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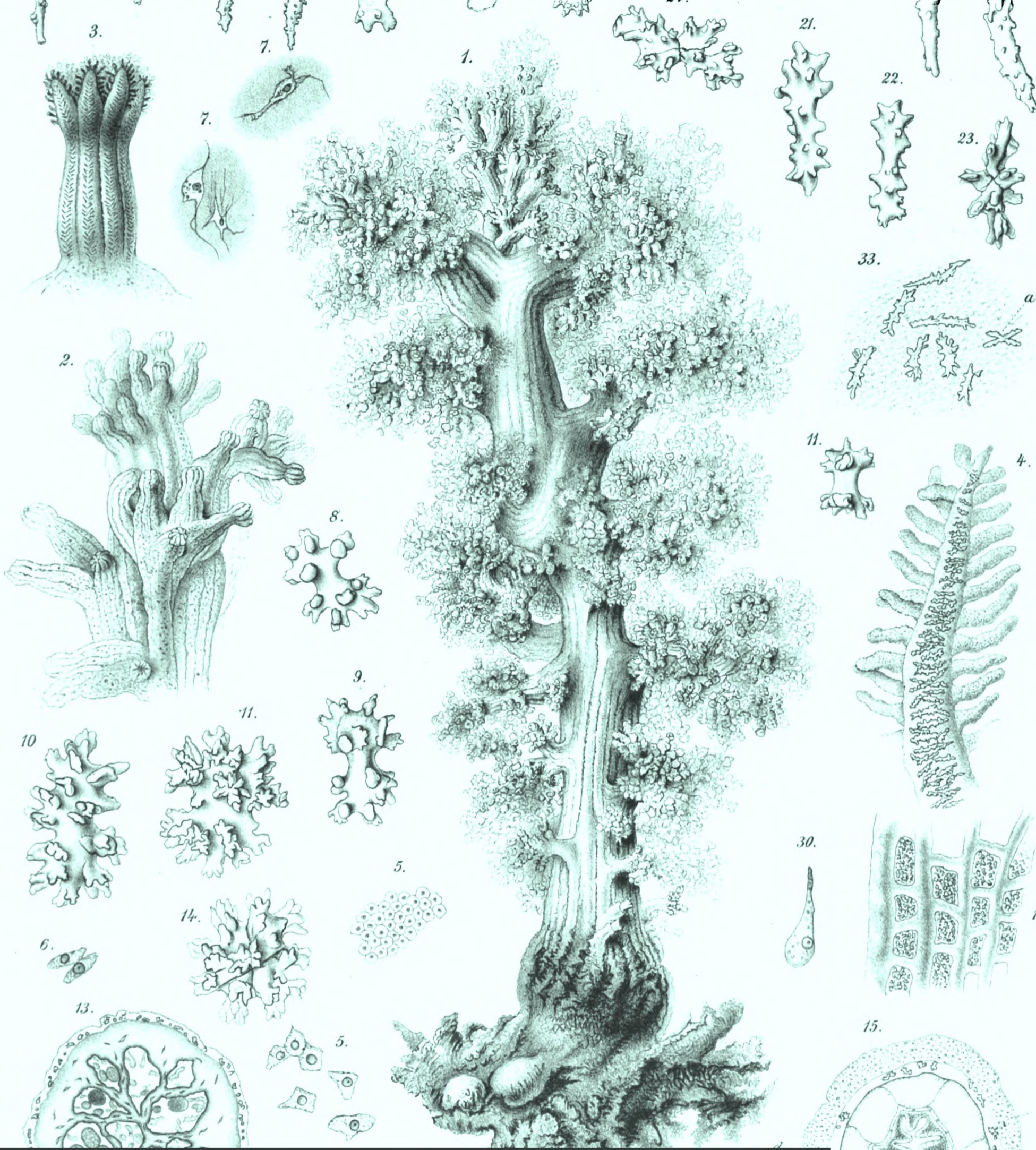
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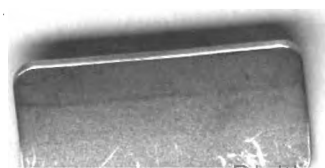
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*Den Norske
Nordhavs-expedition, 1876-1878*





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DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

5. BIND.

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

FEMTE BIND.

ZOOLOGI.

Alyonida	ved	D. C. Danielssen.
Actinida	ved	D. C. Danielssen.
Crinoida	ved	D. C. Danielssen.
Echinida	ved	D. C. Danielssen.
Ophiuroidea	ved	J. Grieg.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

FIFTH VOLUME.

ZOOLOGY.

Aleyonida	by D. C. Danielssen.
Actinida	by D. C. Danielssen.
Crinoida	by D. C. Danielssen.
Echinida	by D. C. Danielssen.
Ophiuroidea	by J. Grieg.

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SIO

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

ALCYONIDA.

VED

D. C. DANIELSSEN.

MED 23 PLANCHER OG 1 KART.



CHRISTIANIA.

GRØNDAHL & SØNS BOGTRYKKERI.

1887.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

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ZOOLOGY.

ALCYONIDA.

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WITH 23 PLATES AND 1 MAP.



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Forord.

De paa den norske Nordhavsexpedition indsamlede Alcyonider ere udelukkende Dybvandsformer, bløde Koraldyr, som for Størstedelen leve i det iskolde Vand. De danne 9 nye Slægter, der alle ere henførte til Underfamilien Alcyoninae, 33 nye Arter, hvoraf 2 tilhøre Slægten *Clavularia*, 1 Slægten *Sympodium* og 1 Slægten *Nidalia* (Gray), samt endelig en ny Underfamilie, *Organinae*, med en ny Slægt og Art.

Af Alcyonariernes store Dyregruppe tør vel Alcyoniderne være den, der er mindst udførligt bearbejdet af Nutidens Zoologer, uagtet de baade ved sine elegante Former og skønne Farver kunne være tiltrækkende nok. Men de ere meget fine, trække sig let sammen, forandre derved sin Form og ere tildels meget vanskelige at holde længere Tid ilive, efterat de have forladt deres naturlige Hjem; især gjælder dette sidste Dybvandsformerne, hvilket Alt gjør, at der til Observationerne knytte sig mange Vanskeligheder, som blive alt større og større, jo længere Dyrene have været opbevarede i Alcohol.

Ihvorvel jeg som Medlem af den norske Nordhavsexpedition var den, der indsamlede de nævnte Koraldyr, og saaledes havde Anledning til at observere dem levende, maa jeg dog tilstaa, at de Observationer, jeg ombord kunde anstille med Hensyn til disse Dyr, vare yderst ufuldkomne. Skibets Bevægelse, der ofte var meget stærk, gjorde, at de Dyr, som kunde trække sig sammen, holdt sig indtrukne i mange Dage, saa jeg blev nødsaget til at kaste dem i Alcohol, for at de ikke skulde gaa tilgrunde; selv de Dyr, der ikke vare retraktile, bøiede dog sine Tentakler saa stærkt ind mod Skiven, at denne ganske blev skjult, og da de efter flere Dages Forløb (indtil 10 Dage) ikke længere viste noget Livstegn, maatte ogsaa disse opbevares paa Alcohol uden at være tilfredsstillende observeret.

Den mere indgaaende Undersøgelse af Materialet er saaledes hovedsagelig foretaget paa Spiritusexemplarer, og det
Den norske Nordhavsexpedition. D. C. Danielsen: Alcyonida.

Preface.

The Alcyonids collected during the Norwegian North-Atlantic Expedition are exclusively deep-sea forms; soft coral animals, that principally exist in the ice-cold waters. They form 9 new genera, which are all assigned to the subfamily Alcyoninae; 33 new species, of which two belong to the genus *Clavularia*, one to the genus *Sympodium*, and one to the genus *Nidalia* (Gray) and, finally, a new subfamilæ *Organinae*, with a new genus and species.

Of all the extensive animal-groups of the Alcyonaria, that of the Alcyonids is probably the one least minutely treated by modern Zoologists, notwithstanding that, both by their elegant forms and beautiful colours, they are sufficiently attractive. They are however very delicate, quickly shrink together, changing, thus, their form, and are often very difficult to retain any length of time alive after removal from their natural home; this last feature is specially applicable to the deep-sea forms; all this combines to surround the observations with difficulties, which become greater and greater the longer the specimens have been preserved in alcohol.

Although I was the member of the Norwegian North-Atlantic Expedition who collected the coral animals referred to, and had thus the opportunity of observing them alive, yet I must confess that, the observations I could undertake on board ship, in relation to these animals, were highly incomplete. The tossing of the ship, which frequently was very great, caused those animals capable of shrinking together to remain contracted for many days, so that at last I was obliged to place them in alcohol in order that they might not be altogether lost. Those animals, even, that were not retraktile still curved their tentacles so greatly in to the disk that it was completely hidden, and as after the lapse of several days (as many as 10 days), they no longer showed signs of life, they also required to be placed in alcohol without having been satisfactorily observed.

The more detailed examination of the material is, therefore, undertaken with the specimens preserved in

tør derfor være tilgiveligt, om Arbeidet i flere Henseender bliver mangelfuldt. Den Hjælp, jeg havde ventet mig af min nu afdøde Ven og Medarbejder, Dr. Johan Koren, svigtede. Allerede for henved 4 Aar siden blev han som Følge af en Hjerneapoplexie lammet i høire Arm og sygnede efterhaanden hen, saa at han intet Arbeide egentlig kunde udføre fra den Tid.

I systematisk Henseende har jeg væsentligst fulgt H. Milne-Edwards System i „Histoire naturelle de Coralliaires”, der i sit Princip forekommer mig at være baade naturligt og hensigtsmæssigt, omendskjønt jeg vel har indseet, at det trænger til en gennemgaaende Omordning for ret at tilfredsstille Tidens Krav. Men jeg mener, at førend Alcyoniderne have været underkastede en gennemgribende Revision paa Basis af den nyere Forskning med dens Hjælpemidler, og førend et større og nyere Material er tilveiebragt, vil ethvert Forsøg paa at forandre den systematiske Ordning af Alcyonidernes Familie kun være et Lapværk. Ser man blot hen til Slægten Alcyonium, saa kan den i Sandhed betragtes som en Samlekasse, hvori mange, temmelig heterogene Dyr inden Familien ere blevne henkastede, uden at man har holdt sig til de for Slægten opstillede Karakterer.

Jeg har fundet det nødvendigt at benytte de anatomisk-histologiske Fund som Hjælpemidler til Bestemmelsen saavel af Slægter som Arter; udelukkende at lægge dem til Grund for en systematisk Inddeling har jeg ikke trøstet mig til, da Materialet dertil ei har været omfattende nok.

Saavel Spiklernes Form som deres Anordning og Lokaliseringen har jeg benyttet ved Diagnoserne; de have afgivet baade for Slægter og Arter, væsentligst for de sidstes Vedkommende, ret gode Karakterer, og de ville faa en endnu større Betydning som karakteristiske Kjendetegn, efterhaanden som Studiet af Alcyonidernes Familie fremmes i den Retning. Undersøgelserne ere jo meget majsommelige, men de lønne sig dog tilsidst.

Saavidt mig bekjendt har der hidtil ikke været paavist noget Nervesystem hos Alcyoniderne, og hvad jeg med Hensyn hertil har fundet, er jo langt fra noget udtømmende, — det er kun Antydninger til et Nervesystem, som fremtidige Undersøgelser paa levende Dyr nok vil komplettere. Kun hos en Slægt og det kun hos en af dens Arter, nemlig *Veringia mirabilis*, har det lykkedes mig at paa-vise paa den øverste Del af Svælgets Bugflade en Gruppe store Ganglieceller med en protoplasmarig Udløber, og under disse, særegne mindre, runde, klare Celler, samt yderst fine Fibriller, der alt synes at tilhøre Nerveapparatet, se Side 7.

Paa samtlige de Arter, jeg har undersøgt, har Svælgrøret (Øsophagus) paa dets indvendige Side, langs Bugfladen, en Grube, tapetseret med lange Pidskeceller. Alcyoniderne synes med Hensyn hertil at nærme sig Zoanthiderne, der heller ikke har mere end en Svælgrube, imedens som bekjendt Actinierne have to. Hos en Slægt findes en særegen Differentieren af Svælgrøret, hvor-

alcohol, and it may therefore be pardoned if the work, in several respects, is faulty. The assistance I had hoped to receive, from my lately deceased friend and collaborateur Dr. Johan Koren, failed me. Already, nearly four years ago, he experienced a shock of paralysis which deprived him of the use of the right arm, and he gradually faded away, so that, from that time, he had not been able to undertake any real work.

In regard to system, I have principally followed that of H. Milne-Edwards in „Histoire naturelle de Coralliaires” which, in its principle, appears, to me, to be both natural and serviceable; although I have been well aware that it requires a thorough rearrangement in order to satisfy modern requirements. But I am of opinion that, until the Alcyonids have undergone a radical revision on the basis of subsequent research, and the assistance it affords; and until a more abundant and newer material has been obtained; every attempt to alter the systematic arrangement of the family of the Alcyonida will only be a patchwork. If we only look at the genus Alcyonium, it may truly be regarded as a repository in which many rather heterogeneous animals of the family have been placed, without the characteristics established for the genus being adhered to.

I have found it necessary to make use of the anatomical-histological discoveries as aids in the determination both of genera and species, but I have not ventured to adopt them, exclusively, as the basis of a systematic arrangement, as the material has not been sufficiently comprehensive.

I have employed in the diagnoses, both, the form of the spicules, as well as their arrangement and localisation; they have given, both for genera and species, but principally in respect of the last-named, particularly good characteristics, and they will obtain a still greater importance as characteristic features, according as the study of the family of the Alcyonida becomes advanced in that direction. The observations are, indeed, very troublesome but they eventually repay themselves.

So far as I am aware, there has not, yet, been shown any nervous system in the Alcyonids, and what I have found in regard to this is, indeed, far from exhaustive; it is only an indication of a nervous system which future examinations of living animals will certainly complete. Only in one genus, and only in one species of that, viz. *Veringia mirabilis*, have I been fortunate enough to point out, on the uppermost part of the ventral surface of the gullet, a group of large ganglial cells with a prolongation rich in protoplasm, and under these, peculiar, smaller, round, pellucid cells, and extremely slender fibrils, which all appear to belong to the nerve-apparatus, vide pag. 7.

In all the species I have examined, the gullet-passage (oesophagus) had, on its internal side along the ventral surface, a cavity (groove) coated with long flagelliform-cells. The Alcyonids appear, in regard to this to approach the Zoantids, which also have not more than one gullet-groove whilst as is well known the Actiniae have two. In one genus, a peculiar differentiation of the gullet-tube is found

ved dettes Hulhed deles efter Længden paa en saadan Maade, at Svælgrenden danner det egentlige Svælg (Œsophagus), imedens den øvrige Del kan betragtes som Tarm, se Side 102.

Svælget er rigt forsynet med encellede Slinkjertler, der forøvrigt findes i stor Mængde paa Polypkroppens udvendige Flade hos alle de undersøgte Arter.

Der har været sagt, at Alcyoniderne fremstille et Ideal for den Kommunisme, hvor ingen Arbejdsdeling finder Sted; men jeg tror ikke, dette forholder sig ganske saa. Hos flere Arter af Slægten *Nephthya* har jeg fundet en virkelig Arbejdsdeling, idet flere Polyper i Kolonien staa udelukkende i Formerelsens Tjeneste. Saasnt Befrugtningen er foregaaet, bøies Tentaklerne ind mod Munden, der lukkes af en seig Slim, og Svælgrøret omdannes til en Uterus, hvori Udviklingen foregaar; i denne Svangerskabsperiode ernæres de befrugtede Polyper af andre i Kolonien, se Side 82.

Det er ogsaa hos Slægten *Nephthya*, jeg har kunnet anstille nogle Iagttagelser over Udviklingen og derved for en Del konstatere Kowalevsky's & Marion's Undersøgelser over Udviklingen af *Sympodium coralloides* samt af *Clavularia crassa* og *petricola*.

Bergen, i Juni 1886.

D. C. Danielssen.

by which its channel is longitudinally divided, in such a manner that, the gullet-groove forms the real gullet (œsophagus) whilst the remaining part may be regarded as an intestine, vide pag. 102.

The gullet is richly supplied with unicellular mucous glands, which, also, are found in great abundance on the external surface of the polyp, in all the species examined.

It has been said that the Alcyonoids furnish an ideal of Communism, where no division of labour takes place, but I do not think this is quite the case. In the genus *Nephthya* I have, in several species, found a genuine division of labour, inasmuch that, several polyps of the colony stand exclusively in the reproductive service. As soon as the fructification has taken place the tentacles become curved in towards the oral aperture, which becomes closed by a viscid mucous. The gullet-tube becomes transformed into a uterus where the development proceeds; during this gravid period the fructified polyps are nourished by others of the colony, vide pag. 82.

It is, therefore, in the genus *Nephthya* that I have been able to make a few observations upon the development and, thereby, to a certain extent, confirm Kowalevsky's and Marion's observations on the development of *Sympodium coralloides* and of *Clavularia crassa* et *petricola*.

Bergen, June 1886.

D. C. Danielssen.

Zoologiske Stationer. (Zoological Stations.)											
Station No.	Datum. (Date.)	Nordlig Breddede. (North Latitude.)		Længde fra Greenwich. (Longitude.)		Dybde. (Depth)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Seabs.)
		Engl. Favne. (Fathoms.)	Meter. (Metres.)	Engl. Favne. (Fathoms.)	Meter. (Metres.)						
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.	Sabulous Clay, 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	Mørkegraat 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	Blødt 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	Sandholdigt 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 sabulous Clay	S.		
(Jan Mayen).											
224	" 1	70 51	8 20 W.	95	174	-0.6	Graasort Sandler.	Dark-grey sabulous Clay	S.		
225	" 2	70 58	8 4 W.	195	357	-0.6	Graasort Sandler.	Dark-grey sabulous Clay	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.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Sweabs.)
				Engl. Favne. (Fathoms.)	Meter. (Metres.)				
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12'	15° 40' E.	341	624	6.05	Ler.	Clay.	S.
		(Vestfjord).							
257	(June) 21	70 4	23 2 E.	160	293	3.9	Ler.	Clay.	S.
		(Altenfjord).							
258	" 21	70 13	23 3 E.	230	421	4.0	Ler.	Clay.	T.
		(Altenfjord).							
260	" 24	70 55	26 11 E.	127	232	3.5	Ler.	Clay.	S. T.
		(Porsangerfjord).							
261	" 25	70 47	28 30 E.	127	222	2.8	Ler.	Clay.	S. T.
		(Tanafjord).							
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.	35	64	1.1	Sten.	Stones.	S.
		(Beeren Eiland).							
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.
		Magdalene Bay.							
370	" 18	78 48	8 37 E.	109	199	1.1	Ler.	Clay.	T.
372	" 19	78 9	14 7 E.	129	236	1.2	Ler.	Clay.	T.
		(Isfjord).							
374	" 22	78 16	15 33 E.	60	110	0.7	Ler.	Clay.	T.
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Familie Alcyonida.

Underfamilie Alcyoninæ.

Vøringia mirabilis, n. g. et n. sp.

Tab. I, Fig. 1—40. Tab. II, Fig. 1—2.

Zoanthodemets Stamme er indtil 200^{mm} høi, 30^{mm} bred nede ved Basaldelen og aftager noget i Tykkelse opad, saa at dens øverste Del er omtrent 20^{mm} bred. Den er rund, har et glat Udseende og er dybt riflet efter Længden som Følge af de stærkt udprægede Længdekanaler, Fig. 1. Basaldelen er meget udvidet og omfatter membranagtigt de Gjenstande, hvortil den er fæstet, Fig. 1. Stammen er rundtom tæt besat med Grene. Nederst ved Basaldelen udspringe enkelte Polyper direkte fra Stammen, Fig. 1.

Grenene have en forskjellig Længde og Tykkelse; de nederste ere meget korte, udelte og for Størstedelen tæt besatte med Polyper, Fig. 1; efterhaanden som de naa længere op paa Stammen tiltage de baade i Længde og Tykkelse, saa at de paa Midten ere længst, indtil 35^{mm} lange og 10—12^{mm} brede ved Grunden, men aftage noget op imod den øverste Del, Fig. 1. Fra disse Grene udskyde overalt, lige fra deres Udspring og til Enden, en stor Mængde tætstaaende Smaagrene, der ere saa tæt besatte med Polyper, at saavel Grenene som Smaagrenene skjules ganske, Fig. 1. 2.

Smaagrenene dannes egentlig af de förlængede Polypkroppe, idet disse samtlige udgaa fra Grenene, Fig. 2. Fra Stammens øverste Ende udspringe 3—4 Grene, tæt besatte med Polyper, Fig. 1. Saavel Stammen som Grenene ere temmelig faste, næsten læderagtige og føles ru.

The Family Alcyonida.

Sub-section Alcyoninæ.

*Vøringia*¹ *mirabilis*, n. g. et sp.

Pl. I, figs. 1—40. Pl. II, figs. 1—2.

The stem of the Zoanthodem measures up to 200^{mm} in height, whilst it is 30^{mm} broad at the basal portion but diminishes somewhat in thickness upwards, so that the uppermost part is only about 20^{mm} broad.

It is cylindrical; has a smooth appearance, and is deeply grooved longitudinally, in consequence of the strongly prominent longitudinal ducts, (Pl. I, fig. 1).

The basal portion is much expanded, and embraces, membranaceously, the objects to which it is attached, (Pl. I, fig. 1). The stem is all around it closely beset with branches. Low down, at the basal portion, a few polyps shoot forth direct from the stem, (Pl. I, fig. 1).

The branches are of various lengths and thicknesses; the inferior ones are very short, non-furcate and, for the greater part, closely beset with polyps, (Pl. I, fig. 1). Gradually, as they shoot forth further up the stem, they increase both in length and in thickness, so that in the middle portion they become longest, measuring up to 35^{mm} in length, and 10—12^{mm} in thickness at the root, but diminish again, somewhat, up towards the uppermost part, (Pl. I, fig. 1). Quite from the root to the extremity of these branches there, everywhere, shoot out a multitude of closely-set branchlets which are so closely beset with polyps that both, the branches as well as the branchlets, are completely concealed, (Pl. I, figs. 1. 2).

The branchlets are in reality formed by the prolonged bodies of the polyps, as all of these proceed from the branches, (Pl. I, fig. 2). From the uppermost extremity of the stem, 3—4 branches closely beset with polyps proceed, (Pl. I, fig. 1). Both, the stem as well as the branches, are rather hard, almost coriaceous, and they feel rough to the touch.

¹ From "Vøringen", the name of the Norwegian North-Atlantic Expeditions Steamship.

Polyperne ere retraktile, cylindriske, vandklare, 12^{mm} lange. Kroppen er 8^{mm} lang og har paa sin udvendige Side 8 Linier, der dele den i 8 Længdefelter, hvert forsynet med 2 Rækker tæt paa hinanden liggende Spikler, Fig. 3. Tentaklerne ere 4^{mm} lange og have paa deres aborale Flade, lige til deres Spids, 2 Rækker Spikler, Fig. 3. 4.

Den nederste Del af Tentakelen er hyppigt blottet for Pinnuler; hvor disse ere tilstede, staa de meget spredte og ere meget smaa, Fig. 4. Pinnulerne ere uden Kalk.

Munden er aflang med lidt opsvulmede Læber.

Zoanthodemets anatomisk-histologiske Bygning.

Stammen er omgivet af et tykt Ectoderm, bestaaende af mange Lag Celler, der ere af lidt forskjellig Størrelse og Form. De yderstliggende ere polyædriske, 0.011^{mm} brede, have en tynd Membran, som indeslutter en rund Kjerne, 0.002^{mm} stor, forsynet med et Kjernelegeme og omgivet af en yderst sparsom Protoplasmamasse, saa at de have et næsten vandklart Udseende, Fig. 5. De indenfor liggende Celler ere mindre kantede, antage dels en rund, dels en aflang Form, ere fra 0.011—0.013^{mm} lange med en rund Kjerne, 0.002^{mm}, og Kjernelegeme, omgivet af et tættere, finkornet Protoplasma, Fig. 6. Disse Celler ere ikke saa klare som de, der findes i det ydre Lag.

Indenfor Ectodermet er et bredt, hyalint Bindevævslag, hvori sees en Mængde større og mindre Ernæringskanaler, der korrespondere med hverandre og ere beklædte med et Epithel, hvis Celler ere lidt aflange, have en rund Kjerne, indhyllet i Protoplasmaindholdet, Tab. II, Fig. 1, a. I de mindste af disse Saftkanaler er Lumenet ganske udfyldt af dette Epithel, Tab. II, Fig. 1, b, hvorom jeg i tidligere Afhandlinger over Pennatulider og Alcyonider har udtalt mig udførligt¹.

Imellem Saftkanalerne ligge spredte Bindevævslegemer, der ere dels aflange, dels kantede med en lidt aflang Kjerne og dens Kjernelegeme samt mange Udløbere, Fig. 7, som korrespondere med de tilgrændsende Celler. Disse Bindevævsceller staa med enkelte af sine Udløbere i direkte

¹ Fauna littoralis Norvegiæ; 3die Hefte.

Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Kyst, ved J. Koren og D. Danielssen. Pag. 2. Bergen 1883.

The polyps are retractile, cylindrical, and pellucid, and they measure 12^{mm} in length. The body is 8^{mm} long, and has, on its exterior side, 8 lines which divide it into 8 longitudinal areas, each of which is furnished with 2 series of spicules placed close to and upon each other, (Pl. I, fig. 3).

The tentacles measure 4^{mm} in length, and on their aboral surface, right up to their point, have 2 series of spicules, (Pl. I, figs 3. 4). The lowest part of the tentacle is frequently devoid of pinnules; when these are present they are placed much dispersed, and are very minute, (Pl. I, fig. 4). The pinnules are non-calcareous.

The oral aperture is oblong, with slightly tumified labiæ.

The Anatomico-histological structure of the Zoanthodem.

The stem is encompassed by a thick ectoderm consisting of many layers of cells, which are of somewhat variable size and form. Those lying on the extreme exterior are polyhedral, and measure 0.011^{mm} in breadth, and they have a thin membrane which encloses a round nucleus measuring 0.002^{mm} in diameter, furnished also with a nucleus body surrounded by an extremely sparing protoplasmic mass, so that they acquire an almost translucent appearance, (Pl. I, fig. 5). The cells, which lie inside, are not so polygonal, and they take, partly, a cylindrical, partly, an oblong form, and measure from 0.011—0.013^{mm} in length; they have a round nucleus measuring 0.002^{mm} in diameter, and a nucleus body surrounded by a dense, minutely-granular protoplasm, (Pl. I, fig. 6). These cells are not so translucent as those which are found in the exterior layer.

Inside of the ectoderm there is a broad, hyaline, connective-tissue layer, in which a multitude of larger and smaller nutritory ducts are visible; these correspond with each other, and are coated with an epithelium whose cells are slightly oblong, and contain a round nucleus enclosed in the protoplasmic substance, (Pl. II, fig. 1, a). In the smallest of these nutritory-ducts, the channel is quite filled out by this epithelium, (Pl. II, fig. 1, b), regarding which I have spoken, at length, in my previous treatises concerning Pennatulidæ and Alcyonidæ¹.

Between the nutritory ducts there lie dispersed, connective-tissue corpuscles, which are, partly, oblong, partly, angular, and have a slightly oblong nucleus and its nucleus body, as well as numerous prolongations, (Pl. I, fig. 7) which correspond with the adjoining-cells. These connec-

¹ Fauna littoralis Norvegiæ 3die Hefte.

Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Kyst, ved J. Koren og D. Danielssen. Pag. 2. Bergen 1883.

Forbindelse med de fine Saftkanaler, Tab. II, Fig. 1, *d*, saa at der i selve Grundmassen for den hele Dyrekoloni er et rigt Saftomløb.

Paa den ydre Flade af Bindevævslaget, indenfor Ectodermet, er leiret en stor Mængde Spikler, der ligge tæt til hverandre og danne væsentligt tornede Dobbeltkugler med et noget indknebet Midtparti Tab. I, Fig. 8. 9; de ere 0.160^{mm} lange, Enderne 0.100^{mm} brede og Midtbeltet 0.032^{mm} bredt. Kun enkeltvis træffes flerdobbelt sammensatte Stjerner, 0.180^{mm} lange, 0.120^{mm} brede fra Straalespids til modsat Straalespids, Fig. 10. Paa den membranagtige Udbredning af Basaldelen, hvori findes en stor Mængde saavel Længde- som Tverkanaler, dannende et sammenhængende Net med store Masker, er Bindevævet udfyldt af simple, smaa Dobbeltstjerner, 0.048^{mm} lange, 0.040^{mm} brede i Enderne, Fig. 11. 12. Spiklerne ligge her hobevis paa hverandre.

Fra den indre Flade af Stammens brede, hyaline Bindevævs lag udløbe Forlængelser, som ere temmelig smale og forbinde sig med hverandre, hvorved Længdekanalerne opstaa og det egentlige Coenenchym dannes. Disse Længdekanaler ere temmelig vide, især gjælder dette de ydre, der løbe igjennem Stammens hele Længde, og paa hver Kanals Vægge er der 8 Septula, som følge hele Kanalens Længde til dens Bund. Til to af disse Septulers frie Rand er ved et tyndt Bindevæv fæstet de to dorsale Gastralfilamenter. Kanalernes Vægge, der maa betragtes som de indre, frie Flader af det hyaline Bindevæv og dets Forlængelser, ere forsynede med Længde- og Tvermuskler, hvilke gaa over paa Septula saaledes, at Tvermusklerne beklæde den ene Flade og Længdemusklerne den anden af hvert Septulum. Muskellaget har et Epithelovertræk (Entoderm), bestaaende af runde Celler, 0.011^{mm}, der ligge i flere Lag paa hverandre, ere temmelig fyldte med et fintkornet Protoplasma, som stundom skjuler den runde, 0.004^{mm} store Kjerne med sit Kjernelegeme. Paa Længdekanalernes Vægge sees imellem Septula større og mindre Aabninger, just paa de Steder, hvor Grenene gaa over i Stammen. Længdekanalernes Antal er kun ringe, — saaledes er der i det her beskrevne Exemplar, hvis Stamme er 200^{mm} høi og omtrent 80^{mm} i Omkreds, høist 20 Kanaler, der alle tage sin Begyndelse paa Stammens øverste Del, hvor de udgaa fra enkelte Polyper og maa betragtes som en Fortsættelse af sammes Mavehulhed.

Grenene have et lignende Epithelovertræk som Stammen; men det hyaline Bindevæv er forholdsvis noget bredere,

tive-tissue cells are, by means of a few of their prolongations placed in direct communication with the minute nutritory-ducts, (Pl. II, fig 1, *d*), so that, even, in the fundamental mass itself, which serves for the entire animal-colony, there is a rich circulation of sap.

On the exterior surface of the connective-tissue layer inside of the ectoderm, there lies entrenched, a great multitude of spicules placed closely together, and forming, principally, aculeated double-spheres having a somewhat constricted middle part, (Pl. I, figs. 8. 9). They measure, 0.160^{mm} in length; the extremities, 0.100 in breadth; and the mesial belt 0.032^{mm} in breadth. Only occasionally, are manifold complex stellates met with, measuring 0.180^{mm} in length, and 0.120^{mm} broad from the point of one ray to the point of the opposite ray, (Pl. I, fig. 10). Upon the membranaceous dilation of the basal part, in which there is found a multitude of longitudinal, as well as transversal, ducts forming a continuous reticulation with large meshes, the connective-tissue is quite filled with plain, minute, bistellates measuring 0.048^{mm} in length, and 0.040^{mm} in breadth at the extremities, (Pl. I, figs. 11. 12). The spicules, in this situation, lie crowded upon each other.

From the inner surface of the broad hyaline connective-tissue layer of the stem, prolongations proceed; these are rather narrow, and connect with each other, by which longitudinal ducts are produced and the Sarcosoma-proper is formed. These longitudinal ducts are rather wide, and this is specially the case with the exterior ones which permeate through the whole length of the stem; upon the walls of each duct there are 8 septula, which follow the entire length of the duct to its bottom. To the free margin of two of these septula, the two dorsal gastral filaments are attached by a thin connective-tissue. The walls of the ducts, which must be considered as the inner free surfaces of the hyaline connective-tissue and its prolongations, are furnished with longitudinal and transversal muscles, which are produced into the septula in such manner, that the transversal muscles clothe the one surface and the longitudinal muscles the other surface of each septulum. The muscular layer has an epithelial covering (Entoderm), consisting of round cells measuring 0.011^{mm} in diameter, placed in several layers upon each other, and pretty well filled with a minute granular protoplasm that occasionally conceals the round nucleus, measuring 0.004^{mm} in diameter, and its nucleus body. On the walls of the longitudinal ducts, between the septula, larger and smaller apertures are seen, exactly in the situations where the branches are produced into the stem. The number of the longitudinal ducts is only small; there are for instance, in the specimen here described, whose stem measures 200^{mm} in height and about 80^{mm} in circumference, 20 ducts, at most, which all have their origin in the uppermost part of the stem, where they proceed from a few polyps, and must be considered as being a continuation of the ventral-cavity of these.

The branches have a similar epithelial covering as the stem, but the hyaline connective-tissue is, relatively,

hvilket ogsaa er Tiltædet med dets Forlængelse. Fig. 13, saa at Grenenes Coenenchym er noget fastere end Stammens, især i deres centrale Del, hvor Polypernes Mavehulhed smalner betydeligt af og danner en fin, med Epithel udfyldt Kanal, som gaar over i Stammen.

I Grenenes periphære Del er Polypernes Mavehulhed videre og forlænger sig hen imod Stammen, hvor den gaar over i en af dennes Længdekanaler. Paa Grenene iagttages lignende Spikler som paa Stammen, kun ere Dobbeltstjernerne og de mere sammensatte Stjerner hyppigere, ligesom en og anden stjerneformig, stærkt tornet Firling findes ind imellem, Fig. 14.

Af de mange Tusinde Polyper, hvoraf Kolonien bestaar, er der saaledes kun omkring 20, der staa i umiddelbar Forbindelse med Stammens Hovedlængdekanaler; de øvrige korrespondere mere eller mindre indirekte med samme, idet enhver Polyp egentlig begrænses ved Grenenes Overgang i Stammen og kun ved de fine Kanaler, hvori Polypernes Mavehulhed omformer sig, kommer til at staa i Rapport med Længdekanalerne.

Polypkroppens ydre Flade er beklædt med et Epithel, bestaaende af et dobbelt Lag lignende Celler, Fig. 15, *a*, som de, der beklæde Stammen og Grenene. Indenfor dette Ectoderm lag er et temmelig bredt, fibrillært Bindevæv, Fig. 15, *b*, hvori findes en Mængde større og mindre Sættkanaler, beklædte med Epithelceller, der ere elliptiske og forsynede med en stor, lidt aflang Kjerne, omgivet af Protoplasmakorn. I dette Bindevæv, nærmest Ectoderm, ere Spiklerne indleirede saaledes, at paa Kroppens øverste Del ved Tentakelranden ligge de paatvers, forøvrigt danne de to Længderækker i hvert Felt imellem Insertionslinierne for Septa, Fig. 3.

De paatversliggende Spikler danne lange, takkede Spindler, der ere dels spidse i begge Ender, dels kun i den ene, dels ganske lige, dels krumme, sjældent S formige, fra 0.400—0.536^{mm} lange og 0.027^{mm} brede paa Midten, Fig. 16. 17. 18.

Lidt længere nede paa Kroppen, hvor Spiklerne ligge i Rækker, ere Spindlerne kortere, lidt bredere, med afstumpede Ender, Fig. 19. 20, og paa Bagkroppen findes sammensatte Stjernespicler og takkede Valses, Fig. 21. 22, men hyppigere takkede Dobbeltkugler af Størrelse som de paa Stammen, — og endelig sees eiendommelige Firlinger i Form af Kors, af hvilke den ene Form har en Længdestok 0.104^{mm} og en Tverstok 0.060^{mm}, Fig. 23, medens den anden er fladere og bredere, Fig. 24; begge ere meget takkede.

somewhat broader, and this is, also, the case with its prolongations, (Pl. I, fig. 13), so that the sarcosoma of the branches is somewhat firmer than on the stem, especially in their central portion where the ventral-cavity of the polyps diminishes, considerably, and forms a minute duct filled with epithelium, which is produced into the stem.

In the peripheral part of the branches, the ventral-cavity of the polyps is wider, and is prolonged towards the stem, and, there, is produced into one of its longitudinal ducts. Similar spicules to those of the stem are observed upon the branches, only, the bistellates and the more complex stellates, are more frequent, whilst, also, an occasional stelli-form, strongly-aculeated quadruplet is observed amongst them, (Pl. I, fig. 14).

Of the many thousands of polyps of which the colony is composed there are, thus, only about 20 which are placed in immediate connection with the main longitudinal ducts of the stem; the others correspond, more or less indirectly, because each polyp is really confined by the production of the branches into the stem, and is only placed in connection with the longitudinal ducts, by the minute ducts into which the ventral cavity of the polyps transforms itself.

The exterior surface of the body of the polyp is clad with an epithelium, consisting of a double layer of similar cells to those that clothe the stem and the branches, (Pl. I, fig. 15, *a*). Inside of this ectoderm-layer there is a, rather broad, fibrous connective-tissue, (Pl. I, fig. 15 *b*), in which a multitude of, larger and smaller, nutritory ducts is found, clad with epithelial cells elliptical in form, and furnished with a large, slightly oblong, nucleus surrounded by protoplasmic granules. In this connective-tissue, nearest to the ectoderm, the spicules lie entrenched in such manner, that at the tentacular margin on the uppermost portion of the body they lie transversally; otherwise, they form two longitudinal series in each area between the lines of the insertions of the septa, (Pl. I, fig. 3).

