay.	S.
252	„ 11	Vestfjord.					Ler.	Clay.	S.
253	„ 15	Skjerstadfjord.		263	481	3. 2	Ler.	Clay.	S.

Station No.	Datum. (*Date*).	Nordlig Bredde. (*North Latitude.*)	Længde fra Greenwich. (*Longitude*).	Dybde. (*Depth*). Engl. Favne. (*Fathoms*).	Dybde. (*Depth*). Meter. (*Metres*).	Bundens Temperatur. (*Temperature at Bottom*). C.	Bunden.	Bottom.	Apparat. (*Apparatus*). S. Skrabe. (*Dredge*). T. Trawl. s. Svabere. (*Swabs*).
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12′	15° 40′ E. (Vestfjord).	341	624	6.°5	Ler.	Clay.	S.
257	*(June)* 21	70 4	23 2 E. (Altenfjord).	160	293	3. 9	Ler.	Clay.	S.
258	„ 21	70 13	23 3 E. (Altenfjord).	230	421	4. 0	Ler.	Clay.	T.
260	„ 24	70 55	26 11 E. (Porsangerfjord).	127	232	3. 5	Ler.	Clay.	S. T.
261	„ 25	70 47	28 30 E. (Tanafjord).	127	232	2. 8	Ler.	Clay.	S. T.
262.	„ 27	70 36	32 35 E.	148	271	1. 9	Ler.	Clay.	T. S.
267	„ 29	71 42	37 1 E.	148	271	—1. 4	Ler, Sten.	Clay, Stones.	S.
270	„ 30	72 27	35 1 E.	136	249	—0. 0	Ler.	Clay.	S.
273	Juli 1	73 25	31 30 E.	197	360	2. 2	Ler.	Clay.	S.
275	*(July)* 2	74 8	31 12 E.	147	269	—0. 4	Ler.	Clay.	T.
280	„ 4	74 10	18 51 E. (Beeren Eiland).	35	64	1. 1	Sten.	Stones.	S.
283	„ 5	73 47	14 21 E.	767	1403	—1. 4	Ler.	Clay.	S.
286	„ 6	72 57	14 32 E.	447	817	—0. 8	Ler.	Clay.	T.
290	„ 7	72 27	20 51 E.	191	349	3. 5	Sandler.	Sabulous Clay.	T.
295	„ 14	71 59	11 40 E.	1110	2030	—1. 3	Biloculinler.	Biloculina Clay.	T.
297	„ 16	72 36	5 12 E.	1280	2341	—1. 4	Biloculinler.	Biloculina Clay.	T.
303	„ 19	75 12	3 2 E.	1200	2195	—1. 6	Biloculinler.	Biloculina Clay.	T.
312	„ 22	74 54	14 53 E.	658	1203	—1. 2	Ler.	Clay.	T.
315	„ 22	74 53	15 55 E.	180	329	2. 5	Ler, Sand.	Clay, Sand.	T.
322	„ 23	74 57	19 52 E.	21	38	0. 2	Haard.	Hard.	S.
323	„ 30	72 53	21 51 E.	223	408	1. 5	Ler.	Clay.	T.
326	Aug. 3	75 31	17 50 E.	123	225	1. 6	Ler.	Clay.	T.
333	„ 4	76 6	13 10 E.	748	1368	—1. 3	Biloculinler.	Biloculina Clay.	T.
336	„ 5	76 19	15 42 E.	70	128	0. 4	Ler, Haard B.	Clay, Hard Bottom.	S.
338	„ 6	76 19	18 1 E.	146	267	—1. 1	Haard.	Hard.	S.
343	„ 7	76 34	12 51 E.	743	1359	—1. 2	Ler.	Clay.	T.
350	„ 8	76 26	0 29 W.	1686	3083	—1. 5	Biloculinler.	Biloculina Clay.	T.
353	„ 10	77 58	5 10 E.	1333	2438	—1. 4	Biloculinler.	Biloculina Clay.	T.
357	„ 12	78 3	11 18 E.	125	229	1. 9	Ler.	Clay.	S.
359	„ 12	78 2	9 25 E.	416	761	0. 8	Ler.	Clay.	S.
362	„ 14	79 59	5 40 E.	459	839	—1. 0	Ler.	Clay.	T.
363	„ 14	80 3	8 28 E.	260	475	1. 1	Ler.	Clay.	T.
366	„ 17	79 35	11 17 E.	61	112	—2. 1	Ler.	Clay.	T.
(„		Magdalena Bay.		37	68	—0. 2			
370	„ 18	78 48	8 37 E.	109	199	1. 1	Ler.	Clay.	T.
372	„ 19	78 9	14 7 E. (Isfjord).	129	236	1. 2	Ler.	Clay.	T.
374	„ 22	78 16	15 33 E. (Advent Bay).	60	110	0. 7	Ler.	Clay.	T.

Svava[1] **glacialis,** n. g. et sp.

Tab. I, fig. 1.

Stokken stiv, tynd, rund, 90^{mm} lang (det største Exemplar). Rachis 56^{mm} lang; i dens øverste Ende viser Axen sig blottet for Sarcosoma i 3^{mm} Længde.

Ventralfladen lidt hvælvet, glat, forsynet med en temmelig bred Midtfure, Fig. 2, og paa hver Side af denne Antydninger til Ventralvulster.

Dorsalfladen hvælvet, har en smal Midtfure; paa hver Side af denne en Række afvexlende, yderst smaa, næsten stilkede Finner, der hver bære i Regelen 4 Polyper, Fig. 1. 3; paa den øverste Del af Rachis sees dels 3, dels 2 Polyper i hver Finne, Fig. 1.

Cellerne ere cylindriske, glatte, 2^{mm} lange og stillede lidt paatvers nedenfra opad, fra Dorsal- imod Ventralfladen, Fig. 1. 3. Deres nedre, lidt smalere Del er paa de to Hjørnecellers indre Flade sammenvoxet med de to mellemste Celler, hvorved den rudimentære Finne dannes, Fig. 5; de to Hjørnecellers ydre Flade er fri. Cellernes øverste Rand er forsynet med 8 smaa, bløde Papiller, Fig. 5, *a*, der næsten ganske udslettes, naar Celleaabningen er udvidet, hvorved Randen faar et undulerende Udseende, Fig. 5. 6, *a*. Naar Cellen er lukket, Polypen indtrukken, har den dels en ovoid, dels en elliptisk Form. Paa enkelte Finner sees 3 Celler at være sammenhængende, imedens den 4de er saagodtsom fri, kun fæstet til Finnen ved en smal Forlængelse af Cellens nederste Del.

Polypkroppen er cylindrisk, glat, omtrent 2^{mm} lang, men udvider sig traktformigt mod Tentakelskiven, Fig. 6; denne er noget hvælvet og har i Midten en lidt aflang Mundaabning. Tentaklerne ere tykke, lige saa lange som Kroppen, og som sædvanligt forsynede med Cirrer. Nedenfor hver Finne sees i en lidt paatversgaaende Række 4 yderst smaa, runde Zooider, Fig. 3. 4, *a*. 5, *b*; har Finnen kun 2 eller 3 Polyper, retter Zooidernes Antal sig derefter.

Paa hver Side af Rachis's Dorsalfure er der paa det største Exemplar 16 Finner, der bære fuldt udviklede Polyper; nedenfor disse komme 12, næsten paatversgaaende, listeformige Finner med 4, 3 og 2 uudviklede Polyper, og endelig sees en enkelt Række af smaa, runde Zooider, Fig. 1, der strækker sig langt nedover Stilken.

Stilken er 34^{mm} lang, rund; hvor Zooiderækken tager sin Begyndelse er den temmelig smal men udvider sig

[1] Svava, en Valkyrie.

Svava[1] **glacialis,** n. g. et sp.

Pl. I, fig. 1.

The stalk is erect, thin, and round, and measures (the largest specimen) 90^{mm} in length. The rachis measures 56^{mm} in length. For a length of 3^{mm}, the superior extremity of the axis is devoid of sarcosoma.

The ventral surface is somewhat arched, and smooth, and is furnished with a rather broad mesial furrow, (fig. 2) on each side of which, there are indications of ventral prominences.

The dorsal surface is arched, and has a narrow mesial furrow; and on each side of this, a series of alternating, extremely minute, almost pedunculated fins; each of which carries, usually, four polyps (figs. 1, 3). On the superior part of the rachis, sometimes 3, sometimes 2 polyps, are seen on each fin (fig. 1).

The cells are cylindrical, and smooth, and measure 2^{mm} in length; they are placed a little diagonally, from downwards to upwards from the dorsal towards the ventral surface (figs 1. 3). Their lower somewhat narrower part, is, at the inner surface of the two corner cells, concreted with the two middle cells; and the rudimentary fin is thereby formed (fig. 5). The outer surface of the two corner cells is free. The upper margin of the cells is furnished with, 8 small, soft, papillæ, (fig. 5, *a*) which are almost entirely obliterated when the aperture of the cell is dilated, and the margin obtains, thus, a wavy appearance (fig. 5. 6, *a*). When the cell is closed and the polyp retracted, it has, partly, an ovate, and, partly, an elliptic form. In a few fins, 3 cells are seen to be attached to each other, whilst the fourth is very nearly detached; in as much, that it is only attached to the fin by a narrow prolongation of the inferior part of the cell.

The body of the polyp is cylindrical, and smooth; and about 2^{mm} long, but it becomes dilated in a funnel-shape, towards the tentacular disk (fig. 6). The latter is a little arched, and in the middle, has a somewhat oblong oral aperture. The tentacles are thick, and of uniform length with the body, and, as usual, are furnished with pinnulæ. Below each fin, and placed in a somewhat transversal series; 4 extremely small, round, zooids are observed (figs. 3. 4, *a*. 5, *b*). If the fin is only furnished with 2, or 3 polyps, the number of the zooids is in proportion thereto.

In the largest specimens; there are 16 fins, situated on each side of the dorsal furrow of the rachis, carrying fully developed polyps; below these again, are, 12 nearly transverse fillet-formed fins, with 4, 3 and 2 undeveloped polyps; and finally, a single series of small round zooids is seen, (fig. 1) which extend far down the stem.

The stem is 34^{mm} long, and is round. At the point where the zooidal series commences, it is rather narrow;

[1] Svava = A valkyrie (a battle nymph).

efterhaanden, saa langt som Zooiderne naa, smalner derpaa noget af for atter at udvide sig, idet den ender i en aflang Blære, der stundom antager Kugleformen.

Farven.

Polypstokken svag gul, Polyperne næsten hvide.

Findested.

Station 31, 124, nogle Exemplarer.

Svava glacialis, varietas alba, nob.

Tab. 1, Fig. 8.

Stokken stiv, rund, tynd, 100^{mm} lang. Rachis 68^{mm} lang; dens øverste Ende er tvers afskaaren, dels nøgen, dels omgiven af Sarcosoma uden Polyper. Paa et Exemplar, der er 60^{mm} langt, er Rachis 40^{mm}.

Ventralsiden flad, bredere end paa Hovedarten og har paa Midten en Fure. Ventralvulsten stærkt fremtrædende, Fig. 9.

Dorsalsiden hvælvet og har paa Midten en smal Længdefure; paa hver Side af denne sees en Række rudimentære Finner, der dels sidde næsten lige over for hinanden, dels afvexlende, Fig. 10. Hver Finne bærer i Regelen 3 Polyper, kun paa et Exemplar saaes 4; men paa den øverste Del af Rachis har Finnen kun 2 Polyper.

Cellerne ere cylindriske, glatte, lidt bugede paa Midten, omtrent 2^{mm} lange; deres øverste, frie Rand glat. Ved deres Grund ere de saaledes sammenvoxede, at begge de ydre Celler ved deres indre Del ere fæstede til Mellemcellen, hvoraf følger, at Finnen er baade smal og kort, Fig. 11. Ved første Øiekast ser det virkelig ud, som om Cellen udspringer direkte fra Sarcosomaet; men naar man ved en Stilet fører en Celle lidt ud fra Stokken, viser det sig, at de to andre følge med. Cellerne have en lidt skraa Retning fra Dorsal- mod Ventralfladen, og hvor de støde til denne, fremtræder den omtalte Ventralvulst, der repræsenterer de radiære Kanaler. Strax nedenfor Finnen sees 3 smaa, runde Zooider, der følge Retningen af Cellerne, Fig. 10.

Polypkroppen er temmelig tyk, er af Cellens Længde, har 8 fine Længdestriber og udvider sig noget op imod Tentakelranden, Fig. 11. Tentaklerne ere næsten dobbelt saa lange som Kroppen, temmelig tykke ved Grunden

but it then becomes enlarged, gradually, as far as the zooids extend; then becomes somewhat narrower, but again expands, and terminates in an oblong vesicle, that occasionally assumes the spherical form.

Colour.

The stalk of the polyp is pale yellow, and the polyps are almost white.

Habitat.

Stations No. 31, No. 124, A few specimens.

Svava glacialis, varietas alba, nob.

Pl. I, fig. 8.

The stalk is erect, round, and thin; and measures 100^{mm} in length. The rachis is 68^{mm} long, and it's superior extremity is truncated. It is, partly, devoid of sarcosoma, and, partly, surrounded with sarcosoma without polyps. In a specimen measuring 60^{mm} long, the rachis is 40^{mm} long.

The ventral side is flat, and broader than in the typical species, and it has a furrow in the middle. The ventral prominence is strongly conspicuous (fig. 9).

The dorsal side is arched, and it has a small longitudinal furrow in the middle; and on each side of this furrow, a series of rudimentary fins is observed; which are placed, partly, exactly opposite each other; and partly, alternating (fig. 10). Each fin, usually, carries 3 polyps; and, only in one specimen, were 4 observed; but, in the superior part of the rachis, the fin has only 2 polyps.

The cells are cylindric, and smooth, and a little bulging at the middle; and they measure about 2^{mm} in length. Their superior, free extremity, is smooth; and at their base, they are concreted, so that both the exterior cells are attached by their inner part, to the intermediate cell; which makes the fin, both narrow, and short (fig. 11). At first sight, it really appears, as if the cell proceeds direct from the sarcosoma; but, when, with the assistance of a sharp pointed sound, a cell is drawn a little out from the stalk, it is seen, that the two others accompany it. The cells have a somewhat diagonal direction, from the dorsal towards the ventral surface; and at the point where they abut with the latter; the ventral prominence spoken of, which represents the radiating canals appears. Immediately below the fin, 3 small round zooids, which follow the line of the cells, (fig. 10) are seen.

The body of the polyp is rather thick, and of the same length as the cell; it has 8, slender longitudinal stripes, and becomes somewhat dilated up towards the tentacular margin (fig. 11). The tentacles are almost

og forsynede med Pinnuler. Mundskiven lidt hvælvet og i dens Centrum en aflang Mundaabning.

Paa et Exemplar, der er 60^{mm} langt, og hvor Rachis er 40^{mm}, er der paa hver Side af Midtfuren 20 Finner med fuldt udviklede Polyper og 16 med uudviklede; nedenfor disse optræder en Række med enkeltstaaende Zooider, der strække sig langt nedover den bulbøse Del, indtil omtrent 16^{mm} fra dennes Ende, der danner en aflang, blæreformig Udvidning.

Farven.

Baade Stok, Finner og Polyper melkehvide.

Findested.

Station 18, 251, nogle Exemplarer.

Anatomisk-histologisk Bygning af Slægten Svava.

Sarcosomaet er tyndt paa Rachis, men bliver noget tykkere i den bulbøse Del, hvor det er 0,178^{mm} bredt. Dets ydre Flade er beklædt med et Epithel, Fig. 13, *c*, bestaaende af flere Lag temmelig smaa, polyædriske Celler forsynede med Kjerne og et rigt Protoplasmaindhold. Indenfor Ectodermet er et forholdsvis bredt, hyalint Bindevævslag, Fig. 14, *a*, hvorfra udgaa listeformige Forlængelser, Fig. 14, *b*, til det indre Bindevæv, som i Forbindelse med dette danner Hudens Længdekanaler, Fig. 14. Paa begge Sider af Bindevævsprolongationerne fæste sig Længdemuskler, Fig. 14, *c*. Det indre Bindevævslag er ligeledes hyalint og danner Tverkanalerne; paa dets indre, frie Væg, der støder til Hovedlængdekanalerne, er det beklædt med et Epithel, Fig. 14, *d*, bestaaende af flere Lag smaa, runde Celler med en yderst tynd Membran og en temmelig stor, rund Kjerne, omgiven af spredte Protoplasmakorn. Saavel Længde- som Tverkanalerne i Sarcosomaet ere beklædte med Epithel, hvis Celler i Længdekanalerne svare ganske til dem, der findes paa Sarcosomaets indre Flade, og som tidligere ere omtalte, imedens Cellerne i Tverkanalerne ere mere aflange og have en lidt aflang Kjerne. Overalt er det hyaline Bindevæv gjennemtrængt af større og mindre Ernæringskanaler, der som sædvanligt ere beklædte med Epithel (Entodermceller), som i de mindste Kanaler udfylde ganske Lumenet. Imellem Sarcosomaets Længde- og Tverkanaler er der rigelige Anastomoser, og da der paa den indre Sarcosomavæg er en Mængde smaa Aabninger, som støde umiddelbart til de 4 Hovedlængdekanaler, saa er der en udbredt Kommunikation for det hele Cirkulationssystem.

twice as long as the body, and are rather thick at the base, and furnished with pinnulæ. The oral disk is a little arched, and there is an oblong oral aperture in its middle.

In a specimen measuring 60^{mm} long, and in which the rachis measures 40^{mm} long, there are 20 fins with fully developed polyps; and 16 fins with undeveloped polyps; situated on each side of the middle furrow. Below these, a series of isolated zooids appears; that extends a long way down over the bulbous part, until within about 16^{mm} from its extremity; which latter forms an oblong vesicular dilation.

Colour.

The stalk, fins, and polyps, are all milky-white.

Habitat.

Stations No. 18, No. 251, A few specimens.

Anatomo-histological structure of the genus Svava.

The sarcosoma is thin on the rachis, but becomes somewhat thicker in the bulbous part; where, it measures 0.178^{mm} broad. Its exterior surface is clad with an epithelium, (fig. 13, *c*) consisting of several layers of, rather small polyhedrous cells, furnished with nuclei, and a rich protoplasmic contents. Within the ectoderm, there is a proportionally broad, hyaloid, connective-tissue layer, (fig. 14, *a*) from which, fillet-formed prolongations proceed (fig. 14, *b*) to the inner connective-tissue, that in connection with the former, forms the longitudinal canals of the integument (fig. 14). On both sides of the connective-tissue prolongations, longitudinal muscles are attached (fig. 14, *c*). The inner layer of connective-tissue is also hyaloid, and forms the transversal canals. On it's inner free wall, which abuts on the main longitudinal canals; it is clad with an epithelium (fig. 14, *d*), consisting of several layers of small round cells, with an extremely thin membrane; and a rather large, round nucleus; surrounded by scattered protoplasmic granules. Both the longitudinal and transversal canals of the sarcosoma, are clad with epithelium, and, in the longitudinal canals; its cells, entirely correspond with those, which are found on the inner surface of the sarcosoma, and which have previously been spoken of; whilst, it's cells in the transversal canals, are more oblong, and have a somewhat oblong nucleus. The hyaloid connective tissue is everywhere penetrated, by larger or smaller nutrient canals; which, as usual, are clad with epithelium (Entoderm cells), which in the smallest canals quite fills up the passage. Between the longitudinal and transversal canals of the sarcosoma, there are abundant anastomozes, and, as there are upon the inner wall of the sarcosoma, a multitude of small apertures, which abut immediately upon the four main longitudinal canals; there is, thus, a diffusive communication for the whole circulatory system.

De 4 store Længdekanaler have som sædvanligt sine 4 Septa, der fæste sig paa Axeskeden, hvormed de smelte sammen, Fig. 13, *a*. I den bulbøse Del forgrene Septaerne sig, idet de gaa over i Sarcosomaet, hvor de bidrage til Dannelsen af store Tverkanaler, Fig. 13, *b*. I den øvrige Del af Stilken samt i Rachis foregaar ingen saadan Deling af Septa. Disse bestaa af en tynd, hyalin Bindevævsmembran, hvori findes en Mængde fine Ernæringskanaler, og paa hvis begge Flader er en Epithelialbeklædning, dannet af lignende Celler som de, der beklæder den hele Kanal, og som ovenfor ere omtalte. I Stokkens øverste Del ere Sidekanalerne ganske sammenskrumpede; den ventrale Knnal er noget videre end Dorsalkanalen.

Generationsorganerne udvikle sig i Sidekanalerne. I Beskrivelsen af den ydre Form omtalte vi, at hvor de uudviklede Polyper ophøre paa Stilkens bulbøse Del, findes der paa hver Side en Række Zooider. Disse have en temmelig vid Mundaabning, Fig. 14, *e*, et cylindrisk Svælg, hvis nederste, frie Ende har en rund, tyk Rand, der rager ind i Sidekanalen, Fig. 13, *d*. 14, *f*. Fra hver af denne tykke Svælgrands Sider udgaar et temmelig bredt Septulum, der fæster sig paa Sidekanalens Væg, Fig. 13, *e*, og hvortil et Gastralfilament er bundet, Fig. 13, *f*, hvis yderste Ende svømmer frit i Kanalens Fluidum. I det brede Septulum opstaa Kjønsorganerne og dannes af stilkede Kapsler, Fig. 14, *g*, hvori Kjønsproduktet udvikler sig. De Exemplarer, vi undersøgte, vare Hunner, — der var Æg i alle Udviklingsstadier og i saa rigelig Mængde, at de hængte paa Septula som Drueklaser og opfyldte næsten fuldstændigt Sidekanalerne, Fig. 14. Desforuden saaes ogsaa enkelte Embryoner, der havde forladt Ægget og laa frit i Kanalen. Hvor denne Rigdom af Æg fandtes, var saavel Ventral- som Dorsalkanalen meget sammentrykket, Fig. 14, *vk*, *dk*; men i samtlige Kanaler kunde dog Fluidumet cirkulere. Udvendig paa den bulbøse Del af Stilken viste den stærke Udvikling ef Generationsorganerne sig derved, at Overfladen var ujævnt udvidet og opsvulmet. Fig. 12, der er aabnet efter Ventralfladen, illustrerer hvorledes Kjønsorganerne udvikle sig i Sidekanalerne. Ventralkanalen og Axen *a* ere borttagne i den Strækning af Stilken, hvor Zooiderne indtage de før beskrevne Siderækker, — og hvorved Dorsalkanalen, Fig. 12, *b*, bliver synbar. I de udvidede Sidekanaler sees de drueformigt udviklede Kjønsorganer, Fig. 12, *c*. De fuldt udviklede Polyper ere golde, medens i de to sidste Rækker af uudviklede Polyper kun findes enkelte Generationskapsler, der ligeledes rage ind i Sidekanalerne for der at udvikle sit Kjønsprodukt.

Vi have Grund til at antage, at Svavaslægten føder levende Unger, og saavidt vi have kunnet erfare, fødes Un-

The 4 large longitudinal canals have, as usual, their 4 septa; which are attached to the sheath of the axis, and with which they become fused together (fig. 13, *a*). In the bulbous part, the septa branch off as they pass over into the sarcosoma, and contribute to the formation of large transversal canals (fig. 13, *b*). In the remainder of the stem, and also in the rachis, no such dividing of the septa takes place. The septa consist, of a thin, hyaloid, connective-tissue membrane; in which is found a multitude of minute nutrient canals, and on both of whose surfaces, there is an epithelium covering, formed of similar cells, to those which cover the entire canal; and which have already been spoken of. In the superior part of the stalk, the lateral canals are quite shrunk together. The ventral canal is somewhat wider than the dorsal canal.

The generative organs develope themselves in the lateral canals. In the description of the exterior habit; we stated, that at the point on the bulbous part of the stem where the undeveloped polyps cease, there is found upon each side, a series of zooids. These have a rather wide oral aperture, (fig. 14, *e*) and a cylindrical gullet, whose lower free extremity has, a round, thick margin, which projects into the lateral canal (fig. 13, *d*. 14, *f*). From each of the sides of this thick gullet-margin; a pretty broad septulum proceeds, which attaches itself to the wall of the lateral canal, (fig. 13, *e*), and to which a gastral filament is secured, (fig. 13, *f*) whose outer extremity floats free, in the secretion of the canal. The sexual organs originate in the broad septulum, and are formed of pedunculated capsules, (fig. 14, *g*), in which the sexual product developes itself. The specimens which we examined were females; there were ova in all stages of development, and in such abundant quantities, that they depended from the septula, like clusters of grapes, and almost, completely, filled up the lateral canals (fig. 14). Besides these, a few embryos which had forsaken the ovum, and lay free in the canal, were also observed. Where this wealth of ova was found, both the ventral and dorsal canal were much shrunk together, (fig. 14, *v*, *k*, *d*, *k*) but in all the canals, however, the secretion could circulate. Outside, on the bulbous part of the stem; the great development of the generative organs became apparent from this; that the surface was unevenly dilated and swollen. Fig. 12, in which the dissection is made from the ventral surface; illustrates the manner in which the sexual organs develope themselves in the lateral canals. The ventral canal and axis (*a*) are removed in that portion of the stem where the zooids assume the lateral series previously described; and the dorsal canal (fig. 12, *b*) becomes thus, visible. In the dilated lateral canals, the grape formed developed sexual organs are observed (fig. 12, *c*). The fully developed polyps are sterile, whilst, in the two last series of undeveloped polyps, only a few generative capsules are found; these also, project into the lateral canals, in order to develope there, their sexual product.

We have reason to believe, that the genus *Svava*, gives birth to living young, and as far as we have been

gerne ved at passere igjennem de før beskrevne Zooiders (Mødrenes) store Mundaabning; thi Sidekanalerne ere lukkede baade for oven og neden.

Septum transversale, Fig. 12, *d*, er 6—7^{mm} høit og deler det nederste Parti af Bulbus i to Dele, nemlig i Ventral- og Dorsalkanalen, hvoraf den sidste er videst. Hvor Septum transversale ophører, 1—2^{mm} fra Bunden, er altsaa kun et Rum, Fig. 12, *e*, hvori begge de nysnævnte Kanaler aabne sig.

Axen bøier sig i Dorsalkanalen 6—8^{mm} fra Stilkens Bund opad, danner en Anse, der er 10^{mm} lang, 2—3^{mm} bred og ender haarfint.

Axeskeden, Fig. 13, *g*. 14, *h*, dannes af en temmelig tyk Bindevævsmembran, hvori sees en Mængde Ernæringskanaler, Fig. 16, *a*, og som baade paa sin ydre og indre Væg ere beklædte med Epithel. Den indre Væg er ved stærke Bindevævstraade fæstet til Axens Cuticula. Denne er saa stærkt adhæreret til Axen, at den ikke kan løsnes fra samme uden at rives istykker. Hvor Sammenvoxningen finder Sted, iagttages en Række af næsten firkantede Celler, hvori sees en liden, rund Kjerne, Fig. 15, *a*.

Axen er paa den nederste Del af Rachis, der hvor Zooidestriben tager sin Begyndelse, 0,267^{mm} bred. Dens Grundmasse bestaar af fibrillært Bindevæv, som danner tætte Lag af koncentriske Ringe, hvoraf nogle synes at være tykkere end andre, Fig. 15, *b*, og hvorimellem sees tykke, temmelig tætliggende, radiære Fibre, Fig. 15, *c*. 16, *b*. Disse radiære Fibre straale ud fra Axens Peripheri, nemlig fra Cuticula henimod Centralstrængen, hvor de ophøre. Centralstrængen er elliptisk, 0,071^{mm} bred, og dannes af to Lag, et lysere, ydre, Fig. 16, *c*, og et noget mørkere, indre, Fig. 16, *d*. I Midten af det indre Lag saaes paa flere Tversnit en rund Aabning, som tydede hen paa en tilstedeværende Centralkanal, der sandsynligvis opfyldes mere eller mindre af Kalkkorn, som forøvrigt ere afsatte i den hele Centralstræng. Axen er overalt gjennemtrængt af fine Kalkkorn, og det er kun ved at fjerne disse, at dens Bindevævsstruktur kan iagttages.

Udenfor Axen findes ikke Kalk hos Slægten *Svava*.

Slægtskarakter.

Smaa Søfjære med rudimentære Finner; en Zooidestribe paa hver Side af Stilken, hvor Generationsorganerne rage ind i de to Sidekanaler og udvikle der Kjønsproduktet. Kalkaxen har en elliptisk Centralstræng og er rig paa radiære Fibre. Sarcosoma, Celler, Polyper uden Kalk.

able to ascertain, the young ones are born, by passing through the previously described large zooidal (the maternal) oral aperture; because, the lateral canals are closed both above and below.

The transversal septum (fig. 12, *d*) is 6—7^{mm} high, and divides the lower portion of the bulb into two parts; namely, the ventral, and the dorsal canal, of which, the last named, is the widest. Where the transversal septum ceases, 1—2^{mm} from the bottom, there is, therefore, only a space (fig. 12, *e*) in which both the canals just spoken of debouch.

The axis becomes curved in the dorsal canal, 6—8^{mm} from the base of the stem. Upwards, it forms a hook, which is 10^{mm} long, 2—3^{mm} broad, and terminates fine as a hair.

The sheath of the axis (fig. 13, *g*. 14, *h*) is formed of a pretty thick connective-tissue membrane, in which, a multitude of nutrient canals (fig. 16, *a*), is seen, and which are clad, both on their inner and outer walls, with epithelium.

The inner wall is attached to the cuticula of the axis, by strong filaments of connective-tissue. The cuticula is so strongly adherent to the axis, that it cannot be separated from it, without being torn in pieces. Where the concretion takes place, a series of nearly quadrangular cells is seen, in which a small round nucleus is observed (fig. 15, *a*).

At the lower part of the rachis; where the zooidal stripe commences; the axis is 0.267^{mm} broad. It's component substance consists, of fibrillous connective-tissue, which forms close layers of concentric rings, of which, some appear to be thicker than others, (fig. 15, *b*) and between which; thick, rather closely set, radiating fibres are seen (figs. 13, *c*. 16, *b*). These radiate fibres proceed from the periphery of the axis; namely, from the cuticula towards the central cord, and there cease. The central cord is elliptic, 0.071^{mm} broad; and, is formed of two layers, a bright one, (the outer one) (fig. 16, *c*), and a somewhat darker one, (the inner one) (fig. 16, *d*). In several sections, a round opening was seen in the middle of the inner layer; that suggested the presence of a central canal, probably, more or less, filled up with calcareous granules, which, otherwise, are found deposited in the entire central cord. The axis is, everywhere, penetrated, by minute calcareous granules, and, it is only upon removing these, that its connective-tissue structure can be observed.

Except in the axis, lime is not found in the genus *Svava*.

Generic Character.

Small sea-pens, with rudimentary fins. A zooidal stripe on each side of the stem, where the generative organs project into the two lateral canals, and there develope the sexual product. The calcareous axis has an elliptic central cord, and is rich in radiate fibre. The sarcosoma. cells, and polyps are all non-calcareous.

Artskarakter.

Svava glacialis opnaar en Størrelse af indtil 100 ^{mm}. Stokken er stiv. Rachis længere end Stilken, bærer paa hver Side af Dorsalfuren 12—16 Rækker udviklede Polyper, 4 i hver Række. Cellerne ere paa deres fri Rand forsynede med 8 yderst smaa, bløde Papiller. Under hver Cellerad 4 smaa, runde Zooider. Stokken ender i en aflang Bulbus. Axen danner en stor Anse, 6—8^{mm} fra Stilkens Bund og ender haarfint i Dorsalkanalen. Ventralfladen uden Zooider. Stokken gulhvid; Celler og Polyper næsten hvide.

Specific Character.

Svava glacialis attains a size of up to 109^{mm} in length. The stalk is erect. The rachis is longer than the stem; and carries on each side of the dorsal furrow, 12—16 series of developed polyps, 4 in each series. The free margin of the cells, is furnished with 8 extremely small, soft papillæ. Below each cellular series, 4 small round zooids. The stalk terminates in an oblong bulb. The axis forms a large hook, 6—8^{mm} from the base of the stem, and terminates, fine as a hair; in the dorsal canal. The ventral surface is free from zooids. The stalk is yellowish white. The cells and polyps almost white.

Dübenia borealis, n. sp.

Tab. II, Fig. 1—7.

Af denne Søfjær blev kun fundet antageligt den øverste Halvdel, der er 50^{mm} lang.

Stokken er tynd, stiv, rund og fattig paa Polyper; dens øverste Ende er blottet for Sarcosoma i en Udstrækning af omtrent 5^{mm}, Fig. 1.

Ventralsiden er næsten flad og har paa Midten en Fure, som er dyb der, hvor en paalangs gaaende Zooiderække paa hver Side omgiver de tilstødende Finner, Fig. 1. 2. Dorsalsiden er rund; kun paa de Steder, hvor Finnerne mødes, er der en fin Fure, Fig. 3.

Finnerne ere rudimentære, 0,081^{mm} brede men neppe saa lange og skjules fuldkommen af Kalkpladen. De sidde paa Dorsalfladen og Siderne afvexlende over for hinanden, Fig. 3; men Afvexlingen er meget utydelig, saa at det fra Ventralsiden ser ud, som om de sidde lige over for hinanden, Fig. 2. Fra det ene Par Finner til det andet er et Mellemrum af 15^{mm}, og over hver Finne er en Gruppe af Zooider, hvortil de før omtalte Zooiderækker støde.

Kalkpladen, der støtter og skjuler den rudimentære Finne, er foroven 1,23^{mm} bred; dens nederste Ende, der gaar over i Stokkens Sarcosoma, er kun 0,027^{mm} bred, Fig.. 4. Den bestaar af længere og kortere Kalkstave, hvoraf de yderste ere de længste og tykkeste, nemlig 2,5^{mm} lange og 0,019^{mm} brede nedimod den nederste Ende, der er smalere og noget tilspidset, Fig. 4, *a*. Kalkstavene ere bundne sammen ved en fast Bindevævsmembran, Fig. 4, *b*, men deres fritragende, lange Spidser ere ganske nøgne.

Hver Finne bærer 2 Polyper, der ved deres nederste Del ere sammenvoxede. De ere cylindriske, ikke retrak-

Dübenia borealis, n. sp.

Pl. II, fig. 1—7.

Of this sea-pen, only, what may be supposed to be the upper half portion was found, and this measures 50^{mm} in length.

The stalk is thin, erect, round, and poorly furnished with polyps; it's upper extremity is devoid of sarcosoma, for an extent of about 5^{mm} (fig. 1).

The ventral side is nearly flat, and, in the middle, has a furrow, which is deep at the point where a longitudinal zooidal series on each side surrounds the abutting fins (figs. 1. 2). The dorsal side is round, and only, at the points where the fins are met with, is there a slender furrow (fig. 3).

The fins are rudimentary, measuring 0.081^{mm} in breadth, and scarcely so much in length, and they are completely concealed by the calcareous plate. They are seated on the dorsal surface and the sides, alternately, opposite each other (fig. 3), but the alternation is so very indistinct, that from the ventral side, it appears as if they were placed right opposite each other (fig. 2). From the one pair of fins to the other, there is an interval of 15^{mm}, and above each fin, there is a group of zooids, upon which the previously mentioned series of zooids abut.

The calcareous plate which supports and conceals the rudimentary fin, is 1.23^{mm} broad, above; whilst the lower extremity, which passes over into the sarcosoma of the stalk, is only 0.027^{mm} broad (fig. 4). It consists, of longer or shorter calcareous rods, of which the external ones are the longest and thickest; viz. 2.5^{mm} in length and 0.019^{mm} in breadth, down towards the inferior extremity, which is narrower and somewhat acuminate (fig. 4, *a*). The calcareous rods are bound together by a firm connective-tissue membrane (fig. 4, *b*) but their free, long, projecting points are quite bare.

Each fin carries 2 polyps, which are concreted at their lower parts. They are cylindrieal, non-retractile,

tile, omtrent 4^{mm} lange med Tentaklerne, Fig. 4. I Kroppens Hud sees en enkelt Spikel, der er trekantet, 0,368^{mm} lang og 0,068^{mm} tyk mod begge Ender, men noget smalere paa Midten, Fig. 5, *a*. 6. Tentaklerne, omtrent 2^{mm} lange, ere forsynede med Pinnuler og have paa deres aborale Side en Række Spikler, der strække sig fra Tentakelens Grund til dens Spids. Disse Spikler ere trekantede, tilspidsede i begge Ender, 0,150^{mm} lange, 0,020^{mm} brede paa Midten, Fig. 5, *b*. 7.

Farven.

Stokken gulhvid, Sarcosomaet halvt gjennemsigtigt. De rudimentære Finner tilligemed den Membran, der omgiver Kalkpladen, gulhvid. Polypkroppen mørk kastaniebrun, Tentaklerne gulhvide med en intens brun Stribe paa Midten af den aborale Flade.

Findested.

Station 252. Vestfjorden syd for Skraaven. 170 Favne. Lerbund med lidt iblandet Smaasten.

Artskarakter.

Polypstokken tynd, rund, stiv. Finnerne staa vidt fra hverandre, bærende hver 2 Polyper. Polypkroppen har paa Midten en enkelt, tyk og lang Spikel. Kalkpladen skjuler ganske Finnen, har i Regelen 7 lange Spikler, hvoraf de yderste ere indtil 2,5^{mm} lange. Stokkens Farve, ligesom Finnernes, gulhvid. Polypkroppen mørk kastaniebrun. Tentaklerne gulhvide med en intens brun Sribe paa Midten af den aborale Flade.

Denne Søfjær nærmer sig med Hensyn til de faatallige Polyper, som hver Finne bærer, noget til *Dübenia abyssicola varietas smaragdina*[1]; men adskiller sig fra denne ikke alene ved Farven men fornemmelig derved, at Polypkroppen har kun en enkelt stor Spikel, imedens *Dübenia abyssicola varietas smaragdina* er paa hver Side af Polypkroppen forsynet med en Række smaa Spikler.

Kophobelemnon abyssorum, n. sp.

Tab. IV, Fig. 17—20.

Stokken er 69^{mm} høi og har Formen af en bred Kølle. Rachis er 25^{mm} lang, 11^{mm} bred paa Midten, hvorefter den

[1] Fauna littoralis norvegiæ, 3die Hefte, pag. 96, Tab. X, Fig. 7, 8. Bergen 1877.

and about 4^{mm} long, including the tentacles, (fig. 4). In the integument of the body, a single spicule is seen; this is triangular, 0.368^{mm} long, and 0.068^{mm} thick towards both extremities, but somewhat narrower at the middle (fig. 5, *a*. 6) The tentacles are about 2^{mm} long and are furnished with pinules, and on their aboral side have, a series of spiculæ, extending from the base of the tentacle to its point. These spiculæ are triangular, and acuminated at both extremities, and they measure 0.150^{mm} in length, and 0.020^{mm} in breadth, at the middle (figs. 5, *b*. 7).

Colour.

The stalk is yellowish-white. The sarcosoma is semi-translucent. The rudimentary fins, and also, the membrane which surrounds the calcareous plate, is yellowish-white. The body of the polyp, is dark chestnut-brown. The tentacles, yellowish-white, with a deep brown stripe in the middle of the aboral surface.

Habitat.

Station No. 252. Vestfjord, south of Skraaven. 170 fathoms. Clay bottom, mixed with gravel.

Specific Character.

The stalk of the polyp is thin, round, erect. The fins are placed wide apart from each other, and each carries 2 polyps. The body of the polyp, has a single, thick, long spicule in the middle. The calcareous plate quite conceals the fin, and usually, has 7 long spiculæ, of which, the external ones measure up to 2.5^{mm} in length. The colour of the stalk, and also, of the fins, is yellowish-white. The body of the polyps, dark chestnut-brown. The tentacles yellowish-white, with a deep brown stripe in the middle of the aboral surface.

In respect of the small number of polyps which each fin carries, this sea-pen approaches somewhat, to *Dübenia abyssicola, varietas smaragdina*[1]; but differs from it, not only in colour, but especially, in, that the polyp body, has only, one single large spicule, whilst *Dübenia abyssicola, varietas smaragdina* is furnished on each side of the polyp body, with a series of small spiculæ.

Kophobelemnon abyssorum, n. sp.

Pl. IV, figs. 17—20.

The stalk is 69^{mm} high, and is formed like a broad club. The rachis is 25^{mm} long, 11^{mm} broad at the middle,

[1] Fauna littoralis norvegiæ, 3die Hefte, pag. 96, Tab. X, fig. 7, 8. Bergen 1877.

smalner noget af opad mod den temmelig brede, afstumpede Ende og nedad mod Stilken, Fig. 17. 18.

Dorsalfladen er lidt hvælvet og paa dens nederste Del iagttages Enden af en noget dyb Fure, der strækker sig i en Bøining omtrent 20^{mm} langt nedover Stilken, Fig. 17. Ovenfor denne Fure udspringe Polyperne saaledes, at de danne 3 Længderækker. I den midterste Række er der 3 Polyper, hvoraf den mellemste staar lidt til Høire. Til Venstre sees 2 og til Høire 3 laterale Polyper. Under den nederste Midtpolyp, lidt til Siden, sees en uudviklet Polyp, og en lignende findes ogsaa under de høire Sidepolyper.

Dorsalfladen er besat med store, konisk fremspingende Zooider, som paa dens øverste Del staa meget tæt sammen, imedens de forøvrigt ere noget spredte og mangle ganske paa de aflange Felter, hvor Polyperne udspringe, Fig. 17. Disse Felter betegne egentlig den ydre Væg af Polypcellen, som er aflang, nedsænket i Sarcosomaet og skjuler ganske Polypen, naar den er indtrukken og danner da en aflang Fremstaaenhed med en stjerneformig Aabning paa dens øverste Del.

Ventralfladen har en dyb, temmelig bred Fure, der er nøgen i Bunden, hvor Axen skinner igjennem, men er til Siderne forsynet med Zooider, Fig. 18. Bugfuren er 30^{mm} lang, ophører 10^{mm} fra øverste Ende og strækker sig langt nedover Stilken. Den er ganske lidet krummet efter Længden og dens tykke Rande ere besatte med Zooider, Fig. 18.

Paa hele Ventralfladen sees Zooider, der paa de nederste $^2/_3$ Dele ere ordnede i 2—3 uregelmæssige Længderækker langs Bugfuren, imedens de paa den øverste Del indtage hele Fladen, Fig. 18, staa meget tæt sammen og støde til Dorsalfladen, saa at det øverste Parti af Rachis, der er frit for Polyper, faar et stærkt papilløst Udseende, Fig. 18.

Stilken er næsten rund, 44^{mm} lang og ender i en aflang Blære. De paa Rachis beskrevne Furer fortsættes nedover Stilken saavel paa Dorsal- som paa Ventralfladen indtil omtrent 25^{mm} fra Endeblæren, og paa hver af deres Sider sees en Række enkeltstaaende Zooider, der rage kun ganske lidet opover Fladen.

Polyperne er cylindriske, gjennemsigtige, 18—20^{mm} lange. Deres Krop er 8—10^{mm} lang med 8 ophøiede Linier, dannede af Spikler, som ligge pakkede paa hverandre i en Længderække og ere 0,357^{mm} lange, 0,018^{mm} brede samt takkede i begge Ender. Imellem disse Ribber er Huden forsynet med lignende Spikler; men her ligge de enkeltvis og have en skraa Retning. Tentaklerne ere 10—12^{mm} lange, have paa Midten af deres aborale Flade en langsgaaende Række store, trekantede Spikler, som ere 0,577^{mm} lange, 0,089^{mm} brede og takkede i Enderne. Den

whence, it becomes somewhat narrower, upwards, towards the rather broad, blunted extremity; and, downwards, towards the stem (fig. 17. 18).

The dorsal surface is a little arched; and on its inferior part, the extremity of a somewhat deep furrow is observed, extending in a curvature, about 20^{mm}, down along the stem (fig. 17). Above this furrow, the polyps project in such a manner, that they form 3 longitudinal series. In the middle series, there are 3 polyps, of which, the median one, is placed a little to the right. To the left, two, and to the right, three, lateral polyps are seen. Below the inferior median polyp, and a little to the side, an undeveloped polyp is seen, and a similar one is seen below the right lateral polyps.

The dorsal surface is beset, with large, conical, protuberant zooids, which upon its superior portion are situated very closely together, whilst, elsewhere, they are somewhat scattered, and are entirely devoid of the oblong areas where the polyps protrude (fig. 17). These areas, really, denote the outer wall of the cell of the polyp; this is oblong, and depressed in the sarcosoma, and quite conceals the polyp, when it is retracted; but it then forms an oblong protuberance, with a stellate aperture on the upper part.

The ventral surface has a deep, rather broad furrow, which is bare at the bottom, where the axis appears visible through it, but is furnished with zooids on it's sides (fig. 18). The ventral furrow is 30^{mm} long, and terminates 10^{mm} from the superior extremity, and extends far down the stem. It is quite slightly curved longitudinally; and it's thick margin is beset with zooids (fig. 18).

On the entire ventral surface, zooids are seen; which on the lower $^2/_3{}^{rd}$ parts, are arranged in 2—3 irregular, longitudinal series along the ventral furrow; whilst, upon the upper part, they occupy the whole surface, (fig. 18), and are placed very closely, together, and abut upon the dorsal surface, so, that the superior portion of the rachis, which is devoid of polyps, acquires a prominent papillous appearance (fig. 18).

The stem is almost round, and is 44^{mm} long, and terminates in an oblong vesicle. The furrows described as pertaining to the rachis, are continued down the stem, both along the dorsal and the ventral surface, until about 25^{mm} from the terminal vesicle; and on each of their sides, a series of isolated zooids is seen, which only project a very little beyond the surface.

The polyps are cylindrical and translucent, 18—20^{mm} long. Their body is 8—10^{mm} long, and has 8 elevated lines formed of spiculæ, which lie, packed upon each other in a longitudinal series, and measure 0.351^{mm} long, and 0.018^{mm} broad, and are aculeated at both the extremities. Between these ribs, the integument is furnished with similar spiculæ, but here, they are placed singly, and in a diagonal direction. The tentacles are 10—12^{mm} long, and have a longitudinal series of large triangular spiculæ, situated in the middle of their aboral surface; these are 0.577^{mm} long,

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1869. Richiardi. *Umbellularia grønlandica.* Monografia della Famiglia del Pennatularii, pag. 103.

1870. Gray. *Umbellula grønlandica.* Catalogue of Sea-Pens or Pennatularidæ, pag. 39.

1872. Kölliker. *Umbellularia grønlandica.* Anatomisch-systematische Beschreibung der Alcyonarien, pag. 381.

1874. Lindahl. *Umbellula encrinus. Umbellulu miniacea. Umbellula pallida.* Om Pennatulidslægtet *Umbellula.* Cuvier. Kungl. Svenska Vetenskaps Akademiens Handlingar, B. 13, No. 3.

1874. Kölliker. *Umbellula Lindahlii.* Die Pennatulide Umbellula und zwei neue Typen der Alcyonarien. Festschrift zur Feier des Fünfundzwansig-jährigen Bestehens der Physicalisch-Medicinischen Gesellschaft in Würzburg, pag. 11.

1878. Marenzeller. *Umbellula encrinus.* Die Coelenteraten, Echinodermen und Würmer der k. k. øst.-ung. Nordpol-Expedition. Denkschriften der kaiserlichen Akademie der Wissenschaften, 35 B., pag. 377.

1880. Kölliker. *Umbellula magniflora?* Report on the Scientific Results of the Voyage of H. M. S. Challenger during the Years 1873—76. Zoology, Vol. I, Part II. Report on the Pennatulida, pag. 24,Pl. XI, fig. 41—42.

Umbellula encrinus blev som bekjendt først funden af Grønlandsfareren Adrians 1753 paa 79° N. Br. og 80 engelske Mile fra Grønland paa en Dybde af 236 Favne. Han fandt 2 Exemplarer, som han lod tørre, og hvoraf det ene var 1785^{mm}, det andet 1287^{mm} langt. Det største Exemplar har Englænderen Ellis beskrevet under Navnet „Clusterpolype", og det andet, mindre er beskrevet af Tyskeren Christopher Mylius under Navn af „Zoophytum grønlandicum". Begge Exemplarer ere sporløst forsvundne, og Beskrivelserne ere, som man vel kan vide, yderst ufuldstændige.

Mere end hundrede Aar hengik, uden at denne høist mærkværdige Slægt gjenfandtes; først 1871 blev atter to Exemplarer, henhørende til denne Slægt, fundne af den svenske Expedition til Grønland og Newfoundland. Disse Exemplarer, der opbevares i Stockholms zoologiske Rigsmuseum, ere beskrevne af Dr. Josva Lindahl som to nye Arter, nemlig *Umbellula miniacea* og *pallida,* hvilke skulle være forskjellige fra *Umbellula encrinus.* Paa den østerrigs-ungarske Nordhavsexpedition i Aarene 1872—74 erholdtes et Exemplar af *Umbellula,* der blev tegnet af Julius Payer, og som i en formindsket Maalestok findes

1857. Herklots. *Umbellularia grønlandica.* Notices p. s. à l'étude des Polypiers nageurs ou Pennatulides.

1869. Richiardi. *Umbellularia grønlandica.* Monografia della Famiglia del Pennatularii, pag. 103.

1870. Gray. *Umbellula grønlandica.* Catalogue of Sea-Pens or Pennatularidæ, pag. 39.

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1874. Lindahl. *Umbellula encrinus. Umbellula miniacea. Umbellula pallida.* Om Pennatulidslægtet *Umbellula.* Cuvier. Kungl. Svenska Vetenskaps Akademiens Handlingar, B. 13, No. 3.

1874. Kölliker. *Umbellula Lindahlii.* Die Pennatulide Umbellula und zwei neue Typen der Alcyonarien. Festschrift zur Feier des Fünfundzwanzig-jährigen Bestehens der Physicalisch-Medicinischen Gesellschaft in Würzburg, pag. 11.

1878. Marenzeller. *Umbellula encrinus.* Die Coelenteraten, Echinodermen und Würmer der k. k. øst.-ung. Nordpol-Expedition. Denkschriften der kaiserlichen Akademie der Wissenschaften, 35 B., pag. 377.

1880. Kölliker. *Umbellula magniflora?* Report on the Scientific Results of the Voyage of H. M. S. „Challenger" during the years 1873—76. Zoology Vol. I, Part II. Report on the Pennatulida, pag. 24, Pl. XI, figs. 41—42.

Umbellula encrinus, was, as we know, first discovered by the Greenland voyager Adrians in 1753; in 97° N. L.; and 80 English miles from Greenland, at a deepth of 236 fathoms. He found two specimens, which he dried; and one of these was 1785^{mm} long, whilst, the other was 1287^{mm} long. The Englishman, Ellis, has described the largest specimen under the designation „Clusterpolype"; and the smaller specimen, is described by the German, Christopher Mylius, under the designation „Zoophytum grønlandicum". Both specimens have disappeared, without a trace of them being left; and, as may well be supposed, the descriptions of them are extremely incomplete.

More than a century elapsed, before this very remarkable genus was rediscovered. Not till 1871, were two specimens pertaining to this genus, again discovered, by the Swedish Expedition to Greenland and Newfoundland. These specimens are preserved in the National Zoological Museum at Stockholm; and are described by Dr. Josva Lindahl, as two new species, viz. *Umbellula miniacea*, and *pallida,* which were supposed to differ from *Umbellula encrinus.* During the Austro-Hungarian North Polar Expedition in 1872—74; one specimen of *Umbellula* was obtained, which was sketched by Julius Payer, and is to be found illustrated on a reduced scale, in his Journal of the

afbildet i hans Reisebeskrivelse.[1] Dr. Marenzeller[2] antager, ifølge Payers Tegning (selve Dyret blev tilbage paa det forulykkede Skib), det for sandsynligt, at dette Exemplar har været den ægte *Umbellula encrinus*; men nogen fuld Sikkerhed haves ikke. Stokkens Længde var 630^{mm}. Challenger-Expeditionen har i Aarene 1873—76 bragt frem i Dagen ikke mindre end 8 Arter af Slægten *Umbellula*, hvilke alle ere beskrevne af Professor Kölliker,[3] og hvoraf de 7 ere forskjellige fra *Umb. encrinus*, imedens den 8de, nemlig *Umb. magniflora*, efter alt at dømme synes at være identisk med den. Kølliker yttrer i saa Henseende Følgende: „The only specimen of this *Umbellula* brought home by the Challenger is in a very bad state of preservation; nevertheless it is of great interest, as it is the only known *Umbellula* which resembles the *Umbellula* of Ellis and Mylius so much, that it seems to be the same species, or at least to come very near it."

Den norske Nordhavsexpedition har paa sine Undersøgelsesreiser, foretagne i Aarene 1876—78, samlet 12 Exemplarer af Slægten *Umbellula* fra forskjellige Lokaliteter og i forskjellige Udviklingsstadier; men alle kunne, som vi senere hen skulle paavise, henføres til Ellis's & Mylius's Art, — og da vort Material har været temmelig righoldigt, have vi ogsaa kunnet sammenholde enkelte Exemplarer med Lindahls to Arter, samt med Köllikers *magniflora*. Af denne Sammenstillen fremgaar, at ogsaa disse 3 Arter maa identificeres med *Umbellula encrinus*, der efter dette faar en stor geografisk Udbredning.

Idet vi nu gaa over til at levere en Beskrivelse af hvert enkelt Exemplars Ydre for senere at fremstille den anatomisk-histologiske Bygning, der er fælles for dem alle, begynde vi med det mindste Exemplar og fortsætte numervis op til det største.

No. 1.

Tab. V, Fig. 1, 2 og 3.

Stokkens Længde fra den nederste Ende til Rachis er 140^{mm}; den er næsten rund, glat, noget vreden efter Længden og overtrukken med Slim. Den nederste, bulbøse Del har en afrundet, næsten tenformet Ende, er 35^{mm} i Udstrækning, omtrent 2^{mm} paa det Bredeste, lidt indkneben paa Midten, men udvider sig atter noget opad, hvor den opnaar en Bredde af 2^{mm}, og aftager nu efterhaanden

[1] Die østerreichisch-ungarische Nordpol-Expedition 1872—74. Wien 1876, pag. 279.

[2] Denkschriften der k. k. Akademie der Wissenschaften. Wien 1878, pag. 377.

[3] Report on the Scientific Results of the Voyage of H. M. S. Challenger, during the years 1873—76. Zoology, Vol. I, Part II. Report on the Pennatulida.

Voyage.[1] Dr. Marenzeller[2] assumes, from Payers illustration, (the specimen itself, was left behind on the wreck of the ship) that it is probable, that this specimen has been a genuine *Umbellula encrinus*; but complete certainty is unattainable. The length of the stalk was 630^{mm}. The „Challenger" Expedition in 1873—76, brought to light, no fewer than 8 species of the genus *Umbellula*, all of which are described by Professor Kölliker.[3] Of these, seven are different from *Umbellula encrinus*, whilst the eighth, viz. *Umbellula magniflora*, seems from all appearances to be identical with it. Kölliker states in this respect, as follows: „The only specimen of this *Umbellula*" „brought home by the „Challenger" is in a very bad" „state of preservation; nevertheless, it is of great interest," „as it is the only known *Umbellula* which resembles the" „*Umbellula* of Ellis and Mylius so much, that it seems to" „be the same species, or at least to come very near it."

The Norwegian North Atlantic Expedition, during the exploring voyages undertaken during the years 1876—78; obtained twelve specimens of the genus *Umbellula*, from different localities, and in various stages of development; but, as we shall show hereafter, all of them, can he assigned to Ellis' and Mylius' species; and, as the material at our command has been pretty abundant; we have also been enabled to compare individual specimens, with Lindahl's two species, and also with Kölliker's *magniflora*. From this comparison it appears, that these three species, may also be indentified with *Umbellula encrinus*; and it would seem, therefore, to have an extensive geographical distribution.

In now proceeding to give a description of the exterior of each individual specimen; in order, subsequently, to discuss the anatomo-histological structure which is common to them all; we commence with the smallest specimen, and proceed numerically, up to the largest one.

No. 1 specimen.

Pl. V, figs. 1, 2 and 3.

The length of the stalk, from the inferior extremity to the rachis, is 140^{mm}; it is almost round, smooth, somewhat twisted longitudinally, and enveloped with mucous. The inferior bulbous part, has a rounded, almost spindleformed, extremity, 35^{mm} in extent, and about 2^{mm} broad at the broadest part; slightly contracted at the middle; and then again expanding somewhat, upwards, where, it attains

[1] Die østerreichisch-ungarische Nordpol-Expedition 1872—74. Wien 1876, pag. 279.

[2] Denkschriften der k. k. Akademie der Wissenschaften. Wien 1878, pag. 377.

[3] Report on the Scientific Results of the Voyage of H. M. S. Challenger, during the years 1873—76. Zoology, Vol. I, Part II. Report on the Pennatulida.

i Tykkelse, indtil den opimod den øverste, udvidede Ende bliver kun 0,5^{mm} tyk, Fig. 1. Den øverste Del af Stokken er krumbøiet og i en Længde af 8^{mm} skedeformet udvidet langs Dorsalfladen, Fig. 1. 2. 3. Denne Udvidning er bredest, hvor den gaar over i Rachis — 2 til 3^{mm} — og aftager successivt nedover. Stilkens Sarcosoma er temmelig tyndt og halvt gjennemsigtigt overalt, naar undtages den bulbøse Del, hvor det er tykkere og opakt. Paa den øverste, skedeformige Udvidning sees enkelte Zooider, der staa som smaa, runde Perler med en lille Aabning paa Midten.

Rachis har baade en Side- og Længdekrumning, er 6^{mm} lang og omtrent 3^{mm} bred.

Dorsalfladen er næsten plan, temmelig smal og tæt besat med Zooider, Fig. 2, *a*. Ventralfladen er stærkt hvælvet, danner en Kjøl paa Midten, der er glat, Fig. 3, *a*, og til hver Side et lidet Skraaplan, som er tæt besat med Zooider, Fig. 3, *b*. Sidefladerne, der ere meget smale, optages af 2 lancetformige, noget ophøiede Zooidefelter, der strække sig op imellem Polyperne, Fig. 2, *b*, saaledes, at der paa hver Side er et Felt imellem 2 Polyper og et andet imellem en Polyp og Dorsalfladen. Disse Felter, der komme tydeligere frem og forøges i Antal, alt eftersom Dyret udvikler sig, og Polypernes Antal tiltager, ere vistnok de samme, som Mylius i sin Beskrivelse kalder Bægerets lancetformige Blade, og som gjenkjendes baade paa hans og Ellis's Afbildninger.

Rachis bærer 5 Polyper, af hvilke den ene danner en fuldstændig Endepolyp, der udspringer fra den øverste Spids af Rachis, Fig. 2, *c*. 3, *c*, og af de 4 øvrige udgaa to paa hver Side, dog nærmere Rygfladen, Fig. 2, *d*. 3, *d*, hvorved en udpræget bilateral Symetri kommer tilsyne. Endepolypens Krop er 5^{mm} lang og omtr. 2^{mm} bred; Tentaklerne næsten dobbelt saa lange. De 3 Sidepolypers Krop er næsten 7^{mm} lang og 2,5^{mm} bred; men den 4de har samme Størrelse som Endepolypen; Tentaklernes Forhold til Kroppen er det samme som hos Endepolypen. Polypernes Krop er cylindrisk, glat og har 8 temmelig brede Længdelinier, der antyde Insertionerne for Septa. Ved Grunden af Endopolypen, nærmest Dorsalfladen, sees en liden, knopformig Forhøining, der er en Polyp i Udvikling, Fig. 2, *e*.

Mundskiven er hvælvet, og i dens Midte sees en aflang Mundspalte, der er forsynet med 8 temmelig tykke, lancetformige Læber, som paa Midten af den indre Flade have en Fure.

Axen strækker sig fra Grunden af den bulbøse Del til Stokkens øverste Ende. Paa denne Vei indtager den Midten af Stokken op imod den øverste, krumbøiede, skedeformig udvidede Del, hvor den nærmer sig saa meget Ventralsiden, at det ser ud, som om den gaar ind i selve

a breadth of 2^{mm}; subsequently, gradually diminishing i thickness, until, the thickness towards the superior expanded extremity becomes reduced to only 0.5^{mm} (fig. 1). The superior part of the stalk is bent, and for about 8^{mm} of its length, is dilated in a sheath-form, along the dorsal surface (figs. 1. 2. 3). This dilation is widest, at the point where it passes over into the rachis — 2 to 3^{mm} wide — and becomes gradually narrower downwards. The sarcosoma of the stem is rather thin, and everywhere, semi-translucent, except at the bulbous part, where, it is thicker and opaque. On the superior sheath-formed dilation, a few zooids are visible, appearing like small round pearls, with a small aperture in the middle.

The rachis is curved, both longitudinally and laterally; and is 6^{mm} long and about 3^{mm} broad.

The dorsal surface is nearly flat; rather narrow, and closely beset with zooids (fig. 2, *a*). The ventral surface is sharply arched; and forms a ridge in the middle which is smooth (fig. 3, *a*), and on each of its sides, forms a small slope, which is closely beset with zooids (fig. 3, *b*). The lateral surfaces are very narrow; and are occupied by two lancet-formed, somewhat elevated, zooidal areas, which extend upwards between the polyps; (fig. 2, *b*) so, that on each side, there is an area between two polyps, and another area between a polyp and the dorsal surface. These polyp areas become more distinct, and numerous, according as the development of the animal proceeds, and the number of polyps increases; and they are no doubt the same, that Mylius in his description calls; the lancet-formed leaves of the chalice, and which may be recognised both in his and Ellis' illustrations.

The rachis carries five polyps; of these, one forms a complete terminal polyp which proceeds from the superior point of the rachis (figs. 2, *c*. 3, *c*). Of the remaining four polyps; two proceed from each side, but closer to the dorsal surface; (figs. 2, *d*. 3, *d*) giving rise to a distinct bilateral symmetry. The body of the terminal polyp is 5^{mm} long and about 2^{mm} broad and the tentacles are nearly twice as long. The body of the three lateral polyps, is nearly 7^{mm} long, and 2.5^{mm} broad; but the body of the fourth polyp, is of the same size as that of the terminal polyp. The proportion between the tentacles and the body, is the same as in the terminal polyp. The body of the polyps is cylindric, and smooth, and it has 8 rather broad longitudinal lines, denoting the insertions for septa. At the base of the terminal polyp; next to the dorsal surface; a small knob-formed protuberance is observed; this is a polyp in process of development (fig. 2, *e*).

The oral disk is arcuate, and in its middle, there is an oblong oral fissure; furnished with 8, rather thick, lancet-formed labiæ, which, in the middle of the interior surface, have a furrow.

The axis extends, from the base of the bulbous part, to the superior extremity of the stalk. In this course; it occupies the middle of the stalk, up towards the superior, bent, sheath-formed, dilated part, where, it approaches so close to the ventral surface; that it appears, as if it passes

Ventralkanalen, kun dækket af det yderst tynde Coenenchym, hvilket dog ikke er Tilfældet. Naar den nærmer sig Rachis, gjør den en Bøining imod Dorsalfladen for strax derefter at vende tilbage til Ventralfladen, hvis Midte den følger lige til Endepolypens Grund; her gjør den atter en Bøining mod Dorsalfladen for derfra at bøie sig S-formigt op imod Ventralfladen, hvor den ender i Ventralkanalen, Fig. 4. Nedentil ender den i en lille Hage. Axen er tykkest i den øverste Del af det bulbøse Parti; den er firkantet med afrundede Kanter og 4 dybe Furer, hvoraf Ventral- og Dorsalfuren er dybest og dreiet efter Længden, saa at Furerne ikke danne rette Linier. Denne Dreining tiltager betydeligt op imod og i selve Rachis. Axen er omgiven af en tyk, membranøs Skede, hvorpaa de 4 Septa fæste sig.

No. 2.

Tab. V, Fig. 5. 6, 7.

Stilken er temmelig opretstaaende, dens hele Længde fra den nederste Ende til Rachis er 150^{mm} lang; den er lidt vreden efter Længden, overtrukken med Slim, og dens øverste Halvdel er næsten rund, imedens den nederste, bulbøse Del, som er 48^{mm} lang, 4—5^{mm} bred, er noget indkneben paa Midten, lidt fladtrykt paa Ventral- og Dorsalfladen og ender i en ovoidformet Skraaflade, der løber ud i en Spids, Fig. 5, *a*. Stilken aftager i Tykkelse successivt op imod den øverste, udvidede Del, hvor den kun er 1^{mm} tyk. Den skedeformige Udvidning er 7^{mm} lang men meget smal; kun der, hvor den gaar over i Rachis, indtager den en Bredde af henved 2^{mm}.