The transversal spicules form long spicate fusees, which, partly, are acuminate in both extremities, partly, only in one extremity, partly, quite straight, partly, bent, but seldom S-formed, and which measure from 0.400^{mm}—0.536^{mm} in length, and 0.027^{mm} in breadth at the middle, (Pl. I, figs. 16. 17. 18).

A little lower down on the body, at the point where the spicules are situated in series, the fusees become shorter and a little broader, and have blunted extremities, (Pl. I, figs. 19. 20), and on the posterior body, complex stellate-spicules, and spicate rollers are found, (Pl. I, figs. 21. 22), but more frequently, spicate double-spheres of similar size to those upon the stem are found, and finally, peculiar cruciform quadruplets are visible, of which, the one form has a longitudinal arm, measuring 0.104^{mm} in length and a transversal arm, measuring 0.060^{mm} in length, (Pl. I, fig. 23), whilst, the other form is flatter and broader, (Pl. I, fig. 24). Both of them are much spicate.

Fra den indre Flade af Bindevævet udgaa de sædvanlige 8 Septa, der fæste sig paa Svælgets ydre Flade. Den indre Bindevævsflade er forsynet med Længde- og Tvermuskler, Fig. 15, *c*, der gaa over paa Septa saaledes, at de longitudinelle Fibre følge den ene Flade og udbrede sig straaelformigt paa Svælget, og de transverselle følge den modsatte Side af Septum og fæste sig ligeledes paa Svælget. Hele Mavehulheden er beklædt med Epithel, bestaaende i Reglen af to Lag runde Celler lig dem, der findes i Stammens Længdekanaler, Fig. 25, *a*. 26. I Mavehulheden, ligesom i dens forlængede Kanal, træffes ofte en hel Del isolerede Celler, der have nogen Lighed med Endothelcellerne, men ere noget mindre, have en klarere Membran og en Kjerne, som er omgivet af et rigt Protoplasma. Lignende Celler sees ogsaa i Hovedlængdekanalerne og danne Elementer i det Fluidum, som cirkulerer i disse. De have meget tilfælles med hvide Blodlegemer hos høiere Dyr og fungere sandsynligvis paa samme Maade, som de. Septa forlænge sig ned igjennem Mavehulheden som Septula til det Sted, hvor denne forsnævres og gaar over i en trang Kanal, — kun for de tidligere omtalte 16—20 Polypers Vedkommende følge de Hovedkanalerne lige til Bunden.

Mundaabningen danner en paatvers gaaende Spalte, der er bredere i den ene Mundvinkel end i den anden. Læberne ere næsten lige, men paa hver Side af dem sees henimod den smale Mundvinkel en liden Knude (Gonidialknude?), der synes at strække sig et Stykke ned igjennem Svælget. Dette danner næsten en Cylinder, der paa sin indre Flade er foldet efter Længden, paa sin ydre er glat og har her en Epithelialbeklædning, bestaaende af to Lag runde Celler, fuldkommen lig dem, som tapetserer Mavehulheden. Indenfor dette Endothel er et Bindevævslag med Ernæringskanaler og Bindevævslegemer, Fig. 15, *d*, paa hvis ydre Flade, mellem denne og Endothelet, er indleiret 8 Længderækker Spikler, Fig. 40, der have forskjellig Form og variere i Størrelse fra 0.050—0.120^{mm} i Længde og fra 0.008—0.010^{mm} Bredde, Fig. 40, *a*.

Den indre Flade af Svælget er foldet efter Længden, og paa den iagttages langs Bugfladen en Rende (Demicanaux, Hollard¹; Gonidial grooves, Canales gonidiales, Gosse), der er triangulær, saaledes at den bredere Del af Trian-

From the inner surface of the connective-tissue, the usual 8 septa proceed, which attach themselves to the exterior surface of the gullet.

The inner connective-tissue surface is furnished with longitudinal and transversal muscles, (Pl. I, fig. 15 *c*), which are produced into the septa in such manner, that the longitudinal fibres follow the one surface and spread radially on the gullet, and the transversal fibres follow the opposite side of the septum and, also, attach themselves to the gullet. The entire ventral-cavity is clad with epithelium, consisting, as a rule, of two layers of round cells like those found in the longitudinal ducts of the stem, (Pl. I, 25, *a*, 26). In the ventral-cavity, as well as in its prolonged duct, a large number of isolated cells are frequently met with; these have some resemblance to the endothelial cells, but are somewhat smaller, and have a more translucent membrane, and a nucleus surrounded by a rich protoplasm. Similar cells are, also, observed in the chief longitudinal ducts, and form an element of the fluid circulating in them. They have much in common with the white blood-corpuscles of the higher animals and, presumably, perform a similar function to what they do. The septa prolong themselves down through the ventral cavity as septula, until they attain the situation where it becomes constricted and is produced as a straitened duct. Only in regard to the 16—20 polyps previously spoken of, do the septa follow the chief ducts right down to their bottom.

The oral aperture forms a transversal fissure, which is broader in the one labial angle than in the other. The labiæ are almost straight, but on each of them, towards the narrower labial angle, a small knot is visible (Gonidial knot?) which appears to extend itself a little down through the gullet. This forms a cylinder, nearly, which on its inner surface is folded longitudinally, and on its outer surface is smooth and has, here, an epithelial covering consisting of two layers of round cells, exactly like those that line the ventral cavity. Inside of this endothelium, there is a layer of connective-tissue, containing nutritory ducts and connective-tissue corpuscles, (Pl. I, fig. 15 *d*); on whose exterior surface, between it and the endothelium, 8 longitudinal series of spicules are entrenched, (Pl. I, fig. 40), which have different forms, and vary in size from 0.050—0.120^{mm} in length, and from 0.008—0.010^{mm} in breadth, (Pl. I, fig. 40 *a*).

The inner surface of the gullet is folded longitudinally and, on it, there is observed along the ventral surface, a channel (Demi-canaux, Hollard¹ — gonidial grooves, — Canales gonidiales, Gosse) which is triangular, in such manner, that

¹ Gosse, Henry. Actinologia Britannica. A History of the British Sea-Anemones and Corals. 1860, pag. XV—XVII and 4.

Hollard, H. Monographie anatomique du genre Actinia de Linné, considéré comme type du groupe général des Polypes Zoanthaires. Annales des Sciences natur. Zoologie, 3. Ser. Tom. XV, pag. 274.

Hertwig, Richard et Oscar. Die Actinien. Jenaische Zeitschrift f. Naturwissenschaften. 13 B., pag. 512—13. 1879.

¹ Gosse, Henry. Actinologia Britannica. A History of the British Sea-Anemones and Corals. 1860, pag. XV—XVII and 4.

Hollard, H. Monographie anatomique du genre Actinie de Linné considéré comme type du groupe général des Polypes Zoanthaires. Annales des Sciences natur. Zoologie 3. Ser. Tom. XV, pag. 274.

Hertwig, Richard et Oscar. Die Actinien. Jenaische Zeitschrift f. Naturwissenschaften. 13 B., pag. 512—13. 1879.

gelen danner Bunden, Fig. 15, *e*. Tab. II, Fig. 2, *a*. Denne Rende strækker sig opad fra Svælgfladens nederste Parti til lidt over Tretjerdedelen af samme og er bredest nedad, Tab. II, Fig. 2, *a*. Den adskiller sig fra den øvrige Del af Svælgvæggen væsentlig ved sin særegne Epithelbeklædning, der dannes af meget lange, næsten traadformige Pidskeceller (Geisselcellen), som have en yderst tynd Membran, ere 0.060^{mm} lange, 0.020^{mm} brede, og en aflang Kjerne, 0.004^{mm} lang, 0.002^{mm} bred, der er placeret snart nedmod den nederste Ende, snart paa Midten og snart høiere oppe, Fig. 27. Celleindholdet er meget klart, og idet hver Celles fri Ende, der synes at være rig paa Protoplasmindhold, støder tæt til Nabocellens, fremkommer en skarp Rand, der har Udseende af en Cuticula, Tab. II, Fig. 2 *b*, hvorfra udgaa en Række lange, ved Grunden tykke Flimmerhaar (Cilier), som rage langt ind i Svælgghulheden, Fig. 28. Tab. II, Fig. 2; enhver Celle bærer kun et saadant Haar, der er 0.040^{mm} langt, Fig. 29.

Ved Tversnit af Svælgget paa Alcoholpræparater faar man et eiendommeligt Billede af denne Svælgrendes Epithel, — det ser ud, som om det bestaar af mange Lag næsten elliptiske Celler, hvoraf de inderste, nærmest Hulheden, antage Cylinderformen og bære paa deres frie Ender Flimmerhaar, Tab. II, Fig. 2 *c*. Kun ved Maceration fremkom disse Cellers sande Form¹.

Udenfor Renden og saa langt, den naar op, er Svælgget beklædt med Cylinderepithel, forsynet med sædvanlige Cilier; men ovenfor Svælgrenden dannes Epithelbeklædningen af Polypens Ectodermceller, der dog langs Rygsiden strækker sig langt nedover Svælgget. Imellem Svælggets Cylinderepithel findes en stor Mængde kolbeformige Legemer, der ligge dels spredte, dels i regelmæssige Rækker omkring Længdefolderne, sjældnere i Grupper, Tab. II, Fig. 2, *d*.

De ere fra 0.020—0.040^{mm} lange og fra 0.010—0.015^{mm} brede, som oftest vandklare og se ud som Vacuoler, have en langstrakt Hals med en Aabning paa Enden, Fig. 30. Tab. II, Fig. 2, *e*. Ved Farvning fremkommer i den nedre, brede Del en næsten rund Kjerne, 0.004^{mm} i Gjennemsnit, med Kjernelegeme, omgivet af en seig Masse, der hyppig var trykket ud igjennem den før omtalte fine Aab-

¹ Dr. Blochman fra Heidelberg, der i længere Tid har arbejdet i Bergens Museum, viste mig Præparater fra den indre Tarmvæg hos Brachiopoderne, hvor det samme Forhold fandt Sted. Af hans Macerationspræparater fremgik det tydelig nok, at Epithelbeklædningen bestod af lange, traadformige Celler, forsynede med lange Cilier, imedens den paa Alcoholpræparater viste sig som ovenfor omtalt, nemlig ligesom bestaaende af flere Cellelag.

the broad part of the triangle forms the bottom, (Pl. I, fig. 15, *e*, Pl. II, fig. 2, *a*). This channel extends itself upwards, from the lowest part of the surface of the gullet, till a little above the three-fourths part of it, and it is broadest below, (Pl. 2, fig. 2 *a*). It is distinguished from the rest of the wall of the gullet principally, by its peculiar epithelial covering, formed of very long, flagellated, almost filiform, cells (geissel-cells) having an extremely thin membrane, and measuring 0.060^{mm} in length, and 0.020^{mm} in breadth, and containing an oblong nucleus measuring 0.004^{mm} in length and 0.002^{mm} in breadth, placed sometimes, down towards the lowest extremity, sometimes, in the middle and, sometimes, higher up, (Pl. I, fig. 27). The cellular substance is very translucent and, as each cell's free extremity, which appears to be rich in protoplasmic substance, approaches close to that of the neighbouring cell, a distinctly-marked margin is produced, which has the appearance of a cuticulum, (Pl. II fig. 2, *b*), from which a series of long cilia, thick at the root, proceed, extending far into the gullet-cavity, (Pl. I, fig. 28, Pl. II, fig. 2). Each cell carries only one such cilium measuring 0.040^{mm} in length, (Pl. I, fig. 29).

On making a transverse section of the gullet, in preparations preserved in alcohol, we obtain a characteristic representation of this gullet-grooves epithelium; it appears, as if it consists of many layers of almost elliptical cells, of which the innermost, next to the cavity, take the cylinder-form, and carry cilia on their free extremities, (Pl. II, fig. 2. *c*). Only after, maceration, did the true form of these cells appear¹.

Outside the channel, and as far up as it reaches, the gullet is clad with cylinder-epithelium furnished with the usual cilia, but above the gullet-channel the epithelial covering is formed by the ectoderm-cells of the polyps, which extend however along the dorsal side far down the gullet. In the gullet's cylinder-epithelium, a great multitude of clavi-form corpuscles are found, which are placed, partly dispersed and, partly, in regular series about the longitudinal folds, more rarely in groups, (Pl. II, fig. 2 *d*).

They measure, from 0.020—0.040^{mm} in length, and from 0.010—0.015^{mm} in breadth, and are most frequently translucent, appearing like vacuoli; they have an elongated neck with an aperture on the extremity, (Pl. I, fig. 30, Pl. II, fig. 2, *e*). On staining, an almost spherical nucleus appears in the lower, broad part; it measures 0.004^{mm} in diameter, and has its nucleus body surrounded by a tough substance, which was frequently exuded from the minute aperture previously spoken of. These corpuscles are not

¹ Dr. Blochman, from Heidelberg, who studied for a considerable time in Bergens Museum, showed me preparations from the inner intestinal wall of the Brachiopods where the same relations existed. From his macerated preparations it appeared, distinctly enough, that the epithelial covering consisted of long filamentous cells furnished with long cilia, whilst in preparations preserved in alcohol it appeared as above described, viz. as if consisting of several cellular layers.

ning. Disse Legemer findes ikke i Svælgruben og ere upaatvivlelig encellede Slimkjertler.

Øverst paa den indre Svælghflade, strax førend Renden tager sin Begyndelse, findes paa Bugsiden under eller udenfor Epithellaaget, imellem dette og Bindevævslaget og ligesom bundet til det første, en Gruppe store, aflange Celler med en overordentlig stor Kjerne med Kjernelegeme og omgivet af en rig Protoplasmamasse, Fig. 25, b. 31. Fra den forlængede Del, der vender til Epithelet, udspringer en Udløber, Fig. 25. 31, som forsvinder imellem Epithelcellerne. Den anden, indre, afrundede Ende af Cellen synes ikke at udsende nogen Forlængelse. Jeg maa betragte disse store Celler som tilhørende Nerveapparatet og for at være unipolære Ganglieceller. Imellem og under dem sees enkelte smaa, runde, temmelig klare Celler med en rund Kjerne omgivet af Protoplasma, Fig. 25, c, hvilke ikke kunne henføres til Epithelceller, men som muligens staa i Forbindelse med disse og kunne være Epithelnerveceller. At de tilhøre Nervesystemet forekommer mig meget sandsynligt, især da længere nede paa Svælget lignende Celler træffes imellem Epithel- og Bindevævslaget og her hviler paa yderst fine Fibriller (Nervestrænge?), som ikke synes at henhøre til Bindevævet. Jeg har ikke kunnet forfølge Nervesystemet videre; thi Materialet har for Størstedelen været opbevaret i Alcohol, hvorfor der vanskelig lader sig gjøre Macerationspræparater af det.

Musklerne paa Svælget danne et Lag af lidt paaskraas gaaende, cirkulære Fibre, der ligge paa dets udvendige Flade, imellem Entoderm laget og Bindevævet.

Fra Svælgets nederste, fri Ende udgaa de sædvanlige 8 Gastralfilamenter, hvoraf de to længste ere fæstede til de 2 dorsale Septula og følge disse til Mavehulhedens Bund. De øvrige 6 ere kortere og frithængende. Samtlige ere dannede af en temmelig fast, hyalin Bindevævsmembran, der paa begge Sider er beklædt med Epithel, som paa de 6 korte bestaar af Entodermceller, lig dem paa Svælgets ydre Flade, imedens det paa de 2 lange bestaar af langstrakte Celler, lig det indre Lag af Ectodermcellerne, der tidligere ere beskrevne.

Kjønnsprodukterne udvikles i den forlængede Mavehulhed, væsentligst paa de ventrale Septula. Kun Æg har jeg set, og i Regelen kun et i hver Kapsel

Tentaklerne ere udvendigt beklædte med et Ectoderm, bestaaende af to Lag Celler, af hvilke de i det yderste Lag ere polyædriske, imedens de i det indre ere mere aflange og rigere paa Protoplasma, Fig. 32, a

Cellerne ere af omtrent samme Størrelse som Polypkroppens Ectodermceller. Indenfor Epithelet er et hyalint Bindevævslag paa hvis ydre, aborale Flade sees en Mængde

found in the gullet-cavity, and are, without doubt, unicellular mucous glands.

On the uppermost part of the inner surface of the gullet, just before the channel begins, there is found on the ventral side, below, or outside of, the epithelial layer and between it and the connective tissue layer, adherent, as it were, to the firstnamed, a group of large oblong cells, containing an extremely large nucleus with its nucleus body surrounded by a rich protoplasmic substance, (Pl. I, fig. 25 b, 31). From the prolonged part, that faces the epithelium, a prolongation springs, (Pl. I, figs. 25. 31), which however disappears again between the epithelial cells. The other, more rounded, extremity of the cell does not appear to send out any prolongation. I must consider these large cells as pertaining to the nerve apparatus, and as being unipolar ganglial cells. Between them, and under them, a few minute, cylindrical, rather translucent cells are visible, which contain a round nucleus surrounded by protoplasm, (Pl. I, fig. 25, c), but, which cannot be assigned to the epithelial cells, although they, possibly, are placed in connection with them and may be epithelial nerve-cells. That they pertain to the nerve system appears, to me, very probable, especially, because further down on the gullet, similar cells are met with between the epithelium and the connective-tissue layer resting, here, on extremely minute fibrils (Nerve-cords) which do not appear to belong to the connective-tissue. I have not been able to follow up the nerve system, further, as my material has, for the greater part, been preserved in alcohol and, from this, it is difficult to make macerated preparations.

The muscles of the gullet form a layer of, somewhat diagonally-running, circular fibres, which are placed upon its exterior surface between the entoderm layer and the connective-tissue.

From the lowest free extremity of the gullet, the usual 8 gastral filaments proceed, of which, the two longest ones are adherent to the two dorsal septula and follow them to the bottom of the ventral cavity. The other 6 are shorter, and freely pendulous. All of them are formed of a rather firm, hyaline connective-tissue membrane, which is clad on both sides with epithelium, which upon the 6 shorter ones consists of entoderm cells like those upon the gullet's exterior surface, whilst upon the two long ones, it consists of elongate cells like the inner layer of ectoderm-cells which has previously been described.

The sexual products are developed in the prolonged ventral cavity, principally on the ventral septula. I have only discovered ova, and, generally, only one ovum in each capsule.

The tentacles are, exteriorly, clad with an ectoderm consisting of two layers of cells, of which, those in the exterior layer are polyhedral, whilst those in the inner layer are more oblong, and richer in protoplasm, (Pl. I, fig. 32, a).

The cells are of about the same size as the ectoderm-cells of the body of the polyp. Inside the epithelium, there is a layer of hyaline connective-tissue on whose exterior

Spikler, Fig. 32, *b*, der paa de nederste to Trediedele ligge paa-skraas, men næsten paatvers paa den øverste Trediedel. Spiklerne ligge tæt paa hverandre, ere forskjelligt formede, stærkt takkede, dels lige, dels krumme, dels tap- eller kølleformede, Fig. 33. Nogle ere næsten flade, men de fleste ere dog mere eller mindre runde. De flade ere fra 0.080—0.160^{mm} lange, og fra 0.012—0.040^{mm} brede, have stumpe Ender, hvorfra Takker udløbe, Fig. 34. 35. 36. 37. 38. Imellem disse ligge yderst tynde, takkede, snart lige, snart krumme Spindler, 0.060^{mm} lange, og enkelte Køller med en bladformig udvidet, takket øvre Ende, Fig. 37, samt et og andet Kors, Fig. 39, som paa Tentakelens Ende er meget simpelt, Fig. 33, *a*. Til Bindevævs indre Flade fæster sig Muskellaget, bestaaende af Længde- og Tverfibre, Fig. 32, *c*, der har et Epithelovertræk, dannet af et Lag langstrakte Celler, i hvis ydre, bredere Del sees en lidt aflang Kjerne med Kjernelegeme. Disse Celler ere 0.043^{mm} lange og 0.010^{mm} brede, Fig. 32, *d*.

Farven.

Bleggul.

Findested.

Station 338.

Slægtskarakter.

Zoanthodemet træformet. Stammen læderagtig, rund med stærkt udprægede, vide Længdekanaler og en membranagtig Basaldel. Grenene ordnede rundt Stammen, tykke, tæt besatte med Smaagrener, der bære en større eller mindre Mængde Polyper, som ere retraktile. Stammen og Grenene rige paa Kalkspikler af forskjellig Form. Polyperne ere baade paa Krop og Tentakler forsynede med tætliggende Spikler. I Svælgets Bindevæv, Spikelrækker. Septa uden Kalk.

Artskarakter.

Zoanthodemet indtil 200^{mm} høit, 80^{mm} i Omkreds ned imod Basaldelen. Grenene ordnede rundt Stammen, tykke, tæt besatte med Smaagrener, der bære en saa stor Mængde Polyper, at Grenene ere ganske skjulte. Stammen med Grenene rige paa Kalkspikler. Polypernes Krop forsynet med 8 Dobbelttrækker Spikler, der danne paa den forreste

aboral surface a multitude of spicules are visible, (Pl. I, fig 32, *b*), which, upon the lowest two-thirds part are placed, diagonally, but almost transversally upon the uppermost third part. The spicules lie close upon each other and are different in form; they are strongly spicate, partly, straight, partly, bent, partly, coniform or clavi-form, (Pl. I, fig. 33). Some are almost flat, but most of them are more or less cylindrical. The flat ones measure, from 0.080—0.160^{mm} in length, and from 0.012—0.040^{mm} in breadth, and they have blunt extremities from which spikes project, (Pl. I, figs. 34. 35. 36. 37. 38). Between these lie, extremely thin, spicate, sometimes straight, sometimes bent, fusees, measuring 0.060^{mm} in length; also a few clavi-form ones with a foliaceous-formed dilated spicate superior extremity, (Pl. I, fig. 37), besides an occasional cruci-form one, (Pl. I, fig. 39), that upon the extremity of the tentacle, is very plain, (Pl. I, fig. 33, *a*). To the inner surface of the connective-tissue the muscular layer adheres, and consists of longitudinal and transversal fibres, (Pl. I, fig. 32, *c*), having an epithelial covering formed of a layer of elongate cells, in whose outer, broadest part, a somewhat oblong nucleus with nucleus body is visible. These cells measure, 0.043^{mm} in length and 0.010^{mm} in breadth, (Pl. I, fig. 32, *a*).

Colour.

Pale-yellow.

Habitat.

Station, Nr. 338.

Generic characteristics.

The Zoanthodem arborescent. The stem coriaceous, cylindrical, with strongly marked, wide longitudinal ducts, and a membranaceous basal part. The branches arranged around the stem, and thick; these again, closely beset with branchlets which carry a greater or smaller multitude of polyps, which are retraktile. The stem, and the branches, rich in calcareous spicules of different forms. The polyps, both on the body and on the tentacles, are furnished with closely-set spicules. In the connective-tissue of the gullet, spicular series. Septa non-calcareous.

Specific characteristics.

The Zoanthodem measures up to 200^{mm} in height, and 80^{mm} in circumference down towards the basal part. The branches arranged around the stem, thick, closely beset with branchlets which carry such a large multitude of polyps that the branches are quite concealed by them. The stem, and the branches, rich in calcareous spicules. The body of

Dels lige, dels krumme, takkede Spindler, paa den bagerste Del sammensatte Stjerner, takkede Dobbeltkugler og Kors. Tentaklerne rige paa Spikler; deres basale Del er enten blottet for Pinnuler eller disse ere meget smaa og spredte. Pinnulerne uden Kalk. Svælget har 8 Rækker Spikler. Kuløren bleggul.

Vøringia fruticosa, (Sars) mihi.

Tab. II. Fig. 3—13.

Alcyonium fruticosum. M. Sars. Fauna littoralis Norvegiæ, 3 Hft., pag. 81, Tab. III, Fig. 8—11.

Afdøde Professor M. Sars har i 3die Hefte af Fauna litt. Norv. givet en kort Beskrivelse med Afbildning af denne Alcyonide og henført den til Slægten *Alcyonium*, en Slægt, der i Aarrækker har været benyttet som et Pulterkammer, hvori en hel Del Alcyonider ere blevne puttede ind. Den ovenfor beskrevne *Vøringia mirabilis* har unægtelig flere Berøringspunkter med *Alcyon. fruticosum*, men ved nærmere Undersøgelse vise de sig dog at være to distinkte Arter, henhørende til samme Slægt. — Jeg har havt god Anledning til at anstille Sammenligninger, saasom jeg sammen med Sars indsamlede i Varangerfjorden flere Exemplarer af *Alcyon. fruticosum*, der nu findes i Bergens Museum, og som maa betragtes som typiske.

Til Slægten *Alcyonium* henfører jeg kun de Individuer, der bære Slægtens Kjendemerker, givne af Milne-Edwards¹ (tidligere, men ufuldstændigt af Pallas), nemlig: „Polypes complètement rétractiles dans un polypiéroïde massif, à tissu sarcoïde, dont la surface est grenue et rude au toucher, mais n'est pas hérissée de spicules naviculaires et dont la partie supérieure se divise en lobes ou en prolongements digitiformes;” thi kun paa den Maade anser jeg det gjørligt at komme udaf den Konfusion, som i Tidernes Løb er tilveiebragt ved ikke at have taget tilbørligt Hensyn til den oprindelige Slægtskarakter.

Alcyonium fruticosum er efter det her anførte ingen *Alcyonium*, den mangler dennes væsentligste Kjendemerke, og naar jeg nu henfører den til Slægten *Vøringia*, skal jeg til Sars's Beskrivelse føie nogle Detailler, der ville adskille den fra *Vøringia mirabilis*.

Zoanthodemet opnaar ikke den Størrelse som hos *Vær. mirab.* Grenene ere ikke saa rigt besatte med Polyper. Stammen og Grenene synes at være mindre rige

the polyps furnished with 8 double series of spicules, which form, on the anterior part, partly straight, partly bent, spicate fusees, and on the posterior part, complex stellates, spicate double-spheres and cruci-forms. The tentacles rich in spicules; their basal part is either devoid of pinnules, or these are very minute and dispersed. The pinnules non-calcareous. The gullet has 8 series of spicules. Colour pale-yellow.

Vøringia fruticosa, (Sars) mihi.

Pl. II., fig. 3—13.

Alcyonium fruticosum. M. Sars. Fauna littoralis Norvegiæ, 3. Hft., pag. 81, Tab. III, Fig. 8—11.

The late Prof. M. Sars has given, in the 3rd Part of Fauna litt. Norv. a short description and illustration of this Alcyonoid, and relegated it to the genus *Alcyonium*, a genus that for many years has been used as a lumber-room in which a whole lot of Alcyonoids have been put away. The “*Vøringia mirabilis*” just previously described has, undeniably, several points in common with *Alcyon. fruticosum*, but upon closer examination they show themselves, however, to be two distinct species pertaining to the same genus. I have had plenty of opportunity to institute comparisons, from the fact that along with Sars I collected in the Varangerfjord, several specimens of *Alcyon. fruticosum*, which may now be seen in Bergens Museum, and must be regarded as prototypes.

To the genus *Alcyonium* I, alone, relegate such individuals as bear the distinguishing characteristics of the genus, as these are stated by Milne-Edwards¹ (previously, but incompletely, by Pallas) namely: “Polypes complètement rétractiles dans un polypiéroïde massif à tissu sarcoïde, dont la surface est grenue et rude au toucher, mais n'est pas hérissée de spicules naviculaires et dont la partie supérieure se divise en lobes ou en prolongements digitiformes”, because in that manner, alone, do I consider it practicable to avoid the confusion that has, in the course of time, been brought about, by sufficient attention not having been paid to the original generic character.

Alcyonium fruticosum is, according to what has been, here, stated, no *Alcyonium*. It is without its chief distinguishing characteristics and, as I now relegate it to the genus *Vøringia*, I will add to Sars' description some details which will distinguish it from *Vøringia mirabilis*.

The Zoanthodem does not attain such a size as in *Vær. mirab.* The branches are not so richly beset with polyps. The stem and the branches appear to be, not so

¹ Milne-Edwards. Annales des sciences natur. 2. Serie, Tom. IV, pag. 333.

Den norske Nordhavsexpedition: D. C. Danielssen: Alcyonida.

¹ Milne-Edwards. Annales des sciences natur. 2. Serie, Tom. IV pag. 333.

paa Kalk. Polyperne ere større, have paa sin Krop 8 Dobbelttrækker Kalkfigurer, der ikke ligge saa tæt som hos *V. mirab.* og bestaa foruden af krumme og lige, takkede Spindler, af krumme, takkede Køller, Tab. II, Fig. 3. 4, takkede Valses, Fig. 5, flade, dels forgrenede, dels i begge Ender gaffelformigt delte Spikler, Fig. 6. 7, ganske smaa, kroneformede Spikler, Fig. 8, og endelig imellem disse mange Former sees enkelte korsformede Firlinger, Fig. 9. 10, forskellige fra dem, der findes hos *Væring. mirabilis*. Tentaklerne bære Pinnuler lige fra Grunden; deres aborale Flade er forsynet med Spikler, hvor en stor Del ligne dem, der findes hos *Væring. mirab.*, medens andre ere forskellige, især er dette Tilfældet med dem, der findes paa Pinnulerne, Fig. 11, hvor *Væring. mir.* ingen har, Tab. I, Fig. 4. Paa Svælget er der kun 4 Rækker Spikler, der ligge temmelig langt fra hverandre, indtage ofte kun de to øverste Trediedele, Fig. 12. 13, og ere tildels forskellige fra dem, der findes paa Svælget af *Væring. mirabilis*, Tab. I, Fig. 40. Endelig er *Væring. fruticosa* fra bleg rosenrød til møniefarvet, medens *Væring. mirabilis* er bleggul.

Artskarakter.

Zoanthodemmet indtil 100^{mm} høit, 30^{mm} i Omkreds ned mod Basaldelen. Stammen rund; Grenene korte, ordnede rundt denne. Smaagrenene, hvorpaa Polyperne sidde spredte, sparsomme; Stammen og Grenene kalkholdige. Polyperne lange, cylindriske; deres Krop forsynet med 8 Dobbelttrækker Spikler, hvilke paa Kroppens forreste Del bestaa af dels krumme, dels lige, takkede Spindler, paa dens bagerste Del af takkede Valses og særegne Kors. Tentaklerne ere lange og forsynede lige til Grunden med Pinnuler. Saavel Tentaklerne som Pinnulerne have paa deres aborale Flade Spikler, hvoraf flere, fornemmelig paa Pinnulerne, ere særegne. Svælget forsynet med 4 Rækker Spikler, liggende langt fra hverandre og dannende dels korte, takkede Spindler med tilspidsede Ender, dels Firlinger som forskjelligt formede Kors.

Farven bleg rosenrød til møniefarvet.

Væringia abyssicola, n. sp.

Tab. II, Fig. 14—41.

Zoanthodemets Stamme er omkring 70^{mm} høi, 25^{mm} i Omkreds paa sin nedre Del, men bliver lidt smalere opad. Den er rund, ser glat ud og er stærkt furet efter Længden. Længdekanalerne ere meget fremtrædende og undulerende

rich in calcium. The polyps are larger and, upon their body, have 8 double series of calcareous corpuscles which are not so closely set as in *Væring. mirab.* and consist of, besides bent and straight spicate fusees, also, of bent spicate subclavates (figs. 3. 4), spicate rollers (fig. 5), flat spicules, partly ramous, partly bifurcated at both extremities (figs. 6. 7); quite minute coroni-form spicules (fig. 8), and finally, amongst these numerous forms, a few cruciform quadruplets are visible (figs. 9. 10) differing from those that are found in *Væring. mirab.* The tentacles are occupied by pinnules quite from the root; their aboral surface is furnished with spicules, of which a great number resemble those that are found in *Væring. mirab.* whilst others are different. This is especially the case with those found on the pinnules (fig. 11), in which situation *Væring. mirab.* has none (Pl. I, fig. 4). On the gullet, there are only 4 series of spicules, placed pretty far apart from and each other and occupying, frequently, only the superior two-third parts (figs. 12. 13) and in a measure differing from those that are observed in the gullet of *Væring. mirab.* (Pl. I, fig. 40). Finally, the colour of *Væring. fruticosa* varies, from pale rose-red to red-lead colour, whilst *Væring. mirab.* is pale-yellow.

Specific characteristics.

The Zoanthodem measures up to 100^{mm} in height, and 30^{mm} in circumference down towards the basal portion. The stem is cylindrical. The branches short, and arranged around the stem. The branchlets, upon which polyps are placed dispersedly, not numerous. The stem and the branches calcareous. The polyps long, cylindrical; their body furnished with 8 double series of spicules which, upon the anterior portion of the body, consist of, partly bent, partly straight spicate fusees and, on the posterior portion, of spicate rollers and peculiar cruciforms. The tentacles are long, and are furnished, right to their root, with pinnules. The tentacles, as well as the pinnules, are furnished with spicules on their aboral surface, of which several, especially upon the pinnules, are peculiar. The gullet is furnished with 4 series of spicules, placed far apart from each other, and forming, partly, short spicate fusees with acuminate extremities, partly, quadruplets in variously shaped cruciforms.

The colour pale rose-red to red-lead colour.

Væringia abyssicola, n. sp.

Pl. II, fig. 14—41.

The stem of the Zoanthodem measures about 70^{mm} in height, and 25^{mm} in circumference at its inferior part, but becomes a little narrower upwards. It is cylindrical, has a smooth appearance, and is strongly grooved longi-

paa Spiritusexemplarer paa Grund af Kontraktionen. Basaldelen er nøgen, membranagtig udvidet og indtil 40^{mm} i Omkreds. De øverste to Trediedele af Stammen er rundtom forsynet med Grene, imedens den nederste Trediedel er blottet for samme; men her sees enkelte Polyper at udspringe direkte fra Stammen. Grenene staa noget fra hverandre, saa at ikke Stammen dækkes; de ere runde, tykke, riflede paalangs og af forskjellig Længde; i Regelen ere de nederste de længste, enkelte ere udelte og ere da besatte med Polyper; men de fleste ere delte og have en eller flere Smaagrene, hvorfra Polyperne udspringe. Saavel paa Grenene som paa Smaagrenene ere Polyperne stillede uden nogen Regelmæssighed og staa temmelig langt fra hverandre, undtagen paa Enderne, hvor de staa tættere, Fig. 14. 15. Den øverste Ende af Stammen er afrundet, og paa den sidder en Gruppe Polyper, omtrent 12—15 i Antal; men strax nedenfor sees paa et Exemplar et Par meget korte, tykke Grene, der bære nogle faa Polyper, hvis Bagkroppe egentlig danne Grenene, medens paa et andet Exemplar en lang Gren udspringer fra Stammens øverste Trediedel, og paa dens afrundede Ende sees 7 Polyper. I det Hele taget frembyde de 3 Specimina, som vi have, flere Forskjelligheder med Hensyn til Grenenes Beskaffenhed og Polypernes Antal. Paa et Exemplar, der er det mindste, 25^{mm} høit, staa Grenene tæt sammen og ere rigt besatte med Polyper, saa at baade Stammen og Grenene skjules. Paa de to andre Exemplarer ere Grenene længere fra hverandre og bære færre Polyper, hvorved Zoanthodemet faar et noget forskjelligt Udseende. Saavel Stammen som Grenene ere temmelig faste og ru at føle paa.

Polyperne ere retraktile, cylindriske, noget bredere ved Tentakelranden end ved deres Grund, $10\text{--}12^{\text{mm}}$ lange, $3\text{--}4^{\text{mm}}$ brede. Kroppen er $6\text{--}7^{\text{mm}}$ lang; dens ydre Flade har 8 stærke, Ribber; saavel disse som de mellemliggende Felter ere rigt besatte med Spikler, Fig. 15. 16, der, som vi senere skulle se, ere ordnede paa en egen Maade. De omtalte Ribber forlænge sig over paa Coenenchymet, eller rettere paa Cellevæggens ydre og øverste Del, saa at, naar Polyperen er indtrukken, men Celleaabningen ikke lukket, ser det ud, som om dennes Rand er forsynet med 8 Papiller, og naar Cellen er lukket, har den Udseende af en 8-straalet Stjerne, Fig. 15. Naar jeg nævner Celle, mener jeg Hulheden i Coenenchymet for Polyperen; thi dennes Krop er jo egentlig en Fortsættelse af Coenenchymets ydre Væg. Tentaklerne ere $4\text{--}5^{\text{mm}}$ lange og have paa deres aborale Flade en Pantserbeklædning af Spikler. Pinnulerne ere temmelig lange og ere ligeledes paa deres aborale Flade bepantret med Spikler, Fig. 16. 17. Mundskiven er lidt hvælvet, og Munden danner en Tverspalte.

tudinally. The longitudinal ducts are very prominent and undulating in specimens preserved in Alcohol, owing to their shrinkage. The basal portion is bare and membraneously dilated, and it measures about 40^{mm} in circumference. The uppermost two-third parts of the stem is furnished with branches, placed around it, whilst the lowest third part is bare of them, but in this situation a few polyps are seen to spring direct from the stem. The branches are placed somewhat apart from each other, so that the stem is not covered; they are cylindrical, thick, and longitudinally grooved, and variable in length. Usually, the lowest ones are the longest, and a few of them are not ramified, in which case they are beset with polyps; but most of them are ramous, and furnished with one or more branchlets, from which the polyps spring. Both upon the branches and the branchlets, the polyps are placed without any regularity and situated pretty far apart from each other, except upon the extremities, where they are placed closer together (figs. 14. 15). The uppermost extremity of the stem is rounded off and, upon it, there is placed a group of polyps, about 12—15 in number, but immediately underneath there is seen, in one specimen, a couple of very short, thick branches, bearing a few polyps whose posterior body, really, forms the branches; whilst in another specimen, a long branch shoots out from the uppermost third part of the stem and, upon its rounded extremity, 7 polyps are visible. Altogether, the three specimens which I have, present several variations with regard to the character of the branches, and the number of polyps. In one specimen which is the smallest one and measures 25^{mm} in height, the branches are placed close together, and are so richly beset with polyps, that both the stem and the branches are concealed. In the two other specimens, the branches are placed further apart from each other, and carry fewer polyps, which gives the Zoanthodem a somewhat different appearance. Both, the stem and the branches, are pretty firm, and rough to the touch.

The polyps are retractile, cylindrical, and somewhat broader at the tentacular margin than at their root. They measure $10\text{--}12^{\text{mm}}$ in length and $3\text{--}4^{\text{mm}}$ in breadth. The body measures $6\text{--}7^{\text{mm}}$ in length. The exterior surface is furnished with 8 strong ribs and both, these as well as the intermediate areas, are richly beset with spicules (figs. 15—16) which, as we shall by and bye see, are arranged in a peculiar manner. The ribs, just mentioned, prolong themselves into the sarcosoma or, more correctly, into the exterior and uppermost part of the wall of the cell, so that when the polyp is retracted, but with its cellular aperture open, it looks as if the margin was furnished with 8 papillæ, but when the cell is closed it has the appearance of an 8-rayed star (fig. 15). When I say the cell, I mean the cavity for the polyp in the sarcosoma, because its body is, really, a continuation of the outer wall of the sarcosoma. The tentacles measure $4\text{--}5^{\text{mm}}$ in length, and upon their aboral surface have a sheathing of spicules. The pinnules are rather long,

Hele Zoanthodemet er meget rigt paa Spikler. Paa Stammen og Grenene findes: bladbedækkede Køller, der stundom ere delte i øverste Ende og ere 0.140^{mm} lange og 0.080^{mm} brede noget over Midten, Fig. 18. 19. 20; Dobbeltstjerner lige brede som lange, 0.060^{mm} i Gjennemsnit, Fig. 21, enkelte Firlinger i Korsform; valseformede Spikler besatte med Vorter, 0.140^{mm} lange, 0.070^{mm} brede paa Midten, Fig. 22. 23, og endelig takkede Spindler, 0.060^{mm} lange, 0.020^{mm} brede, Fig. 24. 25. Paa Polypens Bagkrop, især der, hvor den gaar over i Coenenchymet, ligge Spiklerne paatvers, Fig. 16, *a*, og optræde under forskellige Former, hvoriblandt gjenkjendes flere af dem fra Stammen og Grenene; men hyppigst træffes dog Valser besatte med Vorter, Fig. 22. 23, og meget sammensatte Stjerner, rigt besatte med Takker, 0.136^{mm} lange, 0.080^{mm} brede paa Midten, Fig. 26, hvorimellem hist og her sees korsformede Firlinger besatte med Takker, indtil 0.180^{mm} lange og med en Tverstok indtil 0.100^{mm} , Fig. 27. Paa Forkroppen staa Spiklerne næsten oprette i 8 Dobbelt-rækker, Fig. 16, *b*, og dannes væsentligst af stærkt takkede Spindler, der dels ere lige med næsten tilspidsede Ender, 0.400^{mm} lange, 0.035^{mm} brede, Fig. 28, dels lidt krumme, næsten baadformige, 0.380^{mm} lange, 0.040^{mm} brede, Fig. 29. 30; imellem disse sees enkelte langstrakte, korsformige Firlinger, 0.264^{mm} lange, med en Tverstok 0.072^{mm} , Fig. 31, samt takkede Køller, 0.144^{mm} lange, 0.020^{mm} brede øverst, Fig. 32, og endelig langstrakte, takkede, lige Spikler af Køllens Længde, Fig. 33.

Tentaklerne ere tæt besatte med 2 Rækker paaskraas gaaende Spikler, Fig. 16, *c*, 17, hvoraf Størstedelen danner takkede, dels lige, dels krumme Spindler, med snart spidse, snart afstumpede Ender og ere 0.220^{mm} lange, 0.016^{mm} brede paa Midten, Fig. 34. 35; imellem disse sees takkede Køller, 0.120^{mm} lange, 0.032^{mm} brede i den brede Ende, Fig. 36. Paa Pinnulerne danne Spiklerne dels takkede Køller, Fig. 37, dels takkede Spikler, der ere meget smaa, 0.020^{mm} lange, 0.012^{mm} brede, Fig. 38, hvorimellem iagttages større, noget fladtrykte, lidt takkede Spikler med brede, takkede Ender, 0.024^{mm} brede, Fig. 39, samt nogle korte, tynde, takkede, lige Spindler, 0.060^{mm} lange, 0.008^{mm} brede, Fig. 40.

Svælget er forsynet med 8 Dobbelttrækker Spikler, der bestaa af takkede Spindler med tilspidsede Ender, 0.220^{mm}

and are, likewise, on their aboral surface, sheathed with spicules (fig. 16. 17). The oral-disk is slightly convex, and the oral aperture forms a transversal fissure.

The entire Zoanthodem is very rich in spicules. On the stem and the branches, foliaceous subclavates are found, which are sometimes ramous in the uppermost extremity. They measure, 0.140^{mm} in length, and 0.080^{mm} in breadth a little above the middle (figs. 18. 19. 20). The bi-stellates are as broad as they are long, and measure, 0.060^{mm} in diameter (fig. 21). There are a few cruciform quadruplets, roller-formed spicules beset with warts, and measuring 0.140^{mm} in length, and 0.070^{mm} in breadth at the middle (figs. 22. 23), and finally, spicate fusees measuring 0.060^{mm} in length, and 0.020^{mm} in breadth (figs. 24. 25). On the posterior body of the polyp, especially at the point where it is produced into the sarcosoma, the spicules are placed transversally (fig. 16, *a*) and appear in various forms, amongst which may be recognised several like those of the stem and the branches; but most frequently, however, rollers beset with warts are met with (figs. 22. 23) and very complex stellates, richly beset with spikes, and measuring 0.136^{mm} in length, and 0.080^{mm} in breadth at the middle (fig. 26) between which, there are, here and there, seen, cruciform quadruplets beset with spikes, and measuring up to 0.180^{mm} in length, and the transversal arm measuring up to 0.100^{mm} (fig. 27). On the anterior body, the spicules are placed almost erect, in 8 double-series, (fig. 16, *b*) and are formed, principally, of strongly spicated fusees, which, partly, are straight, with almost acuminate extremities, and measure 0.400^{mm} in length, and 0.035^{mm} in breadth (fig. 28) partly, slightly bent, almost cymbiform fusees, measuring 0.380^{mm} in length, and 0.040^{mm} in breadth (figs. 29. 30). Between these, a few elongate cruciform quadruplets appear, measuring 0.264^{mm} in length, and having a transversal arm, 0.072^{mm} in length (fig. 31) also, spicate subclavates measuring, 0.144^{mm} in length, and 0.020^{mm} in breadth superiorly (fig. 32), and finally, elongate, spicate, straight spicules, of same length as the subclavates (fig. 33).

The tentacles are closely beset with 2 series of diagonally placed spicules (figs. 16 *c*, 17) of which, the greater number form spicate, partly straight, partly bent fusees, sometimes with acuminate, and sometimes with blunted extremities, and measuring 0.220^{mm} in length, and 0.016^{mm} in breadth at the middle (figs. 34. 35). Amongst these, spicate subclavates are seen, measuring 0.120^{mm} in length, and 0.032^{mm} in breadth at the broad extremity (fig. 36). Upon the pinnules, the spicules form, partly, spicate subclavates (fig. 37) partly, spicate spicules which are very minute, measuring 0.020^{mm} in length, and 0.012 in breadth (fig. 38) between which, there may be observed, largish, somewhat flattened, slightly spicated spicules, with broad spicate extremities, and measuring 0.140^{mm} in length, and 0.024^{mm} in breadth (fig. 39) also, a few short, thin, spicate straight fusees, measuring 0.060^{mm} in length, and 0.008^{mm} in breadth (fig. 40).

The gullet is furnished with 8 double series of spicules, which consist of spicate fusees with acuminate

lange, 0.028^{mm} brede og Køller af omtrent samme Længde, samt stærkt takkede, lidt fladtrykte Stave, med afstumpede, tildels delte Ender, 0.120^{mm} lange, 0.040^{mm} brede paa Midten, Fig. 41.

Farven.

Gul, spillende noget i det Brune. Basaldelen brun.

Station.

192. 200. Tre Exemplarer.

Artskarakter.

Zoanthodemet 70—80^{mm} høit. Basaldelen 25^{mm} i Omkreds; Stammen forøvrigt temmelig smal, stærkt riflet efter Længden, og dens øverste to Trediedele ere rundtom forsynede med Grene, den nederste Trediedel uden saadanne; men her udspringe enkelte Polyper direkte fra Stammen. Grenene noget spredte, i Regelen delte; saavel paa Smaa-grenene som paa de udelte Grene sidde Polyperne i Grupper. Stammen, Grenene og Smaagrenene overordentlig rig paa Kalkspikler. Polyperne lange, cylindriske, meget rige paa Spikler og forsynede med 8 fremspringende Ribber. Paa Forkroppen staa Spiklerne næsten opret i 8 tætte Dobbelttrækker og dannes væsentlig af takkede, dels krumme, dels lige Spindler; paa Bagkroppen ligge Spiklerne paatvers og have Form af vortedannede Valser, Dobbeltstjerner, Firlinger og takkede Spindler. Tentaklerne og Pinnulerne fuldstændigt bepantsrede med forskjelligt formede Spikler. Svælget forsynet med 8 tætte Dobbelttrækker, væsentlig takkede, Spindler. Farven gul, spillende lidt i det Brune.

Vøringia polaris, n. sp.

Tab. IX. Fig. 1—40.

Zoanthodemet varierer meget baade med Hensyn til Form og Størrelse efter de forskjellige Lokalteter. Det største Exemplar er 110^{mm} høit, og paa dette danner den membranøse Basaldel to cylindriske Rør, hvoraf det ene er 40^{mm} langt og 35^{mm} tykt, det andet er 30^{mm} langt og 28^{mm} tykt, begge ere fyldte med en graasort Lermasse, Fig. 1. Fra ethvert af disse Basalrørs Midte udgaar en lang Stolon, der bestaar af den samme membranøse Masse

extremities, and measure 0.220^{mm} in length, and 0.028^{mm} in breadth; also subclavates of about the same length; and, strongly spicate, somewhat flattened, staves, with blunted, partly ramous, extremities, and measuring 0.120^{mm} in length, and 0.140^{mm} in breadth at the middle (fig. 41).

Colour.

The colour is yellow, shading somewhat towards brown. The basal part is brown.

Habitat.

Stations, No. 192. 200. Three specimens.

Specific characteristics.

The Zoanthodem measures 70—80^{mm} in height. The basal part is 25^{mm} in circumference. The stem, otherwise, is pretty narrow, strongly grooved longitudinally, and its uppermost two-third parts is, round about it, furnished with branches; the lowest third part has none but, in this situation, a few polyps spring direct from the stem. The branches are somewhat dispersed and, generally, ramous. Both, upon the branchlets and upon the non-ramous branches, the polyps are placed in groups. The stem, the branches, and the branchlets, are extremely rich in calcareous spicules. The polyps are long, and cylindrical, very rich in spicules, and are furnished with 8 projecting ribs. On the anterior body, the spicules are placed, almost erect, in 8 double series, and are formed, principally, of spicate, partly bent, partly straight, fusees. On the posterior body, the spicules are placed transversally, and have the form of protuberated rollers, bi-stellates, quadruplets, and spicate fusees. The tentacles and the pinnules are completely sheathed, with spicules of various forms. The gullet is furnished with 8 closely-set double series of, principally, spicate fusees. The colour is yellow, shading a little towards brown.

Vøringia polaris, n. sp.

Pl. IX, fig. 1—40.

The Zoanthodem varies much, both with respect to its form and its size, according to the different localities. The largest specimen measures, 110^{mm} in height and, in it, the membranaceous basal portion forms two cylindrical tubes, of which, one measures 40^{mm} in length, and 35^{mm} thick; and the other measures, 30^{mm} in length, and 28^{mm} thick; both are occupied by a greyish-black, aluminous mass (fig. 1). From the middle of each of these

som den Del, hvorfra de udgaa; disse Stoloner ere tynde og fæste sig et Stykke fra Basaldelens Grund, Fig. 1, a. Paa nogle mindre Exemplarer danner Basaldelen kun et enkelt, tykt Rør fyldt med Ler; men fra det udgaa flere mere eller mindre tykke Stoloner¹. Stammen er rund, riflet paalangs, 35^{mm} i Omkreds ved Grunden, men aftager noget i Tykkelse opad imod Toppen, hvor den bliver temmelig smal, og hvorfra udgaa 3 tætstaaende, tykke, korte Grene, Fig. 1. Omtrent 12^{mm} fra Basaldelen sees dels enkelte Polyper, dels korte, tykke Grene at udspringe rundt om Stammen, og fra nu af tiltage Grenene baade i Mængde og Størrelse, saa at Stammen paa dens øverste Del er godt forsynet dermed. Paa Midten af Stammens grenbærende Del ere Grenene længst, indtil 20^{mm} lange, og paa dem iagttages flere Smaagrene, Fig. 1. Saavel disse som Grenene ere rigt besatte med Polyper, der staa saa tæt, at de for en Del skjule Grenene.

Hvad ovenfor er beskrevet, gjælder nu væsentlig det største Exemplar; paa andre Exemplarer er Stammen forholdsvis tyndere: Grenene udspringe rundt Stammen, have ofte Smaagrene, og ere rigt besatte med Polyper. Paa to Exemplarer er Stammen nøgen i en temmelig lang Strækning, og dens øverste Ende deler sig i 2—3 Hovedgrene, som ere meget tykke, forholdsvis korte og forsynede med enkelte Smaagrene, der ligesom Grenene bære en Mængde Polyper. Det er disse to Exemplarer, hvis Basaldel er skiveformigt udvidet, Fig. 1, A.

Polyperne ere krukkeformede med bred Tentakelskive og omtrent 8^{mm} lange, Fig. 2. Kroppen er 5^{mm} lang, forsynet med 8 Spikelrækker. Tentaklerne tykke ved Grunden, 3^{mm} lange; Pinnulerne temmelig lange, smale, og saavel disse som Tentaklerne ere rige paa Spikler, Fig. 2.

Hele Zoanthodemet er spikelrigt. Paa Basaldelen med dens Stoloner ligge Spiklerne pakkede paa hverandre og optræde væsentligt under Form af Dobbeltstjerner, hvoraf enkelte nærme sig Dobbeltkuglen med takkede Ender, 0.112^{mm} lange, 0.096^{mm} brede i Enderne og 0.032^{mm} bred paa det glatte Midtparti, Fig. 3. Dobbeltstjernerne have tildels et langt, nøgent Midtparti, Fig. 4; men hyppigst er dette kort, imedens der fra begge Ender udgaa Straaler,

¹ Hos *Vøringia fruticosa* finder man Basaldelen meget forskjellig paa de forskellige Exemplarer. Almindeligst er den noget hult opsvulmet, dannet af en fast Membran, der former sig snart til et Rør, snart til en hul Kugle, der er fyldt med graasort Ler, og fra hvilke flere Stoloner udgaa.

basal tubes there proceeds a long style, consisting of the same membranous substance as the part from which it proceeds. These styles are thin, and are adherent a little above the basal root (fig. 1, a). In a few of the smaller specimens, the basal portion forms only one thick tube filled with alumina but, from it, several, more or less, thick styles proceed, whilst, a few specimens have a discoidal base¹. The stem is cylindrical, and longitudinally grooved, and it measures 35^{mm} in circumference at the base, but diminishes, somewhat, in thickness, up towards the summit; it there becomes pretty narrow, and from that point there proceed, 3 closely placed, thick, short branches (fig. 1). About 12^{mm} above the basal part may be observed, partly, a few polyps, partly, a few, short, thick branches, which shoot out from the stem, round about it; above that point, the branches increase, both in number and size, so that the stem, on its uppermost part, is well supplied with them. At the middle of the ramous part of the stem, the branches are longest, and measure, up to 20^{mm} in length, and several branchlets are seen upon them (fig. 1). Both, these and the branches are richly beset with polyps which are placed so closely, that they, in a measure, conceal the branches.

What is stated above refers principally, however, to the largest specimen; in other specimens the stem is, relatively, thinner, and the branches spring from the stem, round about it, quite from the basal portion; they have often branchlets richly beset with polyps. In two specimens, the stem is bare for a rather considerable extent, and its uppermost extremity ramifies into 2—3 chief branches, which are very thick, relatively short, and furnished with a few branchlets, which, like the branches, carry a multitude of polyps. It is in these two specimens that the basal portion is expanded discoidally (fig. 1, A).

The polyps are urceolate with broad tentacular disks, and measure about 8^{mm} in length (fig. 2). The body measures 5^{mm} in length, and is furnished with 8 spicular series. The tentacles are thick at the root, and measure 3^{mm} in length. The pinnules are rather long, and narrow, and they, as well as the tentacles, are rich in spicules (fig. 2).

The entire Zoanthodem is rich in spicules. In the basal portion with its styles, the spicules are placed packed upon each other, and appear, principally, in the form of bistellates, of which, a few approach in form to the double-sphere with spicate extremities, and measure 0.112^{mm} in length, and 0.096^{mm} in breadth at the extremities, and 0.032^{mm} in breadth at the smooth mesial part (fig. 3). The bistellates have, partly, a long, bare, mesial

¹ In *Vøringia fruticosa*, the basal portion is found to be very variable in the different specimens. Most frequently, it is somewhat expanded, and formed of a firm membrane, which, sometimes, takes the form of a hollow tube, and sometimes, the form of a hollow sphere which is filled with greyish-black Alumina, and from which several styles proceed.

som ende i mange Blade; de ere 0.088^{mm} lange, 0.064^{mm} brede i Enderne, paa Midten 0.020^{mm}. Seet ovenfra eller paaskraas have mange af disse Dobbeltstjerner et smukt straalet Udseende, Fig. 5.5. Meget sjeldnere træffes mere sammensatte Stjerner, der ere 0.148^{mm} lange, 0.102^{mm} brede, paa Midten 0.036^{mm}, Fig. 6; men endnu sjeldnere sees Firlinger, dels i Form af Kors, dels som Rosetter. Den korsformede Firling er 0.156^{mm} lang med en 0.124^{mm} bred Tverstok, Fig. 7; Rosetterne ere 0.104^{mm} lange, 0.080^{mm} brede, Fig. 8. Foruden de ovennævnte Spikelformer sees ogsaa enkeltvis forunderlige Spikler med bladede Udvæxter, hvilke synes at være Afændringer af Dobbeltstjernen; de ere 0.116^{mm} lange, 0.068^{mm} brede mod Enderne og 0.028^{mm} bred omtrent paa Midten, Fig. 9.

Paa Stammen findes for en stor Del lignende Dobbeltstjerner som paa Basaldelen, men i Regelen rigere ornamenterede og noget større; de ere fra 0.096—0.128^{mm} lange og fra 0.072—0.080^{mm} brede i Enderne og med et Midtparti fra 0.024—0.036^{mm} bredt, Fig. 10. Imellem disse Spikler sees en og anden Spindel besat med Blade, 0.120^{mm} lang, 0.060^{mm} bred, og som nærmer sig meget til den sammensatte Stjerneform, Fig. 11.

Paa Grenene træffes atter Dobbeltstjerner almindeligst, men som man vil se af Figurerne, ere de her noget forskellige, idet Enderne ere rigere paa Straaler; de ere fra 0.100—0.120^{mm} lange og fra 0.060—0.076^{mm} brede og fra 0.024—0.032^{mm} brede paa Midten, der i Regelen er nøgen, Fig. 12—17. Ikke saa sjeldent sees imellem de nævnte Dobbeltstjerner store, tilspidsede Spindler, besatte med Blade, der ere 0.168^{mm} lange, 0.064^{mm} brede paa Midten, Fig. 18, og meget sammensatte Stjernespiculer, 0.240^{mm} lange, 0.108^{mm} brede paa Midten, Fig. 19; men særdeles sjeldent iagttages Firlinger, der dels nærme sig Timeglasformen og ere 0.142^{mm} lange, 0.096^{mm} brede i Enderne og 0.036^{mm} bred paa Midten, Fig. 20, dels Korsformen og ere fra 0.100—0.128^{mm} lange med en Bredde fra 0.088—0.104^{mm}, Fig. 21. 22.

Paa Polypens Bagkrop ligge Spiklerne paatvers i 8 Længderækker, Fig. 2, og bestaa dels af Dobbeltstjerner, 0.140^{mm} lange, 0.076^{mm} brede i Enderne og 0.032^{mm} brede paa Midtpartiet, der som oftest er nøgent, Fig. 23, dels af takkede, lidt fladtrykte Spindler med mere eller mindre tversafskaarne Ender, der ere fra 0.120—0.164^{mm} lange og fra 0.076^{mm} brede, stundom ere de indknebne paa Midten, Fig. 24. 25.

part (fig. 4) but, most frequently, that part is short, whilst from both extremities, rays proceed, terminating in numerous leaves. They measure 0.088^{mm} in length, 0.064^{mm} in breadth at the extremities, and 20^{mm} in the middle. Viewed superiorly or diagonally, many of these bistellates have a beautiful radiated appearance (figs. 5.5). Much more rarely do we meet with more complex stellates, measuring 0.148^{mm} in length, and 0.102^{mm} in breadth, and 0.036^{mm} in the middle (fig. 6) but still more rarely are quadruplets seen, partly cruciform, and partly, rosetti-form. The cruciform quadruplet measures 0.156^{mm} in length, and has a 0.124^{mm} broad transversal arm (fig. 7). The rosettes measure 0.104^{mm} in length, and 0.080^{mm} in breadth (fig. 8). Besides the above named spicular forms, there are, also, seen, occasional strange spicules with foliaceous excrescences; these seem to be modifications of the bistellate, and measure 0.116^{mm} in length, and 0.068^{mm} in breadth towards the extremities, and 0.028^{mm} broad at the middle (fig. 9).

On the stem, there are, in large measure, found, similar bistellates to those of the basal part but, as a rule, more richly embellished, and somewhat larger; they measure from 0.096—0.128^{mm} in length, and from 0.072—0.080^{mm} in breadth at the extremities, with a mesial portion measuring from 0.024—0.036^{mm} in breadth (fig. 10). Between these spicules, an occasional fusee beset with leaves is seen, measuring 0.120^{mm} in length and 0.060^{mm} in breadth; it much approaches to the complex stellate-form (fig. 11).

Upon the branches, the bistellate is again met with, usually, but, as one can see from the illustrations, they are, here, somewhat different in aspect, in as much that the extremities are richer in rays; they measure from 0.100—0.120^{mm} in length, from 0.060—0.076^{mm} in breadth, and are from 0.024—0.032^{mm} broad at the middle, which, usually, is bare (figs. 12—17). Between the bistellates spoken of, there are seen, not infrequently, large, acuminate fusees beset with leaves, and measuring 0.168^{mm} in length, and 0.064^{mm} in breadth at the middle (fig. 18); and also, very complex stellate-spicules, measuring 0.240^{mm} in length, and 0.108^{mm} broad at the middle (fig. 19), but exceptionally rarely are quadruplets observed, which, partly, approach to an hour-glass in form, and measure 0.142^{mm} in length, and 0.096^{mm} in breadth at the extremities, and 0.036^{mm} broad at the middle (fig. 20) and partly, are cruciform, measuring from 0.100—0.128^{mm} in length, with a breadth of from 0.088—0.104^{mm} (figs. 21. 22).

On the posterior body of the polyp, the spicules are placed transversally, in 8 longitudinal series (fig. 2) and consist, partly, of bistellates, measuring 0.140^{mm} in length, and 0.076^{mm} in breadth at the extremities, and 0.032^{mm} in breadth at the middle part, which, most frequently, is bare (fig. 23), and partly, of spicate, slightly flattened, fusees with, more or less, truncated extremities, and measuring from 0.120—0.164^{mm} in length, and from 0.056—0.076^{mm} in breadth; occasionally, they are constricted at the middle (figs. 24. 25).

Paa Forkroppen eller rettere paa Grænsen imellem For- og Bagkrop ligge Spiklerne næsten horizontalt og bestaa væsentligst af lange, takkede Spindler, der dels ere lige, dels krumme saavel i Baad- som i S Form og ere fra 0.300—0.340^{mm} lange og fra 0.024—0.052^{mm} brede. Bredden er imidlertid ikke ens overalt; de lige Spindler ere tykkest paa Midten, de krumme ere som oftest tykkest op imod den ene Ende, Fig. 26. 27. Imellem disse store Spindler sees enkelte meget smaa og tynde, lidt takkede, spindelformige Spikler, der ere 0.072^{mm} lange, 0.008^{mm} brede, Fig. 28. Paa selve Forkroppen antage Spindlerne, der her ere meget mindre, en mere opreist Stilling, og idet de slutte sig sammen, danne de 8 svagt fremstaaende Længderibber, som strække sig et lidet Stykke op paa Tentaklernes aborale Flade. Længere op paa denne blive Spiklerne tyndere, ligge paaskraas og danne to Rækker, saaledes at de indre Ender møde hverandre paa Tentaklernes Midte, og de ydre strække sig lidt udover Pinnulerne. Disse spindelformige Spikler ere enten lige eller krumme, besatte med Takker, have tilspidsede Ender og ere 0.108^{mm} lange, 0.008^{mm} brede, Fig. 29. 30. Foruden Spindlerne sees paa Pinnulerne mere fladtrykte Spikler med indskaarne Rande og takkede, afstumpede Ender; de ere 0.064^{mm} lange og 0.020^{mm} brede, Fig. 31—33.

Paa Svælgets ydre Flade, dækket af Epithelet og omgivet af dette, findes 8 enkelte Længderækker Spikler, der staa noget fra hverandre, Fig. 34. De ere mere eller mindre fladtrykte, takkede og forskjelligt formede, ere fra 0.076—0.124^{mm} lange og fra 0.012—0.036^{mm} brede, Fig. 35—40.

Farven.

Stammen er svag rødlig med en i det Grønlig spillende Basaldel. Grene og Polyper ere laxerøde.

Findested.

- Station 87: Et Exemplar.
- 270: Et noget mindre Exemplar.
- 295: 2 Exemplarer.
- 312: Et lidet Exemplar.
- 362: Nogle Exemplarer.

Artskarakter.

Zoanthodemet indtil 110^{mm} høit med en Basaldel, der snart ender cylinderformet, snart skiveformet. Stammen rund, furet paalangs, temmelig haard, forsynet med Grene,

Upon the anterior body or, more correctly, at the margin between the anterior and posterior bodies, the spicules are placed almost horizontally, and consist, principally, of long spicate fusees, which, partly, are straight, and partly, are bent, both, in cymbi-form, as well as in S-form, and measure from 0.300—0.340^{mm} in length, and from 0.024—0.082^{mm} in breadth. The breadth is, however, not uniform throughout. The straight fusees are thickest at the middle, whilst the bent ones are, most frequently, thickest up towards the one extremity (figs. 26. 27). Amongst these large fusees, a few very minute and thin, slightly spicate, fusiform spicules are observed, and these measure, 0.072^{mm} in length, and 0.008^{mm} in breadth, fig. 28. On the anterior body, itself, the fusees, which here are much more minute, assume a more erect position, and as they close together, they form the 8 slightly projecting longitudinal series, which extend a little way up the aboral surface of the tentacles. Further up on this, the spicules become thinner, and are placed diagonally, forming two series, in such manner, that the inner extremities meet each other at the middle of the tentacles, and the outer extremities extend themselves a little out over the pinnules. These fusiform spicules are either straight or bent; they are beset with spikes, have acuminate extremities, and measure, 0.108^{mm} in length, and 0.008^{mm} in breadth (figs. 29. 30). Besides the fusees, there are seen, upon the pinnules, other flattened spicules with indented margins and spicate blunted extremities; they measure 0.064^{mm} in length, and 0.020^{mm} in breadth, figs. 31—33.

On the outer surface of the gullet, covered by epithelium and surrounded by it, 8 single longitudinal series of spicules are observed, which are placed somewhat apart from each other (fig. 34). They are, more or less flattened spicate, and variously formed, and measure from 0.076—0.124^{mm} in length, and from 0.012—0.036^{mm} in breadth (figs. 35—40).

Colour.

The stem is faint reddish, the basal portion shading to greenish. The branches, and polyps, are salmon-coloured.

Habitat.

- Station No. 87. One specimen.
- " 270. One somewhat smaller specimen.
- " 312. A similar specimen.
- " 362. A few specimens.

Specific characteristics.

The Zoanthodem measures up to 110^{mm} in height, and has a basal part which, sometimes, terminates in cylinder-form, sometimes, in discoidal-form. The stem is

som tage deres Begyndelse et Stykke ovenfor Basaldelen. Grenene staa temmelig langt fra hverandre, ere tykke med afstumpede Ender og rigt besatte med Polyper, der tildels gruppere sig, hvorved Smaagrene dannes. Polyperne bægerformede, 8^{mm} lange, hvoraf Tentaklerne udgjør omtrent en Trediedel. Stammen, Grene og Polyper ere rige paa Kalkspikler. Spiklerne optræde paa Basaldelen, Stammen, Grenene og tildels paa Polypernes Bagkrop væsentlig under Form af Dobbeltstjerner og paa Forkroppen, Spindler. Artens Form varierer temmelig betydeligt, men Spiklernes Anordning og Form overalt den samme. Svælget forsynet med 8 enkelte Længderækker Spikler. Farven væsentlig laxerød.

Vøringia pygmæa n. sp.

Tab. IX, Fig. 41—90.

Zoanthodemet er indtil 35^{mm} høit. Stammen er rund, riflet, temmelig fast og ved Grunden 35^{mm} i Omfang, men aftager lidt i Tykkelse op imod den afrundede Top, der er tæt besat med Polyper. Basaldelen er noget udvidet. Paa et Par meget smaa Exemplarer har Basaldelen membranøst ompundet en tynd Gren af Hornera, samt et Anneliderør. Fra Basaldelen og til Toppen er Stammen omgivet af Grene, som ere tykke, furede og mere eller mindre lange, saa at de længste, der sidde omtrent midt paa Stammen, ere indtil 20^{mm}, imedens andre ere kun halvt saa lange. De ere i Reglen nøgne ved Udspringet og i nogle Millimeters Udstrækning, men forøvrigt ere de rigt besatte med Polyper, som danne tætte Grupper, der samle sig i en bred Stilk, som gaar over i Grenen. Disse Smaagrene med Polypgrupper omgive Grenen saa tæt, at denne ganske skjules af dem, Fig. 41.

Polyperne ere i udstrakt Tilstand omtrent 10^{mm} lange, næsten cylindriske, dog bredere paa Bagkroppen, der er temmelig lang og forsynet med 8 Længderækker paa tværliggende Spikler, hvilke gaa over paa Forkroppen, men blive her mere fremspringende, idet Spiklerne ligge paa langs, Fig. 42. Tentaklerne ere 3—4^{mm} lange, og saavel Tentakelstammen som Pinnulerne ere paa deres aborale Flade bepantrede med Spikler, Fig. 43.

Hele Zoanthodemet er rigt paa Spikler, som optræde under forskellige Former paa de forskellige Steder. — Paa Basaldelen ere sammensatte Stjerner almindeligst, Den norske Nordhavsexpedition: D. C. Danielssen: Alcyonida.

cylindrical, and longitudinally grooved, pretty hard, and furnished with branches which begin to spring out a short distance above the basal-part. The branches are placed pretty far apart from each other, and are thick, with blunted extremities; they are richly beset with polyps which, partly, group themselves together and, in that manner, form the branchlets. The polyps are chalice-formed, and measure 8^{mm} in length, of which the tentacles compose about a third part. The stem, branches, and polyps, are rich in calcareous spicules. The spicules appear upon the basal part, the stem, branches and, partly, upon the posterior body of the polyps, principally, in the form of the bistellate and on the anterior body as fusees. The form of the species varies pretty considerably, but the spicular arrangement and form is, everywhere, the same. The gullet is furnished with 8 single, longitudinal, series of spicules. The colour is, principally, salmon-red.

Vøringia pygmæa n. sp.

Pl. IX. Figs. 41—90.

The Zoanthodem measures up to 35^{mm} in height. The stem is cylindrical, grooved, rather firm and, at the base, it measures 35^{mm} in circumference, but diminishes a little in thickness up towards the rounded summit, which is closely beset with polyps. The basal portion is somewhat expanded. In a couple of very small specimens, the basal portion is membranaceously girded by a thin branch of Hornera and, also, by an Annalid-tube. From the basal portion and up to the summit, the stem is surrounded by branches; these are thick, and grooved, and are more or less long, so that the longest ones, which are situated about the middle of the stem, measure up to about 20^{mm}, whilst others are only half as long. As a rule, they are bare at the root and for a few millimetres beyond it, but, otherwise, they are richly beset with polyps, which form closely-set groups that collect themselves into a broad stalk produced into the branch. These branchlets with polyp-groups surround the branch so closely, that it is quite concealed by them (fig. 41).

The polyps are, when in extended condition, about 10^{mm} long, almost cylindrical, but broadest on the posterior body; this is pretty long, and is furnished with 8 longitudinal series of transversally-situated spicules which are produced into the anterior body but become, here, more protuberant, owing to the spicules being placed longitudinally (fig. 42). The tentacles are 3—4^{mm} in length, and both, the tentacular stem as well as the pinnules, are sheathed with spicules on their aboral surface, (fig. 43).

The entire Zoanthodem is rich in spicules, which appear under different forms in the different situations. In the basal portion, complex stellates are most frequent, whilst,

imedens Dobbeltstjernerne ere meget sjeldnere. De første ere 0.148^{mm} lange, 0.076^{mm} brede, Fig. 44. 45; de sidste variere noget, sandsynligvis efter det forskjellige Udviklings-trin, paa hvilke de befinde sig; de mest udviklede ere 0.120^{mm} lange, 0.080^{mm} brede i Enderne med et 0.028^{mm} bredt, nøgent Midtparti, Fig. 46; de mindre udviklede ere indtil 0.088^{mm} lange, 0.048^{mm} brede i Enderne med et nøgent Midtparti, 0.024^{mm} bredt, Fig. 47. 48. Hist og her sees en takket Kølle, 0.204^{mm} lang, 0.088^{mm} bred i den tykke Ende, Fig. 49, samt enkelte bladede Klubber, 0.120^{mm} lange, 0.068^{mm} brede i den tykke Ende, Fig. 50. Men foruden de nævnte Spikler findes paa Basaldelen ikke saa ganske sjeldent Firlinger i meget forskjellige Former og Størrelser. De antage som oftest Korsformen, hvor uformelige end disse Kors kunne være; enkelte Kors ere omtrent lige lange som brede, 0.116^{mm} i Længde og Bredde, Fig. 51. 52; andre have en Længdestok 0.140^{mm} og en Tverstok, 0.108^{mm}, Fig. 53. Sjeldnere nærme disse Firlinger sig Timeglas- eller Rosetformen, Fig. 54. 56, men alle ere mere eller mindre besatte med Takker, Vorter eller Blade, naar undtages en yderst liden, korsformet Firling, som næsten er glat, og hvis Længdestok er 0.048^{mm} og Tverstok 0.028^{mm}, Fig. 57. Rosetterne kunne være dels meget smaa og simple, indtil 0.060^{mm} i Gjennemsnit, Fig. 55, dels ere de større, 0.116^{mm} lange, 0.104^{mm} brede og rigt ornamenterede, Fig. 56.