Rachis er noget dreiet til Siden, temmelig opsvulmet, 10^{mm} lang, paa Midten omtr. 6^{mm} bred og ender lidt afstumpet, Fig. 5. 7; den bærer 7 udviklede Polyper og 1 embryonal. Ventralfladen er konvex, har en Sidedreining, er bred og forstørstedelen besat med Zooider, — kun paa dens nederste Halvdel sees en Midtlinie, hvor Axen, der er nøgen, skinner gjennem, Fig. 7, *a*. Dorsalfladen er smal, lidt konkav, dreiet til Siden og overalt besat med Zooider, der over Ventralfladens Sider danner lancetformede Felter imellem Polyperne, saa at egentlig hele Rachis er tæt besat med Zooider, naar undtages den før omtalte nøgne Stribe paa Ventralfladen, Fig. 6, *a*. Sidefladerne, eller maaske rettere Siderandene, ere yderst smale og danne Grændsen imellem Dorsal- og Ventralfladen.

Terminalpolypen sidder lige i Enden af Rachis, og ved første Øiekast ser det ud, som om den udsprang fra

into the ventral duct itself; covered, only, by the extremely thin sarcosoma; this is, however, not the case. As it approaches the rachis, it curves towards the dorsal surface, turning, immediately afterwards, back to the ventral surface, and following along its mesial line, right to the base of the terminal polyp. It, here, forms another curve towards the dorsal surface, and thence, curves in form of an S, up towards the ventral surface; where, it terminates in the ventral canal (fig. 4). It terminates beneath, in a small hook. The axis is thickest in the superior part of the bulbous portion; it is quadrangular, with rounded edges, and has four deep grooves; of which, the ventral and dorsal grooves are the deepest, and are longitudinally twisted; so that the furrows do not form straight lines. This twisting increases, considerably, up towards, and also, in the rachis itself. The axis is surrounded by a thick membranous sheath, upon which, the four septa are secured.

No. 2 specimen.

Pl. V, figs. 5. 6. 7.

The stem is tolerably vertical, and its whole length, from the inferior extremity to the rachis, is 150^{mm}. It is slightly twisted longitudinally, and is enveloped by mucous; the superior half portion is almost round; whilst the inferior bulbous portion; which is 48^{mm} long, and 4—5^{mm} broad; is somewhat constricted at the middle, slightly flattened, on the ventral and dorsal surfaces; and terminates in an ovate, sloping surface, which projects in a point (fig. 5, *a*). The stem diminishes gradually in thickness, up towards the superior dilated part; at which point, it is only 1^{mm} thick. The sheath-formed dilation is 7^{mm} long, but very narrow; only attaining a breadth of about 2^{mm}, at the point where it passes over into the rachis.

The rachis is somewhat laterally twisted, and is considerably swollen. It is 10^{mm} long, and about 6^{mm} broad at the middle; and its termination is somewhat truncated (figs. 5. 7). It carries seven fully developed polyps, and one embryonal polyp. The ventral surface is convex, and has a lateral twist; it is broad, and for the greater part, is beset with zooids. Only on the inferior half portion, is a mesial line observed; where the axis; which is bare; becomes visible, (fig. 7, *a*). The dorsal surface is narrow, and somewhat concave, it is twisted laterally, and is everywhere beset with zooids; which, on the margins of the ventral surface, form lancet-formed areas between the polyps; so that, in reality, the entire rachis is closely beset with zooids; with exception, of the bare stripe on the ventral surface previously spoken of (fig. 6, *a*). The lateral surfaces, or perhaps more correctly, the lateral margins, are extremely narrow, and form the border between the dorsal and ventral surfaces.

The terminal polyp is situated exactly at the extremity of the rachis; and at first sight, appears, as if it pro-

selve Spidsen, hvilket dog ikke er Tilfældet, thi den tager sit Udspring lidt under denne paa Dorsalfladen, Fig. 6, *a**. 7, *b*. Polypkroppen er 8^{mm} lang, 2^{mm} bred; Tentaklerne 9^{mm} lange. Paa hver Side, strax nedenfor (under) Endepolypen, paa Dorsalfladen udspringe 2 Polyper, hvoraf de til høire Side, Fig. 6, *b*, *b*. 7, *c*, *c*, ere 14^{mm} lange, 3^{mm} brede, med 14^{mm} lange Tentakler; de til venstre, Fig. 6, *c*, *c*. 7, *d*, *d*, ere 11—12^{mm} lange, Tentaklerne 14^{mm}. Tæt under Endepolypen, omtrent paa Midten af Dorsalfladen, staar 2 Polyper, af hvilke den nederste er 6^{mm} lang, 1^{mm} bred, med 7^{mm} lange Tentakler, Fig. 6, *d*, imedens den øverste, nærmest Endepolypen, er 5^{mm} lang, med 7^{mm} lange Tentakler, Fig. 6, *e*. 7, *f*.

Alle Polyper have en cylindrisk, glat Krop, paa hvis udvendige Flade sees 8 hvide Linier, som ere Insertionsstederne for Septa. Igjennem Kropshuden sees det lange, stærkt foldede Svælg. Mundskiven er hvælvet, og i dens Midte er Mundaabningen, der danner en Tverspalte med 8 lancetformede Læber.

Tentaklerne ere næsten cylindriske, paa den adorale Flade tæt besat med yderst fine Papiller og forsynede paa hver Rand med koniske Pinnuler, der staa uregelmæssigt over for hverandre og have forskjellig Størrelse, saaledes at imellem to store staa sædvanligvis 1, stundom 2 meget smaa.

Axen er som hos No. 1.

No. 3.

Tab. V, Fig. 8. 9. Tab. VI, Fig. 10.

Stilken, der paa den øverste Trediedel er næsten S-formigt bøiet, har en Længde af 160^{mm} fra den nederste Ende til Rachis. Den nederste, bulbøse Del, som er noget fladtrykt paa Ventral- og Dorsalfladen, er 48^{mm} lang, noget indkneben paa Midten, 4^{mm} bred foroven, og dens nederste Ende danner en ægformet Skraaflade, der løber ud i en Spids, Fig. 8; — hverken paa denne eller Skraafladen opdagedes nogen Pore. Stilkens øverste Del er stærkt krummet og skedeformigt udvidet imod Rachis. Denne Udvidning er 7^{mm} lang, 2,5^{mm} bred øverst oppe, hvor der sees endel Zooider.

Rachis er stærkt, næsten S-formigt bøiet efter Længden, noget dreiet til Siden, 8^{mm} lang, 4^{mm} bred, og har en afrundet, fri Ende, Fig. 9, *a*. Ventralfladen er konvex og krummet S-formigt; paa Midten af dens nederste Del, der er glat og nøgen, skinner Axen igjennem, imedens den øverste Del og Siderne ere tæt besatte med Zooider, Fig. 9, *b*. Dorsalfladen er omtrent halvt saa lang som Ventral-

ceeded from the point itself; but that is, however, not the case, becanse it originates a little below the point, on the dorsal surface (figs. 6, *a**. 7, *b*). The body of the polyp is 8^{mm} long, and 2^{mm} broad, and the tentacles are 9^{mm} long. On each side, immediately below (underneath) the terminal polyp on the dorsal surface; 2 polyps proceed, of which, those to the right side (figs. 6, *b*, *b*. 7, *c*, *c*), are 14^{mm} long, and 3^{mm} broad, with 14^{mm} long tentacles; and those to the left side, (fig. 6, *c*, *c*. 7, *d*, *d*) are 11—12^{mm} long, with 14^{mm} long tentacles. Close under the terminal polyp, and about the middle of the dorsal surface; 2 polyps are situated, of which, the lower one is 6^{mm} long, and 1^{mm} broad, with 7^{mm} long tentacles (fig. 6, *d*); whilst the other, upper one, next the terminal polyp, is 5^{mm} long, with 7^{mm} long tentacles (figs. 6, *e*. 7, *f*).

All the polyps, have a cylindric, smooth body; on the exterior surface of which, 8 white lines are visible; these are the points of insertion for septa. Through the integument of the body, the long, numerously folded gullet is seen. The oral disk is arched; and in its middle; the oral aperture occurs, and forms a transverse fissure, having 8 lancet formed labiæ.

The tentacles are nearly cylindric; and on the adoral surface, are closely beset with extremely minute papillæ; and are furnished on each margin, with conical pinnules, situated irregularly, opposite each other; these are of varying size, so that in general, between two large, 1, and occasionally 2, very small ones, are placed.

The axis is like that of No. 1 specimen.

No. 3 specimen.

Pl. V, figs. 8. 9. Pl. VI, fig. 10.

The stem is curved on the superior third part, in nearly S-form; and, its length is 160^{mm} from the inferior extremity to the rachis. The inferior bulbous part; which is somewhat flattened on the ventral and dorsal surface, is 48^{mm} long; is somewhat constricted at the middle; and is 4^{mm} broad above. It's inferior extremity forms an ovate sloping surface, which projects in a point. (Pl. V, fig. 8). Neither upon it, nor on the sloping surface, were any pores detected. The superior part of the stem is strongly bent; and is dilated in sheath-form, towards the rachis. This dilation is 7^{mm} long, and 2.5^{mm} broad, at the superior termination; at which point, a number of zooids are visible.

The rachis is strongly bent, longitudinally; nearly in S-form; and is somewhat twisted laterally. It is 8^{mm} long, and 4^{mm} broad, and has a rounded free extremity (Pl. V, fig. 9, *a*). The ventral surface is convex, and bent in the form of an S. In the middle of its inferior part; which is smooth, and bare; the axis appears visible; whilst, the superior part, and the sides, are closely beset

fladen, temmelig smal og lidt konkav, tæt besat med Zooider, der strække sig lancetformigt imellem Polyperne mod Ventralfladen, Fig. 10, *a*. Sidefladerne ere næsten imaginære.

Rachis bærer 7 udviklede Polyper og 1 embryonal. Terminalpolypen sidder midt paa Dorsalfladen, noget under Enden af Rachis, Fig. 9, *b*. 10, *b**, dens Krop er 7^{mm} lang, 3^{mm} bred; Tentaklerne ere lidt længere end Kroppen. Til hver Side af Terminalpolypen, paa Rygfladen, udspringe 2 Polyper, der ere 10^{mm} lange, 4^{mm} brede, med 15^{mm} lange Tentakler, Fig. 9, *c*. 10, *c*. Lige under Terminalpolypen, men lidt til høire Side af Rygfladen, sidde to mindre Polyper, den ene nedenfor den anden. Disse Polyper ere 7^{mm} lange, 3^{mm} brede; Tentaklerne lidt længere end Kroppen, Tab. V, Fig. 9, *d*. Tab. VI, Fig. 10, *d*. Ved Grunden af Terminalpolypen sees en liden, rund, knopformig Forhøining med en liden Aabning i Midten — en Polyp i Udvikling, Fig. 10, *e*. En lignende Knop, men noget større, iagttages imellem den nederste af de 2 smaa Polyper og venstre Sidepolyp.

Dorsalfladen af Rachis er saa fordreiet og kort, at neppe 3^{mm}s Længde kan sees, og fra dens Sider strække sig lancetformede Zooidefelter imellem Polyperne uden at gaa op paa disse. Af saadanne Felter er der 2 paa venstre og 1 paa høire Side.

Polyperne ere ligesom paa de 2 foregaaende kontraktile, udspringe umiddelbart fra Rachis, have en cylindrisk, glat Krop, paa hvis udvendige Flade sees 8 Længde linier, som angive Insertionsstederne for Septa. Det lange, foldede Svælg skinner igjennem Kropsvæggen.

Tentaklerne, Mundskiven, Munden og Læberne som hos No. 1 og 2. Axen ligesaa.

Den bilaterale Symetri, som vi fandt saa stærkt udpræget hos No. 1, er mindre fremtrædende hos No. 2 og endnu mindre hos No. 3, hvor det endog er noget vanskeligt at paavise den, da Rachis er saa fordreiet og udvidet i Bredden, ja vi kunne gjerne sige saa uformelig, at det kun med Møie lader sig gjøre at ordne nogenlunde Polypernes Stilling.

with zooids (Pl. V, fig. 9, *b*). The dorsal surface is, about half as long as the ventral surface; rather narrow, and somewhat concave; and closely beset with zooids, which extend themselves, in lancet form, between the polyps, towards the ventral surface (Pl. VI, fig. 10, *a*). The lateral surfaces are almost imaginary.

The rachis carries, 7 fully developed polyps, and one embryonal polyp. The terminal polyp, is situated, in the middle of the dorsal surface, a little below the extremity of the rachis (Pl. V, fig. 9, *b**, Pl. VI, 10, *b*). It's body is 7^{mm} long, and 3^{mm} broad. The tentacles are a little longer than the body. At each side of the terminal polyp, upon the dorsal surface, 2 polyps proceed; these are 10^{mm} long, and 4^{mm} broad, with 15^{mm} long tentacles (Pl. V, fig. 9, *c*. Pl. VI, 10, *c*). Just beneath the terminal polyp, but, a little to the right side of the dorsal surface; 2 small polyps are situated, one placed below the other. These polyps are 7^{mm} long, and 3^{mm} broad, and the tentacles are somewhat longer than the body (Pl. V, fig. 9, *d*. Pl. VI, 10, *d*). At the base of the terminal polyp, a small, round, knob-formed protuberance is seen; having a small aperture in the middle; this is a polyp in process of development (Pl. VI, fig. 10, *e*). A similar knob, but somewhat larger, is observed between the lowest of the two small polyps, and the left lateral polyp.

The dorsal surface of the rachis is so twisted, and short, that barely 3^{mm} of its length is visible; and from its sides, lancet formed zooidal areas extend themselves between the polyps, without, however, interfering with these. There are two such zooidal areas on the left side, and one on the right side.

The polyps are, as was also the case, with the two previous specimens, contractile; and proceed immediately from the rachis. They have a cylindric, smooth body, upon whose exterior surface, 8 longitudinal lines are seen, denoting the points of insertion for septa. The long, folded, gullet, appears visible through the wall of the body.

The tentacles, oral disk, oral aperture, and labiæ, are similar to these parts in No. 1 and 2 specimens. The axis is also similar.

The bilateral arrangement which is found so distinctly marked in No. 1 specimen, is less prominent in No. 2 specimen, and still less, in No. 3 specimen; where, it is, even, somewhat difficult to point it out, owing to the rachis being so twisted and expanded in breadth; indeed, we may say, it is so shapeless, that it is, only, with difficulty, that the position of the polyps, can be in any measure defined.

No. 4.

Tab. VI, Fig. 11. 12. 13. 14.

Stilken, der paa den øverste Trediedel danner en langstrakt Bue, er noget dreiet efter Længdeaxen, 184^{mm} lang fra Grunden til Rachis. Den nedre, bulbøse Del, som er 50^{mm} lang, paa Midten 2,5^{mm} og paa dens øverste Parti 5^{mm} bred, samt noget fladtrykt paa Ventral- og Dorsalfladen, ender i en ægformet, 4^{mm} bred Skraaflade, der løber ud i en Spids, Fig. 11. Tyndest er Stilken op imod den øverste, skedeformigt udvidede Del, som er stærkt bøiet, 12^{mm} lang, 2,5^{mm} bred, hvor den gaar over i Rachis. Denne er 7^{mm} lang, 5,5^{mm} bred, men smalner successivt af op imod Enden, Fig. 12.

Ventralfladen er stærkt konvex, noget dreiet til Siden og har paa Midten en nøgen, glat Længdelinie, hvor Axen skinner igjennem, men er forresten tæt besat med Zooider, Fig. 12, *a*.

Dorsalfladen er lidt konkav, ikke meget bred og tæt besat med Zooider, der udbrede sig imellem Polyperne, hvor de danne de tidligere omtalte Zooidefelter, af hvilke der ere to paa hver Side, Fig. 13, *a*.

Sidefladerne ere her mere udviklede end paa de 3 foregaaende Exemplarer og ere ligeledes besatte med Zooider, saa at Rachis, naar undtages den omtalte Midtlinie paa Ventralfladen, er ganske indtagen af Zooider.

Rachis bærer 8 udviklede Polyper og 1 uudviklet. Terminalpolypen sidder paa Enden af Rachis; den er 7^{mm} lang, 3^{mm} bred; Tentaklerne omtrent 10^{mm} lange, Fig. 12, *b*. 13, *b*. 14, *b*. Lige under Terminalpolypen sidde ved Siden af hinanden paa Midten af Dorsalfladen 2 smaa Polyper, hvis Krop er 4^{mm} lang med lidt kortere Tentakler, Fig. 13, *c*. 14, *c*. Nedenfor disse to smaa Polyper, ligeledes midt paa Dorsalfladen, staar en Polyp, der er 8^{mm} lang, 2^{mm} bred, med Tentakler lidt længere end Kroppen, Fig. 13, *d*. 14, *d*. Paa hver Side af Dorsalpolyperne udgaa 2 Polyper, hvoraf de 2, der staa nærmest Dorsalsiden, ere 10^{mm} lange, 4^{mm} tykke, med 12^{mm} lange Tentakler, Fig. 14, *e*, imedens de øvrige 2, der staa lige paa Siden, nærmere Ventralfladen, ere 12^{mm} lange, 4^{mm} brede med 14—16^{mm} lange Tentakler, Fig. 12, *c*. 14, *f*. Under Endepolypen, men noget til høire Side henimod Ventralfladen, sees en liden, konisk Forhøining, der er en Polyp i Udvikling.

Rachis er paa dette Exemplar ikke saa stærkt fordreiet som paa det foregaaende; den bilaterale Symetri er heller ikke saa vanskelig at finde sig tilrette i, som Tilfældet var med No. 3.

No. 4 specimen.

Pl. VI, figs. 11. 12. 13. 14.

The stem, on its superior third part, forms an elongated arc, somewhat twisted longitudinally, and is 184^{mm} long, from the base to the rachis. The inferior bulbous portion, is 50^{mm} long, 2.5^{mm} broad at the middle, and 5^{mm} broad at the superior part, and is somewhat flattened on the ventral and dorsal surfaces. It terminates in an ovate sloping surface, having a breadth of 4^{mm}; and projecting in a point (fig. 11). The stem is thinnest, up towards the superior, sheath-formed, dilated part; this is sharply curved, and has a length of 12^{mm}, and a breadth of 2.5^{mm}, at the point where it passes over into the rachis. The rachis is 7^{mm} long, and 5.5^{mm} broad, but becomes gradually narrower towards the extremity (fig. 12).

The ventral surface is sharply convex, and is somewhat twisted laterally; in its middle, there occurs a smooth longitudinal line, through which the axis becomes visible; but, otherwise, it is closely beset with zooids (fig. 12, *a*).

The dorsal surface is somewhat concave; not very broad; and is closely beset with zooids, which spread themselves between the polyps; forming thus, the previously mentioned zooidal areas, of which, there are two on each side (fig. 13, *a*).

The lateral surfaces in this specimen, are more developed than in the three previous specimens; and, are also covered with zooids, so, that the rachis is entirely covered with zooids, except, the mesial line of the ventral surface already spoken of.

The rachis carries, 8 fully developed polyps, and 1 undeveloped polyp. The terminal polyp is situated on the extremity of the rachis, and is 7^{mm} long, and 3^{mm} broad. The tentacles are about 10^{mm} long (figs. 12, *b*. 13, *b*. 14, *b*). Just below the terminal polyp, 2 small polyps are situated alongside each other, in the middle of the dorsal surface. Their body is 4^{mm} long, and the tentacles are somewhat shorter (fig. 13, *c*. 14, *c*). Beneath these two small polyps, and, also, in the middle of the dorsal snrface, there stands a polyp, which is 8^{mm} long, and 2^{mm} broad, with tentacles somewhat longer than the body (figs. 13, *d*. 14, *d*). On each side of the dorsal polyps, two polyps proceed, of which, the two situated next to the dorsal side, are 10^{mm} long, and 4^{mm} thick, and have tentacles 12^{mm} long; (fig. 14, *e*) whilst, the other two; which are situated exactly on the side, nearer to the ventral surface; are 12^{mm} long, and 4^{mm} broad, with tentacles 14—16^{mm} long (fig. 12, *c*. 14, *f*). Below the terminal polyp, but somewhat to the right side, towards the ventral surface; a small conical protuberance is seen; this is a polyp in process of development.

In this specimen, the rachis is not so strongly twisted as in the previous ones. The bilateral arrangement, is, also, not so difficult to trace out as is the case in No. 3 specimen.

Polyperne have fuldstændigt den samme Karakter som de 3 forhen beskrevne Exemplarer. Kalkaxen ligesaa.

Paa disse 4 Exemplarer, der ere fundne paa samme Lokalitet, er Farven den samme. Den bulbøse Del er brunlig, spillende lidt i det Violette. Stilken bleg gulbrun. Rachis som Bulbus. Polypernes Krop violet-brunlig med mørkebrune Længdestriber. Tentaklerne paa den aborale Flade brungule med et violet Anstrøg; paa den nederste Halvdel af den adorale Flade smuk kastaniebrune. Mundskiven lys brungul. Læberne kastaniebrune. Tab. IX, Fig. 64.

Findested.

Station 362.

No. 5.

Tab. VI, Fig. 15. 16. Tab. VII, Fig. 20. 21.

Stilken, der paa den øverste Trediedel danner en udstrakt S-formet Bue, er overtrukken med Slim og 580^{mm} lang fra Grunden til Rachis. Den nederste, bulbøse Del er 95^{mm} lang, indkneben paa Midten, hvor den er 5^{mm} bred; i det øverste Parti opnaar den en Tykkelse af 6^{mm} og i det nederste af 7^{mm}, hvilket sidste ender i en oval Skraaflade, som løber ud i en Spids, Fig. 20 ^{b}. Fra den bulbøse Del, der er fladtrykt mod Dorsal- og Ventralfladen og uigjennemsigtig, bliver Stilken alt smalere og smalere, dreier sig efter Længden og antager en rund Form, indtil den 45^{mm} fra Rachis, hvor den knapt er 2^{mm} tyk, begynder at udvide sig skedeformigt og bøier sig stærkt op til Rachis, i hvilken den gaar over og opnaar her en Bredde af 5^{mm}, Fig. 15. 20 ^{a}.

Rachis er 20^{mm} lang og dreiet til Siden; den udvider sig bægerformet i en Høide af omtrent 12^{mm}, hvor den antager en Bredde af 10^{mm}, Fig. 15, *a*, men smalner nu hurtigt af, saa at den i dens afrundede Ende kun er 4^{mm} tyk, Fig. 15, *b*.

Ventralfladen er næsten plan, lidt konkav opimod Enden; den er overalt tæt besat med Zooider, der dog staa tættest til Siderne, imedens Axen skinner igjennem paa Midtpartiet, hvor Zooiderne ere meget spredte, Fig. 15, *c*.

Dorsalfladen er lidt hvælvet, næsten horizontal, omtrent 5^{mm} bred, tæt besat med Zooider, og fra den forlænge sig imellem Polyperne 6 lancetformige Zooidefelter, der strække sig udover Siderne, som ere næsten flade

The polyps have exactly the same characteristics as in the three previously described specimens. The same may be said of the calcareous axis.

In these four specimens; which were found in the same locality; the colour is the same. The bulbous portion is brownish, with a tendency to pass into violet colour. The stem is pale yellow-brown. The rachis is of the same colour as the bulb. The body of the polyps is brownish violet, with dark brown longitudinal stripes. The tentacles on the aboral surface, are brownish yellow, with a violet tinge. The lower half portion of the adoral surface, has a beautiful chestnut brown colour. The oral disk is light brownish yellow. The labiæ are chestnut brown colour. Pl. IX, Fig. 64.

Habitat.

Station No. 362.

No. 5 specimen.

Pl. VI, figs. 15. 16. Pl. VII, figs. 20. 21.

The stem, forms in its superior third part, an elongated S-formed arc, and is enveloped by mucous; and it measures 580^{mm} in length from the base to the rachis. The inferior bulbous portion, is 95^{mm} long, and is constricted at the middle, at which point, it has a breadth of 5^{mm}, whilst its superior portion attains a breath of 6^{mm}, and the inferior portion a breadth of 7^{mm}. This inferior portion terminates in an ovate sloping surface, which projects in a point (Pl. VII, fig. 20 ^{b}). From the bulbous part, which is flattened towards the dorsal and ventral surfaces, and is, also, opaque; the stem becomes narrower and narrower, and twists itself longitudinally; assuming a round form up to a point about 45^{mm} from the rachis, where, it is barely 2^{mm} thick, and here, it begins to dilate in sheath-form, and curves sharply up to the rachis, into which it passes over, and at this point attains a breadth of 5^{mm} (Pl. VI, fig. 15. Pl. VII, fig. 20 ^{a}).

The rachis is 20^{mm} long, and is twisted laterally. It dilates in a chalice form for a height of about 12^{mm}, where, it assumes a breadth of 10^{mm} (Pl. VI, fig. 15, *a*), but then diminishes, rapidly, in breadth, so that, at the rounded extremity, it is only 4^{mm} thick (Pl. VI, fig. 15, *b*).

The ventral surface is almost flat, and somewhat concave towards the extremity. It is, everywhere, closely beset with zooids, which, however, are more compactly placed towards the sides; whilst, the axis appears visible in the mesial part; where, the zooids are much dispersed (Pl. VI, fig. 15, *c*).

The dorsal surface is somewhat arched; is nearly horizontal; and about 5^{mm} broad. It is closely beset with zooids; and, from it, 6 lancet-formed zooidal areas proceed, prolonging themselves between the polyps; and, extending

og omtrent af samme Bredde som Dorsalfladen, Fig. 20^a, *a*. Lader man denne gaa i et med Sidefladerne, saa faar man et trekantet Spatium (tresidigt Prisma), hvorfra de 13 udviklede Polyper tage deres Udspring, Fig. 16.

Terminalpolypen udgaar fra Enden af Rachis, dog nærmere Dorsalfladen. Dens Krop er 12^{mm} lang, 4^{mm} bred; Tentaklerne 25^{mm} lange, Fig. 15, *d*. Fig. 16, 1* 21, *a*. Omtrent 3^{mm} fra Endepolypen, men midt paa Dorsalfladen, staar en Polyp, hvis Krop er 15^{mm} lang, 3^{mm} bred, Tentaklerne 20^{mm} lange, Fig. 21, *b*; i en lignende Afstand fra denne udspringer ligeledes midt paa Rygfladen en Polyp, der er 18^{mm} lang, 14^{mm} bred, med 16^{mm} lange Tentakler, Fig. 21, *c*. Disse 3 Polyper indtage i en lidt paaskraas opadgaaende Linie Midtpartiet af Rachis, saaledes at Endepolypen staar høiest, Fig. 16, 1. Imellem Endepolypen og den midterste af de 3 nysbeskrevne Polyper, iagttages paa hver Side 2 Polyper, hvis Krop er 16^{mm} lang, 4^{mm} bred, med 16—18^{mm} lange Tentakler (dorsal-laterale Polyper), Fig. 16, 2, 2. 21, *d, d*. Udenom disse Polyper, eller rettere til hver Side men noget nedenfor, udspringe 3 Polyper (laterale Polyper), der ere 30^{mm} lange, 6^{mm} brede, Tentaklerne 45^{mm} lange, Fig. 16, 3, 3, 3. 21, *e, e, e*. Imellem Endepolypen og en af de mindre Polyper til Høire sees en konisk Fremstaaenhed med en liden Aabning paa Spidsen (en begyndende Polyp). Polyperne indtage her en temmelig fremtrædende bilateral symetrisk Stilling paa Rachis, hvilket alene efter Habitus at dømme ikke synes at være Tilfældet; thi Polypgruppen, der er hængende paa Stilken, har Udseende af en rund Dusk, Fig. 20. Det er først, naar Polyperne omhyggelig lægges ud fra hverandre, at Symetrien kommer ret tilsyne. Terminalpolypen med de to nedenfor denne, men i lige Linie staaende Polyper, danner Dorsalfladens Centrum; lidt til hver Side af disse, men endnu paa Dorfladen, vise sig 2 Polyper, og fra hver af de laterale Sider udspringe 3 store Polyper, der ganske skjule de 5 indre Polyper fra Siderne, imedens disse mod Dorsal- og Ventralfladen skjules af Endepolypen og den diametral modsatte Dorsalpolyp. Her er altsaa, om man saa vil, en ydre og indre Række Polyper paa hver Side af de 3 centrale Polyper, Fig. 16.

Polyperne ere cylindriske, næsten lige tykke overalt, — dog ere de ved deres Udspring noget smalere end paa Midten, ligesom den øverste Del mod Tentakelranden er lidt udvidet. Paa Kroppens ydre Flade sees 8 brungule Længdelinier, der antyde Insertionerne for de 8 Septa, Fig. 20^a. Tentaklerne ere cylindriske, lidt fladtrykte paa den nederste Halvdel af den adorale Flade, og paa hver

out over the lateral surfaces; these are almost flat, and have a breadth, about the same as that of the dorsal surface (Pl. VII, fig. 20^a, *a*). If the dorsal surface is continued into the lateral surfaces, we obtain a triangular spatium (trilateral prism), in which the 13 developed polyps have their origin (Pl. VI, fig. 16).

The terminal polyp proceeds from the extremity of the rachis, but closer to the dorsal surface. The body is 12^{mm} long, and 4^{mm} broad and the tentacles are 25^{mm} long (Pl. VI, figs. 15, *d*. 16, 1* Pl. VII, fig. 21, *a*). About 3^{mm} from the terminal polyp; but in the middle of the dorsal surface; a polyp is situated, whose body is 15^{mm} long, and 3^{mm} broad, and the tentacles are 20^{mm} long (Pl. VII, fig. 21, *b*). At a similar distance from that polyp; and, also, in the middle of the dorsal surface; another polyp occurs, which is 18^{mm} long, and 14^{mm} broad, and it has tentacles 16^{mm} long (Pl. VII, fig. 21, *c*). These three polyps, occupy, in a slightly diagonal rising line, the mesial part of the rachis, in such manner, that the terminal polyp is situated uppermost (Pl. VI, fig. 16, 1). Between the terminal polyp and the central one of the three polyps just described, two polyps are observed on each side. Their body has a length of 16^{mm}, and a breadth of 4^{mm}, and the tentacles have a length of 16—18^{mm} (dorso-lateral polyps) (Pl. VI, fig. 16, 2, 2. Pl. VII, fig. 21, *d, d*). Outside these polyps, or more correctly, upon each side, but somewhat lower, 3 polyps proceed (lateral polyps). These are 30^{mm} long, and 6^{mm} broad, with tentacles 45^{mm} long (Pl. VI, figs. 16, 3, 3, 3. Pl. VII, fig. 21, *e, e, e*). Between the terminal polyp and one of the smaller polyps on the right, a small conical protuberance is seen, which has a small aperture at the point (an embryonal polyp). The polyps, in this situation, assume a rather marked bilateral arrangement on the rachis, which, however, would not appear to be the case, if judged only by the habit; because, the groups of polyps depending, from the stem have the appearance of a round tassel (Pl. VII, fig. 20). It is, only, when the polyps are carefully separated apart from each other, that the bilateral symmetry can properly be observed. The terminal polyp, with the 2 polyps which stand in a straight line below it, form the centre of the dorsal surface. A little to each side of these; but still on the dorsal surface; 2 polyps appear; and from each of the lateral margins, 3 large polyps proceed, completely concealing the 5 inner polyps from the sides, whilst, those towards the dorsal and ventral surface, are concealed by the terminal polyp, and the diametrically opposite dorsal polyp. There is therefore, here, if we like to call it so, an outer and an inner series of polyps, on each side of the 3 central polyps (Pl. VI, fig. 16).

The polyps are cylindric; and are, nearly everywhere, of the same thickness; but, at their origin, they are somewhat narrower than in the middle; whilst, also, the upper part, toward the tentacular margin, is a little expanded. On the exterior surface of the body, 8 brownish-yellow, longitudinal lines are seen, denoting the insertions of the 8 septa (Pl. VII, fig. 20^a). The tentacles are

Rand forsynede med konisk tilspidsede, runde Pinnuler, der ere af forskjellig Størrelse og staa uregelmæssigt over for hverandre. Imellem de store Pinnuler er der sædvanlig 1 liden, stundom 2. Antallet varierer efter Tentakelens Længde; paa Tentakler, der ere 25—30^{mm} lange, talte man 24—36 store Pinnuler paa hver Side og omtrent 20 smaa. Øverst paa Tentaklerne kunne flere smaa Pinnuler staa sammen. Saavel Pinnulerne som Tentakelens hele aborale og Størstedelen af den adorale Flade er tæt besat med yderst smaa Papiller, der mangle paa dennes nederste Del, som er nøgen og glat, Fig. 20^{c}. Mundskiven er noget hvælvet mod Centrum, hvor den aflange Mundaabning har 8 lancetformige Læber, 1 i hver Mundvig og 3 paa hver Rand, hvilke have en Længdefure paa Midten af deres indre Flade, Tab. IX, Fig. 44.

Axen er firkantet med 4 dybe Furer og 4 afrundede Kanter; den strækker sig helt igjennem Stokken, hvor den gjør de samme Bøininger, som ere beskrevne under No. 1, dog saaledes, at den yderste, traadformige Ende synes at gaa ind i Ventralkanalen.

Zooiderne indtage ikke alene Rachis men strække sig nedover den skedeformige Udvidning af Stilken, hvor de paa Ventralfladen optage især Sidedelene og lader det midterste Parti være frit, imedens de paa Dorsalfladen sees overalt, dog temmelig spredt paa den nederste Del, Fig. 20^{a}. Længere ned paa Stilken blive de end mere spredte og staa tildels i en Række paa hver Side. Da Zooidernes Bygning, der er ganske eiendommelig, er den samme paa alle Exemplarer, skal den senere hen blive omtalt i alle sine Detailler.

Paa Spiritusexemplarer er Stilken mere eller mindre firkantet, idet Coenenchymet er faldt sammen og slutter sig tæt til den firkantede Axe; men i levende Live, hvor Coenenchymet es udfyldt af Væsker, og hvor de 4 Længdekanaler ere udspændte af det i dem cirkulerende Fluidum, er Stilken rund, naar undtages den nederste, bulbøse Del, hvor den er lidt fladtrykt mod Ventral- og Dorsalfladen.

Farven er den samme som paa de mindre Exemplarer, kun træder den intensere frem her. Den nederste, bulbøse Del er brun, havannafarvet; den øvrige Del af Stilken er gul og gaar paa den skedeformige Udvidning over i en meget lys, brun Farve, som paa Rachis er noget mørkere. Polyperne ere brune. Tentaklerne ere paa den aborale Flade lidt lysere end Kroppen, imedens den adorale derimod er næsten kastaniebrun, hvilket ogsaa er Tilfældet med Mundskiven; men Mundlæberne ere lysere. Forøvrigt varierer Farven noget hos de forskjellige Polyper paa samme Stok, hvilket tildels afhænger af Udviklingsgraden. Paa enkelte Polyper var Mundskiven næsten kjødrød, og da havde ogsaa Tentaklernes adorale Flade

cylindric, somewhat flattened on the inferior half portion of the adoral surface, and, furnished on each margin, with conical, accuminate, round pinnules, of varying size, situated irregularly, opposite to each other. Between the large pinnules; there is, usually, a small one, and, occasionally, 2 small ones. The number of these varies, according to the length of the tentacles. On each side of such tentacles as measure 25—30^{mm} long, 24—36 long pinnules, and about 20 small ones, may be counted. On the superior part of the tentacles, several small pinnules may be found, situated together. The entire aboral surface; and the greater part of the adoral surface; of both the pinnules and the tentacles, are closely beset with extremely minute papillæ. The lower part of the adoral surface, is, however, bare, and smooth (Pl. VII, fig. 20^{c}). The oral disk is somewhat arched towards the centre, at which point, the oblong, oral aperture, has 8 lancet-formed labiæ; one, in each oral wall, and, three, on each margin; the latter of which, have a longitudinal furrow in the middle of their inner surface (Pl. IX, fig. 44).

The axis is quadrangular, with 4 deep grooves, and 4 rounded edges. It extends along the entire stem, making the same curves as are described under No. 1 specimen; but, in such manner, that the outermost, filiform extremity, appears to pass into the ventral canal.

The zooids occupy, not only the rachis, but extend themselves down over the sheath-formed dilation of the stem, occupying, especially, the lateral parts of the ventral surface, but leaving the middle part free, whilst, on the dorsal surface, they are everywhere visible, although rather dispersed on the lower part (Pl. VII, fig. 20^{a}). Further down the stem, they become still more dispersed, and are situated, partly, in a series on each side. As the structure of the zooids is, although quite peculiar, similar in all the specimens, it will be subsequently described in all its details.

In specimens preserved in alcohol, the stem is more or less quadrangular, because the sarcosoma is shrunk together, and closes tight upon the quadrangular axis; but, in the living state, when the sarcosoma is filled with secretions, and when the 4 longitudinal ducts are expanded by the fluid circulating in them, the stem is round; with exception of the inferior bulbous part; where, it becomes a little flattened towards the ventral and dorsal surface.

The colour is the same as in the smaller specimens, but it appears more intense in this specimen. The inferior bulbous part, is brown Havana colour; the superior part of the stem is yellow, but, on the sheath-formed dilation, it assumes a very light brown colour, which becomes somewhat darker on the rachis. The polyps are brown. On the aboral surface, the tentacles are a little lighter in colour than the body; whilst, the adoral side, on the contrary, is almost chestnut brown, which, is, also, the case with the oral disk; but, the oral labiæ are lighter in colour. The colour varies, however, somewhat, in the various polyps on the same stalk, being, in a measure, dependent on the stage of development. In some polyps, the oral

samme Farve, paa andre var den næsten gul; men hos samtlige Polyper havde Mundskiven og Adoralsiden af Tentaklerne samme Farve.

No. 6.

Tab. VI, Fig. 17. 18. 19. Tab. VII, Fig. 22 *a*.

Stilken fra Grunden til Rachis er 470^{mm} lang; den skedeformige Udvidning er 25^{mm} lang, 6^{mm} bred, hvor den gaar over i Rachis. Denne er 15^{mm} lang, 13^{mm} bred. Den øverste Del af Stilken tilligemed Rachis er spiralformigt dreiet. Den nederste, bulbøse Del er 80^{mm} lang, smalere paa Midten (6^{mm} bred) og 8^{mm} bred, baade hvor den opad begynder at smalne af og mod den nederste Ende, hvor der er en ovoid Skraaflade, der ender i en Spids, Fig. 22 *a*, *b*. Denne Skraaflade findes, som man vil have bemærket, hos samtlige Exemplarer, naar undtages det mindste, og det synes, som den bidrager til Stokkens Befæstning i Lerbunden. Det smaleste Parti af Stilken findes op imod den skedeformige Udvidning, hvor den er knapt 1^{mm} bred. Den bulbøse Del er lidt fladtrykt mod Ventral- og Dorsalfladen; den øvrige Del af Stilken, indtil det Sted, hvor den skedeformige Udvidning begynder, er rund og noget dreiet efter Længden.

Rachis er bægerformet udvidet til Siderne, bliver opad noget smalere, uden at det dog er muligt paa Grund af dens stærke Dreining at paavise, hvorledes den ender. Dens Ventralflade er konvex og tæt besat med Zooider; kun paa dens nederste Del iagttages en smal Midtstribe, som er nøgen og glat, og hvor Axen skinner igjennem, Fig. 17, *a*.

Dorsalfladen er nedad lidt konkav, opad hvælver den sig noget for derefter at blive næsten plan; den udvider sig stærkt til Siderne, hvorved fremkomme laterale Flader, der skraane af henimod Ventralfladen. Saavel Dorsalfladen som de laterale Flader ere tæt besatte med Zooider, der forlænge sig i lancetformige Felter imellem Polyperne hen til Ventralfladen. Ogsaa paa den skedeformige Udvidning iagttages tætstaaende Zooider saavel paa Dorsal- som Ventralfladen, og jo længere de komme ned paa Stilken, jo mere spredte blive de, ligesom de da ordne sig mere i Rækker, hvoraf der i Begyndelsen er to, senere en paa hver Side. Rachis bærer 17 udviklede Polyper, af hvilke 2 ere meget smaa.

Terminalpolypen udspringer just der, hvor Dorsalfladen ligesom gaar over i Ventralfladen. Kroppen er 12^{mm}

disk was nearly flesh colour; and when this was so, the adoral surface of the tentacles, had, also, the same colour. In others, the colour was almost yellow; but, in the whole of the polyps, the oral disk, and the adoral side of the tentacles, were, uniformly, of the same colour.

No. 6 specimen.

Pl. VI, figs. 17 18. 19. Pl. VII, fig. 22 *a*.

The stem is 470^{mm} long, from the base to the rachis; and the sheath-formed dilation is 25^{mm} long, and 6^{mm} broad, at the point where it passes over into the rachis. The latter is 15^{mm} long and 13^{mm} broad. The superior portion of the stem, and also the rachis, is twisted spirally. The inferior bulbous part, is 80^{mm} long, and is narrowest at the middle, where, it measures 6^{mm} in breadth. At the point above, where it commences to become narrower, it measure 8^{mm} in breadth; and it also measures 8^{mm} in breadth, towards the lower extremity; where, there is an ovate sloping surface projecting in a point (Pl. VII, fig. 22 *a*, *b*). [This sloping surface; it will have been remarked; is found in all the specimens, with exception of the smallest; and it appears, to contribute in securing the stalk to the clay bottom. The narrowest part of the stalk occurs, up towards the sheath-formed dilation, at which point it is barely 1^{mm} broad. The bulbous portion, is a little flattened towards the ventral and dorsal surface; but the remainder of the stem, up to the point where the sheath-formed dilation begins, is round, and somewhat longitudinally twisted.

The rachis is enlarged laterally, in a chalice form, and becomes, somewhat narrower, upwards; but it is not possible; on account of its sharp twisting; to detect where it terminates. It's ventral surface is convex, and closely beset with zooids, and, only, on the inferior part, may a narrow mesial stripe, be observed; this is bare, and smooth, and through it, the axis appears visible (Pl. VI, fig. 17, *a*).

Below, the dorsal surface is slightly concave; but, above, it is a little arched; becoming then nearly flat; then expanding, greatly, to the sides, producing thus, lateral surfaces which slope off towards the ventral surface. Both the dorsal surface, and the lateral surfaces are closely beset with zooids, which prolong themselves to the ventral surface, in lancet formed areas, between the polyps. On the sheath-formed dilation, there are, also, observed, compactly situated zooids, both, on the dorsal and ventral surface; and the further up the stem that they extend, the more dispersed do they become; whilst, they also arrange themselves more in series, of which, there are 2 at the commencement, and, then, one on each side. The rachis carries 17 developed polyps; of these, 2 are very small.

The terminal polyp originates, just at the point where the dorsal surface appears to pass into the ventral surface.

lang, 4^{mm} bred og Tentaklerne 12—14^{mm} lange, Fig. 17, *b*. 18, *a*. 19,1*. 22, *a*, 1. Lige bag den paa Midtlinien af Dorsalfladen staar en Polyp, der er 13^{mm} lang, 4^{mm} tyk, Tentaklerne 13^{mm} lange, Fig. 18, *b*. 19,1. Et Par Mm. bag eller nedenfor denne staar i samme Linie en Polyp, hvis Krop er 16^{mm} lang, 6^{mm} bred, Tentaklerne 22^{mm} lange, Fig. 18, *c*. 19,1. Disse 3 Polyper, der staa i en Række, danne de 3 centrale Rygpolyper. Paa hver Side af dem, med omtrent 1^{mm} Mellemrum, udspringe 3 Polyper, hvoraf de 2, der staa nærmest Endepolypen, ere 9^{mm} lange, 2.5^{mm} brede, med 10^{mm} lange Tentakler, imedens de øvrige 4 ere 13^{mm} lange, 3 ^{mm} brede, med 10^{mm} lange Tentakler, fig. 18, *d*, *e*, *f*. 19, 2, 2, 2. Disse 2 Rækker udgjør de dorsal-laterale Polyper. Omtrent 1^{mm} udenfor dem udspringe fra hver Sideflade 3 laterale Polyper, der staa i en lidt krumbøiet Række. Kroppen er 18^{mm} lang, 6^{mm} bred og Tentaklerne 22^{mm} lange, Fig. 17, *c*. 18, *g*, *g*, *g*. 19, 3, 3, 3. 22^{a}, 2. Lidt nedenfor og til høire Side af Endepolypen, egentlig imellem Ventral- og Lateralfladen, staar en ganske liden Polyp, hvis Krop er 3^{mm} lang med 2^{mm} lange Tentakler, Fig. 17, 18, *h*. 19, *a*. 22^{a}. En lignende men lidt større Polyp, hvis Krop er 4^{mm} lang, med 3^{mm} lange Tentakler, sidder imellem den bagerste centrale Rygpolyp og høire laterale Polyp, Fig. 18, *i*. 19, *b*.

Polypernes Stilling paa Rachis er ogsaa paa dette Exemplar bilateral, men paa Grund af den fordreiede og udvidede Rachis have de Udseende af at staa i en næsten rund Dusk. De ere cylindriske og have paa Kroppen de 8 Insertionslinier for Septa. Tentaklerne, Mundskiven og Munden som paa det foregaaende Exemplar; det samme er Tilfældet med Farven og Axen.

Findested.

Baade No. 6 og 7 ere fundne paa samme Lokalitet: Station 87.

No. 7.

Tab. VII, Fig. 23.

Stilken er 830^{mm} lang fra Grunden til Rachis. Den bulbøse Del er noget fladtrykt paa Ventral- og Dorsalfladen, 175^{mm} lang; lidt over Midten er den 10^{mm}, ned imod Enden, der har en oval Flade, er den 15^{mm}, og paa den øverste Trediedel er den 12^{mm} bred. Stilken smalner nu efterhaanden af, dreier sig efter Længden, er rund, har et gjennemskinnende Coenenchym og er kun 3^{mm} bred op

The body is 12^{mm} long, and 4^{mm} broad, and the tentacles have a length of 12—14^{mm} (Pl. VI figs. 17, *b*. 18 *a*. 19.1*, Pl. VII fig. 22, *a*. 1). Immediately behind it; on the mesial line of the dorsal surface; a polyp is situated, which is 13^{mm} long, and 4^{mm} thick, with tentacles 13^{mm} in length (Pl. VI figs. 18, *b*. 19.1). A couple of milimetres behind this one, or below, in the same line; a polyp is situated, whose body is 16^{mm} long, and 6^{mm} broad, and with tentacles 22^{mm} long (Pl. VI figs. 18, *c*. 19.1). These 3 polyps are situated in one series, and form the 3 central dorsal polyps. On each side of them, at and interval of about 1^{mm} apart, 3 polyps proceed; of these, the two situated nearest to the terminal polyp, are 9^{mm} long, and 2.5^{mm} broad, and have tentacles 10^{mm} long; whilst, the remaining 4 polyps, are 13^{mm} long, and 3^{mm} broad, and have tentacles 10^{mm} long (Pl. VI figs. 18, *d*, *e*, *f*. 19, 2, 2, 2). These 2 series compose the dorso-lateral polyps. About 1^{mm} outside these; 3 lateral polyps proceed from each lateral surface, and are situated in a slightly curved series. Their body is 18^{mm} long, and 6^{mm} broad, and the tentacles are 22^{mm} long (Pl. VI fig. 17, *c*. 18, *g*, *g*, *g*. 19, 3, 3, 3, Pl. VII fig. 22, *a*. 2). A little below, and to the right side af the terminal polyp; in reality, between the ventral and lateral surface, quite a small polyp is situated, whose body, is 3^{mm} long, and it's tentacles 2^{mm} in length (Pl. VI figs. 17, 18, *h*. 19, *a*. Pl. VII fig. 22, *a*). A similar, but some what larger polyp; whose body is 4^{mm} long, and it's tentacles 3^{mm} long, is situated between the posterior centro-dorsal polyp, and the right lateral polyp (Pl. VI figs. 18, *i*. 19, *b*).

The arrangement of the polyps on the rachis is, also, bilateral in this specimen, but, owing to it's twisted and dilated rachis, they have the appearance of standing in a nearly circular tuft. They are cylindric, and have on the body, the 8 insertion lines for septa. The tentacles, oral disk, and oral aperture, are similar to those of the preceding specimens; and the same may be said of the colour, and the axis.

Habitat.

Both, No. 6 and 7 specimens, were collected from the same locality; Station No. 87.

No. 7 specimen.

Pl. VII, fig. 23.

The stem is 830^{mm} long from the base to the rachis. The bulbous part is some what flattened on the ventral and dorsal surfaces, and is 175^{mm} in length; a little above the middle, it is 10^{mm} broad; and, down towards the extremity, it has an ovate surface, and is there 15^{mm} broad, whilst on it's upper third part it is 12^{mm} broad. The stem diminishes, gradually, in thickness, and is twisted longitudinally. It is

imod den skedeformige Udvidning. Denne er 170^{mm} lang, bliver alt bredere og bredere, dreier sig spiralformigt og antager en Bredde af 12^{mm}, hvor den gaar over i Rachis, Fig. 23, *a*. Saavel Ventral- som Dorsalfladen er tæt besat med Zooider, der blive mere spredte, naar de forlade den skedeformige Udvidning og ordne sig til en Zooidestribe paa hver Side, hvilken strækker sig et langt Stykke nedover Stilken.

Rachis bærer 31 Polyper, er næsten rund, lidt fladtrykt fra Dorsal- mod Ventralfladen, 26^{mm} bred, 35^{mm} høi og 80^{mm} i Omkredsen, hvor Polyperne tage deres Udspring, Fig. 23, *b*, og har en afrundet, smal Ende, der er 5^{mm} bred med en fri Rand imod Ventralfladen, Fig. 23, *c*. Denne er lidt konvex efter Længden med en svag Fure langs Midten, meget smal foroven og overalt tæt besat med Zooider.

Dorsalfladen er lidt konkav paa Midten men noget hvælvet til Siderne, hvor den gaar over i de lidt paaskraagaaende, laterale Flader; med disse danner den, om man vil, et liggende Prisme. Fra Dorsalfladen og de laterale Flader forlænge sig imellem Polyperne 8 lancetformige Zooidefelter, Fig. 23, *b*, *d*, saa at Rachis kun er fri for Zooider paa de Steder, hvor Polyperne udspringe.

Terminalpolypen staar saagodtsom ganske paa den afrundede Ende af Rachis men tydeligt paa dennes Dorsalside; den er 15^{mm} lang, 5^{mm} bred og har 22^{mm} lange Tentakler, Fig. 23,1. Nedenfor, eller bagenfor den, i omtrent 1^{mm} Afstand, sees en liden, smal Polyp, 8^{mm} lang med 8^{mm} lange Tentakler, og nedenfor denne i samme Linie staar en større Polyp, 23^{mm} lang, 5^{mm} bred og med Tentakler af samme Længde som Kroppen. Disse 3 udgjøre de central-dorsale Polyper. Paa hver Side af de 3 Centralpolyper er der 14 Polyper stillede i 3 Rækker, den ene udenfor den anden. I den inderste Række er der 4 Polyper, hvoraf de fleste ere 15^{mm} lange med lige lange Tentakler, kun en til Venstre af Endepolypen er blot 5^{mm} lang med 4^{mm} lange Tentakler; denne Række kan benævnes dorsal-laterale Polyper, Fig. 23, 2, 2. Udenfor disse sees en næsten halvrund Række paa hver Side, bestaaende af 5 Polyper af lidt forskjellig Størrelse, fra 15—25^{mm} lange med Tentakler af samme Længde, saaledes at Størrelsen aftager, jo nærmere de komme Ventralfladen, Fig. 23, 3, 3. Udenom denne 2den Række er der en 3die, ligeledes halvrund Række af 5 Polyper, hvis Kroppe ere fra 35—40^{mm} lange, 10^{mm} tykke; Tentaklerne af Kroppens Længde; ogsaa her er Forholdet saaledes, at jo mere Polyperne nærme sig Ventralfladen, jo kortere blive de, Fig. 23, 4, 4, 4. Disse to ydre Rækker, der dannes af 10 laterale Polyper, omgive næsten hele Rachis, idet begge Rækker slutte sig sammen, saa at kun Ventralfladen i en Bredde af 6^{mm} er blottet. Den Polyp, der egentlig binder disse to Rækker sammen omtrent midt paa Dorsalfladen, er lidt mindre end de

round, and has a sarcosoma appearing through it, and is only 3^{mm} broad, up towards the sheath-formed dilation. This dilation is 170^{mm} long, and becomes broader and broader, twisting itself spirally; and, at the point where it passes over into the rachis, it attains a breadth of 12^{mm} (fig. 23, *a*). Both, the ventral and dorsal surfaces, are closely beset with zooids, which become more dispersed as they leave the sheath-formed dilation, and arrange themselves in a zooidal stripe on each side, extending a long way down the stem.

The rachis carries 31 polyps, and is nearly round; it is a little flattened from the dorsal towards the ventral surface; and measures 26^{mm} broad, 35^{mm} high, and 80^{mm} in circumference, at the point where the polyps have their origin (fig. 23, *b*). It has a rounded narrow extremity, which is 5^{mm} broad, with a free margin towards the ventral surface (fig. 23, c). This latter, is a little convex, longitudinally, with a slight furrow along the middle, very narrow above, and everywhere, closely beset with zooids.

The dorsal surface is a little concave at the middle, and somewhat arched, laterally, where it passes into the rather diagonally sloping lateral surfaces; and it forms with these, what we may call, a horizontal prism. From the dorsal surface, and the lateral surfaces, 8 lanceolate zooidal areas extend themselves between the polyps, (fig. 23, *b*, *d*) so that, the rachis is only devoid of zooids, at the parts where the polyps have their origin.

The terminal polyp is situated, nearly, quite on the rounded extremity of the rachis, yet distinctly, on its dorsal side. It is 15^{mm} long, 5^{mm} broad, and it's tentacles are 22^{mm} long (fig. 23.1). Below, or behind it, at a distance of about 1^{mm}, a small narrow polyp is seen, having a length of 8^{mm}; and, it's tentacles have, also, a length of 8^{mm}; and below this polyp, in the same line, a larger polyp is situated, which is 23^{mm} long, and 5^{mm} broad, with the tentacles of same length as the body. These three polyps compose the centro-dorsal polyps. On each side of the 3 central polyps, there are 14 polyps arranged in 3 series, the one outside the other. In the inmost series, there are 4 polyps, of which, the greater number are 15^{mm} long, with tentacles of the same length; one polyp alone, situated to the left of the terminal polyp, is only 5^{mm} long, with tentacles 4^{mm} long. This series may be designated dorso-lateral polyps (fig. 23, 2, 2). Outside these, a nearly semicircular series, consisting of 5 polyps, is observed on each side. These are of variable size; from 15—25^{mm} long, with tentacles of the same length; and, arranged in such manner, that the size diminishes, the closer they approach to the ventral surface (fig. 23, 3, 3) Outside this second series there is a third series; also a semicircular series; of 5 polyps, whose bodies have a length from of 35—40^{mm}, and a thickness of 10^{mm}; with tentacles same of length as the body; here, also, the arrangement is such, that the nearer the polyps approach to the ventral surface, the shorter do they become (fig. 23, 4, 4, 4). These two exterior series; which are formed of 10 lateral polyps; sur

øvrige, nemlig 30^{mm} lang, 6^{mm} bred og med 25^{mm} lange Tentakler.

Endnu paa dette temmeligt udviklede Exemplar har man en bilateral Ordning af Polyperne, omendskjønt det ved en overfladisk Betragtning ser ud, som om Polyperne ere stillede i en kredsformig Dusk uden al Symetri. Det er først ved at lægge Polyperne meget omhyggelig ud fra hverandre, at den bilaterale Ordning kommer tilsyne.

Polyperne ere cylindriske, have paa deres ydre Flade, som alle de foregaaende, 8 gulbrune Linier, der betegne Insertionsstederne for de 8 Septa paa den indre Kropsflade. Igjennem Kropsvæggen skinner det lange, stærkt foldede Svælg. Tentaklerne ere som paa de tidligere beskrevne, hvilket ogsaa er Tilfældet med Mundskiven og den 8 læbede Mund. Kun den ydre Række (9) Polyper har udviklede Generationsorganer med Æg i forskjellige Stadier.

Axen ender nedentil med en liden Klump lige i Bunden; den dreier sig i lange Spiraler efter Længden til op imod den skedeformige Udvidning, hvor Spiralerne blive kortere.

Paa Spiritusexemplarer, hvor Coenenchymet er sammenfaldt, er Stilken firkantet.

Farven.

Den bulbøse Del er næsten kastaniebrun men bliver lysere op imod dens øverste Parti, saa at hele Stilken samt Rachis er straagul, spillende lidt i det brunlige. Polyperne lys-kastaniebrune; Tentaklerne lidt lysere paa den aborale Flade men mørkere paa Halvdelen af den adorale Flade samt Mundskiven. Mundlæberne lys-gulbrune.

Findested.

Station 87.

No. 8.

Tab. VIII, Fig. 25.

Stilken fra Grunden til Rachis 1480^{mm} lang. Den bulbøse Del er tenformig, fladtrykt paa Ventral- og Dorsalfladen, 500^{mm} lang; dens nederste Del er omtrent 50^{mm} i Omkreds, ender i en ovoid Flade, der løber ud i en stump Spids, men tiltager opad lidt i Tykkelse, indtil den temmelig pludselig udvider sig og indtager da en Omkreds af 100^{mm}. Nu

round, nearly, the whole rachis, as both the series unite with each other, leaving only, a breadth of 6^{mm} of the ventral surface exposed. The polyp which actually unites these two series together about the middle of the dorsal surface, is a little smaller than the others, being 30^{mm} long, and 6^{mm} broad, and the tentacles 25^{mm} in length.

Still, in this pretty fully developed specimen, we find a bilateral arrangement of the polyps; although, on a superficial observation it appears, as if the polyps are arranged in a crescent-formed tuft, without any symmetry. It is only, when the polyps are carefully separated apart from each other, that the bilateral arrangement becomes apparent.

The polyps are cylindric, and like all the previous specimens, have 8 brownish-yellow lines on their exterior surface, denoting the points of insertion for the 8 septa on the inner surface of the body. The long, much folded gullet, appears visible through the wall of the body. The tentacles are like those of the specimens already described; and, this is also, the case with the oral disk, and the oral aperture with it's 8 labiæ. The outer series (9) of polyps alone, has generative organs developed, containing ova in various stages.

The axis terminates beneath, in a small lump, situated quite at the bottom; it twists itself in long longitudinal spirals until in proximity to the sheath-formed dilation, at which point the spirals become shorter.

In the specimens preserved in alcohol, the sarcosoma is shrunk, and the stem appears quadrangular.

Colour.

The bulbous portion is almost chestnut brown, but becomes lighter up towards the superior portion, so that the entire stem, as well as the rachis, is straw-yellow, tending a little to brownish colour. The polyps are a light chestnut brown colour. The tentacles are a little lighter on the aboral surface, but darker on the half portion of the adoral surface and oral disk. The labiæ of the oral aperture are light-brown yellow.

Habitat.

Station No. 87.

No. 8 specimen.

Pl. VIII, fig. 25.

The stem measures 1480^{mm} in length from the base to the rachis. The bulbous part is spindle-formed, and flattened on the ventral and dorsal surfaces. It is 500^{mm} long at it's broadest part, and it's inferior part is about 50^{mm} in circumference, terminating in an ovate surface which projects in a blunted point. It increases a little in

aftager den successivt, er næsten ganske rund, saa at den op imod den skedeformige Udvidning er knap 8^{mm} bred. Fra den stærke Udvidning paa den bulbøse Del begynder Stilkens spiralformige Dreining, der fortsættes gjennem hele Længden, en Dreining, der især er stærkt fremtrædende paa Spiritusexemplaret. Den skedeformige Udvidning er spiraldreiet, Fig. 25, *a*, 150^{mm} lang, 20^{mm} bred, hvor den gaar over i Rachis; den er overalt tæt besat med Zooider, der sidde mere spredte, jo længere de komme ned paa Stilken. Ogsaa paa den øverste Del af det bulbøse Parti sees lignende Zooider.

Rachis er bægerformet, næsten rund, Fig. 25, *b*, 38^{mm} høi, dens øverste Omkreds 150^{mm}. Bredden omtrent 48^{mm}. Ventralfladen er kort, lidt fladtrykt, tæt besat med Zooider. Dorsalfladen smelter saagodtsom sammen med Lateralfladerne, og samtlige ere overalt optagne af Zooider, som danne lancetformige Felter imellem Polyperne, der tilsyneladende staa i Kredse rundt Rachis, men som ved nøiere Granskning vise tydelig Spor af en bilateral Stilling.

Terminalpolypen er 30^{mm} lang, 8^{mm} tyk ved Grunden; Tentaklerne ere 35^{mm} lange, Fig. 25, 1*. Omtrent et Par Mm. nedenfor og bagenfor i lige Linie sees en Polyp, hvis Krop er 35^{mm} lang, 8^{mm} tyk ved Basis og med 40^{mm} lange Tentakler, Fig. 25, 1; i samme Afstand fra denne findes en tredie Polyp af omtrent samme Størrelse som den foregaaende, Fig. 25, 1. Disse 3 Polyper kunne betragtes som de central-dorsale Polyper, idet de udgaa fra Midten af den næsten horizontaltliggende, brede Rygflade. Omkring dem gruppere sig 28 større og mindre Polyper saaledes, at tilhøire er 15 og tilvenstre 13, dersom man tænker sig Rachis inddelt i 1 Centraldel og 2 Sidedele.

Omtrent et Par Mm. tilhøire af de 3 Centralpolyper staar i en liden Bue 4 Polyper, Fig. 25, 2, 2, 2, 2, der ere næsten lige store; deres Krop er 35^{mm} lang, 10^{mm} tyk ved Grunden, og Tentaklerne ere 45^{mm} lange; udenfor og til Siden af disse er 5 Polyper, hvoraf de 4 danne en svagt krummet Linie, imedens den 5te staar for sig selv, Fig. 25, 3, 3, 3, 3, 3; de have den samme Størrelse som de foregaaende 4, og endelig kommer den yderste Række, bestaaende af 6 store Polyper, som alle ere næsten af samme Størrelse; Kroppen er 45^{mm} lang, 16^{mm} bred ved Grunden og Tentaklerne 35^{mm} lange, Fig. 25, 4, 4, 4, 4, 4, 4.

Et Par Mm. tilvenstre at de 3 Centralpolyper staa i en lidt krummet Række 3 Polyper, hvis Krop er 30^{mm} lang, 10^{mm} tyk, Tentaklerne 35^{mm} lange, Fig. 25, 5, 5, 5. Udenfor disse sees 2 Polyper af samme Størrelse som de nysnævnte 3, Fig. 25, 6, 6, og udenfor dem findes atter 2 Polyper, hvis Krop er 35^{mm} lang, 10^{mm} tyk, Tentaklerne 40^{mm} lange, Fig. 25, 7, 7. Udenom disse 7 Polyper staar

thickness, upwards, until, it rather abruptly, becomes enlarged and attains a circumference of 100^{mm}. It subsequently diminishes, gradually, and becomes nearly round, so that, up towards the sheath-formed dilation, it is barely 8^{mm} broad. The spiral twisting of the stem commences, at the large dilation of the bulbous part, and continues through its entire length: — a twisting, which is especially prominent in the specimen preserved in alcohol. The sheath formed dilation is spirally twisted (fig. 25, *a*), and is 150^{mm} long, and 20^{mm} broad at the point where it passes over into the rachis. It is, everywhere, closely beset with zooids, which however, become more dispersed, the further down the stem they are situated. On the superior part of the bulbous portion, similar zooids are also seen.

The rachis is chalice-formed, and nearly round (fig. 25, *b*). It is 38^{mm} high, and 150^{mm} in circumference at the upper part. The breadth is about 48^{mm}. The ventral surface is short, somewhat flattened, and closely beset with zooids. The dorsal surface becomes, almost fused into the lateral surfaces, and, all of them are, everywhere, occupied by zooids forming lanceolate areas between the polyps, which, apparently, are situated in rings around the rachis, but, upon closer inspection, show distinct signs of a bilateral arrangement.

The terminal polyp is 30^{mm} long, and 8^{mm} thick at the base, and the tentacles are 35^{mm} long (fig. 25, 1*). About a couple of milimetres below and behind; in a straight line; a polyp is observed, whose body is 35^{mm} long, and 8^{mm} thick at the base, and its tentacles 40^{mm} in length (fig. 25, 1). At a similar distance from that polyp, a third polyp is observed, of about the same size as the previous one (fig. 25, 1). These 3 polyps may be considered, as the centro-dorsal polyps, because, they proceed from the middle of the nearly horizontal, broad, dorsal surface. Round about them; 28, larger or smaller polyps, are grouped in such manner, that there are 15 polyps to the right, and 13 polyps to the left, if we suppose the rachis subdivided, into a central portion, and 2 lateral portions.

About a couple of millimetres to the right of the 3 central polyps; 4 polyps are seen, situated in a small arc (fig. 25, 2, 2, 2, 2). These are nearly uniform in size, and their body is 35^{mm} long, and 10^{mm} thick at the base, and the tentacles 49^{mm} in length. Outside of these, and to the side, there are 5 polyps; 4 of which, form a gently curved line, whilst the 5th is situated by itself (fig. 25, 3, 3, 3, 3, 3). They are the same size as the previously mentioned 4 polyps; and, finally, we have the exterior series, consisting of 6 large polyps that are nearly uniform in size. The body of these polyps is 45^{mm} long, and 16^{mm} broad at the base, and the tentacles have a length of 35^{mm} (fig. 25, 4, 4, 4, 4, 4, 4).