Paa Stammen og Grenene er Dobbeltstjernen almindeligst, men varierer adskilligt i Form. Nogle ere temmelig spinkle og have et langstrakt Udseende med forlængede, takkede Ender og tre, næsten nøgne Partier, hvoraf det midterste dog er det længste; disse danne en Overgang til de mere sammensatte Stjerner og ere fra 0.084—0.108^{mm} lange og fra 0.040—0.056^{mm} brede med et nøgent Midtparti fra 0.016—0.020^{mm} bredt, Fig. 58. 59; andre ere brede, massive, fra 0.088—0.104^{mm} lange, med rigere takkede Ender, der ere fra 0.052—0.076^{mm} brede; Midtpartiet er fra 0.016—0.032^{mm} bredt, Fig. 60. 61. Imellem Dobbeltstjernerne sees hist og her dels Firlinger, der nærme sig Kors- og Timeglasformen, ere rigt besatte med Takker og fra 0.112—0.120^{mm} lange og omkring 0.080^{mm} brede, Fig. 62—64, dels store, stærkt takkede Spindler, 0.180^{mm} lange, 0.072^{mm} brede, Fig. 65, dels næsten glatte Stave med takkede Ender, 0.124^{mm} lange, 0.040^{mm} brede, Fig. 66, [og endelig enkelte bladede Klubber med Firlingens Mærke, Fig. 67.

bistellates are much more rare. The first-named measure 148^{mm} in length, and 0.076^{mm} in breadth (figs. 44—45); the last-named vary much, presumably, according to the stage of development in which they find themselves; the most fully developed measure, 0.120^{mm} in length, and 0.080^{mm} in breadth at the extremities, and have a bare mesial part that measures 0.028^{mm} in breadth (fig. 46); the less developed ones measure, up to 0.088^{mm} in length, and 0.048^{mm} in breadth at the extremities, and have a bare mesial part, 0.024^{mm} in breadth (figs. 47. 48). Here and there, a spicate subclavate is seen, measuring 0.204^{mm} in length, and 0.088^{mm} in breadth at the thick extremity (fig. 49); also, a few foliaceous clavates which measure, 0.120^{mm} in length, and 0.068^{mm} in breadth at the thick extremity (fig. 50). But besides the spicules mentioned there are, not infrequently, found in the basal portion, quadruplets of very variable form and size. These assume, most usually, the cruci-form, however amorphous these cruci-forms may be. A few cruci-forms are about as long as they are broad, measuring 0.116^{mm} in length and breadth (figs. 51, 52). Others have a longitudinal arm, measuring 0.140^{mm}, and a transversal arm measuring 0.108^{mm} in length (fig. 53). More rarely do these quadruplets approach to the hour-glass, or rosetti-forms (figs. 54—56), but all of them are, more or less, beset with spikes, warts or leaves, with the exception of an extremely minute cruci-form quadruplet, which is almost smooth, and whose longitudinal arm measures, 0.048^{mm} in length, and its transversal arm 0.028^{mm}, (fig. 57). The rosettes may be, sometimes, very small and plain, measuring up to 0.060^{mm} in diameter (fig. 55), and, sometimes larger, measuring 0.116^{mm} in length, and 0.104^{mm} in breadth, and are also richly embellished, (fig. 56).

On the stem and the branches, the bistellate is the most common spicule but varies considerably in its form. A few are rather slender, and have an elongate appearance, with prolonged, spicate extremities and three almost bare parts, of which the medial one is, however, the longest one. These form a transition to the more complex stellates; they measure from 0.084—0.108^{mm} in length, and from 0.040—0.056^{mm} in breadth, with a bare mesial part measuring from 0.016—0.020^{mm} in breadth (figs. 58. 59); others are broad, and more massive, and these measure from 0.088—0.104^{mm} in length, and have more richly spicated extremities measuring from 0.052—0.076^{mm} in breadth. The mesial part measures from 0.016—0.032^{mm} in breadth (figs. 60. 61). Between the bistellates there are, here and there, seen quadruplets, which approach to the cruci-form and hour-glass forms, and these are richly beset with spikes, and measure from 0.112—0.120^{mm} in length, and about 0.080^{mm} in breadth, (figs. 62. 64); also, partly, large, strongly spicated fusees, measuring 0.180^{mm} in length, and 0.072^{mm} in breadth (fig. 65), and partly, almost smooth staves, with spicate extremities, and measuring 0.124^{mm} in length, and 0.040^{mm} in breadth, (fig. 66), and, finally, a few foliaceous clavates having the characteristics of the quadruplets (fig. 67).

Paa Overgangen fra Coenenchymet til Polypkroppen findes almindeligst takkede og bladede Spindler med konisk tilspidsede eller mere afstumpede Ender; de have ofte et smalt, nøgent Midtbelte og ere fra 0.192—0.284^{mm} lange og fra 0.076—0.080^{mm} brede, Fig. 68, 69, samt bladede Tapper eller Køller, der ere 0.192^{mm} lange, 0.076^{mm} brede i den tykke Ende, Fig. 70, og imellem de nævnte Spikler, men sjeldnere, iagttages nogle, der danne Overgangsled imellem Spindel, dobbelt og sammensat Stjerne og ere fra 0.156—0.192^{mm} lange og 0.092^{mm} brede, Fig. 71, 72.

Paa Polypkroppen, især paa dens bagerste Del, gjenfindes enkelte af de Former, som nys omtaltes, samt almindeligst Dobbeltstjerner med et nøgent Midtbelte; disse ere fra 0.096—0.120^{mm} lange og fra 0.052—0.056^{mm} brede i Enderne; det nøgne Midtparti er fra 0.024—0.028^{mm} bredt, Fig. 73, 74; sjeldnere sees mere sammensatte Stjerner, som ere 0.160^{mm} lange og 0.076^{mm} brede, Fig. 75. Paa Forkroppen ere lange, takkede Spindler hyppigst; de ere fra 0.232—0.260^{mm} lange og fra 0.056—0.060^{mm} brede, Fig. 76, 77.

Paa Tentaklernes Basaldel findes Spindler, lig dem paa Forkroppen; længere op blive Spiklerne mindre, noget fladere, men mere takkede og ere her fra 0.132—0.180^{mm} lange og fra 0.044—0.048^{mm} brede, Fig. 78—81; paa den øverste Del ere de ganske smaa og flade, 0.064^{mm} lange, 0.036^{mm} brede, Fig. 82, 83. Paa Tentaklernes Sider og paa Pinnulerne ere Spiklerne mere tynde, langstrakte, tildels stærkt takkede og indtil 0.056^{mm} lange, 0.008^{mm} brede, Fig. 86, 88.

Svælgat har paa begge Sider 2 Rækker Spikler, saa at Bug- og Rygsiden er spikelfri, Fig. 89. Spiklerne danne her dels takkede Spindler fra 0.092—0.112^{mm} lange og fra 0.024—0.040^{mm} brede, Fig. 90, dels forskelligt formede Rosetter, der ere fra 0.072—0.076^{mm} lange og fra 0.032—0.048^{mm} brede, Fig. 84, 85.

Generationsorganerne ere udviklede i den bagerste Del af Mavehulheden og strække sig tildels ned i dens Forlængelser, hvor en Mængde Æg i forskellige Udviklingsstadier fandtes.

Artskarakter.

Zoanthodemet er indtil 35^{mm} høit med en skiveformig, membranøs Basaldel, der omspænder dels Anneliderør, dels Korallstumper. Stammen er tyk, aftagende lidt i Tykkelse mod Toppen, der er tæt besat med Polyper, og fra dens Grund og til Enden rundt om forsynet med tykke, furede Grene, som ere rigt besatte med Polyper, der stundom

At the junction of the sarcosoma with the body of the polyp, spicate and foliaceous fusees are, most frequently, found, having conically acuminate, or more obtuse, extremities; these frequently have a narrow bare mesial belt, and measure from 0.192—0.284^{mm} in length, and from 0.076—0.080^{mm} in breadth (figs. 68, 69), also, foliaceous cones or subclavates, measuring 0.192^{mm} in length, and 0.076^{mm} in breadth at the thick extremity (fig. 70); and between the spicules mentioned, but less frequently, may be observed, a few others that form the connecting-link between the fusee and the double and complex stellates, and which measure from 0.156—0.192^{mm} in length, and 0.092^{mm} in breadth (fig. 71, 72).

On the body of the polyp, especially on its posterior part, a few of the forms which have just been spoken of may be recognised, also, most frequently, bistellates with a bare mesial belt. These measure from 0.096—0.120^{mm} in length, and from 0.052—0.056^{mm} in breadth at the extremities, the bare mesial portion measuring, from 0.024—0.028^{mm} in breadth (figs. 73, 74); more rarely, still more complex stellates may be observed, measuring from 0.160^{mm} in length, and 0.076^{mm} in breadth, (fig. 75). On the anterior body, long spicate fusees are, most frequently, met with, and these measure, from 0.232—0.260^{mm} in length, and from 0.056—0.060^{mm} in breadth (figs. 76, 77).

On the basal portion of the tentacles, fusees are found like those upon the anterior body. Further up, the spicules become smaller, and somewhat flatter, but more spicate, and, here, they measure, from 0.132—0.180^{mm} in length, and from 0.044—0.048^{mm} in breadth (figs. 78—81), whilst on the uppermost part they are quite minute and flat, and measure 0.064^{mm} in length, and 0.036^{mm} in breadth (figs. 82, 83). On the sides of the tentacles, and on the pinnules, the spicules are thinner, elongate, and sometimes strongly spicate, measuring from 0.056^{mm} in length, and 0.008^{mm} in breadth, (figs. 86—88).

The gullet has, on both sides, 2 series of spicules, arranged in such manner, that the ventral and the dorsal sides are devoid of spicules (fig. 89). The spicules form, here, partly, spicate fusees measuring from 0.092—0.112^{mm} in length, and from 0.024—0.040^{mm} in breadth (fig. 90), partly, variously formed rosettes which measure from 0.072—0.076^{mm} in length, and from 0.032—0.048^{mm} in breadth, (figs. 84—85).

The generative organs are developed in the posterior part of the ventral-cavity, and extend themselves, partly, down into its prolongations, where a mass of ova in different stages of development was found.

Specific characteristics.

The Zoanthodem measures up to 35^{mm} in height, and has a discoidally formed, membranaceous basal part, which incloses, partly, annalid-tubes, partly, lumps of coral. The stem is thick, diminishing a little in thickness towards the summit, which, latter, is closely beset with polyps, and from the base up to the summit, it is furnished, round about

staa i Grupper paa tykke, korte Smaagrene. Polyperne ere cylindriske, noget bredere i Forkroppen, indtil 10^{mm} lange og forsynede med 8 Længderibber. Tentaklerne ere $3-4^{mm}$ lange; Pinnulerne ere temmelig korte, og begge omgivne med Spikler paa deres aborale Flade. Svælget har 2 Rækker Spikler paa hver Side; Ryg- og Bugside ere uden Spikler. Hele Zoanthodemet er spikelrigt. Paa Basaldelen er sammensatte Stjerner almindeligst; paa Stamme og Grene er Dobbeltstjernen og paa Polyperne Spindel og Dobbeltstjernen de hyppigste Spikelformer.

Farven.

Bleg gulrød.

Findested.

Station 124. 3 Exemplarer.

Vøringia dryopsis¹, n. sp.

Tab. XVII, Fig. 55—60. Tab. XVIII, Fig. 1—54.

Zoanthodemet er indtil 50^{mm} høit. Stammen er omtrent 30^{mm} høi, næsten lige tyk overalt, 28^{mm} i Omfang ved Grunden, furet paalangs, og fra dens øverste Ende udgaa $4-5$ tykke, opretstaaende Grene, der danne ligesom Kronen paa Stammen. Denne er for største Delen nøgen, kun paa dens øverste Del, strax nedenunder Grenenes Udspring, iagttages dels isolerede, dels smaa Grupper af Polyper. Grenene ere indtil 12^{mm} lange, 5^{mm} brede ved deres Udspring, men udvide sig lidt mod Enden og ere overalt tæt besatte med Polyper, naar undtages den nederste Del af deres undre Flade, der som oftest er nøgen, Tab. XVII, Fig. 55. Basaldelen er fast, membranøs, meget udvidet og omspænder stundom ganske de Gjenstande, hvortil den er fæstet, saaledes som Tilfældet er med det afbildede Exemplar, der aldeles omslutter et Stykke Rør af *Tubularia imperialis*, og paa hvilket tillige sees en ung Koloni, hvor endnu ingen Grene ere fremkomne, Fig. 55, *a*, samt en liden Polyp, der visselig ganske nylig har sat sig fast, Fig. 55, *b*.

¹ δρυς = Egetræ.

it, with thick, grooved branches, richly beset with polyps, which, occasionally, are placed in groups, on thick short branchlets. The polyps are cylindrical, and somewhat broadest in the anterior body; they measure up to 10^{mm} in length, and are furnished with 8 longitudinal ribs. The tentacles measure $3-4^{mm}$ in length; the pinnules are pretty short; both are surrounded by spicules on their aboral surfaces. The gullet has 2 series of spicules on each side; the dorsal and ventral sides are devoid of spicules. The entire Zoanthodem is rich in spicules. In the basal part, complex stellates are most common; on the stems and branches, the bistellate is most common; whilst, on the polyps the fusee and bistellate are the most frequent spicular forms.

Colour.

Pale yellowish-red.

Habitat.

Station No. 124. 3 specimens.

Vøringia dryopsis¹, n. sp.

Pl. XVII, figs. 55—60. Pl. XVIII, figs. 1—54.

The Zoanthodem measures up to 50^{mm} in height. The stem measures about 30^{mm} in height, and is almost uniform in thickness throughout, measuring 28^{mm} in circumference at the base. It is grooved longitudinally, and, from its uppermost extremity, 4 to 5 thick, erect, branches issue, forming, as it were, the corona of the stem. The stem is, for the greater part, bare, and only in its uppermost part, immediately under the roots of the branches, are there observed, partly solitary, partly small, groups of polyps. The branches measure up to 12^{mm} in length, and 5^{mm} in breadth at the root, but they become a little broader towards the extremity, and are, everywhere, closely beset with polyps, with the exception of the lowest part of their inferior surface, which, most frequently, is bare, (Pl. XVII, fig. 55). The basal part is hard, membranaceous, much dilated, and, occasionally, completely encompasses the objects to which it is attached, as was the case with the specimen illustrated; it completely encompasses a portion of the tube of *Tubularia imperialis* upon which there is, also, seen a young colony in which no branches have yet appeared (Pl. XVII, fig. 55 *a*), also a small polyp that, evidently, has quite lately attached itself (Pl. XVII fig. 55, *b*).

¹ δρυς = the oak.

Polypcellerne ere runde, staa temmelig tæt, uden at være sammenvoxede og have paa deres Rand, naar Polypen enten ikke er fuldt udstrakt eller paa det nærmeste indtrukken, 8 Papiller; er Polypen ganske udstrakt, gaar dennes Bagkrop over i Cellen, uden at Overgangen er synderlig mærkbar, Tab. XVIII, Fig. 1.

Polyperne ere omtrent 8^{mm} lange, cylindriske, med en temmelig udpræget Bagkrop, der er forsynet med 8 Ribber, dannet af paatversliggende Spikler, hvilke fortsættes et Stykke nedad paa Cellen og opad paa Forkroppen, hvor de løbe sammen og forme sig i Guirlander, som gaa over paa Tentaklerne, Tab. XVIII, Fig. 1. Op imod Mundskiven sees imellem Tentaklernes Grunddel triangulære, nøgne Rum, i hvis Midte løber en Række Spikler over paa Mundskiven, Tab. XVIII, Fig. 1. Tentaklerne ere omtrent halvt saa lange som Kroppen og have en rig Spikelbeklædning paa deres aborale Flade. Pinnulerne staa temmelig tæt, ere lange og forsynede med Spikler, Tab. XVIII, Fig. 1.

Anatomisk-histologisk Undersøgelse.

Hele Zoanthodemet er udvendigt beklædt med et Ectoderm, der dannes af flere Lag polyædriske Celler, ikke synderligt afvigende fra dem, der tidligere ere beskrevne; men i dette Ectoderm, ligesom i det indenfor liggende hyaline Bindevævslag, ere Spiklerne leirede. Ogsaa her viser det sig, at hvor Spiklerne ligge i Bindevævet, der ere de omgivne af Ectodermceller. Paa Polyperne er den ydre Epithelialbeklædning noget tyndere end paa Stammen og Grenene, hvilket gjør, at Polyperne ere mere gjenemsigtige end de øvrige Dele.

Svælget er langt, cylindrisk og forsynet med 6 enkle Spikelrækker, hvoraf tre ligge paa hver Side med et bredt, nøgent Rum paa Bug- og Rygsiden, Tab. XVIII, Fig. 2. 3. Svælgrenden er oval og beklædt med lange Pidskeceller, som sædvanligt.

I den bagre Del af Mavehulheden og tildels i dens Forlængelse i Grenen sees Æg i forskellige Udviklingsstadier. Hos den unge Polyp, omtrent 4^{mm} lang, der nylig havde forladt sit embryonale Liv og sat sig fast paa det omtalte Rør, kan det bedst sees, hvorledes Polypens Bagkrop egentlig danner Polypcellen; thi her er endnu ingen Stamme eller Gren dannet, — det er kun Polypkroppen, som her fremstiller sig, og dennes forreste Del har trukket sig noget ind i dens bagre, der former sig som Celle, Tab. XVII, Fig. 55, b.

The polyp-cells are cylindrical, and are pretty closely placed to each other without, however, being concreted together; on their margin they have — when the polyp is either not fully extended, or when it is almost entirely retracted — 8 papillæ. When the polyp is quite extended, its posterior body passes over into the cell without the transition being particularly apparent, (Pl. XVIII, fig. 1.)

The polyps measure about 8^{mm} in length; they are cylindrical, and have a rather prominent posterior body furnished with 8 ribs formed of transversally placed spicules which are produced a little way down the cell, and on to the anterior body, upwards, where they unite together, forming themselves into garlands that pass over to the tentacles (Pl. XVIII, fig. 1.) Up towards the oral disk, between the basal parts of the tentacles, triangular bare spaces are seen, in whose middle, a series of spicules passes over to the oral disk (Pl. XVIII, fig. 1.) The tentacles are about half the length of the body, and have a rich spicular covering on their aboral surface. The pinnules are placed pretty closely to each other, and are long and furnished with spicules (Pl. XVIII, fig. 1.)

Anatomo-histological Examination.

The entire Zoanthodem is, externally, covered with an ectoderm formed of several layers of polyhedral cells not materially differing from those which have, previously, been described, but in this ectoderm, as also in the hyaline connective-tissue lying inside of it, the spicules are entrenched. Here, also, it appears that where the spicules lie in the connective-tissue, they are surrounded by ectoderm cells. The external epithelial covering is somewhat thinner on the polyps than on the stem and the branches, which causes the polyps to be more transparent than the other parts.

The gullet is long and cylindrical, and is furnished with 6 single series of spicules, of which 3 are situated on each side, leaving a broad, bare, space on the ventral and dorsal side, (Pl. XVIII, fig. 2. 3). The gullet passage is oval, and is covered with long flagelliform cells as usual.

In the posterior portion of the gastral cavity and, also, partly, in its prolongation into the branch, ova in different stages of development are seen. In the young polyp — about 4^{mm} in length — which had lately emerged from the embryonal existence and attached itself to the tube already mentioned, it can best be observed how the posterior body of the polyp, in reality, forms the polyp-cell, because there is, here, no stem or branch yet formed; it is the polyp-body that alone presents itself, here, and its anterior part has retracted itself somewhat into its

Paa Basaldelen ligge Spiklerne tæt paa hverandre, og her findes de sammensatte Stjerner, Dobbeltstjerner og Klubber at være stærkest repræsenterede, sjældnere Spindler og Firlinger. De sammensatte Stjerner have brede Straaler med takkede Ender, ere 0.132^{mm} lange og 0.064^{mm} brede, Tab. XVII, Fig. 56. Dobbeltstjernerne ere mere eller mindre udviklede, enkelte ere langstrakte og lidt krummede, men alle have et nøgent Midtbelte; de ere fra 0.076 — 0.100^{mm} lange og fra 0.032 — 0.064^{mm} brede, med et Midtbelte, der er fra 0.012 — 0.020^{mm} bredt, Tab. XVII, Fig. 57. 58. 59. 60. Klubberne ere bredbladede, takkede, og Skaffet undertiden spaltet; de ere fra 0.092 — 0.120^{mm} lange og fra 0.052 — 0.120^{mm} brede foroven, Tab. XVIII, Fig. 4. 5. 6. Firlingerne antage mest Korsformen, enkelte have Form af en firearmet Stjerne, stærkt ornamenteret, og ere omtrent lige lange som brede, 0.088^{mm} , Tab. XVIII, Fig. 7. 8; de øvrige ere fra 0.060 — 0.092^{mm} lange med en Tverstok fra 0.060 — 0.076^{mm} bred, Fig. 9. 10. 11. 12. Spindlerne have brede, temmelig langt fra hverandre staaende Takker og nærme sig noget de mindre udviklede, sammensatte Stjerner; de ere 0.096^{mm} lange og 0.044^{mm} brede paa Midten; Enderne ere tilspidsede, Fig. 13.

Paa Stammen er bladede Spindler og Dobbeltstjerner almindeligst, noget sjældnere ere Klubber og Spindler, næsten glatte, stundom gaffelformigt delte i Enderne; men meget sjældent er her Firlinger. De bladede Spindler nærme sig meget de sammensatte Stjerner, som findes paa Basaldelen, men ere dog forskellige fra dem ved deres tilspidsede Ender. Bladene have tandede Rande; de ere 0.140^{mm} lange og 0.060^{mm} brede paa Midten, Fig. 14. Dobbeltstjernerne ere meget særegne, de have intet nøgent Midtparti, og dette er som oftest besat med smaa Papiller, der tildels have en Stjerneform; stundom ere deres Straaler saa rigt ornamenterede, at de antage en smuk Rosetform; de ere fra 0.084 — 0.100^{mm} lange og fra 0.044 — 0.068^{mm} brede i Enderne; Midtpartiet er omkring 0.032^{mm} bredt, Fig. 15. 16. 17. 18. Klubberne ere mere eller mindre udviklede, nogle ere besatte med brede, i Randen tandede Blade og ligne Blomsterbuketter, andre ere sparsomt besatte, dels med Blade, dels med Takker; de ere fra 0.088 — 0.132^{mm} lange og fra 0.032 — 0.064^{mm} brede foroven, Fig. 19. 20. 21. 22. 23. De næsten glatte Spindler ere 0.108^{mm} lange og 0.032^{mm} brede paa Midten, Fig. 24, og de gaffelformige, som ere tæt besatte med temmelig lange Papiller, ere 0.156^{mm} lange og 0.040^{mm} brede paa Midten, Fig. 25. Firlingen er i Korsform, besat med Papiller, har en skjæv Tverstok, der er 0.080^{mm} , imedens Længdestokken er 0.092^{mm} , Fig. 26.

posterior part which forms itself, thus, into the cell, (Pl. XVII, Fig. 55, b).

In the basal part, the spicules are placed close upon each other and, here, the complex stellates, bistellates and clavates, are found to be the forms most numerous represented, the fusees and quadruplets being less frequent. The complex stellates have broad rays with spicate extremities, and they measure 0.132^{mm} in length, and 0.064^{mm} in breadth, (Pl. XVII, fig. 56). The bistellates are more or less developed; a few are elongate and slightly curved, but all of them have a bare mesial stripe; they measure from 0.076 — 0.100^{mm} in length, and from 0.032 — 0.064^{mm} in breadth, with the mesial stripe measuring from 0.012 — 0.020^{mm} in breadth, (Pl. XVII, fig. 57. 58. 59. 60). The clavates are broad-leafed, spicate, and their shaft is, occasionally, fissured; they measure from 0.092 — 0.120^{mm} in length, and from 0.052 — 0.120^{mm} in breadth above (Pl. XVIII, figs. 4. 5. 6). The quadruplets assume, principally, the cruciform; a few have the form of a four-rayed star strongly ornamented, these are about as long as they are broad and measure 0.088^{mm} (Pl. XVIII, figs. 7. 8). The others measure from 0.060 — 0.092^{mm} in length, and have a transversal arm which measures, from 0.060 — 0.076^{mm} (Pl. XVIII, figs. 9. 10. 11. 12). The fusees have broad spikes placed pretty far apart from each other, and approach in form, somewhat, to the imperfectly developed complex stellates; they measure 0.096^{mm} in length, and 0.044^{mm} in breadth at the middle, the extremities are acuminate (Pl. XVIII, fig. 13).

In the stem, foliaceous fusees and bistellates are the most frequent forms; somewhat more rarely are clavates and fusees met with, which are almost smooth, and occasionally bifurcated in the extremities; very rarely are quadruplets met with here. The foliaceous fusees approach greatly in form to the complex stellates found in the basal part but, yet, are different from them in regard to the acuminate extremities, and the leaves have dentated margins; they measure 0.140^{mm} in length, and 0.060^{mm} in breadth at the middle (Pl. XVIII, fig. 14). The bi-stellates are very peculiar; they have no bare mesial part, it being, most frequently, beset with small papillæ that sometimes have a stelliform, and their rays are, occasionally, so ornamented that they assume a beautiful rosetti-form; they measure from 0.084 — 0.100^{mm} in length, and from 0.044 — 0.068^{mm} in breadth at the extremities, the mesial part measuring about 0.032^{mm} in breadth (Pl. XVIII, figs. 15. 16. 17. 18). The clavates are more or less developed; a few are beset with broad leaves dentated in the margins, and resemble bouquets of flowers; others are sparingly beset, sometimes with leaves, sometimes, with spikes; they measure from 0.088 — 0.132^{mm} in length, and from 0.032 — 0.064^{mm} in breadth above (Pl. XVIII, figs. 19. 20. 21. 22. 23). The nearly smooth fusees measure 0.108^{mm} in length, and 0.032^{mm} in breadth at the middle (Pl. XVIII, fig. 24), and the bifurcated ones are closely beset with pretty long papillæ; they measure 0.156^{mm} in length, and 0.040^{mm} in breadth at the middle (Pl. XVIII, fig. 25). The quadruplets are cruci-

Paa Grenene træffes hyppigst Klubber. De ere forsynede med Blade, der have tandede Rande og ere stundom ordnede i Krands; de ere 0.128^{mm} lange og fra 0.056—0.068^{mm} brede foroven, Fig. 27. 28.

Paa Polypernes Bagkrop ere sammensatte Stjerner almindeligst, sjeldnere ere Klubber, Spindler og yderst sjældent en Firling. De sammensatte Stjerner nærme sig meget de paa Basalen; men ved den tilspidsede Ende have de adskilligt tilfælles med de bladede Spindler paa Stammen. Deres Straaler ere brede med takkede Rande; de ere 0.136^{mm} lange og 0.056^{mm} brede, Fig. 29.

Klubberne, som ere noget langstrakte og nærme sig Kølleformen, ere forsynede med i Randen tandede Blade; de ere 0.152^{mm} lange, 0.052^{mm} brede foroven, Fig. 30. Spindlerne ere mere eller mindre takkede, have tildels en afstumpet, takket Ende og ere fra 0.080—0.148^{mm} lange og fra 0.024—0.036^{mm} brede, Fig. 31. 32. 33. Firlingerne ere tæt besatte med Papiller i Form af Blade og have en mindre udpræget Korsform, ere 0.140^{mm} lange med en skjæv Tverstok, der er 0.100^{mm}, Fig. 34. Endelig sees endnu sjeldnere end Firlingen en særegen Spikel, der synes at være en monstrøs Dobbeltstjerne, hvis Straaler ere brede og ende i smaa Stjerner; den er 0.104^{mm} lang og 0.056^{mm} bred i Enderne og 0.020^{mm} bred paa Midten, Fig. 35.

Paa Forkroppen er det hovedsagelig Spindelformen, der er den prædominerende. Kun overordentlig sjældent træffes her en Firling. Spindlerne ere takkede, snart krumme, snart lige med mere eller mindre tilspidsede Ender; de ere fra 0.116—0.232^{mm} lange og fra 0.016—0.028^{mm} brede, Fig. 36. 37. 38. 39. Firlingerne ere overalt besatte med Papiller og have her, som næsten overalt hos denne Art, en meget skjæv Tverstok, der er 0.112^{mm}, imedens Længdestokken er 0.144^{mm}, Fig. 40. 41. Ogsaa takkede Klubber og næsten valseformede Spikler sees imellem Spindlerne paa Forkroppen, Fig. 42. 43. Paa Tentaklerne og Pinnulerne ere Spindlerne mindre takkede og tildels noget flade; de ere fra 0.092—0.196^{mm} lange og fra 0.024—0.036^{mm} brede, Fig. 44. 45. 46. 47.

Paa Svælget ere Spiklerne ligesom fladtrykte, temmelig takkede og vexle noget i Form; hyppigst forekommer Spindlerne, sjældent en og anden Firling. Spindlerne ere fra 0.068—0.112^{mm} lange og fra 0.020—0.028^{mm} brede, Fig. 48. 49. 50. 51. 52. Firlingerne have en mere eller

form, and beset with papillæ; they have a crooked transversal arm measuring 0.080^{mm}, whilst their longitudinal arm measures 0.092^{mm} (Pl. XVIII, fig. 26).

On the branches, the clavate is the form most frequently met with. They are furnished with leaves having dentated margins, and are occasionally arranged in wreaths; they measure 0.128^{mm} in length, and from 0.056—0.068^{mm} in breadth above (Pl. XVIII, figs. 27. 28).

On the posterior body of the polyps, complex stellates are the most frequent forms, more rarely are clavates and fusees met with, and extremely rarely is a quadruplet present. The complex stellates approach much to those of the basal part in form, but in their acuminate extremities they have a good deal in common with the foliaceous fusees of the stem; their rays are broad and have spicate margins; they measure 0.136^{mm} in length and 0.056^{mm} in breadth (Pl. XVIII, fig. 29).

The clavates are somewhat elongate, and approach the subclavates in form; they are furnished with leaves dentated in the margins, and measure 0.152^{mm} in length, and 0.052^{mm} in breadth above (Pl. XVIII, fig. 30). The fusees are more or less spicate, and occasionally have a blunted spicate extremity; they measure from 0.080—0.148^{mm} in length, and from 0.024—0.036^{mm} in breadth (Pl. XVIII, figs. 31. 32. 33). The quadruplets are closely beset with papillæ, in the form of leaves, and have a less prominent cruciform; they measure 0.140^{mm} in length, and have a crooked transversal arm measuring 0.100^{mm} (Pl. XVIII, fig. 34). Finally, still more rarely than the quadruplets, a peculiar spicule is seen, which appears to be a monstrous bistellate whose rays are broad and terminate in small stars; it measures 0.104^{mm} in length, and 0.056^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the middle (Pl. XVIII, fig. 35).

On the anterior body, the fusee is the form that principally predominates. A quadruplet is, here, only extremely rarely met with. The fusees are spicate, sometimes bent, sometimes straight, with more or less acuminate extremities; they measure from 0.116—0.232^{mm} in length, and from 0.016—0.028^{mm} in breadth (Pl. XVIII, figs. 36. 37. 38. 39). The quadruplets are, everywhere, beset with papillæ, and have, here, as is almost always the case with this species, a very crooked transversal arm measuring 0.112^{mm} in length, whilst the longitudinal arm measures 0.144^{mm} in length (Pl. XVIII, figs. 40. 41). A few spicate clavates and nearly cylindrical spicules, are also seen amongst the fusees of the anterior body (Pl. XVIII, figs. 42. 43). On the tentacles and the pinnules, the fusees are less spicate and partly somewhat flat; they measure from 0.092—0.196^{mm} in length, and from 0.024—0.036^{mm} in breadth (Pl. XVIII, figs. 44. 45. 46. 47).

On the gullet, the spicules appear as if flattened, and are rather spicate, and vary somewhat in form. Fusees occur the most frequently, rarely does an occasional quadruplet appear. The fusees measure from 0.068—0.112^{mm} in length, and from 0.020—0.028^{mm} in breadth (Pl. XVIII,

mindre udviklet Korsform, ogsaa her gjentager den skjæve Tverstok sig, Fig 53. 54.

Farven.

Farven næsten hvid, spillende lidt i det Gule.

Findested.

Station 270. 275. 312 og 343; et Exemplar paa hver.

Artskarakter.

Zoanthodemet indtil 50^{mm} høit. Stammen næsten lige tyk overalt, kort, nøgen. Fra dens Top reiser sig 4—5 tykke, opretstaaende Grene med lidt udvidede Ender og rigt besatte med Polyper. Fra Stammens øverste Del udgaa Polyper, dels enkelte, dels i smaa Grupper. Basaldelen fast, membranøst udspændt over de Gjenstande, hvortil den er fæstet. Polyperne indtil 8^{mm} lange, cylindriske, med en udpræget Bagkrop, forsynet med 8 adskilte Længderibber. Forkroppen har op imod Mundskiven 8 triangulære Rum, i hvis Midte en Spikelrække. Tentaklerne omtrent halvt saa lange som Kroppen med temmelig lange Pinnuler. Svælget har 3 enkle Spikelrækker paa hver Side med et lidt nøgent Melletrum paa Ryg- og Bugside. Polycellerne ere runde, ikke over Coenenchymets Niveau, med takket Rand, naar Polypen ikke er udstrakt. Paa Basaldelen ere sammensatte Stjerner, Dobbeltstjerner og Klubber almindeligst; paa Stammen og Grenene, ere bladede Spindler, Dobbeltstjerner og Klubber hyppigst paa Polypens Bagkrop er sammensatte Stjerner, og paa Forkroppen er Tentakler, Pinnuler og takkede Spindler mest fremtrædende. Farven hvid, spillende lidt i det Gule

Vøringia Jan-Mayeni, n. sp.

Tab. XVIII. Figs. 55—90.

Zoanthodemet buskformet, omkring 30^{mm} høit. Basaldelen skiveformigt udvidet, fast og stærkt inkrusteret af Kalk. Stammen omtrent 25^{mm} i Omkreds ved Grunden, smalner lidt af op imod den afrundede Top, der er tæt

figs. 48. 49. 50. 51. 52). The quadruplets have a, more or less developed, cruciform and, here, also, the crooked, transversal arm recurs (Pl. XVIII, figs. 53. 54).

Colour.

The colour is almost white, shading a little towards yellow.

Habitat.

Stations Nos. 270. 275. 312 and 343; one specimen from each station.

Specific characteristics.

The Zoanthodem measures up to 50^{mm} in height. The stem, almost uniform in thickness throughout, short, and bare; from its summit 4—5 thick erect branches issue, having slightly dilated extremities, and richly beset with polyps. From the uppermost part of the stem, polyps issue, placed, partly, solitarily, partly, in small groups. The basal part hard, and membranaceously extended over the objects to which it is attached. The polyps measure up to 8^{mm} in length, are cylindrical, have a prominent posterior body furnished with 8 separated longitudinal ribs. Towards the oral disk, the anterior body has 8 triangular spaces having a spicular series in their middle. The tentacles measure about half the length of the body and have pretty long pinnules. The gullet has 3 single series of spicules on each side, with a small bare interval on the dorsal and ventral side. The polyp-cells are cylindrical and do not project above the surface of the sarcosoma and they have a spicate margin when the polyp is retracted. On the basal part complex stellates, bi-stellates and clavates, are the most frequent forms; on the stem, and on the branches, foliaceous fusees, bi-stellates and clavates are the most frequent forms. On the posterior body of the polyp, complex stellates; and on the anterior body, tentacles, and pinnules, spicate fusees are the most predominant spicular forms. Colour, white, shading a little towards yellow.

Vøringia Jan-Mayeni, n. sp.

Pl. XVIII. Figs. 55—90.

The Zoanthodem is fruticose, and measures about 30^{mm} in height. The basal part is discoidally dilated, and is hard and strongly encrusted with calcium. The stem measures about 25^{mm} in circumference at the base, and

besat med Polyper. Strax ovenfor Basaldelen deler Hovedstammen sig i to, hvoraf den ene Stamme er meget kortere end den anden, Fig. 55. Fra den korte Stamme udgaar kun en Gren, der er tyk og kort, og hvis bredere Ende indtages af Polyper. Den længere Stamme har 4—5 Grene, hvoraf den nederste er 10^{mm} lang, omtrent 5^{mm} bred paa Midten og temmelig tæt besat med Polyper, der grupper sig paa den noget afrundede Ende; de øvrige Grene ere meget kortere; den øverste er omtrent 2^{mm} lang og dannes egentlig derved, at 3—4 Polyper ere sammenvoxede ved Grunden, Fig. 55. Fra selve Hovedstammen udgaa dels enkelte, dels 2—3 ved Grunden sammenvoxede Polyper; det samme finder ogsaa Sted overalt paa den lange Stamme, som dels derved, dels ved de tæt sluttende Grene saagodtsom ganske dækkes. Stammen og Grenene ere haarde, læderagtige og meget rige paa Kalkafsætninger.

Polypcellerne, der ere korte, cylindriske og meget kalkholdige, staa stundom et Stykke fra hverandre, men som oftest tæt sammen og kunne kun iagttages, naar Polyperne ere halvt indtrukne; ere disse fuldt udstrakte, sees Cellen at gaa over i Polypen uden anden synbar Grænse, end at Spiklerne ligge noget tættere i Cellen, der, som tidligere paavist, egentlig udgjør den bagerste Del af Polypkroppen.

Polyperne ere indtil 12^{mm} lange, næsten cylindriske, lidt indknebne imellem For- og Bagkrop, Fig. 56. Denne sidste er omtrent 5^{mm} lang, smalner lidt af, hvor den gaar over i Cellen, er tæt besat med Spikler, der ligge paatvers og synes ikke at være delte i Rækker, saaledes som Tilfældet er paa Forkroppen, som er omtrent 3^{mm} lang og har 8 stærke Længderibber, dannede af Spikler og adskilte ved ligesaa mange dybe Furer, der ogsaa ere forsynede med Spikler, Fig. 56. Tentaklerne ere omtrent 4^{mm} lange og have paa hele deres aborale Side et stærkt Spikelpantser, som strækker sig udover de temmelig lange Pinnuler. Den stærke Spikelbeklædning gjør, at Polyperne ere temmelig uigjennemsigtige¹.

¹ En Polyp havde i sin Bagkrop, som syntes at være sygelig, produceret en meget smuk Perle, der havde et Knappenaalshoveds Størrelse, var fuldstændig rund, hvidgul med et smukt Farvespil som en ægte Muslingperle, men adskilte sig dog fra denne derved, at den var halv gjennemsigtig. Jeg berører dette for at antyde, at der gives andre Dyr end Molluskerne, som kunne producere Perler.

diminishes in thickness, a little, towards its rounded summit, which is closely beset with polyps. The parent stem divides itself, immediately above the basal part, into two parts, one of which is much shorter than the other (fig. 55). From the short stem, a single branch issues, which is thick and short, and its broad extremity is occupied by polyps. The long stem has 4—5 branches, of which the lowest one measures 10^{mm} in length, and about 5^{mm} in thickness at the middle; it is pretty closely beset with polyps, which group themselves together on the somewhat rounded extremity; the other branches are much shorter; the uppermost one measures about 2^{mm} in length and is, in fact, formed by the concretion together at their base of 3—4 polyps (fig. 55). From the parent stem itself, there issue, sometimes single, sometimes 2—3 polyps concreted together at the base, and the same thing occurs throughout the long stem which, partly, from that cause and, partly, from the close placing of the branches, is almost quite covered. The stem and the branches are hard, coriaceous, and very rich in calcareous deposits.

The polyp-cells are short and cylindrical, and very calcareous; they are placed, occasionally, a little distance apart from each other, but most frequently close to each other, and can only be observed when the polyps are semi-retracted. When the polyps are fully extended, the cell is seen to pass over into the polyp, without other noticeable margin than that the spicules lie somewhat closer in the cell, which, as already shewn, really constitutes the posterior part of the polyp body.

The polyps measure up to 12^{mm} in length, and are nearly cylindrical; they are somewhat constricted between the anterior and posterior body (fig. 56). The latter measures about 5^{mm} in length, and diminishes a little in thickness at the point where it passes over into the cell; it is closely beset with spicules placed transversally, and which do not appear to be arranged into series like what is the case on the anterior body; that — the anterior body — measures about 3^{mm} in length, and has 8 strong longitudinal ribs formed of spicules, separated by the same number of deep grooves, which also are furnished with spicules (fig. 56). The tentacles measure about 4^{mm} in length and, on their entire aboral side, have a strong spicular sheathing which extends itself over the rather long pinnules. The strong spicular covering causes the polyps to become pretty opaque¹.

¹ One polyp had, in its posterior body which appeared to be morbid, produced a very beautiful pearl about the size of a pins head, and completely globular, whitish yellow in colour, with a fine play of colours like a genuine mussel-pearl, but differing, however, from that in being semi-transparent. I mention this in order to indicate that there are other animals besides the molluscs which can produce pearls.

Anatomisk-histologisk Undersøgelse.

Hele Zoanthodemet har et Ectoderm, dannet af flere Lag temmelig store, klare, polyædriske Celler, forsynede med en rund, lidt excentrisk liggende Kjerne samt Kjernelegeme. I de indre Lag sees imellem Ectodermcellerne mange ægformede, encellede Slimkjertler, der dels ere tomme og have Udseende af Vacuoler, dels har en centralliggende, lidt atlang Kjerne omgivet af Protoplasmakorn; paa enkelte af disse Slimkjertler kunne iagttages en Udførselsgang, der munder ud paa Overfladen. Foruden disse Slimkjertler ere en stor Mængde tætliggende Spikler indleirede saavel i Stammens som Polypernes Ectoderm. Bindevævslaget er hyalint, temmelig smalt, og fra dets indre Væg udgaa i Stammen og Grenene de Forlængelser, der danne Kanalernes Skillevægge, og som i Polypkroppen danne Septa; hverken i disse eller i Stammens Skillevægge findes Kalk. Den indvendige Flade af Bindevævslaget er overalt beklædt med et Endothel, bestaaende af et Lag runde Celler, der ere temmelig klare, have en rund Kjerne med Kjernelegeme og et yderst fintkornet, gjenemsigtigt Indhold. Svælget er cylindrisk, langstrakt og har 8 Længderækker Spikler, Fig. 56, A, og paa dets indre Bugflade en oval Svælgenrede, der er beklædt med lange Pidskeceller.

Paa Basaldelen ligge Spiklerne noget kompakte paa hverandre, og de hyppigste Former, hvorunder de optræde, ere Dobbeltstjerner og Klubber; sammensatte Stjerner ere meget sjældnere og Firlinger endna sjældnere. Dobbeltstjernerne ere mere eller mindre udviklede; de fuldkomment udviklede have et temmelig langt Midtbelte, der dels er ganske nøgent, dels besat med Papiller. Straalerne i begge Ender ere meget brede med tandede Rande, og stundom ender hver Straale i en liden Stjerne; de ere fra 0.120—0.160^{mm} lange og fra 0.056—0.088^{mm} brede i Enderne med Midtpartiet fra 0.024—0.036^{mm} bredt, Fig. 57. 58. 59. 60. 61. 62. Klubberne ere dels sparsomt besatte med Takker eller Blade, der staa langt fra hverandre, dels ere de meget rigt forsynede med brede, i Randen takkede Blade; de første, kan hælde, ere mindre udviklede; de ere fra 0.128—0.172^{mm} lange og fra 0.056—0.068^{mm} brede foroven, Fig. 63. 64; de sidste nærme sig noget de sammensatte Stjerner, ere 0.188^{mm} lange og fra 0.104^{mm} brede foroven, Fig. 65. Firlingerne ere i Kors- og Rosetform, begge rigt udsmykkede med Blade og Papiller og fra 0.108—0.144^{mm} lange og 0.120^{mm} brede, Fig. 66. 67.

Paa Stammen ere de sammensatte Stjerner almindeligst, sjældnere Klubber og Dobbeltstjerner. De sammen-

Anatomo-histological Examination.

The entire Zoanthodem has an ectoderm, formed of several layers of pretty large translucent polyhedral cells, furnished with a round, somewhat eccentrically placed, nucleus and nucleus-corpuscle. In the inner layers there are seen, between the ectoderm-cells, many oviform, unicellular mucous glands which are, partly, empty, and have the appearance of vacuoli, or they have, partly, a centrally placed, somewhat oblong, nucleus surrounded by protoplasmic granules. In a few of these mucous glands, an excretory duct which discharges upon the exterior surface may be observed. Besides these mucous glands, there are a great many closely placed spicules entrenched, both, in the stem, and in the ectoderm of the polyps. The connective tissue is hyaline and rather narrow, and from its inner wall issue — in the stem and the branches — the prolongations which form the divisional walls of the ducts, and which, in the polyp-body, form septa. Neither in these, nor in the divisional walls of the stem, is calcium found. The interior surface of the connective-tissue layer is, everywhere, clad with an endothelium, consisting of a layer of cylinder-cells which are pretty translucent, and which contain a round nucleus with nucleus-corpuscle, and an extremely minute, granular transparent protoplasm. The gullet is cylindrical and elongate, and has 8 longitudinal series of spicules (fig. 56, A) and on its inner ventral surface it has an oval gullet-passage clad with long flagelliform cells.

In the basal part, the spicules are placed, somewhat compactly, upon each other, and the most frequent forms in which they occur are the bistellates and clavates; complex stellates are much less frequent, and quadruplets are still more rare. The bistellates are more or less developed; the completely developed ones have a pretty long middle stripe, partly, quite bare, and partly, beset with papillæ. The rays are, at both extremities, very broad, and have dentated margins, and sometimes each ray terminates in a small star; they measure from 0.120—0.160^{mm} in length, and from 0.056—0.088^{mm} in breadth at the extremities, and the middle part measures from 0.024—0.036^{mm} in breadth (figs. 57. 58. 59. 60. 61. 62). The clavates are, partly, sparingly beset with spikes, or leaves, placed far apart from each other, or they are, partly, very richly furnished with broad leaves dentated in the margins. The first named are perhaps only partially developed; they measure from 0.128—0.172^{mm} in length, and from 0.056—0.068^{mm} in breadth above (figs. 63. 64). The last named approach, in form, somewhat, to the complex stellates; they measure 0.188^{mm} in length, and 0.104^{mm} in breadth above (fig. 65). The quadruplets appear as cruciforms and rosetti-forms, both, richly adorned with leaves and papillæ; they measure from 0.108—0.144^{mm} in length, and 0.120^{mm} in breadth (fig. 66. 67).

In the stem, the complex stellates are the most frequent spicular form; more rarely do clavates and bistel-

satte Stjerner have brede, takkede Straaler med nøgne Rum imellem Straalebundterne; de ere 0.184^{mm} lange, 0.104^{mm} brede foroven, Fig. 68. Dobbeltstjernerne ligne noget de paa Basaldelen, og Straalerne ende gjerne i en liden Stjerne; de ere 0.132^{mm} lange, 0.076^{mm} brede i Enderne og 0.026^{mm} brede paa Midten; Fig. 69. 70. Klubberne ere større og rigere besatte med Blade, end de paa Basalen; de ere 0.216^{mm} lange, 0.124^{mm} brede foroven, Fig. 71.

Paa Grenene ligge Spiklerne ligesom paa Stammen tæt paa hverandre, og Formerne ere her væsentlig Klubber, der ere 0.176^{mm} lange og 0.108^{mm} brede foroven og have brede, tandede Blade, Fig. 72. Imellem Klubberne sees dels enkelte Dobbeltstjerner, dels Rosetter og dels særegne, bladbesatte Spikler. Rosetterne ere omtrent lige brede som lange, 0.132^{mm} i Gjennemsnit, Fig. 73. De særegne Spikler ere 0.216^{mm} lange, 0.112^{mm} brede, Fig. 74.

Paa Polypernes Bagkrop ere Klubber og sammensatte Stjerner almindeligst, Dobbeltstjerner og Firlinger sjeldnere. Klubberne ere forsynede med brede, i Randen tandede Blade; de ere fra 0.140—0.168^{mm} lange og fra 0.084—0.096^{mm} brede foroven, Fig. 75. 76. De sammensatte Stjerner variere noget; nogle nærme sig Dobbeltstjernen med et nøgent Midtparti, ere 0.176^{mm} lange, 0.076^{mm} brede med 0.036^{mm} bredt Midtbelte, Fig. 77; andre have næsten Spindelformen, have tandede Straaler og ere 0.168^{mm} lange, 0.050^{mm} brede, Fig. 78. Firlingerne ere dels i Kors-, dels i Rosetform og rigt ornamenterede med Blade og Takker. De korsformede ere fra 0.124—0.128^{mm} lange med en Tverstok fra 0.116—0.132^{mm}, Fig. 79. 80. Rosetten er 0.172^{mm} lang, 0.120^{mm} bred, Fig. 81.

Paa Forkroppen er Spindelformen den dominerende; Klubber ere her sjeldnere og sammensatte Stjerner sees kun enkeltvis. Spindlerne ere i Reglen rigt besatte med Blade, der have takkede Rande. De ere dels krumme, dels lige, enten tilspidsede eller mere eller mindre afstumpede i Enderne; de ere fra 0.172—0.516^{mm} lange og fra 0.048—0.100^{mm} brede paa Midten, Fig. 82. 83. 84. Klubberne ere noget forskellige fra dem paa Bagkroppen, de ere nemlig mere langstrakte, og Bladene synes at være mindre; de ere 0.200^{mm} lange og 0.072^{mm} brede foroven, Fig. 85.

Paa Tentaklerne ligge Spiklerne meget kompakte, ere noget fladere end paa Kroppen og have forskjellig Form; enkelte ere næsten spydformede, andre spatelformede, atter andre nærme sig Spindelen. De spydformede ere svagt takkede, 0.144^{mm} lange, 0.028^{mm} brede, Fig. 86; de spateldannede rage mest ind i Pinnulerne, have takkede

lates appear. The complex stellates have broad spicate rays, with bare spaces appearing between the bundles of rays; they measure 0.184^{mm} in length, and 0.104^{mm} in breadth above (fig. 68). The bistellates resemble, somewhat, those of the basal part; the rays terminate, often, in a small star; they measure 0.132^{mm} in length, and 0.076^{mm} in breadth at the extremities, and 0.036^{mm} in breadth at the middle (figs. 69. 70). The clavates are larger, and more richly beset with leaves than those of the basal part; they measure 0.216^{mm} in length, and 0.124^{mm} in breadth above (fig. 71).

On the branches, the spicules are placed, as in the stem, closely upon each other, and the forms met with here, are, principally, clavates measuring 0.176^{mm} in length, and 0.108^{mm} in breadth above, and having broad dentated leaves (fig. 72). Between the clavates, there are seen, partly, a few bistellates, partly, rosettes, and partly, peculiar leaf-covered spicules. The rosettes are about as broad as they are long, and measure 0.132^{mm} in diameter (fig. 73). The peculiar spicules measure 0.216^{mm} in length, and 0.112^{mm} in breadth (fig. 74).

In the posterior body of the polyps, the clavate and complex stellates are the most frequent spicular forms, the bistellates and quadruplets being less frequent. The clavates are adorned with broad leaves dentated in the margins, and measure from 0.140—0.168^{mm} in length, and from 0.084—0.096^{mm} in breadth above (fig. 75. 76). The complex stellates vary somewhat, a few approach in form to the bistellates, and have a bare middle part; they measure 0.176^{mm} in length, and 0.076^{mm} in breadth, and have a middle stripe measuring 0.036^{mm} in breadth (fig. 77). Others are almost fusiform; these have dentated rays, and measure 0.168^{mm} in length, and 0.050^{mm} in breadth (fig. 78). The quadruplets are, partly, cruciforms, and partly, rosetti-forms, and they are richly adorned with leaves and spikes. The cruciforms measure, from 0.124—0.128^{mm} in length, and have a transversal arm measuring from 0.116—0.132^{mm} (figs. 79. 80). The rosetti-forms measure 0.172^{mm} in length, and 0.120^{mm} in breadth (fig. 81).

On the anterior body, the fusee is the predominant spicular form; clavates are, here, less frequent, and complex stellates are seen only exceptionally. The fusees are, as a rule, richly beset with leaves having spicate margins. They are, partly, curved, partly, straight, either acuminate or more less blunted at the extremities; they measure from 0.172—0.516^{mm} in length, and from 0.048—0.100^{mm} in breadth at the middle (figs. 82. 83. 84). The clavates are somewhat different from those on the posterior body; they are, for instance, more elongate, and the leaves appear to be smaller; they measure 0.200^{mm} in length, and 0.072^{mm} in breadth above (fig. 85).

On the tentacles, the spicules are placed very compactly, and they are somewhat flatter than those on the body, and have a different form. A few are almost spear-shaped, others are spatula-shaped, whilst others, again, approach to the fusiform. The spear-shaped spicules are faintly spicate; they measure 0.144^{mm} in length, and

Rande og ere 0.168^{mm} lange, 0.044^{mm} brede i Bladet, Fig. 87; de andre Former ere mere eller mindre takkede, dels med stumpe, dels tilspidsede Ender og fra 0.128—0.204^{mm} lange og 0.036^{mm} brede, Fig. 88. 89.

Paa Svælget ere Spiklerne noget fladtrykte og have en meget forskjellig Form, snart som Spindler, snart nærme de sig Dobbeltstjernen, snart Spatelen, snart Firlingen. De ere i Regelen takkede med indskaarne Rande og stundom spaltede Ender; de ere fra 0.072—0.128^{mm}, Fig. 90.

Farven.

Gul.

Findested.

Station 237. Et Exemplar.

Artskarakter.

Zoanthodemet buskformet, omtrent 30^{mm} høit. Basaldelen skiveformet udvidet, haard af inkrusteret Kalk. Stammen af omtrent 25^{mm} Omkreds ved Grunden, smalner lidt af mod den afrundede Top, der er tæt besat med Polyper. Grenene ere faa, men brede, udspringe et Stykke ovenfor Basaldelen og slutte sig tæt til Stammen; de nederste Grene ere længst og bredest, men alle ere, især paa deres noget afrundede Ende, tæt besatte med Polyper. Stammen og Grenene haarde, læderagtige, rige paa Kalk. Polypcellerne korte, cylindriske, stillede mere eller mindre fra hverandre, stærk kalkholdige. Polyperne indtil 12^{mm} lange, cylindriske, lidt indknebne mellem For- og Bagkrop, meget spikelrige; Forkroppen forsynet med 8 Længderibber. Tentaklerne omtrent 4^{mm} lange; den aborale Side indkapslet af Spikler. Pinnulerne vel forsynede med Spikler. Svælget har 8 enkle Rækker Spikler. Paa Basaldelen ere Dobbeltstjerner og Klubber, paa Stammen sammensatte Stjerner og paa Grenene Klubber hyppigst. Paa Polypens Bagkrop ere Klubber og sammensatte Stjerner mest fremtrædende, og paa Forkroppen ere store Spindler almindeligst. Farven gul.

0.028^{mm} in breadth (fig. 86). The spatula-shaped spicules extend farthest into the pinnules, and have spicate margins; they measure 0.168^{mm} in length, and 0.044^{mm} in breadth in the leaf (fig. 87); the other forms are more or less spicate, partly, with blunt, partly, with acuminate extremities; they measure from 0.128—0.204^{mm} in length, and 0.036^{mm} in breadth (figs. 88. 89).

On the gullet, the spicules are somewhat flattened and have a very variable form, appearing sometimes as fusees, sometimes approaching in form to the bistellate, sometimes, to the spatula-form, and, again, sometimes to the quadruplet-form. They are, as a rule, spicate, and have dentated margins, and occasionally appear with fissured extremities; they measure from 0.072—0.128^{mm} in length (fig. 90).

Colour.

The Colour is yellow.

Habitat.

Station No. 237. One specimen.

Specific characteristics.

The Zoanthodem fruticose; measures about 30^{mm} in height. The basal part discoidally dilated, hard, owing to encrusted calcium. The stem measures about 25^{mm} in circumference at the base, diminishes in thickness a little, upwards, towards the rounded summit, which is closely beset with polyps. The branches are few in number, but broad; issue a little distance above the basal part, and close tightly in to it. The lowest branches are the longest, and broadest, but all of them are — especially on their somewhat rounded extremities — closely beset with polyps. The stem, and the branches, hard, coriaceous, rich in calcium. The polyp-cells short, cylindrical, placed more or less apart from each other and strongly calcareous. The polyps measure up to 12^{mm} in length, cylindrical, a little constricted between the anterior and posterior body, furnished with 8 longitudinal ribs. The tentacles about 4^{mm} in length. The aboral side ensheathed with spicules. The pinnules well supplied with spicules. The gullet has 8 single series of spicules. In the basal part, bistellates and clavates. In the stem, complex stellates; and on the branches, clavates, predominate. In the posterior body of the polyp, clavates and complex stellates most predominant, and in the anterior body, large fusees the most frequent. Colour yellow.

Vøringia clavata, n. sp.

Tab. XX. Fig. 45--83.

Zoanthodemet er indtil 30^{mm} høit. Basaldelen er skiveformigt udvidet, ikke meget tyk, fast og læderagtig. Stammen er ved Grunden 40^{mm} i Omkreds, men aftager i Tykkelse successivt op imod Toppen, hvor den er omkring 25^{mm} i Omfang; den er fast, læderagtig, riflet paalangs og tæt besat med Grene lige fra Basaldelen til Toppen, der ender i en Klynge af Grene fra 5—8 i Antal, Fig. 45. Grenene ere læderagtige, korte, tykke, tildels nøgne ved deres Udspring og som oftest udelte; men omtrent 1^{mm} fra Stammen tiltage Grenene i Tykkelse og udvide sig kølleformigt mod Enden, der er ganske afrundet, Fig. 45. Grenene slutte sig tæt til Stammen, som de næsten ganske skjule og ere rigt besatte med Polyper, der staa temmelig tætte, men ere dog fuldkommen adskilte. Polypcellen er nedsænket i Coenenchymet og lukker sig saa fuldstændigt, naar Polypen er indtrukken, at det er meget vanskeligt endog ved Loupen at opdage den; kun en yderst fin, rund Aabning tilkjendegiver dens Tilværelse. Grenene have, naar Kolonien er i Vigør, Formen af en Kølle, men da enkelte Grene ere i Enderne delte i 2, yderst sjældent 3, lidt mindre Grene, faa de derved et lappet Udseende, Fig. 45. Polyperne ere 4—5^{mm} lange, Tentaklerne indbefattet, med en kort, lidt smal Bagkrop, hvor Spiklerne ligge paatvers, og en noget buget Forkrop med 8 Ribber og ligesaa mange Furer, hvor Spiklerne ligge paalangs, Fig. 46. Den nederste Del af Bagkroppen, der hvor denne er paavei til at gaa over i Cellen, er næsten spikelfri, Fig. 46. Tentaklerne ere 2^{mm} lange, temmelig tykke ved Grunden og paa deres aborale Side forsynede med to paaskraas liggende Spikelrækker, Fig. 46. Pinnulerne ere temmelig lange og uden Spikler, men forsynede med Nematocyster i stor Mængde, hvilke ogsaa findes paa den noget hvælvede Mundskive.

Anatomisk-histologisk Undersøgelse.

Zoanthodemet er overalt beklædt med et Ectoderm, bestaaende af flere Lag polyædriske Celler. Imellem disse sees overalt paa Stammen og Grenene isolerede, encellede, ægformede Slimkjertler, ligesom Spiklerne ere leirede dels

Vøringia clavata, n. sp.

Pl. XX. Figs. 45—83.

The Zoanthodem measures up to 30^{mm} in height. The basal part is discoidally dilated, and not very thick; it is hard and coriaceous. The stem measures, at its base, 40^{mm} in circumference, but diminishes, gradually, in thickness, up towards its summit, at which point it measures about 25^{mm} in circumference. It is hard, coriaceous, longitudinally grooved, and closely beset with branches through its entire height from the basal part to the summit, which latter terminates in a cluster of branches, 5 to 8 in number (fig. 45). The branches are coriaceous, short, and thick, and are, partly, bare at the roots, and generally, non-ramous, but at a distance of about 1^{mm} from the stem, the branches increase in thickness, and become dilated in subclaviform towards the extremity, which is quite rounded (fig. 45). The branches lie closely in to the stem, so as nearly to conceal it, and they are richly beset with polyps placed pretty closely to each other, but, yet, perfectly separated. The polyp-cell is depressed in the sarcosoma, and becomes so completely closed when the polyp is retracted, that it is very difficult, even with the help of a magnifying glass, to detect it, only a minute circular aperture announcing its presence. When the colony is in vigour, the branches have a subclavate form, but as a few of the branches are ramified at the extremities into 2, or, very rarely, 3 slightly smaller branchlets, they acquire, thus, a patched appearance (fig. 45). The polyps measure 4—5^{mm} in length, including the tentacles, and have a short, narrowish, posterior body on which the spicules are placed transversally, and a somewhat bulging anterior body, having 8 ribs and the same number of grooves, where the spicules are placed longitudinally (fig. 46). The lowest part of the posterior body, at the point where it is about to pass over to the cell, is almost devoid of spicules (fig. 46). The tentacles measure 2^{mm} in length, and are rather thick at the base, and, on their aboral side, they are furnished with two, transversally placed, series of spicules (fig. 46). The pinnules are pretty long, and devoid of spicules, but are furnished with nematocysts in great abundance, which, also, are found on the somewhat arcuate oral disc.

Anatomo-histological Examination.

The Zoanthodem is, everywhere, clad with an ectoderm, consisting of several layers of polyhedral cells. Between these, there is, everywhere, seen, on the stem and the branches, isolated, unicellular, oviform mucous glands,

i Ectodermets indre Lag, dels i det indenfor Epithelialbeklædningen værende, hyaline Bindevæv, hvor de ere omgivne af Ectodermceller. Polypernes Ectoderm bestaar af kun to Lag Celler, lig dem paa Stammen. Svælgrøret er cylindrisk, forsynet med 4 enkle Rækker Spikler, 2 paa hver Side, med et bredt Midtparti, hvori paa Rygsiden sees enkelte Spikler, imedens Bugpartiet er spikelfrit. Fig. 47. Svælgrenden er oval og beklædt med lange Pidskeceller, men den øvrige Del af Svælgkøllheden har et Epithelialovertræk, bestaaende af kortere, cilierende Celler, hvorimellem sees pæreformede, encelledede Slimkjertler. I den bagerste Del af Mavehulheden sees Æg i forskjellige Udviklingsstadier.

Paa Basaldelen ligge Spiklerne tæt pakkede paa hverandre og optræde her væsentligst under Form af Dobbeltstjerner, sjældnere ere sammensatte Stjerner og Spindler, men sjældnere Firlinger, Køller og Klubber. Dobbeltstjernerne ere ganske særegne; de have meget brede Straaler, der ende i en liden Stjerne, sammensat af små Kugler, og et nøgent Midtparti, som paa enkelte er meget kort; de ere fra 0.076—0.140^{mm} lange og fra 0.052—0.068^{mm} brede i Enderne, og Midtbeltet er fra 0.016—0.028^{mm} bredt, Fig. 48. 49. 50. De sammensatte Stjerner have lignende brede Straaler som Dobbeltstjernerne, der ligeledes ende i en liden Stjerne; de ere 0.128^{mm} lange og 0.076^{mm} brede. Fig. 51. Spindlerne have Bladbesætning med tandede Blade, ere 0.132^{mm} lange og 0.050^{mm} brede, Fig. 52. Køllerne, der ere meget sjældne, ere udstyrede med stjerneformede Papiller og ere 0.252^{mm} lange og 0.068^{mm} foroven, Fig. 53. Klubberne, der ogsaa ere meget sjældne, have en rig Bladforsiring; Bladene have indskaarne Rande; de ere 0.132^{mm} lange og 0.072^{mm} brede foroven, Fig. 54. Firlingerne have en mere eller mindre udpræget Korsform, ere tæt besatte dels med Papiller, dels med Blade og fra 0.080—0.088^{mm} lange, 0.076^{mm} brede, Fig. 55. 56.

Paa Stammen ere sammensatte Stjerner hyppigst, men næsten ligesaa almindeligt findes ganske særegne Dobbeltstjerner; sjældnere ere Spindler, hvilke nærme sig temmelig meget dem paa Basalen. De sammensatte Stjerner have brede Straaler, der ende i en liden, firearmet Stjerne; de ere 0.116^{mm} lange, 0.072^{mm} brede, Fig. 57. Dobbeltstjernerne ere mærkelige; hver Ende har i Regelen 4 brede Straaler, der hver ende i en liden firearmet Straale; Midtpartiet er nøgent og ofte saa kort, at det vanskeligt iagttages, naar ikke Spikelen ligger lige paa Siden; de ere fra 0.092—0.128^{mm} lange og fra 0.068—0.100^{mm} brede i Enderne. Midtpartiet er fra 0.016—0.028^{mm} bredt, Fig. 58. 59. 60. 61. Spindlerne have brede Takker, der ende i en firestraalet Stjerne; de ere 0.148^{mm} lange, 0.064^{mm} brede, Fig. 62.

whilst, also, the spicules are entrenched, partly, in the inner layers of the ectoderm, and partly, in the hyaline connective tissue lying inside of the epithelial covering, where they are surrounded by ectodermic cells. The ectoderm of the polyps consists of only two layers of cells, like those of the stem. The gullet-tube is cylindrical, and is furnished with 4 single series of spicules, 2 upon each side, leaving a broad intermediate area, in which, upon the dorsal side, a few spicules are observed, whilst the ventral portion is devoid of spicules (fig. 47). The gullet-passage is oval, and is clad with long flagelli-form cells, whilst the remaining portion of the gullet-cavity has an epithelial coating, consisting of shortish, ciliated, cells, between which, piriform, unicellular mucous glands are seen. In the extreme posterior part of the gastral cavity, ova in various stages of development are visible.

On the basal part, the spicules lie closely packed upon each other, and occur, here, principally, in the form of bistellates, more rarely as complex stellates and fusees, and, still more rarely, as quadruplets, subclavates and clavates. The bistellates are quite peculiar; they have very broad rays which terminate in a small star composed of small spheres, and a bare mesial portion, which in some, is very short; they measure from 0.076—0.140^{mm} in length, and from 0.052—0.068^{mm} in breadth at the extremities, and the mesial stripe measures from 0.016—0.028^{mm} in breadth (figs. 48. 49. 50). The complex stellates have broad rays similar to those of the bistellates, and which likewise terminate in a small star; they measure 0.128^{mm} in length, and 0.076^{mm} in breadth (fig. 51). The fusees have leafy ornaions with dentated margins; they measure 0.132^{mm} in length, and 0.050^{mm} in breadth (fig. 52). The subclavates are very rare, and are furnished with stelliform papillæ; they measure 0.252^{mm} in length, and 0.068^{mm} in breadth above (fig. 53). The clavates, which also are very rare, have a rich leafy decoration, the leaves being indented in the margins; they measure 0.132^{mm} in length, and 0.072^{mm} in breadth above (fig. 54). The quadruplets have a, more or less, prominent cruciform, and are closely beset, partly, with papillæ, partly, with leaves; they measure from 0.080—0.088^{mm} in length, and 0.076^{mm} in breadth (figs. 55. 56).

In the stem, complex stellates are the most frequent, spicular forms, but, nearly as frequently, quite peculiar bistellates are, also, observed. Fusees, which approach pretty much in form to those of the basal part, are more rare. The complex stellates have broad rays which terminate in a small four-rayed star; they measure 0.116^{mm} in length, and 0.072^{mm} in breadth (fig. 57). The bistellates are remarkable; each extremity has, as a rule, four broad rays, each of which terminates in a small four-rayed star; the intermediate portion is bare and, often, so short, that it can with difficulty be detected unless the spicule lies quite on its side; they measure from 0.092—0.128^{mm} in length, and from 0.068—0.100^{mm} in breadth at the extremities. The intermediate portion measures from 0.016—0.028^{mm} in breadth (figs. 58. 59. 60. 61). The

Paa Grenene ere Dobbeltstjernerne hyppigst, men foruden dem træffes dog Klubber ofte, sjældent sees Spindler. Dobbeltstjernerne have meget brede Straaler, der paa enkelte ere meget korte, næsten som Papiller, men ende i en liden, firestraalet Stjerne; Midtpartiet er mere eller mindre langt, nøgent; de ere fra 0.064—0.100^{mm} lange og fra 0.048—0.056^{mm} brede i Enderne; Midtbeltet er fra 0.016—0.024^{mm} bredt, Fig. 63. 64. 65. Klubberne ere, især foroven, besatte med brede Takker, der ende i en firestraalet Stjerne. Skafte er kort og har et Par lignende Takker; de ere 0.120^{mm} lange, 0.076^{mm} brede foroven, Fig. 66. Spindlerne ere særegne, have langt fra hverandre staaende, brede Blade, der ogsaa ende i en liden Stjerne; de ere 0.152^{mm} lange, 0.064^{mm} brede, Fig. 67.

Paa Polypkroppen er det Spindler og Køller, som ere mest fremherskende. Spindlerne ere dels krumme, dels lige, yderst sparsomt besatte med Takker, enkelte ere næsten glatte; de ere fra 0.232—0.248^{mm} lange og fra 0.036—0.052^{mm} brede paa Midten, Fig. 68. 69. Køllerne ere heller ikke meget takkede; Takkerne ere i Reglen smaa, staa langt fra hverandre; de ere fra 0.156—0.236^{mm} lange og fra 0.044—0.052^{mm} brede foroven, Fig. 70. 71. 72. Imellem de nævnte Former sees hist og her mindre og lidt fladere Spikler, der have afstumpede Ender og faa Takker; de ere fra 0.084—0.144^{mm} lange og fra 0.028—0.036^{mm} brede, Fig. 73. 74.

Paa Tentaklerne er det væsentligst Spindel- og Kølleformen, som gjør sig gjældende. Spindlerne ere dels næsten glatte, dels takkede; Takkerne ere smaa, staa temmelig langt fra hverandre; paa de takkede Spindler ere Enderne stærkt tilspidsede; de ere fra 0.196—0.300^{mm} lange og fra 0.032—0.044^{mm} brede, Fig. 75. 76. Køllerne have noget tilfælles med dem paa Kroppen, men ere dog lidt forskellige fra dem; enkelte ere glatte, andre ere takkede med den øverste Ende næsten spaltet, og paa et Par af disse takkede Køller sees paa Midten et udpræget Kors; de ere fra 0.116—0.240^{mm} lange og fra 0.024—0.040^{mm} brede foroven, Fig. 77. 78. 79.

Paa Svælgroret sees hyppigst Firlinger og Spindler forsynede med Takker. Spiklerne ere her noget fladtrykte. Firlingerne ere tildels korsformede, 0.100^{mm} lange med en Tverstok, der er 0.088^{mm}, Fig. 80, dels nærme de sig Timeglasformen, Fig. 81. Spindlerne ere fra 0.124—0.148^{mm} lange og fra 0.016—0.028^{mm} brede, Fig. 82. 83.

fusees have broad spikes which terminate in a four-rayed star; they measure 0.148^{mm} in length, and 0.064^{mm} in breadth (fig. 62).

On the branches, the bistellate is the spicular form most frequently met with, but, besides it, clavates are, also, frequently, observed; fusees are rarely observed. The bistellates have very broad rays, which, in some, are very short, almost like papillæ, but terminate in a small, four-rayed star; their intermediate portion is, more or less, long, and bare; they measure from 0.064—0.100^{mm} in length, and from 0.048—0.056^{mm} in breadth at the extremities. The intermediate stripe measures from 0.016—0.024^{mm} in breadth (figs. 63. 64. 65). The clavates are, especially above, beset with broad spikes, which terminate in a four-rayed star. The shaft is short, and has a couple of similar spikes; they measure 0.120^{mm} in length, and 0.076^{mm} in breadth above (fig. 66). The fusees are peculiar, and have broad leaves placed far apart from each other, and which also terminate in a small star; they measure 0.152^{mm} in length, and 0.064^{mm} in breadth (fig. 67).

On the body of the polyp, fusees and subclavates are the most predominant spicular forms. The fusees are, sometimes, bent, sometimes, straight, and are extremely sparingly beset with spikes, a few of them are almost smooth; they measure from 0.232—0.248^{mm} in length, and from 0.036—0.052^{mm} in breadth at the middle (figs. 68. 69). Neither are the subclavates very spicate, and their spikes, as a rule, are small, and placed far apart from each other; they measure from 0.156—0.236^{mm} in length, and from 0.044—0.052^{mm} in breadth above (figs. 70. 71. 72). Between the forms just named, there are, here and there, seen, smaller, and somewhat flatter spicules, having blunted extremities and few spikes; these measure from 0.084—0.144^{mm} in length, and from 0.028—0.036^{mm} in breadth (figs. 73. 74).

On the tentacles, it is, principally, the fusiform and subclaviform spicular forms that are met with, as predominating. The fusees are, sometimes, almost smooth, sometimes, spicate. The spikes are small and placed pretty far apart from each other. In the spicate fusees, the extremities are strongly acuminate; they measure from 0.196—0.300^{mm} in length, and from 0.032—0.044^{mm} in breadth (figs. 75. 76). The subclavates resemble, somewhat, those of the body, but are, yet, a little different from them; a few are smooth, others are spicate, and have the uppermost extremity almost fissured, and in a couple of these spicate subclavates a prominent cross is observed in the middle. They measure from 0.116—0.240^{mm} in length, and from 0.024—0.040^{mm} in breadth above (figs. 77. 78. 79).

On the gullet-tube, quadruplets and fusees, furnished with spikes are the most frequent spicular forms observed. The spicules are, here, somewhat flattened. The quadruplets are, partly, cruciform, and measure 0.100^{mm} in length, with a transversal arm measuring 0.088^{mm} (fig. 80); sometimes their form approaches to that of the sand-glass (fig. 81). The fusees measure from 0.124—0.148^{mm} in

Farven.

Farven er næsten hvid. spillende yderst svagt i det blege Rosenrøde.

Findested.

Station 192. 4 Exemplarer, hvoraf 3 ere Hunner.

Artskarakter.

Zoanthodemet indtil 30^{mm} høit. Basaldelen skiveformigt udvidet. Stammen er tyk, smalner successivt af mod Toppen, der deler sig i 5—8 Grene, og er lige fra Basaldelen til Toppen tæt besat med korte, tykke Grene, der næsten ganske dække Stammen, ende kølleformigt og ere rige paa Polyper. Disse ere 4—5^{mm} lange med buget Forkrop, forsynet med 8 Længderibber, adskilte ved lige saa mange Furer, og en kort Bagkrop, der er fattig paa Spikler. Tentaklerne ere omtrent 2^{mm} lange med Spikler paa deres aborale Flade. Pinnulerne uden Spikler. Polypcellerne ere runde, vel adskilte og nedsænkede i Coenenchymet. Paa Basaldelen væsentligst Dobbeltstjerner. Paa Stammen sammensatte Stjerner og særegne Dobbeltstjerner. Paa Polypkroppen hovedsagelig Spindler og Køller. Paa Svælgrøret 4 Længderækker Spikler. Farven næsten hvid, spillende lidt i det Røde.

Vøringia capitata, n. sp.

Tab. XXI. Fig. 1.

Zoanthodemet indtil 15^{mm} høit. Basaldelen skiveformigt udvidet, tynd men fast og læderagtig, furet efter Længden og stærkt inkrusteret af Kalk. Stammen, omtrent 25^{mm} i Omkreds ved Grunden, beholder sin Tykkelse til op imod Toppen, der deler sig i 3 Grene, og er lidt furet paalangs, temmelig blød, men rig paa Kalk. Lige fra Grunden og til Toppen er Stammen rundt om tæt besat med Grene, som slutte sig tæt til Stammen, Tab. XXI, Fig. 1. Grenene ere korte, tykke og udvide sig kugleformigt i Enden, der væsentlig bærer Polyperne, imedens de nærmest Stammen ere nøgne, Fig. 1. 2. Paa enkelte Grene sees isolerede Polyper at udgaa fra den indre Del

length and from 0.016—0.028^{mm} in breadth (figs. 82. 83).