A couple of millimetres to the left of the 3 central polyps; 3 other polyps are situated, in a slightly curved series. Their body is 30^{mm} long, and 10^{mm} thick, and the tentacles have a length of 35^{mm} (fig. 25, 5, 5, 5). Outside of these; 2 polyps of similar size as the 3 polyps just spoken of, are seen (fig. 25, 6, 6), and, outside of them, still other 2 polyps are found, whose bodies measure,

den halvrunde Række af 6 store Polyper, fuldkommen lig dem, som ovenfor ere omtalte paa høire Side, Fig. 25, 8, 8, 8, 8, 8, 8.

Maalene af Polyperne ere foretagne paa Spiritus-exemplaret; men paa det levende Exemplar, der er tegnet Tab. XI, XII, havde Polyperne en ganske anden Størrelse; saaledes vare de i den ydre Række, naar de vare fuldt udstrakte, indtil 100 ^{mm} lange, 50—60 ^{mm} i Omkreds ved Grunden og Tentaklerne 70—80 ^{mm} lange.

Vi have paa dette Exemplar søgt at fremhæve de Rester af en tidligere bilateral Symetri, som endnu ved en skrupuløs Undersøgelse kan findes; men vi tilstaa, at den bilaterale Regelmæssighed er for en stor Del forsvunden, idet Rachis danner en næsten rund Kvast, hvorpaa Polyperne, der udgjøre Duskerne, ere stillede i 3 ringformede Rækker om de 3 Centralpolyper. I første, ydre Række ere de 12 store Polyper; denne Række er fuldkommen sammenhængende, saa at Ventralfladen er indtagen af 2 Polyper, Fig. 25, *c*, *c*; indenfor denne Række kommer en anden Række af 12 noget mindre Polyper, men denne Ring er afbrudt paa Ventralfladen, hvor der er en Afstand af 5 ^{mm} imellem de 2 Polyper, der ikke slutte sig sammen, Fig. 25, *d*, *d*. Endelig kan man forestille sig en 3die, indre Række, der bestaar af 4 Polyper, som forresten staa saa uregelmæssigt og usammenhængende, at man kun med Tvang kan danne en afbrudt Ring deraf. Imellem den ydre og mellemste Kreds, nær Ventralfladen, sees en liden, konisk Forhøining, der er en ganske ung Polyp.

Polyperne ere cylindriske, meget tykke ved Grunden og kunne kontrahere sig stærkt, baade efter Længden og Bredden. Paa Kroppens ydre Flade, der i udspændt Tilstand er glat og uden Folder, sees 8 temmelig brede Længdelinier, der betegne Insertionsstederne for de 8 Septa. Huden er ikke gjennemsigtig, saaledes som Tilfældet er paa de tidligere omtalte; thi den er meget stærkt kontraheret som Følge af Opbevaringen i Spiritus. Tentaklerne og Mundskiven er som paa No. 7, men de 8 Mundlæber ere større og mere fremspringende.

Axen gaar lige ned til Bunden af Stokken, hvor den ender med en kort Hage. Den er som sædvanligt firkantet med 4 dybe Furer og afrundede Kanter; men den er meget mere spiralformigt dreiet efter hele sin Længde end nogen af de foregaaende.

Alle 31 Polyper have udviklede Generationsorganer og ere Hanner.

Farven er som paa No. 7; se forresten den i levende Live afbildede Figur, Tab. XII, hvor Farven er gjengivet med Nøiagtighed.

35 ^{mm} in length, and 10 ^{mm} in thickness, and the tentacles have a length of 40 ^{mm} (fig. 25, 7, 7). Outside of these 7 polyps; the semicircular series of 6 large polyps appears, exactly similar to those spoken of above as pertaining to the right side (fig. 25. 8, 8, 8, 8, 8, 8).

The measurements of the polyps are taken from the specimen in alcohol, but in the live specimen which is seen illustrated on Pl. XI, XII, the polyps had quite another size, so that, those in the outer series, when they were fully extended, measured up to 100 ^{mm} long, and 50—60 ^{mm} in circumference at the base, and the tentacles were 70—80 ^{mm} long.

We have endeavoured in this specimen, to trace out the remains of any earlier bilateral arrangement that a searching examination might still bring to light; but, we confess, that the bilateral regularity has for the most part disappeared; whilst, the rachis forms a nearly round knob, on which, the polyps which compose the tufts, are situated in 3 annullar series, around the 3 central polyps. In the first outer series, there are 12 large polyps in a perfectly continuous series, so that, the ventral surface is occupied by 2 polyps (fig. 25, *c*, *c*). Inside this series; another series of 12, somewhat smaller polyps appears, but this series is interrupted on the ventral surface, and here, there is an interval of 5 ^{mm} between the 2 polyps which do not unite with each other (fig. 25, *d*, *d*). Finally, we may conceive a 3rd inner series, consisting of 4 polyps, which otherwise, are situated so irregularly, and unconnectedly, that it is only with difficulty, an interrupted ring can be formed out of them. Between the external and the middle ring; near the ventral surface; a small conical prominence is observed, this is a quite young polyp.

The polyps are cylindric, and very thick at the base. They are capable of great longitudinal and lateral contraction. On the exterior surface of the body; which in the dilated condition is smooth, and free from folds; 8 rather broad, longitudinal lines are observed, denoting the points of insertion for the 8 septa. The integument is not translucent; as is the case in the specimens we have already spoken of; because, it is very greatly contracted in consequence of its preservation in alcohol. The tentacles and the oral disk are like those of No. 7 specimen, but the 8 labiæ of the oral aperture are larger and more prominent.

The axis extends quite to the base of the stalk, where, it terminates in a short hook. It is, as is generally the case, quadrangular, having 4 deep grooves, and rounded edges; but, it is much more spirally twisted along the whole of its length, than any of the preceding specimens.

All the 31 polyps have, developed generative organs, and are males.

The colour is like that of No. 7 specimen, and is otherwise like the illustration; (Pl. XII) taken from life; in which the colour is exactly repeated.

Findested.

Station 18.

No. 9.

Tab. VII, Fig. 24.

Stilken fra Grunddelen til Rachis 1560^{mm} lang. Den bulbøse Del er tenformig og ender i en stump Spids; dens nedre Del er næsten rund, omtrent 50^{mm} i Omkreds, imedens den øvre, mere udvidede Del er noget fladtrykt paa Ventral- og Dorsalfladen og 60^{mm} i Omkreds. Fra denne øvre Udvidning aftager Stilken successivt, indtil den indtager kun 3^{mm} i Bredde op imod den skedeformige Del. Denne er 12^{mm} bred, hvor den gaar over i Rachis og tæt besat med Zooider, der strække sig nedover Stilken, hvor de paa Ventral- og Dorsalfladen ordne sig til Rækker lige ned til den runde Del af Bulbus. Paa dette Exemplar er Stilken aldeles ikke dreiet, førend op imod Rachis, hvor den i Forening med denne gjør en S-formig Bøining, Fig. 24.

Rachis er bægerformet, næsten rund, kun lidt fladtrykt paa Ventralfladen og har en Omkreds af 90^{mm}, Fig. 24, *a*; den er 26^{mm} høi, 30^{mm} bred, lidt hvælvet nedenfra opad men mere fladtrykt paa Midten og bærer 28 Polyper. Ventralfladen er 10^{mm} bred paa det bredeste, men smalner af opad, saa at den op imod Endepolypen er omtrent 5^{mm} bred, Fig. 24, *b*. Dorsalfladen er bred og kan inddeles i en Centraldel og to lidt paaskraagaaende Sideflader. Hele Rygsiden er tæt besat med Zooider, som danne lancetformige Felter ind imellem Polyperne, der indtage en næsten lignende Stilling som paa No. 8 med Undtagelse af, at Ventralfladen her er nøgen, det vil sige uden Polyper.

Ligesom paa de foregaaende er her 3 Centralpolyper, der indtage Midtpartiet af Rygsiden, og hvoraf Endepolypen, som sædvanligt, er den mindste.

Terminalpolypen danner Grændsen foroven imellem Ventral- og Dorsalfladen; den er 16^{mm} lang, 5^{mm} bred med 25^{mm} lange Tentakler, Fig. 24, 1*. De to bagenfor (nedenfor) paa Rygsidens Midtlinie staaende Polyper ere 25^{mm} lange, 5^{mm} brede; Tentaklerne lige lange som Kroppen. De centrale Dorsalpolyper staa 1—2^{mm} fra hinannen, fig. 24, 1, 1. Ved Siden af dem til Venstre staa i en lidt krumbøiet Række 3 Polyper, Fig. 24, 2, 2, 2, af hvilke den forreste, nærmest Ventralfladen, er 15^{mm} lang, 3^{mm} bred, Tentaklerne af Kroppens Længde, Fig. 24; den ba-

Habitat.

Station, No. 18.

No. 9 specimen.

Pl. VII, fig. 24.

The stem measures 1560^{mm} in length from the basal part to the rachis. The bulbous part is spindle-formed, and terminates in a blunt point. It's inferior portion is almost round, and is about 50^{mm} in circumference; whilst the superior, more dilated portion, is somewhat flattened on the ventral and dorsal surfaces, and is 60^{mm} in circumference. From the superior dilation, the stem diminishes, gradually, in breadth, until, in proximity to the sheath formed portion, it is only 3^{mm} broad. The sheath-formed part is 12^{mm} broad at the point where is passes into the rachis; and is, closely, beset with zooids, which extend themselves down along the stem, where they arrange themselves in series, on the ventral and dorsal surfaces right down to the round part of the bulb. In this specimen, the stem is not at all twisted until in proximity to the rachis, and then, in conjunction with the rachis, it forms an S formed curve (fig. 24).

The rachis is chalice-formed, nearly round, and only a little flattened on the ventral surface, and it has a circumference of 90^{mm} (fig. 24, *a*). It is 26^{mm} high, and 30^{mm} broad, and is a little arched from below, upwards, but more flattened in the middle, and it also carries 28 polyps. The ventral surface is 10^{mm} broad at the broadest part, but diminishes in breadth, upwards, so that, up towards the terminal polyp, it is only about 5^{mm} broad (fig. 24, *b*). The dorsal surface is broad, and may be subdivided into a central portion, and two, somewhat diagonally sloping, lateral surfaces. The whole of the dorsal side is, closely, beset with zooids, forming lanceolate areas between the polyps; assuming a nearly similar arrangement as in No. 8 specimen, with the exception, that in this specimen, the ventral surface is bare, that is to say, is devoid of polyps.

Just as in the previous specimen, there are in this one, 3 central polyps occupying the middle portion of the dorsal side, and, of these, the terminal polyp, as is usually the case, is the smallest one.

The terminal polyp forms the superior margin between the ventral and dorsal surface. It is 16^{mm} long, and 5^{mm} broad, and the tentacles are 25^{mm} in length (fig. 24, 1*). The two posterior (below) polyps, situated in the mesial line of the dorsal side, are 25^{mm} long, and 5^{mm} broad, and the tentacles are of the same length as the body. The centro-dorsal polyps, are situated at intervals of 1—2^{mm} apart from each other (fig. 24. 1, 1). Alongside of these, to the left hand, 3 polyps appear, situated in a slightly curved series (fig. 24, 2, 2, 2),

gerste er 35 mm lang, 7 mm bred med 35 mm lange Tentakler, og den mellemste er 25 mm lang, 5 mm bred og har 20 mm lange Tentakler. Udenfor disse 3 dorsal-laterale Polyper staa 2 lidt uregelmæssigt stillede Polyper, fig. 24, 3, 3. Kroppen er 30 mm lang, 5 mm bred, Tentaklerne 30 mm lange, og atter udenfor men ligesom afvexlende med dem sees to Polyper, fig. 24, 4, 4, hvis Krop er 35 mm lang, 7 mm bred; Tentaklerne af Kroppens Længde. Endelig er der i den yderste Række 5 store Polyper, der ere stillede i en Halvkreds, saaledes at de gaa fra Midten af Dorsalfladen til henimod Ventralfladen, fig. 24, 5, 5, 5, 5, 5. Disse Polyper ere 40 mm lange, 7 mm brede med 35 mm lange Tentakler og udgjøre i Forening med de 4 foregaaende de egentlige laterale Polyper.

Til høire Side af Centralpolyperne sees en svagt krumbøiet Række af 4 Polyper, fig. 24, 6, 6, 6, 6, hvoraf de 3 ere 25 mm lange, 6 mm brede med Tentakler af Kroppens Længde; den 4de, som er meget mindre, staar imellem og er 15 mm lang, 3 mm tyk og med 15 mm lange Tentakler. Udenfor denne Række findes en ligeledes krumbøiet, dannet af 4 Polyper, fig. 24, 7, 7, 7, 7, hvis Krop er 35 mm lang, 5 mm bred og med Tentakler lige lange som Kroppen; udenom denne Række staar den halvkredsformige, bestaaende af 5 store Polyper, fig. 24, 8, fuldkommen lig den paa venstre Side, hvortil den slutter sig, dog saaledes, at paa Ventralfladen bliver et Mellemrum af 7 mm Bredde, hvorved Kredsen her afbrydes.

Den bilaterale Symetri er paa dette Exemplar mere iøinefaldende end paa det foregaaende, men den er dog langtfra saa udpræget som paa de yngre Individer. De ydre 10 store, laterale Polyper ere stillede i en Ring, der kun er afbrudt paa Ventralfladen, fig. 24; indenfor denne Ring ere Polyperne grupperede omkring eller rettere til Siderne af Centralpolyperne temmelig uregelmæssigt; dog kunne de, naar Fantasien tages lidt til Hjælp, ordnes i to Kredse, den ene indenfor den anden; men hvad der paa dette Exemplar har bevaret mere af den oprindelige bilaterale Form, end Tilfældet er paa No. 8, tør være den Omstændighed, at Rachis paa langt nær er saa fordreiet, i Forening med, at det sandsynligvis er en yngre Polypstok. Omendskjønt denne indtager en større Længde, er dog Polypernes Antal mindre, ligesom de ere smækrere og synes i det Hele taget ikke at være saa udviklede som paa No. 8, idet mange af de indre Polyper ere uden Kjønsorganer. De to ydre Rækker have udviklede Testikler.

Polyperne ere cylindriske, lidt tykkere ved Grunden,

of which, the anterior polyp, next the ventral surface, measures 15 mm in length, and 3 mm in breadth, and the tentacles have the same length as the body (fig. 24). The posterior polyp measures 35 mm in length, and 7 mm in breadth, and the tentacles measure 35 mm in length. The mesial polyp measures 25 mm in length, and 5 mm in breadth, and the tentacles are 20 mm long. Outside of these 3 dorso-lateral polyps, 2 somewhat irregularly placed polyps are situated (fig. 24, 3, 3). Their body is 30 mm long and 5 mm broad, and the tentacles measure 30 mm in length; and, again, outside of these polyps, but, as it were, alternating with them; 2 polyps are seen (fig. 24, 4, 4), whose body measures 35 mm in length, and 7 mm in breadth, and the tentacles have the same length as the body. Finally, there are, in the exterior series, 5 large polyps, which are placed in a semicircle, in such manner, that they proceed from the middle of the dorsal surface, to the immediate proximity of the ventral surface (fig. 24, 5, 5, 5, 5, 5). These polyps are 40 mm long, and 7 mm broad, and the tentacles measure 35 mm in length; in conjunction with the preceding polyps, they form the actual lateral polyps.

On the right side of the central polyps, there is seen, a slightly curved series of 4 polyps (fig. 24, 6, 6, 6, 6), of which, 3 measure 25 mm in length, and 6 mm in breadth, and the tentacles have the same length as the body. The 4th polyp is much smaller, and is situated between; it measures 15 mm in length, and 3 mm in thickness, and the tentacles measure 15 mm in length. Outside of this series, there is seen another, also curved, series of 4 polyps (fig. 24, 7, 7, 7, 7). Their body measures 35 mm long, and 5 mm broad, and the tentacles have the same length as the body; and, outside of this series, the semicircular formed series, consisting of 5 large polyps (fig. 24, 8), is situated, exactly like the series on the left side with which it unites, but, in such manner, that there remains on the ventral surface, an interval of 7 mm in breadth, by which the circle is, here, interrupted.

The bilateral symmetry is, in this specimen, more prominent than in the preceding one, but, it is still far from being so distinct as in the younger individuals. The exterior 10 large lateral polyps, are arranged in a ring, which is only interrupted on the ventral surface (fig. 24). Inside this ring, the polyps are grouped, around, or more correctly, to the sides of the central polyps, rather irregularly, but may, however, with a little imaginative assistance, be arranged in 2 rings, the one inside of the other; but what has preserved in this specimen, more of the original bilateral arrangement than is the case in No. 8 specimen, may be the circumstance, that the rachis is not nearly so twisted, in conjunction with the fact, that it is, probably, a young polyp-stalk. Although this has a greater length, the polyps are, yet, less numerous, and are, also, more slender, and they appear altogether, not to be so developed as in No. 8 specimen, because, many of the inner polyps have no sexual organs. The two outer series have, developed testicles.

The polyps are cylindric, and a little thicker at the

smalne af paa Midten, men udvide sig igjen noget op imod Tentakelranden. Paa den udvendige Kropsflade sees de 8 Længdelinier for Insertionerne af Septa. Kroppens Hud uigjennemsigtig. Tentaklerne, Mundskiven og Munden som paa den foregaaende.

Farven er omtrent som paa No. 8. Hele Polypstokken har som sædvanligt et temmeligt tykt, gelatinøst Overtræk, der let gaar af ved Berørelse, og hvorved Overhuden drages med. Den nederste (bulbøse) Del har en lys, havannabrun Farve, den øvrige Del er meget lysere brungul. Hvor det gelatinøse Overtræk med Overhuden var borte, var Sarcosomaets Farve bleg gulhvid. Paa Rachis er Overhuden fastere, tyndere og har en svag gulbrun Farve. Polyperne ere smukt kastaniebrune; Pinnulerne ere noget lysere, imedens Mundskiven er mørkere. Mundlæberne omtrent af samme Farve som Pinnulerne.

Axen som paa de Foregaaende, kun langtfra saa dreiet.

Findested.

Station No. 18.

No. 10.

Tab. VIII, Fig. 26.

Stilken fra Grunden til Rachis 1820 ^{mm} lang. Den bulbøse Del er 340 ^{mm} lang, aldeles rund, næsten lige tyk overalt, kun dens øverste Parti, der er 50 ^{mm} i Omkreds, er noget fladtrykt, næsten firkantet; dens nederste Ende er tvers afskaaren og 55 ^{mm} i Omkreds. Den skedeformige Udvidning er 180 ^{mm} lang, 15 ^{mm} bred, tæt besat med Zooider, der længere ned paa Stilken ordne sig i Rækker paa Ventral- og Dorsalsiden. Fra den bulbøse Del aftager Stilken i Tykkelse, saa at den op imod den skedeformige Udvidning kun er 3.5 ^{mm} tyk. Stilken er ganske lige indtil den øverste Trediedel, men her begynder den svagt at dreie sig efter Længden, saa at den skedeformige Udvidning er spiralformigt vreden, Fig. 26.

Rachis er bægerformet, næsten rund og ender i en saagodtsom fritstaaende Knop, 5 ^{mm} bred, Fig, 26, *a*, og hvor Polyperne tage deres Udspring, er den 95 ^{mm} i Omkreds. Den er 35 ^{mm} høi, ligesaa bred og bærer 35 Polyper.

Ventralfladen er noget langstrakt, lidt konkav i Midten, 12 ^{mm} bred paa den midterste Del, men smalner betydeligt

base, diminishing in thickness at the middle, but again expanding somewhat, in proximity to the tentacular margin. On the exterior surface of the body, 8 longitudinal lines for the insertions of septa are observed. The integument of the body is non-translucent. The tentacles, oral disk, and oral aperture are similar to the same parts in the preceding specimen.

The colour is almost similar to that of No. 8 specimen. The entire stalk of the polyp has, as is commonly the case, a rather thick gelatinous covering, which is readily removed by contact, and which takes the cuticle along with it. The inferior (bulbous) part has a light Havana brown colour; the remaining part, is a much lighter brownish-yellow. Where the gelatinous covering and cuticle were absent, the sarcosoma's colour was pale yellow-white. On the rachis, the cuticle is more consistent, and is thinner, and has a light yellow-brown colour. The polyps are a beautiful chestnut brown. The pinnules are somewhat lighter in colour, whilst, the oral disk is darker. The labiæ of the oral aperture are of nearly the same colour as the pinnules.

The axis is similar to that of the preceding specimen, only, not nearly so much twisted.

Habitat.

Station No. 18.

No. 10 specimen.

Pl. VIII, fig. 26.

The stem measures 1820 ^{mm} from the base to the rachis. The bulbous part measures 340 ^{mm} in length, and is perfectly round, and almost uniformly thick throughout. The superior portion alone, is somewhat flattened, and nearly quadrangular, and measures about 50 ^{mm} in circumference. It's inferior extremity is transversely truncated, and is 55 ^{mm} in circumference. The sheath-formed dilation is 130 ^{mm} long, and 15 ^{mm} broad, and closely beset with zooids, which, lower down on the stem, arrange themselves in series, on the ventral and dorsal sides. From the bulbous part, the stem diminishes in thickness, so that, it is 3.5 ^{mm} thick in proximity to the sheath-formed dilation. The stem is quite straight, up to it's superior third part, but it, there, begins to twist itself gently, longitudinally, so that the sheath-formed dilation becomes twisted in spiral form (fig. 26).

The rachis is chalice-formed, and almost round, and it terminates in a nearly detached knob, which is 5 ^{mm} broad (fig. 26, *a*) and, at the point where the polyps have their origin, it's circumference is 95 ^{mm}. It is 35 ^{mm} high, and the same in breadth, and carries 35 polyps.

The ventral surface is somewhat elongate, and a little concave in the middle; it is 12 ^{mm} broad at the lower

af op imod den afrundede Ende, Fig. 26; den er tæt besat med Zooider.

Dorsalfladen har et Midtparti, der er næsten plant, og to Sideflader, der ere temmelig brede og skraane af imod Ventralfladen. Saavel Dorsalfladen som Lateralfladerne ere tæt besatte med Zooider, der danne 8 lancetformige Felter imellem Polyperne.

Terminalpolypen udspringer ved den knopformige Ende af Rachis paa Dorsalfladen, Hig. 26, 1*; den er 25 ^{mm} lang, 5 ^{mm} tyk; Tentaklerne 30 ^{mm} lange; strax bagenfor (nedenfor) denne staar en liden Polyp, 16 ^{mm} lang, 3 ^{mm} tyk; Tentaklerne 12 ^{mm} lange, Fig. 26, 1; omtrent 1 ^{mm} bagenfor denne lille Polyp sees en Polyp, der er 21 ^{mm} lang, 3.5 ^{mm} tyk; Tentaklerne 18 ^{mm} lange, Fig. 26, 1, og endelig staar bagenfor denne 3die Polyp en 4de, der er 26 ^{mm} lang, 5 ^{mm} bred; Tentaklerne 30 ^{mm} lange, fig. 26, *b*. Disse 4 Polyper staa i en lige Række og danne de centrale Dorsalpolyper. Her er en Afvigelse, idet her er 4 Centralpolyper, imedens hos alle de 5 foregaaende kun har været 3. Et Par Mm. til venstre Side af den 3die Centralpolyp (Endepolypen er den 1ste) staar en liden Polyp ganske isoleret; den er 15 ^{mm} lang, 2 ^{mm} bred; Tentaklerne lige lange som Kroppen, Fig. 26, 2, og noget foran (ovenfor) men til Siden sees to Polyper i næsten lige Linie, Fig. 26, 3, 3, af hvilke den forreste, nærmest Ventralfladen, er 15 ^{mm} lang, 3 ^{mm} bred med 15 ^{mm} lange Tentakler, og den bagerste er 22 ^{mm} lang, 4 ^{mm} bred, Tentaklerne 22 ^{mm} lange. Udenfor disse iagttages en lidt krumbøiet Række af 5 Polyper, Fig. 26, 4, 4, 4, 4, 4, hvoraf de 4 ere lige store, nemlig 35 ^{mm} lange, 7 ^{mm} brede med 40 ^{mm} lange Tentakler, imedens den 5te, der staar imellem den 1ste og 2den i Rækken, er kun 8 ^{mm} lang, knap 1 ^{mm} bred og med omtrent 8 ^{mm} lange Tentakler. Til Siden, udenfor denne Række, staa 3 Polyper i en lidt uregelmæssigt krumbøiet Linie med et Par Mm.s Mellemrum, Fig. 26, 5, 5, 5; deres Krop er 40 ^{mm} lang, 7—8 ^{mm} bred og Tentaklerne af Kroppens Længde. Disse 11 Polyper kunne betragtes som dorsal-laterale Polyper og omgives af 4 store, laterale Polyper, der staa i en Halvkreds, Fig. 26, 6, 6, 6, 6, ere fra 50—65 ^{mm} lange, 10—12 ^{mm} brede og med Tentakler af 55 ^{mm}s Længde.

Til høire Side af Centralpolyperne i omtrent 2 ^{mm}s Afstand staar en Række af 7 Polyper, Fig. 26, 7, 7, 7, 7, 7, 7, 7, hvoraf den forreste, nærmest Ventralfladen, er 32 ^{mm} lang, 6 ^{mm} bred med 42 ^{mm} lange Tentakler; den 2den er meget mindre, Kroppen 20 ^{mm} lang, 3 ^{mm} bred, Tentaklerne 20 ^{mm} lange, Fig. 26, *c*; de øvrige 5 tiltage i Størrelse, alt efterson de stille sig længere bag paa Ryggen, fra 25 ^{mm} lange,

part, but diminishes in breadth, considerably, in proximity to the rounded extremity (fig. 26). It is closely beset with zooids.

The dorsal surface has a middle part which is nearly flat, and two lateral surfaces which are rather broad, and slope off towards the ventral surface. Both, the dorsal surface as well as the lateral surfaces, are closely beset with zooids, which form 8 lanceolate areas between the polyps.

The terminal polyp has its orgin beside the knob-formed extremity of the rachis, on the dorsal surface (fig. 26, 1*). It is 25 ^{mm} long, and 5 ^{mm} thick, and the tentacles are 30 ^{mm} long. Immediately behind (below) it, a small polyp is situated, which measures 16 ^{mm} in length, and 3 ^{mm} in thickness, and it's tentacles are 12 ^{mm} long (fig. 26, 1). About 1 ^{mm} behind this little polyp, another polyp is observed, which is 21 ^{mm} long, and 3.5 ^{mm} thick, and with tentacles 18 ^{mm} long (fig. 26, 1) and, finally, behind this 3rd polyp, there is situated a 4th polyp, which measures 26 ^{mm} in length, and 5 ^{mm} in breadth, and has tentacles, 30 ^{mm} long (fig. 26, *b*). These 4 polyps are arranged in a straight series, and form the centro-dorsal polyps. There is, here, a divergence, inasmuch, that there are 4 central polyps, whilst, in all the 5 preceding specimens, there have only been 3 central polyps. A couple of millimetres to the left side of the 3rd central polyp, (the terminal polyp is the 1st) a small polyp is situated, quite isolated. It measures 15 ^{mm} in length, and 2 ^{mm} in breadth, with tentacles of the same length as the body; (fig. 26, 2) and somewhat in front, (above) but, to the side; two polyps are seen, situated in a nearly straight line (fig. 26, 3, 3), of which, the anterior one, nearest the ventral surface, is 15 ^{mm} long and 3 ^{mm} broad, and the tentacles measure 15 ^{mm} in length. The posterior polyp is 22 ^{mm} long and 4 ^{mm} broad, and it's tentacles are 22 ^{mm} long. Outside of these, a somewhat curved series of 5 polyps is observed (fig. 26, 4, 4, 4, 4, 4), of which, four are uniform in size, viz 35 ^{mm} long, and 7 ^{mm} broad, with tentacles 40 ^{mm} long; whilst the 5th polyp, which is situated between the 1st and 2nd in the series, is only 8 ^{mm} long, and barely 1 ^{mm} broad, and it's tentacles are 8 ^{mm} long. At the side; outside this series; 3 polyps are situated in a somewhat irregularly curved line, with a couple of millimetres interval between them (fig. 26, 5, 5, 5). Their body is 40 ^{mm} long, and 7—8 ^{mm} in breadth, and the tentacles have the same length as the body. These 11 polyps may be considered to be, dorso-lateral polyps, and are surrounded by 4 large lateral polyps, which are placed in a semicircle (fig. 26, 6, 6, 6, 6), and measure 50—65 ^{mm} in length, and 10—12 ^{mm} in breadth, and the tentacles 55 ^{mm} in length.

To the right side of the central polyps, at a distance of about 2 ^{mm}, a series of 7 polyps is situated (fig. 26, 7, 7, 7, 7, 7, 7, 7), of which, the anterior polyp; nearest the ventral surface; is 32 ^{mm} long, and 6 ^{mm} broad, with tentacles 42 ^{mm} in length. The second polyp is much smaller; it's body measures 20 ^{mm} in length, and 3 ^{mm} in breadth, and the tentacles are 20 ^{mm} in length (fig. 26, *c*). The remaining

5 mm brede med 25 mm lange Tentakler til 45 mm lange, 10 mm brede og med 45 mm lange Tentakler. Til Siden og udenfor denne Række er stillet 3 Polyper i en krumbøiet Linie, der ere af omtrent lige Størrelse, 42 mm lange, 12 mm brede; Tentaklerne lige lange som Kroppen, Fig. 26, 8, 8, 8. Disse to Rækker dorsal-laterale Polyper omgives af 5 store, laterale Polyper, der staa i en Halvkreds og slutte sig paa Ryggen fuldkommen til de tilsvarende 4 paa venstre Side, som de ligne i et og alt, imedens der paa Bugsiden bliver et temmelig stort, aabent Rum, Fig. 26.

Den bilaterale Symetri er temmelig godt bevaret, og det er paa dette Exemplar som paa de tidligere omtalte, at da Rachis har udvidet sig saa betydeligt i Bredden og er dreiet, faa Rækkerne en næsten horizontal Stilling paa den saagodtsom plane Rygside; imidlertid viser en nøiagtig Undersøgelse, at Rækkerne, naar undtages Centralrækken, have en lidt skraa Stilling forfra bagtil, nedenfra opad, saa at Polyperne i Regelen naa hen til Midten af Rygfladen, hvor især de laterale støde sammen uden at efterlade noget synderligt Mellemrum, saaledes som Tilfældet ialmindelighed er paa Ventralfladen.

Polyperne ere som paa de Foregaaende. De to yderste Rækker Polyper, der have fuldt udviklede Kjønsorganer, ere Hanner; de centrale og dorsal-laterale ere golde.

Farven ligesom paa No. 9. Hele Polypstokken overtrukken med et gelatinøst Slim.

Axen som paa No. 9.

Findested.

Station No. 31.

No. 11.

Tab. VIII, Fig. 27.

Stilken er fra den nederste Ende til Rachis 1900 mm lang. Den bulbøse Del er 345 mm lang, dennes nederste Halvdel er rund, 60 mm i Omfang strax ovenfor den konisk afstumpede Ende; den øverste Halvdel er firkantet, ogsaa 60 mm i Omfang; Midtpartiet er noget smalere. Omtrent 430 mm fra den øverste Del af Bulbus begynder Stilken at dreie sig noget efter Længden og fortsætter med Dreiningen helt op til Enden. Paa det smaleste er Stilken 4 mm.

Den skedeformige Udvidning er 55 mm lang, 11 mm bred,

5 polyps increase in size; according, as they are arranged posteriorly on the dorsal surface; rising from 25 mm long, 5 mm broad, with 25 mm long tentacles; up to 55 mm long, 10 mm broad, with 45 mm long tentacles. To the side, and outside of this series, 3 polyps are arranged in a curved line, and these, are nearly uniform in size, viz 42 mm in length, and 12 mm in breadth, with the tentacles of same length as the body (fig. 26, 8, 8, 8). These two series of dorso-lateral polyps are surrounded by 5 large lateral polyps, which are placed in a semicircle, and completely unite on the dorsal side, with the corresponding 4 polyps on the left side, which they resemble in all respects; whilst, upon the ventral surface, a pretty large open space is left (fig. 26).

The bilateral symmetry is tolerably well preserved; and in this specimen, like those already spoken of, the series assume a nearly horizontal position on the almost flat dorsal surface, owing to the rachis becoming so much dilated in breadth, and also, so much twisted. A minute examination, however, shows, that the series has a somewhat diagonal arrangement, running from front to back, and downwards to upwards, so that, in general, the polyps reach to the middle of the dorsal surface; where, the lateral ones, especially, unite with each other, without leaving any considerable interspace, such as is the case, generally, on the ventral surface.

The polyps are similar to those of the preceding specimens. The two exterior series of polyps, have fully developed sexual organs, and are males. The central and dorso-lateral polyps are sterile.

The colour is similar to that of No. 9 specimen. The entire polypdom, is coated with a gelatinous mucous.

The axis is similar to that of No. 9 specimen.

Habitat.

Station No. 31.

No. 11 specimen.

Pl. VIII, fig. 27.

The stem measures 1900 mm from the inferior extremity to the rachis. The bulbous part is 345 mm long, and it's inferior half portion is round; it is 60 mm in circumference immediately above the conically blunted extremity. The superior half portion is quadrangular, and is also 60 mm in circumference. The middle portion is somewhat narrower. About 430 mm from the superior part of the bulb, the stem commences to twist itself somewhat, longitudinally, and it continues the twisting, right up to the extremity. The stem is 4 mm thick at it's narrowest point.

The sheath-formed dilation is 55 mm long, and 11 mm

hvor den gaar over i Rachis og er stærkt dreiet, Fig. 27, *a*, overalt tæt besat med Zooider, der nedover Stilken samle sig i Rækker paa Ventral- og Dorsalfladen, men blive alt sparsommere og sparsommere, saa at de paa den bulbøse Del staa ganske enkeltvis.

Rachis er bægerformet, rund og saa fordreiet, at det ikke er muligt at se, hvor den ender. Den er 110^{mm} i Omkreds, 23^{mm} høi, 32^{mm} bred og bærer 26 Polyper, som indtage saavel Dorsal- som Ventralfladen, der egentlig er imaginær; thi Rachis danner en opad stærkt udvidet Klump, hvorpaa Polyperne sidde tilsyneladende i Kredse, den ene indenfor den anden. Imidlertid kan Polyperne lægges saaledes ud fra hverandre, at en bilateral Symetri kan fremstilles; men den bliver jo altid ufuldkommen og maa kun betragtes som Rester af en fordums saadan.

Omtrent paa Midten af den næsten horizontalt liggende Rygside staa 3 Polyper i Rad, hvoraf den forreste, Fig. 27, 1*, er Terminalpolypen, hvis Krop er 25^{mm} lang og 9^{mm} bred ved Grunden; Tentaklerne 45^{mm} lange; den anden er lidt større, Fig. 27, 1; men den tredie, bagerste, er den største; dens Krop er 35^{mm} lang, 10^{mm} bred; Tentaklerne 45^{mm} lange. Denne Række danner de central-dorsale Polyper, ihvorvel de ere skudte noget til Siden paa Grund af Fordreiningen af Rachis.

Til venstre Side af Centralpolyperne staa 3 omtrent lige lange Polyper i en lidt skjæv Række, Fig. 27, 2, 2, 2; Kroppen er 35^{mm} lang, 7^{mm} bred; Tentaklerne 40^{mm} lange. Den forreste af disse 3 dorsal-laterale Polyper udspringer egentlig fra Ventralfladen. Udenfor dem sees 5, omtrent lige store Polyper, der staa i en Halvkreds og maa betragtes som de egentlige laterale Polyper, Fig. 27, 3, 3, 3, 3, 3; Kroppen er 50^{mm} lang, 10^{mm} bred; Tentaklerne 65^{mm} lange.

Til høire Side, der er større end venstre, staa ved Siden af Centralpolyperne 4 lige store Polyper i en næsten lige Linie; Kroppen er 35^{mm} lang, 7^{mm} bred; Tentaklerne 45^{mm} lange, Fig. 27, 4, 4, 4, 4; udenfor dem staa atter 4 lige store Polyper i en lidt skjæv Række, Fig. 27, 5, 5, 5, 5; Kroppen 33^{mm} lang, 7^{mm} bred; Tentaklerne 40^{mm} lange. Til Siden af disse staa 2 Polyper, Fig. 27, 6, 6, af hvilke den ene er lige stor som de sidst omtalte 4, imedens den anden, der staar ganske nær den yderste Række, er kun 22^{mm} lang, 4^{mm} bred med 25^{mm} lange Tentakler. Disse 10 Polyper, som repræsentere de dorsal-laterale, omgives af 5 store, laterale Polyper, Fig. 27, 7, 7, 7, 7, 7, stillede i en Halvkreds, der slutter sig ganske til de laterale Polyper paa venstre Side, hvorved den ydre Polypkreds dannes, som kun paa Ventralfladen er yderst lidt afbrudt, Fig. 27, *b*.

Af alle de tidligere beskrevne Former er der ingen,

broad at the point where it passes over into the rachis, and it is strongly twisted (fig. 27, *a*). It is, everywhere, closely beset with zooids, which, down along the stem, are collected in series on the ventral and dorsal surfaces, but they become more and more sparingly placed, so that, finally, on the bulbous part, they are placed quite singly.

The rachis is chalice-formed, and round, and is so much twisted, that it is impossible to detect where it terminates. It is 110^{mm} in circumference, and 23^{mm} high; it's breadth is 32^{mm}; and it carries 26 polyps, which occupy both the dorsal and ventral surfaces; the latter surface is, however, only imaginary, becanse, the rachis forms an upwards, strongly-dilated lump, upon which the polyps, apparently, are seated in rings, the one inside the other. But, the polyps may, however, be separated apart from each other, and a bilateral arrangement thus presented; it is, however, always incomplete, and can only be considered, as the remains of an earlier bilateral arrangement.

At about the middle of the nearly horizontally placed dorsal side, 3 polyps are placed in a series, of which, the anterior one (fig. 27, 1*), is the terminal polyp; the body of this one, is 25^{mm} long, and 9^{mm} broad at the base, and it's tentacles are 45^{mm} in length. The second polyp is a little larger (fig. 27, 1); but the third (posterior) one is the largest. It's body is 35^{mm} long and 10^{mm} broad, and the tentacles are 45^{mm} long. This series forms the centro-dorsal polyps, although, they are somewhat pushed aside in consequence of the twisting of the rachis.

To the left side of the central polyps, 3 nearly uniformly long polyps are placed in a somewhat crooked series (fig. 27, 2, 2, 2). Their body is 35^{mm} long, and the breadth is 7^{mm}, whilst the tentacles are 40^{mm} long. The anterior one of these dorso-lateral polyps, originates, really, in the ventral surface. Outside these, 5 nearly uniformly large polyps are observed, situated in a semicircle, and may be considered to be, the real lateral polyps (fig. 27, 3, 3, 3, 3, 3). Their body is 50^{mm} long, and 10^{mm} broad, and the tentacles are 65^{mm} long.

On the right side; which is larger than the left one; 4 polyps of uniform size are situated in an almost straight line, alongside the central polyps. Their body is 35^{mm} long and 7^{mm} broad, and the tentacles are 45^{mm} long (fig. 27, 4, 4, 4, 4). Outside these, there is placed, still other 4 polyps of uniform size, in a slightly crooked series (fig. 27, 5, 5, 5, 5). Their body is 33^{mm} long, and 7^{mm} broad, and the tentacles are 40^{mm} long; and alongside of these, again, 2 polyps are situated (fig. 27, 6, 6), of which, the one is similar in size to the 4 polyps last spoken of, whilst, the other, which is placed near the outer series, is only 22^{mm} long, and 4^{mm} broad, with tentacles 25^{mm} long. These 10 polyps, which represent the dorso-lateral polyps, are surrounded by 5 large lateral polyps (fig. 27, 7, 7, 7, 7, 7) placed in a semicircle, and which quite unite with the lateral polyps on the left side, and in this manner, the outer polyp-ring is formed; which, upon the ventral surface alone, is extremely little interrupted (fig. 27, *b*).

Of all the previously described forms, there is none,

hos hvem den bilaterale Symetri er paa saa god Vei til at forsvinde, som just hos denne, og havde man ikke kunnet forfølge den fra de tidligere Udviklingsstadier, skulde man let have overseet den ganske paa dette Exemplar.

Ved Polyperne er intet Særegent at iagttage fra de Foregaaende. Samtlige Polyper have udviklede Kjønsorganer og ere Hanner.

Axen som paa de tidligere omtalte Exemplarer.

Hele Stokken er overtrukken med et tykt, gelatinøst Slim, der er bunden til Epithelet, saa at det ene ikke kan fjernes uden det andet.

Farven som paa No. 10.

Findested.

Station No. 31.

No. 12.

Tab. VIII, Fig. 28.

Stilken fra Grunden til Rachis er 2270^{mm} lang. Den bulbøse Del er 400^{mm} lang og er omtrent lige tyk overalt, omkring 5^{mm} i Omkreds. Dens nederste Halvdel er rund og har en konisk afstumpet Ende; den øvre Del er næsten firkantet, og her begynder Stilken allerede at dreie sig efter Længden i lange Spiraler, der blive kortere, jo længere de komme op paa Stilken, saa at den skedeformige Udvidning, der er 180^{mm} lang, 15^{mm} bred, er 3 Gange dreiet, Fig. 28, *a*. Stilken er kun 4^{mm} tyk op imod den skedeformige Udvidning, der er tæt besat med Zooider, som forlænge sig nedover Stilken til omtrent Midten af den bulbøse Del.

Rachis er stærkt fordreiet, næsten rund, lidt aflang forfra bagtil, 120^{mm} i Omkreds, 36^{mm} høi, 35^{mm} bred og bærer 40 Polyper. Kun en fin Linie antyder Ventralfladen; forresten er hele den øverste Del besat med Polyper, medens den nederste, bægerformede Del, danner 8 lancetformige Zooidefelter, der strække sig op imellem de laterale Polyper og udbrede sig overalt paa Rachis, Fig. 28.

Paa den udvidede Rachis omtrent paa Midten af Dorsalfladen, lidt til Venstre, staa i en ret Linie forfra bagtil 3 central-dorsale Polyper, Fig. 28, 1, 1, 1, af hvilke den forreste er Terminalpolypen, hvis Krop er 25^{mm} lang, 4^{mm} bred og med 24^{mm} lange Tentakler, Fig. 28, 1*; den mellemste er 34^{mm} lang, 5^{mm} bred med 25^{mm} lange Ten-

in which the bilateral symmetry is in such a fair way to disappear, as in this one; and if we had not been able to trace it from the earlier stages of development, we might, easily, have completely overlooked it in this specimen.

There is nothing, specially, differing from the preceding specimens, to be remarked in regard to the polyps of this one. All the polyps have, developed sexual organs, and are males.

The axis is similar to that of the specimens previously spoken of.

The entire stalk is coated with a thick gelatinous mucous, which is so adherent to the epithelium, that the one, can not be removed without the other following along with it.

The colour is similar to that of No. 10 specimen.

Habitat.

Station No. 31.

No. 12 specimen.

Pl. VIII, fig. 28.

The stem measures 2270^{mm} in length from the base to the rachis. The bulbous part is 400^{mm} long, and it's thickness is nearly uniform throughout; whilst, the circumference is about 5^{mm}. It's inferior half portion is round, and has a conical blunted extremity. The upper part is nearly quadrangular, and, already, at this point, the stem begins to twist itself longitudinally, in long spirals, which diminish in length, the further up the stem they extend, so that, the sheath-formed dilation, which is 180^{mm} long, and 15^{mm} broad, is 3 times twisted (fig. 28, *a*). The stem is only 4^{mm} thick in proximity to the sheath-formed dilation; this is closely beset with zooids; these extend themselves down, along the stem, to about the middle of the bulbous part.

The rachis is strongly twisted, nearly round, and slightly oblong from front to back, and measures 120^{mm} in circumference, 36^{mm} in height, 35^{mm} in breadth; it carries 40 polyps. A minute line is all that denotes the ventral surface; otherwise, the entire superior part is beset with polyps, whilst, the inferior chalice-formed part, forms 8 lanceolate zooidal areas, which extend themselves up between the lateral polyps, and spread themselves all over the rachis (fig. 28).

On the dilated rachis; about the middle of the dorsal surface, and a little to the left; 3 centro-dorsal polyps (fig. 28, 1, 1, 1) are situated, in a straight line from front to back. The anterior one of these, is the terminal polyp, and it's body is 25^{mm} long and 4^{mm} broad; the tentacles are 24^{mm} long (fig. 28, 1*). The intermediate polyp

takler, og den bagerste er 26^{mm} lang, 4^{mm} bred med 22^{mm} lange Tentakler.

Til Høire af Centralpolyperne men mere fortil staa en Rad af 3 Polyper, lidt paaskraa, Fig. 28, 2, 2, 2, hvoraf den forreste, der udspringer fra Ventralfladen, er størst, 38^{mm} lang, 7^{mm} bred med 25^{mm} lange Tentakler; den mellemste er 30^{mm} lang, 5^{mm} bred med 25^{mm} lange Tentakler, og den 3die, bagerste, er 25^{mm} lang, 4^{mm} bred med 25^{mm} lange Tentakler. Udenfor disse sees en krummet Række af 5 Polyper, Fig. 28, 3, 3, 3, 3, 3, der strækker sig næsten fra Midten af Dorsal- til Midten af Ventralfladen, og af hvilke den forreste og bagerste er 45^{mm} lang, 7^{mm} bred med 35^{mm} lange Tentakler; de 3 mellemste ere indbyrdes lige store, Kroppen 37^{mm} lang, 4^{mm} bred; Tentaklerne 25^{mm} lange. Til Siden af dem kommer 2 Polyper, fig. 28 4, 4, der staa 8^{mm} fra hinanden og ligesom afvexlende med de 4 Polyper, der danne den næst yderste Række; de ere lige store, Kroppen 40^{mm} lang, 8^{mm} bred, Tentaklerne 35^{mm} lange. De 4 Polyper staa temmelig langt fra hverandre i en Halvkreds og ere lige store, Fig. 28, 5, 5, 5, 5; Kroppen 45—50^{mm} lang, 8^{mm} bred, Tentaklerne 40^{mm} lange; de afvexle med de 5 store, laterale Polyper, Fig. 28, 6, 6, 6, 6, 6, der danne den yderste, halvkredsformige Række og have alle næsten samme Størrelse; Kroppen er 65—70^{mm} lang, 12^{mm} bred ved Grunden, 6^{mm} op imod Tentakelskiven, og med 55^{mm} lange Tentakler.

Til Venstre af Centralpolyperne, noget fortil, staar en paaskraa gaaende Række af 4 Polyper, Fig. 28, 7, 7, 7, 7, af hvilke de 3 forreste, der gaa over paa Ventralfladen, ere omtrent lige store, Kroppen 40^{mm} lang, 6^{mm} bred, Tentaklerne 30^{mm} lange; den bagerste er 35^{mm} lang, 3^{mm} bred med 25^{mm} lange Tentakler. Til Siden og udad for disse staa 2 Polyper, Fig. 28, 8, 8, hvoraf den forreste er 45^{mm} lang, 6^{mm} bred; Tentaklerne 30^{mm} lange; den bagerste er 38^{mm} lang, 5^{mm} bred; Tentaklerne 33^{mm} lange. Længere bagtil sees 4 Polyper, Fig. 28. 9, 9, 9, 9, dannende næsten en Tværrække; de staa temmelig langt fra hverandre og ere af forskjellig Størrelse; den 1ste (forreste), der staar længst til Siden, Fig. 28, *b*, er 22^{mm} lang, 3^{mm} bred; Tentaklerne 15^{mm} lange; den 2den, der staar omtrent 3^{mm} fra den forreste, er 30^{mm} lang, 3^{mm} bred; Tentaklerne 30^{mm} lange; den 3die er den mindste, kun 15^{mm} lang, 2^{mm} bred med 15^{mm} lange Tentakler; den 4de, som er den bagerste, staar strax bag, dog lidt til Siden af den bagerste Centralpolyp og er 35^{mm} lang, 4^{mm} bred med 30^{mm} lange Tentakler. Bagenfor disse 4 Polyper findes en Tværrække af 3 Polyper, Fig. 28, 10, 10, 10, hvoraf den bagerste, Fig. 28, *c*, er 50^{mm} lang, 8^{mm} bred, med 35^{mm} lange Tentakler; de to andre aftage noget i Størrelse, saa at den forreste er 35^{mm} lang, 5^{mm}

is 34^{mm} long, and 5^{mm} broad, and the tentacles are 25^{mm} long. The posterior polyp is 26^{mm} long, and 4^{mm} broad, and the tentacles are 22^{mm} long.

To the right of the central polyps, but more in front, a series of 3 polyps is placed a little diagonally (fig. 28, 2, 2, 2), of these, the anterior one, which proceeds from the ventral surface, is the largest, and measures 38^{mm} in length, 7^{mm} in breadth, and it's tentacles are 25^{mm} in length. The intermediate polyp is 30^{mm} long, and 5^{mm} bread, and it's tentacles are 25^{mm} in length. The 3rd one (posterior) measures 25^{mm} in length, 4^{mm} in breadth, and it's tentacles are 25^{mm} long. Outside these, a curved series of 5 polyps is seen (fig. 28, 3, 3, 3, 3, 3), which extends, nearly, from the middle of the dorsal surface, to the middle of the ventral surface, and, of which, the anterior and posterior polyps, measure 45^{mm} in length, 7^{mm} in breadth, and the tentacles, 35^{mm} long. The three intermediate polyps are of uniform size, the one with the other, and their body measures 37^{mm} in length, 4^{mm} in breadth, and the tentacles, 25^{mm} long. To the side of these; 2 polyps are situated (fig. 28, 4,4), which are placed 8^{mm} apart from each other, and, as it were, alternate with the 4 polyps forming the second outermost series. These 2 polyps are of similar size; the body is 40^{mm} long, and 8^{mm} broad, and the tentacles are 35^{mm} long. The 4 polyps are placed considerably apart from each other, but, in a semicircle, and they are uniform in size (fig. 28, 5, 5, 5, 5). Their body measures 45—50^{mm} in length, 8^{mm} in breadth and the tentacles are 40^{mm} long; they alternate with the 5 large lateral polyps (fig. 28, 6, 6, 6, 6, 6), which form the exterior crescent-shaped series, and these are, nearly, all of uniform size. Their body measures 65—70^{mm} in length, 12^{mm} in breadth at the base, and 6^{mm} in breadth in proximity to the tentacular disk; the tentacles are 55^{mm} long.

To the left of the central polyps; somewhat in front; a diagonal series of 4 polyps (fig. 38, 7, 7, 7, 7), is situated; of these, the 3 in front, which pass over to the ventral surface, are nearly of uniform size. The body is 40^{mm} long, and 6^{mm} broad, and the tentacles, are 30^{mm} long. The posterior polyp is 35^{mm} long, 3^{mm} broad, and it's tentacles are 25^{mm} long. To the side, and outside these; 2 polyps appear, (fig. 28, 8, 8). of which, the anterior one is 45^{mm} long, and 6^{mm} broad, and the tentacles are 30^{mm} long. The posterior one is 38^{mm} long, 5^{mm} broad, and the tentacles are 33^{mm} long. Further back, 4 polyps are visible (fig. 28, 9, 9, 9, 9), forming a nearly transverse series. These, are placed pretty far apart from each other, and are of various sizes. The anterior one; placed most to the side; (fig. 28, *b*) is 22^{mm} long, 3^{mm} broad, and it's tentacles are 15^{mm} long. The second is placed at an interval of about 3^{mm} from the first, and is 80^{mm} long, 3^{mm} broad, and it's tentacles are 30^{mm} long. The third is the smallest; it is only 15^{mm} long, 2^{mm} broad, and its tentacles are 15^{mm} long. The 4th, which is the posterior one, is placed immediately behind, yet a little to the side of the posterior central polyp, and is 35^{mm} long, 4^{mm} broad, and it's tentacles are 30^{mm} long. Behind these 4 polyps; a transverse

bred med 30^{mm} lange Tentakler. Udenom disse samtlige Polyper paa venstre Side staa de 5 store, laterale Polyper, der have samme Størrelse som de tilsvarende paa høire Side, hvortil de fuldstændigt slutte sig og danne dermed en sammenhængende Ring, Fig. 28.

Man vil nu af ovenstaaende Angivelse over Polypernes Stilling bedst kunne erkjende, at uagtet det ved en løselig Betragtning er umuligt at finde nogen bilateral Symetri, er der dog tydelige Spor efter en saadan, der ved den stærke Fordreining og Udvidning af Rachis, som igjen er betinget af Kalkaxens Dreininger, har tabt meget af Karakteren. Opgives den bilaterale Symetri, som man for endel kan gjøre saavel paa dette Exemplar som paa No. 8, 9 og 11, saa vil man ved lidt Imagination faa Polyperne til at være stillede i Ringe rundt Rachis, saaledes at de store, laterale Polyper danne den ydre Ring, at de dorsal-laterale Polyper danne en Ring indenfor denne, hvorved den anden Rings Polyper staa afvexlende imellem den ydre Rings, og saa fremdeles; men jo længere man kommer ind mod Centrum, jo vanskeligere bliver det at fastholde Ringdannelsen; thi Uregelmæssigheden i Stillingen bliver altfor stor.

Polyperne have forøvrigt samme Karakterer som de Foregaaende. Naar undtages et Par af de mindste Polyper, have Alle udviklede Generationsorganer. De ere Hunner, have Æg i alle Udviklingsstadier og enkelte Embryoner, saa det er sandsynligt, at *Umbellula encrinus* føder levende Unger. I enhver Kapsel er der i Regelen kun et Æg.

Zooiderne danne i Regelen flere Rækker nedover paa hele Stilken, saaledes staa de paa den bulbøse Del indtil dennes nederste Trediedel i 4, lidt uregelmæssige Rækker saavel paa Ventral- som Dorsalsiden; paa de laterale Flader ere de sjeldnere.

Det maa bemærkes, at paa samtlige de Exemplarer, hvor Zooiderne strakte sig nedover Stilken, var Tentakelen i Regelen indtrukken, medens det modsatte var Tilfældet paa den skedeformige Udvidning og Rachis, — her var i Regelen Tentakelen fuldstændigt udstrakt, hvorved disse Dele fik ligesom et laaddent Udseende.

Findested.

Station No. 31. Paa Station No. 176 fandtes et Stykke af Axen af et lidet Exemplar.

series of 3 polyps is observed (fig. 28, 10, 10, 10), of which, the posterior one (fig. 28, *c*), is 50^{mm} long, and 8^{mm} broad, and the tentacles measure 35^{mm} in length. The other two diminish somewhat, in size, so that, the anterior one of them, measures 35^{mm} in length, 5^{mm} in breadth, and the tentacles 30^{mm} in length. Outside the whole of these polyps, and on the left side, the 5 large lateral polyps are situated; these are similar in size, to the corresponding ones of the right side, with which they completely unite, and form, thus, an uninterrupted ring (fig. 28).

From the above description of the arrangement of the polyps, it will be readily apparent, that upon a superficial examination only, it is impossible to detect any bilateral arrangement, but, that nevertheless, there are distinct traces of such a bilateral symmetry; that, owing to the strong twisting, and enlargement of the rachis; which again, is conditional on the twisting of the calcarous axis; has lost much of its distinguishing characteristics. If we abandon the bilateral symmetry, which we may in a measure do, both, relative to this specimen, as well as No. 8, 9, and 11; we may, by a slight stretch of the imagination, fancy the polyps arranged in rings round the rachis, in such manner, that the large lateral polyps form the outer ring, and the dorso-lateral polyps form a ring inside it, by which, the second ring's polyps become placed, alternately, between the outer ring's polyps, and so on throughout; but, the nearer we approach to the centre, the more difficult does it become, to maintain the annular formation; because, the irregularity in the arrangement becomes excessive.

The polyps have, otherwise, the same characteristics as the polyps of the preceding specimens, If we except a couple of the smallest polyps, all of them have, developed generative organs. They are females, and contain ova in all stages of development, and also, a few embryos, so that, it is probable, that *Umbellula encrinus* reproduces living young ones. In each capsule, there is, as a rule, only one ovum.

The zooids on the whole of the stem, downwards, generally form several series, so that, on the bulbous part and to its lowest third part, they are situated, in 4 somewhat irregular series, both on the ventral and dorsal side. They are not so numerous on the lateral surfaces.

It must be remarked, that in all the specimens, where the zooids extended themselves down along the stem, the tentacle was, generally, retracted, whilst, the opposite was the case on the sheath-formed enlargement, and the rachis. There, the tentacle was, as a rule, completely extended, by which these parts acquired a shaggy appearance.

Habitat.

Station No. 31. At station No. 176, a portion of the axis of a small specimen was obtained.

Vi have nu leveret en nogenlunde fuldstændig Beskrivelse af denne høist interessante *Pennatulide's* Ydre, og vi have behandlet særskilt hvert Exemplar af de 12, der ere fundne paa den norske Nordhavsexpedition, væsentlig fordi de frembyde i de forskjellige Aldere og Udviklingsstadier Særegenheder, som, hvor kun et enkelt Specimen haves til Raadighed, let kan lede til Antagelse af særskilte Arter, noget, der efter vor Formening har fundet Sted ved de af Dr. Lindahl opstillede 2 Arter, *Umbellula miniacea* og *Umb. pallida* og sandsynligvis med Professor Köllikers *Umbellula magniflora*, hvilke samtlige vi have opførte i Synonymien. Allerede Kölliker har fundet Lindahls Arter saa lidet adskilte fra hinanden, at han har slaaet dem sammen under Navnet *Umbellula Lindahli*, og vi ere ved Sammenligning med vore Exemplarer komne til den fuldstændige Overbevisning, at de ere mindre udviklede (yngre) Exemplarer af den gamle, ærværdige *Umbellula encrinus*. Af vore Beskrivelser fremgaar det formentlig med Bestemthed, at ethvert Exemplar frembyder en eller anden Særegenhed, der staaende for sig alene uden at kunne sammenlignes med en Række Exemplarer i forskjellige Aldere, vil kunne benyttes som Artsmærker, saaledes som Dr. Lindahl har gjort. Forudsat at vi havde fundet de 12 Exemplarer igjennem et længere Tidsrum og kun 1 Exemplar af Gangen, havde der da været for os omtrent de samme Grunde til Dannelsen af 10—12 Arter, som der har været for Dr. Lindahl til at danne 2. Slægten *Umbellula* er let kjendelig med sin særegne, forholdsvis lange Stilk, med sin forkrøblede Rachis og med de store, hængende Polyper; men Arten *encrinus* er temmelig variabel, alt eftersom Exemplaret er mere eller mindre udviklet, — og kun ved et større Sammenligningsmaterial, saaledes som det vi have været saa lykkelige at være i Besiddelse af, kan det undgaaes at opstille nye Arter, der dog til syvende og sidst falder sammen med den gamle *encrinus*.

Ser vi nu hen til vore 12 Exemplarer, finde vi, at Stilken varierer paa hvert enkelt; den danner foroven en større eller mindre Bue, ofte afhængig af Polypernes Tyngde; den er paa enkelte Exemplarer overordentlig meget dreiet efter Længden, paa andre er den ganske opret og lige; dens nederste, bulbøse Del er forskjellig baade i Tykkelse og Længde, stundom ganske rund, hyppig fladtrykt paa Ventral- og Dorsalfladen, hos enkelte firkantet og ender hyppigst som en afstumpet Konus med en ovoid Skraaflade; Stilkens øverste, skedeformige Del varierer ligeledes dels efter Exemplarets Alder, dels eftersom Stilkens Dreininger ere mere eller mindre udstrakte.

Rachis er jo ogsaa meget forskjellig; paa enkelte Exemplarer er den yderst kort og kun lidet dreiet, saa at Enden er let at observere, paa andre er den længere, meget bred og stærkt fordreiet, saa at den danner en tyk Klump, paa hvilken det er ugjørligt at paavise noget egentligt Endepunkt.

We have now presented a somewhat complete description of this highly remarkable *Pennatulida's* exterior, and have treated each specimen, of the 12 specimens collected during the Norwegian North-Atlantic Expedition, by itself, principally, because they display peculiarities in the various ages and stages of devlopment, which, when only one specimen is at disposal, may easily lead to the adoption of separate species. This has, in our opinion, happened with the 2 species *Umbellula miniacea*, and *Umbellula pallida*, established by Dr. Lindahl, and probably, also, with Professor Köllikers *Umbellula magniflora*, all of which, we have placed in the common synonymy. Köliker has previously found Lindahl's species, so little different from each other, that he has classed them together under the designation *Umbellula Lindahli*; and, we have, after comparison with our specimens, arrived at the complete conviction, that they are, partially developed (younger) specimens of the old, venerable *Umbellula encrinus*. From our description, it appears, presumably, with certainty, that each specimen presents, some one or other peculiarity, which taken by itself; without opportunity of comparison with a series of specimens of different ages; may be used as a specific characteristic, in the manner Dr. Lindahl has done. Supposing that we had collected our 12 specimens over a long period of time, and only one specimen at a time, there would, then, have also been for us, about the same reasons for the formation of 10 or 12 species, as there has been for Dr. Lindahl to form 2 species. The genus *Umbellula* is easily recognisable by it's peculiar, relatively long stem, with it's scrubby rachis, and by the large pendant polyps; but the species *encrinus* is pretty variable, according, as the specimen is more or less developed, and, only, with the assistance of an extensive comparative material, like what we have been so fortunate to obtain posession of, is it possible to avoid the creation of new species, which, after all is said and done, conform to the old *encrinus*.

If we examine our 12 specimens, we find, that the stem is different in each one of them. They all form at the upper part, a larger or smaller arc, frequently dependdent on the weight of the polyps. In some specimens, the stem is greatly twisted longitudinally, whilst, in other specimens it is quite erect and straight. Its lower bulbous part is variable, both, in thickness, and in length; sometimes, it is quite round; frequently, it is flattened on the ventral and dorsal surfaces. In a few specimens, the stem is quadrangular, and terminates, often, as a blunted cone having an ovate diagonal surface. The superior sheath-formed part, also varies, partly, as a consequence of the age of the specimen, and partly, also, according as the twisting of the stem is more or less extensive.

The rachis too, is very various. In a few specimens it is extremely short, and only slightly twisted, so that, it's extremity is easily detected. In other specimens, it is longer, very broad, and strongly twisted, so that, it forms a thick lump, in which it is impracticable to detect any

Af disse Afvigelser af Rachis er igjen den bilaterale Symetri for en stor Del afhængig. Vi have seet, at omendskjønt den bilaterale Anordning egentlig er gjennemgaaende hos Alle, er der dog Exemplarer, hvor den skjuler sig saa godt, at den ved overfladisk Betragtning let kan oversees, imedens den hos yngre Specimina er let iøinefaldende; og hvad nu Polyperne angaar, saa frembyde de jo mange Forskjelligheder ikke alene paa Exemplarerne sig imellem men endogsaa paa selvsamme Stok. Saaledes finde vi store og smaa i den samme Koloni, hvilke ere forskjellige i Farve, eftersom de ere yngre eller ældre, ligesom Tentaklernes Forhold til Polypkroppen varierer betydeligt.

Zooider findes jo paa Alle; de have samme Form, der er ganske eiendommelig, idet de ere forsynede med en lang Tentakel, der kan ganske indtrækkes i den runde, kugleformige Krop. Paa enkelte Exemplarer kan Tentakelen være indtrukken hos saagodtsom alle Zooider, og de ligne da almindelige Zooider hos *Virgulariderne*; paa andre er Tentakelen enten ganske eller mere eller mindre udstrakt, og da se de ud som lange nedhængende Papiller, Tab. VIII, Fig. 29. Det er sandsynligvis disse Lindahl ogsaa har bemærket, og som han har kaldet "skaftet", uden nærmere at beskrive dem. Men ihvorvel Zooiderne ere ens hos Alle — paa meget unge Exemplarer er Tentakelen kun lidet udviklet — saa staa de dog snart tæt sammen, snart mere spredte paa de forskjellige Specimina. Endelig er Farven ogsaa temmelig variabel, især gjælder dette Polyperne; den brune Farve er dog Grundtonen.

Dr. Lindahls to Exemplarer have, efter Alt at dømme, været meget unge; herpaa tyder Polypernes Antal og Størrelse, men hovedsagelig den Omstændighed, at han ingen Generationsorganer fandt hos dem. Vi have to Exemplarer af omtrent samme Størrelse som Lindahls, nemlig No. 5 og 6; men hos disse, ligesom hos de 4 mindre, fandt vi heller ikke Kjønsorganer, imedens hos alle de øvrige, der havde en høiere Alder, fandtes Generationsorganer vel udviklede, dog saaledes, at hos enkelte (No. 7) havde kun de ydre Polyprækker fuldt udviklede Kjønsorganer; alle de øvrige Polyper hos dette Exemplar vare endnu kjønsløse. Men hos de fuldt udvoxne havde samtlige Polyper udviklede Generationsorganer. Paa Ellis's Exemplar have Kjønsorganerne visselig været udviklede; han omtaler idetmindste nogle runde Legemer, som kan antages for Æg.