Colour.

The colour is almost white, shading extremely faintly towards pale rose-red.

Habitat.

Station No. 192. Four specimens, of which 3 are females.

Specific characteristics.

The Zoanthodem measures up to 30^{mm} in height. The basal part discoidally dilated. The stem thick, diminishing in thickness, gradually, towards the summit, which ramifies into 5—8 branches; the entire height from the basal part to the summit closely beset with short, thick branches which almost quite cover the stem; these branches terminate in subclaviform, and are richly furnished with polyps. The polyps measure 4—5^{mm} in length, have a bulging anterior body furnished with 8 longitudinal ribs separated by a similar number of grooves, and a short posterior body poorly furnished with spicules. The tentacles measure about 2^{mm} in length, and have spicules on their aboral surface. The pinnules devoid of spicules. The polyp-cells cylindrical, well-separated, and depressed in the sarcosoma. Bistellate spicules in the basal part principally. On the stem, complex stellates and peculiar bistellates. On the polyp-body, fusees and subclavates principally. On the gullet-tube four longitudinal series of spicules. Colour almost white, shading a little towards red.

Vøringia capitata, n. sp.

Pl. XXI. Fig. 1—28.

The Zoanthodem measures up to 15^{mm} in height. The basal part is discoidally dilated, and thin, but it is hard and coriaceous, and is grooved longitudinally, and strongly encrusted with calcium. The stem measures about 25^{mm} in circumference at the base, retaining its thickness till near the summit which ramifies into 3 branches, and is slightly furrowed, longitudinally; it is pretty soft although rich in calcium. Right from the base and up to the summit, the stem is, round about it, closely beset with branches which lie close in to the stem (fig. 1). The branches are short and thick, and they dilate at the extremities in spheriform, the extremity being principally occupied by polyps, whilst

af Grenen, men dette er undtagelsesvis. Polypcellerne $\frac{1}{2}$ ere runde, staa temmelig tæt i hverandre og ere forsynede med 8 adskilte Længderibber, dannede af Kalkspikler, hvorefter mellem sees en nøgen, smal Fure, som opimod Randen eller der, hvor Cellen gaar over i Polypens Bagkrop, udvider sig til et triangulært Spatium. Fig. 3, a. Naar Polypen er lidt indtrukket, faar Cellens Rand et ottetandet Udseende. Fig. 3, b.

Polyperne ere 5—6^{mm} lange, cylindriske, men udvide sig tragformigt op imod Tentakelskiven. Paa Størstedelen af Polypkroppen ligge Spiklerne paatvers; kun op imod dens forreste Del antage de en mere perpendicular Retning, som tiltager, idet de gaa over paa Tentaklerne; men hvor denne Overgang foregaar, nemlig opimod Tentakelskiven, dannes imellem hver 2 Tentaklers Grund et temmelig stort, nøgent, triangulært Rum, der er overordentligt tæt besat med Nematocyster, Fig. 3, c. Tentaklerne ere halvt saa lange som Kroppen, omtrent 2^{mm}, vel forsynede med Spikler paa den aborale Side, hvor de op imod Enderne ligge paatvers. Pinnulerne ere uden Spikler, men saavel paa disse som paa Tentaklernes adoral Side og paa hele Mundskiven er der en Mængde Nematocyster. Mundaabningen danner en Tverspalte med temmelig tykke Læber. Naar Kolonien er i Vigør og Polyperne udstrakte, har hver Gren en Kugleform, der end tydeligere fremtræder, naar Polyperne ere indtrukne, Fig. 2.

I anatomisk-histologisk Henseende adskiller den sig ikke væsentligt fra den foregaaende Art. Svælgrøret synes i Forhold til Polypkroppens Længde at være temmelig kort; det har kun to Rækker Spikler, og disse ligge langt fra hverandre, saa Svælget i det Hele taget er fattigt paa Kalk, Fig. 4. Svælgrenden er smal, men forsynet med de sædvanlige lange Pidskeceller; i den øvrige Del af Svælget er der i den cilierende Epithelialbeklædning indleiret mange isolerede, ægformede, encellede Slimkjertler. Den bagerste Del af Mavehulheden er hos mange Polyper næsten udfyldt af Æg i de forskjelligste Stadier, ligesom der i Polypcellerne hyppigt træffes Æg.

Paa Basaldelen ligge Spiklerne tæt paa hverandre og bestaa væsentligst af Dobbeltstjerner, sjældent træffes en Klubbe eller sammensat Stjerne og yderst sjældent en Firling. Dobbeltstjernerne ere meget vekslede, men Grundformen gjenkjendes dog. De har alle brede Straaler i begge Ender med et mere eller mindre nøgent Midtbelte. Straalerne ende ofte i smaa Stjerner, der dannes af yderst smaa, runde Kalkkorn, som forresten findes afsat næsten overalt; de ere fra 0.096—0.168^{mm} lange, fra 0.044—0.146^{mm} brede i

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

the part of the branches nearest the stem is bare (figs. 1, 2). On a few branches, solitary polyps are seen to issue from the inner part of the branch; that is, however, exceptional. The polyp-cells are cylindrical, and are placed pretty far apart from each other; they are furnished with 8, separated, longitudinal ribs formed of calcareous spicules, and between these a bare narrow furrow is observed, which, up towards the margin, or at the point where the cell passes over into the posterior body of the polyp, becomes dilated to a triangular space (fig. 3, a). When the polyp is a little retracted, the cellular margin acquires an octodentate appearance (fig. 3, b).

The polyps measure 5—6^{mm} in length, and are cylindrical, but up towards the tentacular disk they dilate in infundibuliform. In the greater part of the body of the polyp, the spicules are placed transversally, and only up towards the anterior part do they assume a more perpendicular direction, which increases as they pass over on to the tentacles, but where this transition takes place, namely, in proximity to the tentacular disk, a pretty large bare triangular area is formed between the bases of each 2 tentacles, and this space is extremely closely beset with nematocysts (fig. 3, c). The tentacles are half the length of the body, and measure about 2^{mm}; they are well furnished with spicules on the aboral side, where, in proximity to the extremities, they are placed transversally. The pinnules are devoid of spicules, but upon these, as well as, also, on the adoral side of the tentacles, and on the entire oral disk, there is a multitude of nematocysts. The oral aperture forms a transverse fissure having tolerably thick labiæ. When the colony is in full vigour and the polyps extended, each branch has a spherical form, which appears still more distinctly when the polyps are retracted (fig. 2).

In anatomo-histological relations, this species does not materially differ from the preceding one. The gullet-tube appears to be pretty short in proportion to the length of the polyp-body; it has only two series of spicules, and these are placed far apart from each other, so that, altogether, the gullet is poor in calcium (fig. 4). The gullet-passage is narrow, but is supplied with the usual, long, flagelliform cells. In the remaining part of the gullet, there is observed, entrenched in the ciliating epithelial covering, many isolated, oviform, unicellular mucous glands. The posterior portion of the gastral cavity is, in many polyps, almost filled up with ova in the most different stages of development, whilst, also, ova are frequently met with in the cells of the polyps.

In the basal part, the spicules are placed close upon each other, and consist, principally, of bistellates; rarely is a clavate or complex stellate met with, and still more rarely is a quadruplet seen. The bistellates are very various in form but, still, the normal form is recognised. They all have broad rays at both extremities, and have a, more or less, bare, medial stripe. The rays often terminate in small stars, which are formed of extremely minute, round, calcareous granules, which, indeed, are found

Enderne; Midtbelte fra 0.020—0.060^{mm} bredt, Fig. 5. 6. 7. 8. 9. 10. (De sidste 3 ere mindre udviklede Former). Imellem Dobbeltstjerne sees enkeltvis enten en sammensat Stjerne, der næsten har Form af Klubben, eller en Klubbe, nærmende sig den sammensatte Stjerne; de have ligeledes brede Straaler, som ere besatte med smaa Kalkkorn, der stundom se ud, som om de vare strøede ud over Straalerne, ligesom de findes paa Midtpartierne; disse Spikler ere 0.228^{mm} lange, 0.132^{mm} brede, Fig. 11. Firlingerne have Korsform og ere besatte med spredte Blade eller Papiller, hvorimellem sees de fine, runde Kalkkorn; de ere 0.136^{mm} lange med en Tverstok 0.132^{mm}, Fig. 12.

Paa Stammen og Grenene ligge Spiklerne temmelig kompakte, og er her sammensatte Stjerner almindeligst; sjældnere Køller. De sammensatte Stjerner ere tildels lidt krumbøiede og da lidt uformelige; men forresten have de alle brede Blade med takkede Rande og ere besatte med yderst smaa Kalkkorn; de ere fra 0.160—0.216^{mm} lange og fra 0.088—0.100^{mm} brede, Fig. 13. 14. Køllerne ere forsynede med brede, i Randen indskaarne Blade; enkelte nærme sig Spindelformen, og alle have en større eller mindre Mængde runde Kalkkorn; de ere fra 0.192—0.232^{mm} lange og fra 0.068—0.088^{mm} brede, Fig. 15. 16. Imellem disse Spikler sees, men yderst sjældent, en bred, med Blade rigt udstyret Spikel i Rosetform, der ligesom er bestrøet med smaa, runde Kalkkorn og 0.216^{mm} lang og 0.148^{mm} bred, Fig. 17.

Paa Cellerne ere elliptiske Spindler hyppigst, meget sjældnere ere Dobbeltstjerne og yderst sjelden en Firling. De elliptiske Spindler variere temmelig meget i Form; enkelte nærme sig noget Køllen, andre noget sammensatte Stjerner. I Almindelighed have de Midtbelte, der er overstrøet med Smaakorn, ellers ere de udstyrede med brede Blade, som ere takkede i Randen og ligeledes kornbestrøede; de ere fra 0.248—0.276^{mm} lange og fra 0.104—0.124^{mm} brede, Fig. 18. 19. Dobbeltstjerne have brede, delte Straaler med takkede Rande; Midtpartiet er ogsaa besat med Blade; de ere 0.132^{mm} lange, 0.072^{mm} brede i Enderne med et 0.032^{mm} bredt Midtbelte, Fig. 20. Firlingen er i Form af en meget rigt ornamenteret Roset, overstrøet med fine Kalkkorn, der nærme sig noget den paa Stammen omtalte brede, med Blade prydede Spikel, Fig. 17, men adskiller sig fra denne dog derved, at den virkelig har 4 Afdelinger: Firlingens Karakter; den er 0.232^{mm} lang, 0.172^{mm} bred i Enderne, paa Midten 0.120^{mm} bred, Fig. 21.

deposited almost everywhere. These bistellates measure from 0.096—0.168^{mm} in length, and from 0.044—0.146^{mm} in breadth at the extremities. The medial stripe measures from 0.020—0.060^{mm} in breadth (fig. 5. 6. 7. 8. 9. 10). (The last 3 are imperfectly developed forms). Between the bistellates there is, occasionally, observed, either a complex stellate having almost the claviform, or a clavate approaching in form to the complex stellate; these, also, have broad rays that are beset with minute calcareous granules appearing, sometimes, as if they were strewed over the rays, and granules are likewise found on the medial parts; these spicules measure 0.228^{mm} in length, and 0.132^{mm} in breadth (fig. 11). The quadruplets have the cruciform, and are beset with scattered leaves or papilla, between which the minute round calcareous granules are seen; they measure 0.136^{mm} in length, and have a transversal arm measuring 0.132^{mm} (fig. 12).

On the stem and the branches, the spicules are placed pretty compactly, and, here, complex stellates are the most frequent spicular forms met with, more rarely are subclavates seen. The complex stellates are, sometimes, a little crooked, and are, then, somewhat misshapen, but otherwise, they all have broad leaves having spicate margins, and are beset with extremely minute calcareous granules; they measure from 0.160—0.216^{mm} in length, and from 0.088—0.100^{mm} in breadth (figs. 13. 14). The subclavates are furnished with broad leaves dentated in the margins, a few approach in form to the fusiform, and all of them have a greater or less abundance of round calcareous granules; they measure from 0.192—0.232^{mm} in length, and from 0.068—0.088^{mm} in breadth (figs. 15. 16). Between these spicules, there is seen -- but extremely rarely -- a broad spicule richly adorned with leaves, in rosetiform, and which appears as if strewed over with minute, round, calcareous granules; it measures 0.216^{mm} in length, and 0.148^{mm} in breadth (fig. 17).

On the cells, elliptic fusees are the most frequent spicular form, much more rarely do bistellates appear, and extremely seldom is a quadruplet seen. The elliptic fusees vary pretty much in form, a few approach in form to the subclavate, others, again, somewhat to the complex stellate. In general, they have medial stripes which are overstrawed with minute granules, or they are furnished with broad leaves which are spicate in the margins and, likewise, overstrawed with granules; they measure from 0.248—0.276^{mm} in length, and from 0.104—0.124^{mm} in breadth (fig. 18. 19). The bistellates have broad, ramous, rays with spicate margins, and the medial part is, also, beset with leaves; they measure 0.132^{mm} in length, and 0.072^{mm} in breadth at the extremities, and have a medial stripe measuring 0.032^{mm} in breadth (fig. 20). The quadruplet has the form of a very richly ornamented rosette overstrawed with minute, calcareous granules, and it approaches, somewhat, in form to the broad spicule adorned with leaves previously spoken of as found upon the stem (fig. 17), but differs from it, however, in, really, having four divisions, the characteristic feature of the quadruplet;

Paa Kroppen forekommer væsentligt Spindler; imellem dem sees hist og her Klubber eller Koller. Spindlerne ere dels lige, dels mere eller mindre krumme; de lige ere takkede med tilspidsede Ender; de krumme ere hyppigst og forekomme snart i S Form, snart i Baadform; de ere meget takkede; paa enkelte ere Takkerne saa store, at de faa Bladform, men overalt ere Spindlerne overstroede med fine Kalkkorn; de ere fra 0.300—0.360^{mm} lange, fra 0.024—0.046^{mm} brede, Fig. 22. 23. 24. Klubberne ere ogsaa tildels noget krummede, forsynede med Takker og fine Kalkkorn; de ere 0.180^{mm} lange, 0.056^{mm} brede i den tykke Ende, Fig. 25.

Paa Tentaklerne træffes omtrent lignende takkede Spindler som paa Kroppen, men foruden dem findes paa den øverste Del af Tentaklernes aborale Side mindre, paa-tversliggende, temmelig flade, i Randene stærkt indskaarne Spikler, der ere fra 0.056—0.112^{mm} lange og fra 0.032—0.060^{mm} brede, Fig. 26. 27. 28.

Paa Svælgrøret, der er meget fattigt paa Spikler, ligge de i to uregelmæssige Rækker og dannes dels af enkelte Firlinger, dels af mere eller mindre flade, takkede, særegne, sammensatte Spindler, Fig. 4.

Farven.

Gul.

Findested.

- Station 224. Et fuldvovent og et Par unge Exemplarer, siddende paa *Arca glacialis*.
 Station 267. 5 Exemplarer, hvoraf enkelte siddende paa Rør af *Tubularia imperialis*.
 Station 275. Mange Exemplarer.

Artskarakter.

Zoanthodemet indtil 15^{mm} høit. Basaldelen skiveformigt udvidet, tynd, men fast, læderagtig. Stammen næsten lige tyk overalt, omtrent 25^{mm} i Omkreds ved Grunden, deler sig i Toppen i 3 Grene, er lidt furet paa langs, blød, men rig paa Kalk og lige fra Grunden og til Toppen rundt om tæt besat med tætsluttende Grene. Disse ere tykke, korte, udvidende sig kugleformigt i Enderne,

it measures 0.232^{mm} in length, 0.172^{mm} in breadth at the extremities, and 0.120^{mm} in breadth at the middle (fig. 21).

On the body, fusees are the form of most frequent occurrence, and between these, there are seen, here and there, clavates, or subclavates. The fusees are, sometimes straight, sometimes more or less bent; the straight ones are spicate, and have acuminate extremities; the bent ones are the most frequent, and appear often in S-form, often cymbiform; they are very spicate and, in a few, the spikes are so large, as to acquire the foliiform, but the fusees are, everywhere, overstrewed with minute calcareous granules; they measure from 0.300—0.360^{mm} in length, and from 0.024—0.046^{mm} in breadth (figs. 22. 23. 24). The clavates are, also, occasionally, somewhat bent, and are furnished with spikes and minute calcareous granules; they measure 0.180^{mm} in length, and 0.056^{mm} in breadth at the thick extremity (fig. 25).

On the tentacles, nearly similar spicate fusees to those of the body are met with, but, besides them, there are found on the uppermost part of the aboral side of the tentacles, smaller, transversally-placed, rather flat, spicules, strongly indented in the margins; they measure from 0.056—0.112^{mm} in length, and from 0.032—0.060^{mm} in breadth (figs. 26. 27. 28).

On the gullet-tube, which is very poor in spicules, the spicules are placed in two irregular series, and consist of, partly, a few quadruplets, and partly, of, more or less flat, spicate, peculiar, complex stellates (fig. 4).

Colour.

The colour is yellow.

Habitat.

- Station No. 224. One full-grown, and a couple of young specimens seated on *Arca glacialis*.
 Station No. 267. Five specimens, of which some seated on tubes of *Tubularia imperialis*.
 Station No. 275. Many specimens.

Specific characteristics.

The Zoanthodem measures up to 15^{mm} in height. The basal portion discoidally dilated, thin, but hard and coriaceous. The stem, almost uniform in thickness throughout, measures about 25^{mm} in circumference at the base, ramifies at the summit into 3 branches, is a little furrowed longitudinally, soft, but rich in calcium, and is, right from the base to the summit, beset round about it, with

hvor Polyperne fortrinsvis sidde. Polypcellerne runde, staa tæt i hverandre og forsynede med 8 adskilte, spikelrige Længderibber, hvorimellem en smal, nøgen Fure, der op imod Cellens Rand udvider sig til et triangulært Rum. Polyperne 5—6^{mm} lange, cylindriske, udvidende sig traktformigt imod Tentakelskiven, hvor der findes 8 trekantede, nøgne Felter, rigt besatte med Nematocyster. Tentaklerne halv saa lange som Kroppen, forsynede med Spikler paa den aborale Flade. Pinnulerne uden Spikler; saavel paa disse som paa Tentaklernes adorale Side samt paa Mundskiven en Mængde Nematocyster. Paa Basaldelen væsentligst Dobbeltstjerner; paa Stammen fornemmelig sammensatte Stjerner og særegne brede, rigt ornamenterede Spikler; paa Polypcellen elliptiske Spindler, Dobbeltstjerner og eiddommelige Firlinger; paa Polypkroppen hovedsagelig lange, dels krumme, dels lige, takkede Spindler; saa godt som overalt ere Spiklerne ligesom overstrøede med fine Kalkkorn; paa Svælget to Rækker spredte, flade, uregelmæssige Spikler. Farven gul.

I et tidligere Arbeide¹ af J. Koren og mig er opstillet Slægten *Duva* og karakteriseret saaledes:

“Zoanthodemet trædannet, stærkt forgrenet. Stammens Basaldel bred. Hovedgrenene lange, bløde, bøielige, enten dele sig i Smaagrene, disse i flere Stilke, der hver bærer paa deres Ender flere Polyper, eller forblive udelte, men ogsaa da bære paa Enden en Samling af Polyper, hvilke dels ere sammenvoxede ved Grunden, dels skilte ved et smalt Coenenchym. Polyperne ikke retraktile, korte, men vel udviklede, forsynede med lange, spindelformede, takkede Spikler. Grenene og Smaagrenene uden Kalk. Spiklerne i Stammen dels mangestraalede, korte Spindler, dels simple Dobbeltstjerner, ikke synbare for blotte Øie. Septa uden Kalk.”

Senere Undersøgelser have gjort det nødvendigt at foretage nogen Forandring ved denne Karakteristik. Der er nemlig fundet paa den norske Nordhavsexpedition ikke mindre end 8 nye Arter, som jeg finder at maatte henføre til Slægten *Duva*, omendskjønt flere af dem afvige fra den oprindelig givne Slægtskarakter derved, at der findes Kalkspikler saavel i Stammen som i Grenene. At danne en ny Slægt for disse anser jeg ikke fornødent; thi naar undtages Kalkafsætningen i Stamme og Grene, saa have de baade i deres ydre og indre Bygning saameget tilfælles, at en Adskillelse i to Slægter ikke vil kunne begrundes. Hertil kommer, at jeg hos enkelte Arter har fundet Antydninger til Overgange, idet der nemlig enten

closely enveloping branches. These are thick and short, and at the extremities they become dilated in spheriform, the polyps being especially situated there. The polyp-cells are cylindrical, and placed close to each other; they are furnished with 8 separated, longitudinal ribs rich in spicules, between which there is a narrow bare furrow that, in proximity to the margin of the cell, becomes dilated to a triangular space. The polyps 5—6^{mm} in length, cylindrical, dilating, in proximity to the tentacular disk, in infundibuli form, where, 8 triangular bare areas richly occupied by nematocysts are found. The tentacles are half the length of the body, and are furnished with spicules on their aboral surface. The pinnules are devoid of spicules. On the pinnules, and also on the adoral side of the tentacles, a multitude of nematocysts are found. On the basal part, principally, bi-stellate spicules. On the stem, principally, complex stellates and peculiar, broad, richly ornamented, spicules. On the polyp-cell, elliptic fusees, bistellates and peculiar quadruplets. On the polyp-body, principally, long, partly bent, partly straight, spicate fusees, almost everywhere the spicules are, as it were, overstrewn with minute, calcareous granules. On the gullet, two series of scattered, flat, irregular spicules. The colour yellow.

In a previous¹ work, by J. Koren and myself, I have proposed to form the genus *Duva* and distinguished it thus:

“The Zoanthodem aborescent, strongly ramous. The” “basal part of the stem broad. The main branches long,” “soft, flexible, and ramifying, either into branchlets, and” “these, again, into small stalks each of which carries on its” “extremity several polyps; or they remain entire, but in” “that case, also, they carry on the extremity a collection” “of polyps [which, partly, are conereted together at the” “root, and partly, are separated by a narrow sarcosoma.” “The polyps non-retractile, short, but well developed, and” “furnished with long, fusiform, spicate spicules. The” “branches and the branchlets non-calcareous. The spicules” “of the stem, partly, multi-radiate, short fusees; partly,” “plain bistellates invisible to the naked eye. Septa non-” “calcareous”.

Subsequent examinations have shown the necessity of making some change in these characteristics. There has, in fact, been discovered during the Norwegian North-Atlantic Expedition, no fewer than 8 new species which I feel compelled to relegate to the genus *Duva*, although several of them differ from the generic character originally stated, inasmuch that calcareous spicules are found, both, in the stem as well as in the branches. I do not consider it necessary to form a new genus for these, because, with the exception of the calcareous deposit in the stems and branches, they have, in both their interior and exterior structure, so much in common, that a separation into two genera can not be maintained. To this

¹ Bergens Museum. Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna ved J. Koren og D. C. Danielssen, Pag. 3. Bergen 1883.

¹ Bergens Museum. Nye Alcyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna ved J. Koren og D. C. Danielssen, Pag. 3. Bergen 1883.

i Stammen eller Grenene have været faa, spredte Spikler, hvorfor saadanne Kolonier vanskelig skulle kunne henføres til nogen af de to Slægter, men maatte staa midt inellem. For at lette Oversigten har jeg derfor troet at burde dele Slægten *Duva* i to Linier, — den ene omfattende de Arter, hos hvem den største Del af Zoanthodemets Stamme og samtlige Grene med Forgreninger ere uden Spikler, — og den anden, omfattende de Arter, hvor hele Zoanthodemet er forsynet med saadanne.

Slægtskarakteren for *Duva* vil som Følge heraf blive stillet saaledes:

Zoanthodemet trædannet, forgrenet. Grenene nøgne i større eller mindre Udstrækning fra Stammen, delende sig i mindre Grene, der hver bære paa deres Ende flere Polyper, som dels ere sammenvoxede ved Grunden, dels skilte ved et smalt Coenchym. Polyperne ikke retraktile, vel udviklede og rigt forsynede med Spikler, især paa hele Rygsiden. Enten er hele Zoanthodemet rigt paa Spikler, eller Størstedelen af Stammen, samt Grenene og Smaagrenene ere uden saadanne. Septa uden Kalk.

Underafdeling.

A. Hele Zoanthodemet spikelholdigt.

Hertil hører:

- Duva arborescens*, n. sp.
- *aurantiaca*, n. sp.
- *frigida*, n. sp.
- *glacialis*, n. sp.

B. Størstedelen af Stammen, Grenene og deres Forgreninger uden Spikler.

Hertil hører:

- Duva spitzbergensis*, n. sp.
- *violacea*, n. sp.
- *flava*, n. sp.
- *cinerea*, n. sp.

Duva arborescens, n. sp.

Tab. II, Fig. 42—54, Tab. III, Fig. 1—17.

Zoanthodemet indtil 120^{mm} høit. Stammen er rund, glat, furet efter Længden med en lidet udvidet Basaldel, der er 60^{mm} i Omkreds, og en temmelig rig Forgrening, lige fra 20^{mm} fra Grunden og op til Toppen, Tab. III, Fig. 1.

must be added, that in a few species I have found indications of a transition, inasmuch, for instance, that either in the stem or the branches, there have been few dispersed spicules, and therefore such colonies could with difficulty be assigned to either of the two genera, but must be placed intermediately between them. In order, therefore, to make the review easier, I have thought it desirable to treat the genus *Duva* under two subdivisions, the one subdivision including the species in which the larger part of the stem of the Zoanthodem and all the branches with their ramifications are devoid of spicules; and the other subdivision including the species where the entire Zoanthodem is furnished with them.

The generic character of *Duva* will, in consequence of this, be stated, thus:

The Zoanthodem arborescent, ramous. The branches bare for a greater or lesser extent from the stem, ramifying into branchlets, each of which carries, on its extremity, several polyps, which, partly, are concreted together at the root, partly, are separated by a narrow sarcosoma. The polyps non-retractile, well developed, and richly supplied with spicules, especially on the entire dorsal side. The entire Zoanthodem is, either, rich in spicules, or the greatest part of the stem and, also, the branches and branchlets are devoid of these. — Septa non-calcareous.

Subdivisions.

A. The entire Zoanthodem containing spicules.

To this subdivision pertain:

- Duva arborescens*, n. sp.
- *aurantiaca*, n. sp.
- *frigida*, n. sp.
- *glacialis*, n. sp.

B. The greater part of the stem, the branches and their ramifications; devoid of spicules.

To this subdivision pertain.

- Duva spitzbergensis*, n. sp.
- *violacea*, n. sp.,
- *flava*, n. sp.
- *cinerea*, n. sp.

Duva arborescens, n. sp.

Pl. II, figs. 42—54. Pl. III, figs. 1—17.

The Zoanthodem measures, up to 120^{mm} in height. The stem is cylindrical, smooth, and longitudinally grooved, and it has a slightly expanded basal part, measuring 60^{mm} in circumference, and a rather rich ramification extending through the entire length, from 20^{mm} above the root up to the summit (Pl. III, fig. 1).

Basaldelen er fast, læderagtig og føles noget ru af den i den ydre Hud afsatte Kalk; den øvrige Del af Stammen er blødere, glattere, meget bøielig, aftager noget i Tykkelse og er mindre rig paa Kalk; men ved stærk Loupe kan dog Spikler iagttages i Coenenchymets ydre Flade, Fig. 2. Stammens øverste Ende deler sig i 3 Hovedgrene, der igjen dele sig. De nederste Grene ere de korteste, ofte kun et Par Millimeter; længere op paa Stammen afvekle korte og lange Grene om hverandre uden nogen Regelmæssighed, Fig. 1. De længste Grene ere omkring 35^m lange og 25^m i Omkreds ved deres Udspring. Grenene ere glatte, runde, furede efter Længden, dele sig i kortere eller længere Afstand fra Stammen i 4—5 mindre Grene, der ere korte, men forholdsvis tykke, og som atter deles i omtrent lige mange Smaagrener, fra hvilke udgaa 3—5 Stilke, der hver bære 3—5 Polyper, Fig. 1. 2. Samtlige disse Grene ere i levende Live halv gjennemsigtige, temmelig faste, ligesom elastiske ved Tryk, idet Længdekanalerne ere stærkt udspændte af Ernæringsvædske og forsynede med Kalkspikler.

Polyperne ere 7—8^m lange, ikke retraktile, udspringe alle fra Grenenes yderste Forgreninger, ere cylindriske, noget bredere ved Mundskiven, men smalne af mod den temmelig lange Bagkrop, Fig. 2. Hyppigst ere to Polyper sammenvoxede ved Grunden, og da er Stilken, hvori de gaa over, noget tykkere, Fig. 3. Polypkroppens ydre Flade er forsynet med 8 dobbelte Længderækker Spikler, der strække sig lige fra Grunden og op til Tentaklernes Basaldel uden at gaa over paa disse, Fig. 3. Tentaklerne ere fra 3—4^m lange, omtrent ligesaa lange som Kroppen, forsynede med Pinnuler og uden Kalkspikler.

Den histologisk-anatomiske Bygning af Slægten *Duva* har J. Koren og jeg i et tidligere Arbeide¹ beskrevet og skal jeg kun her tilføie, at paa Svælgets indre Flade er en triangulær Grube, der er beklædt med lignende Pidskeepithel, som det, der er omtalt hos Slægten *Vøringia*; tillige findes imellem det øvrige Epithel, som beklæder den indre Svælgvæg, encellede Slimkjertler, lig dem hos *Vøringia*.

Stammens Basaldel er rig paa Spikler, der optræde som Spindler og Dobbeltstjerner. Spindlerne ere stærkt tornede, dels lige, dels krumme med tilspidsede Ender; de ere

¹ Bergens Museum. Nye Aleyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna ved J. Koren og D. C. Danielsen.

The basal part is firm and coriaceous, and it feels somewhat rough to the touch, owing to the calcium deposited in the exterior integument. The remaining part of the stem is softer, smoother, and very flexible, and it diminishes somewhat in thickness; neither is it so rich in calcium, but with the assistance of a powerful magnifier, spicules may, however, be observed in the exterior surface of the sarcosoma (Pl. III, fig. 2). The uppermost extremity of the stem ramifies into 3 main branches, which again ramify. The lowest branches are the shortest ones, measuring, frequently, only a couple of millimetres in length. Further up the stem, short and long branches alternate with each other without any regularity (Pl. III, Fig. 1). The longest branches measure, about 35^m in length, and 25^m in circumference at their root. The branches are smooth, cylindrical, and longitudinally grooved, and, at a greater or lesser distance from the stem, ramify into 4—5 smaller branches, which are short, but relatively thick, and which, again ramify into about a similar number of branchlets from which 3—5 stalks proceed, each of them carrying 3—5 polyps (Pl. III, figs. 1. 2). All of these branches are, in the live state, semi-transparent, pretty firm, and, as it were, elastic upon application of pressure, owing to the longitudinal ducts being greatly dilated by the nutritory fluids; they are also furnished with calcareous spicules.

The polyps measure 7—8^m in length, are non-retractile, and they all spring from the extreme ramifications of the branches; they are cylindrical, somewhat broadest at the oral disk, but diminish in breadth towards the rather long posterior body (Pl. III, fig. 2). Very frequently, two polyps are conereted together at their root, and the stalk into which they are produced is, then, somewhat thicker (Pl. III, fig. 3). The exterior surface of the body of the polyp is furnished with 8 double longitudinal series of spicules, which extend themselves right from the root, and up to the basal part of the tentacles without, however, being produced into these (Pl. III, fig. 3). The tentacles measure from 3—4^m in length — about the same length as the body — and they are furnished with pinnules, and are devoid of calcareous spicules.

I have, in a previous work¹, by J. Koren and myself, described the anatomo-histological structure of the genus *Duva*, and shall only add, here, that on the inner surface of the gullet there is a triangular cavity which is lined with a similar flagellate-celled epithelium to that spoken of in connection with the genus *Vøringia*; further, that between the remaining epithelium which clothes the inner wall of the gullet, there are found unicellular mucous glands like those in *Vøringia*.

The basal part of the stem is rich in spicules, which appear as fusees and bistellates. The fusees are strongly spicate, partly bent, partly straight, with acuminate

¹ Bergens Museum. Nye Aleyonider, Gorgonider og Pennatulider, tilhørende Norges Fauna ved J. Koren og D. C. Danielsen.

fra 0.120—0.200^{mm} lange, og fra 0.050—0.080^{mm} brede fra den ene Tornespids til den anden paa modsat Side, Tab. II, Fig. 42. 43. Dobbeltstjernerne ere stærkt indknebne og næsten glatte paa Midten, brede i begge Ender; de ere 0.080^{mm} lange, 0.060^{mm} brede i Enderne og 0.020^{mm} paa Midten, Fig. 44. Imellem disse sees mere enkeltvis sammensatte Stjerner, Fig. 45. og Firlinger i Form af Kors. Foruden de her nævnte findes der jo andre Spikler, der antage Former, som man træffer dels høiere oppe paa Stammen, dels paa Grenene og Polyperne; men da disse ikke ere særegne for Basaldelen, er det ikke nødvendigt at omtale dem nærmere her. I det Hele taget søger jeg altid at fremstille de Spikler, der ere eiendommelige for de Dele af Dyrekolonien, hvori de findes, og som i væsentlig Grad kunne hjælpe til Artsbestemmelsen; thi saavidt mine Undersøgelser gaar, finder man hos en stor Del af Alcyoniderne de samme Spikelformer gjentage sig, medens man i Regelen imellem Fællesformerne finder andre, forskellige fra disse, og som tilhøre den særegne Art, hvori de optræde.

Paa Stammens nedre Del ligge Spiklerne mere spredte end paa Basaldelen; de danne dels enkle Spindler med afstumpede Ender, besatte med temmelig brede Torne og ere 0.068^{mm} lange, 0.018^{mm} brede, Fig. 46. 47. 48, dels korsformede Firlinger.

Paa Stammens Midtparti ligge Spiklerne endnu mere spredte, og her er den hyppigste Form Dobbeltstjernen, Fig. 49, hvorimellem sees, enkelte af Spindelformerne fra Stammens nedre Del.

Øverst paa Stammen og tildels paa Hovedgrenene have de mest fremtrædende Spikler Formen af korte Valsler, 0.072^{mm} lange, 0.040^{mm} brede, med næsten tværs afskaarne Ender, rigt besatte med tykke Vorter, paa hvilke sees smaa Korn, Fig. 50, og vingedannede Spindler med stumpe Ender, 0.064^{mm} lange, 0.016^{mm} brede, Tab. III, Fig. 4. 5. 6. 7. 8.

Paa Grenene findes, foruden de nysnævnte øverst paa Stammen, dels Dobbeltstjerner, 0.060^{mm} lange, 0.028^{mm} brede i Enderne, Fig. 11, dels takkede Spindler, og imellem disse enkelte smaa Firlinger, Fig. 9. 10.

Paa Smaagrenene sees hyppigst Firlinger i forskellige Korsformer besatte med større og mindre Vorter. Armene paa Korsene ere meget brede og omtrent lige

extremities, and they measure from 0.120—0.200^{mm} in length, and from 0.050—0.080^{mm} in breadth, measured from the one spicate-point to the other one on the opposite side (Pl. II, figs. 42. 43). The bistellates are greatly constricted and almost smooth, at the middle, but broad at both extremities; they measure 0.080^{mm} in length, 0.060^{mm} in breadth at the extremities, and 0.020^{mm} at the middle (Pl. II, fig. 44). Between these there are seen, placed more isolated, complex stellates (Pl. II, fig. 45), and cruciform quadruplets. Besides the ones mentioned here, yet other spicules are found, that assume forms which we meet with, partly higher up the stem, and, partly on the branches and polyps, but as these are not peculiar to the basal part it is unnecessary to speak of them, here. Generally speaking, I always endeavour to present the spicules which are peculiar to those portions of the animal colony in which they are found, and which, in an essential measure, are of assistance in deciding the species, because, so far as my observations extend, I find, in a great many of the Alcyonoids, the same spicular forms repeating themselves; whilst, as a rule, between forms held in common, others are found differing from these, and pertaining to the peculiar species in which they appear.

In the lower part of the stem, the spicules are situated more dispersed than on the basal part, and form, partly, single fusees with blunted extremities beset with rather broad aculeæ, and measuring 0.068^{mm} in length, and 0.018^{mm} in breadth (Pl. II, figs. 46. 47. 48) and, partly, cruciform quadruplets.

On the middle part of the stem, the spicules are situated still more dispersed and, here, the bistellate is the form most frequently met with (Pl. II, fig. 49); but amongst them however, a few of the fusiform like those of the lower part of the stem may be seen.

Uppermost on the stem and, partly, on the main branches, the most prominent spicules have the form of short rollers measuring 0.072^{mm} in length, and 0.040^{mm} in breadth and having, almost transversally truncated extremities richly beset with thick warts, upon which small granules are observed (Pl. II, fig. 50); and also, pennate-formed fusees with blunt extremities, which measure 0.064^{mm} in length, and 0.016^{mm} in breadth (Pl. III, figs. 4. 5. 6. 7. 8).

On the branches; besides those just mentioned, as uppermost on the stem; we find, partly, bistellates measuring 0.060^{mm} in length, and 0.028^{mm} in breadth at the extremities (Pl. III, fig. 11) partly, spicate fusees, and, between these, a few small quadruplets (Pl. III, figs. 9. 10).

On the branchlets, variously shaped cruciform quadruplets are, most frequently, observed, and these are beset with larger or smaller warts. The arms of the cross are

lange, saa det er vanskeligt at bestemme, hvad der er Længdestok, og hvad der er Tverstok. Firlingerne ere omtrent 0.040^{mm} saavel i Længde som Brede, Fig. 12. 13. 14; imellem disse sees enkelte, takkede Dobbelkugler, 0.060^{mm} lange, 0.028^{mm} brede i Enderne, Fig. 15. 16, dels takkede Spindler, Fig. 17.

Polypkroppens Spikler ere stillede i 8 Dobbeltrækker, saaledes at i enhver Række staa de paaskraa imod hverandre, Tab. III, Fig. 3. Den hyppigste Form, hvorunder Spiklerne optræde her, er den takkede Spindel med tilspidsede Ender, fra 0.200 — 0.280^{mm} lang og fra 0.030 — 0.040^{mm} bred paa Midten, Tab. II, Fig. 51; imellem Spindlerne sees ofte stærkt tornede Koller, snart lige, snart krumme, 0.300^{mm} lange og 0.060^{mm} brede i den tykke Ende, Tab. II, Fig. 52. 53. Kun enkeltvis træffes paa en korsformet Firling, hvis Længdestok er 0.080^{mm} og Tverstok 0.120^{mm} , Fig. 54, ligesom der hist og her findes enkelte smaa, takkede Spindler med dels spidse, dels stumpede Ender, 0.120^{mm} lange, 0.020^{mm} brede paa Midten.

Hvor Polypkroppen gaar over i Stilken (Smaagren) ophøre de tætte Spikelrækker; Spiklerne ligge der mere spredte og have de for Smaagrenene beskrevne Former, Tab. III, Fig. 3.

Generationsorganerne udvikles som sædvanligt i næsten runde, stilkede Kapsler i den bagre Del af Mavehulheden. Kjønnene ere adskilte.

Farven.

Bleggul; i levende Live spillende lidt i det Røde med en brunlig Basal.

Findested.

Station 315. Et mindre Exemplar.
— 370. Et stort Exemplar.

Artskarakter.

Zoanthodemet indtil 120^{mm} høit. Stammen 60^{mm} i Omkreds ved Grunden, furet paalangs og forgrenet 20^{mm} fra Grunden og indtil Toppen. Basaldelen læderagtig, ikke synderlig udvidet. Grenene nøgne, mangedelte. De yderste Smaagrene bære 3—5 Polyper. Stammen, Grenene, Smaagrenene og Stilkene (den yderste Forgrening) ere forsynede med Kalkspikler i forskellige Former. Polyperne langstrakte, cylindriske med en temmelig lang Bagkrop.

very broad, and about uniform in length, so that it is difficult to decide which is the longitudinal, and which the transversal arm. The quadruplets measure about 0.040^{mm} both, in length and breadth (Pl. III, figs. 12. 13. 14). Between these, a few spicate double spheres are observed, measuring 0.060^{mm} in length, and 0.028^{mm} in breadth at the extremities (Pl. III, figs. 15. 16), and, partly, spicate fusees (Pl. III, fig. 17).

The spicules of the body of the polyp are placed in 8 double series, in such manner, that in each series they are placed diagonally opposite to each other (Pl. III, fig. 3). The most frequent form in which the spicules appear, in this situation, is the spicate fusee with acuminate extremities, and measuring from 0.200 — 0.280^{mm} in length, and from 0.030 — 0.040^{mm} in breadth at the middle (Pl. II, fig. 51). Between the fusees, strongly aculeated clavates are frequently observed, sometimes straight, sometimes bent, and measuring 0.300^{mm} in length, and 0.060^{mm} in breadth at the thick extremity (Pl. II, figs. 52. 53). Only occasionally, is a cruciform quadruplet met with, whose longitudinal arm measures 0.280^{mm} and its transversal arm 0.120^{mm} (Pl. II, fig. 54) whilst, also, there are, here and there, found, a few small spicate fusees with, partly, acuminate, partly, blunt extremities, and measuring 0.120^{mm} in length, and 0.020^{mm} in breadth at the middle.

Where the body of the polyp is produced into the stalk (Branchlet), the closely-set spicular series cease. The spicules, there, are placed more dispersed, and they possess the forms described as pertaining to the branchlets (Pl. III, fig. 3).

The generative organs are developed, as usual, in almost spherical pedunculated capsules, in the posterior part of the ventral cavity. The sexes are separated.

Colour.

Pale yellow; in the live state, shading a little towards red and with a brownish basal part.

Habitat.

Station Nr. 315. A small specimen.
— 370. A large specimen.

Specific characteristics.

The Zoanthodem measures up to 120^{mm} in height, and the stem 60^{mm} in circumference at the base, is longitudinally grooved, ramified, commencing 20^{mm} up from the base and thence to the summit. The basal part is coriaceous, and not particularly dilated. The branches bare, much ramified, the extreme branches carrying 3—5 polyps. The stem, the branches, the branchlets, and the stalks, (the extreme ramifications) are furnished with calcareous

Hele Polypkroppen forsynet med 8 Dobbelttrækker takkede, dels spindel, dels kølleformede Spikler, hvorimellem sees enkelte korsformede Firlinger. Tentaklerne uden Spikler. Farven gul, spillende lidt i det Røde.

Duva aurantiaca, n. sp.

Tab. IV. Fig. 1—41.

Zoanthodemet er 75^{mm} høit. Stammen er rund, temmelig stiv, furet paalangs, 40^{mm} i Omfang ved Grunden, men aftager noget i Tykkelse opad, hvor den ender i to tykke Grene. Basaldelen er fast, læderagtig, stærkt furet paa langs og ikke synderlig udvidet. Omtrent 30^{mm} fra Grunden er hele Stammen rundt om forsynet med Grene, der staa noget fra hverandre og afvekle i Længde og Tykkelse. De nederste ere kortest og tyndest, men tiltage opad, saa at de øverste ere baade de længste og tykkeste. Grenene ere temmelig stive, furede og dele sig enten lige ved deres Udspring, eller strax efter i en eller flere Smaagrene, der igjen forgrene sig i flere, tynde Stilke, som bære 4—8 Polyper, hvoraf snart 2, snart 3 ere sammenvoxede ved Grunden, Fig. 1. 2. Saavel i Stammen som i samtlige Grene, Smaagrene og Stilke findes rigelige Kalkafsætninger, der give dem deres Fasthed.

Polyperne ere korte, 5—6^{mm} lange, ikke synderlig gjennemsigtige. Mundskiven meget bred, lidt hvælvet. Munden lidt fremspringende, næsten rund. Kroppen er 3—4^{mm} lang, har paa Dorsalsiden 6 Spiklerækker, 3—4 Spikler i Bredden, hvilke strække sig langs hele Kroppen og et Stykke op paa Tentaklerne, Fig. 3; paa Ventralsiden er to korte Spiklerækker, som tabe sig omtrent midt paa Kroppen i et bredt Spikelbelte, der gaar tvers over denne, Fig. 4. Oven- og nedenfor dette Belte er Bugfladen uden Spikler, Fig. 4. Tentaklerne ere noget kortere end Kroppen, tykke og paa deres aborale Sides nederste Halvdel forsynede med en Spiklerække, Fortsættelse af Kroppens, Fig. 3.

Hele Zoanthodemet er rigt paa Kalk. I Basaldelen ligge Spiklerne pakkede paa hverandre og fremtræde under mange Former. Spindelformen er den hyppigste, saaledes: Spindler, som ere vingeformigt udvidede og sparsomt besatte med Takker, 0.088^{mm} lange, 0.044^{mm} brede, Fig. 5. 6; takkede, sammensatte Spindler med stumpe Ender og vidt fra hverandre staaende Takker eller Udlobere, der ere for-

Den norske Nordhavsekspektion. D. C. Danielssen: Alcyonida.

spicules of variable forms. The polyps elongate, cylindrical, with a rather long posterior body. The entire body of the polyp furnished with 8 double series of spicate, fusiform, partly, sub-claviform spicules, amongst which are a few cruciform quadruplets. The tentacles devoid of spicules. The colour yellow, shading a little towards red.

Duva aurantiaca, n. sp.

Pl. IV. Fig. 1—41.

The Zoanthodem measures 75^{mm} in height. The stem is cylindrical, pretty stiff, and longitudinally grooved; and it measures 40^{mm} in circumference at the base, diminishing, somewhat, in thickness upwards, where it terminates in two thick branches. The basal part is firm, coriaceous, and strongly grooved longitudinally, and is not particularly dilated. About 30^{mm} from the base, the entire stem is, round about it, furnished with branches, which are placed somewhat apart from each other and alternate in length and thickness. The lowest ones are shortest and thickest, but they become enlarged, upwards, so that the uppermost ones are, both, the longest and the thickest. The branches are rather stiff; they are grooved, and ramify either quite at their root, or immediately beyond it, into several branchlets which again ramify into several thin stalks carrying 4—8 polyps, of which, sometimes two, and sometimes three, are concreted together at the base (figs. 1. 2). Both, in the stem, as well as in all of the branches, the branchlets and the stalks, abundant calcareous deposits are found, which impart to them their stiffness.

The polyps are short, and measure 5—6^{mm} in length, and they are not particularly transparent. The oral-disk is very broad, and somewhat arcuate. The oral aperture is rather protuberant and almost circular. The body measures 3—4^{mm} in length, and has, upon its dorsal side, 6 spicular series, 3—4 spicules in the breadth, and these extend themselves along the entire body and some way up the tentacles (fig. 3). On the ventral side, there are two short spicular series which crowd together about the middle of the body, into a broad spicular belt that passes across it (fig. 4). Above and below this belt, the ventral surface is devoid of spicules (fig. 4). The tentacles are somewhat shorter than the body, and thick, and, on the lowest half part of their aboral side, they are furnished with a spicular series which is a continuation of that of the body (fig. 3).

The entire Zoanthodem is rich in calcium. In the basal portion, the spicules lie packed upon each other, and present themselves in many forms. The fusi-form is the most frequent one; appearing thus, as fusees, pennately expanded, sparingly beset with spikes, and measuring 0.088^{mm} in length, and 0.044^{mm} in breadth (figs. 5. 6); spicate, complex fusees, with blunt extremities, and spikes, placed

synede med Vorter; disse Spindler ere 0.139^{mm} lange, 0.044^{mm} brede, Fig. 7. Imellem de nævnte Spindler sees lige, næsten glatte Spikler, kugleformige i den ene Ende og kronedannede i den anden, 0.100^{mm} lange, 0.016^{mm} brede paa Midten, Fig. 8; korte, rosetformede Spikler med en smal Basis og en bred, tornet Krone, 0.060^{mm} lange, Kronen 0.052^{mm} bred, Fig. 9; Dobbeltstjerner, Fig. 10. 11, iblandt hvilke findes enkelte med et langt, glat Midtparti, 0.120^{mm} lange, 0.014^{mm} paa Midten, Fig. 12; tornede Koller, 0.120^{mm} lange, 0.070^{mm} brede i den tykke Ende, Fig. 13, og endelig enkelte Firlinger i Form af Kors, der dog ere sjeldne, og hvis Længdestok er 0.080^{mm} og Tverstok 0.060^{mm}.

Paa Stammens nederste Del træffes omtrent lignende Spikler som paa Basaldelen, kun ligge de der ikke saa kompakte; derimod findes paa den øvrige Del af Stammen andre Former, saaledes Dobbeltstjerner med Takker eller Vorter, 0.080^{mm} lange, 0.016^{mm} brede paa Midten, Fig. 14. 15. 16; en Del yderst smaa Firlinger, der have et meget forskjelligt Udseende, tilnærmelsesvis en Korsform, af 0.043^{mm} Længde og 0.032^{mm} Bredde, Fig. 17. 18. 19; men foruden de her nævnte Spikler, støder man ogsaa paa kjendte Spikler fra Basaldelen.

Grenene og deres Forgreninger lige indtil de tynde Stilke, som bære Polyperne, ere vel forsynede med Spikler, der ligge temmelig tæt uden dog at komme i Berørelse med hverandre, Fig. 3, kun paa enkelte Steder hænder det, at Spiklerne have samlet sig i smaa Grupper. Takkede Spindler, dels krumme, dels lige med tilspidsede eller afstumpede Ender ere de hyppigste, Fig. 20—24. De variere noget i Størrelse, fra 0.120—0.240^{mm} lange og fra 0.020—0.040^{mm} brede. Imellem dem sees enkelte, takkede Valser, 0.120^{mm} lange, 0.040^{mm} brede, Fig. 25, — enkelte Koller med stærke Takker, 0.200^{mm} lange, 0.040^{mm} i den brede Ende, Fig. 26, samt korsformede, takkede Firlinger med en Længdestok, 0.120^{mm}, og en Tverstok, 0.060^{mm}, Fig. 27. 28.

Paa Polypkroppens bagerste Del, hvor den gaar over i Stilken, sees omtrent lignende Spikler som de, der ere antydende paa Smaagrenene og Stilkene, dog iblandet enkeltvis med andre, der tilhøre den øvrige Del af Kroppen. Paa denne variere Formerne særdeles meget. Takkede, krumme og lige Spindler af samme Størrelse som de paa Smaagrenene, tildels meget tyndere, Fig. 29. 30. 31, samt takkede, lige Koller, 0.140^{mm} lange, 0.040^{mm} i den brede Ende, Fig. 32, ere de almindeligste; sjeldne ere takkede Valser, Fig. 33. 34, og yderst sjældent forgrenede Spikler, Fig. 35, men ikke saa ganske sjældent træffes hist og her forskjellige Firlinger, der dog alle have antaget Korsformen:

far apart from each other, or prolongations furnished with warts; these fusees measure 0.139^{mm} in length, and 0.044^{mm} in breadth (fig. 7). Between the fusees mentioned, are observed, straight and almost smooth spicules, spheri-form in the one extremity and coroni-form in the other, measuring 0.100^{mm} in length, and 0.016^{mm} in breadth at the middle (fig. 8); short, rosetti-form spicules, with a narrow base and a broad aculeated corona, measuring 0.060^{mm} in length, and the corona 0.052^{mm} in breadth (fig. 9); bistellates (figs. 10. 11) amongst which are found a few with a long smooth medial part, and measuring 1.120^{mm} in length, and 0.014^{mm} at the middle (fig. 12); aculeated subclavates, measuring 0.120^{mm} in length, and 0.070^{mm} in breadth at the thick extremity (fig. 13); and finally, a few cruciform quadruplets, which, however, are rare, and whose longitudinal arm measures 0.080^{mm} and the transversal arm 0.060^{mm} in length.

In the lowest part of the stem we meet with spicules, having about the same forms as those of the basal portion, only, that there, they are not placed so compactly. On the other hand, upon the rest of the stem we find other forms, such as bistellates with spikes, or warts, and measuring 0.080^{mm} in length, and 0.016^{mm} in breadth at the middle (figs. 14. 15. 16); further, a number of extremely minute quadruplets which have a very variable appearance, approaching, approximately, to the cruciform, and measuring 0.043^{mm} in length, and 0.032^{mm} in breadth (figs 17. 18. 19), but besides the spicules, here, mentioned, we meet with familiar spicules like those of the basal part.

The branches and their ramifications, including even the thin stalks that carry the polyps, are well supplied with spicules, which are placed rather close without, however, coming into contact with each other (fig. 3); in a few places only does it happen that the spicules collect themselves into small groups. The most frequent forms are spicate fusees, partly bent, partly straight, with acuminate or blunted extremities (figs. 20—24). They vary somewhat in size, measuring from 0.120—240^{mm} in length, and from 0.020—0.040^{mm} in breadth. Between them, are visible, a few spicate rollers, measuring 0.120^{mm} in length, and 0.040^{mm} in breadth (fig. 25); occasional subclavates with strong spikes and measuring 0.200^{mm} in length, and 0.040^{mm} in breadth at the broad extremity (fig. 26); also, cruciform spicate quadruplets, with a longitudinal arm measuring 0.120^{mm} and a transversal arm 0.060^{mm} (figs. 27. 28)

On the posterior part of the body of the polyp, where it becomes produced into the stalk, spicules are observed of about the same kind as those indicated as pertaining to the branchlets and the stalks, but interspersed, occasionally, with others that pertain to the remaining part of the body. On this, the forms vary in a great degree. Spicate, bent and straight, fusees of same size as those of the branchlets but, partly, much thinner (figs. 29. 30. 31) and also, spicate, straight subclavates measuring 0.140^{mm} in length, and 0.040^{mm} in breadth at the broad extremity (fig. 32) are the most frequent, rarely do we find spicate rollers (figs. 33. 34), and extremely rarely

saaledes bladet, korsformet Firling, 0.200^{mm} Længdestok, med en uformelig Tverstok, Fig. 36; korsformede, takkede, mindre Firlinger, Fig. 37. 38. 39; korsformet Firling stærkt besat med Torne, Længdestok. 0.100^{mm} , Tverstok, 0.050^{mm} , Fig. 40, og endelig en ganske liden, glat, korsformet Firling, omtrent lige lang som bred, 0.048^{mm} i Gjennemsnit, Fig. 41.

Generationsorganerne udvikle sig paa mindst 4 Septula.

Farven.

Stammen og Grenene ere mørk orangegule; Polyperne violette; Tentaklerne intens violette.

Findested.

Station 359. Et Exemplar.

Artskarakter.

Zoanthodemet indtil 75^{mm} høit. Stammen temmelig stiv, furet paalangs, 40^{mm} i Omkreds ved Grunden, endende opad i to tykke, korte Grene. Basaldelen fast, læderagtig, ikke synderlig udvidet. Stammen rundt om forsynet med noget spredte Grene, afvexlende i Længde og Tykkelse. Grenene temmelig stive, dele sig snart i Smaagrene, som igjen forgrene sig i tynde Smaastilke, bærende hver 4—8 Polyper, af hvilke dels 2, dels 3 ere sammenvoxede ved Grunden. Stammen, Grenene, Smaagrenene og Stilkene rige paa Spikler. Polyperne korte, tykke. Langs Kroppens hele Dorsalside 6 Spikelrækker, strækkende sig op paa Tentaklerne. Paa Ventralsiden to korte Spikelrækker, tabende sig midt paa Bugen i et bredt Belte; oven- og nedenfor dette ingen Spikler. Spiklerne have yderst forskjellig Form; korsdannede Firlinger træffes hyppigst. Stammen og Grenene mørk orangegule. Polyperne intens violette.

Duva frigida, n. sp.

Tab. IV. Fig. 42—69.

Zoanthodemet indtil 22^{mm} høit. Stammen, der er rund, fast, furet paalangs, er ved Grunden 20^{mm} i Omfang.

ramified spicules (fig. 35), but not quite so rarely do we meet, here and there, with different kinds of quadruplets, which have, however, all assumed the cruciform; for instance, foliaceous cruciform quadruplets, with a longitudinal arm measuring 0.200^{mm} , but having an amorphous transversal arm (fig. 36); cruciform, spicate, smaller quadruplets (figs. 37. 38. 39); a cruciform quadruplet strongly beset with aculeæ, having a longitudinal arm measuring 0.100^{mm} and a transversal arm measuring 0.050^{mm} (fig. 40); and finally, a quite small, smooth, cruciform quadruplet, about as long as is it broad, measuring 0.048^{mm} in diameter (fig. 41).

The generative organs develop themselves on, at least, 4 septula.

Colour.

The stem and the branches are dark orange-yellow. The polyps violet. The tentacles deep-violet.

Habitat.

Station No. 359. One specimen.

Specific characteristics.

The Zoanthodem measures up to 75^{mm} in height. The stem rather stiff, longitudinally grooved, measures 40^{mm} in circumference at the base, and terminates, upwards, in two thick short branches. The basal portion firm, coriaceous, and not particularly dilated. The stem, round about it, furnished with, somewhat dispersed, branches alternating in length and thickness. The branches pretty stiff, ramify, sometimes, into branchlets which, again, ramify into thin small stalks, each of them carrying 4—8 polyps, of which, sometimes 2, and sometimes 3, are concreted together at the base. The stem, the branches, the branchlets and the stalks rich in spicules. The polyps short, and thick. Along the entire dorsal side of the body, 6 spicular series, extending themselves up on the tentacles. On the ventral side, two short spicular series which become absorbed in a broad belt on the ventrum; above and below this belt no spicules. The spicules have an extremely variable form; but cruciform quadruplets are the most frequent. Colour; the stem and the branches dark orange-yellow; the polyps deep violet.

Duva frigida, n. sp.

Pl. IV. Figs. 42—69.

The Zoanthodem measures up to 22^{mm} in height. The stem, which is cylindrical, firm, and longitudinally

men aftager successivt i Tykkelse opad, hvor den ender i to Grene, som hver bærer 5—6 Polyper. Basaldelen er fast, læderagtig, membranagtig udbredt over den Gjenstand, hvortil den er fæstet, og Længdekanalerne ere stærkere fremtrædende end paa den øvrige Del af Stammen. Omtrent et Par Millimeter fra Basaldelen og til Toppen er Stammen rigt forsynet med Grene, der sidde rundt om samme. Lige ved Grunden udspringer en Del Polyper direkte fra Stammen, Fig. 42.

Grenene ere runde, stive, svagt furede og af noget forskjellig Længde; omtrent paa Midten af Stammen ere de længst. De ere nøgne i 3—4^{mm} Længde fra Udspringet, og fra deres Ende udgaar i Regelen 3 Smaagrener, der bære hver 6—7 Polyper, som danne en Gruppe, Fig. 42. Hver Gren har 4 Længdekanaler, der omgive et bredt Centrum af Bindevæv, hvori findes større og mindre Ernæringskanaler. Coenenchymet er saavel i Stammen som i Grenene forholdsvis meget tykt og bidrager til at give disse Dele sin Fasthed. Baade Stammen og Grenene indeholde Spikler.

Polyperne ere cylindriske med en udvidet Forkrop og en langstrakt Bagkrop, Fig. 43. De ere 7—8^{mm} lange, 2,5^{mm} brede ved Mundskiven, men smalner af mod Bagkroppen, der er ved Udspringet omtrent halvt saa bred som Mundskiven. Denne er noget hvælvet og har i Midten den aflange Mundaabning med tykke Læber. Tentaklerne ere 3—4^{mm} lange og udgjøre omtrent Halvdelen af Polypens Længde. Polyperne ere rige paa Spikler og ved Grunden ere 2 og 3 sammenvoxede, Fig. 43.

Zoanthodemet er hos de 4 Exemplarer, der bleve fundne paa Expeditionen, fæstet til *Hornera frondosa*, dels døde, dels levende Specimina. Basaldelen udbreder sig over en større Strækning af Korallen og dræber derved dennes Individuer paa det Sted, Fig. 42.

Paa Basaldelen ligge Spiklerne temmelig pakkede paa hverandre og danne forskellige Former. Den almindeligste er takkede Klubber, fra 0.100—0.120^{mm} lange og 0.060^{mm} brede i den tykke Ende; de have alle et meget kort Skaft, Fig. 44. 45; kun sjældent træffes en lang, stærkt takket Kølle, 0.260^{mm} lang, 0.040^{mm} bred foroven, Fig. 46. Hypigere sees Dobbeltstjerner, 0.096^{mm} lange, 0.040^{mm} brede i Enderne med et smalt, nøgent Midtbelte, Fig. 47. Sammensatte Stjerner, Fig. 48, og takkede Valser, Fig. 49, ere sjældne; de første ere 0.122^{mm} lange, 0.060^{mm} brede; de sidste ere 0.120^{mm} lange og 0.060^{mm} brede. Hist og her, men sjældent, sees snart lige, snart krumme, takkede Spindler, 0.280^{mm} lange, 0.040^{mm} brede, Fig. 50. Iblandt de ovennævnte Spikler findes noget forskjelligt formede Firlinger, saaledes korsformet Firling, besat med smaa Vorter, Længestok, 0.100^{mm}, Tverstok, 0.092^{mm}, Fig. 51; Firling, sparsomt besat med smaa Vorter, 0.080^{mm} bred, 0.060^{mm}

grooved, measures, at the base, 20^{mm} in circumference, but diminishes, gradually, in thickness upwards, where it terminates in two branches, each of which carries 5—6 polyps. The basal part is firm and coriaceous, and it is membranaceously spread over the object to which it is attached, and the longitudinal ducts are more prominent than on the other parts of the stem. From about a couple of millimetres above the basal part, and thence to the summit, the stem is abundantly furnished with branches, situated round about it. Quite at the root, a number of polyps spring direct from the stem (fig. 42).

The branches are cylindrical, stiff and faintly grooved, and they have a somewhat variable length, being longest about the middle of the stem. For a distance of 3—4^{mm} from their root they are bare, and from their extremities there, usually, spring 3 branchlets, each of which carries 6—7 polyps which form a group (fig. 42). Each branch has 4 longitudinal ducts which surround a broad central portion of connective-tissue, in which larger and smaller nutritory-ducts are found. Both in the stem and the branches the sarcosoma is, relatively, very thick, and contributes to impart to these parts their firmness. Both, the stem and the branches, contain spicules.

The polyps are cylindrical, and have a dilated anterior body and an elongate posterior body (fig. 43). They measure 7—8^{mm} in length, and 2.5^{mm} in breadth at the oral disk, but become diminished towards the posterior body, which, at its origin, is about half the breadth of the oral disk. This latter is somewhat arcuate, and carries, in its middle, the oblong oral aperture with thick labiæ. The tentacles measure 3—4^{mm} in length, and compose about half part of the length of the polyps. The polyps are rich in spicules, and 2, and sometimes 3 of them, are concreted together at the base (fig. 43).

In the 4 specimens that were found during the expedition, the Zoanthodem is secured to *Hornera frondosa*, partly dead, partly living specimens. The basal part spreads itself over a considerable extent of the coral, and destroys, thus, the individual members on that spot (fig. 42).

In the basal part, the spicules are placed, pretty much packed upon each other, and consist of different forms. The most common form is the spicate clavate, measuring from 0.100—0.120^{mm} in length, and 0.060^{mm} in breadth at the thick extremity; all, of them, have a very short shaft (figs. 44. 45), only rarely is a long strongly spicate subclavate met with, measuring 0.260^{mm} in length, and 0.040^{mm} in breadth above (fig. 46). More frequently are bistellates seen, measuring 0.096^{mm} in length, and 0.040^{mm} in breadth at the extremities, and having a narrow bare mesial belt (fig. 47). Complex stellates (fig. 48) and spicate rollers (fig. 49) are rare. The first mentioned measure 0.122^{mm} in length, and 0.060^{mm} in breadth; and the last mentioned measure, 0.120^{mm} in length and 0.060^{mm} in breadth. Here and there, but rarely, sometimes straight, sometimes bent, spicate fusees are seen, measuring 0.280^{mm} in length, and 0.040^{mm} in breadth (fig. 50). Amongst the above-mentioned

lang, Fig. 52; Firling, der er 0.080^{mm} lang, og hvis øverste Del er klumpet og 0.040^{mm} bred, medens den nederste Del er regelmæssig, 0.040^{mm} bred, Fig. 53; endelig findes Rosetter, besatte med Vorter og forsynede med et Kors-tegn paa Midten; de ere 0.088^{mm} lange, 0.072^{mm} brede og sjeldne, Fig. 54.

Paa Stammen ere Spiklerne meget spredte og danne de samme Former, som findes paa Grenene og Smaagrenene, hvor de ligge meget tættere. De hyppigst her forekommende ere takkede Spindler, hvoraf mange have konisk tilspidsede Ender; de ere fra 0.160—0.200^{mm} lange og fra 0.020—0.040^{mm} brede, Fig. 55. 56. Imellem Spindlerne sees vortede Valser, dels med, dels uden et smalt, nøgent Belte paa Midten, Fig. 57. 58; enkelte korsformede Firlinger besatte med Papiller, Fig. 59; — Armene ere omtrent lige lange, 0.060^{mm}, men den ene Arm er meget bredere og uformelig, — samt enkelte, takkede Tvillinger, 0.100^{mm} lange, med 0.040^{mm} brede Ender og et nøgent Midtbelte, 0.020^{mm} bredt.

Paa Polypkroppens forreste Del og Tentaklernes Grund ere takkede Spindler med dels tilspidsede, dels mere eller mindre afstumpede Ender de almindeligste; de ere fra 0.140—0.220^{mm} lange og fra 0.018—0.040^{mm} brede, Fig. 60, a. Køller ere ogsaa hyppige; de ere alle stærkt tornede. 0.260^{mm} lange, 0.080^{mm} brede foroven, Fig. 61; men enkelte ere smalere og ligne fuldkommen den, som er afbildet i Figur 46. Imellem Spindlerne og Køllerne findes korsformede, stærkt tornede Firlinger med en Længdestok 0.280^{mm}, hvis nederste Del er noget krummet, og en Tverstok, 0.120^{mm}, Fig. 62; bladede Firlinger i Form af Køller, 0.200^{mm} lange og 0.060^{mm} brede foroven, Fig. 63; bladet Firling i begyndende Korsform, Længdestokken tilspidset i begge Ender, 0.220^{mm}, Tverstokken kun lidet udviklet, Fig. 64.

Paa Tentaklerne findes væsentlig korte, brede, næsten flade Spikler med indskaarne Rande og besatte med Papiller; de ligge paatvers af den aborale Side og naa næsten op til Tentakelens Ende; de ere fra 0.068—0.080^{mm} lange og fra 0.030—0.040^{mm} brede, Fig. 60, b. 65. 66.

Bagkroppen optages væsentlig af takkede Spindler og bladede Køller. Spindlerne ere dels lige, dels krumme, fra 0.260—0.300^{mm} lange og fra 0.035—0.060^{mm} brede, Fig. 67. Køllerne ere fra 0.100—0.200^{mm} lange og 0.060^{mm}

spicules, somewhat variable forms of quadruplets are found for instance, a cruciform quadruplet beset with small warts, and having a longitudinal arm measuring 0.100^{mm}, and a transversal arm measuring 0.092^{mm} (fig. 51); a quadruplet sparingly beset with small warts, and measuring 0.080^{mm} in breadth, and 0.060^{mm} in length, (fig. 52); a quadruplet measuring 0.080^{mm} in length, whose uppermost part is obliterated, and which measures 0.040^{mm} in breadth, whilst its lowest part measures, uniformly, 0.040^{mm} in breadth (fig. 53); finally, but rarely, rosettes are met with, beset with warts, and furnished with a crucial sign in the middle; they measure 0.088^{mm} in length, and 0.072^{mm} in breadth (fig. 54).

On the stem, the spicules are much dispersed, and consist of the same forms as are found on the branches and branchlets, where they are however placed much closer. The forms most frequently met with, here, are spicate fusees, of which, many have conical acuminate extremities; they measure from 0.160—0.200^{mm} in length, and from 0.020—0.040^{mm} in breadth (figs. 55. 56). Between the fusees, warted rollers are seen, partly with, and partly without, a narrow bare belt in the middle (figs. 57. 58); also, a few cruciform quadruplets beset with papillæ (fig. 59) with their arms about uniform in length, and measuring 0.060^{mm}, but the one arm is much broader than the other, and is amorphous; also, a few spicate twins measuring 0.100^{mm} in length, with 0.040^{mm} broad extremities, and a bare mesial belt 0.020^{mm} in breadth.

On the anterior part of the body of the polyp, and on the root of the tentacles, spicate fusees with, partly, acuminate, partly, more or less, blunted extremities, are the most frequent spicular forms, and these measure from 0.140—0.220^{mm} in length and from 0.018—0.040^{mm} in breadth (fig. 60, a). Subclavates are, also, frequent; they are all strongly aculeated, and measure 0.260^{mm} in length and 0.080^{mm} in breadth, above (fig. 61); but a few are narrower, and completely resemble that which is illustrated in figure 46. Between the fusees and the subclavates, strongly aculeated cruciform quadruplets are found, having a longitudinal arm measuring 0.280^{mm}, and with the lowest part somewhat curved, and a transversal arm measuring 0.120^{mm} (fig. 62); also, foliaceous quadruplets in the form of subclavates, measuring 0.200^{mm} in length, and 0.060^{mm} above (fig. 63); and a foliaceous quadruplet, in rudimentary cruciform, having a longitudinal arm acuminate at both extremities, and measuring 0.220^{mm}; the transversal arm is only slightly developed (fig. 64).

On the tentacles, short, broad, almost flat, spicules with indented margins, and beset with papillæ, are principally found; these are placed across the aboral side, and reach almost up to the extremity of the tentacle. They measure from 0.068—0.080^{mm} in length, and from 0.030—0.040^{mm} in breadth (figs. 60, b. 65. 66).

The posterior body is occupied, principally, by spicate fusees and foliaceous subclavates. The fusees are, partly, straight, partly, bent, and measure from 0.260—0.300^{mm} in length, and from 0.035—0.060^{mm} in breadth (fig. 67).

brede foroven. Fig. 68; Haandgrebet er paa mange meget kort, Fig. 69.

Farven.

Gul.

Findested.

Station 48. 4 Exemplarer.

Artskarakter.

Zoanthodemet indtil 22^{mm} høit. Stammen furet paa langs, rund, et Par Millimeter fra Grunden rundt om tæt besat med Grene, saa den næsten ganske skjules. Grenene nøgne til Enden, hvor de i Regelen dele sig i 3 Smaagrene, der hver bærer 6—7 Polyper. Disse ere cylindriske med udvidet Forkrop og en langstrakt Bagkrop, 7—8^{mm} lange og rigt besatte med takkede Spindler, bladede Køller og Firlinger. Tentaklerne omtrent halvt saa lange som Kroppen og paa deres aborale Side lige til Enden forsynede med paatversliggende, næsten flade, takkede Spikler. Basaldelens Spikler danne Klubber, Køller, Dobbeltstjerner, Spindler, Valser og Firlinger. Stammen mindre rig paa Spikler, men Grenene og Smaagrenene rigt forsynede med saadanne under Form af Spindler, Firlinger, Tvillinger og Valser. Farven gul.

Duva glacialis, n. sp.

Tab. V. Fig. 34—81.

Zoanthodemet er indtil 70^{mm} høit. Stammen er ved Grunden 60^{mm} i Omkreds, rund og furet efter Længden, men aftager temmelig pludselig i Tykkelse, idet den 45^{mm} opad er kun henved 30^{mm} i Omfang og i Toppen knapt 12^{mm}, hvor den deler sig i flere Smaagrene, bærende Polyper. Basaldelen er meget udvidet, fast, tyk, læderagtig. Strax ovenfor Basaldelen sees enkelte, spredte, korte, tynde Grene, som dele sig i flere Smaagrene, der bære større eller mindre Grupper af Polyper; men Hovedgrenene tage først deres Begyndelse omtrent paa det Sted, hvor Stammen aftager i Tykkelse. Et Par af disse Grene ere næsten ligesaa tykke som denne Del af Stammen og have en Længde af indtil 25^{mm}, imedens de øvrige Grene ere korte. Grenene staa langt fra hverandre, ere runde, furede og dele sig i Regelen nogle Milimeter fra Stammen i 2 mindre

The subclavates are from 0.100—0.200^{mm} in length, and 0.060^{mm} in breadth above (fig. 68). The shaft is very short in many of them (fig. 69).

Colour.

Yellow.

Habitat.

Station No. 48. Four specimens.

Specific characteristics.

The Zoanthodem measures up to 22^{mm} in height. The stem is longitudinally grooved, cylindrical, and, from a couple of millimetres above the base, is closely beset, round about, with branches, so that it becomes almost concealed. The branches bare to the extremity, where they usually ramify into 3 branchlets, each of which carries 6—7 polyps. These are cylindrical, with dilated anterior body and an elongated posterior body, are 7—8^{mm} in length, and richly beset with spicate fusees, foliaceous subclavates and quadruplets. The tentacles are about half the length of the body, and are, on their aboral side, right out to the extremity, furnished with transversal almost flat spicate spicules. The spicules of the basal part form clavates, subclavates, bistellates, fusees, roller and quadruplets. The stem is less rich in spicules, but the branches, and the branchlets, are richly furnished with them, in the form of fusees, quadruplets, twins and rollers. The colour yellow.

Duva glacialis, n. sp.

Pl. V. Figs. 34—81.

The Zoanthodem measures up to 70^{mm} in height. The stem measures, at the base, 60^{mm} in circumference, and is cylindrical and longitudinally grooved; it diminishes in thickness rather abruptly; 45^{mm} up, it measures only about 30^{mm} in circumference, whilst it measures, barely, 12^{mm} at the summit, where it ramifies into several branchlets carrying polyps. The basal part is much dilated, firm, thick, and coriaceous. Immediately above the basal part, a few dispersed, short, thin branches are seen, which ramify into several branchlets, carrying larger or smaller groups of polyps, but the main branches first appear about the situation where the stem diminishes in thickness. A couple of these branches are almost as thick as that part of the stem, and measure up to 25^{mm} in length, whilst the other branches are short. The branches are situated far apart

Grene, der meget snart forgrene sig i 3—4 Smaagrene, som hver bærer 4—6 Polyper. Saavel Stammen som Grenene og Smaagrene ere faste, stive og forsynede med Spikler, der kun kan iagttages ved stærk Loupe, Fig. 34. 35.