Omendskjønt baade Ellis's og Mylius's Beskrivelser ere meget ufuldstændige og kunde heller ikke være andet, saasom enhver af dem kun havde et tørret Exemplar til deres Disposition, saa kan der dog ikke reises Skygge af Tvivl om, at vore Exemplarer ere identiske med deres, og at saaledes Ellis's "*Clusterpolype*" og Mylius's „*Neue grönländische Thierphlanze*" er gjenfunden, og det i saamange vel konserverede Exemplarer, at de ikke paany skulle gaa tabte for Videnskaben.

actual terminal point. On these divergencis in the rachis, the bilateral symmetry, again, is, in a great degree dependent. We have seen, that although the bilateral arrangement, really, is present in them all, yet, there are specimens where it is so concealed, that on superficial examination, it may easily be overlooked, whilst, in the younger specimens it, prominently, meets the eye. In respect to the polyps; these too, also, present many divergencies, not only between the specimens themselves, but even in the polyps of one and the same stalk. For instance, we find large and small in the same colony, which very in colour, according as they are younger or older, whilst, also, the proportion between the tentacles and the body of the polyp differs greatly.

Zooids are, however, found on them all, and these have the same quite peculiar form, inasmuch as, that they are furnished with a long tentacle, with is capable of being retracted into the circular bullet-shaped body. In some specimens, the tentacle can be retracted in nearly the whole of the zooids, and they, then, resemble the common zooids in *Virgularidæ*. In other specimens, the tentacle is, entirely, or more or less, partially, extended, and they then resemble long pendant papillæ (Pl. VIII, fig. 29). It is, presumably, these, that Lindahl has also observed, and which he has called "skaftet", without, however, more minutely, describing them. But, although, the zooids are alike in all, yet, the tentacle is, in young specimens, only little developed; and further, they are situated, oftentimes, compactly, oftentimes more dispersed, in the different specimens. Finally, the colour is, also, rather variable, and this is specially so, regarding the polyps. Brown colour is, however, the prevailing tone.

Dr. Lindahl's two specimens have, to all appearance, been very young; the number and size of the polyps point to that; but, mainly, the circumstance, that he did not observe generative organs in them, leads to that conclusion. We have two specimens of about similar size as Lindahl's viz. No. 5 and 6, but, in these, as well as in the 4 smaller ones, neither have we observed sexual organs; whilst, in all the others which had a more advanced age, generative organs, well developed, were observed; but yet, in individuals (No. 7) the outer series of polyps, alone, had fully developed sexual organs. All the other polyps in this specimen, were, as yet, sexless; but, in the full grown individuals, the whole of the polyps had developed generative organs. In Ellis's specimen, the sexual organs have evidently been developed; at all events, he speaks of some round bodies, which he assumes to be ova.

Although both Ellis's and Mylius's descriptions are very incomplete, and could not well be otherwise, seeing, that each of them, had at their disposal, only, one dried specimen; yet, there can not be raised the shadow of a doubt, that our specimens are identical with theirs; and, that therefore, Ellis's "*Clusterpolype*", and Mylius's "*Neue grönländische Thierphlanze*", are now rediscovered, and in so many well preserved specimens, that they are not likely, again, to become lost to science.

Dr. Lindahl har givet en schematisk Fremstilling af Polypernes Anordning, saaledes som han har tænkt sig den foregaar. Den er kun en Hypothese; thi nogen direkte Iagttagelse over Polypernes Udvikling og Stilling paa Rachis foreligger ikke. Efter hvad vi have observeret paa vore 12 Exemplarer, foregaar ikke Polypernes Frembrud paa den af ham tænkte Maade. Vi ere fuldstændig enige med ham deri, at Terminalpolypen er den første, som bryder ud af Rachis; men stort længere strækker heller ikke Enigheden sig. Naar Terminalpolypen er dannet, mener Lindahl, at nedenfor denne fremkommer en ny Polyp, som han betegner "Basalpolyp", saalænge den beholder denne Plads. Han siger fremdeles: "Undertiden har han ändrat plats och blifvit lateral polyp, idet han stält sig vid venstra sidan af terminalpolypen, undantrængd af en ny, i tilväxt stadd polyp, hvilken intagit den förres plats som basalpolyp i midtellinien af rachis, och i sin ordning växer fatt sina båda föregångare och drager sig åt andra (högra) sidan om terminalpolypen". Af det foreliggende Material udbryder de laterale Polyper efter Endepolypens Dannelse uden nogen saadan Vandring, som Lindahl antyder, og efterat et Par laterale Polyper ere fremkomne paa hver Side, udvoxer Rachis i Bredden, hvorpaa de central-dorsale og senere de dorsal-laterale Polyper udvikle sig efterhaanden, ligesom de laterale Polyper tiltage i Antal. Udvikligen af Rachis og det Rum, som derved vindes, synes at være det Bestemmende for Polypernes Anordning; men forøvrigt kan intet sikkert herom siges, førend man har en langt større og mere sammensluttende Række af Exemplarer, end vi have havt.

Vi skulle nu gaa over til at fremstille den indre Bygning af *Umbellula encrinus*.

Den anatomisk-histologiske Bygning.

De 4 store Længdekanaler, der gjennemløbe hele Stokken, undergaa Forandringer væsentligt, eftersom Axedreiningerne foregaa. Paa Midten af Stokken ere Kanalerne næsten lige vide; Ventral- og Dorsalkanalen er dog lidt større i Omfang end Sidekanalerne, og her ligger Axen i Centrum. Længere op imod den skedeformige Udvidning, hvor Axen nærmer sig Ventralfladen, begynder samtlige Længdekanaler at fordreie sig noget, hvilken Fordreining bliver endnu stærkere i den skedeformige Udvidning og i selve Rachis. Vi maa henvise til de to Tversnit, Tab. VIII, Fig. 30 og 31, for at gjøre det ret forstaaeligt. Det første Tversnit, Fig. 30, er foretaget omtrent midt paa den skedeformige Udvidning, og her viser det sig, at Axen er skudt helt hen til Ventralsiden, Fig. 30, *a*; Ventralkanalen er ligesom dreiet og udvidet mod Sidekanalen, Fig. 30, *b*. Den høire Sidekanal er trukken mod Dorsalkanalen og temmelig udvidet imod Coenenchymvæggen, Fig. 30, *c*. Dorsalkanalen

Dr. Lindahl has given an outline representation of the development of the polyps, as he has supposed it to proceed. This is only a hypothesis, however, because it is based on no direct observation of the development and arrangement of the polyps on the rachis. From what we have observed in our 12 specimens, the first appearance of the polyps does not occur in the manner he has supposed. We quite agree with him in this; that the terminal polyp is the first one which springs from the rachis, but the unanimity does not proceed much further. When the terminal polyp is formed, Lindahl thinks, that below it, a new polyp appears, which be designates "basal polyp" so long as it retains that position. He states further: "Sometimes it has shifted position and become a lateral polyp, and becomes situated at the left side of the terminal polyp, forced out by a new polyp in a state of growth, that has occupied the situation of the first, as basal polyp in the mesial line of the rachis, and in it's arrangement grows away from both its predecessors, and places itself at the other side (right) of the terminal polyp". From observation of our material, we find that the lateral polyps appear after the formation of the terminal polyp, without any such travel as Lindahl indicates, and after a couple of lateral polyps have appeared on each side, the rachis expands in breadth, and then the centro-dorsal, and, subsequently, the dorso-lateral polyps, develope themselves, gradually, whilst, also, the lateral polyps become more numerous. The development of the rachis, and the space which is thereby obtained, seems to be the regulating moment in the arrangement and development of the polyps; but, nothing certain, however, can be said as to this, before a much larger and more continuous series of specimens is obtained, than we have had.

We shall now proceed to discuss the inner structure of *Umbellula encrinus*.

The anatomo-histological Structure.

The 4 large longitudinal canals which extend through the whole of the stalk, undergo changes, more particularly, according, as the twistings of the axis occur. In the middle of the stem, the canals are almost uniform in width; the ventral and dorsal canals are, however, a little greater in size than the lateral canals, and here, the axis lies in the centre. Further up, towards the sheath-formed dilation, where the axis approaches the ventral surface; all the longitudinal canals commence to twist themselves a little, and the twisting becomes still greater in the sheath formed dilation, and also in the rachis itself. We must refer to the two sectional illustrations (Pl. VIII, fig. 30 and 31) to make our description more intelligible. The first section (fig. 30) illustrates the situation about the middle of the sheath-formed dilation, and, here, it is seen, that the axis is pushed quite aside to the ventral side (fig. 30 *a*). The ventral canal appears, as if twisted, and dilated

er den mindst fortrukne; men ogsaa den er bleven noget forrykket, ligesom den er mere langstrakt, end Tilfældet er længere nede paa Stilken, Fig. 30, *d*. Den venstre Sidekanal er løftet op og er trangere, Fig. 30, *e*, — kort sagt, alle Længdekanalerne ere trukne mod Dorsalfladen, der ogsaa er meget udvidet, ligesom Coenenchymet her er meget tykt, Fig. 30, *f*, imedens det paa Ventralfladen er overordentligt tyndt, Fig. 30, *g*. De 4 Septa ere fortrukne i Lighed med Kanalerne. Disse ere med Hensyn til deres Lumen ingenlunde formindskede, de ere kun blevne mere udstrakte i Bredden i den skedeformige Udvidning, — en Anordning, der bidrager til, at denne Del kan betydeligt opsvulme og udspændes af den i Kanalerne cirkulerende Vædske. Det forholder sig ikke saaledes, som Dr. Lindahl i sin Afhandling "om Pennatulid-Slägtet *Umbellula*" angiver, "at Dorsalkanalen er den hovedsagelig udvidede Kanal, der giver den skedeformige Udvidning sin Form, og at den ved en eller anden Anledning, ved indesluttede Gasers Expansion kan blæres op;" Forholdet er som ovenfor antydet meget simplere.

Figur 31 illustrerer Længdekanalerne lige ved Begyndelsen af Rachis. Axen er her endnu mere fordreiet; Ventralkanalen er ganske fortrukken, Fig. 31, *a*; Dorsalkanalen, Fig. 31, *b*, har næsten sin naturlige Form, naar undtages, at den er udvidet efter Dorsalfladens Bredde, og Sidekanalerne, Fig. 31, *c*, *c*, ere ligeledes betydeligt udvidede paa Dorsalsiden. Samtlige Kanaler ere temmelig smale ved Axen men udvider sig stærkt mod Coenenchymvæggen, Fig. 30. 31. Op igjennem Rachis blive Sidekanalerne noget smalere, indtil de op imod Terminalpolypen ophøre, idet begge Septa paa hver Side smelte sammen, saa at der bliver kun to Kanaler, nemlig Dorsal- og Ventralkanalen, hvoraf den første bliver trangere og trangere, indtil ogsaa den forsvinder nogle Millimeter fra Terminalpolypen. Ventralkanalen, der er endnu temmelig vid, og hvori Axen ender, gjør en stærk Bøining under Endepolypen, smalner betydeligt af og ender paa Ventralsiden, 4—5^{mm} under Terminalpolypens Grund, i en rund, gjennemboret Papille.

I den bulbøse Del af Stilken ere de 4 Længdekanaler kun liden Forandring underkastede, hvorimod de 4 Septa mærkeligt modificeres, ligesom et Septum transversale optræder. Omtrent 10^{mm} fra Stokkens Grund deler det ventral-laterale Septum paa hver Side sig i to Længdefolder; den ene, bagerste, Fig. 32, *a* gaar hen og indsererer sig langs Sidedelen af Axens Skede lige ned til dennes Ende, om hvilken den slaar sig, og er her sammenvoxen med den tilsvarende fra den anden Side, Fig. 33, *a*; den anden, forreste, Fold, Fig. 32, *b*, der er den tykkeste, gaar paaskraas nedad og indad foran Axeskeden og møder paa Midten af Ventralfladen en tilsvarende Fold fra den anden Side, med

towards the lateral canal (fig. 30, *b*). The right lateral canal is drawn towards the dorsal canal, and is pretty much dilated towards the wall of the sarcosoma (fig. 30, *c*). The dorsal canal is the least distorted, but, it is, also, somewhat displaced, whilst, also, it is more elongated, than is the case further down the stem (fig. 30, *d*). The left lateral canal is elevated and narrower (fig. 30, *e*); in short; all the longitudinal canals are drawn towards the dorsal surface, which, also, is much dilated, and the sarcosoma is, also, very thick here (fig. 30, *f*); whilst, on the ventral surface, it is extremely thin (fig. 30, *g*). The 4 septa are distorted, similar to the canals. These are, so far as regards their channel, in no way diminished; they have, only, become dilated in breadth throughout the sheath-formed dilation, an arrangement which conduces to the canals becoming capable, of being considerably swollen and expanded by the fluids circulating in them. It is not the case, as Dr. Lindahl in his memoir "om Pennatulid-Slägtet *Umbellula*" states it to be, viz. that the dorsal canal is the principal dilated canal which gives to the sheath-formed dilation it's shape, and that it may on some one or other occasion, be expanded by the elastic action of the enclosed gases. The real case is, as above explained, much simpler.

Fig. 31 illustrates the longitudinal canals as seen, exactly at the commencement of the rachis. The axis is, here, still more twisted; and the ventral canal is quite distorted (fig. 31, *a*). The dorsal canal (fig. 31, *b*) has almost the natural shape, with the exception, that it is dilated throughout the breadth of the dorsal surface; and the lateral canals (fig. 31, *c*, *c*) are also considerably dilated on the dorsal side. All of the canals are rather narrow close to the axis, but become greatly dilated towards the wall of the sarcosoma (fig. 30, 31). Upwards, throughout the rachis, the lateral canals become somewhat narrower, until they altogether cease close up towards the terminal polyp, owing to both the septa on each side becoming fused together, so, that there are, then, only two canals, namely, the dorsal and the ventral canals, of which, the first becomes narrower and narrower, until, also, it ceases a few millimetres distant from the terminal polyp. The ventral canal, which is still, tolerably wide; and in which the axis terminates; makes a sharp curve under the terminal polyp; then becomes considerably reduced in width, and terminates on the ventral side, 4—5^{mm} below the base of the terminal polyp, in a round perforated papilla.

In the bulbous part of the stalk, the 4 longitudinal canals experience, only, very little change; whilst, on the other hand, the 4 septa are remarkably modified, and a septum-transversale appears. About 10^{mm} from the base of the stalk, the ventro-lateral septum becomes divided on each side, in two longitudinal folds; the posterior fold (fig. 32 *a*), proceeds to insert itself along the lateral part of the sheath of the axis, right down to it's extremity, round which it entwines itself; and, it becomes, here, concreted with the corresponding fold from the other side (fig. 33, *a*). The other, anterior fold (fig. 32, *b*), which is the thickest one, proceeds diagonally, downwards and

hvilken den smelter sammen og danner et bredt Belte, Fig. 32, *c*, Fig. 34, *a*, der skjuler ganske et bagenfor liggende, transverselt Septum, til hvis Midte det er adhæreret, imedens der fra Beltets Siderande udgaa flere stærke Bindevævstraade, som fæste sig til Coenenchymets indre Væg, Fig. 32, *d*. Foruden at dette Belte er fæstet langs Midten af det transverselle Septum, er det tillige sammenvoxet til dettes nederste, fri Rand, Fig. 34, *b*. Fjernes dette Belte, saa træder Septum transversale tydeligt frem, Fig. 34, *c*; det er 2,5^{mm} høit, er fæstet paa begge Sider til Coenenchymets indre Væg, Fig. 34, *d*, og deler det nederste Rum i Stilken i to Dele, den ventrale og dorsale Kanal, idet de laterale Kanaler egentlig ophører der, hvor det transverselle Septum optræder, Fig. 34, *e*.

Septum transversale er dannet af en dobbelt Bindevævsmembran, der opad har en tyk Rand, Fig. 34, *f*, hvortil det føromtalte Belte ogsaa er fæstet. Denne Dobbelmembran folder sig saa, at en Del slaar sig bagover paa Axeskeden, forlænger sig derefter nedover dennes forreste Væg, omgiver Skedens nederste Ende og danner ligesom en Sæk, hvori denne ligger; den forreste Del af Membranen udgjør det egentlige transverselle Septum, hvis nederste, fri Rand er nogle Millimeter fra Stilkens Bund, saa at Enden af Axen sees nedenfor den, Fig. 34, *g*. Nedenfor Septum transversale er der selvfølgeligt kun et eneste Rum, hvori ikke alene den særdeles vide Dorsal- og Ventralkanal aabner sig men ogsaa Sidekanalerne, idet Bunden af disse sidste er gjennembrudt ved de mange Bindevævstraade, hvorved Septa fæste sig til Coenenchymvæggen.

De dorsal-laterale Septa fæste sig indad paa Axeskedens Sidevæg, Fig. 35, *a*, lige ned til Axens Ende, Fig. 35, *b*; men naar de komme i Niveau med det Sted, hvor de ventral-laterale Septa afgive den omtalte Fold, der danner Beltet, sende de en meget stærk Fold fra sig, Fig. 35, *c*, der bidrager væsentligt til Dannelsen af Septum transversale, Fig. 35, *d*.

Unægteligt har det havt sine Vanskeligheder at udrede disse temmelig indviklede Forholde i den bulbøse Del af Stilken, og det lader sig derfor let forklare, at Dr. Lindahl, der kun har havt et sparsomt Material, som han ikke engang tilstrækkeligt har kunnet benytte, har misforstaaet disse Forholde. Han har ganske overseet baade det beskrevne Belte og Septum transversale; han udtaler sig nemlig saaledes: "*Umbellula*'s skaft har i sin nedersta del en helt egendomlig bygnad, idet att ändblåsan utgöres af den utvidgade nederste änden af ventralsidans hufvudkanal, hvars båda sidoväggar, de ventrala-laterala septa, böja sig in under de öfrige tre hufvudkanalerna, så att de bilda deras botten. Nämnda septa göra dervid et starkt veck

inwards, in front of the sheath of the axis, and meets at the middle of the ventral surface, a corresponding fold from the other side, with which it becomes fused, forming a broad band (fig. 32, *c*, Pl. IX, fig. 34, *a*) that completely conceals a transversal septum which lies behind it, and to whose middle it is adherent; whilst, from the lateral margins of the band; several strong filaments of connective-tissue proceed, which are secured to the inner wall of the sarcosoma (fig. 32, *d*). Besides this band being adherent along the middle of the transverse septum, it is, also, concreted with the inferior free margin (fig. 34. *b*). If this band is removed, the septum-transversale becomes distinctly prominent (fig. 34, *c*); it is 2.5^{mm} high, and is attached on both sides to the inner wall of the sarcosoma (fig. 34, *d*) dividing the inferior space in the stem, into two parts, viz. the ventral and the dorsal canals; because, the lateral canals really cease at the point where the transversal septum appears (fig. 34, *e*).

The septume-transversale is formed, of a double membrane of connective-tissue, with a thick superior margin (fig. 34, *f*) to which the band previously spoken of, is also attached. This double membrane folds itself, in such manner, that a portion folds backwards on the sheath of the axis, then extends itself down along it's anterior wall and surrounds the inferior extremity of the sheath, forming, as it were, a bag, in which it is enclosed. The anterior part of the membrane forms the real transverse septum, whose inferior free margin is distant, a few millimetres from the base of the stem, so, that the extremity of the axis is observable below it (fig. 34, *g*). Below the septum transversale, there is, consequently, only a single space, in which, not only, the tolerably wide dorsal and ventral canals open, but, also, the lateral canals; as the bottom of these last, is perforated by the numerous connective-tissue filaments by which the septa are attached to the wall of the sarcosoma.

The dorso-lateral septa are attached, inwards, to the lateral wall of the sheath of the axis (fig. 35, *a*), right down to the extremity of the axis (fig. 35, *b*); but, when they come in line with the point where the ventro-lateral septa produce the fold spoken of as forming tbe band, they push forward a very strong fold (fig. 35 *c*) which contributes, principally, in the formation of the septum-transversale (fig. 35, *d*).

The clearing up of these rather complex relations in the bulbous part of the stem, has, undeniably, had it's difficulties; and, it is, therefore, easy to understand, how Dr. Lindahl, who had only slight material to work with, and which, he was not, even, in a position to sufficiently utilise, has misunderstood these relations. He has quite overlooked both, the band and the septum-transversale, which we have described. He states the following: "*Umbellula*'s shaft has, in it's lower part, a quite peculiar structure, inasmuch,that the terminal vesicle is formed by the dilated lower extremity of the main canal of the ventral side, through both of whose lateral walls, the ventro-lateral septa curve in, under the other three main canals, so, that they

uppåt, hvarigenom den af dem beklädde änden af kalkaxeln kommer att hänga et stycke ned i ändblåsan.“

Umbellula encrinus har, som vore Beskrivelser paaviser, ingen Endeblære; den ender nedad sædvanligvis noget afstumpet med en Skraaflade; Septum transversale med det omtalte Belte deler den nederste Del i en Ventral- og Dorsalkanal, hvoraf den sidste er videst, og som vi senere komme til at omtale, imedens Sidekanalerne indsnevres noget; men samtlige Kanaler støde til det eneste Hulrum, som findes nedenfor det transverselle Septum, og som er det Fællesrum, hvori de 4 Længdekanalers Indhold mødes. Hvor indviklet end den anatomiske Bygning synes at være i det nederste Parti af den bulbøse Del, saa nærmer den sig dog meget til Bygningen hos Pennatuliderne i Almindelighed; sagtens er Septum transversale meget lidet, men det findes dog, og det nævnte Belte synes ved sin større Længde at skulle hjælpe noget paa det, saa at Delingen af det nederste Rum faar en længere Udstrækning, imedens det Forhold, Dr. Lindahl har beskrevet, er ganske fremmed for Pennatuliderne.

De 4 Septa, der dele Stokkens Indre i 4 Længdekanaler, udgaa fra den indre Coenenchymvæg og fæste sig paa Kalkaxens Skede, med hvilken de smelte sammen. Der er en liden Strækning i den øverste, smale Del af Stilken, hvor Septa, idet de udgaa fra Coenenchymvæggen, ere ganske hele, det vil sige ikke gjennembrudte; men saavel i den skedeformige Udvidning og i Rachis, som i hele den øvrige Del udgaa Septa med stærke Bindevævsbjelker, der fornemmelig i Bulbus staa langt fra hverandre, og hvorved fremkommer større eller mindre aflange Aabninger, gjennem hvilke den ene Længdekanal kommunicerer med den anden, Tab. VIII, Fig. 32, *e*. Nede i Bulbus og oppe i den skedeformige Udvidning staa disse Aabninger meget tæt sammen og ere større, saa at Kommunikationen i disse Dele maa være meget livlig.

Septa dannes af en tyk, fast, hyalin Bindevævsmembran (Mesoderm?), hvori findes en stor Mængde fine, forgrenede Saftkanaler, der kommunicere med hverandre, og hvis Lumen ganske er udfyldt af Epithel, bestaaende af lidt aflange Celler med Kjerne og kornet Indhold, Fig. 36, *a*. Begge Sider af Septa ere beklædte med Epithel, der bestaar af flere Lag runde Celler, lignende dem, som beklæde Længdekanalerne. Disse Celler ere runde, have en tynd Membran og en lidt excentrisk, rund Kjerne, omgiven af en yderst finkornet Masse (Entodermceller). De omtalte Saftkanaler ere forsynede med større eller mindre Laguner, hvori Epithelbeklædningen ikke ganske udfylder Lumenet. Muskler findes ikke i Septa.

Foruden disse 4 Længdekanaler, der ere eiendommelige for Pennatulidebygningen, beskriver Dr. Lindahl endnu

form their bottom. The septa referred to make, thus, a strong curve upwards, through which, the extremity of the calcareous axis which they cover, extends a little into the terminal vesicle.

As our description shows, *Umbellula encrinus*, has no terminal vesicle. It terminates downwards, generally, somewhat truncated, with a diagonally sloping surface. The septum-transversale, with the band already spoken of; divides the lower part into a ventral and dorsal canal; of these, the last named is the widest, and we shall, subsequently, come to speak of it; whilst, the lateral canals become somewhat contracted; but, the whole of the canals open into the only cavity which is found below the transversal septum, and which forms the common chamber in which the contents of the 4 longitudinal canals meet. However complex the anatomical structure seems to be in the lower part of the bulbous portion, yet, it approaches much, in similarity, to the structure of the Pennatulidæ, in general; certainly the septum-transversale is very small, but, still, it is found there, and the band we have spoken of would appear, by its greater length, as if it was intended to supplement it, so that, the division of the lower space might attain a longer extent; but the relations described by Dr. Lindahl are quite foreign to the Pennatulidæ.

The 4 septa which divide the interior of the stalk into 4 longitudinal canals, proceed from the inner wall of the sarcosoma, and attach themselves to the sheath of the calcarous axis, with which they become fused. There is a small extent in the superior narrow part of the stem, where the septa, as they proceed from the wall of the sarcosoma, are quite entire, that is to say, are not perforated; whilst, both, in the sheath-formed dilation, and in the rachis, as well as, in all the other parts, the septa issue as strong connective tissue rods, which, especially in the bulb, are placed far apart from each other, forming larger or smaller oblong openings, through which the one longitudinal canal communicates with the other (Pl. VIII, fig. 32, *e*). Down in the bulb, and up in the sheath-formed dilation, these openings are placed very close together, and are larger, so that, the circulation in these parts must be very active.

The septa are formed, of a thick, firm, hyaloid membrane of connective-tissue (*Mesoderm?*) in which is found, a multitude of minute, ductiferous ramifications communicating with each other; and whose channels are quite filled up by epithelium, consisting of slightly oblong cells containing a nucleus and granular contents (fig. 36, *a*). Both sides of the septa are clad with epithelium, consisting of several layers of circular cells like those which clothe the longitudinal canals. These cells are round, and have a thin membrane; and they contain a somewhat eccentric round nucleus, surrounded by an extremely minute granular substance (Entoderm cells). The ductiferous ramifications which we have spoken of, are furnished with larger or smaller lagunes; in which, the epithelium covering does not quite fill the channel. No muscles are found in the septa.

Besides these 4 longitudinal canals; which are peculiar to the Pennatulida's structure; Dr. Lindahl describes,

12 Bikanaler. Han siger: "I öfre delen af nedra skaftansvällningen finna vi jemte de fyra hufvudkanalerna tolf mindre långsgående bikanaler, hvilka omslutas af de dikomiskt klufna septa, der dessa förena sig med skaftväggen." Tegningen, som ledsager denne Beskrivelse, viser ogsaa tydeligt denne dikotomiske Deling af Septa; men det er en Misforstaaelse, naar det antages, at derved fremkomme Længdekanaler paa dette Sted. I vore Figurer 30 og 31 er denne Deling af de 4 Septa henimod Coenenchymvæggen fremstillet; men Delingen fortsættes eller rettere forgrener sig og gaar over i det Maskenet, hvoraf Tverkanaler i det hyaline Bindevæv dannes, Fig. 31 *d*. Langsgaaende Bikanaler til de 4 Hovedkanaler findes ikke; det er kun rummeligere Tverkanaler, som findes paa de Steder, hvor Septa udgaa fra Coenenchymet, hvilke Lindahl visselig ogsaa vilde have erkjendt som saadanne, om han havde havt Anledning til at udstrække den anatomiske Undersøgelse noget videre.

Stokkens Coenenchym er paa de forskjellige Steder mere eller mindre tykt. I den bulbøse Del er det 3 – 4^{mm} tykt og svampet; paa det smaleste Parti af Stilken er det knapt 1^{mm}, og paa den skedeformige Udvidning er det paa Ventralsiden endnu meget tyndere, Fig. 30 *h*, imedens det paa Dorsalsiden er meget tykt, 5—6^{mm}, Fig. 30, *f*; lignende Forhold finder ogsaa Sted ved Rachis; men om end Tykkelsen er forskjellig, saa er dog den indre Struktur ens overalt.

Coenenchymets ydre Flade er overalt tapetseret med et temmelig tykt Epithel (Ectoderm), bestaaende af flere Lag polyædriske Celler, 0,008^{mm} brede med en stor, rund Kjerne og finkornet Protoplasmaindhold, Fig. 37 *a*, 38 *a*, 39 *a*, 40 *a*; imellem disse polyædriske Celler sees ogsaa mere aflange Celler af omtrent samme Størrelse. Omgivet af Ectodermet og ligesom nedsænket i dette iagttages en overordentlig stor Mængde temmelig klare, aflange Legemer, som vi antage for encellede Slimkjertler. De ere aflange, 0,040^{mm} lange, 0,024^{mm} brede. Kjernen er stor, aflang, 0,008 lang, 0,006^{mm} bred, Fig. 37, *b*. 38, *b*. 39, *b*. 40, *b*; de have en noget forskjellig Størrelse paa de forskjellige Steder, ligesom de i Regelen ligge enkeltvis; men nede paa den bulbøse Del ligge de tildels som Drueklaser, og da kunne de være stundom mere runde, stundom mere aflange, Fig. 41. Den Omstændighed, at disse encellede Kjertler ere noget nedsænkede i Epithelet, giver Overfladen ved mikroskopisk Undersøgelse Udseende af et Net, i hvis Masker Kjertlerne ligge, Tab. X, Fig. 59. De ere i naturlig Tilstand næsten vandklare og have en temmelig tynd Membran, ligesom mange ere uden Kjerne, saa vi længe vare i Tvivl om, hvortil vi skulle henføre disse Legemer; men ved Farvning med Jodgrønt viste de sig aabenbart som Celler; den store, aflange Kjerne traadte tydeligt frem, et yderst finkornet Indhold, der omgav Kjernen, var grønfarvet, og endelig saaes paa enkelte en tydelig Udførselsgang, hvis Aabning var traktformig, Fig. 38, *c*. Disse Kjertler findes overalt, ikke alene paa Stokken, men som

still, other 12 ductiferous branches. He says: "In the upper part of the lower shaft enlargement, we find, besides the four main canals, twelve smaller longitudinal branch ducts, which are enclosed by the dichotomously divided septa, where these attach themselves to the wall of the shaft." The illustration which accompanies the description shows, also, distinctly, this dichotomous division of the septa, but, it is a misunderstanding, when it is assumed that longitudinal canals are thereby produced in this situation. In our illustrations (figs. 30 and 31), this division of the 4 septa in proximity to the wall of the sarcosoma is represented, but the division is continued, or rather, ramifies, and passes into the reticulation, which forms the transverse ducts in the hyaloid connective tissue (fig. 31, *d*). The longitudinal ductiferous branches to the 4 main canals are not found; it is, only, wider transverse canals, which are found in the situations, where septa issue from the sarcosoma; and this, Lindahl would certainly have also ackowledged to be the case, if he had had opportunity to extend the anatomical examination somewhat further.

The sarcosoma of the stalk is more or less thick in the various situations. It is 3—4^{mm} thick in the bulbous part, and spongy; at the narrowest part of the stem, it is barely 1^{mm} thick, and on the ventral side of the sheath formed dilation it is still thinner, (fig. 30, *h*) whilst, upon the dorsal side it is very thick, 5—6^{mm} (fig. 30, *f*). A similar relation is also found in the rachis, but, although, the thickness is variable, the inner structure is everywhere alike.

The sarcosoma's exterior surface is, everywhere, coated with a rather thick epithelium (Ectoderm), consisting of several layers of polyhedrous cells, 0,008^{mm} in breadth, containing a large round nucleus and minute granular protoplasma (figs. 37, *a*. 38, *a*. 39, *a*. 40, *a*.). Between these polyhedrous cells, more oblong cells, but of the same size are observable. Surrounded by the ectoderm, and embedded, as it were, in it, a very large number of rather clear, oblong bodies are observed, and these, we suppose to be single-celled mucous glands. They are oblong 0,040^{mm} long and 0,024^{mm} broad. The nucleus is large, and oblong, and measures 0,008^{mm} long, and 0,006^{mm} broad (figs. 37, *b*. 38, *b*. 39, *b*. 40, *b*.). They have a somewhat varying size in the different situations; whilst, as a rule, they are also situated singly; but, down in the bulbous part, they are found situated, partly, like clusters of grapes, and can then, occasionally, appear more round, occasionally, more oblong (fig. 41). The circumstance that these single-celled glands are somewhat depressed in the epithelium, imports a reticulated appearance to the surface, when observed under the microscope; the glands being situated in the meshes of the reticulation (Pl. X fig. 59). In the natural state, they are almost as clear as water, and have a rather thin membrane, whilst, also, many appear without nucleus, so, that for a long time, we were in doubt what to consider these bodies; but, on being coloured with iodine-green they proved themselves, indisputably, to be cells. The large, oblong nucleus came prominently out; and an extremely minute granular substance which surrounded the

vi senere skulle se, ogsaa paa Polyperne i en utrolig Mængde, og det tykke, gelatinøse Slim, der i levende Live indhyller disse Dele, lader sig derfor let forklare. Ectodermcellernes Indhold er tildels brunt pigmenteret; men dette Pigment er mere eller mindre intens, saaledes er det paa den bulbøse Del intensere end paa den øvrige Del af Stilken.

Saavidt os bekjendt er der ikke hidtil fundet Slimkjertler hos Pennatuliderne, ihvorvel næsten alle Søfjære, naar man tager dem op af Søen, føles slimede; men ikke hos nogen have vi iagttaget saa tykt, gelatinøst Overtræk som hos *Umbellula encrinus*, og derfor var det at vente, at der maatte findes særegne Organer for denne Afsondring. Det tør nok hænde, at man herefter ved Afbenyttelsen af Jodgrønt vil finde Slimkjertler hos mange Pennatulider; thi det er ikke sandsynligt, at disse Organer alene skulle findes hos *Umbellula encrinus*.

Indenfor Ectodermet er et Lag fast, fibrillært Bindevæv, hvori findes spindelformede Bindevævslegemer med Kjerne, og hvis Udløbere tildels korrespondere med hinanden, Fig. 37, *c*. 39, *c*. 40, *c*. Dette fibrillære Bindevæv støder til et meget bredt, hyalint Bindevævslag, der indtager hele den øvrige Del af Coenenchymet, og hvori der er større og mindre Spalter, der danne saavel Længde- som Tverkanaler. Lige ved den indre Rand af det fibrillære Bindevæv, eller der, hvor dette støder sammen med det hyaline, findes i en enkelt Række, men Side om Side, Længdekanalerne, Fig. 36, *b*. 39, *d*. Disse Længdekanaler ere ikke lige vide; enkelte ere trangere end andre, og af og til er en meget vid placeret imellem to eller flere trange, Fig. 39, *e*. Det fibrillære Bindevæv danner i Længdekanalerne et listeformigt Fremspring, der rager mere eller mindre ind i Kanalen, Fig. 39, *e*. 40, *d*, ja ikke sjeldent forlænger dette Fremspring sig helt igjennem denne, hvorved den deles, og saaledes fremkomme de mindre Kanaler, der da intet Fremspring have, Fig. 39, *d*. Men ret hyppigt sees to saadanne Fremspring at rage temmelig langt ind i Længdekanalen, der da sædvanligvis er meget vid. Længdemusklerne ere fæstede ikke alene paa disse Bindevævslister men ogsaa paa Kanalens Sidevægge, Fig. 39, *f*. 40, *f*, og bestaa af temmelig stærke Fibre, hvorved Længdekanalen kan forkortes. Man ser Virkningen af disse Længdemuskler meget godt udvendigt paa Coenenchymet, hvor Kanalerne vise sig i fine Bugtninger langs hele Stilken; lettest iagttages de dog paa dennes bulbøse Del. Længdekanalerne ere paa deres hele indre Flade beklædte med et Epithel, der bestaar af runde Celler med en klar, gjennemsigtig Membran og en rund Kjerne omgiven af fine, næsten klare Protoplasmakorn. Cellerne ere 0,008^{mm} og Kjernen 0,002^{mm}, Fig. 40, *g*. Det hyaline Bindevævslag er meget bredt og danner et Net af Tverkanaler, der løbe i alle Retninger og give Coenenchymet sin svampede Karakter, Fig. 36, *c*. 39, *g*. 40, *h*. Dette hyaline Bindevæv er gjennemtrængt af en stor Mængde fine Ernæringskanaler, som forgrene sig

nucleus was tinged green, and finally, in a few; a distinct excretory duct, whose aperture was funnel shaped (fig. 38, *c*), was seen. These glands are everywhere found, not only on the stalk, but, as we shall subsequently see, also, in incredible numbers on the polyps, and the thick gelatinous mucous, which in the live state enclosed these parts, becomes therefore easily explainable. The contents of the ectoderm cells are, partly, tinged brown, but the colour is variable in intensity, so that, for instance, at the bulbous part, it appears deeper than in the remainder of the stem.

As far as we are aware, there have not, hitherto, been found, mucous glands in the Pennatulidæ, although, nearly all sea-pens feel slimy when taken out of the sea; but, in none, have we observed such a thick gelatinous covering as in *Umbellula encrinus*; and, it was therefore to be expected that special organs for this secretion would be found. It may probably happen, hereafter, that by the application of iodine green, mucous glands will be found in many Penatulidæ; because, it is not likely that these organs are found, exclusively, in *Umbellula encrinus*.

Inside the ectoderm, there is a layer of compact fibrillous connective-tissue, in which spindle-formed connective-tissue bodies having a nucleus, are found, whose prolongations, partly, correspond with one another (fig. 37 *c*, 39 *c*, 40 *c*). This fibrillous connective-tissue abuts, on a very broad, hyaloid layer of connective-tissue, that occupies the whole of the remaining portion of the sarcosoma, and, in which larger and smaller fissures occur, which form both, longitudinal and transversal canals. Exactly at the inner margin of the fibrillous connective-tissue, or, at the point where it unites with the hyaloid tissue, a single series of longitudinal canals placed side by side, is found (figs. 36, *b*, 39, *d*). These longitudinal canals are not uniformly wide; some are narrower than others; and, now and then, a very wide one is situated between two or more narrow ones (fig. 39, *e*). The fibrillous connective tissue forms, a fillet-formed prominence in the longitudinal canals, which projects more or less into the canal (figs. 39, *e*, 40, *d*); indeed, this prominence prolongs itself, not infrequently, quite through the canal, which thus becomes divided, and produces the smaller canals which have then, no prominence (fig. 39, *d*). Most frequently, however, two such prominences are observed, to extend pretty far into the longitudinal canal, which, then, is generally very wide. The longitudinal muscles are attached, not only to these connective-tissue fillets, but, also, to the lateral walls of the canal (figs. 39, *f*, 40 *f*); and consist, of rather strong fibres, by means of which, the longitudinal canals may be shortened. The effect of these longitudinal muscles is very well seen, externally, on the sarcosoma, where the canals appear in fine windings along the entire stem; they are, however, most easily, seen on the bulbous part of the stem. The entire inner surface of the longitudinal canals, is covered with an epithelium, consisting of round cells, having a clear transparent membrane, and containing a round nucleus, surrounded by minute, almost clear, protoplasmic grains. The cells are 0,008^{mm} in width, and the

paa mange Slags Maader, og paa Tværsnit danne disse Saftkanaler med deres Forgreninger særegne Figurer, der let kunne antages for særegne Legemer, hvilket ogsaa Dr. Lindahl sandsynligvis har gjort; han kalder dem nemlig "stjernformiga korpuskler". Bindevævslegemer ere her yderst sparsomme og kunne ikke let forvexles med de nysnævnte Saftkanaler, der ere forsynede med Epithel, som tildels ganske udfylder Lumenet, Fig. 39, *g*. 40, *h*, *i*.

Tverkanalerne have meget forskjellig Form; de ere smale og vide om hverandre med rige, anastomoserende Forgreninger, Fig. 36, *c*, og danne hyppig store Udvidninger (Laguner), hvorfra udløbe smalere Kanaler, Fig. 39, *i*, 40, *k*. Tverkanalerne med deres Laguner ere beklædte med et Epithel, bestaaende af lignende Celler som de, der ere omtalte ved Længdekanalerne, Fig. 39, *i*, *k*. 40, *l*.

Imellem Længde- og Tverkanalerne iagttages smale Sidekanaler, der udgaa fra Længdekanalerne, hvorved Kommunikationen frembringes, og disse Kanaler ere beklædte med et lignende Epithel, Fig. 39, *l*. 40, *m*. Der findes ingen Muskler hverken i Tverkanalerne eller i dem, hvorigjennem Kommunikationen med Længdekanalerne foregaar. Den indre Flade af det hyaline Bindevæv, der altsaa vender til de 4 Længdekanaler, er beklædt med et Epithel, bestaaende af flere Lag Celler, som fuldkommen ligner de, der findes paa Septa, og som tidligere ere omtalte. Paa hele den indre Flade af Stokkens Coenenchym sees en Mængde større og mindre, dels runde, dels aflange Aabninger, Fig. 32, *e*, hvorigjennem det nu beskrevne Kanalsystem kommunicerer med de 4 Hovedlængdekanaler. Transverselle eller circulære Muskler findes ikke.

Dr. Lindahl angiver, at "Skaftväggens struktur visar innerst en fortsättning af samma cellager, som bekläder sidorna af septa. För öfrigt utgöres väggens inre hälft af fibrillär bindväf genomdragen af en mängd tvärgående muskelfibrer, stundom förenade till större muskelpartier; närmare midten er bindväfven en homogen substans, hvari tvärkanalerna löpa, och äfven mellan dem inflätar sig en och annan strimma af tvärmuskler. Väggens yttre hälft består af bindväf med stjernformiga korpuskler, och deri återfinna vi de förut omtalade långskanalerna med sitt lager af långsgående muskler. Ytterst finnas här och der lemningar efter ett genom sprit och skafning förstördt epithelium."

nucleus is $0{,}002^{mm}$ broad (fig. 40, *g*). The hyaloid connective-tissue layer is very broad, and forms a reticulation of transverse canals, which ramify in all directions, and import to the sarcosoma it's spongy character (figs. 36, *c*, 39, *g*, 40, *h*). This hyaloid connective-tissue is penetrated, by a great number of minute nutrient ducts, which ramify in all directions; and the sectional aspect of these secretory canals with their ramifications, displays peculiar forms, which might, easily, be taken for separate bodies; this Dr. Lindahl has, probably, also, done, as he calls them: "stellate corpuscles". The connective-tissue bodies, are, in this situation, very sparse, and can not, readily, be mistaken for the secretory canals just spoken of; and which are furnished with epithelium, that in a measure, completely, fills the canal (figs. 39, *g*, 40, *h*, *i*).

The transverse canals have a very variable form. They are narrow and wide, irregularly; and have multitudinous anastomozing ramifications (fig. 36, *c*) and, often, form large dilations (lagunes) from which narrower canals issue (figs. 39, *i*, 40, *k*). The transverse canals with their lagunes, are covered with an epithelium, consisting of similar cells to those spoken of in connection with the longitudinal canals (fig. 39, *i*, *k*, 40, *l*).

Between the longitudinal and the transverse canals, narrow lateral canals are observed, which issue from the longitudinal canals, and by which, the circulation is effected; these canals are covered with a similar epithelium (fig. 39, *l*, 40, *m*). No muscles are found; neither in the transverse canals, nor in those in which the circulation with the longitudinal canals proceeds. The inner surface of the hyaloid connective-tissue; consequently, that facing towards the 4 longitudinal canals; is covered with an epithelium consisting of several layers of cells, exactly, resembling those observed on the septa, which have been already spoken of. On the whole of the inner surface of the sarcosoma of the stalk, a multitude of larger and smaller, partly, round, partly, oblong, apertures (fig. 32, *e*) are observable; through which, the lately described ductiferous system communicates with the 4 longitudinal canals. Transversal, or circular muscles, are nowhere found.

Dr. Lindahl states, that "the structure of the wall" "of the shaft, shows, interiorly, a continuation of the same" "cell-layer as covers the sides of the septa. Otherwise, the" "inner half of the wall is composed of fibrillous connective" "tissue, penetrated by a multitude of transverse muscular" "fibres, sometimes united to larger muscle bundles; nearer" "the middle, the connective tissue becomes a homogenous" "substance, in which, the transverse canals pass, and above," "between them, an occasional band of transverse muscles" "appears. The exterior half of the wall, consists of connect-" "ive tissue, containing stellate corpuscles, and here, we" "find, again, the longitudinal canals previously spoken of" "with their layer of longitudinal muscles. Exteriorly, there" "is found, here and there, the remains of an epithelium, de-" "stroyed by abrasion, and by the spiritous preservation."

Man vil se, at Dr. Lindahls Beskrivelse af Coenenchymets Struktur afviger væsentligt fra Resultatet af vore Undersøgelser i den Retning. Hvor han har fundet fibrillært Bindevæv med en Mængde Tvermuskler, have vi iagttaget hyalint Bindevæv, rigt paa Saftkanaler og gjennemdraget af Tverkanaler i alle Retninger, forsynede med Epithel men uden Muskelfibre; og hvor han angiver, at Væggens ydre Halvdel bestaar af hyalint Bindevæv med stjerneformige Korpuskler, der have vi fundet et udpræget fibrillært Bindevævslag, forsynet med spindelformige Bindevævslegemer. Vi tør antage, at Dr. Lindahl ikke har havt de fornødne Hjælpemidler, hvorved man er istand til med Sikkerhed at skjelne de forskjellige Væv fra hverandre, og at det er Grunden til, at hans Fremstilling er bleven mindre korrekt. Forresten ser det næsten ud, som om han har beskrevet sit Tversnit af "Skaftväggen" omvendt; thi sikkert er det, at fibrillært Bindevæv kun findes paa den ydre Flade, hvor han har hyalint Bindevæv, og at dette derimod findes overalt indad, hvor han har fibrillært Bindevæv. Kun Længdemuskler findes i Stokkens Coenenchym og disse alene i Længdekanalerne.

Polypkroppen er udvendig beklædt med et temmelig tykt Epithel (Ectoderm), der bestaar af flere Lag polyædriske Celler, fuldkommen lig dem, der findes paa Coenenchymets ydre Væg, og som tidligere ere beskrevne, — kun skulle vi bemærke, at en stor Del af disse Ectodermceller ere forsynede med rigt, brunt Pigmentindhold, der giver Polypen sin Farve, Fig. 42, *a*. 43, *a*. Imellem Epithelcellerne og nedsænket i Ectodermet gjenfinde vi de samme encellede Slimkjertler, som vi før have omtalt, — og de ere i lige stor Mængde tilstede her som paa Stokken, kun ligge de enkeltvis overalt; Grupper af dem træffes ikke her, Fig. 42, *b*. Indenfor Ectodermet er et meget bredt forgrenet, hyalint Bindevævslag, Fig. 42, *c*, der ved sine Forlængelser indad danner et Net med større eller mindre Masker, som udgjør Kanalsystemet, bestaaende af Længdekanaler, Fig. 42, *d*, og Tverkanaler, Fig. 42, *e*, beklædte med Epithel, dannet af aflange Celler med Kjerne og Protoplasmaindhold. Disse Epithelceller ligge temmeligt langt fra hverandre, Fig. 42, *f*; kun i de trange Kanaler ligge de aldeles tæt sammen. I dette Bindevæv iagttages foruden Bindevævslegemer ogsaa yderst fine Punkter, der sandsynligvis ere Aabninger for Ernæringskanaler, og paa dets indre Væg er et tyndt Lag Længdemuskler, Fig. 42, *g*, indenfor hvilket iagttages det tykke Lag af stærke, transverselle Muskler, Fig. 42, *h*, som beklædes af Epithel, dannet af flere Lag runde Celler med Kjerne og Protoplasmaindhold. Cellerne ere 0,011^{mm} og Kjernen omtrent 0,002^{mm}, Tab. X, Fig. 46, *a*.

It will be seen, that Dr. Lindahl's description of the structure of the sarcosoma, differs, materially, from the result of our researches in this direction. Where he has found fibrillous connective-tissue with a multitude of transverse muscles, we have observed, hyaloid connective-tissue rich in secretory ducts, and penetrated by transverse canals in all directions, furnished with epithelium, but without muscular fibres; and, where, he states, that the exterior half of the wall, consists of hyaloid connective-tissue with stellate corpuscles, we have found, a prominent layer of fibrillous connective-tissue, furnished with spindle-formed corpuscles of connective-tissue. We venture to suppose, that Dr. Lindahl has not had the necessary assistance at his disposal, to place him in a position to distinguish with certainty, the various tissues from each other, and that, that is the reason his representation is not quite correct. Indeed, it would almost appear, as if he had described the sectional aspect of the wall of the shaft, reversed, because, it is quite certain, that fibrillous connective-tissue is only found on the exterior surface, where, he describes hyaloid connective-tissue as present, and, that it, on the other hand, is found everywhere, interiorly, where he has observed fibrillous connective-tissue. Only longitudinal muscles are found in the sarcosoma of the stalk, and these only, in the longitudinal canals.

The body of the polyp is, exteriorly, covered with a rather thick epithelium (Ectoderm), consisting of several layers of polyhedrous cells, exactly like those found on the outer wall of the sarcosoma, and which have previously been described. We would, only, remark here, that a large portion of these ectoderm cells is furnished with rich brown-tinged contents, which imparts the colour to the polyp (fig. 42, *a*, 43, *a*). Between the epithelium cells, and depressed in the ectoderm, we again find the same single-celled mucous glands which we have previously described, and they are present, here, in as great abundance as on the stalk, only, they are everywhere placed singly; groups of them, are not met with in this situation (fig. 42, *b*). Inside of the ectoderm, there is a very broad, ramifying layer of hyaloid connective-tissue (fig. 42, *c*), which, by it's prolongations inwards, forms a reticulation, with larger or smaller meshes, and forms the ductiferous system, consisting of longitudinal canals (fig. 42, *d*), and transversal canals (fig. 42, *e*), covered with epithelium formed of oblong cells containing a nucleus and protoplasm contents. These epithelium-cells are placed, pretty far apart from each other (fig. 42, *f*), and, only, in the narrow canals do they lie perfectly close together. In this connective tissue, may be observed, besides the connective tissue corpuscles, also, extremely minute points, which probably, are openings for nutrient ducts; and on it's inner wall, there is a thin layer of longitudinal muscles (fig. 42, *g*), inside which, is observed, the thick layer of strong transversal muscles (fig. 42. *h*), that is covered with epithelium, formed of several layers of round cells containing a nucleus and protoplasm contents. The cells are 0,011^{mm} in width, and the nucleus is about 0,002^{mm} broad (Pl. X, fig. 46, *a*).

Mundskiven og Tentaklerne have samme histologiske Bygning som Kroppen. Omkring Munden samle Kroppens transverselle Muskelfibre sig og danne en Slags Sluttemuskel; forøvrigt er Muskellagene saavel i Mundskiven som i Tentaklerne Fortsættelse af Kroppens.

Svælget er meget langstrakt; hos en Polyp, hvis Krop var 44^{mm} lang, var det 23^{mm} langt; det er cylindrisk, meget stærkt foldet paatvers, Fig. 45, *a*, og afdelt i 8 Felter ved de 8 Septa, som fæste sig paa det, Fig. 45, *b*. 47, *a*. Dets udvendige Flade er beklædt med et Epithel, der bestaar af flere Lag runde Celler, som have en tynd, klar Membran, en temmelig stor, excentrisk Kjerne, omgiven af Protoplasmakorn. Cellerne ere 0,011^{mm} og Kjernen 0,002^{mm}, fuldkommen lig dem, som findes paa Polypkroppens indre Væg, Fig. 43, *b*. 46, *a*. 50, *e*. Imellem disse Entodermceller sees hist og her lignende runde Celler, men hvori findes intens brune Pigmentkorn, Fig. 46, *b*. 50, *f*. Indenfor Epithellaget er et temmelig smalt, fibrillært Bindevævslag, Fig. 43, *c*. 51, *b*, hvori sees dels Bindevævslegemer, dels en Mængde fine Saftkanaler, der ere forsynede med Epithel, hvis lidt aflange Celler ganske udfylde Lumenet. Fra dette Bindevæv udsendes pyramideformigt tilspidsede Forlængelser, der danne Grundlaget for Svælgets Folder, Fig. 43, *d*. 51, *c*. Paa disse Bindevævspyramider ere Længdemusklerne fæstede, Fig. 43, *e*. 51, *d*, imedens Tvermusklerne vise sig langs deres Grunddel, Fig. 51, *e*. Hele Svælgets indre Væg, der er stærkt foldet paatvers og farvet mørkebrunt, har et Epithelovertræk, der er fæstet til Muskellaget, og som omtrent i den øverste Halvdel bestaar af polyædriske Celler, der have et mørkt, kastaniebrunt Pigmentindhold og ere lig dem, som ere beskrevne paa Kroppens ydre Flade. Imellem disse Celler sees hist og her aflange, næsten klare Celler med en stor, aflang Kjerne og et klart kornet Indhold, hvilke minde om de encellede Slimkjertler paa Polypkroppens og Stokcoenenchymets ydre Flade. I Svælgets nederste Halvdel optræder et noget forskjelligt Epithellag, som nærmer sig temmelig meget til det, der beklæder dets ydre Væg og Kammervæggene. Det bestaar af runde Celler, 0,008^{mm} store, som have en tynd, gjennemsigtig Membran, en rund, noget excentrisk Kjerne, 0,002^{mm} og et finkornet Indhold, hvori findes mange, temmelig intens mørkebrune Pigmentkorn, Fig. 48, *a*. Imellem disse Celler sees andre, lidt aflange Celler, der ere aldeles klare, have en rund Kjerne, omgiven af en yderst finkornet Masse og ere sandsynligvis encellede Slimkjertler, Fig. 48, *b*, og endelig iagttages overalt i Svælgets Epithel lange, gjennemsigtige, brunlige Legemer, i hvis Midte løber paalangs en spiralformig Traad (Nematocyster), Fig. 51, *f*. Imellem Folderne paa Svælget saaes Rester af Molusklarver, Crustacelarver, Echinodermlarver, samt en hel Del Diatomeer, Alt Næringsstoffe, der vare vel indhyllede i en rig Slimmasse.

The oral disk, and the tentacles, have the same histological structure as the body. The transversal muscular fibres of the body collect around the oral aperture, and form a kind of sphincter. The layers of muscles are, otherwise, both in the oral disk and the tentacles, a continuation of those of the body.

The gullet is very elongated. In one polyp whose body measured 44^{mm} long, the gullet was 23^{mm} long. It is cylindrical; very much folded transversally (fig. 45, *a*), and is divided into 8 divisions, by the 8 septa which adhere to it (figs. 45, *b*, 47, *a*). It's exterior surface is covered with an epithelium, consisting of several layers of round cells, with a thin clear membrane, and containing, a rather large eccentric nucleus surrounded by protoplasmic granules. The cells are 0,011^{mm} wide, and the nucleus is 0,002^{mm} broad, and exactly like those which are found on the inner wall of the body of the polyp (figs. 43, *b*, 46, *a*, 50, *e*). Between these entoderm cells, there are seen, here and there, similar round cells, but, in which, deep brown-tinged granules are found (figs. 46, *b*, 50, *f*). Inside of the layer of epithelium, there is a rather narrow layer of fibrillous connective-tissue (figs. 43, *c*, 51, *b*), in which is seen, partly, connective tissue corpuscles, and, partly, a multitude of minute secretory ducts; these are furnished with epithelium, whose slightly oblong cells quite fill out the channel. From this connective-tissue, pyramidal acuminated prolongations issue, and these form the foundation of the gullet folds (figs. 43, *d*, 51, *c*). The longitudinal muscles are adherent to these connective-tissue pyramids (figs. 43, *e*, 51, *d*), whilst, the transversal muscles appear along their basal part (fig. 51, *e*). The inner wall of the whole of the gullet is much folded, transversely, and is coloured dark brown. It has an epithelium covering, which is secured to the muscular layer, and which, for about it's superior half portion, consists of polyhedrous cells, having a dark, chestnut brown coloured contents, and, which are like those which have been described as pertaining to the body's exterior surface. Between these cells, there are here and there seen, oblong, almost clear cells, with a large oblong nucleus and a clear granular contents, which recall to mind the single-celled mucous glands on the body of the polyp and the exterior surface of the sarcosoma. In the gullet's inferior half part, a somewhat different layer of epithelium appears, and this approaches, pretty much, in similarity, to that, covering it's outer wall, and the chamber walls. It consists of round cells, 0,008^{mm} wide, with a thin, transparent membrane, which contain a round, somewhat eccentric nucleus 0,002^{mm} broad, and a minute granular contents, in which is seen, many rather deep-brown coloured granules (fig. 48, *a*). Between these cells, other, somewhat oblong cells, are seen; these are perfectly clear, and contain a round nucleus surrounded by an extremely minute-grained substance, and are, presumably, single-celled mucous glands (fig. 48, *b*); and finally, in the epithelium of the gullet, there is, everywhere, observed, long, brownish translucent bodies, in whose middle there runs, longitudinally, a spiral formed filament (nematocyst) (fig. 51, *f*).

Vi omtalte, at paa Svælgets ydre Flade fæster de 8 Septa sig. Disse, der udgaa fra den indre Kropsvæg og insererer sig paa Svælget, deler den øverste Del af Gastralhulheden i 8 Kamre. De to dorsale Septa, Fig. 43, *f*, konvergere stærkt henimod Svælget, saa at det dorsale Kammer, Fig. 43, *g*, her bliver temmelig trangt; de ventrale Septa, Fig. 43, *h*, konvergere ikke saameget, derfor er ogsaa Bugkammeret videre, Fig. 43, *i*, men Sidekamrene ere videst, Fig. 43, *k*. Disse Septa, der ere Forlængelser af Kropsvæggens indre Bindevæv, dannes af en Bindevævsmembran, Fig. 43, *l*. 50, *a*, hvori findes mange fine, forgrenede Ernæringskanaler med sit Epithel. Fra denne hyaline Bindevævslamels ene Flade udgaa listeformige Forlængelser, Fig. 50, *b*, paa hvis begge Sider Længdemusklerne ere fæstede, Fig. 50, *c*; udenpaa dette Muskellag er et Epithel, dannet af lignende Celler som de, der beklæde Svælgets ydre Flade, og som tidligere er omtalt, Fig. 50, *e*. Paa Bindevævslamellens anden Flade sees Tvermusklerne, Fig. 50, *d*, der ligeledes ere overtrukne med fuldkommen lignende Epithel, som altsaa tapetserer hele Kammeret.

Muskelanordningen paa Septa er, som man har seet, noget forskjellig fra den, der finder Sted hos *Pennatulideme* i Almindelighed; thi, saavidt os bekjendt, er der ikke tidligere iagttaget de listeformige Fremspring paa hvert Septums ene Flade, til hvilke Længdemusklerne ere fæstede. Disse Fremspring ere saa store, at de endog med en svag Loupe kunne sees; men forøvrigt er Anordningen den sædvanlige, nemlig at de transverselle Muskler paa den ene Side vender mod Polypens Dorsalflade, og de longitudinelle Muskler paa den anden Side mod Ventralfladen, saaledes at Dorsalkammerets Sidevægge, Fig. 43, *g*, kun har transverselle Muskler, imedens Ventralkammeret derimod har alene longitudinelle Muskler, Fig. 43, *i*.

Fra den nederste Ende af Svælget blive Septa, naar de forlade dette, betydelig smalere og gaa nu langs hele Væggen af Mavehulheden, Fig. 47, *b*, under Navn af Septula lige ned til dennes Bund, Fig. 47, *c*. Septula danne altsaa paa Mavevæggen 8 stærke, listeformige Fremspring med en fri Rand.

Paa hver Side af Septulum er ligesom paa Septum Muskellaget fæstet, paa den ene Side nemlig Længdemusklerne, Fig. 49, *a*, paa den anden Tvermusklerne, Fig. 49[1], *a*, og til den fri Rand er Gastralfilamentet bundet med en meget tynd Bindevævsmembran, Fig. 49, *b*.

Den nederste frie, runde Rand af Svælget er tyk, ligesom opsvulmet, og her samler de circulære Muskler sig

Between the folds of the gullet, the remains of mulluscous, crustaceous, and echinodermatous larvæ were observed, also, a great many diatomes, and all these nutritive substances were well enclosed in a rich mucous secretion.

We stated that, the 8 septa are attached to the exterior surface of the gullet. They issue from the inner wall of the body, inserting themselves in the gullet, and divide the superior part of the gastric cavity into 8 chambers. The two dorsal septa (fig. 43, *f*), converge, greatly, towards the gullet, so that, the dorsal chamber (fig. 43) becomes rather narrow, here. The ventral septa (fig. 43, *h*), do not converge so much, and the ventral chamber is therefore also wider (fig. 43, *i*), but the lateral chambers are the widest (fig. 43, *k*). These septa, which are prolongations of the inner connective-tissue of the wall of the body, are formed by a membrane of connective-tissue (figs. 43, *l*, 50, *a*), in which, is found, many minute nutrient ductiferous ramifications with their epithelium. From the one surface of this hyaloid connective-tissue lamella, fillet-formed prolongations issue (fig. 50, *b*) to both of whose sides longitudinal muscles are adherent. On the exterior of this muscular layer, there is an epithelium, formed of similar cells to those which cover the exterior surface of the gullet, and which have previously been spoken of (fig. 50, *e*). On the other surface of the connective tissue lamella, transverse muscles are seen (fig. 50, *d*), which, also, are clothed with exactly similar epithelium; and this, consequently, coats the entire chamber.

The muscular arrangement of the septa is, as will be seen, somewhat different from that which is found in *Pennatulidæ* in general; because, so far as we are aware, there has not, previously, been observed, the fillet-formed prominence, on the one surface of each septum, to which the longitudinal muscles are attached. These prominences are so large, that they may, even, be observed with an ordinary magnifying glass; but, the arrangement, otherwise, is the usual one, viz. that the transversal muscles of the one side, face towards the polyps dorsal surface; and the longitudinal muscles of the other side, face towards the ventral surface, so that, the lateral walls of the dorsal chamber (fig. 43, *g*) have only transversal muscles; whilst, on the other hand, the ventral chamber has only longitudinal muscles (fig. 43, *i*).

From the lower extremity of the gullet, at the point where they leave it, the septa become considerably narrower, and then pass along the entire wall of the ventral cavity (fig. 47, *b*), appearing as septula, and extending right down to the bottom (fig. 47, *c*). The septula form, thus, on the wall of the stomach, 8 strong fillet-formed prominences having a free margin.

On each side of the septulum; as in the case of the septum; the muscular layer is so attached, that on the one side we find longitudinal muscles (fig. 49, *a*), and on the other side, transverse muscles (fig. 49[1], *a*), and the gastral filament is secured to the free margin, by a very thin membrane of connective-tissue (fig. 49, *b*).

The inferior, free, round margin of the gullet, is thick, as if it were tumified, and in this situation, the circular

til en stærk Sphincter. Strax ovenfor denne Rand udgaa de 8 Gastralfilamenter som en bred, med Fryndser forsynet Krave, Fig. 45, *c*. 47, *d*, men skille sig snart i de 8 krusede Organer, der følge langs Septula, Fig. 45, *d*. 47, *e*, saagodtsom lige ned til Bunden af Mavehulheden, Fig. 47, *c*. Af disse Gastralfilamenter er der to, de dorsale, der ere nogle Millimeter længere end de øvrige; men det er ogsaa det Hele, forresten ere de omtrent lige lange. Gastralfilamenterne ere meget brede efter deres hele Længde, Fig. 49, *c*; de dannes af en tynd Bindevævsmembran, beklædt med de tidligere beskrevne Endothelceller, der giver hele Gastralhulheden sit Overtræk. Paa Gastralfilamenterne udvikle Generationsorganerne sig, et Forhold, der i væsentlig Grad afviger fra, hvad der hidtil er kjendt hos *Pennatuliderne*, hvor Kjønsorganerne udvikle sig paa Septula.

I de brede, flotterende Gastralfilamenter udvikles en stor Mængde runde Kapsler, der allerede meget tidligt indeslutte Kjønsproduktet, Fig. 52. Disse Kapsler, som ere stilkede, ere kun lidet forskjellig i deres Bygning hos de forskjellige Kjøn; de dannes af en fast, hyalin Bindevævsmembran, der udvendigt er beklædt med Gastralhulhedens Epithelialovertræk, — og paa hvis indvendige Flade er et Epithellag, der hos Hannen (Testikelen) bestaar af elliptiske Celler, der ere $0{,}006^{mm}$ brede paa Midten og $0{,}013^{mm}$ lange med en lidt excentrisk Kjerne, som er næsten rund, $0{,}001^{mm}$ bred, og et finkornet Protoplasmaindhold, hvori sees enkelte, stærkt røde Pigmentkorn, Fig. 53. Hos Hunnen bestaar Kapselens (Æggestokkens) indre Epithellag af runde, temmelig klare Celler, noget lig Endothelcellerne, men uden de omtalte Pigmentkorn. I enhver Kapsel hos Hunnen udvikler der sig kun et Æg, Fig. 52, *b*, ligesom Embryodannelsen foregaar i denne Kapsel, der saaledes fungerer ogsaa som Uterus. Vi saa Embryoner liggende i Kapslerne, og frit i Gastralhulheden fandtes enkelte, der vare frigjorte, ligesom tomme Kapsler ikke vare sjeldne. Et saadant Embryo var næsten kugleformet og havde paa den ene Ende en Indsænkning, det begyndende Gastræastadium, Fig. 54, *a*. *Umbellula encrinus* føder altsaa levende Unger. Kjønskapslerne (Testiklerne) hos Hannen vare i deres fulde Udvikling ganske fyldte med Spermatozoer, der havde en Pæreform, Fig. 55. Hovedet var rundt med en dunkel Flæk i Midten, $0{,}003^{mm}$ bredt. Halen var bred, idet den udgaar fra Hovedet, og temmelig kort; Spermatozoens hele Længde udgjorde $0{,}014^{mm}$. De fleste Spermatozoer havde tabt deres Hale, saa man iagttog kun en Mylder af runde, glindsende Legemer, hvori den dunkle Flæk saaes.

Kjønsorganerne udvikle sig, som tidligere berørt, i Gastralfilamenterne, hvor de danne store, frit hængende Drueklaser, Fig. 45, *e*. 47, *f*. 49, *d*, der strække sig saa

muscles converge, forming a strong sphincter. Immediately above this margin, 8 gastral filaments issue, having the appearance of a broad fringed collar (fig. 45, *c*, 47, *d*), but separating themselves, quickly, into the 8 curly organs which stretch along the septula (fig. 45, *d*, 47, *e*), almost down to the bottom of the ventral cavity (fig. 47, *c*). Of these gastral filaments, there are two; the dorsal ones; which are a few millimetres longer than the others, but that is all, as, otherwise, they are about uniform in length. The gastral filaments are very broad throughout their whole length (fig. 49, *c*). They are formed of a thin connective-tissue membrane, clad with the previously described cells of the endothelium, which furnish the coating of the whole gastral cavity. The generative organs develope themselves on the gastral filaments, a circumstance, that in a material degree differs from what has previously been known relative to *Pennatulidæ*, where the sexual organs are developed on the septula.

In the broad floating gastral filaments, a multitude of round capsules are developed, which, already, at an early stage, enclose the sexual product (fig. 52). These capsules are pedunculated, and in the different sexes, are only slightly different in their structure. They are formed of a firm, hyaloid connective-tissue membrane, which is, externally, clad with the epithelium covering of the gastral cavity, and on whose interior surface, there is an epithelium layer, which, in the male (the testicle), consists of elliptic cells, $0{,}006^{mm}$ broad at the middle, and $0{,}013^{mm}$ long, containing a somewhat eccentric, nearly round nucleus, 0,001 broad, and also, a minute granular protoplasmic contents, in which a few deep-red coloured granules (fig. 53) are seen. In the female, the inner epithelium layer of the capsule (the ovary) consists of round, rather clear, cells, somewhat like the endothelial cells, but without the coloured granules spoken of. In each capsule in the female, only one ovum is developed (fig. 52, *b*), whilst, also, the formation of the embryo proceeds in this capsule, which thus, performs as well, the function of a uterus. We observed embryos lying in the capsules; and also, in the gastral cavity there were a few which were detached, whilst, also, empty capsules were not infrequently seen. Such an embryo was, nearly, spherical in form, and on the one extremity, had a depression forming the commencing stage of the gastræa (fig. 54, *a*). *Umbellula encrinus*, therefore, gives birth to living young. The sexual capsules (testicles) in the male, were, in their full developement, quite filled with spermatozoa. These were pyriform (fig. 55) with round heads, having an indistinct spot in the middle, $0{,}003^{mm}$ broad. The tail was broad as it issued from the head, but rather short. The entire length of the spermatozoa measured $0{,}014^{mm}$. Most of the spermatozoa had lost their tails, so that, only a throng of round, bright corpuscles was observable, in which the indistinct spots were seen.

The sexual organs develope themselves, as previously stated, in the gastral filaments, where, they form, large, freely pendant, grape-like clusters (fig. 45, *e*, 47, *f*, 49, *d*),

langt, som Gastralfilamenterne naa, nemlig indtil 20^{mm} ned i Rachis, der udgjør egentlig Bunden af Polypens Mavehulhed. Alle 8 Gastralfilamenter ere optagne af Kjønsorganerne; men paa de to dorsale begynde de et længere Stykke nede end paa de øvrige 6. De ere i saadan Rigdom tilstede, at de hos mange Polyper ganske udfylde Gastralhulheden. Denne bliver ned imod Bunden alt smalere og smalere og ender i en trang Kanal, der gaar over i det transverselle Kanalsystem.

Paa enhver Polypstok ere samtlige Polyper af samme Kjøn; af de 6 Exemplarer, hvor Kjønsorganerne vare udviklede, var der 4 Hunner og 2 Hanner. Disse sidste havde intet Særpræg, ifølge hvilket man af det Ydre skulde være istand til at skjelne dem fra Hunnerne; men naar man undersøgte Generationsorganerne, saa vare disse hos Hannen melkehvide, imedens de hos Hunnen havde en rødlig Farve.

Vi have i vor Beskrivelse af *Umbellulaens* Ydre omtalt løseligt de ganske eiendommelige Zooider, som findes overalt paa Stokken, naar undtages den nederste Del af det bulbøse Parti; vi skulle nu gaa noget nærmere ind paa dem.

Den noget aflange Zooidekrop med den lange Tentakel, Fig. 56, *a*, er udvendigt beklædt med et Epithellag, der paa Kroppen er temmelig tykt, bestaaende af flere Lag Celler, imedens det paa Tentakelen og dens Pinnuler er noget tyndere, ligesom Cellelagene her ere færre. Cellerne ere polyædriske og fuldkommen lig dem, som findes paa Stokcoenenchymets ydre Flade, Fig. 57, *a*. 58, *a*. 59, *a*. 60. Imellem Ectodermcellerne og nedsænket i dem sees en Mængde af de encellede Slimkjertler med deres Kjerne og Udførselsgang, Fig. 57, *b*. 58. 59. 60, *b*. Paa et Tværsnit vise disse Kjertler sig som en smuk, lysende Perlekrands, Fig. 58. 60; men seet fra Overfladen vise de sig som store Fordybninger i Epithellaget, Fig. 59, ligesom de uden at være præparerede med Jodgrønt synes at være ganske tomme. Selv efter Farvningen synes mange af dem at være kjerneløse, og det har forekommet os, at mange ogsaa vare aldeles uden Indhold. Indenfor Ectodermet er et smalt, hyalint Bindevæv, Fig. 58, *c*. 60, *c*, i hvilket sees fine Ernæringskanaler, og hvortil Muskellaget, der bestaar af sparsomme, circulære Muskelfibre, fæster sig, Fig. 58, *d*, og meget stærke Længdemuskler, Fig. 58, *e*. 60, *d*. Muskellaget er forsynet med Epithelovertræk, dannet af flere Lag runde Celler, ganske lig dem, som tidligere ere beskrevne paa Polypkroppens indre Væg, Fig. 58, *f*. Fra Zooidekroppens indre Flade udgaa 8 Septa, der fæste sig paa Svælget, Fig. 60, *e*, og danne derved de for Zooiden som for Polypen almindelige 8 Kamre. Septa dannes ligesom hos Polypen af en Bindevævslamel, paa hvis ene Side ere transverselle Muskler, Fig. 60, *f*, og paa den anden longitudinelle, Fig. 60, *g*; disse Muskler ere beklædte med lignende Epithel som det, der beklæder Polypens indre Kropsvæg. Anordningen af Musklerne er den samme som tidligere omtalt hos Polypen. Hos Zooiden er der ogsaa en lateral, symetrisk Retning saaledes, at i Dorsalkammeret,

which extend themselves as far as the gastral filaments reach, or, about 20^{mm} down the rachis; which forms, really, the bottom of the polyp's ventral cavity. All of the 8 gastral filaments are occupied by sexual organs, but, upon the 2 dorsal ones, they begin a little lower down than on the other 6. They are present in such abundance, that in many polyps they quite fill up the gastral cavity. This becomes narrower and narrower towards the bottom, and terminates in a narrow canal which passes over into the transversal ductiferous system.

On each polyp stalk, all it's polyps are of the same sex. In the 6 specimens in which the sexual organs were developed, 4 were females, and 2 were males. The latter had no distinguishing feature which enabled them by their exterior appearance, to be distinguished from the females, but, when the generative organs were examined, these were found to be milk white in the males, whilst, in the females, they had a reddish colour.

In our description of the *Umbellula*'s exterior, we have loosely referred to the quite peculiar zooids which are, everywhere, found on the stalk, with exception of the inferior part of the bulbous portion, and we shall now refer to them more particularly.

The somewhat oblong zooidal body, with the long tentacle (fig. 56, *a*), is, exteriorly, covered with a layer of epithelium, which is rather thick upon the body, and consists of several cellular layers; whilst, in the tentacle and it's pinnulæ, it is somewhat thinner, whilst, also, the cellular layers are here, less numerous. The cells are polyhedrous, and, exactly, like those found on the outer surface of the sarcosoma of the stalk (figs. 57, *a*, 58, *a*, 59, *a*, 60). Between the ectoderm cells, and depressed in them, a multitude of the single-celled mucous glands, with their nuclei and excretory ducts are seen (figs. 57, *b*, 58, 59, 60, *b*). A sectional aspect shows these glands, like a beautiful, brilliant, pearl wreath (figs. 58, 60); but, viewed from the surface, they appear, as large depressions in the epithelium layer (fig. 59), whilst also, until treated with Iodine green they appear to be quite empty. Even, after being coloured, many of them appear to be without nucleus, and it has appeared to us, that many of them have, really, been without contents. Inside of the ectoderm, there is a narrow, hyaloid connective-tissue (figs. 58, *c*, 60, *c*) in which, minute nutrient ducts are seen, and to which the muscular layer is attached. This layer consists, of sparse, circular, muscular fibres (fig. 58, *d*) and very strong longitudinal muscles (figs. 58, *e*, 60, *d*). The muscular layer is furnished with epithelium covering, formed of several layers of round cells quite similar to those which have been previously described as pertaining to the inner wall of the body of the polyps (fig. 58, *f*). From the inner surface of the body of the zooids, 8 septa issue; these attach themselves to the gullet (fig. 60, *e*), and form, thus, for the zooid as well as for the polyp, the 8 usual chambers. Septa are formed, as in the case of the polyp, by a connective-tissue lamella, on one of whose sides there are transversal muscles (fig. 60, *f*) whilst, on the other side, there are longitudinal muscles

Fig. 60, *l*, ere Sidevæggene beklædte med transverselle Muskler, medens i Ventralkammeret. Fig. 60, *m*, have Sidevæggene Længdemuskler. I Sidekamrene har den ene Væg transverselle, den anden longitudinelle Muskler, Fig. 60.

Svælget er langtfra saa foldet, som Tilfældet er hos Polypen, Fig. 57, *c*. 60, *k*; det har imidlertid den samme histologiske Bygning; kun synes det ydre Epithellag at være tykkere, Fig. 60, *h*, og dets Celler at være mindre, Fig. 60¹, *i*. Svælgets øverste Del smalner af og gaar over i den lidt aflange Mund med to tykke Læber, imedens det nedad har en fri Ende, hvorfra udgaa to Gastralfilamenter, Fig. 57, *e*, som ere temmelig lange og naa lige ned til Bunden af Zooidens Mavehulhed. Denne forlænger sig i en smal Kanal, der gaar over i Coenenchymets Tverkanaler. Zooiderne tilføre altsaa det indre Kanalsystem i Stokkens Sarcosoma Søvand, som vistnok maa udgjøre et betydeligt Kvantum, naar Hensyn tages til Zooidernes overordentlig store Mængde.

Naar Zooiden er stærkt sammentrukken, danner den en næsten kuglerund Forhøining, i hvis Midte sees en liden, rund Aabning eller aflang Spalte, Fig. 56, *b*, og paa et enkelt af vore Exemplarer ere saagodtsom alle Zooider paa den Vis sammentrukne; kun ved en skrupuløs Undersøgelse findes enkelte, der have Tentakelen halvt udstrakt. Saasnart Tentakelen udstrækkes noget, forlænger Kroppen sig, Fig. 56, *c*, og er den fuldt udstrakt, har Zooidekroppen en ovoid Form, Fig. 56, *d*. Tentakelen er bevægelig i næsten alle Retninger; fra dens Sider udgaa lange, papilløse Pinnuler, der give den et grenet Udseende, Fig. 56, *f*. Ikke hos alle findes disse Pinnuler, men naar de findes, og det er meget hyppigt, have de samme Bygning som Tentakelen, ere hule, korrespondere med Tentakelens Hulhed og kunne forkortes og forlænges efter Omstændighederne. Nogen Aabning paa deres afrundede Ende kunde ikke iagttages. Figur 56 giver et godt Billede af disse mærkelige Zooider i deres forskjellige Form, alt eftersom de ere mere eller mindre udstrakte.

Kalkaxen strækker sig fra Stokkens Bund til dens øverste Ende. Den har sin største Tykkelse paa den øverste Del af det bulbøse Parti, hvorfra den smalner af saavel opad som nedad. I sin største Længde er den firkantet med 4 dybe Furer, af hvilke den paa Ventralfladen er noget videre end de øvrige, samt 4 afrundede Hjørner, Fig. 61. Axen bliver i dens øverste og nederste Del alt mere og mere rund og taber ganske sine Furer, Fig. 62. 63. I den nederste Halvdel af Bulbus ligger Axen i Dorsalkanalen, hvor den omtrent 20^{mm} fra Bunden gjør en let Bøining mod Høire, Fig. 62, hvorpaa den paany bøier sig

(fig. 60, *g*). These muscles are covered with similar epithelium to that, which covers the inner wall of the polyp's body. The arrangement of the muscles is, the same as that previously spoken of as pertaining to the polyp. In the zooids, there is, also, a symmetrical order, thus: — in the dorsal chamber (fig. 60, *e*), the lateral walls are clad with transversal muscles, whilst, in the ventral chamber (fig. 60, *m*), the lateral walls have longitudinal muscles. In the lateral chambers, the one wall has transversal, and the other, longitudinal muscles (fig. 60).

The gullet is not nearly so much folded, as is the case in the polyp (figs. 57, *c*, 60, *k*); it has, however, the same histological structure, only, the exterior layer of epithelium appears to be thicker (fig. 60, *h*), and the cells to be smaller (fig. 60¹, *i*). The superior part of the gullet contracts, and passes into the somewhat oblong oral aperture with two labiæ, whilst, it also has, an inferior free extremity, from which, two gastral filaments issue (fig. 97, *e*); these are rather long, and reach right down to the bottom of the zooid's ventral cavity. This is prolonged into a narrow canal, which passes over into the transverse canals of the sarcosoma. The zooids, consequently, introduce water into the inner ductiferous system of the sarcosoma of the stalk, and this must, certainly, be in considerable quantity, when the extraordinary abundance of zooids is borne in mind.

When the zooid is strongly contracted, it forms a nearly spherical prominence; in whose middle, a small round aperture, or oblong fissure is observable (fig. 56, *b*), and, in one of our specimens, almost all of the zooids are contracted in this way; only, on vigilant examination, are a few found, which have the tentacle half extended. Whenever the tentacle is somewhat extended, the body elongates (fig. 56, *c*), and when fully extended, the body of the zooid has an ovate form (fig. 56, *d*). The tentacle is moveable in almost all directions; and from it's sides, long papillous pinnules issue, imparting a ramous appearance to it (fig. 56, *f*). These pinnules are not found in all, but when they are found and that is, very frequently; they have the same structure as the tentacle, and are hollow, and they correspond with the cavity of the tentacle, and can be retracted or extended, according to circumstances. No opening on their rounded extremity could be observed. Fig. 56 gives a good illustration of these remarkable zooids in their various forms, according, as they are more or less extended.

The calcareous axis extends itself from the base of the stalk, to it's superior extremity. It is thickest at the superior part of the bulbous portion, from which point, it diminishes in thickness, both upwards and downwards. For the greater part of it's length, it is quadrangular, and has 4 deep lateral grooves, of which, that on the ventral side is somewhat wider than the others, and it, also, has 4 rounded corners (fig. 61). The axis becomes in its superior and inferior parts, gradually, more and more round, and it's grooves quite disappear (figs. 62, 63). In the inferior half of the bulb, the axis lies in the dorsal canal, where,

næsten ret nedad, Fig. 62, *b*, for derefter at ende i en traadformig Hage, Fig. 62, *c*. Opad i den øverste Del af Rachis bliver Axen rund og gaar ind i Ventralkanalen; her gjør den, omtrent 6^{mm} fra Endepolypens Grund, en stærk Bøining opad mod Høire, Fig. 63, *a*, og kommer da lige ved Endepolypen, hvor den bøier sig nedad og til Venstre, Fig. 63, *b*, for derefter S-formigt at ende i en yderst liden Knop, Fig. 63, *c*. Axen har en brun Farve og dannes af fibrillært Bindevæv, imellem hvis Fibre er afsat en stor Mængde Kalk, saa at den er meget fast men ogsaa meget bøielig, især gjælder dette sidste dens øverste Halvdel; i den bulbøse Del er Axen derimod saa tyk, at den her ikke lader sig bøie. Ved et Tversnit viser Axen sig, efter at være berøvet Kalken, at have en Centralkjerne, der er næsten korsformet eller dannet af 2 Buer, hvis konvexe Dele løbe sammen, Fig. 61, *a*. Kjernen er noget lysere end de omgivende Dele. Disse dannes af koncentriske Ringe eller Lag af Bindevævsfibriller, imellem hvilke er en rigelig Kalkafsætning, Fig. 36, *d*. Lagene overskjæres af radiære Bindevævsfibre, der straale divergerende ud fra Centrum mod Peripherien, Fig. 36, *e*, hvor de gaa over i Axens *Membrana propria*. Denne er yderst tynd, hyalin, bestaar af fibrillært Bindevæv og er med dens indre Flade stærkt sammenvoxen til Axen, saa at den ikke kan skilles fra denne, uden at Dele af Axen følge med; dens ydre Flade er vel fastvoxen til Skeden, men Forbindelsen er ikke saa intim; den foregaar væsentlig ved Bindevævstraade, saa at der bliver Rum eller Kanaler, hvori Ernæringsvædsken flyder, Fig. 36, *f*.

Skeden bestaar af to Membraner; den indre er temmelig tynd men fast og er ved sin indre Flade fastvoxen til Axens *Membrana propria* (Cuticula), som tidligere omtalt, medens dens ydre Flade er glat, har yderst fine Aabninger og vender imod Skedens Lumen, Fig. 36, *g*; den ydre Membran er meget tyk, fast og ganske eiendommelig, Fig. 36, *i*. Lige fra Rachis og til Begyndelsen af den bulbøse Del er den ydre Membran ganske fri paa sin indre Flade, der er glat, gjennemboret af fine Aabninger og har et trekantet Fremspring paa alle 4 Sider, hvilket svarer til Axefurens Vinkel, som det næsten udfylder, Fig. 61, *b*. Imellem den indre Membrans ydre Flade og den ydre Membrans indre Flade er saaledes et Rum rundt hele Axen, Fig. 61, *d*, der udfyldes af Ernæringsfluidum, som igjennem de fine Porer kommunicerer med de 4 Hovedlængdekanaler. I den bulbøse Del af Stokken er Forholdet noget anderledes. Her er en fuldstændig Sammenvoxning imellem Skedens ydre og indre Membran, hvorved det nysnævnte Rum forsvinder; men i det Bindevæv, som udfylder Rummet, er der en stor Mængde Saftkanaler, forsynede

about 20^{mm} from the bottom, it makes a gentle curve to the right (fig. 62), and then curves anew, almost direct downwards (fig. 62, *b*), terminating thereafter in a filiform hook (fig. 62, *c*). Above, in the superior part of the rachis, the axis becomes round, and passes into the ventral canal. In this situation, about 6^{mm} from the base of the terminal polyp, it makes a sharp bend upwards towards the right (fig. 63, *a*), and then passes close by the terminal polyp, and here, curves downwards to the left (fig. 63, *b*), and then terminates in the form of the letter S, in an extremely small knob (fig. 63, *c*). The axis has a brown colour, and is formed of fibrillous connective-tissue, between whose fibres there is disposed a large quantity of lime, so that, it becomes very compact, but yet very flexible, and this last feature is specially the case in the superior half portion. In the bulbous portion, the axis is, on the contrary, so thick, that in that situation it does not admit of being flexed. After being deprived of the lime, it's sectional aspect shows the axis to have a central nucleus which is nearly cruciform, being formed of 2 arcs whose convex parts are concreted together (fig. 61, *a*). The nucleus is somewhat brighter than the surrounding parts. These are formed of concentric rings, or layers of connective-tissue fibres, between which, there is an abundant calcareous deposit (fig. 36, *d*). The layers are intersected by radiating connective-tissue fibres, which radiate divergently, from the centre towards the periphery (fig. 36, *e*), and they, there, pass over into the *membrana propria* of the axis. This is extremely thin and hyaloid, and consists of fibrillous connective-tissue, and, upon it's inner surface, it is strongly concreted with the axis, so that, they cannot be separated without portions of the axis adhering. It's exterior surface is also concreted with the sheath, but this connection is not so intimate, and is, essentially, produced by connective-tissue filaments, in such manner, that there remain spaces, or canals, in which the nutritive secretions flow (fig. 36, *f*).

The sheath consists of two membranes, of which, the inner one is rather thin, but compact, and by it's inner surface, it is concreted to the *membrana propria* of the axis (cuticula), as previously stated; whilst, the exterior surface is smooth, with extremely minute apertures, and it faces towards the internal cavity of the sheath (fig. 36, *g*). The exterior membrane is very thick, compact, and quite peculiar (fig. 36, *i*). Entirely, from the rachis, to the commencement of the bulbous part, the exterior membrane is quite free on it's inner surface; this is smooth, and penetrated by minute openings, and has, also, a triangular prominence on all the 4 sides, which corresponds to the angle of the axis furrow, and nearly fills it out (fig. 61, *b*). Between the outer surface of the inner membrane, and the outer membrane's inner surface, there is, thus, a space round the entire axis (fig. 61, *d*), which is occupied by the nutrient fluid that circulates through the minute pores into the 4 principal longitudinal canals. In the bulbous part of the stalk, the case is somewhat different. Here, there is a complete fusion between the outer and

med det sædvanlige Epithel, Fig. 36, *h*. Paa den ydre Membrans ydre Flade, der støder umiddelbart til de 4 Længdekanaler, ere de 4 Septa indsererede, og imellem disse iagttages fra Begyndelsen af den bulbøse Del og lige ned til Axens Bøining en ganske særegen Fortykkelse af Membranen, Fig. 32, *f*. 32, *b*. 35, *e*. Denne Fortykkelse (Hypertrophi), der paa enkelte Steder er mindst et Par Millimeter tyk, indtager næsten Kanalens hele Bredde, men er dog bredest i Ventral- og Dorsalkanalen og frembyder ligesom en Mængde Udskjæringer, Fig. 32, *g*, i hvis Bund findes fine Aabninger, som føre ind til de tidligere omtalte Saftkanaler i det Bindevæv, Fig. 36, *h*, der danner Sammenvoxningen imellem Skedens ydre og indre Membran. Det hele har et Udseende dels af udskaaret Løvværk, dels af indridset Netværk; forøvrigt iagttages overalt paa Membranens ydre Flade ovenfor den bulbøse Del en Mængde fine Aabninger, der især ere tydelige til Siderne, og som føre ind til Skedens Hulhed.

Førend vi afslutte denne Afhandling skulle vi nu meddele en tabellarisk Oversigt over de hidtil fundne Exemplarer af *Umbellula encrinus*.

inner membrane of the sheath, which causes the space just described, to disappear, but, in the connective-tissue which fills out the space, there are a multitude of nutrient ducts furnished with the usual epithelium (fig. 36, *h*). On the outer membrane's outer surface, which abuts, immediately, upon the 4 longitudinal canals, the 4 septa are inserted, and between these, there is observed, a quite peculiar tumefaction of the membrane (figs. 32, *f*, 32, *b*, 35, *e*), extending from the commencement of the bulbous part, right down to the curve of the axis. This tumefaction (Hypertrophy), which, in some places, is at least a couple of millimetres thick, occupies, nearly, the entire breadth of the canal, but, yet, it is broadest in the ventral and dorsal canals, and presents, as it were, a number of carvings, (fig. 32, *g*), in whose bottom minute apertures are observed; these lead into, the previously spoken of, nutrient ducts in the connective-tissue (fig. 36, *h*) which forms the concretion between the outer and inner membrane of the sheath. The whole has an appearance, partly, of carved fretwork, partly, of inlaid reticulation, and, there is, otherwise, everywhere, observed on the outer surface of the membrane above the bulbous part, a multitude of minute apertures, specially prominent on the sides, and which lead into the cavity of the sheath.

Before we conclude this memoir, we shall now give a tabular specification of the specimens of *Umbellula encrinus*, which have hitherto been found.

Tabellarisk Oversigt

Tabular specification

over Størrelsen af de hidtil fundne Exemplarer af *Umbellula encrinus.*

of the dimensions of all the specimens of Umbellula encrinus hitherto known.

Umbellula encrinus.	Ellis's Exemplar. *(specimen.)*	Mylius's Exemplar. *(specimen.)*	Lindahls 2 Exemplarer. *(2 specimens.)*		Payers Exemplar. *(specimen.)*	Köllikers Exemplar *(specimen)*	Danielssens og Korens 12 Exemplarer af Umbellula encrinus. *(Danielssen's and Koren's 12 specimens of Umbellula encrinus.)*												Umbellula encrinus.
			Umb. miniacea.	Umb. pallida.		Umb. magni-flora.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.	No. 11.	No. 12.	
	mm	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	*mm*	
Stokkens Længde . .	1800	1300	423	332	630	740	146	160	168	191	600	485	865	1518	1586	1855	1923	2306	Length of the stalk.
Længden af Stilkens skedeformige Udvidning	51—76	63	27	15	—	85	8	7	7	12	30	25	170	150	130	180	55	180	Length of the sheath-formed dilation.
Længden af Stilkens bulbøse Del	—	152	76	52	—	77	35	48	48	50	95	80	175	500	420	340	345	400	Length of the stalk's bulbous portion.
De største Polypers Længde	65	63	75	56	—	45	21	28	25	28	75	40	80	80	75	125	115	125	Length of the largest polyps.
Polypkroppens Længde	43	38	19	17	—	26	7	14	10	12	30	18	40	35	40	65	50	70	Length of the body of the polyps.
Tentaklernes Længde	22	25	56	39	—	19	14	14	15	16	45	22	40	45	35	60	65	55	Length of the tentacles.
Axens største Tvervidde	6.5	5	1.35	—	—	—	—	—	—	—	—	—	—	—	7	—	—	—	Maximum transverse width of the axis.
De udviklede Polypers Antal	23	30	17	9	—	—	5	7	7	8	13	17	31	31	28	35	26	40	Number of developed polyps.
De uudviklede Polypers Antal . . .	—	—	6	2	—	—	1	1	2	1	1	—	—	—	—	—	—	—	Number of embryonal polyps.

Cladiscus Köllikeri, n. sp.

Tab. II, Fig. 8—13.

Stokken meget tynd, stiv, rund; det største Exemplar 48^{mm} langt; Rachis 30^{mm} lang; dens øverste Ende dels tvers afskaaren og blottet for Sarcosoma i 1—2^{mm} Længde, dels noget afstumpet og omgiven af nøgent Sarcosoma; paa et Exemplar sees Polyper ogsaa paa den øverste Del af Rachis, hvor der er Antydning til en Terminalpolyp, Fig. 8.

Den bulbøse Del (Stilken) er omtrent halvt saa lang som Rachis og ender i en aflang, stundom næsten kugleformet, halv gjennemsigtig Blære, hvis Muskulatur, der bestaar af Længde- og Tverfibre, skinne tydeligt igjennem, og i hvis Bund der synes at være en ganske liden Aabning, omgiven af en Sphincter.

Ventralsiden er næsten flad og har paa Midten en smal Fure, paa hvis Sider sees en Række Zooider, der ere klokkeformige og ligge paatvers, saa at den vide, runde Mundaabning vender udad, imedens Kroppens nederste, smalere Del vender indad imod Furen, Fig. 9, *a*. 10, *a*. Disse Zooider ere med smaa Mellemrum skilte fra hverandre; men hvor Cellerne fra hver Side nærme sig hinanden imod Bugfuren, ligge Zooiderne tættere, ja næsten lige ved Siden af hinanden, Fig. 9. Fra Zooidens nederste Svælgende udgaa to Gastralfilamenter, der ere fæstede til Septula, Fig. 10, *b*, hvilke gaa paaskraas et Stykke ind i Sarcosomaet.

Dorsalsiden er hvælvet, og kun paa de Steder, hvor Polypcellerne fra hver Side nærme sig hinanden, er en kort smal Fure, Fig. 11, *a*.

Polypcellerne staa i afvexlende Rækker paa hver Side af Rachis's Dorsalflade, i Regelen 3 Celler i hver Række; men paa enkelte Exemplarer findes kun 2. De staa i en skraa Retning fra Dorsal- til henimod Midten af Ventralsiden, og hvor der er 3, ere de to sammenvoxede i deres nederste Ende, hvorved en smal Stilk dannes, der gaar over i Sarcosomaet, imedens den Tredie gaar umiddelbart over i Rachis, Fig. 12; sjeldent sidde alle 3 isolerede.

Cellerne ere cylindriske, glatte, næsten vandklare, 0,68^{mm} lange, 0,52^{mm} brede, lidt smalere nedad, videre foroven, hvor den fri Rand er forsynet med 8 lange Papiller, Fig. 12, *a*. Rummet imellem Cellerækkerne er omtrent 1,5^{mm}, og paa en Rachis, der er 30^{mm} lang, findes paa hver Side 18 Cellerækker med udviklede Polyper; nedenfor disse er der 10—12 uudviklede Cellerækker, der gaar over i en enkelt Række smaa, runde Zooider, som strække sig et Stykke ned paa den bulbøse Del og ligne fuldkommen de ovenfor omtalte paa Dorsalsiden, Fig. 8.

Cladiscus Köllikeri, n. sp.

Pl. II, figs. 8—13.

The stalk is very thin, erect, and round, and it measured, in the largest specimen, 48^{mm} in length, whilst the rachis measured 30^{mm} long. The superior extremity is partly truncated, and for about 1—2^{mm} of its length, it is devoid of sarcosoma, and it is, also, partly blunted, and surrounded by bare sarcosoma; but, in one specimen, polyps are seen upon the superior part of the rachis, where there is also indication of a terminal polyp (fig. 8).

The bulbous part (the stem) is about half the length of the rachis, and terminates in an oblong, sometimes almost spherical, semi-translucent vesicle; whose muscular structure is composed of longitudinal, and transversal fibres, which appear, distinctly, visible through it's wall; and in whose bottom there appears to be, a quite small aperture, enclosed by a sphincter.

The ventral side is almost flat, and has a narrow furrow in the middle, on whose sides a series of zooids is seen. These are bell-shaped, and placed transversally, in such manner, that the wide, round, oral aperture, faces outwards, whilst the inferior, narrow part of the body, faces inwards towards the furrow (fig. 9, *a*, 10, *a*). These zooids are separated from each other by small intervals, and at the point where the cells of each side approach each other, in proximity to the ventral furrow, the zooids are situated closer, indeed, close alongside of each other (fig. 9). From the inferior extremity of the gullet of the zooids, two gastral filaments issue; these are secured to the septula (fig. 10, *b*) which run, diagonally, a small way into the sarcosoma.

The dorsal side is arched, and, only, in those situations where the cells of the polyps of each side approach other, is there seen, a short narrow furrow (fig. 11, *a*).

The cells of the polyps are situated in alternating series on each side of the dorsal surface of the rachis, usually, 3 cells in each series, but, in a few specimens, only 2 cells are so situated. They are placed in a diagonal direction, from the dorsal side to, nearly, the middle of the ventral side; and when there are 3 cells, two of them are concreted in their inferior extremity, producing thus, a narrow stem which passes into the sarcosoma, whilst, the third cell passes, immediately, over, into the rachis (fig. 12), and but rarely, are all the 3 cells isolated.

The cells are cylindrical, smooth, and nearly translucent, and they measure 0.68^{mm} long and 0.52^{mm} broad. They are slightly narrower below, and broader above; where, the free margin is furnished with 8 long papillæ (fig. 12, *a*). The space between the series of cells is about 1.5^{mm}, and on one rachis which measures 30^{mm} long, 18 series of cells with developed polyps are found on each side; below these, there are 10—12 undeveloped cellular series, which pass, over, into a single series of small, round zooids, that extend a short way down along the bulbous part, and completely, resemble those pertaining to the dorsal side, (fig. 8), spoken of above.

Under Cellerne paa Dorsalsiden sees to paaskraas gaaende Rækker smaa, runde Zooider, Fig. 11, *b*, 3 i hver Række; de frembyde intet Særegent.

Polyperne ere retraktile, omtrent dobbelt saa lange som Cellerne og forsynede med 8 tykke Tentakler med tykke, korte, langt fra hinanden staaende Cirrer, Fig. 12.

Paa Midten af Rachis er saavel Cellerne som Polyperne størst; op imod den øverste Ende blive de noget mindre, og her sees dels to paa hver Side, dels en enkelt Polyp. Endepolypen, der sidder paa Dorsalsiden, er neppe halvt saa stor som de øvrige.

Generationsorganerne udvikle sig i Gastralhulheden hos de tidligere beskrevne, klokkeformige Zooider paa disses to forlængede Septula og danne stilkede Kapsler, hvori Kjønsproduktet udvikles. Paa et Exemplar iagttoges i Mundaabningen af en saadan Zooide fuldt udviklede Æg, Fig. 13, der sandsynligvis skulde udstødes for at befrugtes, da *Cladiscus Köllikeri* ikke føder levende Unger. Kjønnet er adskilt.

Kalkaxen er tynd, rund, naar næsten lige ned i Endeblærens Bund, hvor den er yderst fin og danner en Anse.

Farven.

Stokken hvid, spillende lidt i det Gule. Cellerne og Polyperne hvide.

Findested.

Station 326, nogle Exemplarer.

Artskarakter.

Stokken er 48^{mm} lang, tynd, stiv, rund; Rachis 30^{mm} lang. Ventralfladen optaget til begge Sider af Midtfuren af paatvers liggende, klokkeformige Zooider. Cellerne cylindriske, glatte, sidde i afvexlende Rækker (3 i hver). Under Cellerne paa Dorsalsiden 2 Rækker smaa, runde Zooider, 3 i hver Række. Axen danner en Anse næsten nede i Endeblærens Bund. Farven hvid.

Gunneria[1] **borealis**, n. g. et n. sp.

Tab. IV, Fig. 8—16.

Af denne Søfjær have vi kun en Stump, nemlig hele Stilken og den nederste Del af Rachis, hvor der findes blot en enkelt, fuldt udviklet Polyp, da Sarcosomaet ovenfor

[1] Slægten opkaldt efter den som Naturforsker bekjendte Biskop Gunnerus.

Below the cells on the dorsal side, two diagonal series of small round zooids are seen (fig. 11, *b*); placed, 3 in each series; these, present nothing particularly remarkable.

The polyps are retractile, and are about twice as long as the cells; they are furnished with 8 thick tentacles, having thick, short pinnules, placed pretty far apart (fig. 12).

Both, the cells and the polyps, are largest at the middle of the rachis; up, towards the superior extremity, they become somewhat smaller, and in this situation, they are met with, sometimes two, and sometimes, only one polyp on each side. The terminal polyp, which is situated on the dorsal side, is, barely, half so large as the others.

The generative organs develope themselves in the gastral cavity of the previously described bell-shaped zooids, upon their two prolonged septula, and there, form pedunculated capsules, in which the sexual product developes. In one specimen, fully developed ova were observed in the oral aperture of such a zooid (fig. 13); and were, presumably, about to be discharged in order to be impregnated; because, *Cladiscus Köllikeri* does not give birth to living young ones. The sexes are separated.

The calcareous axis is thin, and round, and extends, nearly, quite down to the bottom of the terminal vesicle, where, it becomes extremely slender, and forms a hook.

Colour.

The stalk is white, tending slightly to yellow. The cells and polyps are white.

Habitat.

Station No. 326, a few specimens.

Specific Character.

The stalk is 48^{mm} long, thin, erect, and round. The rachis is 30^{mm} long. The ventral surface is occupied, on both sides of the mesial furrow, by diagonally situated, bell-shaped zooids. The cells are cylindrical, and smooth, and, are placed in alternating series (3 in each). Below the cells on the dorsal side, there are 2 series of small round zooids, 3 in each series. The axis forms a hook, almost, at the bottom of the terminal vesicle. The colour is white.

Gunneria[1] **borealis**, n. g. et n. sp.

Pl. IV, figs. 8—16.

We have only a fragment of this sea-pen, namely, the entire stem, and the inferior portion of the rachis, upon which there is found, only, one single fully developed

[1] The genus is named after the well known naturalist Bishop Gunnerus.

er bortrevet, saa at Axen er blottet i en Udstrækning af 30^{mm}, hvor Rachis er afbrækket, Fig. 8. Men da vi af det meget ufuldkomne Exemplar dog kan faa saamegen Oplysning, at vi med nogenlunde Sikkerhed kan bestemme, at denne Søfjær ikke kan henføres til nogen af de bekjendte Slægter, og da hertil kommer, at den synes at nærme sig en Overgangsform, have vi troet det af Interesse at beskrive den, hvor ufuldstændig end Beskrivelsen nødvendigvis maa blive.

Naar vi have nævnt en Overgangsform, saa skulle vi med nogle Ord begrunde dette. Vi have ikke iagttaget hos nogen *Pennatulide* en saadan Rigdom af Kalk som den, der findes hos *Gunneria borealis*. Sarcosomaet danner formelig en Kalkskorpe. Cellerne ere saa stærkt incrusterede af Kalkspikler, at det selv ved kaustisk Kalilud har sine Vanskeligheder at faa dem skilte fra hverandre, — og Polyperne ere saavel paa Krop som Tentakler i en overordentlig Grad opfyldte af Kalkspikler. Med Hensyn hertil har jo *Gunneria* adskilligt tilfælles med *Gorgoniderne*; og ser man hen til Spiklernes Form, især i Stilken, saa voxer jo Fællesskabet noget; men med alt dette have vi dog for os en udviklet *Pennatulide*, der nærmer sig meget til Protoptilerne og maa vel henføres til deres Familie, nemlig *Protoptilidæ*.

Den hele Stump er 103^{mm} lang, hvoraf Stilken udgjør 52^{mm} og Rachis, forsynet med Sarcosoma, 15^{mm}.

Efter de uudviklede Polypceller at dømme, hvilke væsentlig indtage den Del af Rachis, som er bevaret, danne de skjæve Rækker, der gaa fra Ventralfladen over paa den noget hvælvede Dorsalflade, som ganske indtages af Celler, Fig. 8. I hver Række er der 4—5 Celler, og i det yderst smale Rum imellem Rækkerne sees enkelte mindre Celler; men Zooider findes ikke. Disse uudviklede Celler variere noget i Størrelse; de ere fra 1—2^{mm} lange og 0,6—1^{mm} brede foroven med en liden Aabning, hvis fri Rand er forsynet med et forskjelligt Antal yderst fine Papiller, Fig. 8. Cellernes indre Væg er sammenvoxet med Sarcosomaet.

Polyperne i disse Celler have en brunlig Farve, det vil sige Svælget og de 8 Gastralfilamenter ere brunlige; Tentaklerne ere rudimentære. Strax ovenfor disse uudviklede Celler sees til Venstre en næsten udviklet Celle med sin Polyp, Fig. 8, *a*, og lidt længere oppe paa Dorsalsiden sidder den eneste, fuldt udviklede Celle med Polyp, som findes paa dette i høi Grad defekte Exemplar, Fig. 8, *b*.

Den udviklede Celle er 3^{mm} lang, dens Aabning, hvis fritstaaende Rand er forsynet med 8 tykke Papiller (Tænder), er 2,5^{mm}, Fig. 9, *a*. Cellens indre Væg er forstørstedelen sammenvoxet med Sarcosomaet; men Randen er fri og rager lidt ud fra Rachis.

polyp, owing to the sarcosoma above being torn away, so that, the axis becomes exposed for a length of 30^{mm}, and the rachis is then broken off (fig. 8). But, as the incomplete specimen affords so much information, that we are able with considerable certainty to satisfy ourselves that this sea-pen can not be assigned to any of the known genera; whilst, to this, comes to be added, that it appears to approach to a transition-form; we have thought it of sufficient interest to be described, however incomplete the description must of necessity be.

As we have mentioned that it approaches to a transition-form, we will in a few words substantiate this. We have not observed in any *Pennatulida* such an abundance of calcium as is found in *Gunneria borealis*. The sarcosoma forms, in fact, a calcareous crust. The cells are so strongly encrusted with calcareous spicules that, even, on treatment with a solution of caustic potash, it is no easy matter to separate them from each other, and the polyps, both, on the body and the tentacles, are filled up in an extraordinary degree, with calcareous spicules. In this respect indeed, *Gunneria* has much in common with *Gorgonidæ*, and if we regard the form of the spicules, especially, on the stem, the resemblance becomes still more prominent, but, nevertheless, we have before us a developed *Pennatulida* which approaches, much, to the Protoptili, and must, without doubt, be assigned to their family, namely, *Protoptilidæ*.

The entire fragment measures, 103^{mm} in length; of this, the stem occupies 52^{mm}, and the rachis — furnished with sarcosoma — 15^{mm}.

Judging from the appearance of the polyp cells which, principally, occupy the portion of the rachis that is preserved, they form crooked series, proceeding from the ventral surface over to the somewhat arched dorsal surface, which is quite occupied by cells (fig. 8). In each series there are 4—5 cells, and in the extremely narrow space between the series, a few smaller cells are seen, but no zooids are found. These undeveloped cells vary much in size; they measure from 1—2^{mm} long, and from 0.6—1.0^{mm} broad, above; and they have a small aperture, whose free margin is furnished with, a varying number of extremely minute papillæ (fig. 8). The inner wall of the cells is concreted with the sarcosoma.

The polyps in these cells have a brownish colour, that is to say: — the gullet, and the 8 gastral filaments are brownish. The tentacles are rudimentary. Immediately above these undeveloped cells, a nearly developed cell with its polyp, is observed to the left (fig. 8, *a*), and a little further up, on the dorsal side, the only fully developed cell and polyp which is found in this highly defective specimen, is seen situated (fig. 8, *b*)

The developed cell is 3^{mm} long, and the aperture is 2.5 broad; whilst, the free independent margin is furnished with 8 thick papillæ (teeth) (fig. 9, *a*). The greater part of the wall of the cell is concreted with the sarcosoma, but the margin is free, and protrudes a little from the rachis.

Samtlige Celler, saavel de udviklede som uudviklede, ere rigelig forsynede med Kalkspikler, der have en forskjellig Størrelse, imedens den trekantede Form tilhører dem alle. De ere fra 0,161 til 0,440^{mm} lange og fra 0,018—0,032^{mm} brede. Deres Ender ere hyppigst afstumpede og enkeltvis forsynede med Takker. Disse Spikler ere i mange Lag saa sammenpakkede, at den tykke Cellevæg har et Udseende, som om den er dannet af bare Kalk, saa at det selv med kaustisk Kalilud har sine Vanskeligheder at skille Spiklerne tilstrækkelig fra hverandre.

Polyperne ere cylindriske og sandsynligvis retraktile, 6^{mm} lange, hvoraf Kroppen er 3^{mm} lang. Paa Kroppen iagttages 8 meget ophøiede, paalangsgaaende, brede Ribber, Fig. 9, *b*, der dannes af mange Lag tæt paa hinanden liggende, trekantede Spikler, som ere afrundede paa Enderne og tildels finttakkede; de ere fra 0,320—0,440^{mm} lange og fra 0,020—0,028^{mm} brede. Felterne imellem disse Ribber, Fig. 9, *c*, ere ligeledes optagne af lignende Spikler, men her ligge de mere paatvers og ere mere spredte. Tentaklerne have samme Længde som Kroppen og ere forsynede med tykke, koniske Pinnuler, Fig. 9. Naar undtages den midterste Del af den adorale Flade, er hele Tentakelen ligesom indkapslet af Kalkspikler. Paa den aborale Flade er en høi, bred Ryg, sammensat af Spikler, lig de største paa Kroppen; men til Siderne og paa Pinnulerne ere Spiklerne ikke saa sammenpakkede, ligesom de ere mindre og have tildels en lidt forskjellig Form. De ere dels elliptiske, dels have de spidse, dels afstumpede, finttakkede Ender, ere fra 0,150—0,200^{mm} lange, og fra 0,008—0,012^{mm} brede. Mundskiven er lidt hvælvet og rig paa Kalkspikler, lig dem i Polypkroppen. Svælget er foldet paatvers, har en brun Farve, og i dets Bindevæv er en Mængde Spikler leirede, fuldkommen lig dem, som findes paa Tentaklernes Pinnuler.

Ventralfladen er lidt fladtrykt, har en meget smal, paalangsgaaende Fure, Fig. 8, *c*, fra hvis Rande Cellerækkerne tage deres Begyndelse. Naar undtages dette yderst smale, nøgne Belte paa Ventralfladen, er den øvrige Del af Rachis besat med Polyper.

Under de ovenbeskrevne, udviklede Polyper sees en rund Zooide, som er vel indpakket i Kalkspikler. Det er sandsynligt, at der imellem Rækkerne af de udviklede Polypceller findes Zooider.

Stilken er rund, smalner ganske lidt af ned imod Enden, der danner en konisk Bulbus, Fig. 8. Stilkens Sarcosoma er temmelig tyk og fast af Spikelafsætninger. Spiklerne i Stilken ere forskjellige i Form og Størrelse. Størstedelen er trekantet, noget fladtrykt med brede, takkede Ender og Kanter, Fig. 10—14, de ere fra 0,150—0,180^{mm} lange, fra 0,020—0,028^{mm} brede; enkelte ere næsten gaffel-

All the cells, both, the fully developed as well as the undeveloped, are abundantly furnished with calcareous spicules, which have a variable size, although, the triangular form is common to all of them. They measure from 0.161^{mm} to 0.440^{mm} long, and from 0.018—0.032^{mm} broad. Their extremities are, most frequently, blunted, and are, occasionally, aculeated. These spicules are so tightly packed, in many layers, that the thick wall of the cell obtains the appearance of being composed of calcium alone, and even, when caustic potash in solution is used, it is not without difficulty, that the spicules can be sufficiently separated from each other.

The polyps are cylindrical, and probably retractile. They measure 6^{mm} in length, of which, the body occupies 3^{mm}. On the body there is observable, 8 considerably elevated, broad, longitudinal ribs (fig. 9, *b*); these are formed of many layers of triangular spicules placed close upon each other, and which are rounded on the extremities, and partly, minutely aculeated; they measure from 0.320—0.440^{mm} long, and from 0.020—0.028^{mm} broad. The areas between these ribs (fig. 9, *c*), are, also, occupied by similar spicules, but here, they are situated more transversally, and are more dispersed. The tentacles have the same length as the body, and are furnished with thick conical pinnules (fig. 9). With the exception of the mesial part of the adoral surface, the entire tentacle is, as it were, enclosed in a capsule of calcareous spicules. On the aboral surface, there is, a high broad dorsum, composed of spicules similar to the largest spicules of the body, but, to the sides, and on the pinnules, the spicules are not so much packed together; whilst, also, they are smaller here, and have, partly, a different form. They are, partly, elliptical, and they have, partly, pointed, and partly, blunted, minutely aculeated extremities; they measure from 0.150—0.200^{mm} long, and from 0.008—0.012^{mm} broad. The oral disk is slightly arched, and is rich in calcareous spicules like those of the body of the polyp. The gullet is folded transversally, and has a brown colour; and embedded in its connective-tissue, a mass of spicules is found, exactly similar to those found on the pinnules of the tentacles.

The ventral surface is a little flattened, and has a very narrow longitudinal furrow (fig. 8, *c*), in whose margin, the cellular series have their origin. With exception of this extremely narrow, unoccupied stripe on the ventral surface, the whole of the remainder of the rachis is beset with polyps.

Below the above described developed polyps, a round zooid is seen, which is well enclosed by calcareous spicules. It is probable, that zooids are found between the series of the developed cells of the polyps.

The stem is round, and becomes reduced a little in thickness, down towards the extremity, where, it forms a conical bulb (fig. 8). The sarcosoma of the stem is rather thick, and firm, owing to deposited spiculæ. The spicules of the stem are, variable in form and size, and the greater number are triangular, somewhat flattened, and have broad aculeated extremities and edges (figs. 10—14);

formigt delte i den ene Ende. Imellem disse lange Spikler findes en Mængde mindre, næsten runde, sammensatte af flere Kalkkorn og 0,008^{mm} brede, Fig. 15. 16.

Kalkaxen er rund og ender 3^{mm} fra den bulbøse Dels Bund i en liden Anse.

Farven.

Saavel Rachis med sine Celler som Stilk er blygraa. Polyperne ere næsten vandklare, men faar et brunligt Skjær derved, at det brune Svælg skinner igjennem. Tentaklerne ere paa Midten af deres adorale Flade svagt brunlige, hvilket ogsaa er Tilfældet med Pinnulerne; men forresten have de Blyglandsen, fremkaldt ved Spikelpantseret.

Findested.

Station 101.

Protoptilum lofotense, n. sp.

Tab. II, Fig. 14—20.

Af denne Søfjær blev fundet kun et Fragment, der dog væsentlig bestod af saagodtsom hele Rachis; Stilken manglede ganske.

Det forresten vel konserverede Stykke er 90^{mm} langt.

Rachis er meget stiv. Cellerne danne lidt uregelmæssige, paatversgaaende Rækker, 3 i hver Række, saaledes nemlig, at den midterste Celle indtager Midtpartiet af Dorsalfladen og staar noget høiere end de to andre, en paa hver Side af Midtcellen, Fig. 14. Af disse to laterale Celler staar i Regelen den ene lidt ovenfor den anden; kun i en enkelt Række, omtrent midt paa Rachis, stod de saagodtsom lige overfor hinanden.

Cellerne ere stillede saaledes, at den øvre Celles Grunddel rækker til den nedenfor staaendes Aabning; forresten iagttages Cellernes Stilling og Forhold til hinanden særdeles godt paa den noget hvælvede Dorsalside, Fig. 14.

Cellerne ere næsten traktformige, 3—5^{mm} lange, deres indre Væg er fastvoxet til Rachis, og Aabningens ydre, fri Rand, der er lidt høiere end den indre, fastvoxede, er forsynet med 3 stærke, lancetformige Tænder, Fig. 14. 16, *a*. Paa Midtcellens Grund, stundom et Stykke op paa samme, imellem den og Sidecellerne sees runde Zooider, staaende dels i smaa Grupper, dels enkeltvis, Fig. 17; de have en rund, vid Aabning, Fig. 17, *a*. Cellerne paa den nederste Del af Rachis aftage betydeligt i Størrelse og bære uudviklede Polyper.

they measure from 0.150—0.180^{mm} long, and from 0.020—0.028^{mm} broad. A few of them are, almost bifurcated in the one extremity. Between these long spicules, a multitude of smaller ones are found; these are almost round, and are composed of several calcareous grains; they measure 0.008^{mm} broad (figs. 15, 16).

The calcareous axis is round, and terminates in a small hook, 3^{mm} from the bottom of the bulbous portion.

Colour.

Both, the rachis with its cells, and also, the stem, are leaden-grey. The polyps are almost as clear as water, but, owing to the brown gullet appearing visible through, they obtain a brownish tinge. At the middle of their adoral surface, the tentacles are faintly brownish, which, also, is the case with the pinnules; but they, otherwise, have the leaden lustre produced by the spicular plating.

Habitat.

Station No. 101.

Protoptilum lofotense, n. sp.

Pl. II, figs. 14—20.

Only a fragment of this sea-pen was found, which, however, essentially, consisted of almost the entire rachis; the stem is completely awanting.

This in other respects well preserved fragment, is 90^{mm} long.

The rachis is very erect. The cells form somewhat irregular transversal series, 3 in each series, in such manner, that the intermediate cell occupies the mesial part of the dorsal surface, and it projects more than the two others, which are placed one on each side of the mesial cell (fig. 14). The one of these two lateral cells is usually situated, a little above the other one, and, only, in a single series about the middle of the rachis, were they found situated, nearly opposite to each other.

The cells are so placed, that the basal portion of the superior cell extends to the aperture of the one placed below it; the arrangement of the cells and their relation to each other is, however, particularly well observed on the somewhat arched dorsal side (fig. 14).

The cells are almost funnel-shaped, and are 3—5^{mm} long, their inner wall is concreted with the rachis, and the outer free margin of the aperture, which is a little higher than the inner concreted one, is furnished with 3 strong lanceolate teeth (figs. 14, 16, *a*). At the base of the mesial cell, occasionally, a small piece up it, and also, between it and the lateral cells, round zooids are seen situated, partly, in small groups, partly, singly (fig. 17) and these have a round wide aperture (fig. 17, *a*). The cells on the inferior part of the rachis diminish, considerably, in size, and carry undeveloped polyps.

Ventralsiden er næsten flad, dens midterste Del danner et smalt, nøgent Belte, og til hver Side er en regelmæssig Række Zooider, der ligesom begrændser Ventralfladen, Fig. 15. Disse Zooider, der rage lidt mere frem end de paa Dorsalsiden, staa længere fra hinanden, og hvor de støde til Sidecellerne, er der som oftest to ved Siden af hinanden, ellers dannes Rækken kun af enkeltstaaende Zooider. Imellem enkelte Cellerækker sees Zooiderne at udfylde Rummet lige til Ventralrækken.

Cellerne ere overalt rigt besatte med lange, stavformede Spikler, der ere noget forskjellige baade i Længde og Bredde, fra 0,560—0,893^{mm} lange og fra 0,020—0,035^{mm} brede, Fig. 20; de ere trekantede, tilspidsede i begge Ender, farvefri og ligge tæt til og paa hinanden; i de føromtalte Tænder ordne disse Spikler sig pyramideformigt imod Tandens Spids. Aldeles lignende Spikler findes i Sarcosomaet, der er temmelig tyndt og halvt gjennemsigtigt; kun i det smale, nøgne Belte paa Ventralfladen ligge Spiklerne enkeltvis og meget langt fra hverandre og danne afbrudte Længderækker; de ere 0,223^{mm} lange, 0,017^{mm} brede paa Midten.

Polyperne ere cylindriske; deres Krop er omtrent 3^{mm} lang, forsynet med 8 svage Længderibber, der antyde Insertionerne for Septa og er uden Kalk. Tentaklerne ere fjederformede, lange, omkring 5—6^{mm} og have paa hver Side omtrent 20 Pinnuler. Paa Midtpartiet af Tentaklernes aborale Flade sees lige fra Grunden og næsten til Spidsen en uafbrudt Række af trekantede, valseformede Spikler, Fig. 18, hvoraf de ved Tentakelens Grund og Spids ere meget smaa, imedens de øvrige ere fra 0,290—0,318^{mm} lange og fra 0,020—0,027^{mm} brede, Fig. 19.

Zooiderne have en vid, næsten rund Mundaabning, Fig. 17, *a*, og ere omgivne krandsformigt af spindelformede, trekantede Spikler, der udgaa vifteformigt fra Grunden, ligge paa hverandre og udbrede sig omkring Zooiden, saa at denne er vel beskyttet. Disse Spikler ere fra 0,280—0,357^{mm} lange og fra 0,020—0,035^{mm} brede, Fig. 17, *b*.

Spiklerne ere overalt uden Farve.

Farven.

Rachis svagt gulrød. Polypcellerne ved Grunden smuk teglstensrøde. Polyperne vandklare; Tentaklerne ligesaa.

Findested.

Station 252. Vestfjorden, syd for Skraaven. 170 Favne. Lerbund med iblandet Smaasten. Et Exemplar.

The ventral surface is almost flat; it's mesial part forms a narrow unoccupied stripe, and on each of the sides, there is a regular series of zooids, which, as it were, defines the ventral surface (fig. 15). These zooids protrude a little more forward than those of the dorsal side, and are situated further apart from each other, whilst, also, at the point where they abut on the lateral cells, there are, usually, two of them placed alongside each other, but otherwise, the series is solely composed of solitary zooids. Between a few of the cellular series, the zooids are seen to occupy the space right up to the ventral series.

The cells are, everywhere, richly beset with long, rod-like spicules, which vary somewhat, both, in length and breadth, measuring from 0.560—0.893^{mm} long, and from 0.020—0.035^{mm} broad (fig. 20). They are triangular, acuminated at both extremities, and colourless, and they are placed close up to, and upon each other. In the teeth already spoken of, these spicules arrange themselves in pyramidal form towards the point of the tooth. Exactly similar spicules are found in the sarcosoma, which is pretty thin and semi-transparent. Only in the narrow, unoccupied stripe on the ventral surface, do the spicules appear, singly, at long intervals from each other, and form interrupted longitudinal series. They measure 0.223^{mm} in length, and 0.017^{mm} in breadth at the middle.

The polyps are cylindrical; their body is about 3^{mm} long, and is furnished with 8 delicate longitudinal ribs, which denote the insertions for the septa, and are devoid of calcium. The tentacles are feather-shaped, and about 5—6^{mm} long, and they have about 20 pinnules on each side. In the mesial part of the aboral surface of the tentacles, there is seen, extending right from the base and almost to the point, a continuous series of triangular, roller-formed spicules (fig. 18), of which, those situated at the base, and point of the tentacles, are very small, whilst, the others, are from 0.290—0.318^{mm} long, and from 0.020—0.027^{mm} broad (fig. 19).

The zooids have a wide, almost round oral aperture (fig. 17, *a*,), and are surrounded in wreath form, by fusiform triangular spicules, which issue from the base in a fan-shape, lie upon each other, and spread themselves around the zooid, so that it is well protected. These spicules are from 0.280—0.357^{mm} long, and from 0.020—0.035^{mm} broad (fig. 17, *b*).

The spicules are, everywhere, colourless.

Colour.

The rachis is faint yellowish-red. The polyp-cells are, at their base, a beautiful brick-red colour. The polyps are clear as water, and the tentacles are the same.

Habitat.

Station No. 252. Westfjord, south of Skraaven. 170 fathoms. Clay bottom with gravel intermixed. One specimen.

Artskarakter.

Polypcellerne, der ere lange, traktformige og paa deres Aabnings fri Rand have 3 Tænder, sidde i Tverrækker (3 i hver) saaledes, at Midtcellen indtager Midtpartiet af Dorsalsiden og staar lidt høiere end de to laterale Celler. Zooider imellem Midtcellen og Sidecellerne og ofte op paa den første. Ventralfladen har et bredt, nøgent Midtbelte; til hver Side af dette en Række Zooider. Rachis svagt gulrød. Polypcellerne ved Grunden smuk teglstensrøde. Polyperne vandklare.

Protoptilum Mohni [1], n. sp.

Tab. III, Fig. 1—7.

Stokken er saagodtsom hel, kun paa den nederste Ende af Bulbus er Sarcosomaet afrevet, men Axen er uskadt.

Stokkens Længde er 150^{mm}, deraf udgjør Rachis 75^{mm}. Stilkens bulbøse Del er smal, kun 2^{mm} bred paa det Bredeste, Fig. 1; om den ender i en rund Blære eller i en aflang Bulbus, kan ikke afgjøres.

Rachis er paa Midten omtrent 2^{mm} bred; nedad bliver den smalere, og dens øverste Ende er blottet for Sarcosoma i en Udstrækning af 13^{mm}, hvor altsaa Axen fremtræder aldeles nøgen, Fig. 1.

Dorsalfladen er lidt hvælvet, hvilket især er tydeligt paa den nederste Del af Rachis. De udviklede Celler sidde meget uregelmæssigt, — saaledes er der paa den nederste Del af Rachis kun 2 Celler, en paa hver Side, og her er Midtlinien af Dorsalfladen optagen af Zooider og uudviklede Celler, Fig. 1. Noget længere oppe bliver der 3 Celler, hvoraf den ene er lidt mindre end de to andre og indtager Midten af Dorsalfladen, Fig. 1, *a*. Endnu længere oppe paa Rachis tiltager Antallet af Celler, hvilke staa i uregelmæssige Rækker, dels 3 paa høire Side, 1 paa Midten og 1 paa venstre Side, dels 3 og 2, og endelig øverst oppe 3 paa hver Side og 1 paa Midten af Dorsalfladen. Nedenfor de udviklede Celler optræder paa hver Side en paaskraasgaaende Række uudviklede Celler, 3 i hver, og under dem sees en næsten paatversgaaende Række, hvori er 2 Celler, og endelig er der kun 1 Celle. Imellem de Rækker, hvori der er 3 Celler, og som gaa fra Ventral- til Dorsalfladen, iagttages enkelte Celler; men ingen Zooider findes der, Fig. 1. De udviklede Celler derimod synes at have en modsat Retning, nemlig fra Dorsal- til Ventralfladen. Rækkerne staa afvexlende overfor hinanden, Fig. 3—4. Nederst paa Rachis staa Cellerækkerne noget fra

[1] Arten opkaldt efter Professor, Dr. H. Mohn, Medlem af den norske Nordhavsexpedition.

Specific Character.

The polyp cells are long, and funnel-shaped; and on the free margin of their aperture, 3 teeth are situated. They are placed in transversal series (3 in each) in such manner, that the mesial cell occupies the mesial part of the dorsal side, and protrudes a little more than the two lateral cells. Zooids are situated between the mesial cell and the lateral cells, and also often upon the former. The ventral surface has a broad unoccupied mesial stripe, and at each side ot it a series of zooids. The rachis is faint yellowish-red colour. The polyp cells are at the base a beautiful brick-red colour. The polyps are clear as water.

Protoptilum Mohni [1], n. sp.

Pl. III, figs. 1—7.

The stalk is almost complete, and only, upon the inferior extremity of the bulb is the sarcosoma torn away, but the axis is left uninjured.

The length of the stalk is 150^{mm}; of which, the rachis occupies 75^{mm}. The bulbous part of the stem is narrow, and only, 2^{mm} broad at its broadest part (fig. 1); whether it terminates in a round vesicle, or, in an oblong bulb, could not be detected.

At the middle, the rachis is about 2^{mm} broad, but becomes narrower downwards, whilst, it's superior extremity is devoid of sarcosoma for an extent of 13^{mm}, and there, therefore, the axis appears perfectly bare (fig. 1).

The dorsal surface is a little arched, and this is, most distinctly, seen on the lower part of the rachis. The developed cells are situated, very irregularly, so that, on the inferior part of the rachis there are only 2 cells, one placed on each side, and in this situation, the mesial line of the dorsal surface is occupied by zooids and undeveloped cells (fig. 1). Somewhat further up, there are 3 cells, of which, the one, is a little smaller than the two others, and occupies the middle of the dorsal surface (fig. 1, *a*). Still further up the rachis, the cells become more numerous, and are situated in irregular series, sometimes, 3 on the right side, 1 in the middle, and 1 on the left side; sometimes, 3 and 2, and finally, at the top, 3 on each side, and 1 in the middle of the dorsal surface. Below the developed cells, a diagonal series of undeveloped cells appears on each side, 3 in each series, and below them, a nearly transversal series consisting of 2 cells, is seen; and finally, there occurs only one cell. Between the series in which there are 3 cells, and which proceed from the ventral to the dorsal surface; a few cells are observed, but no zooids are seen there (fig. 1). The developed cells on the other hand, appear to have an opposite direction,

[1] This species has been named after Professor Dr. H. Mohn, a member of the Norwegian North-Atlantic Expedition.

Ventralsiden er næsten flad, dens midterste Del danner et smalt, nøgent Belte, og til hver Side er en regelmæssig Række Zooider, der ligesom begrændser Ventralfladen, Fig. 15. Disse Zooider, der rage lidt mere frem end de paa Dorsalsiden, staa længere fra hinanden, og hvor de støde til Sidecellerne, er der som oftest to ved Siden af hinanden, ellers dannes Rækken kun af enkeltstaaende Zooider. Imellem enkelte Celleraekker sees Zooiderne at udfylde Rummet lige til Ventralrækken.

Cellerne ere overalt rigt besatte med lange, stavformede Spikler, der ere noget forskjellige baade i Længde og Bredde, fra 0,560—0,893^{mm} lange og fra 0,020—0,035^{mm} brede, Fig. 20; de ere trekantede, tilspidsede i begge Ender, farvefri og ligge tæt til og paa hinanden; i de føromtalte Tænder ordne disse Spikler sig pyramideformigt imod Tandens Spids. Aldeles lignende Spikler findes i Sarcosomaet, der er temmelig tyndt og halvt gjennemsigtigt; kun i det smale, nøgne Belte paa Ventralfladen ligge Spiklerne enkeltvis og meget langt fra hverandre og danne afbrudte Længderækker; de ere 0,223^{mm} lange, 0,017^{mm} brede paa Midten.

Polyperne ere cylindriske; deres Krop er omtrent 3^{mm} lang, forsynet med 8 svage Længderibber, der antyde Insertionerne for Septa og er uden Kalk. Tentaklerne ere fjederformede, lange, omkring 5—6^{mm} og have paa hver Side omtrent 20 Pinnuler. Paa Midtpartiet af Tentaklernes aborale Flade sees lige fra Grunden og næsten til Spidsen en uafbrudt Række af trekantede, valseformede Spikler, Fig. 18, hvoraf de ved Tentakelens Grund og Spids ere meget smaa, imedens de øvrige ere fra 0,290—0,318^{mm} lange og fra 0,020—0,027^{mm} brede, Fig. 19.

Zooiderne have en vid, næsten rund Mundaabning, Fig. 17, *a*, og ere omgivne krandsformigt af spindelformede, trekantede Spikler, der udgaa vifteformigt fra Grunden, ligge paa hverandre og udbrede sig omkring Zooiden, saa at denne er vel beskyttet. Disse Spikler ere fra 0,280—0,357^{mm} lange og fra 0,020—0,035^{mm} brede, Fig. 17, *b*.

Spiklerne ere overalt uden Farve.

Farven.

Rachis svagt gulrød. Polypcellerne ved Grunden smuk teglstensrøde. Polyperne vandklare; Tentaklerne ligesaa.

Findested.

Station 252. Vestfjorden, syd for Skraaven. 170 Favne. Lerbund med iblandet Smaasten. Et Exemplar.

The ventral surface is almost flat; it's mesial part forms a narrow unoccupied stripe, and on each of the sides, there is a regular series of zooids, which, as it were, defines the ventral surface (fig. 15). These zooids protrude a little more forward than those of the dorsal side, and are situated further apart from each other, whilst, also, at the point where they abut on the lateral cells, there are, usually, two of them placed alongside each other, but otherwise, the series is solely composed of solitary zooids. Between a few of the cellular series, the zooids are seen to occupy the space right up to the ventral series.

The cells are, everywhere, richly beset with long, rod-like spicules, which vary somewhat, both, in length and breadth, measuring from 0.560—0.893^{mm} long, and from 0.020—0.035^{mm} broad (fig. 20). They are triangular, acuminated at both extremities, and colourless, and they are placed close up to, and upon each other. In the teeth already spoken of, these spicules arrange themselves in pyramidal form towards the point of the tooth. Exactly similar spicules are found in the sarcosoma, which is pretty thin and semi-transparent. Only in the narrow, unoccupied stripe on the ventral surface, do the spicules appear, singly, at long intervals from each other, and form interrupted longitudinal series. They measure 0.223^{mm} in length, and 0.017^{mm} in breadth at the middle.

The polyps are cylindrical; their body is about 3^{mm} long, and is furnished with 8 delicate longitudinal ribs, which denote the insertions for the septa, and are devoid of calcium. The tentacles are feather-shaped, and about 5—6^{mm} long, and they have about 20 pinnules on each side. In the mesial part of the aboral surface of the tentacles, there is seen, extending right from the base and almost to the point, a continuous series of triangular, roller-formed spicules (fig. 18), of which, those situated at the base, and point of the tentacles, are very small, whilst, the others, are from 0.290—0.318^{mm} long, and from 0.020—0.027^{mm} broad (fig. 19).

The zooids have a wide, almost round oral aperture (fig. 17, *a*,), and are surrounded in wreath form, by fusiform triangular spicules, which issue from the base in a fan-shape, lie upon each other, and spread themselves around the zooid, so that it is well protected. These spicules are from 0.280—0.357^{mm} long, and from 0.020—0.035^{mm} broad (fig. 17, *b*).

The spicules are, everywhere, colourless.

Colour.

The rachis is faint yellowish-red. The polyp-cells are, at their base, a beautiful brick-red colour. The polyps are clear as water, and the tentacles are the same.

Habitat.

Station No. 252. Westfjord, south of Skraaven. 170 fathoms. Clay bottom with gravel intermixed. One specimen.

Artskarakter.

Polypcellerne, der ere lange, traktformige og paa deres Aabnings fri Rand have 3 Tænder, sidde i Tverrækker (3 i hver) saaledes, at Midtcellen indtager Midtpartiet af Dorsalsiden og staar lidt høiere end de to laterale Celler. Zooider imellem Midtcellen og Sidecellerne og ofte op paa den første. Ventralfladen har et bredt, nøgent Midtbelte; til hver Side af dette en Række Zooider. Rachis svagt gulrød. Polypcellerne ved Grunden smuk teglstensrøde. Polyperne vandklare.

Protoptilum Mohni [1], n. sp.

Tab. III, Fig. 1—7.

Stokken er saagodtsom hel, kun paa den nederste Ende af Bulbus er Sarcosomaet afrevet, men Axen er uskadt.

Stokkens Længde er 150^{mm}, deraf udgjør Rachis 75^{mm}. Stilkens bulbøse Del er smal, kun 2^{mm} bred paa det Bredeste, Fig. 1; om den ender i en rund Blære eller i en aflang Bulbus, kan ikke afgjøres.

Rachis er paa Midten omtrent 2^{mm} bred; nedad bliver den smalere, og dens øverste Ende er blottet for Sarcosoma i en Udstrækning af 13^{mm}, hvor altsaa Axen fremtræder aldeles nøgen, Fig. 1.

Dorsalfladen er lidt hvælvet, hvilket især er tydeligt paa den nederste Del af Rachis. De udviklede Celler sidde meget uregelmæssigt, — saaledes er der paa den nederste Del af Rachis kun 2 Celler, en paa hver Side, og her er Midtlinien af Dorsalfladen optagen af Zooider og uudviklede Celler, Fig. 1. Noget længere oppe bliver der 3 Celler, hvoraf den ene er lidt mindre end de to andre og indtager Midten af Dorsalfladen, Fig. 1, *a*. Endnu længere oppe paa Rachis tiltager Antallet af Celler, hvilke staa i uregelmæssige Rækker, dels 3 paa høire Side, 1 paa Midten og 1 paa venstre Side, dels 3 og 2, og endelig øverst oppe 3 paa hver Side og 1 paa Midten af Dorsalfladen. Nedenfor de udviklede Celler optræder paa hver Side en paaskraasgaaende Række uudviklede Celler, 3 i hver, og under dem sees en næsten paatversgaaende Række, hvori er 2 Celler, og endelig er der kun 1 Celle. Imellem de Rækker, hvori der er 3 Celler, og som gaa fra Ventral- til Dorsalfladen, iagttages enkelte Celler; men ingen Zooider findes der, Fig. 1. De udviklede Celler derimod synes at have en modsat Retning, nemlig fra Dorsal- til Ventralfladen. Rækkerne staa afvexlende overfor hinanden, Fig. 3—4. Nederst paa Rachis staa Cellerækkerne noget fra

[1] Arten opkaldt efter Professor, Dr. H. Mohn, Medlem af den norske Nordhavsexpedition.

Specific Character.

The polyp cells are long, and funnel-shaped; and on the free margin of their aperture, 3 teeth are situated. They are placed in transversal series (3 in each) in such manner, that the mesial cell occupies the mesial part of the dorsal side, and protrudes a little more than the two lateral cells. Zooids are situated between the mesial cell and the lateral cells, and also often upon the former. The ventral surface has a broad unoccupied mesial stripe, and at each side ot it a series of zooids. The rachis is faint yellowish-red colour. The polyp cells are at the base a beautiful brick-red colour. The polyps are clear as water.

Protoptilum Mohni [1], n. sp.

Pl. III, figs. 1—7.

The stalk is almost complete, and only, upon the inferior extremity of the bulb is the sarcosoma torn away, but the axis is left uninjured.

The length of the stalk is 150^{mm}; of which, the rachis occupies 75^{mm}. The bulbous part of the stem is narrow, and only, 2^{mm} broad at its broadest part (fig. 1); whether it terminates in a round vesicle, or, in an oblong bulb, could not be detected.

At the middle, the rachis is about 2^{mm} broad, but becomes narrower downwards, whilst, it's superior extremity is devoid of sarcosoma for an extent of 13^{mm}, and there, therefore, the axis appears perfectly bare (fig. 1).

The dorsal surface is a little arched, and this is, most distinctly, seen on the lower part of the rachis. The developed cells are situated, very irregularly, so that, on the inferior part of the rachis there are only 2 cells, one placed on each side, and in this situation, the mesial line of the dorsal surface is occupied by zooids and undeveloped cells (fig. 1). Somewhat further up, there are 3 cells, of which, the one, is a little smaller than the two others, and occupies the middle of the dorsal surface (fig. 1, *a*). Still further up the rachis, the cells become more numerous, and are situated in irregular series, sometimes, 3 on the right side, 1 in the middle, and 1 on the left side; sometimes, 3 and 2, and finally, at the top, 3 on each side, and 1 in the middle of the dorsal surface. Below the developed cells, a diagonal series of undeveloped cells appears on each side, 3 in each series, and below them, a nearly transversal series consisting of 2 cells, is seen; and finally, there occurs only one cell. Between the series in which there are 3 cells, and which proceed from the ventral to the dorsal surface; a few cells are observed, but no zooids are seen there (fig. 1). The developed cells on the other hand, appear to have an opposite direction,

[1] This species has been named after Professor Dr. H. Mohn, a member of the Norwegian North-Atlantic Expedition.

hverandre, indtil 1—5^{mm}, imedens de overste Cellerækker ligge næsten paa hinanden. Samtlige Celler sees væsentligst fra Dorsalsiden.

Cellerne ere med deres indre Væg fastvoxede til Rachis. De ere fra 2—4^{mm} lange og meget brede, næsten buget foroven, hvor deres vide Aabning, der er aflang efter Bredden, har paa den ydre, fri Rand 2—5 lancetformige Tænder med en meget bred Basis, Fig. 3. Cellevæggen er opfyldt af stavformige, trekantede, tæt paa hinanden liggende, dels vandklare, dels svagt rosenrøde Spikler, som ere fra 0,445—0,625^{mm} lange, fra 0,027—0,045^{mm} brede, Fig. 5; stundom iagttages imellem disse lange Spikler nogle smaa, der ere 0,179^{mm} lange, 0,010^{mm} brede, Fig. 6.

Dorsalfladen og de laterale Flader ere tæt besatte med Zooider uden synderlig Regelmæssighed, Fig. 3, 4; tættest staa de langs Dorsalfladens Midtlinie, Fig. 3. Yderst til Siderne ordne de sig mere i paatversgaaende, lidt uregelmæssige Rækker, Fig. 4, der synes at gaa fra Dorsal- mod Ventralfladen. Zooiderne ere 0,402^{mm} lange, 0,178^{mm} brede og omgivne af spindelformige Kalkspikler, som ere 0,446^{mm} lange, 0,018^{mm} brede, bleg-rosenrøde og ordnede pyramideformigt i en Spids.

Af de uudviklede Cellerækker er der 17 til hver Side, hvori der er 3 Celler, 2—3 Rækker med 2 Celler i hver, og saa kommer 3—4 enkeltstaaende Celler.

Ventralfladen har et lidt hvælvet, 1^{mm} bredt, nøgent Belte, til hvis Sider sees de før omtalte Zooider, Fig. 2.

Polyperne ere cylindriske, deres Krop er omtrent 2^{mm} lang, næsten vandklar og uden Spikler. Tentaklerne ere 2—3 Gange saa lange som Kroppen og have paa deres aborale Flade, ligefra Grunden til Spidsen, en Række valseformige Spikler, der ere 0,268^{mm} lange, 0,027^{mm} brede; kun paa en Tentakel vare Spiklerne svagt rosenrøde, ellers vare de ufarvede.

Sarcosomaet er især paa Rachis temmelig tyndt, og dets ydre Bindevæv er opfyldt dels med røde, dels med ufarvede Spikler af samme Form og Størrelse som de, der ere omtalte ved Cellerne. I det nøgne Belte paa Ventralfladen ligge Spiklerne spredte enkeltvis efter Længden, Fig. 7. I Stilken er Sarcosomaet tykkere, og her er dets ydre Bindevæv fuldtpakket af trekantede, farveløse Spikler, der ere indknebne paa Midten, 0,231^{mm} lange, 0,018^{mm} brede.

Axen er rund, foroven tvers afskaaren, forneden ender den haarfint i en Anse.

namely, from the dorsal to the ventral surface. The series are placed, alternating and opposite to each other (figs. 3, 4). At the foot of the rachis; the cellular series are situated, up to 1—5^{mm} apart from each other, whilst, the superior cellular series lie almost upon each other. All the cells are observed, principally, from the dorsal side.

The inner wall of the cells is concreted with the rachis. The cells are from 2—4^{mm} long, and very broad, almost bulging, superiorly; at which point, the wide aperture, which is oblong laterally, has 2—5 lanceolate teeth with a very broad base (fig. 3), and these are situated upon the outer free margin. The wall of the cell is filled up with rod-like, triangular spicules, lying close upon each other, and these are, partly, clear as water, and, partly, faint rosy-red in colour. These spicules measure from 0.445—0.625^{mm} long, and from 0.027—0.045^{mm} broad (fig. 5); occasionally, between these long spicules, a few small ones are observed, and these measure 0.179^{mm} long, and 0.010^{mm} broad (fig. 6).

The dorsal surface, and the lateral surfaces are, closely beset with zooids, without these having any considerable regularity (figs. 3, 4), but they are situated closest, along the mesial line of the dorsal surface (fig. 3). On the extreme sides, they become arranged in more transversal, somewhat irregular series (fig. 4), which appear to proceed, from the dorsal to the ventral surface. The zooids are 0.402^{mm} long, and 0.178^{mm} broad; and they are surrounded by fusiform calcareous spicules, which are 0.446^{mm} long, and 0.018^{mm} broad; and have a pale rosy-red colour, and are arranged in a pyramidal point.

Of the undeveloped cellular series; 17 are found on each side, in which there are 3 cells, also 2—3 series with 2 cells in each, and then, there are 3—4 isolated cells.

The ventral surface has a somewhat arched, bare stripe, 1^{mm} broad, at each of whose sides, the zooids (fig. 2) previously spoken of, are observed.

The polyps are cylindrical; their body is about 2^{mm} long, almost clear as water and devoid of spicules. The tentacles are 2—3 times as long as the body, and, upon their aboral surface, they have, extending right from the base to the point, a series of roller-shaped spicules which are 0.268^{mm} long, and 0.027^{mm} broad; only upon one tentacle, were the spicules a faint rosy-red colour, otherwise, they were colourless.

The sarcosoma is rather thin, especially, upon the rachis, and its exterior connective-tissue is filled up with, partly, red, and partly, with colourless spicules, of same form and size as those spoken of as pertaining to the cells. In the bare stripe on the ventral surface, the spicules are placed longitudinally and singly (fig. 7). In the stem, the sarcosoma is thicker, and in this situation, it's exterior connective-tissue is entirely filled with triangular, colourless spicules, which are constricted at the middle, and measure 0.231^{mm} long, and 0.018^{mm} broad.

The axis is round, and truncated above. It terminates below, fine as a hair, in a hook.

Farven.

Rachis smuk teglstensrød. Stilken lysegul. Polyperne blegrøde med bleg-gulrøde Tentakler.

Findested.

Station 255. Kun et Exemplar.

Artskarakter.

Stokken smal. Rachis lige lang som Stilken. De udviklede Cellerækker afvexlende overfor hinanden og hvori sees dels 1 Celle, dels 2 Celler paa hver Side, dels 3 paa den ene og 2 paa den anden Side samt 1 i Midten af Dorsalfladen og endelig 3 paa hver Side. Cellerne ere forholdsvis korte, meget vide, næsten bugede i deres øverste Parti, og Aabningernes ydre Rand forsynet med 3—5 Tænder. Dorsalfladen er hvælvet, tæt besat med temmelig store Zooider omgivne af en Bundt bleg-rosenrøde Spikler, og imellem Zooiderne sees enkelte uudviklede Celler. Ventralfladen har et nøgent Midtbelte, ved Siden deraf 1—2 Rækker Zooider. Rachis smuk teglstensrød. Stilken lysegul. Polyperne blegrøde med bleg-gulrøde Tentakler.

Colour.

The rachis is a beautiful brick-red. The stem is light-yellow. The polyps are pale-red, and the tentacles are pale yellowish-red.

Habitat.

Station No. 255. Only one specimen.

Specific Character.

The stalk is narrow. The rachis is of the same length as the stem. The developed cellular series are situated, alternating, and opposite each other; in them, there is seen, sometimes, one cell, sometimes, two cells, on each side; and occasionally, 3 on the one, and 2 on the other side, besides 1 in the middle of the dorsal surface, and, finally, 3 on each side. The cells are relatively short, and very wide, they are almost bulging in their superior portion, and, the exterior margin of the apertures is furnished with 3—5 teeth. The dorsal surface is arched, and closely beset with rather large zooids surrounded by a bundle of pale rosy-red spicules, and between the zooids a few undeveloped cells are seen. The ventral surface has a bare, mesial stripe, alongside of which, there are 1—2 series of zooids. The rachis is a beautiful brick-red colour. The stem light-yellow. The polyps pale-red, and the tentacles are pale yellowish-red.

Protoptilum carinatum, n. sp.

Tab. III. Fig. 8—11.

Af denne Søfjær haves kun Rachis, der er 215^{mm} lang; dens øverste Ende er blottet for Sarcosoma i en Udstrækning af 30^{mm}, hvor den runde Axe er blottet, Fig. 8. Der hvor Sarcosomaet ender, omslutter det Axen i Form af en Konus og er uden saavel Celler som Zooider. Det synes som om Sarcosomaet, efterhaanden som Polyperne af en eller anden Grund uddø paa den øverste Ende af Rachis, afsnører sig og derved sætter en midlertidig Grændse for den indtraadte Dødsproces. Paa en hel Del Pennatulider findes den øverste Ende af Rachis blottet for Sarcosoma; men i Regelen iagttages dette kun hos ældre Individer; vi have idetmindste aldrig seet meget unge Pennatulider berøvede sit Sarcosoma paa den omtalte Maade. Det er derfor sandsynligt, at den Omstændighed, at den øverste Ende af Rachis i større eller mindre Udstrækning blottes for Sarcosoma og frembyder den nøgne Axe, tyder hen paa en Dødsmaade, der er særegen for flere Slægter af den store Pennatulidefamilie.

Langs den noget hvælvede Dorsalflade løber en smal men dyb Midtfure bølgeformigt indtil den øverste Fjerdedel af Rachis, Fig. 9. 10, hvor Furen sukcessivt forsvinder og

Protoptilum carinatum, n. sp.

Pl. III. figs. 8—11.

We have only the rachis of this sea-pen, and it measures 215^{mm} in length. It's superior extremity is devoid of sarcosoma for an extent of 30^{mm}; and here, the round axis is exposed (fig. 8). At the point where the sarcosoma terminates, it encloses the axis in the form of a cone, and is devoid of both, cells and zooids. It seems, as if the sarcosoma, when the polyps for some cause or other die off on the superior extremity of the rachis, cuts itself, gradually, off by a constrictive process, and thereby places a temporary limit to the mortal process which has been in progress. In a great many of the Pennatulidæ, the superior extremity of the rachis is devoid of sarcosoma, but, as a rule, this is only observed in the older specimens (We, at least, have never seen very young Pennatulidæ deprived of their sarcosoma in the manner referred to). It is, therefore, probable, that the circumstance of the superior extremity of the rachis being for a greater or smaller extent bare of sarcosoma, exposing the uncovered axis; indicates a mortal process which is peculiar to several genera of the large family of Pennatulidæ.

Along the somewhat arched dorsal surface, a narrow, but deep and undulating mesial furrow proceeds, up to the superior fourth part of the rachis (figs. 9, 10), where the

afløses af en fin, ophøiet Linie. Denne Fure ligesom dækkes af dens venstre fremragende, temmelig skarpe Rand, der taber sig i den ovenomtalte fine, ophøiede Linie.

Cellerne ere stillede paa hver Side af Midtfuren i langt fra hinanden staaende Rækker, Fig. 9. 11. Disse have en meget skraat opadgaaende Retning fra Dorsal- til Ventralfladen. I hver Række er der 3 Celler, som have en Traktform og ere fra 3—5^{mm} lange, saaledes nemlig at den egentlige Dorsalcelle er mindst, og den, der staar nærmest Ventralfladen, er størst, Fig. 10. Cellerne ere glatte, glindsende, deres indre Væg er fastvoxet til Rachis og er noget længere end den ydre, Fig. 10, *a*, hvoraf følger, at Aabningen er skjæv saaledes, at den ydre, fri Rand, der i Regelen er forsynet med 3 stærke Tænder, staar lavere end den indre, fastvoxede Rand, Fig. 10, *b*.

Celleaabningen er 1,5^{mm} vid, og paa enkelte Celler er der paa den fri Rand 5—6 meget smaa Papiller, der giver Randen et undulerende Udseende. Paa den nederste Del af Rachis ere Cellerne mindre, staa længere fra hinanden og tildels kun 2 i hver Række, imedens paa den øverste Del af Rachis staa Cellerne noget tættere, og her sees enkelte mindre Celler, som staa til Siden af Rækken uden egentlig at tilhøre denne, Fig. 8.

Imellem hver Cellerække er en Gruppe Zooider, der strække sig fra Dorsalfladens Midtfure paa hver Side til henimod Ventralfladen, hvor de ordne sig i Rækker (2—3 i hver), Fig. 8. 10, *c*, imedens de langs Midtfuren danne en uregelmæssig Længderække, Fig. 9. Lignende Zooider findes ogsaa dels imellem Cellerne, hvor de staa enkeltvis, dels paa selve Cellen, Fig. 10, *e*.

Nedenfor de udviklede Celler sees mange, næsten paatversgaaende Rækker med uudviklede Celler, 2—3 i hver Række, og imellem hvilke findes enkeltstaaende Zooider.

Ventralfladen er lidt hvælvet og har langs Midten en cylindrisk, stærkt fremspringende, vandklar, nøgen Kjøl, der ser ud, som om det var en fin Glasstav, der var placeret langs denne Flades Midtlinie, Fig. 10, *f*. Paa hver Side af Kjølen iagttages to Længderækker Zooider, Fig. 10, *g*, der ere noget mere eleverede end de paa Dorsalfladen.

Cellerne ere rigt besatte med større og mindre stavformige, trekantede Spikler, der ere vandklare, — kun yderst faa have et rødligt Skjær, som imidlertid er saa svagt, at det kun med stor Opmærksomhed kan iagttages. Spiklerne ere fra 0,222^{mm}—1,023^{mm} lange og fra 0,041—0,055^{mm} brede og ere ordnede saaledes, at i Midtpartiet af Cellen ligge de næsten i en ret Linie, men til Siderne straale de vifteformigt ud fra Midtlinien, hvorved de i den nederste Ende af Cellen samle sig i en afstumpet Konus, imedens de foroven pyramideformigt gaa over i Tænderne. I Re-

furrow gradually disappears, and is replaced by a slender elevated line. This furrow is covered, as it were, by its protuberant, rather sharp left margin, which becomes absorbed in the slender elevated line, spoken of above.

The cells are situated on each side of the mesial furrow, in series, placed at considerable intervals apart (figs. 9, 11). These have a very diagonal, upward direction, from the dorsal to the ventral surface. In each series, there are 3 cells, having a funnel-shape, and measuring from 3—5^{mm} in length; they are so placed that, the real dorsal cell is the smallest one, and the cell which is placed nearest to the ventral surface is the largest one (fig. 10). The cells are smooth, and shining; the inner wall is concreted with the rachis, and is somewhat longer than the outer wall (fig. 10, *a*), and consequently, the aperture becomes crooked, in such manner, that the exterior free margin; which is usually furnished with 3 strong teeth; is situated lower than the inner concreted margin (fig. 10, *b*).

The cellular aperture is 1.5^{mm} wide; and, in a few cells, there are found 5—6 very small papillæ situated on the free margin, which impart to it an undulatory appearance. On the inferior part of the rachis, the cells are smaller, and are placed further apart from each other; and, occasionally, there are only 2 in each series; whilst, upon the superior part of the rachis, the cells are placed somewhat closer; in this situation, a few smaller cells are seen placed at the side of the series, without, actually, belonging to it (fig. 8).

Between each cellular series, there is a group of zooids, extending on each side, from the mesial furrow on the dorsal surface to the proximity of the ventral surface, where, they arrange themselves in series (2—3 in each) (fig. 8, 10, *c*), whilst, along the mesial furrow, they form an irregular longitudinal series (fig. 9). Similar zooids are found, also, partly, between the cells, where, they appear, singly, and partly, on the cell itself (fig. 10, *e*).

Below the developed cells, many almost transversal series of undeveloped cells (2—3 in each series) are observed, and between these, solitary zooids are found.

The ventral surface is somewhat arched, and has, along its middle, a cylindrical, strongly protuberant bare keel, which is clear as water, and appears as if, it was a slender glass-rod placed along the mesial line of this surface (fig. 10, *f*). On each side of this keel, two longitudinal series of zooids are observed (fig. 10, *g*); these are somewhat more elevated than those of the dorsal surface.

The cells are richly beset with, larger and smaller, rod-like, triangular spicules, which are clear as water; but an extreme few have a reddish tinge, which however, is so faint, that it can only be observed on very close attention being paid to it. The spicules measure from 0.222^{mm}—1.023^{mm} in length, and from 0.041—0.055^{mm} in breadth; and they are arranged in such manner, that in the mesial part of the cell, they are found placed, almost, in a straight line, whilst, on the sides, they radiate from the mesial line in fan-shape, and they, thus, collect together

gelen ligge de paa hinanden og danne tildels større eller mindre Bundter.

Polyperne ere cylindriske, vandklare, saa at man gjennem Kroppen kan se Skillevæggene; de ere imellem 3—4^{mm} lange. Tentaklerne ere fjederformede, mindst dobbelt saa lange som Kroppen, og paa den aborale Flade forsynede med en Midtrække af vandklare, trekantede, i begge Ender noget tilspidsede Spikler, der ere 0,136^{mm} lange, 0,014^{mm} brede og gaa fra Tentakelens Grund til dens Spids.

Mundskiven er lidt hvælvet, og i dens Midte sees den aflange Mundaabning, der fører ind til det lange, paa sin indvendige Flade stærkt foldede Svælg. Fra dettes nederste fri, runde og noget tykke Rand udgaa 8 Gastralfilamenter, hvoraf to ere længere end de øvrige. Langt nede i Gastralhulheden udvikle Generationsorganerne sig paa Septula; de danne stilkede Kapsler, hvori hos Hunnen udvikler sig i Regelen kun 1 Æg. Protoptileslægten har efter alt at dømme særskilt Kjøn, idetmindste forholder det sig saa hos de Arter, vi have havt Anledning til at undersøge og beskrive.

Zooiderne adskille sig ikke fra dem, der findes hos *Protopt. lofotense*, naar undtages, at Munden er aflang, imedens den hos *Protopt. lofotense* viste sig at være rund, hvilket forresten kan være Følgen af en stærkere sammentrukken Tilstand. De ere ligesom hos *Protopt. lofotense* omgivne krandsformigt af trekantede Spikler, der ere noget afstumpede i den nederste Ende, imedens den øverste er meget tilspidset; de største ere 0,536^{mm} lange, 0,054^{mm} brede.

Sarcosomaet er temmelig tyndt, og i det ydre Bindevæv er sammenpakket en Mængde vandklare, trekantede Spikler lig dem, som findes i Cellerne, og som med Hensyn til Form ikke afvige fra dem, der ere afbildede paa Pl. II, Fig. 17; men i den før beskrevne Kjøl langs Ventralfladens Midte findes ikke Kalkspikler, hvilket er Tilfældet hos de to foregaaende Arter.

Farven.

Rachis er bleggul; Cellerne ere næsten hvide; Polypernes Krop vandklar; Tentaklerne som Cellerne.

Findested.

Station 255.

Artskarakter.

Rachis 215^{mm} lang. Dorsalsiden hvælvet med en smal, dyb Midtfure; paa hver Side af denne Cellerækker, der staa langt fra hinanden og gaa paaskraas opad fra Dorsal- mod Ventralsiden. I hver Række 3 Celler, som ere

at the inferior extremity of the cell, in the form of a truncated cone; whilst, superiorly, they pass over in a pyramidal form into the teeth. They are, as a rule, placed upon each other, and form, partly, larger or smaller bundles.

The polyps are cylindrical, and clear as water, so that, the dividing walls become visible through the body; and, they measure between 3—4^{mm} in length. The tentacles are feather-shaped, and are at least twice as long as the body. On the aboral surface, they are furnished with a mesial series of spicules, which are clear as water, triangular in shape, and acuminated at both extremities. They measure 0.136^{mm} long, 0.014^{mm} broad, and extend from the base of the tentacle to its point.

The oral disk is a little arched, and in its middle, the oblong oral aperture which leads into the (on its interior surface strongly folded) gullet, is seen. From the inferior, free, round, and somewhat thick margin of the gullet, 8 gastral filaments proceed, of which, two are longer than the others. Far down in the gastral cavity, the generative organs develope themselves on the septula. They form pedunculated capsules, in which, in the case of the female, there is, usually, only one ovum developed. The Protoptilum genus has to all appearance, separated sexes; at all events, this has been the case with the species which we have had an opportunity of examining and describing.

The zooids do not differ from those which are found in *Protopt. lofotense*, with the exception that, the oral aperture is oblong, whilst, in *Protopt. lofotense*, this was shown to be round; but that, however, may be the consequence of a more strongly contracted condition. Like those of *Protopt. lofotense*, they are surrounded in wreath form, by triangular spicules, which are somewhat blunted at the inferior extremity, whilst, the superior extremity is very acuminate. The largest of these zooids measures, 0.536^{mm} long, and 0.054^{mm} broad.

The sarcosoma is rather thin, and in the external connective-tissue there is, compactly crowded, a multitude of triangular spicules, clear as water, like those found in the cells: these, in regard to form, do not differ from those which are illustrated in Pl. II, fig. 17; but, in the keel already described as situated along the mesial line of the ventral surface, no spicules are found, whilst, the case is the opposite in the preceding species.

Colour.

The rachis is pale-yellow. The cells are nearly white. The body of the polyps is as clear as water. The tentacles are like the cells in colour.

Habitat.

Station No. 255.

Specific character.

The rachis is 215^{mm} long. The dorsal side is arched, and has a narrow, deep, mesial furrow; on each side of this furrow, there are series of cells, placed far apart from each other, and extending, diagonally, from the dorsal,

lange, traktformige og med skjæv Aabning, paa hvis fri, lavere staaende Rand findes 3 Tænder. Imellem Cellerækkerne og tildels imellem og paa Cellerne Zooider, der ordne sig i Rækker paa Ventralsiden. Denne har langs Midtlinien en stærkt fremspringende Kjøl. Rachis er bleggul; Cellerne næsten hvide; Polyperne vandklare.

towards the ventral side. In each series there are 3 cells; these are long, and funnel-shaped, and have a crooked aperture, upon whose free, inferior margin 3 teeth are situated. Between the cellular series, and partly, also, between the cells, and also, on the cells themselves, zooids occur, and these are arranged in series on the ventral side. Along the mesial line of the ventral surface there is a strongly protuberant keel. The rachis is pale-yellow in colour. The cells nearly white. The polyps clear as water.

Protoptilum armatum, n. sp.

Tab. IV, Fig. 1—7.

Af denne Søfjær blev fundet et Exemplar, der havde næsten hele Rachis godt bevaret, imedens Sarcosomaet paa hele Stilken var afrevet, saa at Axen var aldeles blottet, men forresten hel, Fig. 1.

Hele Søfjærens Længde er 290^{mm}. I den øverste Ende er Axen blottet i en Udstrækning af 2^{mm} og konisk tilspidset, Fig. 1. 2.

Dorsalsiden er lidt hvælvet. Cellerne staa temmelig langt fra hinanden i skjæve Rækker, der gaa paaskraas over Ryggen fra den ene Rand af Ventralfladen til den anden, Fig. 2. Paa den nedre Del af Rachis bestaar hver Række af 3 Celler; paa Midten er der afvexlende 4 og 2 i hver Række, Fig. 4, og længere oppe sees i enkelte, meget skjæve Rækker 5, men hyppigst 3, Fig. 2, og her staa Rækkerne meget tættere sammen end længere nede paa Rachis.

Cellerne ere smale, noget forskjellig i Størrelse paa de forskjellige Steder af Rachis; saaledes ere de, der indtage Midtpartiet af Dorsalfladen, mindst, imedens de, som staa til Siderne nærmest Ventralfladen, ere størst, Fig. 2. 4, nemlig 3^{mm} lange, med sin 1^{mm} vide, næsten halvmaaneformige Aabning, hvis fri Rand har 2 Tænder, Fig. 4. 5. Cellerne paa den øverste Del af Rachis have en mere rund Aabning med 3 Tænder, Fig. 2. Den indre Cellevæg er som sædvanligt hos denne Slægt fastvoxen til Rachis.

Imellem Cellerækkerne sees spredte, næsten elliptisk formede Zooider, der enkeltvis ogsaa sees imellem Cellerne, Fig. 2. 4. 5, *a*; men til Siderne ordne de sig i Tværrækker, 2—3 i hver, hvilket bedst iagttages paa Ventralsiden, Fig. 3. Dorsalfladens Midtparti er temmelig fattigt paa Zooider, imedens de paa Siderne og Ventralfladen ere i rigelig Mængde tilstede, Fig. 3. 4.

Ventralsiden er flad; Midtpartiet danner et smalt, nøgent Belte, Fig. 3, der dreier sig noget langs hele Rachis, saa at det fremstiller en bølget Linie. Til Siderne

Protoptilum armatum, n. sp.

Pl. IV, figs. 1—7.

One specimen of this sea-pen was obtained, in which, nearly, the entire rachis is in a good state of preservation; the sarcosoma along the whole stem is, however, torn away, leaving the axis completely exposed, but, otherwise, complete (fig. 1).

The entire length of the sea-pen is 290^{mm}. In the superior extremity, the axis is uncovered for an extent of 2^{mm}, and it is conically acuminated (figs. 1, 2).

The dorsal side is a little arched. The cells are situated, pretty far apart from each other, in crooked series, proceeding, diagonally, across the back, from the one margin of the ventral surface to the other margin (fig. 2). On the inferior part of the rachis, each series consists of 3 cells. In the middle, there are, alternately, 4 and 2 cells in each series (fig. 4), and, further up, in a few very crooked series, 5 cells are seen, but, most frequently, 3 (fig. 2), and here, the series are situated much closer together than is the case further down the rachis.

The cells are narrow, and somewhat variable in size on the different parts of the rachis, so that, those which occupy the mesial part of the dorsal surface are the smallest, whilst, those placed on the sides, nearest to the ventral surface, are the largest (figs. 2, 4), namely, 3^{mm} long; they have a nearly crescent-shaped aperture 1^{mm} wide, on whose free margin there are 2 teeth (figs. 4, 5). The cells upon the superior part of the rachis have a more circular aperture, with 3 teeth (fig. 2). The inner wall of the cell is, as usual in this genus, concreted with the rachis.

Between the cellular series, zooids of nearly elliptical form are seen, dispersed, and they are, also, observed, placed, singly, between the cells (figs. 2, 4, 5, *a*), but to the sides they become arranged in transversal series, 2—3 in each series; this is best observed on the ventral side (fig. 3). The mesial part of the dorsal surface is rather poorly supplied with zooids, whilst, upon the sides, and on the ventral surface, they are present in rich abundance (figs. 3, 4).

The ventral side is flat, and the mesial part forms a narrow unoccupied stripe (fig. 3), twisting, slightly, along the whole of the rachis, so that, it presents an

af dette Belte sees lidt paaskraasgaaende Zooiderækker, Fig. 3, *a*, 2—3 i hver Række, hvilke støde til de imellem Cellerækkerne spredte Zooider, Fig. 4, *a*.

Cellernes ydre Væg er rigt udstyret med større og mindre, trekantede Spikler, hvoraf de fleste have en teglstensrød Farve. Ligesom Spiklerne ere forskjellige i Størrelse, saaledes ere de ogsaa noget forskjellige i Form. Der er i Regelen 3 Størrelser; de mindste ere 0,142^{mm} lange, 0,016^{mm} brede; de mellemste ere 0,268^{mm} lange, 0,018^{mm} brede, og de største ere 0,893^{mm} lange, 0,045^{mm} brede, Fig. 6. Med Hensyn til Formen, saa vexler den imellem Spikler med mere eller mindre tilspidsede Ender og saadanne, der have afstumpede, takkede Ender. Spiklerne ligge tæt paa hinanden og ere ordnede som paa *Protoptilum carinatum*. Cellernes indre Væg, der er fastvoxet, er saagodtsom uden Spikler.

Zooiderne have en aflang Mund, ere dækkede af flere Bundter Spikler, som ere trekantede, fordetmeste teglstensrøde med tilspidsede Ender; de ere i rigere Mængde tilstede end paa nogen af de foregaaende 3 Arter, og ere meget lange, omtrent som de længste paa Cellerne, hvorved Rachis faar et paa Spikler meget rigt Udseende.

I det føromtalte, nøgne Belte langs Ventralfladen ligge Spiklerne enkeltvis, adskilte fra hinanden og i afbrudte Længderækker, Fig. 7. De ere trekantede, lidt indknebne paa Midten, med afstumpede, takkede Ender; de ere 0,303^{mm} lange, 0,018^{mm} brede i Enderne, men 0,016^{mm} brede paa Midten, Fig. 7.

Polyperne ere cylindriske. Kroppen er omtrent 2^{mm} lang, bleg rosenrød, med 3 Gange saalange Tentakler, der ere lidt blegere end Kroppen og have paa Midten af den aborale Flade en Række rødlige Spikler, af Form og Størrelse lig dem paa de tidligere beskrevne Arter.

Sarcosomaet er tyndt, halvt gjennemsigtigt og spikelrigt overalt, kun ikke hvor den indre Cellevæg er fastvoxen.

Axen er rund, ender foroven i en liden Konus, der er blottet for Sarcosoma; nedentil ender den haarfint i en Anse. Hvorvidt Axen strækker sig lige ned i Bunden af den bulbøse Del, eller den bøier af længere oppe, kan ikke afgjøres, da hele Stilkens Sarcosoma var afrevet ved Skraben.

Farven.

Rachis er teglstensrød, stærkt glindsende af Spikelrigdommen. Cellerne ere lidt blegere og Polyperne med deres Tentakler ere endnu blegere.

Findested.

Station 9.

undulating line. On the sides of this stripe, slightly diagonal series of zooids are seen (fig. 3, *a*), 2—3 in each series; these abut upon the zooids dispersed between the cellular series (fig. 4, *a*).

The exterior wall of the cells is richly supplied with larger and smaller triangular spicules, of which, the greater number have a brick-red colour. Just, as the spicules are variable in size, are they, also, somewhat variable in form. There are usually 3 sizes of these, the smallest measure 0.142^{mm} long, and 0.016^{mm} broad; the median measure, 0.268^{mm} long, and 0.018^{mm} broad; and the largest measure, 0.893^{mm} long, and 0.045^{mm} broad (fig. 6). With respect to the form of the spicules; this varies between spiculæ with more or less acuminate extremities, and spiculæ with blunted aculeated extremities. The spicules lie close upon each other, and are arranged in same manner as in *Protoptilum carinatum*. The interior wall of the cells is concreted, and is almost devoid of spicules.

The zooids have an oblong, oral aperture, and are covered by several bundles of spiculæ of triangular shape; most of which have a brick-red colour, and posess acuminated extremities; these are more numerously present than in any of the 3 preceding species, and they are very long, almost as long as, the longest pertaining to the cells; and they impart to the rachis, a rich appearance of spicular wealth.

In the unoccupied stripe previously spoken of, the spicules are placed, singly, along the ventral surface, separated by intervals from each other, and in interrupted longitudinal series (fig. 7). They are triangular, somewhat constricted at the middle, and have blunted aculeated extremities; they measure 0.303^{mm} long, 0.018^{mm} broad at the extremities, but 0.016^{mm} broad at the middle (fig. 7).

The polyps are cylindrical. Their body is about 2^{mm} long, and is pale rosy-red in colour; whilst, the tentacles are 3 times the length of the body, and are a little paler in colour than it; in the middle of the aboral surface, there is a series of reddish spicules, in form and size, like those of the previously described species.

The sarcosoma is thin, semitranslucent, and, everywhere, rich in spiculæ, excepting, only, the point where the wall of the cell is concreted.

The axis is round, and terminates above, in a small cone, devoid of sarcosoma. It terminates below, fine as a hair, in a hook. Whether the axis extends right down to the bottom of the bulbous part, or, whether it curves off further up, cannot be decided, because, the sarcosoma of the whole stem was torn off by the dredge.

Colour.

The rachis is brick-red, and strongly resplendent owing to it's wealth of spiculæ. The cells are a little paler in colour, than the rachis; and the polyps, with their tentacles, are still paler.

Habitat.

Station No. 9.

Artskarakter.

Stokken 290^{mm} lang, endende foroven i en nøgen Konus. Cellerækkerne paaskraas over Dorsalfladen, dels 3, dels afvexlende 2 og 4 Celler i hver Række. Imellem Cellerækkerne spredte, aflange Zooider. Cellerne smale, korte, med en halvmaaneformig Aabning, hvis Rand er forsynet med to Tænder. Ventralfladen har et smalt, nøgent Belte, strækkende sig bølgeformigt langs hele Rachis. Ved Siden af dette Belte paaskraasgaaende Zooiderækker, 2—3 i hver; Zooiderne omgivne af stærke Spikelbundter. Rachis teglstensrød; Cellerne og Polyperne blegere.

Specific character.

The stalk is 290^{mm} long, terminating above, in a naked cone. The cellular series are, on the dorsal surface, placed diagonally, partly, 3, and, partly, 2 and 4 cells alternating, in each series. Between the cellular series, scattered oblong zooids are found. The cells are narrow, and short, and have a crescent-shaped aperture, whose margin is furnished with two teeth. The ventral surface has, a narrow, unoccupied stripe, extending in undulatory form along the entire rachis. At the side of this stripe, there are diagonal series of zooids, 2—3 in each series. The zooids are surrounded by strong bundles of spiculæ. The rachis is brick-red; the cells and polyps are paler in colour.

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Forklaring over Figurerne.

Tab. I, Fig. 1. *Svava glacialis*, seet fra Rygsiden, forstørret.

— 2. Et Stykke af den samme, seet fra Bugsiden, forstørret.

— 3. Et Stykke af den samme, seet fra Rygsiden, forstørret. *a*, Zooider.

— 4. Et Stykke af den samme, seet fra Siden og halvt fra Ryggen, forstørret. *a*, Zooider.

— 5. En Række Polyper med deres korte Finne og et lidet Stykke af Sarcosomaet, forstørret. *a*, Cellens fri Rand med Papiller; *b*, Zooider.

— 6. En Celle med en udstrakt Polyp, forstørret. *a*, Cellens fri Rand.

— 7. To Polyper, idet de strække sig udaf Cellerne, forstørret. *a*, Cellens fri Rand.

— 8. *Svava glacialis, varietas alba*, seet fra Rygsiden, forstørret.

— 9. Et Stykke af den samme, seet fra Bugsiden.

— 10. Et Stykke af den samme, seet fra Ryggen og halvt fra Siden, forstørret.

— 11. En Række Polyper med deres korte Finne, forstørret.

— 12. *Svava glacialis*; den øverste Del af Rachis afskaaren; hele Stilken aabnet efter Længden af Ventralfladen; et Stykke af Axen og Ventralkanalen borttagne for at vise Dorsalkanalen og de udviklede Generationsorganer i Sidekanalerne, forstørret. *a*, Axen; *b*, Dorsalkanalen; *c*, Generationsorganerne; *d*, Septum transversale; *e*, Rummet i Bunden af Stilken.

— 13. Et Tversnit af Stilken, strax nedenfor

Explanation of the Plates.

Pl. I, fig. 1. Dorsal aspect of *Svava glacialis*; magnified.

— 2. Ventral aspect of a portion of the same; magnified.

— 3. Dorsal aspect of a portion of the same; magnified. *a*, Zooids.

— 4. Aspect of a portion of *Svava glacialis*, viewed, partly, laterally, and partly, dorsally; magnified. *a*, Zooids.

— 5. A series of polyps, with their short fins, and a small piece of the sarcosoma; magnified. *a*, The cellular free margin with papillæ. *b*, Zooids.

— 6. A cell with an extended polyp; magnified. *a*, The free margin of the cell.

— 7. Two polyps, as they appear extending themselves out of the cells; magnified. *a*, The free margin of the cell.

— 8. Dorsal aspect of *Svava glacialis, varietas alba*; magnified.

— 9. Ventral aspect of the same.

— 10. Aspect of a portion of *Svava glacialis, varietas alba*, viewed, partly, dorsally, and partly, laterally; magnified.

— 11. A series of polyps, with their short fins; magnified.

— 12. *Svava glacialis*; with the superior part of the rachis cut off; the entire stem laid bare, longitudinally, on the ventral surface; a part of the axis, and the ventral canal removed, in order to exhibit the dorsal canal and the developed generative organs in the lateral canals; magnified. *a*, The axis. *b*, The dorsal canal. *c*, The generative organs. *d*, The septum-transversale. *e*, The space at the base of the stem.

— 13. Sectional aspect of the stem, immediately

Zooidestribens Begyndelse, forstørret. *vk*, Ventralkanalen; *dk*, Dorsalkanalen; *lk*, Lateralkanalerne. *a*, et Septum, der fæster sig paa Axeskeden; *b*, et lignende Septum, der viser Delingen i Sarcosomaet; *c*, Sarcosomaets ydre Epithel; *d*, Zooidens Svælgrand; *e*, Zooidens Septulum; *f*, Gastralfilamentet; *g*, Axeskeden, indenfor hvilken Axen.

Tab. I, Fig. 14. Et Tversnit længere nede paa Stilken, forstørret. *vk*, Ventralkanal; *dk*, Dorsalkanal. *a*, ydre Bindevæv; *b*, Bindevævsforlængelse; *c*, Længdemuskler; *d*, indre Bindevæv; *e*, Zooidens Mundaabning; *f*, Zooidens Svælgrand, ragende ind i Sidekanalen; *g*, stilkede Generationskapsler; *h*, Axeskeden.

— 15. Tversnit af Axens halve Diameter med sin Skede, forstørret. *a*, Cuticula; *b*, koncentriske Lag; *c*, radiære Fibre.

— 16. Tversnit af Axen med dens Skede, forstørret. *a*, Ernæringskanaler i Skedens Væg; *b*, radiære Fibre; *c*, det ydre Lag af den elliptiske Centralstræng; *d*, det indre Lag af samme.

Tab. II, Fig. 1. *Diibenia borealis*, forstørret.
— 2. Et Stykke af den samme, seet fra Bugen, forstørret.
— 3. Et Stykke af den samme, seet fra Ryggen, forstørret.
— 4. Et Stykke af den samme, seet fra Ryggen, stærkere forstørret. *a*, den nederste Ende af Kalkpladen; *b*, Membranen, der binder Kalkspiklerne sammen.
— 5. En Polyp, opskaaren efter Længden, forstørret. *a*, Kalkspikelen paa Kroppen; *b*, Kalkspiklerne paa Tentaklerne.
— 6. Polypkroppens Spikel, stærkt forstørret.
— 7. En Spikel fra Tentaklerne, stærkt forstørret.
— 8. *Cladiscus Köllikeri*, forstørret.
— 9. Et Stykke af den samme, seet fra Bugen, stærkere forstørret. *a*, Zooider.
— 10. En Række Zooider, stærkt forstørret. *a*, Mundaabning; *b*, Gastralfilament.

below the commencement of the zooidal stripe; magnified. *vk*, The ventral canal. *dk*, The dorsal canal. *lk*, The lateral canals. *a*, A septum, adherent to the sheath of the axis. *b*, A similar septum, exhibiting the division in the sarcosoma. *c*, The outer epithelium of the sarcosoma. *d*, Margin of the gullet of the zooid. *e*, Septulum of the zooid. *f*, The gastral filament. *g*, The sheath of the axis, inside of which is the axis.

Pl. I, fig. 14. Sectional aspect of the stem, lower down than the last named; magnified. *vk*, The ventral canal. *dk*, The dorsal canal. *a*, External connective-tissue. *b*, Connective-tissue prolongation. *c*, Longitudinal muscles. *d*, Internal connective-tissue. *e*, The zooid's oral aperture. *f*, Margin of the gullet of the zooid projecting into the lateral canal. *g*. Pedunculated generative capsules. *h*, The sheath of the axis.

— 15. Sectional aspect of the semi-diameter of the axis, with it's sheath; magnified. *a*, Cuticula. *b*, Concentric layers. *c*, Radiating fibres.

— 16. Sectional aspect of the axis, with it's sheath; magnified. *a*, Nutrient canals in the wall of the sheath. *b*, Radiating fibres. *c*, The exterior layer of the elliptic central cord. *d*, The interior layer of the same.

Pl. II, fig. 1. Aspect of *Diibenia borealis*; magnified.
— 2. Ventral aspect of a portion of the same; magnified.
— 3. Dorsal aspect of a portion of the same; magnified.
— 4. Dorsal aspect of a portion of the same; still more magnified. *a*, The inferior extremity of the calcareous plate. *b*, The membrane which binds the calcareous spiculæ together.
— 5. Aspect of a polyp, disected longitudinally; magnified. *a*, The calcareous spicule on the body. *b*, The calcareous spicules on the tentacles.
— 6. Aspect of the spicule of the body of the polyp; greatly magnified.
— 7. Aspect of a spicule of the tentacles; greatly magnified.
— 8. Aspect of *Cladiscus Köllikeri*; magnified.
— 9. Ventral aspect of a portion of the same; much magnified. *a*, Zooids.
— 10. A series of zooids; greatly magnified. *a*, The oral aperture. *b*, Gastral filament.

Tab. II, Fig. 11. Et Stykke af *Cladiscus Köllikeri*, seet fra Ryggen, forstørret. *a*, Midtfuren; *b*, Zooider.

— 12. Et Stykke af den samme, seet halvt fra Siden, halvt fra Ryggen, stærkere forstørret. *a*, Polypkrop med sine 8 Papiller.

— 13. En Zooide, i hvis Mundaabning sees Æg i forskjellige Udviklingsstadier, stærkt forstørret.

— 14. *Protoptilum lofotense*, seet fra Ryggen, forstørret.

— 15. Et Stykke af den samme, seet fra Bugen, forstørret.

— 16. En Celle med Polyp af den samme, forstørret. *a*, Cellens 3 Tænder.

— 17. En Zooide, omgiven af Spikler, forstørret. *a*, Zooidens Mundaabning; *b*, Spikel.

— 18. En Tentakel af den samme, hvor Spikelrækken sees paa den aborale Flade, forstørret.

— 19. Tentakelspikel, stærkt forstørret.

— 20. En Cellespikel, stærkt forstørret.

Tab. III, Fig. 1. *Protoptilum Mohni*, seet fra Ryggen, forstørret. *a*, Celler.

— 2. Et Stykke af samme, seet fra Bugen, forstørret.

— 3. Et Stykke af samme, seet fra Ryggen. *a*, den bugede Celle med sine Tænder.

— 4. Et Stykke af den samme, seet fra Siden.

— 5, 6. Spikler fra Cellen.

— 7. Spikler fra det nøgne Belte paa Ventralfladen, forstørret.

— 8. *Protoptilum carinatum*, seet fra Ryggen, forstørret.

— 9. Et Stykke af den samme, seet fra Ryggen, forstørret.

— 10. Et Stykke af den samme, seet halvt fra Siden, halvt fra Bugen, forstørret. *a*, Celleaabning, hvor Cellens indre Væg sees; *b*, Celleranden med dens Tænder; *c*, Zooider; *d*, Zooider mellem Cellerne; *e*, Zooider paa Cellen; *f*, Kjølen paa Ventralfladen; *g*, Zooiderækken langs Ventralfladen.

— 11. Et Stykke af den samme, seet fra Ryggen.

Tab. IV, Fig. 1. *Protoptilum armatum*, seet fra Ryggen, naturlig Størrelse.

— 2. Den øverste Ende af samme, seet fra Ryggen, forstørret.

— 3. Et Stykke af den samme, seet fra Bugen. *a*, Zooider.

Pl. II. fig. 11. Dorsal aspect of a portion of *Cladiscus Köllikeri*; magnified. *a*, The mesial furrow. *b*, Zooids.

— 12. Aspect of a portion of the same, viewed, partly, laterally, partly, dorsally; much magnified. *a*, The body of the polyp with its 8 papillæ.

— 13. Aspect of a zooid, in whose oral aperture ova are seen in various stages of development; greatly magnified.

— 14. Dorsal aspect of *Protoptilum lofotense*; magnified.

— 15. Ventral aspect of a portion of the same; magnified.

— 16. Aspect of a cell, with polyp of the same; magnified. *a*, The 3 teeth of the cell.

— 17. Aspect of a zooid, surrounded by spiculæ; magnified. *a*, The oral aperture of the zooid. *b*, A spicule.

— 18. Aspect of a tentacle of the same; magnified. The spicular series is seen on the aboral surface.

— 19. A spicule of the tentacle; greatly magnified.

— 20. A spicule of the cell; greatly magnified.

Pl. III. fig. 1. Dorsal aspect of *Protoptilum Mohni*; magnified. *a*, Cells.

— 2. Ventral aspect of a portion of the same; magnified.

— 3. Dorsal aspect of a portion of the same. *a*, The bulging cell, with its teeth.

— 4. Lateral aspect of a portion of the same.

— 5, 6. Cellular spicules.

— 7. Spicules, from the uncovered stripe on the ventral surface; magnified.

— 8. Dorsal aspect of *Protoptilum carinatum*; magnified.

— 9. Dorsal aspect of a portion of the same; magnified.

— 10. Aspect of a portion of the same, viewed, partly, laterally, and partly, dorsally. *a*, The cellular aperture; showing the inner wall of the cell. *b*, The cellular margin, with its teeth. *c*, Zooids. *d*, Zooids between the cells. *e*, Zooids upon the cell. *f*. The keel on the ventral surface. *g*, The zooidal series along the ventral surface.

— 11. Dorsal aspect of a portion of the same.

Pl. IV, fig. 1. Dorsal aspect of *Protoptilum armatum*; natural size.

— 2. Dorsal aspect of the superior extremity of the same; magnified.

— 3. Ventral aspect of a portion of the same. *a*, Zooids.

Tab. IV, Fig. 4. Et Stykke af den samme, seet fra Siden. *a*, Zooider.
— 5. En Celle med Polyp, forstørret. *a*, Zooider.
— 6. En Cellespikel, forstørret.
— 7. Spikler fra det nøgne Belte paa Ventralfladen.
— 8. *Gunneria borealis*, seet fra Bugen, forstørret. *a*, En Celle med Polyp; *b*, en fuldt udviklet Celle med Polyp; *c*, Furen paa Ventralfladen.
— 9. En Celle med Polyp, forstørret. *a*, Cellen med sine 8 Tænder; *b*, Ribberne paa Polypkroppen; *c*, Felterne imellem Ribberne.
— 10—14. Spikler fra Stilken, forstørret.
— 15—16. Do. Do. Do.
— 17. *Kophobelemnon abyssorum*, seet fra Ryggen, naturlig Størrelse.
— 18. Den samme, seet fra Bugen.
— 19. Spikel fra Rachis, forstørret.
— 20. Spikel fra Stilken, forstørret.

Tab. V, Fig. 1. Et ungt Exemplar af *Umbellula encrinus* i naturlig Størrelse, seet fra Siden.
— 2. Den samme, seet fra Dorsalfladen, forstørret. *a*, Dorsalfladen af Rachis; *b*, Zooidefelt; *c*, Terminalpolyp; *d*, lateral Polyp; *e*, en liden Polyp i Udvikling.
— 3. Den samme, seet fra Ventralfladen, forstørret. *a*, Midtlinien af Rachis, hvor Axen skinner igjennem; *b*, Siden af Ventralfladen, besat med Zooider; *c*, Terminalpolyp; *d*, lateral Polyp.
— 4. Kalkaxen fra den samme, naturlig Størrelse.
— 5. En ung *Umbellula encrinus* i naturlig Størrelse, seet fra Siden.
— 6. Den samme, seet fra Ryggen, forstørret. *a*, Zooider paa Rachis; *a**, Terminalpolyp; *b*, to laterale Polyper paa høire Side; *c*, to Do. paa venstre Side; *d*, *e*, dorsale Polyper.
— 7. Den samme, seet halvt fra Bugen, halvt fra Siden. *a*, Midtlinien paa Ventralsiden, hvor Axen skinner igjennem; *b*, Terminalpolyp; *c*, *c*, høire laterale Polyper; *d*, *d*, venstre laterale Polyper; *e*, *f*, Dorsalpolyper.
— 8. En ung *Umbellula encrinus* i naturlig Størrelse.
— 9. Den samme, seet fra Bugen, forstørret. *a*, Den fri Ende af Rachis; *b*, Midtlinien paa Ventralfladen, hvorigjennem

Pl. IV, fig. 4. Lateral aspect of a portion of the same. *a*, Zooids.
— 5. A cell with polyp; magnified. *a*, Zooids.
— 6. A cellular spicule; magnified.
— 7. Spiculæ from the uncovered stripe of the ventral surface.
— 8. Ventral aspect of *Gunneria borealis*; magnified. *a*, A cell with polyp. *b*, A fully developed cell with polyp. *c*, The furrow on the ventral surface.
— 9. A cell with it's polyp; magnified. *a*, The cell with it's 8 teeth. *b*, The ribs on the body of the polyp. *c*, Areas between the ribs.
— 10—14. Spicules from the stem; magnified.
— 15—16. do. do. do.
— 17. Dorsal aspect of *Kophobelemnon abyssorum*; natural size.
— 18. Ventral aspect of the same.
— 19. Spicule from the rachis; magnified.
— 20. Spicule from the stem; magnified.

Pl. V, fig. 1. Lateral aspect of a young specimen of *Umbellula encrinus*; natural size.
— 2. Dorsal aspect of the same; magnified. *a*, The dorsal surface of the rachis. *b*, The zooidal area. *c*, Terminal polyp. *d*, Lateral polyp. *e*, A small polyp in process of development.
— 3. Ventral aspect of the same; magnified. *a*, The mesial line of the rachis, where the axis appears visible through it. *b*, The lateral margin of the ventral surface, beset with zooids. *c*, Terminal polyp. *d*, Lateral polyp.
— 4. Ventral aspect of the calcareous axis; natural size.
— 5. Lateral aspect of a young *Umbellula encrinus*; natural size.
— 6. Dorsal aspect of the same; magnified. *a*, The zooids upon the rachis. *a**, The terminal polyp. *b*. Two lateral polyps on the right side. *c*, Two lateral polyps on the left side. *d*, *e*, Dorsal polyps.
— 7. Aspect of the same, viewed, partly, laterally, and partly, ventrally. *a*, The mesial line on the ventral side, where the axis appears visible through. *b*, The terminal polyp. *c*, *c*, Right hand lateral polyps. *d*, *d*, Left hand lateral polyps. *e*, *f*, Dorsal polyps.
— 8. A young *Umbellula encrinus*; natural size.
— 9. Ventral aspect of the same; magnified. *a*, The free extremity of the rachis. *b*, The mesial line on the ventral surface, through which the axis appears visible.

Axen skinner; *b**, Terminalpolyp; *c*, laterale Polyper; *d*, dorsale Polyper.

Tab. VI, Fig. 10. Den samme, seet fra Ryggen, forstørret. *a*, Rachis med sine Zooider; *b*, Terminalpolypen; *c*, laterale Polyper; *d*, Dorsalpolyp; *e*, en Polyp i Udvikling.

— 11. En ung *Umbellula encrinus*, naturlig Størrelse.

— 12. Den samme, seet fra Bugen, forstørret. *a*, Midtlinien af Ventralfladen, hvorigjennem Axen sees; *b*, Terminalpolyp; *c*, laterale Polyper.

— 13. Den samme, seet fra Ryggen, forstørret. *a*, Zooidefelter; *b*, Terminalpolyp; *c*, Dorsalpolyper; *d*, Dorsalpolyp.

— 14. Den samme, seet ovenfra og fra Ryggen. *b*, Terminalpolyp; *c*, Dorsalpolyper; *d*, Dorsalpolyp; *e*, *f*, laterale Polyper.

— 15. Den øverste Del af den 5te *Umbellula encrinus*, seet fra Bugen, lidt forstørret. *a*, Ventralfladen af Rachis; til Siderne lancetformede Zooidefelter; *b*, den afrundede Ende af Rachis; *c*, Midtpartiet, hvor Axen skinner igjennem; *d*, Terminalpolyp.

— 16. Schematisk Fremstilling af Polypernes Stilling paa Rachis, seet ovenfra og fra Bugen. 1*, Terminalpolyp; 1, 1, Dorsalpolyper; 2, 2, lateral-dorsale Polyper; 3, 3, 3, laterale Polyper.

— 17. Den øverste Del af det 6te *Umbellula encrinus*, seet fra Bugen, lidt forstørret. *a*, Midtlinien af Ventralfladen, hvorigjennem Axen skinner; til Siderne Zooidefelter; *b*, Terminalpolyp; *c*, laterale Polyper.

— 18. Den samme, seet fra Ryggen og ovenfra. Polyperne ere lagte fra hverandre. *a*, Terminalpolyp; *b*, *c*, central-dorsale Polyper; *d*, *e*, *f*, dorsal-laterale Polyper; *g*, *g*, *g*, laterale Polyper; *h*, en liden Polyp i Udvikling.

— 19. Schematisk Fremstilling af Polypernes Stilling paa Rachis af den samme, seet ovenfra og fra Ryggen. 1*, Terminalpolyp; 1, 1, dorsal-centrale Polyper; 2, 2, 2, dorsal-laterale Polyper; 3, 3, 3, laterale Polyper; *a*, en liden Polyp i Udvikling; *b*, en do.

Tab. VII, Fig. 20*a*. *Umbellula encrinus* No. 5, naturlig Størrelse. *a*, Rachis.

— 20*b*. Stilken, naturlig Størrelse.

*b**, The terminal polyp. *c*, Lateral polyps. *d*, Dorsal polyps.

Pl. VI, fig. 10. Dorsal aspect of the same; magnified. *a*, The rachis with its zooids. *b*, The terminal polyp. *c*, Lateral polyps. *d*, Dorsal polyp. *e*, A polyp in process of development.

— 11. A young *Umbellula encrinus*; natural size.

— 12. Ventral aspect of the same; magnified. *a*, The mesial line of the ventral surface, through which the axis is visible. *b*, The terminal polyp. *c*, Lateral polyps.

— 13. Dorsal aspect of the same; magnified. *a*, The zooidal areas. *b*, Terminal polyp. *c*, Dorsal polyps. *d*, Dorsal polyp.

— 14. Superior dorsal aspect of the same. *b*, Terminal polyp. *c*, Dorsal polyps. *d*, Dorsal polyp, *e*, *f*, Lateral polyps.

— 15. Ventral aspect of the superior portion of *Umbellula encrinus*, No. 5; somewhat magnified. *a*, The ventral surface of the rachis, with lateral lanceolate zooidal areas. *b*, The rounded extremity of the rachis. *c*, The mesial part, where the axis appears visible through. *d*, Terminal polyp.

— 16. An outline representation of the position of the polyps upon the rachis; superior ventral aspect. 1*, Terminal polyp. 1, 1, Dorsal polyps. 2, 2, Latero-dorsal polyps. 3, 3, 3, Lateral polyps.

— 17. Ventral aspect of the superior portion of *Umbellula encrinus*, No. 6; somewhat magnified. *a*, Mesial line of the ventral surface, through which the axis appears visible; and also the lateral zooidal areas. *b*, Terminal polyp. *c*, Lateral polyps.

— 18. Superior dorsal aspect of the same. The polyps are separated, apart, from each other. *a*, Terminal polyp. *b*, *c*, Centro-dorsal polyps. *d*, *e*, *f*, Dorso-lateral polyps. *g*, *g*, *g*, Lateral polyps. *h*, A small polyp in process of development.

— 19. Outline representation of the position of the polyps, on the rachis of the same; superior dorsal aspect. 1*, Terminal polyp. 1, 1, Dorso-central polyps. 2, 2, 2, Dorso-lateral polyps. 3, 3, 3, Lateral polyps. *a*, A small polyp in process of development. *b*, A similar polyp.

Pl. VII, fig. 20*a*. *Umbellula encrinus*, No. 5; natural size. *a*, The rachis.

— 20*b*. The stalk; natural size.

Tab. IV, Fig. 4. Et Stykke af den samme, seet fra Siden. *a*, Zooider.
— 5. En Celle med Polyp, forstørret. *a*, Zooider.
— 6. En Cellespikel, forstørret.
— 7. Spikler fra det nøgne Belte paa Ventralfladen.
— 8. *Gunneria borealis*, seet fra Bugen, forstørret. *a*, En Celle med Polyp; *b*, en fuldt udviklet Celle med Polyp; *c*, Furen paa Ventralfladen.
— 9. En Celle med Polyp, forstørret. *a*, Cellen med sine 8 Tænder; *b*, Ribberne paa Polypkroppen; *c*, Felterne imellem Ribberne.
— 10—14. Spikler fra Stilken, forstørret.
— 15—16. Do. Do. Do.
— 17. *Kophobelemnon abyssorum*, seet fra Ryggen, naturlig Størrelse.
— 18. Den samme, seet fra Bugen.
— 19. Spikel fra Rachis, forstørret.
— 20. Spikel fra Stilken, forstørret.

Tab. V, Fig. 1. Et ungt Exemplar af *Umbellula encrinus* i naturlig Størrelse, seet fra Siden.
— 2. Den samme, seet fra Dorsalfladen, forstørret. *a*, Dorsalfladen af Rachis; *b*, Zooidefelt; *c*, Terminalpolyp; *d*, lateral Polyp; *e*, en liden Polyp i Udvikling.
— 3. Den samme, seet fra Ventralfladen, forstørret. *a*, Midtlinien af Rachis, hvor Axen skinner igjennem; *b*, Siden af Ventralfladen, besat med Zooider; *c*, Terminalpolyp; *d*, lateral Polyp.
— 4. Kalkaxen fra den samme, naturlig Størrelse.
— 5. En ung *Umbellula encrinus* i naturlig Størrelse, seet fra Siden.
— 6. Den samme, seet fra Ryggen, forstørret. *a*, Zooider paa Rachis; *a**, Terminalpolyp; *b*, to laterale Polyper paa høire Side; *c*, to Do. paa venstre Side; *d*, *e*, dorsale Polyper.
— 7. Den samme, seet halvt fra Bugen, halvt fra Siden. *a*, Midtlinien paa Ventralsiden, hvor Axen skinner igjennem; *b*, Terminalpolyp; *c*, *c*, høire laterale Polyper; *d*, *d*, venstre laterale Polyper; *e*, *f*, Dorsalpolyper.
— 8. En ung *Umbellula encrinus* i naturlig Størrelse.
— 9. Den samme, seet fra Bugen, forstørret. *a*, Den fri Ende af Rachis; *b*, Midtlinien paa Ventralfladen, hvorigjennem

Pl. IV, fig. 4. Lateral aspect of a portion of the same. *a*, Zooids.
— 5. A cell with polyp; magnified. *a*, Zooids.
— 6. A cellular spicule; magnified.
— 7. Spiculæ from the uncovered stripe of the ventral surface.
— 8. Ventral aspect of *Gunneria borealis*; magnified. *a*, A cell with polyp. *b*, A fully developed cell with polyp. *c*, The furrow on the ventral surface.
— 9. A cell with it's polyp; magnified. *a*, The cell with it's 8 teeth. *b*, The ribs on the body of the polyp. *c*, Areas between the ribs.
— 10—14. Spicules from the stem; magnified.
— 15—16. do. do. do.
— 17. Dorsal aspect of *Kophobelemnon abyssorum*; natural size.
— 18. Ventral aspect of the same.
— 19. Spicule from the rachis; magnified.
— 20. Spicule from the stem; magnified.

Pl. V, fig. 1. Lateral aspect of a young specimen of *Umbellula encrinus*; natural size.
— 2. Dorsal aspect of the same; magnified. *a*, The dorsal surface of the rachis. *b*, The zooidal area. *c*, Terminal polyp. *d*, Lateral polyp. *e*, A small polyp in process of development.
— 3. Ventral aspect of the same; magnified. *a*, The mesial line of the rachis, where the axis appears visible through it. *b*, The lateral margin of the ventral surface, beset with zooids. *c*, Terminal polyp. *d*, Lateral polyp.
— 4. Ventral aspect of the calcareous axis; natural size.
— 5. Lateral aspect of a young *Umbellula encrinus*; natural size.
— 6. Dorsal aspect of the same; magnified. *a*, The zooids upon the rachis. *a**, The terminal polyp. *b*. Two lateral polyps on the right side. *c*, Two lateral polyps on the left side. *d*, *e*, Dorsal polyps.
— 7. Aspect of the same, viewed, partly, laterally, and partly, ventrally. *a*, The mesial line on the ventral side, where the axis appears visible through. *b*, The terminal polyp. *c*, *c*, Right hand lateral polyps. *d*, *d*, Left hand lateral polyps. *e*, *f*, Dorsal polyps.
— 8. A young *Umbellula encrinus*; natural size.
— 9. Ventral aspect of the same; magnified. *a*, The free extremity of the rachis. *b*, The mesial line on the ventral surface, through which the axis appears visible.

Axen skinner; *b**, Terminalpolyp; *c*, laterale Polyper; *d*, dorsale Polyper.

Tab. VI, Fig. 10. Den samme, seet fra Ryggen, forstørret. *a*, Rachis med sine Zooider; *b*, Terminalpolypen; *c*, laterale Polyper; *d*, Dorsalpolyp; *e*, en Polyp i Udvikling.

〰 11. En ung *Umbellula encrinus*, naturlig Størrelse.

〰 12. Den samme, seet fra Bugen, forstørret. *a*, Midtlinien af Ventralfladen, hvorigjennem Axen sees; *b*, Terminalpolyp; *c*, laterale Polyper.

〰 13. Den samme, seet fra Ryggen, forstørret. *a*, Zooidefelter; *b*, Terminalpolyp; *c*, Dorsalpolyper; *d*, Dorsalpolyp.

〰 14. Den samme, seet ovenfra og fra Ryggen. *b*, Terminalpolyp; *c*, Dorsalpolyper; *d*, Dorsalpolyp; *e*, *f*, laterale Polyper.

〰 15. Den øverste Del af den 5te *Umbellula encrinus*, seet fra Bugen, lidt forstørret. *a*, Ventralfladen af Rachis; til Siderne lancetformede Zooidefelter; *b*, den afrundede Ende af Rachis; *c*, Midtpartiet, hvor Axen skinner igjennem; *d*, Terminalpolyp.

〰 16. Schematisk Fremstilling af Polypernes Stilling paa Rachis, seet ovenfra og fra Bugen. 1*, Terminalpolyp; 1, 1, Dorsalpolyper; 2, 2, lateral-dorsale Polyper; 3, 3, 3, laterale Polyper.

〰 17. Den øverste Del af det 6te *Umbellula encrinus*, seet fra Bugen, lidt forstørret. *a*, Midtlinien af Ventralfladen, hvorigjennem Axen skinner; til Siderne Zooidefelter; *b*, Terminalpolyp; *c*, laterale Polyper.

〰 18. Den samme, seet fra Ryggen og ovenfra. Polyperne ere lagte fra hverandre. *a*, Terminalpolyp; *b*, *c*, central-dorsale Polyper; *d*, *e*, *f*, dorsal-laterale Polyper; *g*, *g*, *g*, laterale Polyper; *h*, en liden Polyp i Udvikling.

〰 19. Schematisk Fremstilling af Polypernes Stilling paa Rachis af den samme, seet ovenfra og fra Ryggen. 1*, Terminalpolyp; 1, 1, dorsal-centrale Polyper; 2, 2, 2, dorsal-laterale Polyper; 3, 3, 3, laterale Polyper; *a*, en liden Polyp i Udvikling; *b*, en do.

Tab. VII, Fig. 20*a*. *Umbellula encrinus* No. 5, naturlig Størrelse. *a*, Rachis.

〰 20*b*. Stilken, naturlig Størrelse.

*b**, The terminal polyp. *c*, Lateral polyps. *d*, Dorsal polyps.

Pl. VI, fig. 10. Dorsal aspect of the same; magnified. *a*, The rachis with its zooids. *b*, The terminal polyp. *c*, Lateral polyps. *d*, Dorsal polyp. *e*, A polyp in process of development.

— 11. A young *Umbellula encrinus*; natural size.

— 12. Ventral aspect of the same; magnified. *a*, The mesial line of the ventral surface, through which the axis is visible. *b*, The terminal polyp. *c*, Lateral polyps.

— 13. Dorsal aspect of the same; magnified. *a*, The zooidal areas. *b*, Terminal polyp. *c*, Dorsal polyps. *d*, Dorsal polyp.

— 14. Superior dorsal aspect of the same. *b*, Terminal polyp. *c*, Dorsal polyps. *d*, Dorsal polyp, *e*, *f*, Lateral polyps.

— 15. Ventral aspect of the superior portion of *Umbellula encrinus*, No. 5; somewhat magnified. *a*, The ventral surface of the rachis, with lateral lanceolate zooidal areas. *b*, The rounded extremity of the rachis. *c*, The mesial part, where the axis appears visible through. *d*, Terminal polyp.

— 16. An outline representation of the position of the polyps upon the rachis; superior ventral aspect. 1*, Terminal polyp. 1, 1, Dorsal polyps. 2, 2, Latero-dorsal polyps. 3, 3, 3, Lateral polyps.

— 17. Ventral aspect of the superior portion of *Umbellula encrinus*, No. 6; somewhat magnified. *a*, Mesial line of the ventral surface, through which the axis appears visible; and also the lateral zooidal areas. *b*, Terminal polyp. *c*, Lateral polyps.

— 18. Superior dorsal aspect of the same. The polyps are separated, apart, from each other. *a*, Terminal polyp. *b*, *c*, Centro-dorsal polyps. *d*, *e*, *f*, Dorso-lateral polyps. *g*, *g*, *g*, Lateral polyps. *h*, A small polyp in process of development.

— 19. Outline representation of the position of the polyps, on the rachis of the same; superior dorsal aspect. 1*, Terminal polyp. 1, 1, Dorso-central polyps. 2, 2, 2, Dorso-lateral polyps. 3, 3, 3, Lateral polyps. *a*, A small polyp in process of development. *b*, A similar polyp.

Pl. VII, fig. 20*a*. *Umbellula encrinus*, No. 5; natural size. *a*, The rachis.

— 20*b*. The stalk; natural size.

Tab. VII, Fig. 20^c. En Tentakel, forstørret.
— 21. Den samme. *a*, Terminalpolyp; *b*, *c*, dorsal-centrale Polyper; *d*, dorsal-laterale Polyper; *e*, laterale Polyper.
— 22^a. *Umbellula encrinus* No. 6, naturlig Størrelse. 1, Terminalpolyp; 2, lateral Polyp.
— 22^b. Stilken af samme, naturlig Størrelse.
— 23. *Umbellula encrinus* No. 7, naturlig Størrelse. *a*, Den skedeformige Udvidning gaaende over i Rachis; *b*, den bredeste Del af Rachis; *c*, den fri Ende af Rachis; *d*, lancetformede Zooidefelter. 1, Terminalpolyp. 2, 2, dorsal-laterale Polyper. 3, 3, 3, dorsal-laterale Polyper. 4, 4, 4, laterale Polyper.
— 24. Schematisk Fremstilling af *Umbellula encrinus* No. 9. Den skedeformige Udvidning. Rachis med Polyper, seet fra oven og Ventralsiden. *a*, Ventralfladen; *b*, Enden af Rachis. 1*. Terminalpolyp; 1, 1, dorsal-centrale Polyper; 2, 3, 4, venstre dorsal-laterale Polyper; 5, laterale Polyper; 6, 7, høire dorsal-laterale Polyper; 8, laterale Polyper.

Tab. VIII, Fig. 25. Schematisk Fremstilling af Polypernes Stilling paa Rachis af *Umbellula encrinus* No. 8. *a*, Den skedeformige Udvidning; *b*, Ventralfladen af Rachis; *c*, *c*, Ventralpolyper; *d*, *d*, ventral-laterale Polyper. 1*, Terminalpolyp. 1, 1, Dorsal-centrale Polyper; 2, 3, høire dorsal-laterale Polyper; 4, laterale Polyper. 5, 6, 7, venstre dorsal-laterale Polyper; 8, laterale Polyper.
— 26. Schematisk Fremstilling af Polypernes Stilling paa Rachis af *Umbellula encrinus* No. 10 med den skedeformige Udvidning, seet fra oven, Bugen vendt fortil. *a*, den afrundede, fri Ende af Rachis; *b*, den 4de central-dorsale Polyp; *c*, en liden dorsal-lateral Polyp. 1*, Terminalpolyp; 1, 1, 1, central-dorsale Polyper; 2, 3, 4, 5, dorsal-laterale Polyper; 6, laterale Polyper, alle paa venstre Side af de central-dorsale Polyper. 7, 8, dorsal-laterale Polyper; 9, laterale Polyper.
— 27. Schematisk Fremstilling af Polypernes Stilling paa Rachis af *Umbellula encrinus* No. 11, seet ovenfra; Bugen vendt fortil. *a*, den skedeformige Udvidning; *b*, Ventralfladen. 1*, Terminalpolyp; 1, 1, central-dorsale Polyper; 2, dorsal-laterale Polyper; 3, laterale Polyper

Pl. VII, fig. 20^c. A tentacle; magnified.
— 21. The same. *a*, Terminal polyp. *b*, *c*, Dorso-central polyps. *d*, Dorso-lateral polyps. *e*, Lateral polyps.
— 22^a. *Umbellula encrinus*, No. 6; natural size. 1, Terminal polyp. 2, Lateral polyp.
— 22^b. The stem of the same; natural size.
— 23. *Umbellula encrinus*, No. 7; natural size. *a*, The sheath-formed dilation which passes over into the rachis. *b*, The broadest part of the rachis. *c*, The free extremity of the rachis. *d*, The lanceolate zooidal areas. 1, Terminal polyp. 2, 2, Dorso-lateral polyps. 3, 3, 3, Dorso-lateral polyps. 4, 4, 4, Lateral polyps.
— 24. Outline representation of *Umbellula encrinus*, No. 9. The sheath-formed dilation. Superior ventral aspect of the rachis, with its polyps. *a*, The ventral surface. *b*, The extremity of the rachis. 1*, Terminal polyp. 1, 1, Dorso-central polyps. 2, 3, 4, Left hand dorso-lateral polyps. 5, Lateral polyps. 6, 7. Right hand dorso-lateral polyps. 8, Lateral polyps.

Pl. VIII, fig. 25. Outline representation of the position of the polyps, on the rachis of *Umbellula encrinus*, No. 8. *a*, The sheath-formed dilation. *b*, Ventral surface of the rachis. *c*, *c*, Ventral polyps. *d*, *d*, Ventro-lateral polyps. 1*, Terminal polyp. 1, 1, Dorso-central polyps. 2, 3, Right hand dorso-lateral polyps. 4, Lateral polyps. 5, 6, 7, Left hand dorso-lateral polyps. 8, Lateral polyps.
— 26. Outline representation of the position of the polyps on the rachis of *Umbellula encrinus*, No. 10, with the sheath-formed dilation; superior aspect; the venter facing anteriorly. *a*, The rounded free extremity of the rachis. *b*, The 4th centro-dorsal polyp, *c*, A small dorso-lateral polyp. 1*, Terminal polyp. 1, 1, 1, Centro-dorsal polyps. 2, 3, 4, 5, Dorso-lateral polyps. 6, Lateral polyps, all pertaining to the left hand side of the centro-dorsal polyps. 7, 8, Dorso-lateral polyps. 9, Lateral polyps.
— 27. Outline representation of the position of the polyps on the rachis of *Umbellula encrinus*, No. 11; Superior aspect; the venter facing anteriorly. *a*, The sheath-formed dilation. *b*, The ventral surface. 1*, Terminal polyp. 1. 1, Centro-dorsal polyps. 2, Dorso-lateral

til venstre; 4, 5, 6, dorsal-laterale Polyper; 7, laterale Polyper til høire.

Tab. VIII, Fig. 28. Schematisk Fremstilling af Polypernes Stilling paa Rachis af *Umbellula encrinus* No. 12, seet ovenfra; Bugen fortil. *a*, skedeformet Udvidning; *b*, *c*, dorsal-laterale Polyper i yderste Række. 1*, Terminalpolyp; 1, 1, central-dorsale Polyper. 2, 3, 4, 5, dorsal-laterale Polyper; 6, laterale Polyper til høire Side. 7, 8, 9, 10, dorsal-laterale Polyper; 11, laterale Polyper til venstre Side.

— 29. Bægerformet Rachis med lancetformede Zooidefelter, samt den øverste Del af den skedeformige Udvidning, noget forstørret.

— 30. Et Tversnit af den midterste Del af den skedeformige Udvidning, noget forstørret. *a*, Axen; *b*, Ventralkanalen; *c*, høire Sidekanal; *d*, Dorsalkanalen; *e*, venstre Sidekanal; *f*, Coenenchymet paa Dorsalsiden med sine Kanaler; *g*, Coenenchymet paa Ventralsiden; *h*, et listeformigt Fremspring i Ventralkanalen.

— 31. Tversnit af den øverste Del af den skedeformige Udvidning, forstørret. *a*, Ventralkanal; *b*, Dorsalkanal; *c*, *c*, Sidekanalerne udvidede mod Dorsalfladen; *d*, Deling af Septa, hvorved store Tverkanaler dannes.

— 32. Størstedelen af den bulbøse Del, seet fra Ventralsiden, naturlig Størrelse. *a*, den bagerste Længdefold af det ventral-laterale Septum; *b*, den forreste Længdefold af samme Septum; *c*, det brede Belte, dannet af de to forreste Længdefolder af det ventral-laterale Septum; *d*, Bindevævstraade; *e*, Aabninger paa Coenenchymets indre Væg; *f*, den fortykkede Bindevævslamel paa den ydre Flade af Skedens ydre Membran; *g*, Udskjæringer og Indrids i samme.

Tab. IX, Fig. 33. Den nederste Ende af Stokkens bulbøse Del, aabnet fra Ventralsiden, naturlig Størrelse. *a*, den bagerste Fold af det ventral-laterale Septum, dens Tilhæftning udad til Coenenchymets indre Væg og indad til Axen; *b*, den ydre Flade af Axens Skede.

— 34. Den nederste Ende af Bulbus, aabnet

polyps. 3, Left hand lateral polyps. 4, 5, 6, Dorso-lateral polyps. 7, Right hand lateral polyps.

Pl. VIII, fig. 28. Outline representation of the position of the polyps on the rachis of *Umbellula encrinus*, No. 12; superior aspect. The venter facing anteriorly. *a*, The sheath-formed dilation. *b*, *c*, Dorso-lateral polyps of the exterior series. 1*, Terminal polyp. 1, 1, Centro-dorsal polyps. 2, 3, 4, 5, Dorso-lateral polyps; 6, Right hand lateral polyps. 7, 8, 9, 10, Dorso-lateral polyps. 11, Left hand lateral polyps.

— 29. Chalice-formed rachis, with lanceolate zooidal areas; also, the superior portion of the sheath-formed dilation; somewhat magnified.

— 30. Transverse sectional aspect of the mesial portion of the sheath-formed dilation; somewhat magnified. *a*, The axis. *b*, The ventral canal. *c*, The right lateral canal. *d*, The dorsal canal, *e*, The left lateral canal. *f*, The sarcosoma of the dorsal side with its canals. *g*, The sarcosoma of the ventral side. *h*, A fillet-formed prominence in the ventral canal.

— 31. Transverse sectional aspect of the superior portion of the sheath-formed dilation; magnified. *a*, The ventral canal. *b*, The dorsal canal. *c*, *c*, Lateral canals, dilated towards the dorsal surface. *d*, Division of septa, by which large transversal canals are formed.

— 32. Ventral aspect of the greater part of the bulbous portion; natural size. *a*, The posterior longitudinal fold of the ventro-lateral septum. *b*, The anterior longitudinal fold of the same septum. *c*, The broad band formed by the two anterior longitudinal folds of the ventro-lateral septum. *d*, Connective-tissue filaments. *e*, Apertures in the inner wall of the sarcosoma. *f*, The tumefied connective-tissue lamella, on the outer surface of the exterior membrane of the sheath. *g*, Carvings and inlayings of the same.

Pl. IX, fig. 33. The inferior extremity of the bulbous portion of the stalk, dissected from the ventral side; natural size. *a*, The posterior fold of the ventro-lateral septum; its attachment, outwards, to the inner wall of the sarcosoma, and inwards, to the axis. *b*, The exterior surface of the sheath of the axis.

— 34. The inferior extremity of the bulb,

fra Ventralsiden, naturlig Størrelse. *a*, det brede Belte, der dannes af de to forreste Folder af det ventral-laterale Septum, opslaaet; *b*, en Rest af det brede Belte, slaaet nedad for at vise Tilhæftningen til den nederste Rand af Septum transversale; *c*, Septum transversale; *d*, Bindevævstraade, der fæster Septum transversale til den indre Coenenchymvæg; *e*, Bunden af Sidekanalen; *f*, den øverste Rand af Septum transversale; *g*, Axens Ende.

Tab. IX, Fig. 35. Den nederste Ende af Bulbus, seet fra Dorsalsiden, naturlig Størrelse. *a*, de dorsal-laterale Septa, fæstende sig paa Axeskedens Sidevæg; *b*, Axens Ende; *c*, en stærk Fold fra de dorsal-laterale Septa, hvilken væsentlig bidrager til Dannelsen af Septum transversale; *d*, Septum transversale.

— 36. Et Tversnit af endel af Stokkens bulbøse Del, forstørret. *a*, et Septum, der gaar fra Coenenchymvæggen til Axeskeden, og hvori sees en Mængde Ernæringskanaler; *b*, Længdekanalerne i Coenenchymet; *c*, Tverkanaler; *d*, koncentriske Lag i Axen; *e*, radiære Binvævsfibre i Axen; *f*, Axens *membrana propria* (cuticula); *g*, Axeskedens indre Membran; *h*, Bindevæv, der danner Sammenvoxningen mellem Skedens indre og ydre Membran, og hvori sees en Mængde Saftkanaler i Skedens ydre Membran. *i*, Skedens ydre Membran.

— 37. Et Tversnit af en Zooides Tentakel, stærkt forstørret. *a*, Ectodermceller; *b*, encellet Slimkjertel; *c*, fibrilært Bindevæv med spindelformige Bindevævslegemer.

— 38. Et Længdesnit af Zooidens Tentakel; *a*, Ectodermceller; *b*, encellet Slimkjertel; *c*, Kjertelens Aabning.

— 39. Tversnit af Stokkens Coenenchym, 60 Gange forstørret; tegnet under *Camera lucida*. *a*, *b*, Ectoderm med encellede Slimkjertler; *c*, stærkt rødfarvet, fibrillært Bindevæv med Bindevævslegemer; *d*, Længdekanaler; *e*, listeformigt Fremspring i Længdekanalerne; *f*, blaat farvede

dissected from the ventral side; natural size. *a*, The broad band, formed by the two anterior folds of the ventro-lateral septum; turned up. *b*, A remnant of the broad band; turned down, to show the attachment to the inferior margin of the septum-transversale. *c*, The septum-transversale. *d*, Connective-tissue filaments which attach the septum-transversale to the inner wall of the sarcosoma. *e*, The bottom of the lateral canal. *f*, The superior margin of the septum-transversale. *g*, The extremity of the axis.

Pl. IX, fig. 35. Dorsal aspect of the inferior extremity of the bulb; natural size. *a*, The Dorso-lateral septa attached to the lateral wall of the sheath of the axis. *b*, The extremity of the axis. *c*, A strong fold from the dorso-lateral septa, which principally contributes to the formation of the septum-transversale. *d*, Septum-transversale.

— 36. Transverse sectional aspect of a portion of the bulbous part of the stalk; magnified. *a*, A septum, proceeding from the wall of the sarcosoma to the sheath of the axis, and in which a multitude of nutrient ducts are seen. *b*, The longitudinal canals in the sarcosoma. *c*, Transversal canals. *d*, Concentric layers in the axis. *e*, Radiating connective-tissue fibres in the axis. *f*, *Membrana propria* (cuticula) of the axis. *g*, Inner membrane of the sheath of the axis. *h*, The connective-tissue which forms the concretion between the inner and outer membranes of the sheath, and in which a multitude of secretory ducts are seen in the outer membrane of the sheath. *i*, Outer membrane of the sheath.

— 37. Transverse sectional aspect of the tentacle of a zooid; greatly magnified. *a*, Ectoderm cells. *b*, Single-celled mucous gland. *c*, Fibrillous connective-tissue, containing fusiform connective-tissue corpuscles.

— 38. A longitudinal section of the tentacle of the zooid. *a*, Ectoderm cells. *b*, Single-celled mucous gland. *c*, Aperture of the gland.

— 39. Section of the sarcosoma of the stalk; magnified 60 times; drawn under *camera lucida*. *a*, *b*, Ectoderm with single-celled mucous glands. *c*, Deep-red coloured fibrillous conective-tissue, containing connective-tissue corpuscles. *d*, Longitudinal canals. *e*, Fillet-formed prominence

Længdemuskler; *g*, *h*, blegt farvet, hyalint Bindevæv, hvori fine Ernæringskanaler; *i*, Tverkanalernes Laguner, af hvilke den ene kommunicerer med en Længdekanal; *k*, Epithel, som beklæder Kanalerne; *l*, en smal Kanal imellem Længdekanalen og en Lagune.

Tab. IX, Fig. 40. Et lignende Tversnit, 160 Gange forstørret, tegnet under *Camera lucida*. *a*, grønt farvede Ectodermceller; *b*, encellede, grønt farvede Slimkjertler; *c*, fibrillært Bindevæv med spindelformige Bindevævslegemer; *d*, listeformige Forlængelser af dette Bindevæv, hvilke rage ind i Længdekanalerne; *e*, blaat farvede Længdemuskler paa de listeformige Fremspring; *f*, blaat farvede Længdemuskler paa Længdekanalernes Sidedele; *g*, stærkt rødt farvet Epithel, som beklæder Længdekanalerne; *h*, *i*, hyalint Bindevæv, hvori stjerneformige Aabninger for Ernæringskanalerne; *k*, en af Tverkanalernes Laguner; *l*, Tverkanalernes Epithel; *m*, Kommunikation imellem en Længde- og Tverkanal; *n*, Tverkanal.

— 41. En Gruppe af encellede Slimkjertler, forstørret.

— 42. Et Tversnit af en Polyps Kropsvæg, stærkt forstørret. *a*, Ectodermceller; *b*, encellede Slimkjertler; *c*, hyalint Bindevæv med dets Forlængelser, som danner Kanalsystemet; *d*, Længdekanaler; *e*, Tverkanaler; *f*, Endothelceller; *g*, Længdemuskler; *h*, Tvermuskler; *i*, Epithel.

— 43. Tversnit af en Polyp, forstørret *a*, Ectoderm; *b*, Epithel, som beklæder den ydre Svælgvæg samt hele Kammeret; *c*, Bindevævslag paa Svælget; *d*, Bindevævsfremspring paa den indre Svælgvæg; *e*, Længdemuskler paa disse Fremspring; *f*, dorsale Septa; *g*, Dorsalkammer; *h*, ventrale Septa; *i*, Ventralkammer; *k*, Sidekamre.

— 44. Mundaabningen med dens 8 Læber.

— 64. En ung *Umbellula encrinus* i naturlig Størrelse, tegnet i levende Live.

Tab. X, Fig. 45. En Polyp, aabnet efter Længden; Huden slaaet til Siden; et Par Septa løsnet fra Svælget. *a*, det lange, paatvers foldede Svælg; *b*, Septa; *c*, Svælgets

in the longitudinal canals. *f*, Blue-coloured longitudinal muscles. *g*, *h*, pale-coloured hyaloid connective-tissue in which is found, minute nutrient ducts. *i*, Lagunes of the transversal canals, of which the one communicates with a longitudinal canal. *k*, The epithelium which clothes the canal. *l*, A narrow canal between the longitudinal canal and a lagune.

Pl. IX, fig. 40. A similar section; magnified 160 times; drawn under *camera lucida*. *a*, Green-coloured ectoderm cells, *b*, Single-celled green-coloured mucous glands, *c*, Fibrillous connective-tissue with fusiform connective-tissue corpuscles, *d*, Fillet-formed prolongations of this connective-tissue, which project into the longitudinal canals. *e*, Blue-coloured longitudinal muscles on the fillet-formed prominence. *f*. Blue-coloured longitudinal muscles on the lateral parts of the longitudinal canals. *g*, The deep-red coloured epithelium which clothes the longitudinal canals. *h*, *i*, Hyaloid connective-tissue, in which is seen stellate apertures for the nutrient ducts. *k*. One of the lagunes of the transversal canals. *l*. Epithelium of the transverse canals. *m*, Communication between a longitudinal and a transversal canal. *n*, Transverse canal.

— 41. A group of single-celled mucous glands; magnified.

— 42. Section of the wall of the body of a polyp; greatly magnified. *a*, Ectoderm cells. *b*, Single-celled mucous glands. *c*, Hyaloid connective-tissue, with its prolongations forming the ductiferous system. *d*, Longitudinal canals. *e*, Transversal canals. *f*, Endothelious cells, *g*, Longitudinal muscles. *h*, Transverse muscles. *i*, Epithelium.

— 43. Sectional aspect of a polyp; magnified. *a*, Ectoderm. *b*, The epithelium which clothes the outer wall of the gullet and the entire chamber. *c*, Layer of connective-tissue in the gullet. *d*, Connective-tissue prominence on the inner wall of the gullet. *e*, Longitudinal muscles on these prominences. *f*, Dorsal septa. *g*, Dorsal chamber. *h*, Ventral septa. *i*, Ventral chamber. *k*, Lateral chambers.

— 44. The oral aperture with its 8 labiæ.

— 64. A young *Umbellula encrinus*; natural size; drawn from the living specimen.

Pl. X, fig. 45. A polyp, dissected longitudinally; the integument pushed aside, and a couple of septa detached from the gullet. *a*, The long transversally folded gullet. *b*,

nederste Ende; *d*, Gastralfilamenter; *e*, Generationsorganer.

Tab. X, Fig. 46. Entodermceller fra Polypkroppens indre Flade. *a*, klare Celler; *b*, pigmenterte do.

— 47. Den øverste Del af den skedeformige Udvidning samt Rachis med Polyper, naturlig Størrelse. En Polyp, aabnet efter Længden. *a*, Svælg; *b*, *c*, Septulum; *d*, *e*, Gastralfilamenter; *f*, Generationsorganer.

— 48. En Bindevævspyramide med Epithelbeklædning fra Svælgets indre Flade, stærkt forstørret. *a*, røde Pigmentkorn i Cellen; *b*, encellet Kjertel.

— 49. Nederste Ende af Svælget med et Septulum samt et Gastralfilament, forstørret. *a*, Længdemuskler paa Septulum; *b*, Bindevævsmembran, hvormed Gastralfilamentet er fæstet til Septulum; *c*, Gastralfilament; *d*, Generationsorganer.

— 49¹. Den anden Side af ovennævnte Septulum, forstørret. *a*, Tvermuskler.

— 50. Et Septum imellem Polypens Kropsvæg og Svælget, stærkt forstørret. *a*, Bindevævslamel; *b*, listeformig Bindevævsforlængelse; *c*, Længdemuskler paa Bindevævslisterne; *d*, Tvermuskler; *e*, *f*, Epithelceller.

— 51. Tversnit af Svælget, forstørret. *a*, ydre Epithel; *b*, Bindevæv; *c*, Bindevævspyramide; *d*, Længdemuskler; *e*, Tvermuskler; *f*, Nematocyster.

— 52. Et Stykke af Generationsorganet, forstørret. *a*, *b*, Kapsler, hvori Æg i forskjellige Udviklingsstadier.

— 53. Celler, som beklæde Generationskapselens indre Flade, forstørret.

— 54. Et Embryo, forstørret. *a*, Gastræamund.

— 55. En Spermatozoe, forstørret.

— 56. En Gruppe Zooider, lidt forstørret. *a*, en fuldt udstrakt Zooide; *b*, indtrukne Zooider; *c*, en Zooide, hvor Tentakelen er begyndt at komme frem; *d*, fuldt udstrakte Zooider; *e*, aflang Aabning paa den lidt indtrukne Tentakel; *f*, Pinnuler paa Tentakelen.

— 57. Længdesnit af en Zooide, forstørret. *a*, *b*, Ectoderm med Slimkjertler; *c*, Svælget; *d*, indre Væg af Tentakelen; *e*, Gastralfilamenter.

Septa. *c*, Inferior extremity of the gullet. *d*, Gastral filaments. *e*, Generative organs.

Pl. X, fig. 46. Entoderm cells from the inner surface of the body of the polyp. *a*, Clear cells. *b*, Coloured cells.

— 47. The superior part of the sheath-formed dilation and the rachis with polyps; natural size. A polyp dissected longitudinally. *a*, The gullet. *b*, *c*, Septulum. *d*, *e*, Gastral filaments. *f*, Generative organs.

— 48. A connective-tissue pyramid with epithelium covering, from the inner surface of the gullet; largely magnified. *a*, Red-coloured granules in the cell. *b*, Single-celled gland.

— 49. Inferior extremity of the gullet, with a septulum and a gastral filament; magnified. *a*, Longitudinal muscles of the septulum, *b*, Connective-tissue membrane, by which the gastral filament is attached to the septulum. *c*, Gastral filament *d*, Generative organs.

— 49¹. Aspect of the other side of the same septulum, magnified. *a*, Transversal muscles.

— 50. A septum, between the wall of the body of the polyp and the gullet; greatly magnified. *a*, Connective-tissue lamella. *a*, Fillet-formed connective-tissue prolongation. *c*, Longitudinal muscles of the connective-tissue fillets. *d*, Transversal muscles. *e*, *f*, Epithelium cells.

— 51. Transverse section of the gullet; magnified. *a*, Exterior epithelium. *b*, Connective-tissue. *c*, Connective-tissue pyramids. *d*, Longitudinal muscles. *e*, Transversal muscles. *f*, Nematocysts.

— 52. A portion of the generative organ; magnified. *a*, *b*, Capsules, with ova in various stages of development.

— 53. Cells which clothe the inner surface of the capsule of the generative organ; magnified.

— 54. An Embryo; magnified. *a*, Mouth of the gastræa.

— 55, A spermatozoa; magnified.

— 56. A group of zooids; slightly magnified. *a*, A fully extended zooid. *b*, Retracted zooids. *c*, A zooid, in which the tentacle has commenced to appear. *d*, Fully extended zooids. *e*, Oblong aperture in the slightly retracted tentacle. *f*, Pinnules on the tentacle.

— 57. Longitudinal section of a zooid; magnified. *a*, *b*, Ectoderm with mucous glands. *c*, The gullet. *d*, Inner wall of the tentacle. *e*, Gastral filaments.

Tab. X, Fig. 58. Et Tversnit af Zooidens Tentakel, forstørret. *a*, Ectodermceller; *b*, encellet Slimkjertel; *c*, Bindevæv; *d*, Tvermuskler; *e*, Længdemuskler; *f*, Epithel; *g*, Hulheden.

— 59. Den øverste Del af Tentakelens udvendige Flade, forstørret. *a*, Ectodermceller; *b*, encellet Slimkjertel.

— 60. Et Tversnit af Zooidens Krop, forstørret. *a*, *b*, Ectoderm med Slimceller; *c*, Bindevæv; *d*, Længdemuskler; *e*, *f*, Tvermuskler paa Septum; *g*, Længdemuskler paa Septum; *h*, ydre Epithellag; *i*, dettes Celler; *k*, Svælget; *l*, Dorsalkammer; *m*, Ventralkammer; *n*, indre Epithel.

— 61. Tversnit af Stokken omtrent paa dens Midte, lidt forstørret. *a*, Coenenchymet; *b*, triangulær Bindevævsfortykkelse paa den indre Væg af Skedens ydre Membran; *c*, Skedens indre Membran; *d*, det aabne Rum imellem Skedens ydre og indre Membran; *e*, Længdekanal; *f*, Septum; *g*, Axen.

— 62. Den nederste Ende af Kalkaxen, naturlig Størrelse. *a*, første Bøining; *b*, anden Bøining; *c*, Axens fine Ende.

— 63. Den øverste Ende af Kalkaxen med dens 3 Bøininger, *a*, *b*, *c*; naturlig Størrelse.

Tab. XI. *Umbellula encrinus* No. 12, tegnet efter Maalene i levende Live, naturlig Størrelse.

Tab. XII. *Umbellula encrinus*, tegnet i levende Live. *a*, Den øverste Del af Stokkens bulbøse Del; *b*, sammes mellemste Del; *c*, den nederste Del.

Pl. X, fig. 58. A section of the tentacle of the zooid; magnified. *a*, Ectoderm cells. *b*, Single-celled mucous gland. *c*, Connective-tissue. *d*, Transversal muscles. *e*, Longitudinal muscles. *f*, Epithelium. *g*, The cavity.

— 59. The superior portion of the exterior surface of the tentacle; magnified. *a*, Ectoderm cells. *b*, Single-celled mucous gland.

— 60. A sectional aspect of the body of the zooid; magnified. *a*, *b*, Ectoderm with mucous glands. *c*, Connective-tissue. *d*, Longitudinal muscles. *e*, *f*, Transverse muscles of the septum. *g*, Longitudinal muscles of the septum. *h*, Exterior layer of epithelium. *i*, It's cells. *k*, The gullet. *l*, The dorsal chamber. *m*, The ventral chamber. *n*, The inner epithelium.

— 61. Section of the stalk, at about its middle; slightly magnified. *a*, The sarcosoma. *b*, Triangular connective-tissue tumefaction on the inner wall of the exterior membrane of the sheath. *c*, Inner membrane of the sheath. *d*, Open space between the exterior and interior membrane of the sheath. *e*, Longitudinal canal. *f*, Septum. *g*, Axis.

— 62. The inferior extremity of the calcareous axis; natural size. *a*, The first curve. *b*, The second curve. *c*, The slender extremity of the axis.

— 63. The superior extremity of the calcareous axis; natural size. *a*, *b*, *c*, It's three curves.

Pl. XI. *Umbellula encrinus*, No. 12, drawn from the living specimen; natural size.

Pl. XII. *Umbellula encrinus*, drawn from the living specimen. *a*, The superior portion of the bulbous part of the stalk. *b*, Mesial portion of the same. *c*, The inferior portion of the same.

Indhold.

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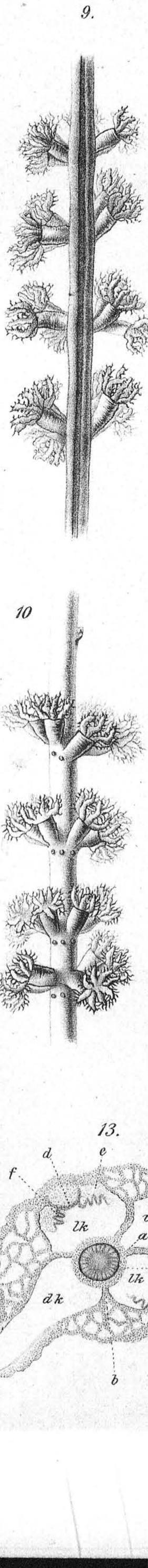
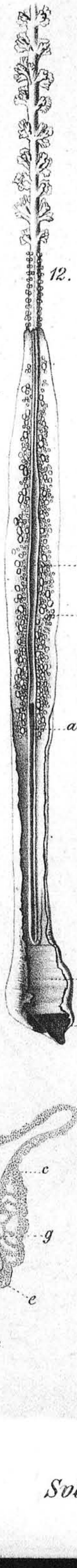
Translated into English by Tho.s M. Wilson.





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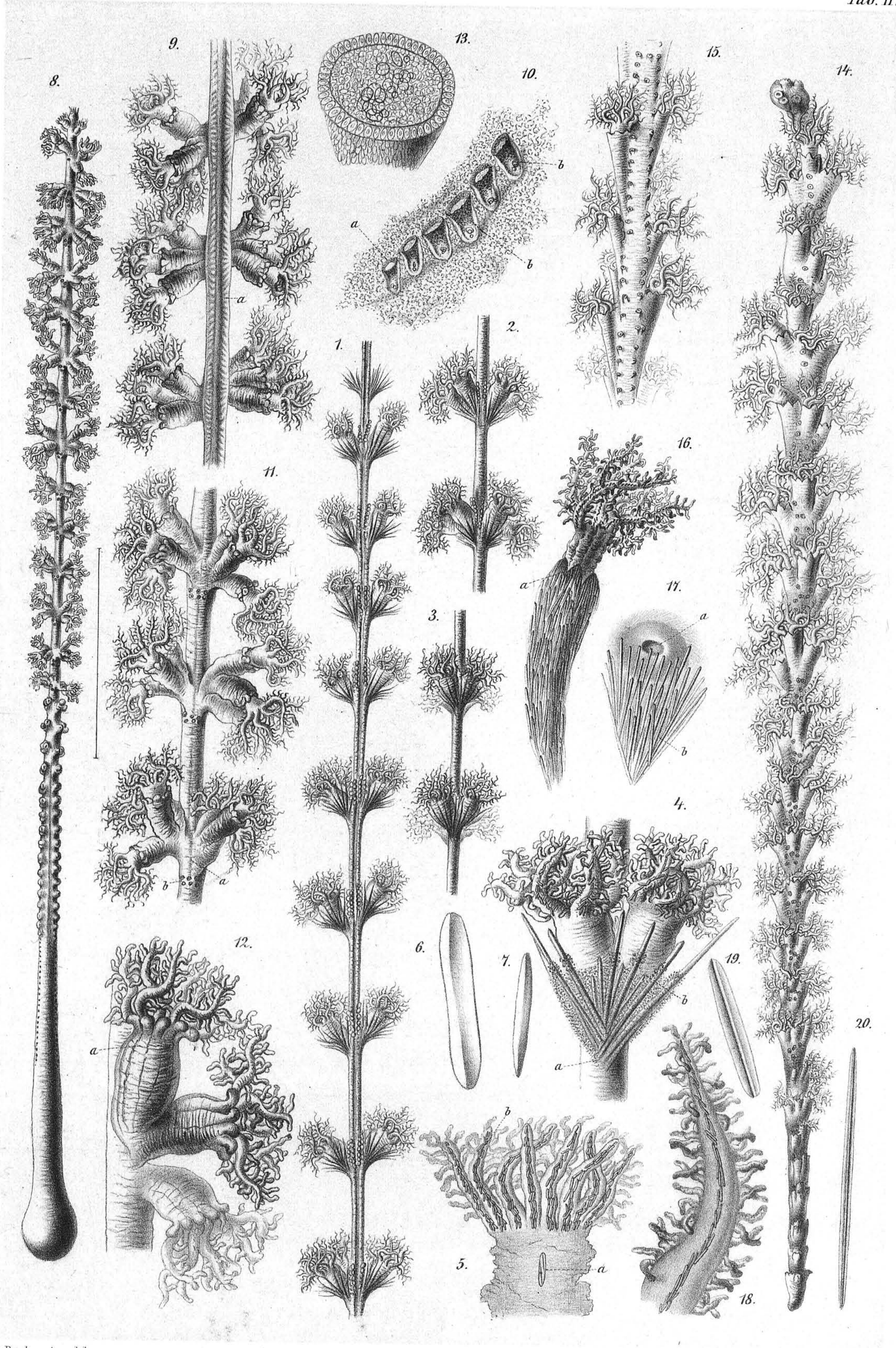
Svava glacialis, n. g. et sp.



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Dübenia borealis, n. sp. 1-7. Cladiscus Köllikeri, n. sp. 8-13. Protoptilum lofotense, n. sp. 14-20.

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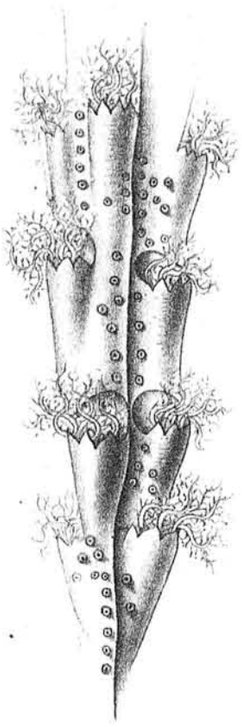

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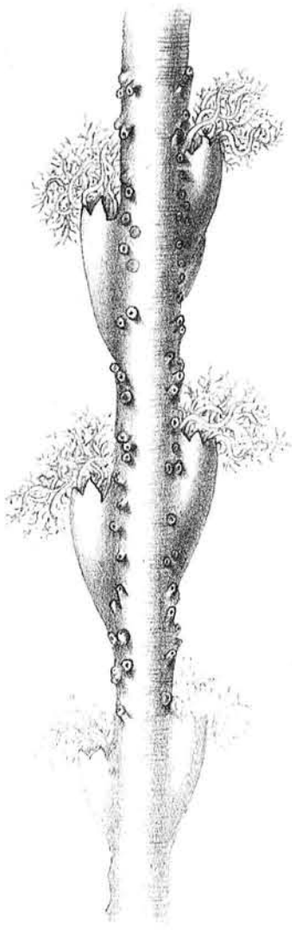

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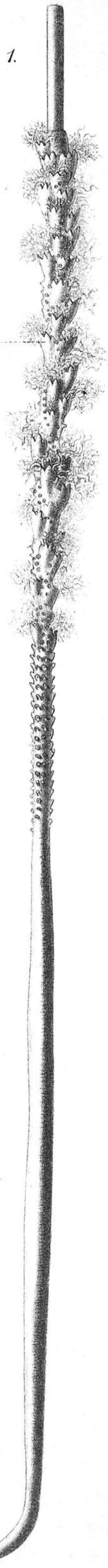

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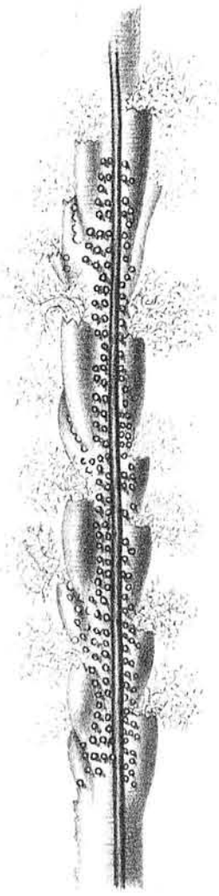

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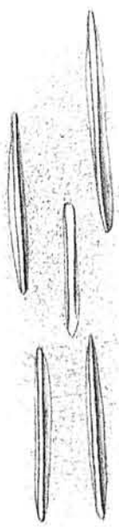

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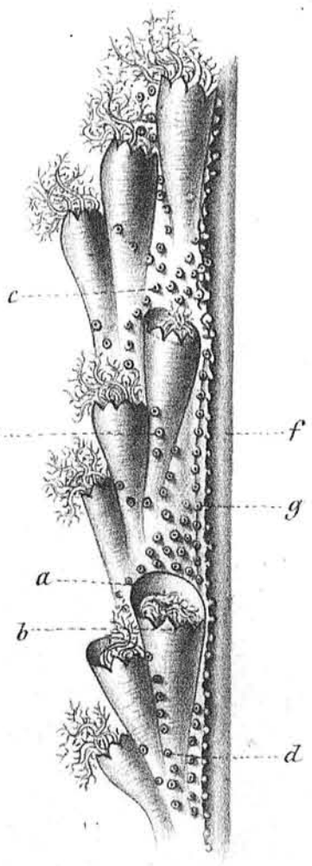

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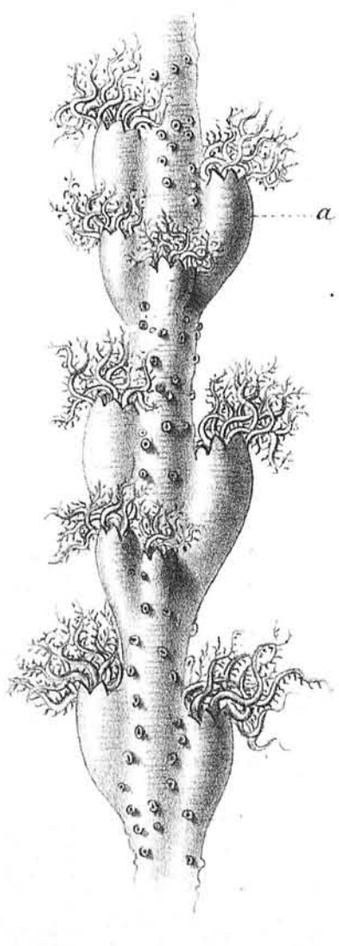

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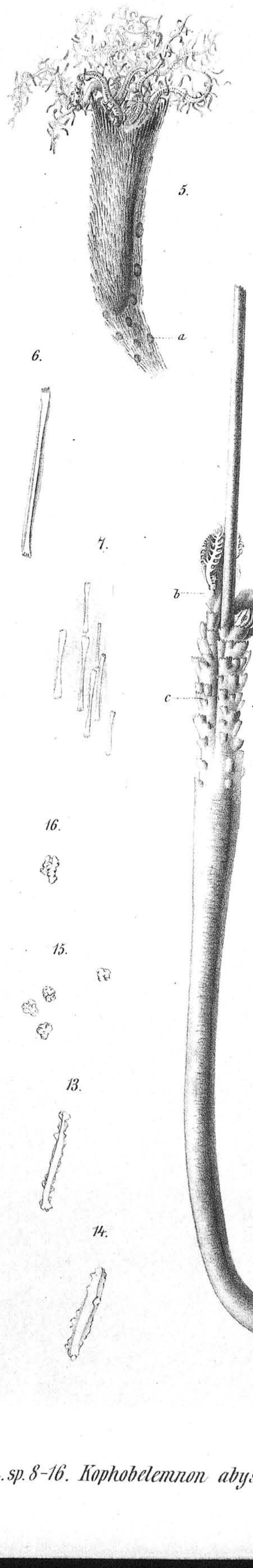

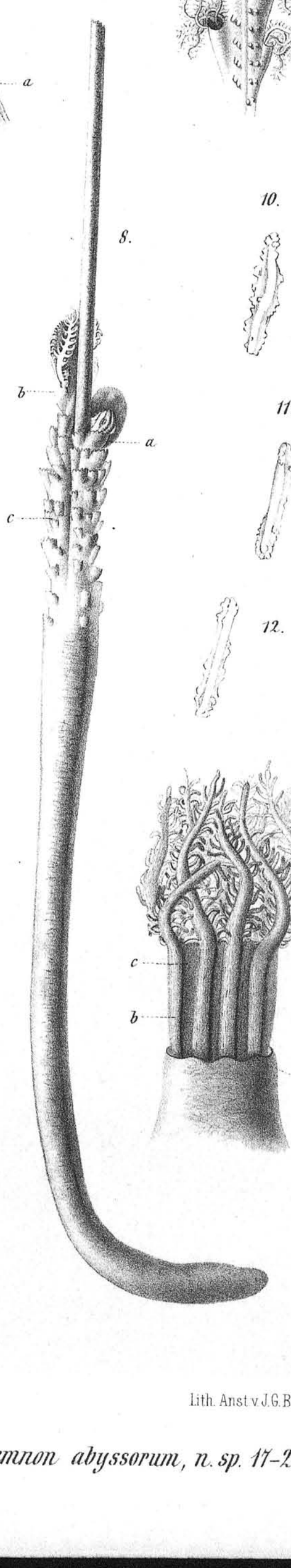

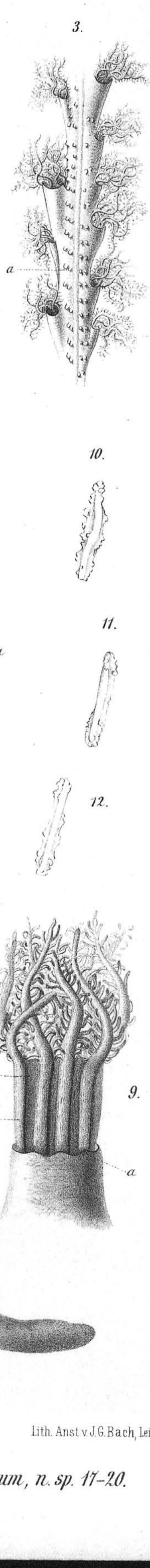

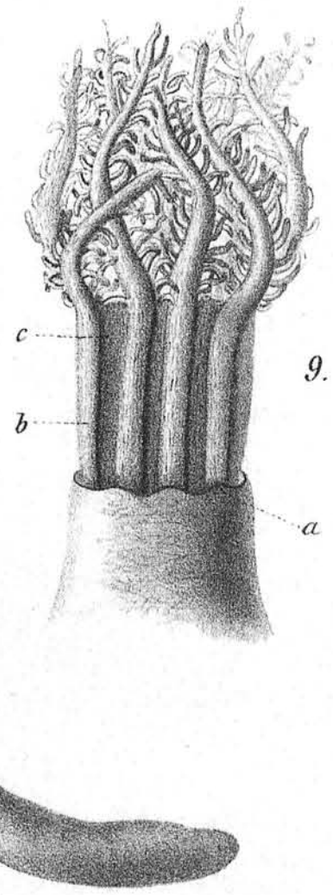

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Protoptilum armatum, n.sp. 1-7. Gunneria borealis, n.sp. 8-16. Kophobelemnon abyssorum, n.sp. 17-20.

8.

1.

3.

a
c
b
a

5.

a

4.

6.

c
e
a
b
d
b
c
a

2.

d
e
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d
b
a
f
e
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c
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d
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c
c
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b

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Umbellula encrinus, Linné.

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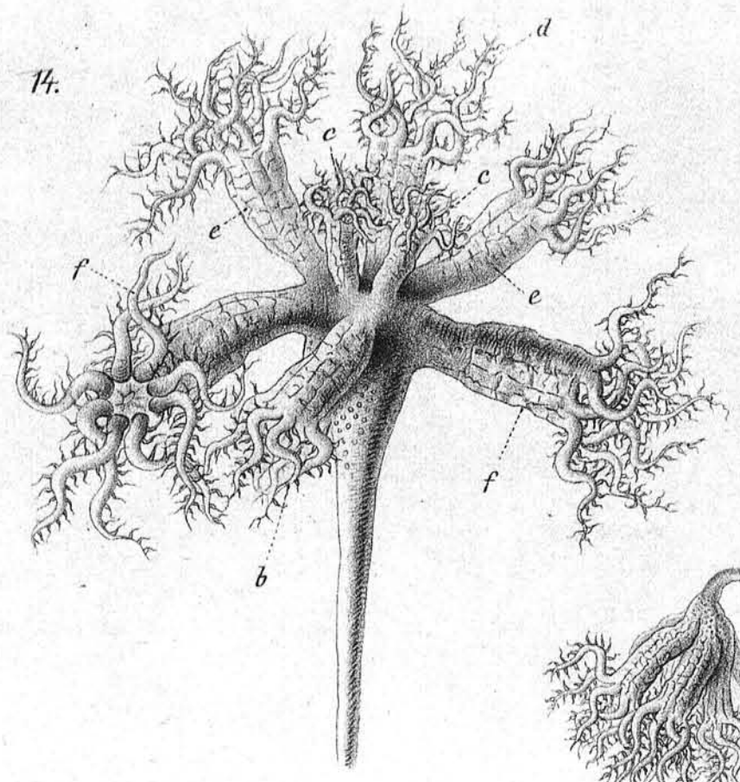

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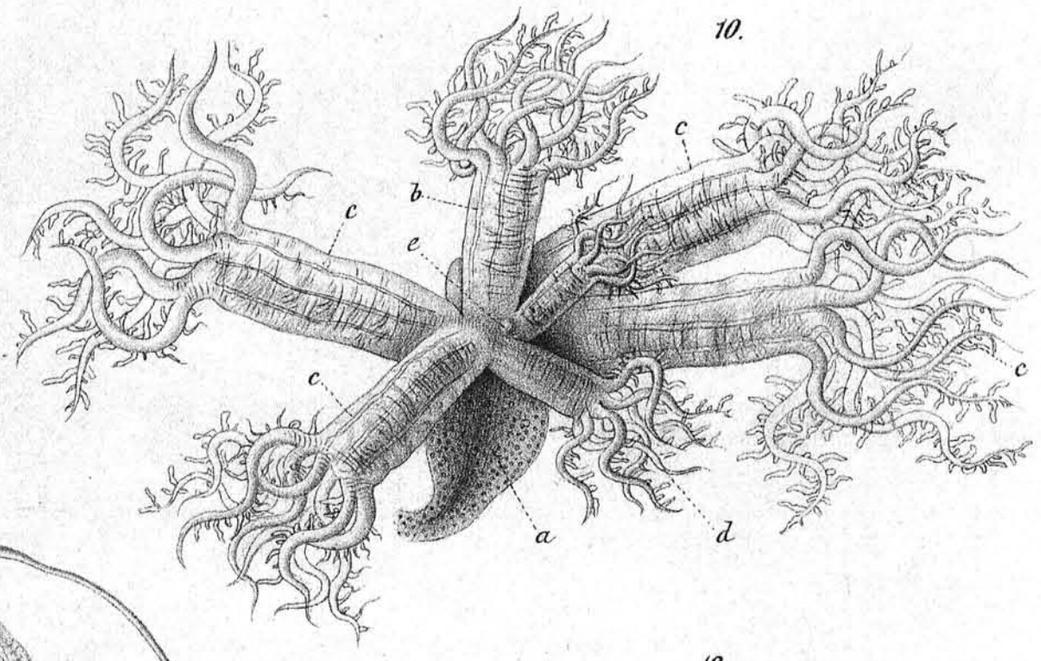

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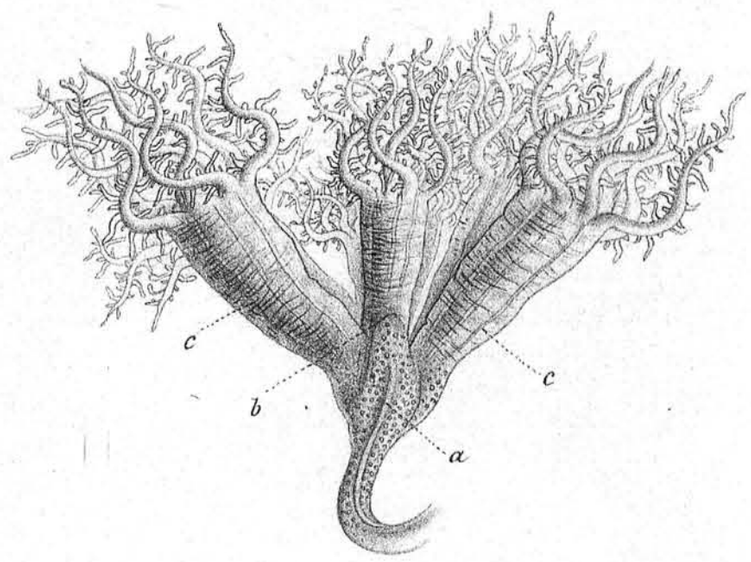

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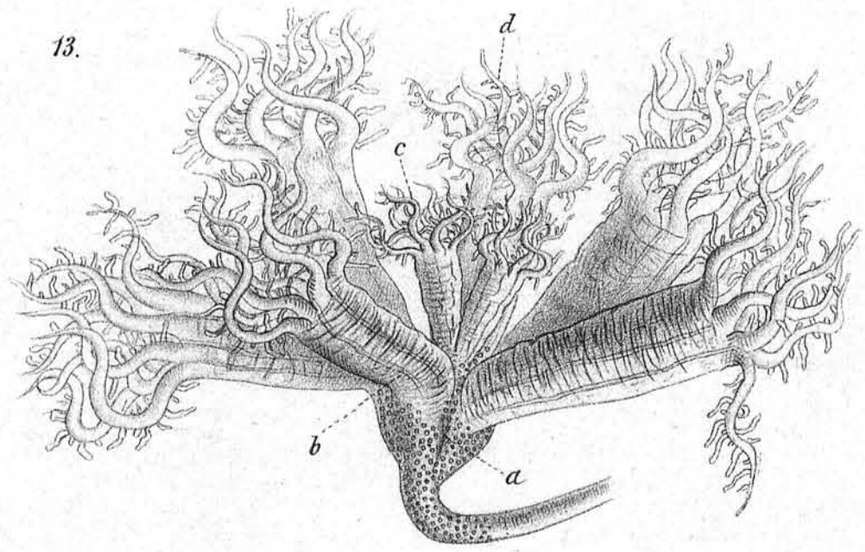

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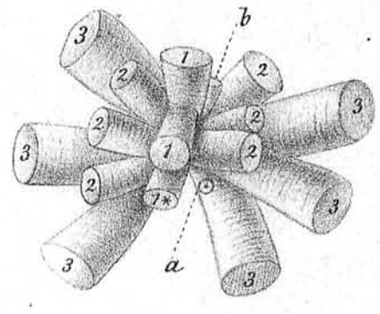

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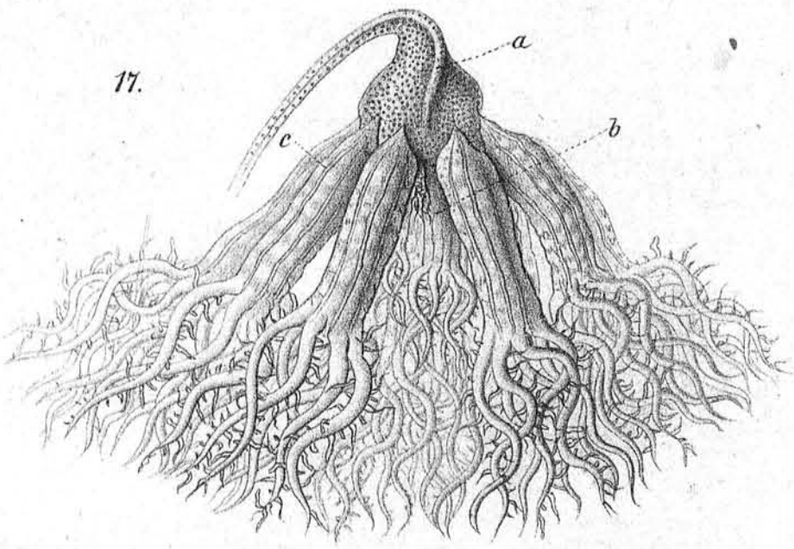

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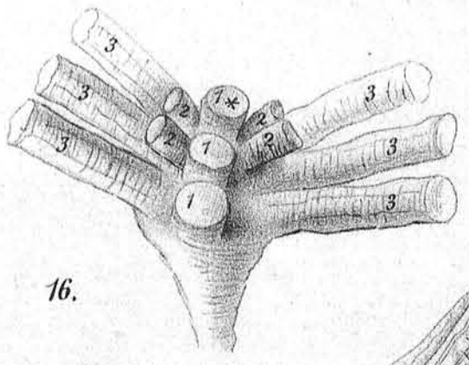

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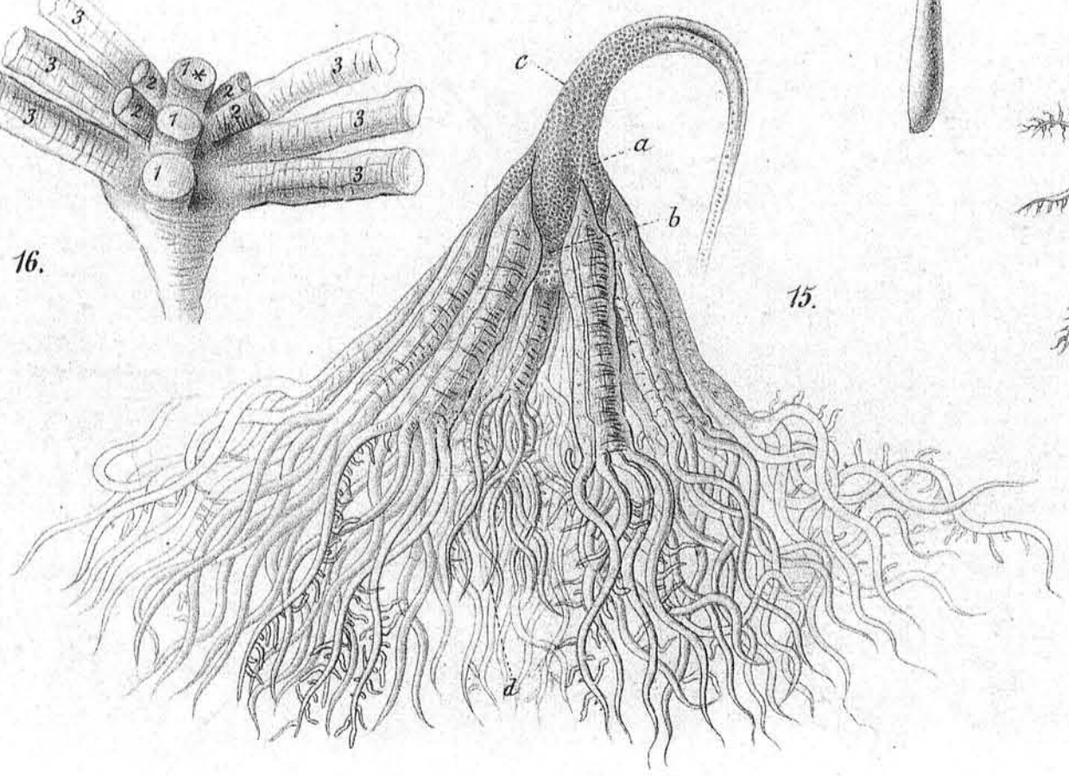

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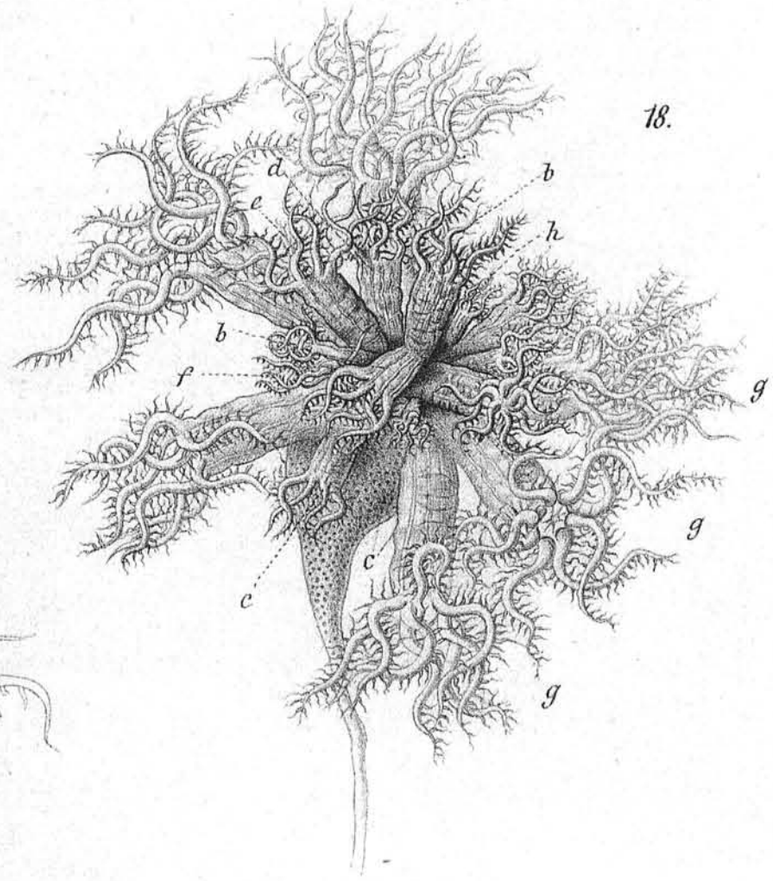

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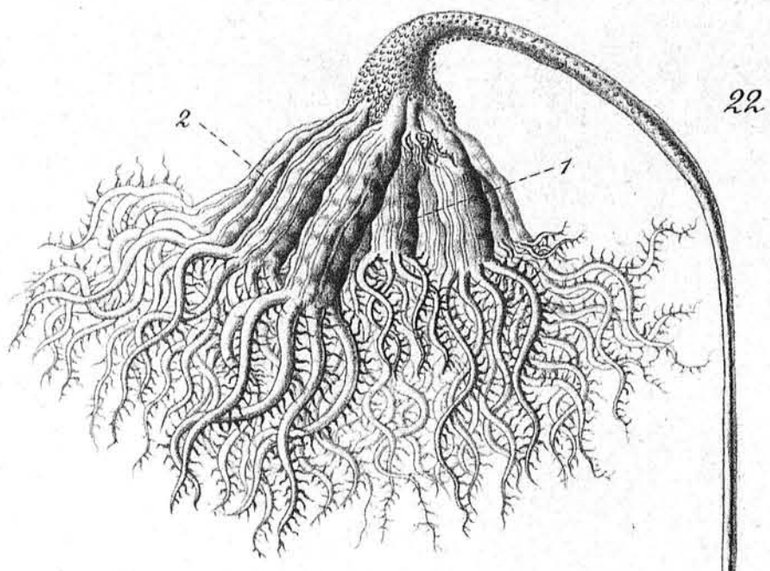

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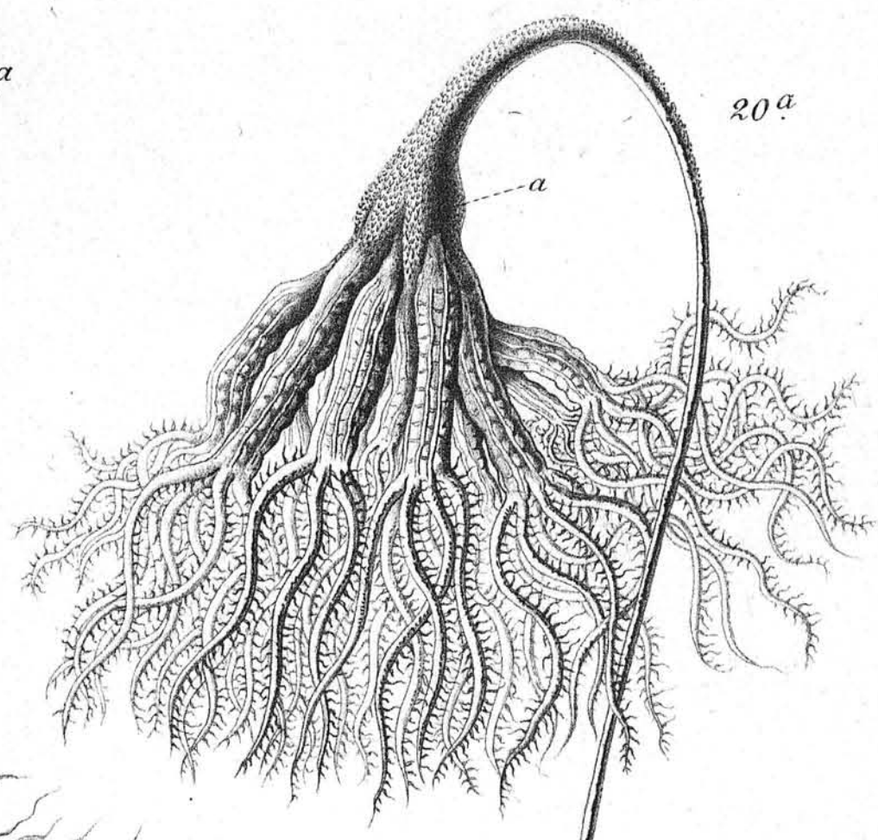

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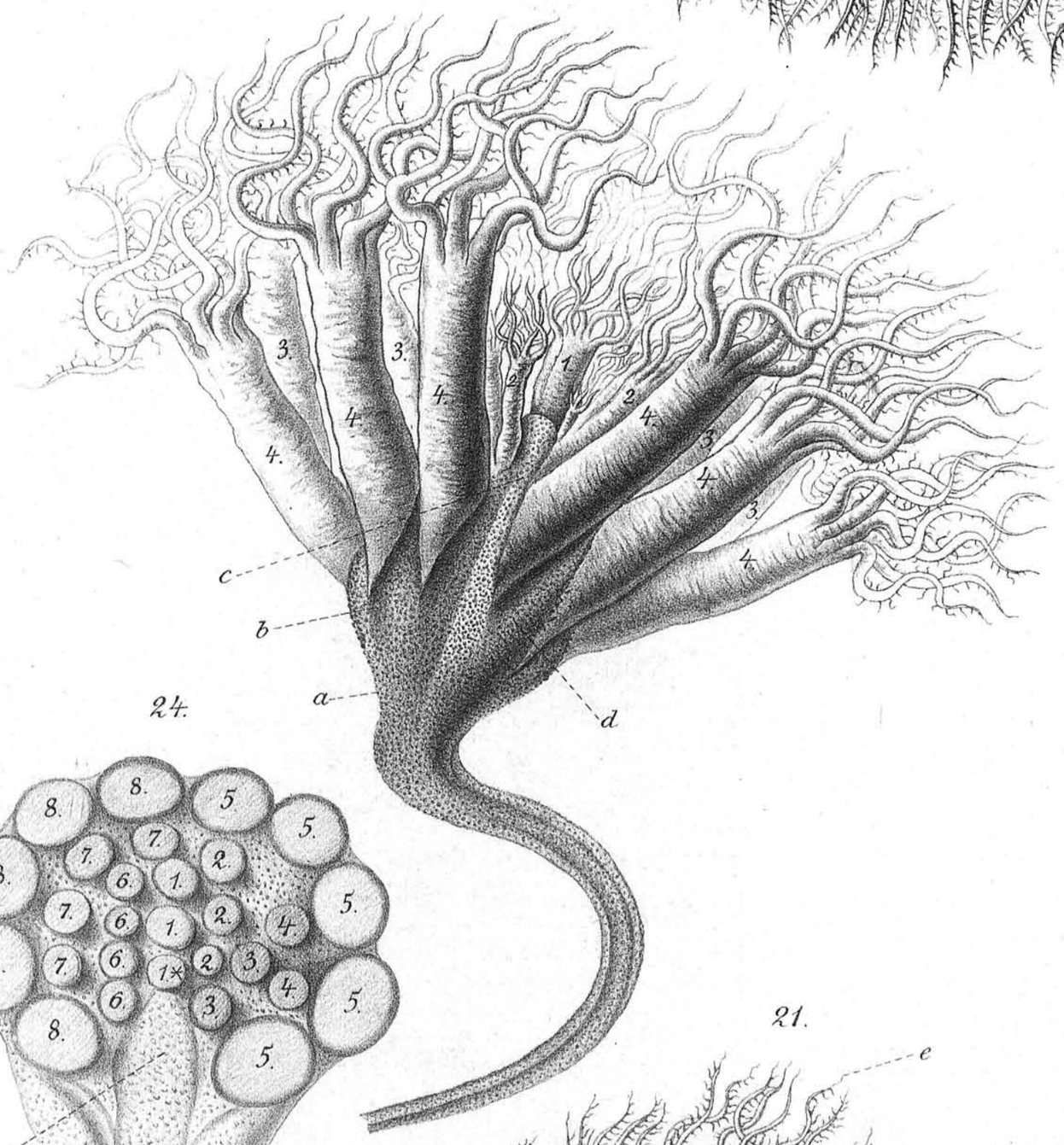

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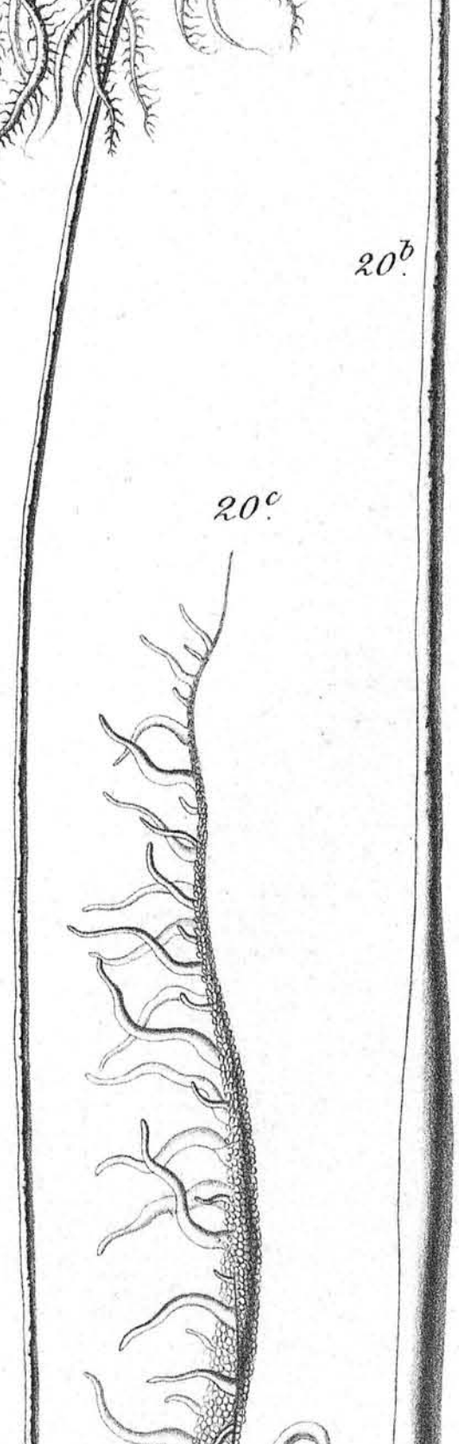

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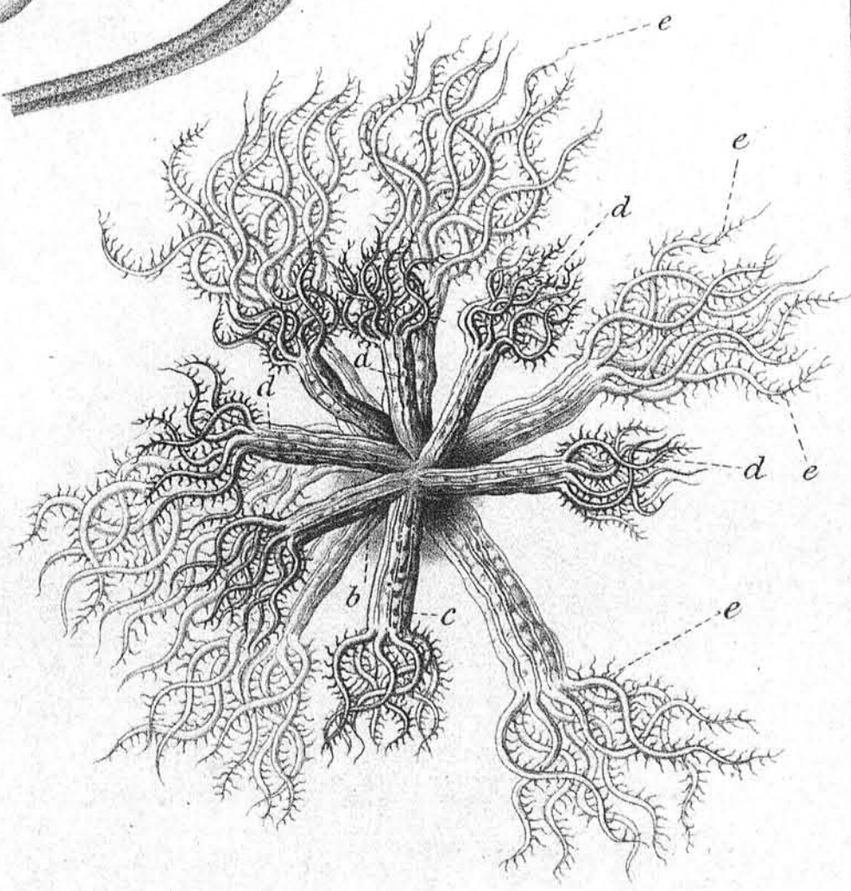

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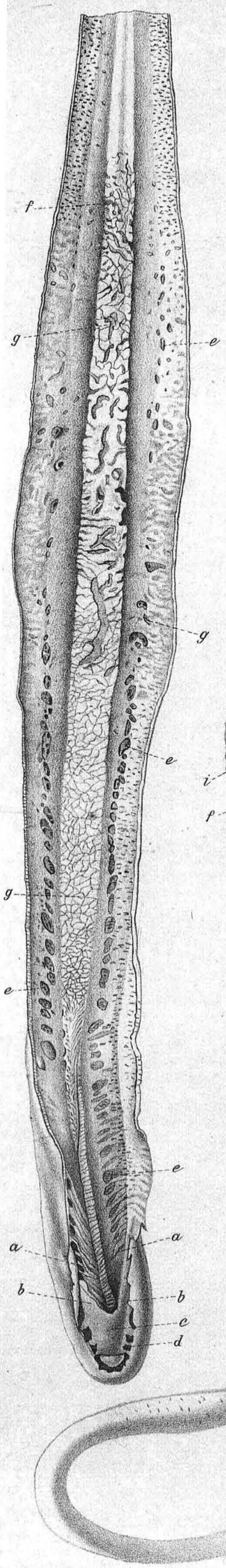

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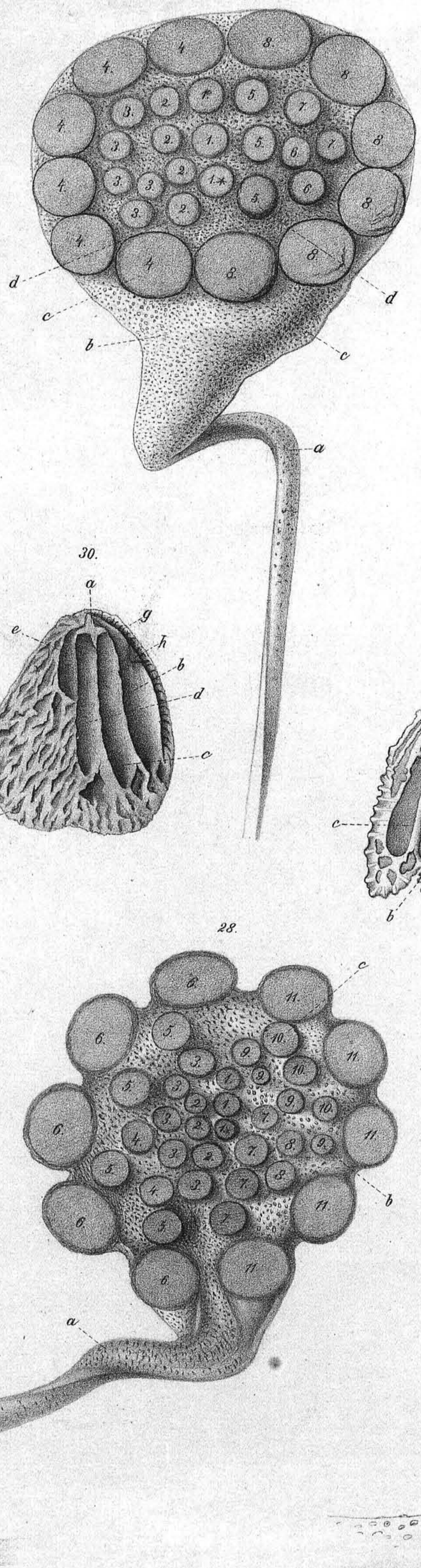

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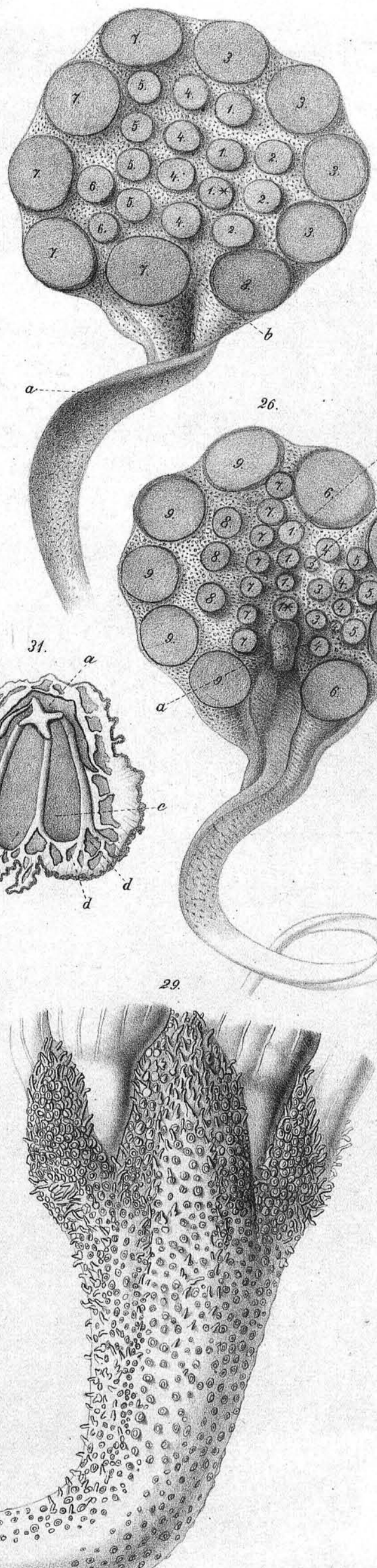

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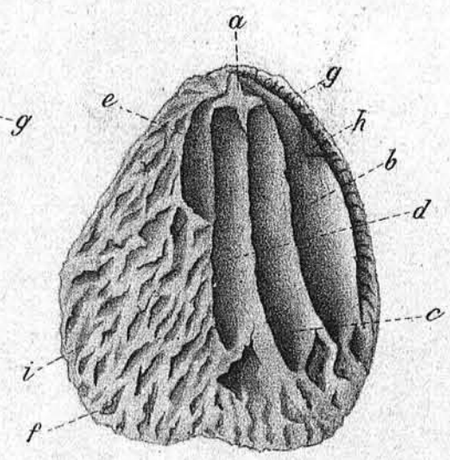

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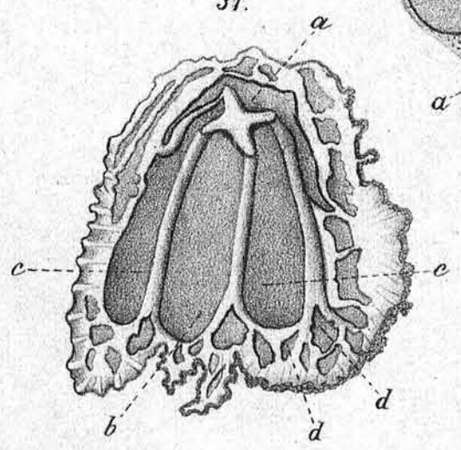

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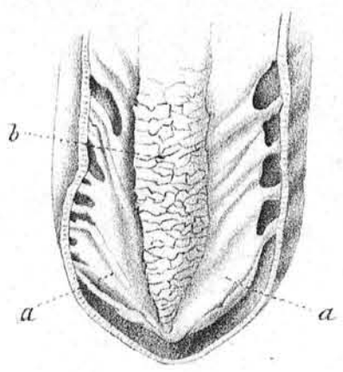

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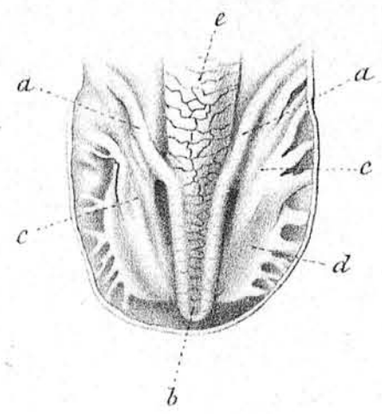

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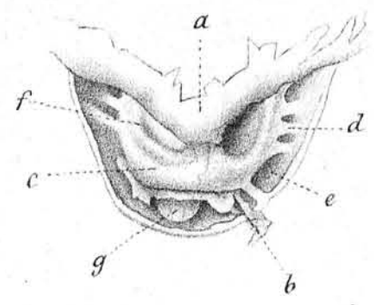

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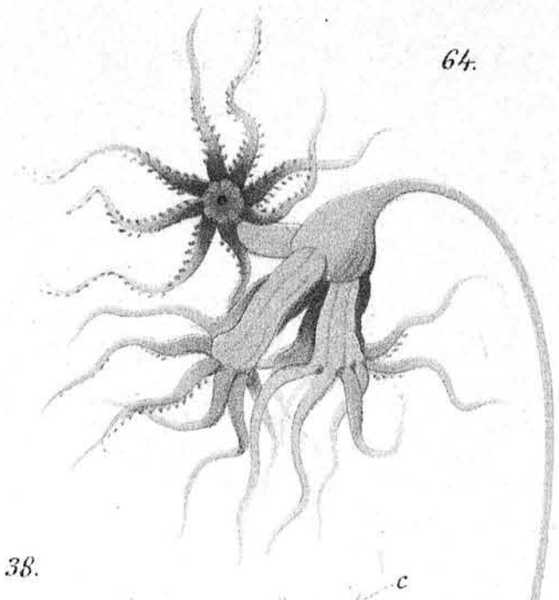

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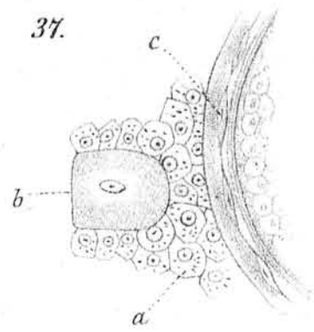

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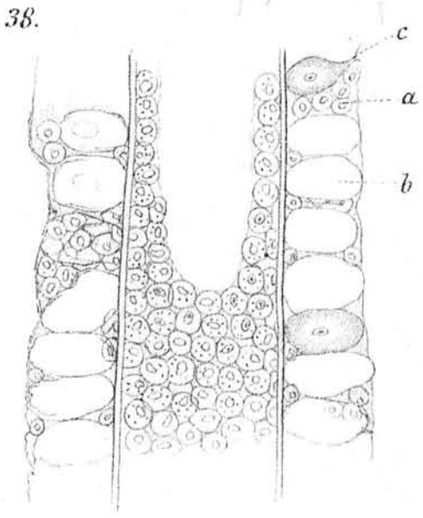

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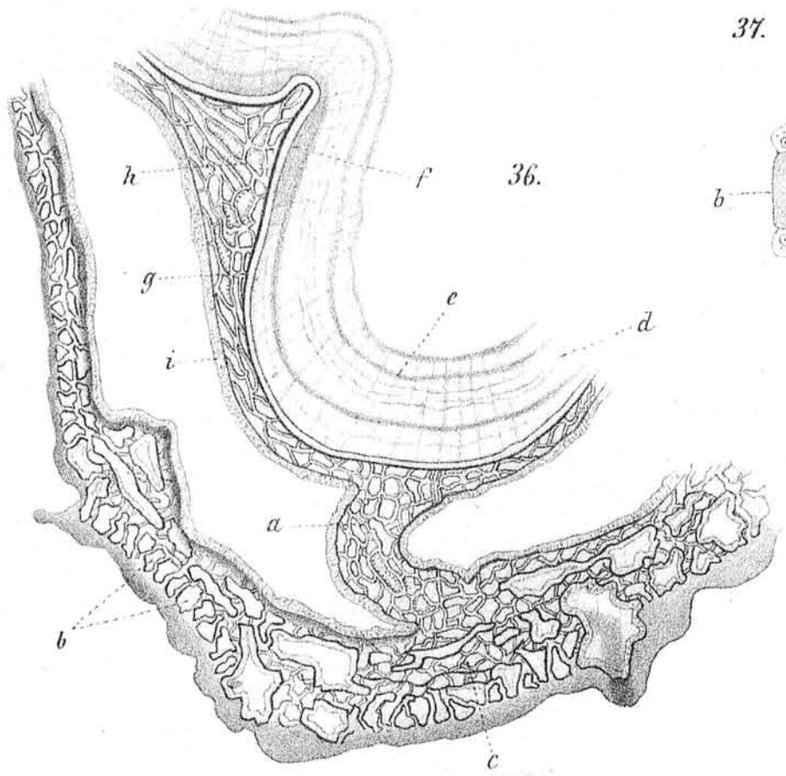

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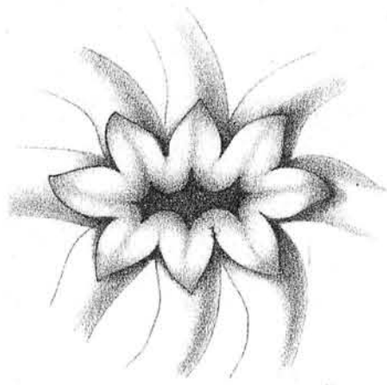

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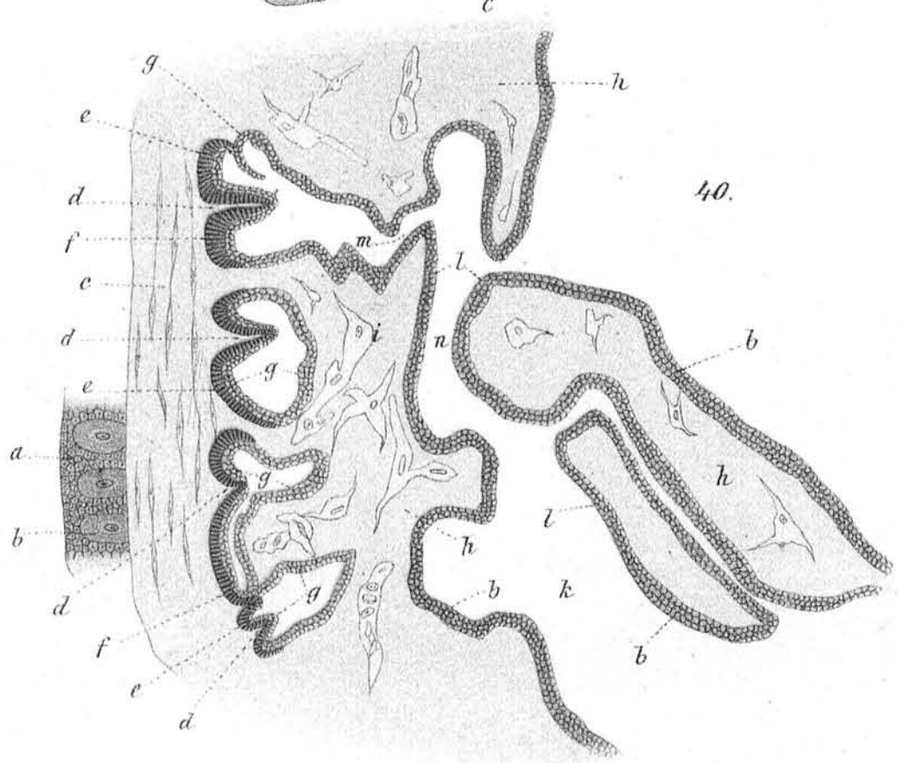

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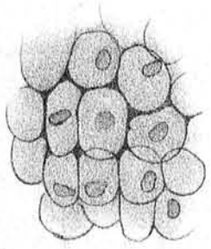

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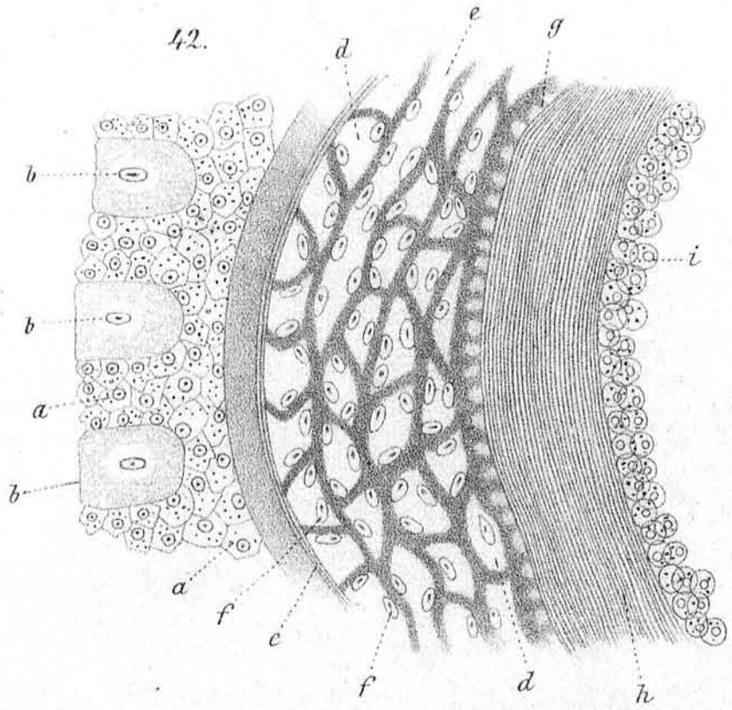

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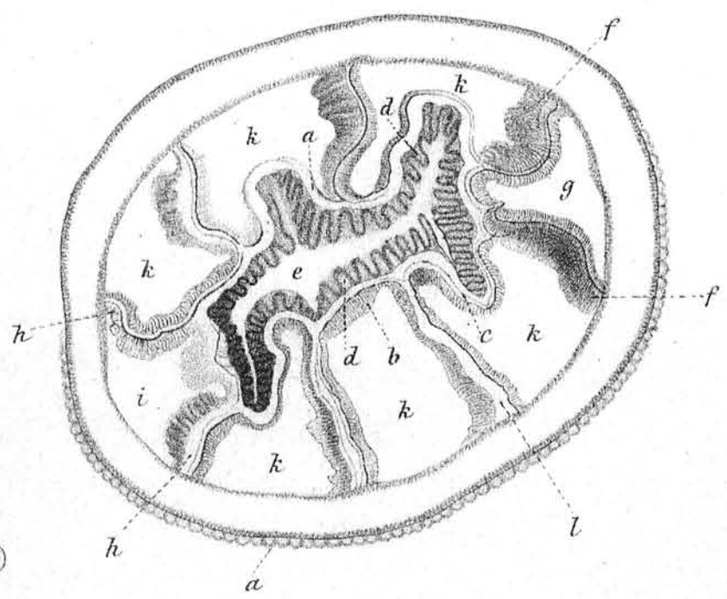

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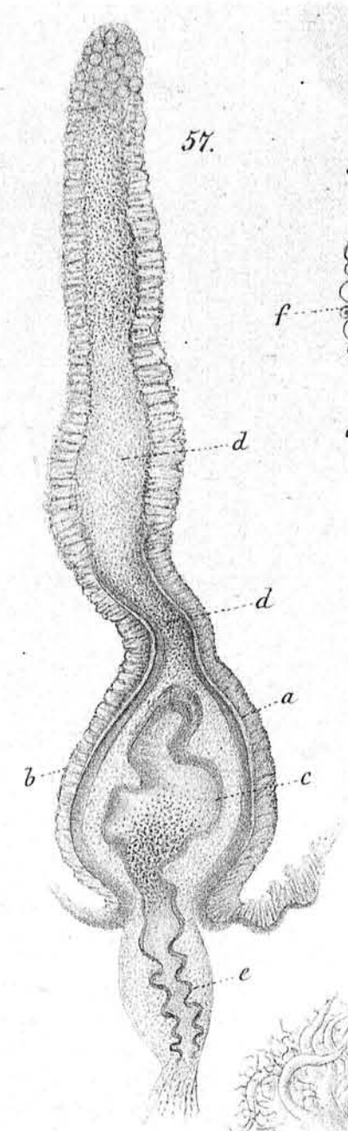
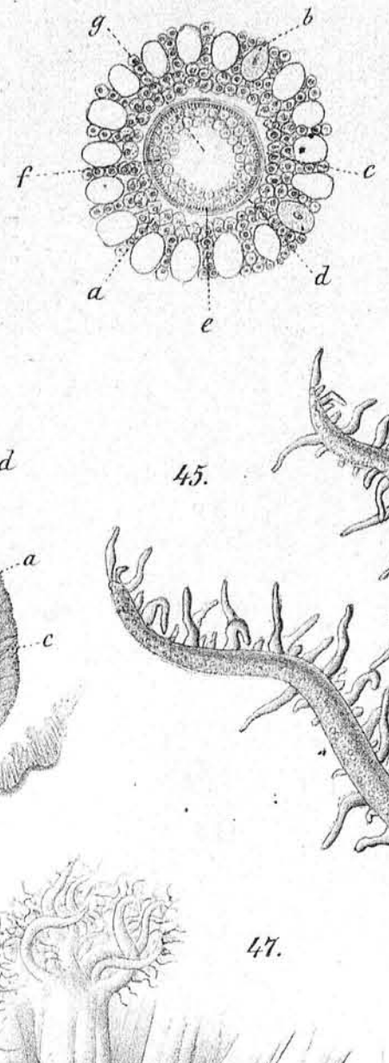
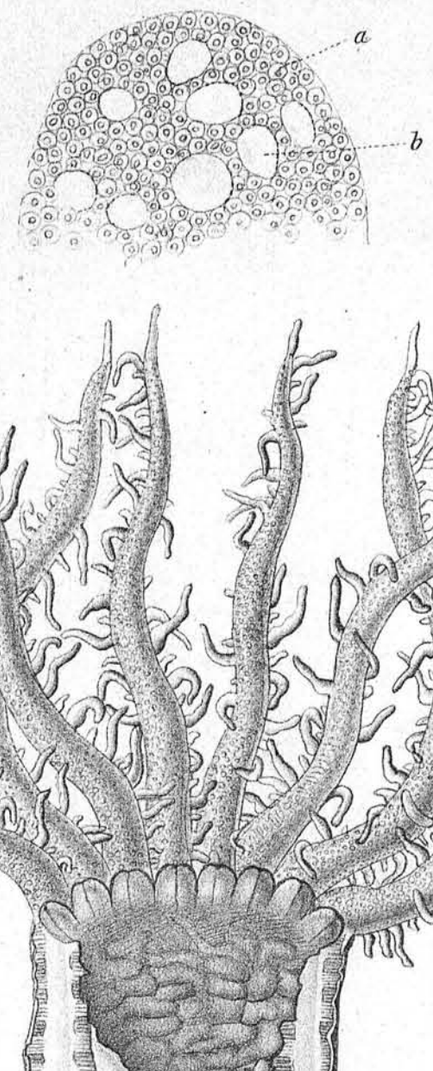
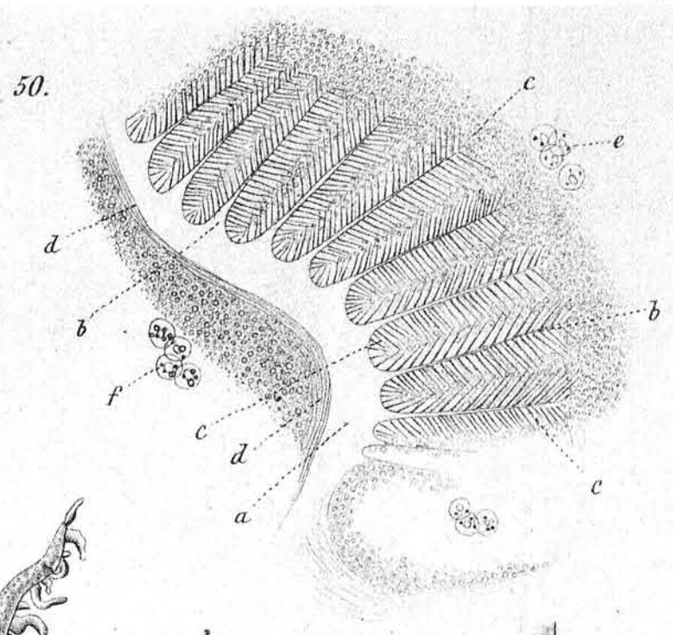
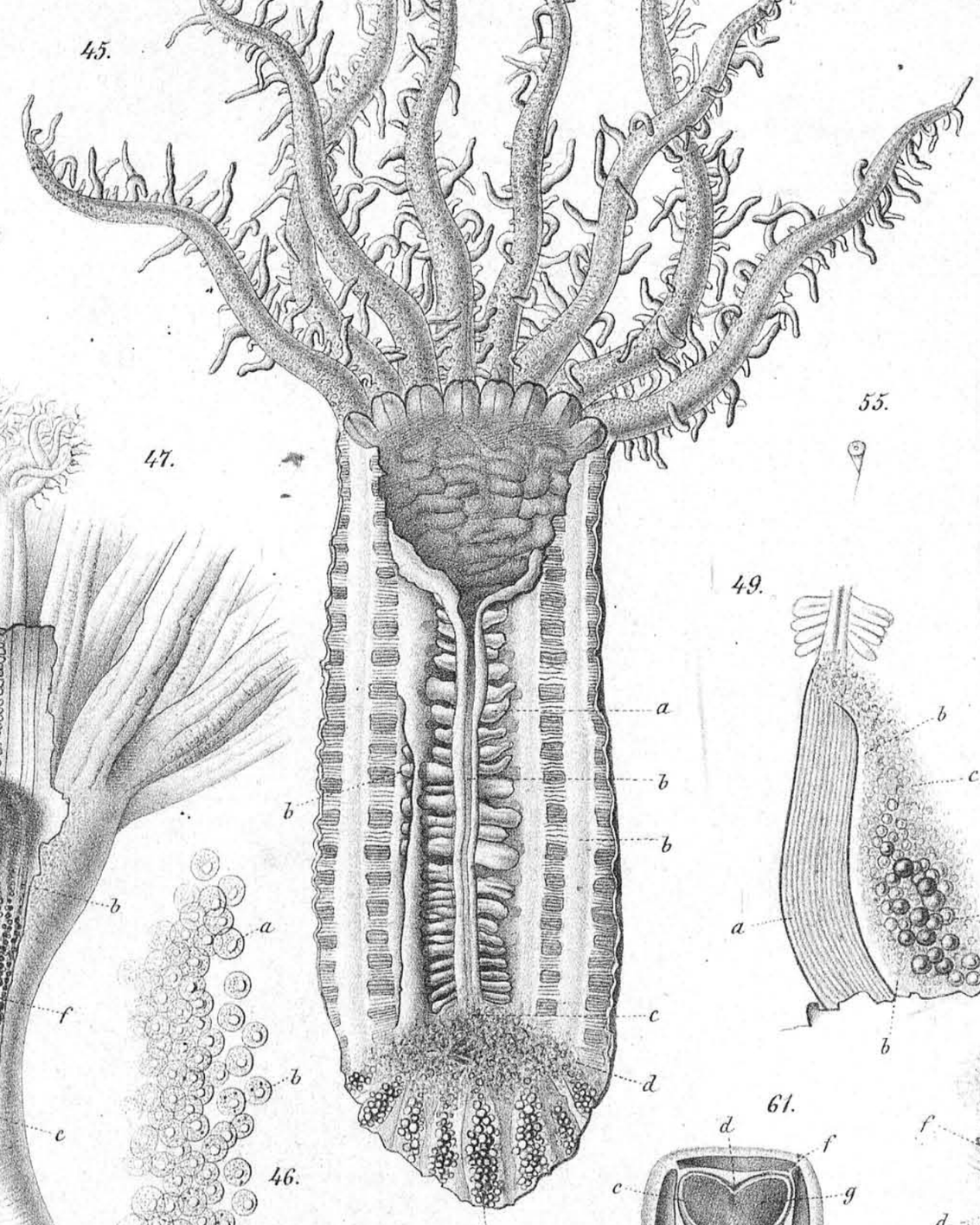
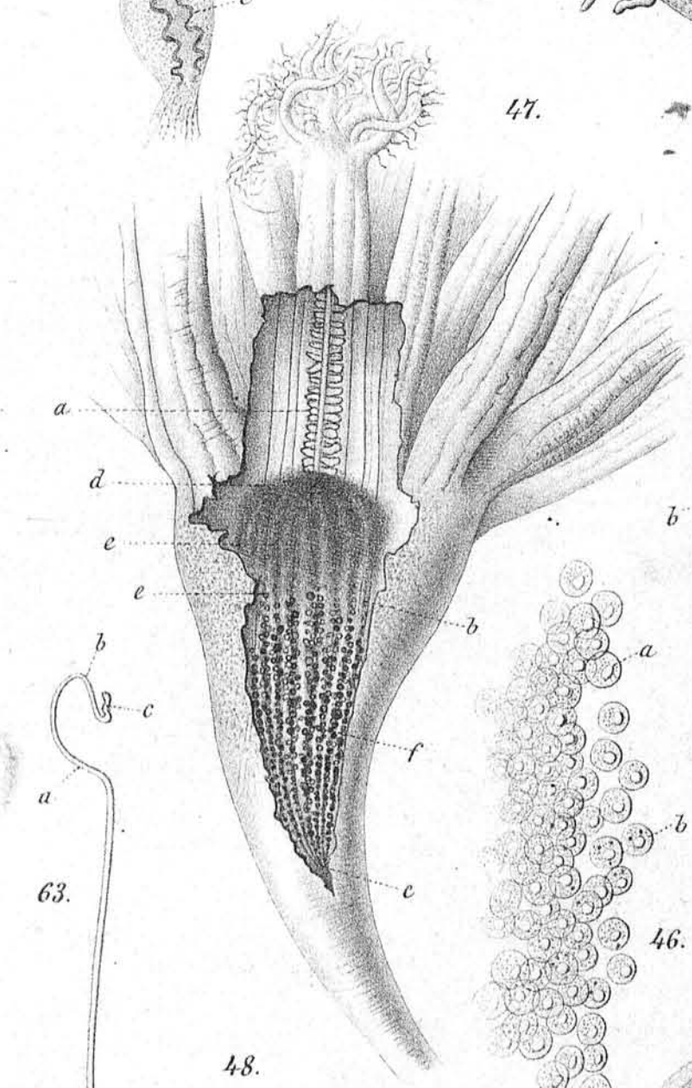


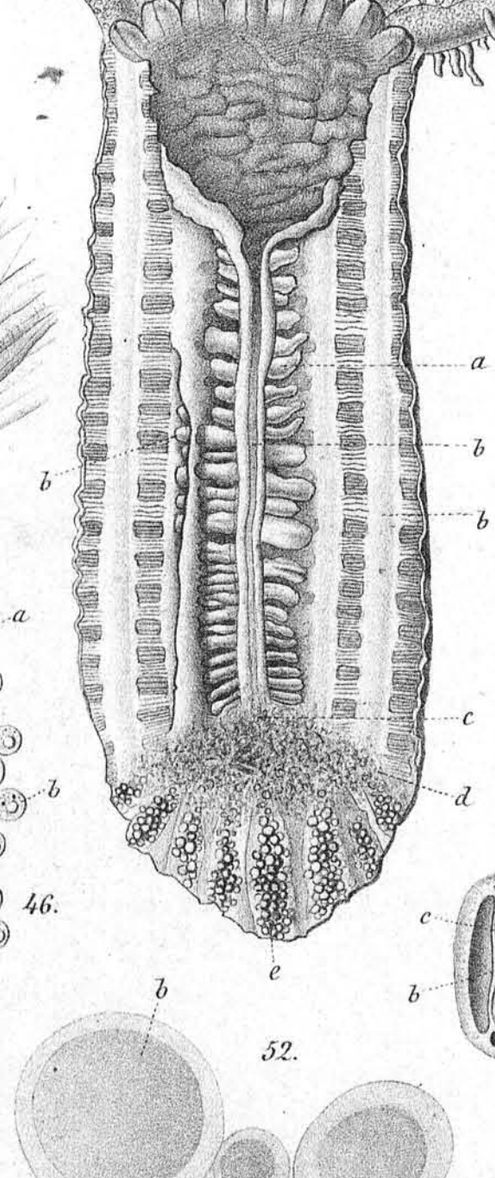


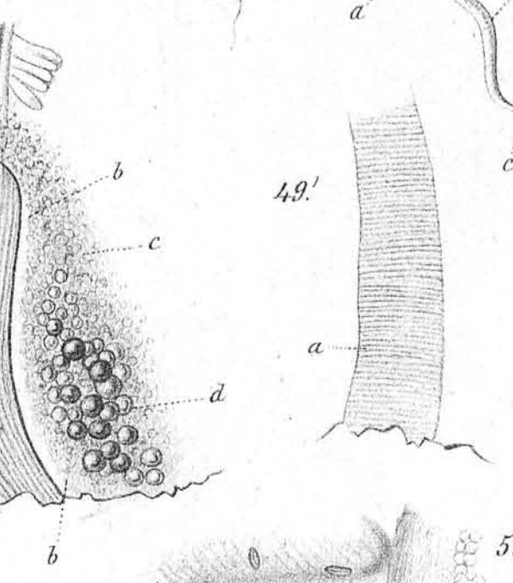


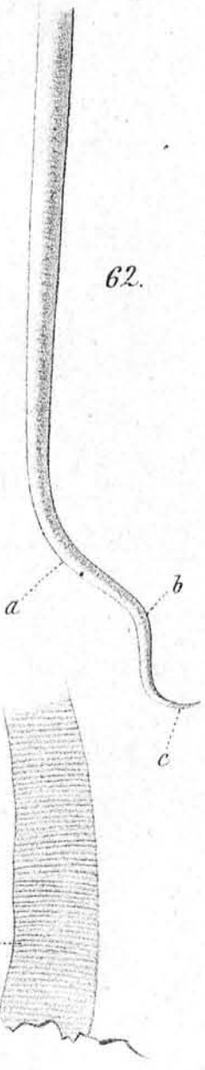


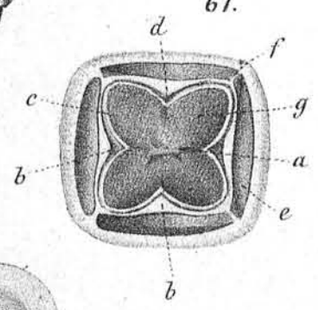


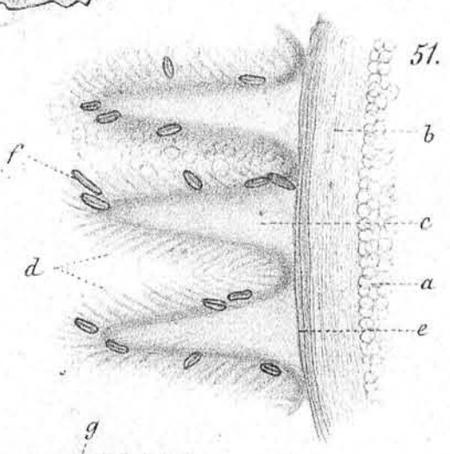


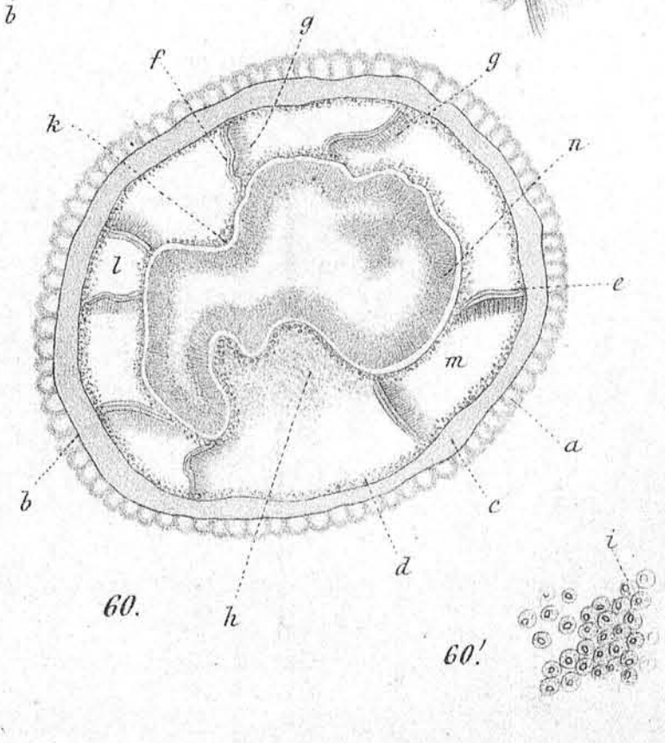


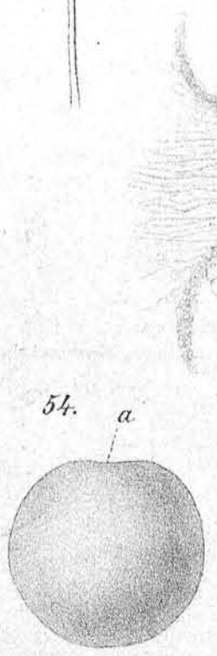


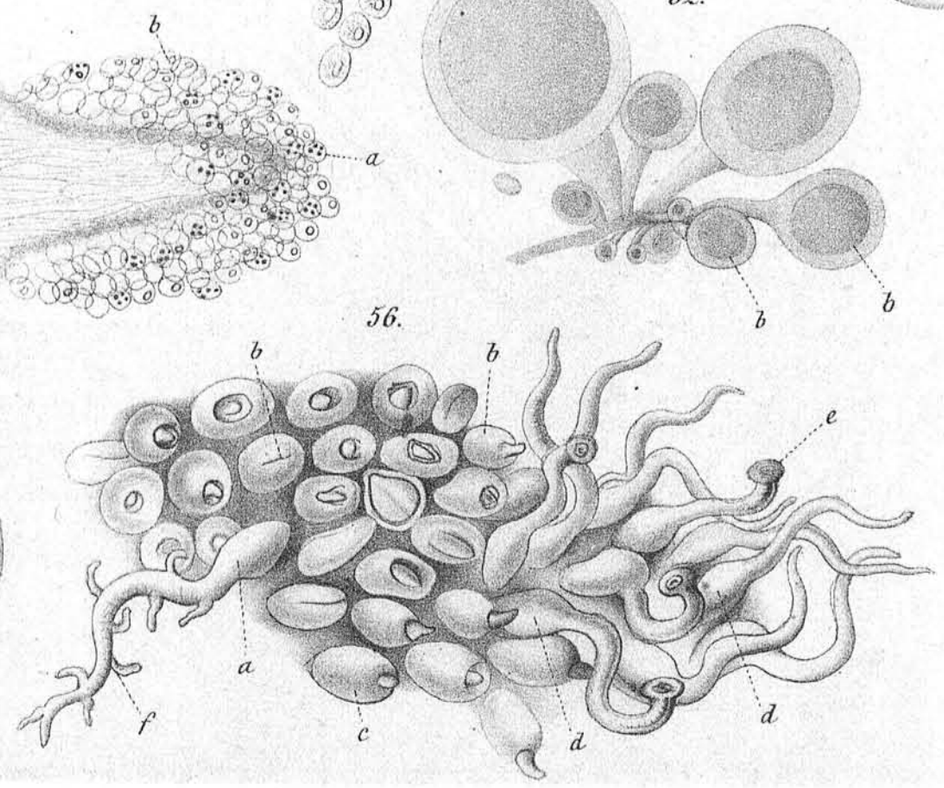








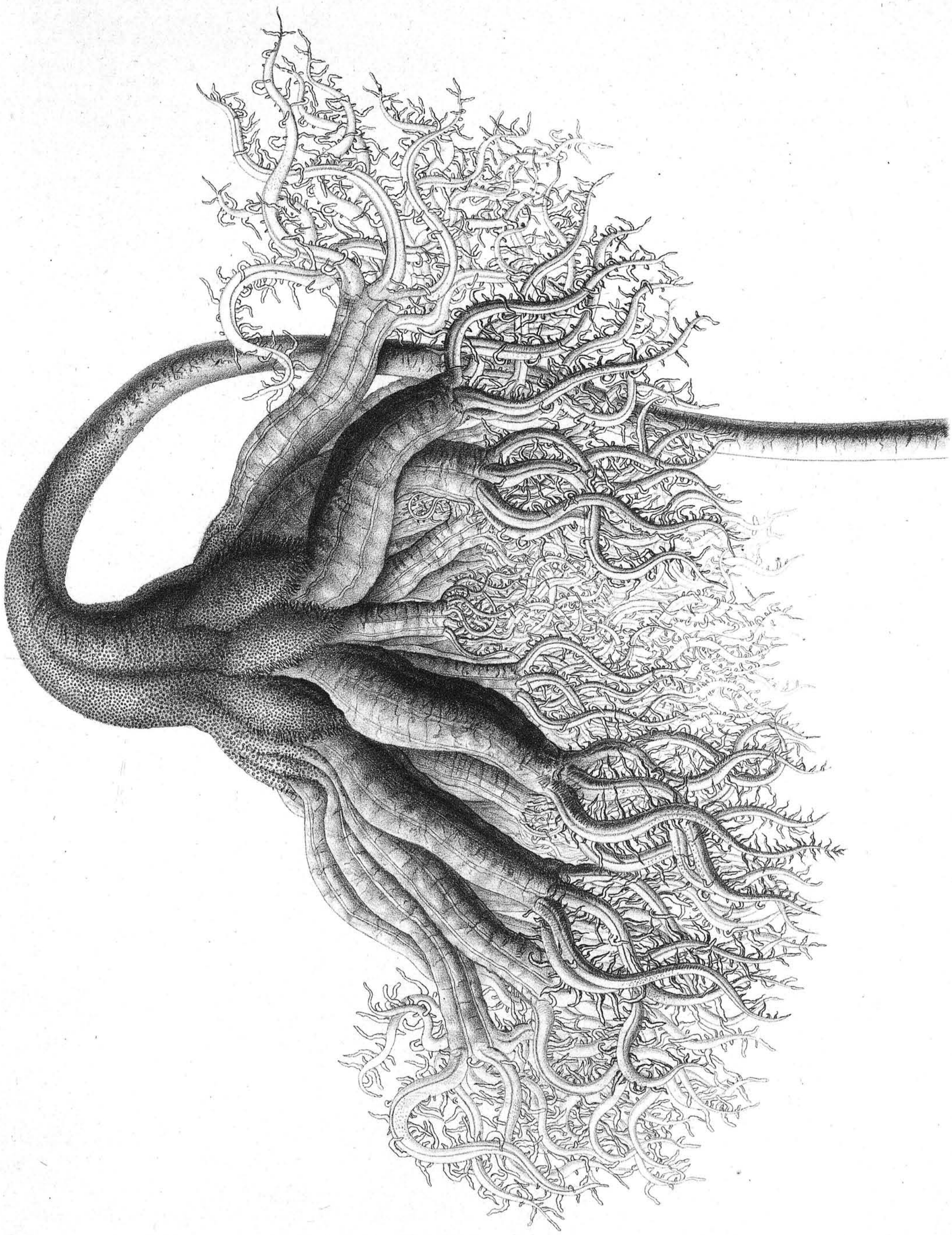




H. Bucher jun. del.

Lith. Anst. v. J. G. Bach, Leipzig.

Umbellula encrinus, Linné.



H Bucher, jnr. del. Lith Anst v. J.G.Bach Leipzig

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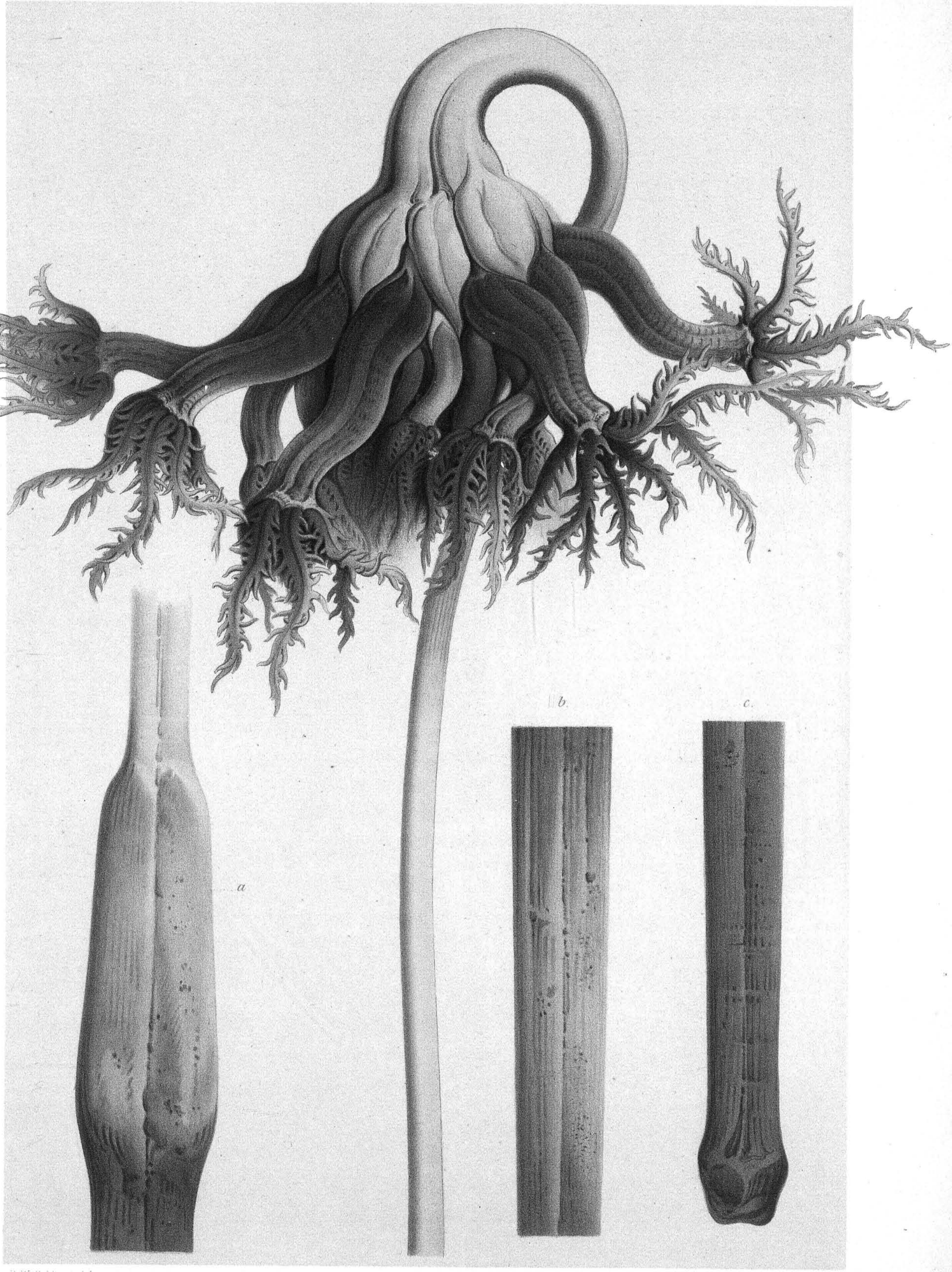


F. W. Schiertz. del. Lith. Anst v. J. G. Bach, Leipzig.

Umbellula encrinus, Linné.

Norske Nordhavs-Expedition.

Zoologiske Stationer.

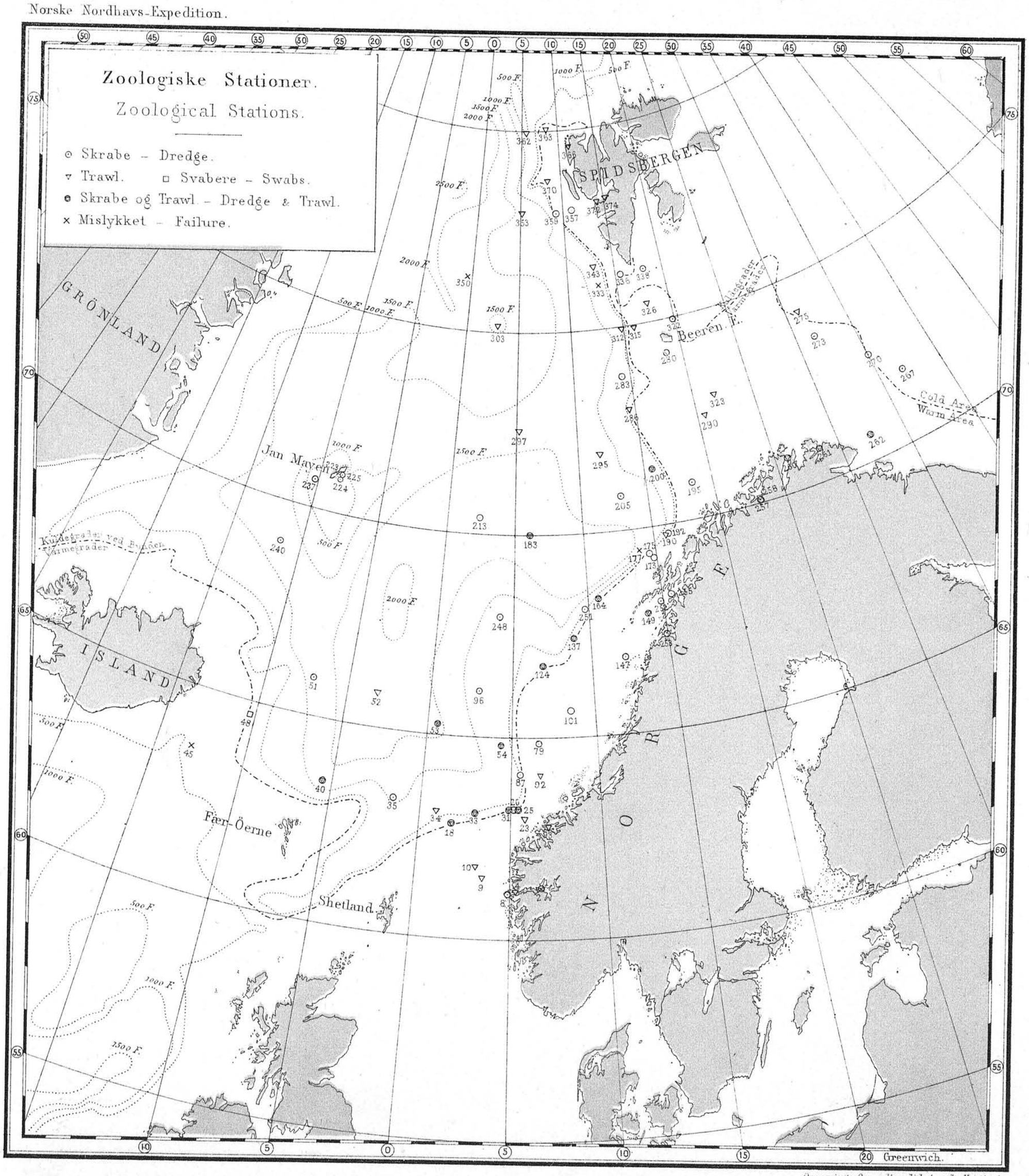
Zoological Stations.

⊙ Skrabe – Dredge.

▽ Trawl. □ Svabere – Swabs.

⊙▽ Skrabe og Trawl – Dredge & Trawl.

× Mislykket – Failure.



Den private Opmaalings Kth. Anstalt. Kristiania.