Polyperne ere cylindriske, langstrakte, 5^{mm} lange, med en kort, noget udvidet Forkrop og en smal, noget længere Bagkrop, Fig. 36; de ere rigt forsynede med Spikler, som ere ordnede i Rækker overalt paa Ryggen og Siderne, Fig. 36, imedens den nederste Del af Bugen er saagodt-som spikelfri, Fig. 37, hvorfor de i Spiritus opbevarede Polyper altid ere stærkt bøiede mod Bugsiden. Tentaklerne ere 2,5^{mm} lange, omtrent halvt saa lange som Polypens hele Længde, temmelig tykke, og de 4 Rygtentakler have paa deres aborale Side en Række Spikler, Fortsættelse af Ryggens, der strækker sig et Stykke ovenfor Tentakelens Midte, Fig. 36; Pinnulerne ere uden Kalk. I Polypernes Mavehulhed sees Æg.

I Basaldelen ligge Spiklerne kompakt paa hverandre i flere Lag, hvilket giver denne Del af Zoanthodemets sin betydelige Haardhed. Hovedmassen af Spiklerne optræder her under ganske særegne Former, for største Delen forskellige fra dem, vi tidligere have fundet hos Alcyoniderne. Kun hos *Duva aurantiaca* fandtes enkeltvis nogle Spikler i Basaldelen, der havde nogen Lighed med dem. De kunne sammenlignes med Søiler, som have en bred, lidt knudet Basal, et temmelig langt, næsten glat, rundt Skaft, og et Kapitæl, der er bredt som Basalen og besat med Blade; de ere 0.180^{mm} lange; Basalen og Kapitelet er 0.080^{mm} bredt, Skaftet 0.026^{mm} bredt, Fig. 38. Søilespiklerne optræde hist og her imellem de Spikler, der udgjør Hovedmassen og hvoraf enkelte have Køllefornen, men Størsteparten danner korte, lidt knudrede, dels lige, dels krumme Bjelker, der ere 0.140^{mm} lange 0.032^{mm} brede, Fig. 39—44. Temmelig ofte sees ogsaa imellem de nævnte Bjelker korsformede Firlinger, hvis Arme ere omtrent lige lange, 0.090^{mm} i Gjennemsnit, og som have paa deres Ender enkelte smaa Papiller, Fig. 45; men meget sjeldnere sees Firlinger af Timeglasform, som ere 0.100^{mm} lange, 0.080^{mm} brede i Enderne og 0.040^{mm} brede paa Midten, Fig. 46. Overordentlig sjeldent træffes en meget sammensat, tornet eller bladet Spindel, der er 0.100^{mm} lang, 0.080^{mm} paa Midten, Fig. 47. 48, samt korte Klubber, 0.080^{mm} lange, med 0.052^{mm} bredt Hoved og 0.024^{mm} bredt Skaft, Fig. 49.

Stammen er ligeledes meget rig paa Spikler, der paa den nederste Halvdel ligge tæt til hverandre, men spredes mere, jo længere man kommer op imod Toppen. Paa

from each other, and are cylindrical, grooved, and, as a rule, ramify, a few millimetres from the stem, into two smaller branches which very speedily again ramify into 3—4 branchlets, each of which carries 4—6 polyps. Both, the stem, as well as the branches and the branchlets, are firm, stiff, and supplied with spicules which are only observable, however, through a powerful magnifier (figs. 34. 35).

The polyps are cylindrical, elongate, and measure 5^{mm} in length, and they have a short, somewhat dilated anterior body, and a narrow, somewhat longer posterior body (fig. 36); they are richly furnished with spicules, which are, everywhere, arranged in series on the dorsum and the sides (fig. 36), whilst, the lowest part of the ventrum is almost devoid of spicules (fig. 37); for this reason the polyps preserved in alcohol are always strongly curved towards the ventral side. The tentacles are 2,5^{mm} in length, or about half of the entire length of the polyp; they are tolerably thick, and the 4 dorsal tentacles have, on their aboral side, a series of spicules which is a continuation of the dorsal one, and extends itself a little way above the middle of the tentacle (fig. 36). The pinnules are non-calcareous. In the ventral cavity of the polyps, ova are observed.

In the basal part, the spicules are placed compactly upon each other in several layers, and this imparts, to that part of the Zoanthodem, its firmness. The main body of the spicules appear, here, in quite peculiar forms, different, for the greater part, from those which we have previously found in the Alcyonoids. In *Duva aurantiaca* alone, did we find, occasionally, a few spicules in the basal part, having some resemblance to them. They may be said to resemble columns with a broad somewhat protuberant base, a rather long, almost cylindrical shaft, and a capital, as broad as the base, beset with foliage; they measure 0.180^{mm} in length, and the base and capital measure 0.080^{mm} in breadth; the shaft measures 0.026^{mm} in breadth (fig. 38). The columnar spicules appear, here and there, between the spicules which compose the main body and of which a few have the subclaviform, but the greater number of them form short, slightly rugged, partly straight, partly bent, beams, measuring 0.140^{mm} in length, and 0.032^{mm} in breadth (figs. 39—44). Pretty frequently, there are, also, seen between the beams mentioned, cruciform quadruplets, whose arms are about uniform in length, and measure 0.090^{mm} in diameter, and which, on their extremities, have a few small papillæ (fig. 45), but, much less frequently, quadruplets of the hour-glass form are seen, which measure 0.100^{mm} in length, and 0.080^{mm} in breadth at the extremities, and 0.040^{mm} at the middle (fig. 46). Extremely rarely, a very complex, aculeated, or foliaceous fusee is met with, which measures 0.100^{mm} in length, and 0.040^{mm} in breadth at the middle (figs. 47. 48), also, short clavates, measuring 0.080^{mm} in length, and having a 0.052^{mm} broad head, and a 0.024^{mm} broad shaft (Fig. 49).

The stem is, likewise, very rich in spicules which, in the lowest half portion, are placed close to each other, but become more dispersed the further up they proceed towards

Stammens Midtdel sees Dobbelstjerner, 0.100^{mm} lange, 0.040^{mm} brede, Fig. 50; takkede og vortede Køller, 0.120^{mm} lange, 0.052^{mm} brede i den tykke Ende, Fig. 51, 52, samt takkede Spindler med afstumpede Ender, fra 0.060—0.120^{mm} lange og fra 0.016—0.040^{mm} brede, at være de almindeligste. Men imellem dem findes enkelte Firlinger, lig dem paa Basaldelen; knudede, timeglasformede Firlinger, 0.088^{mm} lange, 0.064^{mm} brede i Enderne og 0.016^{mm} paa Midten, Fig. 53; glatte, timeglasformede Firlinger, 0.032^{mm} lange, 0.016^{mm} brede i Enderne og 0.008^{mm} brede paa Midten, Fig. 54; yderst smaa, knudede, næsten korsformede Firlinger, 0.040^{mm} i Gjennemsnit, Fig. 55, men disse sidste ere overordentlig sjeldne; endelig findes enkelte, vingeformigt udvidede, takkede Spindler, 0.060^{mm} lange, 0.016^{mm} brede, Fig. 56, 57, 58.

Øverst paa Stammen og Grenene, hvor Spiklerne ligge mere spredte, ere disse rige paa Former. Firlinger træffes her hyppigt, saaledes korsformede, knudede Firlinger med Længdestok, 0.088^{mm}, Tverstok, 0.060^{mm}, Fig. 59; knudet Firling i Form af Timeglas, 0.072^{mm} lang, 0.032^{mm} bred i Enderne, 0.020^{mm} bred paa Midten, Fig. 60; takket, timeglasformet Firling, 0.060^{mm} lang, 0.040^{mm} bred i Enderne, 0.020^{mm} bred paa Midten, Fig. 61; Firling i Form af en Stjerne med brede Straaler, omtrent lige lang som bred, 0.060^{mm} i Gjennemsnit, Fig. 62; tornet Tvilling med gaffelformede Ender, 0.060^{mm} lang, 0.036^{mm} bred i Enderne, 0.012^{mm} paa Midten, Fig. 63; men hyppigere end samtlige disse Spikler ere dog takkede Spindler med dels tilspidsede, dels afstumpede Ender, Fig. 64, 65, samt korte, bladede Køller, Fig. 66. Spindlerne ere fra 0.080—0.100^{mm} lange og fra 0.016—0.020^{mm} brede, og Køllerne 0.080^{mm} lange og 0.040^{mm} brede opad.

Paa Polypkroppen, især paa Rygsiden, ligge Spiklerne temmelig kompakte og bestaa væsentlig af Spindler og Køller. Spindlerne ere takkede, dels krumme, dels lige, med baade tilspidsede og afstumpede Ender; de ere fra 0.128—0.220^{mm} lange og omtrent lige brede, nemlig 0.040^{mm} paa Midten, Fig. 67—70. Køllerne, der ere sjeldnere og tildels mindre end Spindlerne, ere ligeledes takkede, 0.080^{mm} lange, 0.032^{mm} brede foroven, Fig. 71, 72; imellem disse Spikler sees især paa Forkroppen enkeltvis Firlinger, hvoraf nogle have en temmelig udpræget Korsform med en Længdestok, 0.080—0.180^{mm} lang og Tverstok fra 0.040—0.120^{mm} Fig. 73, 74; imedens andre, der dog ere yderst sjeldne, nærme sig mere Stjerneormen og ere 0.056^{mm} i Gjennemsnit, Fig. 75.

the summit. On the middle part of the stem, bistellates which measure 0.100^{mm} in length, and 0.040^{mm} in breadth, (fig. 50); spicate, and warted subclavates, measuring 0.120^{mm} in length, and 0.052^{mm} in breadth at the thick extremity (figs. 51, 52); further, also, spicate fusees with blunted extremities, measuring from 0.060—0.120^{mm} in length, and from 0.016—0.040^{mm} in breadth, are seen to be the most frequent. But, between them, a few quadruplets are found, like those of the basal part; protuberated hour-glass formed quadruplets, measuring 0.083^{mm} in length, 0.064^{mm} in breadth at the extremities, and 0.016^{mm} in breadth at the middle (fig. 53); smooth, hour-glass formed quadruplets, measuring 0.032^{mm} in length, and 0.016^{mm} in breadth at the extremities, and 0.008^{mm} in breadth at the middle (fig. 54); extremely minute protuberated almost cruciform, quadruplets, measuring 0.040^{mm} in diameter (fig. 55), but these last mentioned are extremely rare; finally, a few pennately dilated, spicate fusees are found, measuring 0.060^{mm} in length, and 0.016^{mm} in breadth (figs. 56, 57, 58).

On the uppermost part of the stem and on the branches, where the spicules are placed more dispersed, they are rich in forms. Quadruplets are, here, most frequent, for instance, cruciform protuberated quadruplets, with a longitudinal arm measuring, 0.088^{mm}, and a transversal arm measuring 0.060^{mm} (fig. 59); a protuberated quadruplet in the form of an hour-glass, measuring 0.072^{mm} in length, and 0.032^{mm} in breadth at the extremities, and 0.020^{mm} broad at the middle (fig. 60); a spicate hour-glass formed quadruplet measuring 0.060^{mm} in length, 0.040^{mm} in breadth at the extremities, and 0.020^{mm} broad at the middle (fig. 61); a quadruplet in form of a star, having broad rays of about the same length as breadth, and measuring 0.060^{mm} in diameter (fig. 62); an aculeated twin, with bifurcated extremities, and measuring 0.060^{mm} in length, 0.036^{mm} in breadth at the extremities, and 0.012^{mm} broad at the middle (fig. 63); but, more frequent than any of the spicules mentioned, are, however, spicate fusees with, partly, acuminate and partly, blunted extremities (figs. 64, 65) also, short foliaceous subclavates (fig. 66). The fusees measure from 0.080—0.100^{mm} in length, and from 0.016—0.020^{mm} in breadth, and the subclavates measure 0.080^{mm} in length, and 0.040^{mm} in breadth upwards.

On the body of the polyp, especially on the dorsal side, the spicules are placed pretty compactly, and consist, principally, of fusees and subclavates. The fusees are spicate, partly bent, partly straight, and have both acuminate and blunted extremities; they measure from 0.128—0.220^{mm} in length, and are about uniform in breadth, viz. 0.040^{mm} at the middle (figs. 67—70). The subclavates are not so frequent and are, partly, smaller than the fusees; they are likewise spicate, and measure 0.080^{mm} in length, and 0.032^{mm} in breadth above (figs. 71, 72). Between these spicules, especially on the anterior body, occasional quadruplets are observed, of which a few have a rather distinguished cruciform, with a longitudinal arm measuring 0.080—0.180^{mm} in length, and a transversal arm measuring from

Paa Tentaklernes aborale Side ere Spiklerne mindre, men danne langs Midtlinien en Længderække, hvori de ligge meget tæt; takkede Spindler og Køller, lig dem paa Kroppen, ere hyppige; de aftage i Størrelse, jo længere de naa op paa Tentakelen, men imellem disse sees mange forskjelligt formede, temmelig flade Spikler med Takker og indskaarne Rande, fra 0.048—0.060^{mm} lange og fra 0.008—0.032^{mm} brede, Fig. 76—81.

Farven.

Bleggul, spillende lidt i det Røde.

Findested.

Station 164. Et større og et mindre Exemplar.

Artskarakter.

Zoanthodemet indtil 70^{mm} høit. Stammen ved Grunden 70^{mm} i Omkreds, rund, furet, aftager temmelig pludselig i Tykkelse. Basaldelen udvidet membranagtigt. Strax ovenfor Basaldelen enkelte tynde, korte Grene, bærende flere Polyper. Hovedgrenene begynde længere oppe paa Stammen, ere tykke, staa langt fra hverandre, dele sig i kort Afstand fra Stammen i 2, og hver af disse forgrene sig i 3—4 Smaagrene, der hver bærer 4—6 Polyper. Disse ere cylindriske, 5^{mm} lange; Forkroppen noget udvidet, Bagkroppen smal, temmelig lang. Polypproppen og de 4 Rygtentakler forsynede med Spikler. Hele Zoanthodemet rigt paa saadanne. Spiklerne paa Basaldelen optræde væsentligt i Form af knudede Bjelker, hvorimellem Søiler, Køller, Firlinger og enkelte Spindler. Paa Stammens nedre Halvdel ere Dobbeltstjerner, Køller og Spindler de almindeligste; paa den øvre Halvdel træffes Firlinger hyppigere end paa noget andet Sted af Kolonien. Paa Polyperne er Spindelformen hyppigst. Farven bleggul, spillende lidt i det Røde.

Duva spitsbergensis, n. sp.

Tab. III. Fig. 18—29.

Zoanthodemet indtil 110^{mm} høit. Stammen 45^{mm} i Omkreds ved Grunden, furet efter Længden og rundt om forsynet med Grene fra den øverste Del af Basalen til Toppen, Fig. 18. Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

0.040—0.120^{mm} (figs. 73. 74), whilst others, which, however, are extremely rare, approach more to the stellate form, and measure 0.056^{mm} in diameter (fig. 75).

On the aboral side of the tentacles, the spicules are smaller, but they form a longitudinal series along the mesial line, in which they become set very closely; spicate fusees and subclavates, like those of the body, are frequent; they diminish in size the further up they extend upon the tentacle, but, between them, many variably-formed, rather flat spicules, with spikes and indented margins are visible, which measure from 0.048—0.060^{mm} in length, and from 0.008—0.032^{mm} in breadth (fig. 76—81).

Colour.

Pale yellow, shading a little towards brown.

Habitat.

Station No. 164. A largish and a smaller specimen.

Specific characteristics.

The Zoanthodem measures up to 70^{mm} in height. The stem, at the base, measures 70^{mm} in circumference, is cylindrical, grooved, and diminishes rather abruptly in thickness. The basal part is membranaceously dilated. Immediately above the basal part, a few thin short branches carrying several polyps. The main branches commence further up the stem, are thick, and placed far apart from each other; at a short distance from the stem they ramify into 2, and each of these again, ramifies into 3—4 branchlets, each of which carry 4—6 polyps. These are cylindrical and 5^{mm} in length. The anterior body somewhat dilated. The posterior body narrow, rather long. The body of the polyp, and the 4 dorsal tentacles, furnished with spicules. The entire Zoanthodem rich in these. In the basal part the spicules appear, principally, in the form of protuberated beams, between which, columns, subclavates, quadruplets and a few fusees. On the lower half part of the stem, bistellates, subclavates, and fusees, are the most frequent, and on the other half part quadruplets are more frequent than in any part of the colony. In the polyps, the fusiform is the most frequent. Colour, pale yellow, shading a little towards red.

Duva spitsbergensis, n. sp.

Pl. III. figs. 18—29.

The Zoanthodem measures up to 110^{mm} in height. The stem measures 45^{mm} in circumference at the base; is longitudinally grooved; and, round about it, is furnished,

Basaldelen er kun lidet udvidet og føles glat. Hele Stammen er meget blød; dens øverste Ende deler sig i to Hovedgrene; Længdekanalerne ere stærkt fremtrædende og gjennemsinnende, saa at Septula godt kan sees. Hovedgrenene have forskjellig Længde; nederst paa Stammen ere de kortest, paa Midten længst, omkring 20^{mm} , og ved deres Udspring 15^{mm} i Omkreds; længere oppe blive de kortere, men noget tykkere. De ere glatte, runde, meget bløde, bøielige og gjennemsigtige; mange af dem dele sig lige ved Grunden, men som oftest dele de sig et Stykke fra deres Udspring i 2 Grene, hvorfra igjen udgaa mange Smaagrener, som dele sig i Stilke (Endegrenene), der bære fra 3—6 Polyper, Fig. 18. Kun Stammens Basaldel indeholder Kalkspikler, dens øvrige Del, ligesom samtlige Grene med; deres Forgreninger, er uden saadanne.

Polyperne ere cylindriske, $8-10^{\text{mm}}$ lange, med en noget forlænget Bagkrop og udspringe alle fra de yderste Forgreningers Ender. Hyppigst ere 2, sjeldnere 3 Polyper sammenvoxede ved deres Grunddel. Polyperne ere ganske klare, saa at Svælget og Mesenterialfilamenterne kunne sees, og paa deres ydre Flade findes 8 Dobbelttrækker Spikler, hvoraf de 2 paa Dorsalsiden indtage Størstedelen af Polypens Længde; de 2 paa Ventralsiden ere meget korte og indtage kun en liden Del af Forkroppen, imedens de paa Siderne aftage i Længde fra Dorsal- til Ventral-siden. Tentaklerne ere omtrent 4^{mm} lange, forsynede med Pinnuler, og paa deres aborale Flade gaa Kroppens Spikelrækker et lidet Stykke op paa Basaldelen, Fig. 19.

I Stammens Basaldel ligge Spiklerne temmelig spredte og ere meget smaa. Formerne, hvorunder de optræde, ere mange. Takkede Spindler med stumpe og spidse Ender, 0.100^{mm} lange, 0.048^{mm} brede, Fig. 20. 21; Firlinger i Form af Kors, besatte med smaa Papiller, 0.044^{mm} i Bredde og Længde, Fig. 22; takkede Spindler med vingeformige Udvidninger, 0.098^{mm} lange, 0.033^{mm} brede, Fig. 23. 24. 25.

Spiklerne paa Polypkroppen og Tentaklerne danne takkede Spindler med spidse og tildels stumpe Ender, 0.250^{mm} lange, 0.030^{mm} brede, Fig. 26; tornede, dels krumme, dels lige Køller, 0.300^{mm} lange, 0.050^{mm} brede, Fig. 27. 28, og imellem disse to Former sees enkelte korsformede Firlinger, hvis Længdestok er 0.300^{mm} og Tverstok 0.130^{mm} , Fig. 29.

from the uppermost part of the basal portion to the summit, with branches (fig. 18).

The basal part is only slightly dilated, and feels smooth to the touch. The entire stem is very soft and its uppermost extremity ramifies into two main branches. The longitudinal ducts are strongly prominent, and translucent, so that the septula can easily be seen. The main branches are not uniform in length. They are shortest on the lowest part of the stem, and longest on its middle and measure, there, about 20^{mm} in length, and 15^{mm} in circumference at the root. Further up, they become shorter but somewhat thicker. They are smooth, cylindrical, very soft, flexible, and translucent; many of them ramify, quite at the root, but, most frequently, they ramify a little way beyond the root into 2 branches, from which, again, many branchlets proceed, and these separate into stalks (terminal branches) that carry from 3—6 polyps (fig. 18). The basal part of the stem, alone, contains calcareous spicules; the remainder, as well as all of the branches and their ramifications, are devoid of these.

The polyps are cylindrical, and measure $8-10^{\text{mm}}$ in length, and have a somewhat prolonged posterior body; they all proceed from the outermost extremities of the ramifications. Most frequently, 2, and, more rarely, 3 polyps are concreted together at their basal part. The polyps are quite translucent, so that the gullet and the mesenterial filaments are visible; on their exterior surface, 8 double series of spicules are found, of which the 2 on the dorsal side occupy the greater part of the length of the polyp. The 2 on the ventral side are much shorter, and occupy only a small part of the anterior body, whilst those upon the sides diminish in length, from the dorsal to the ventral side. The tentacles measure about 4^{mm} in length, and are furnished with pinnules; upon their aboral surface, the spicular series of the body proceed a little way up the basal part (Fig. 19).

In the basal part of the stem, the spicules are placed pretty dispersed, and are very minute. The forms in which they appear are numerous; spicate fusees, with blunt and acuminate extremities, measuring 0.100^{mm} in length, and 0.048^{mm} in breadth (figs. 20. 21); cruciform quadruplets, beset with small papillæ and, measuring 0.044^{mm} in breadth and length (fig. 22); spicate fusees, with pennate dilations and, measuring 0.098^{mm} in length, and 0.033^{mm} in breadth (figs. 23. 24. 25).

The spicules on the body of the polyp and the tentacles, form spicate fusees, having acuminate and, partly, blunt extremities, and these measure 0.250^{mm} in length, and 0.030^{mm} in breadth (fig. 26); aculeated, partly, bent, partly, straight subclavates measuring 0.300^{mm} in length, and 0.050^{mm} in breadth (figs. 27. 28), and between these two forms, a few cruciform quadruplets are seen, whose longitudinal arm measures 0.300^{mm} , and the transversal arm 0.130^{mm} (fig. 29).

Farven.

Farven er bleg gulrød. Polypkroppen næsten vandklar med et svagt rødt Skjær af det gennemskinnende Svælg. Tentaklerne lidt mørkere.

Findested.

Station 370. Et større og et mindre Exemplar.

Af den her givne Beskrivelse vil det erfares, at *Duva spitsbergensis* har saameget tilfælles med *Duva arborescens*, at det er næsten umuligt makroskopisk at skille dem fra hinanden. Benyttes derimod en stærk Loupe, vil det strax vise sig, at imedens *Duva arborescens* har Kalkspikler overalt i Zoanthodem, mangler *Duva spitsbergensis* saadanne paa de fleste Steder, hvorved den nærmer sig mere *Duva rosea, mihi*, men hvorfra den dog adskiller sig i flere Henseender.

Artskarakter.

Zoanthodemet indtil 110^{mm} høit. Stammens Omfang ved Grunden 45^{mm}, furet paalangs, rundt omgivet af Grene fra Basaldelen til Toppen. Basaldelen glat. Grenene nøgne, stærkt forgrenede; de yderste Smaagrene bære 3—6 Polyper. I Stammens Basaldel smaa, spredte Spikler som takkede Spindler med vingeformede Udvidninger og korsformede Firlinger. Hele den øvrige Del af Stammen med dens Grene og Smaagrene uden Spikler. Polyperne cylindriske med en lang Bagkrop. Polypkroppen forsynet med 8 Dobbelt-rækker Spikler, hvoraf de 2 paa Bugside ere meget korte, imedens de 2 paa Rygsiden indtage næsten hele Polypens Længde. Spiklerne paa Kroppen optræde som takkede Spindler, tornede Køller og korsformede Firlinger. Tentaklerne have paa deres aborale Flades Grund Spikler, der ere Fortsættelser af Kropsspiklerne. Farven bleg gulrød. Polyperne næsten vandklare med et svagt rødt Skjær af Svælg. Tentaklerne mørkere.

Colour.

The colour is pale yellowish red. The body of the polyp is almost pellucid, with a faint reddish tinge imparted by the translucent gullet. The tentacles are a little darker in colour.

Habitat.

Station No. 370. One largish, and one smaller specimen.

From the description given, here, it will be gathered, that as *Duva spitsbergensis* has so much in common with *Duva arborescens*, it is almost impossible to distinguish them from each other macroscopically. If, on the other hand, a powerful magnifier is used, it will, immediately, become apparent, that whilst *Duva arborescens* has, everywhere, calcareous spicules on the Zoanthodem, *Duva spitsbergensis* is devoid of these on most parts of it, and it, thus, approaches more to *Duva rosea, mihi*, but from which it is distinguished, however, in several respects.

Specific characteristics.

The Zoanthodem measures up to 110^{mm} in height. The circumference of the stem is, at the base, 45^{mm}; it is longitudinally grooved, cylindrical, and, from the basal part to the summit, is encompassed by branches; the basal part smooth; the branches bare, and strongly ramified; the outermost branchlets carry 3—6 polyps. In the basal part of the stem, minute, dispersed, spicules, appearing as spicate fusees with pennate dilations, and as cruciform quadruplets. The entire remainder of the stem, with its branches and branchlets, devoid of spicules. The polyps cylindrical, with a long posterior body; the body of the polyp furnished with 8 double-series of spicules, of which, the 2 series on the ventral side are very short, whilst the 2 series on the dorsal side occupy almost the entire length of the polyp. The spicules on the body appear as spicate fusees, aculeated subclavates, and cruciform quadruplets. The tentacles have, at the base of their aboral surface, spicules which are a continuation of the spicules of the body. The colour is pale yellowish red. The polyps almost pellucid, with a faint reddish tinge imparted from the gullet. The tentacles darker in colour.

Duva violacea, n. sp.

Tab. III. Fig. 30—52.

Zoanthodemet er indtil 80^{mm} høit. Stammen, der ved Grunden er 70^{mm} i Omkreds, deler sig omtrent 35^{mm} fra Grunden i to, hvoraf den ene er lidt tykkere end den anden, Fig. 30. Basaldelen er temmelig fast, lidt udvidet og meget furet; fra den udspringe et Par yderst korte og tynde Grene, paa hvis Ender sidde nogle faa — 3—4 — Polyper. De nævnte to Stammer ere 45^{mm} høie, glatte, bløde, med temmelig fremtrædende Længdekanaler og lige fra Grunden forsynede med en Mængde bløde, meget bøielige Grene, der dele sig i mange Smaagrene, som igjen forgrene sig i flere tynde Stilke, der hver bærer fra 3—6 Polyper. Smaagrenene ligesom Stilkene ere runde, glatte, glindsende og halv gjennemsigtige, Fig. 30.

Polyperne ere cylindriske, Fig. 31, noget bredere mod Mundskiven, der er lidt hvælvet. Paa Polypkroppens Rygside sees 6 Rækker Spikler, der indtage Kroppens hele Længde og strække sig op til Grunden af Tentaklerne; i hver Række er der 3—4 Spikler i Bredden, Fig. 32. Paa Bug siden er der kun 2 Rækker, og disse ere meget korte, idet de afbrydes af et paa Midten af Kroppen paa tversgaaende Spikelbelte; ovenfor dette Belte er saaledes Bug siden delt i 3 nøgne Felter, hvoraf det Midterste er det største; under Beltet er hele Fladen fri for Spikler, Fig. 33. Tentaklerne ere tykke, forsynede med Pinnuler og uden Spikler. I Regelen er dels 2, dels 3 Polyper sammenvoxede ved Grunden, Fig. 32, og kun sjældent sees en enkelt Polyp at gaa umiddelbart over i Stilken; hvor dette er Tilfældet, er altid denne enkelte Polyp længere, idet nemlig Bagkroppen er noget forlænget.

Kjønnsprodukterne udvikle sig ikke alene i den bagerste Del af Mavehulheden, men ogsaa i dennes Forlængelse i Stilken, hvor Æggene stundom ligge pakkede og give den Udseende af en Perlesnor. Kun paa 2 af Septula udvikle Kjønnsorganerne sig.

Basaldelen er det eneste Parti af Stammen og Grenene, der er forsynet med Spikler. De ligge temmelig tæt i det ydre Binde vævslag, dækket af Ectodermet og have forskjellige Former. De hyppigste ere dog simple Dobbeltstjerner, dels med et nøgent, smalt Midtparti og vorteddannede Takker paa Enderne, Fig. 34. 35. 36, dels med et Midtparti, der er besat med yderst smaa Takker; de ere fra $0.060—0.100^{mm}$ lange og fra $0.012—0.016^{mm}$ brede paa Midten. Foruden disse Dobbeltstjerner findes enkelte Køller, der ere takkede i den tykke Ende med et tilrundet, næsten

Duva violacea, n. sp.

Pl. III. Figs. 30—52.

The Zoanthodem measures up to 80^{mm} in height. The stem, which at the base measures 70^{mm} in circumference, ramifies, at about 35^{mm} beyond the base, into two parts, of which, the one is a little thicker than the other (fig. 30). The basal part is pretty firm, a little dilated, and much grooved, and from it, there shoot out a couple of extremely short and thin branches, on whose extremities a few, 3—4, polyps are situated. The two stems mentioned, measure 45^{mm} in height and are smooth and soft; they have rather prominent longitudinal ducts and, quite from their base, are furnished with a multitude of soft, very flexible branches which ramify into numerous branchlets, which, again, ramify into several thin stalks, each of which carries 3—6 polyps. The branchlets, as well as the stalks, are cylindrical, smooth, and shining, and are semitransparent (fig. 30).

The polyps are cylindrical (fig. 31), somewhat broadest towards the oral disk, which is a little arcuated. On the dorsal side of the body of the polyp, 6 series of spicules are seen; these occupy the entire length of the body and extend themselves up to the root of the tentacles; in each series, there are 3—4 spicules in the breadth (fig. 32). On the ventral side, there are only two series, and these are very short, because they are interrupted by a spicular belt running transversally across the middle of the body. Above this belt, the ventral side is, consequently, divided into 3 bare areas, of which the mesial one is the largest; below the belt the entire surface is devoid of spicules (fig. 33). The tentacles are thick, furnished with pinnules, and devoid of spicules. As a rule, sometimes 2, and sometimes 3, polyps are concreted together at the base (fig. 32), and, only rarely is an occasional polyp seen to be produced immediately into the stalk. Where that is the case, this occasional polyp is always longer than the others, owing to its posterior body being somewhat prolonged.

The sexual products develop themselves, not only in the posterior part of the ventral cavity, but also in its prolongation into the stalk, where, the ova, now and then, lie crowded, and impart to it the appearance of a string of pearls. Upon 2 of the septula only do the sexual organs develop themselves.

The basal part is the only part of the stem and the branches that is furnished with spicules. They are placed, pretty close, in the exterior layer of connective-tissue, are covered by the ectoderm, and possess varying forms. The most frequent forms are, however, plain bistellates, partly, having a bare narrow mesial part and wart-shaped spikes on the extremities (figs. 34. 35. 36); partly, having a mesial part beset with extremely minute spikes; they measure, from $0.060—0.100^{mm}$ in length, and from $0.012—0.016^{mm}$ in breadth at the middle. Besides these bistellates, a

glat, langt Skaft, omtrent af samme Længde som Dobbeltstjerne, Fig. 37, og takkede, tornede, lige eller krumme Spindler med dels afrundede, dels takkede, dels mere eller mindre tilspidsede Ender, fra 0.100—0.140^{mm} lange og fra 0.012—0.016^{mm} brede, Fig. 38. 39. 40. Hist og her, men kun sjældent, sees imellem de nævnte Spikler enkelte Firlinger, besatte med smaa Papiller, og 0.080^{mm} lange, 0.060^{mm} brede, Fig. 41.

Polypkroppens Spikler ere meget forskellige. De almindeligste ere takkede Spindler, dels med stumpede, dels med tilspidsede Ender, fra 0.120—0.200^{mm} lange og fra 0.020—0.040^{mm} brede, Fig. 42. 43, samt takkede og vortede Køller, fra 0.140—0.180^{mm} lange og fra 0.040—0.080^{mm} brede i den øverste Ende, der stundom kan være tvers afskaaren og da ligeledes besat med Vorter, Fig. 44.

Imellem de nævnte Spikler træffes ofte snart Tvillinger, snart Firlinger. Tvillingerne ere dels takkede, dels tornede, næsten flade med takkede Ender og lidt indknebne paa Midten; de ere af forskjellig Størrelse, fra 0.050—0.080^{mm} lange og fra 0.010—0.020^{mm} brede, Fig. 45. 46. Firlingerne antage mere eller mindre Korsformen; enkelte af dem ere temmelig flade, men alle ere besatte med større og mindre fremspringende Takker; nogle ere næsten lige brede som lange; deres Gjennemsnit er indtil 0.0120^{mm}, andre ere mere langstrakte og da 0.080^{mm} lange, 0.040^{mm} brede, Fig. 47—51; men saa sjældne ere vel udprægede Kors, at paa en hel Polypkrop iagttoges kun et enkelt, hvis Længdestok var 0.160^{mm} og Tverstok 0.040^{mm}, Fig. 52.

Farven.

Hele Zoanthodemet er violet, dog saaledes at Stammen og Grenene spille lidt i det Gule. Polyperne ere intense violette.

Findested.

Station 359. Et Exemplar.

Artskarakter.

Zoanthodemet indtil 80^{mm} høit. Stammen deler sig et lidet Stykke ovenfor Grunddelen i to, hvoraf den ene er lidt tykkere, end den anden. Basaldelen 70^{mm} i Omkreds, og fra den udspringe et Par yderst korte, tynde Grene, paa hvis Ender findes 3—4 Polyper. Fra de 2 Stammer udgaa mange større og mindre Grene, der ramifiere sig flere Gange; de yderste Smaagrener bære paa deres Ender

few subclavates are found, which are spicate at the thick extremity, and have a circular, almost smooth, long shaft of about same length as that of the bistellates (fig. 37); also spicate, aculeate, straight, or bent, fusees, with partly, rounded, partly, spicate, partly, more or less, acuminate extremities, and measuring from 0.100—0.140^{mm} in length, and from 0.012—0.016^{mm} in breadth (figs. 38. 39. 40). Here and there, but only rarely, there are seen between the spicules mentioned, a few quadruplets beset with small papillæ, and measuring 0.080^{mm} in length, and 0.060^{mm} in breadth (fig. 41).

The spicules of the body of the polyp are very variable. The most frequent forms are, spicate fusees, partly, with blunt, partly, with acuminate extremities, and measuring from 0.120—0.200^{mm} in length, and from 0.020—0.040^{mm} in breadth, (figs. 42. 43); also, spicate and warted subclavates, measuring from 0.140—0.180^{mm} in length, and from 0.040—0.080^{mm} in breadth at the uppermost extremity, which sometimes may be met with transversely truncated, and, in that case is also beset with warts (fig. 44).

Between the spicules mentioned, sometimes, twins, sometimes, quadruplets, are frequently met with. The twins are, partly, spicate, partly, aculeated, almost flat, with spicate extremities and slightly constricted at the middle; they are of variable length, measuring from 0.050—0.080^{mm} in length, and from 0.010—0.020^{mm} in breadth (figs. 45. 46). The quadruplets assume, more or less, the cruciform, a few of them are rather flat, but all of them are beset with larger or smaller protuberant spikes; some of them are almost as broad as they are long, and measure up to 0.120^{mm} in diameter; others are more elongate, and measure, then, 0.080^{mm} in length, and 0.040^{mm} in breadth (figs. 47—51), but clearly distinguished cruciforms are so rare, that on the entire body of a polyp only a single one was observed, whose longitudinal arm measured 0.160^{mm} and the transversal arm 0.040^{mm} (fig. 52).

Colour.

The entire Zoanthodem is violet, in such manner, however, that the stem and the branches shade a little towards yellow. The polyps are intense violet.

Habitat.

Station No. 359. One specimen.

Specific characteristics.

The Zoanthodem measures up to 80^{mm} in height. The stem ramifies, a little way above the base, into two parts, of which, the one part is somewhat thicker than the other. The basal part is 70^{mm} in circumference, and from it a couple of extremely short thin branches shoot out, on whose extremities there are 3—4 polyps. From the 2 stems, many larger and smaller branches proceed, which be-

fra 3—6 Polyper, af hvilke dels 2, dels 3 ere sammenvoxede ved Grunden. Stammerne og Grenene med deres Forgrevninger ere uden Kalk, kun Basaldelen har Spikler, hvoraf Dobbeltstjernen er den almindeligste Form. Polyperne ere temmelig korte, forsynede med Spikelrækker, som paa Rygsiden indtage Kroppens hele Længde, men paa Bugsiden kun den øverste Halvdel. Spiklerne have væsentligt Form af takkede Spindler, Køller, Tvillinger og Firlinger. Farven: Stammen og Grenene violette, spillende lidt i det Gule; Polyperne intens violette.

Duva flava, n. sp.

Tab. V. Fig. 1—33.

Zoanthodemmet er indtil 35^{mm} høit. Stammen rund, furet paalangs, temmelig blødt og 20—25^{mm} i Omfang ved Grunden. Basaldelen tynd, fast, membranagtigt udvidet. Stammen, der aftager lidt i Tykkelse opad, er lige fra Grunden og til Toppen tæt besat med korte, forholdsvis tykke Grene, hvoraf enkelte et Par Millimeter fra deres Udspring dele sig i to mindre Grene, som atter dele sig i flere Smaagrener, der hver bære flere Polyper, imedens de fleste Grene lidt længere fra Stammen dele sig i 3—4 mindre, som dele sig i ligesaa mange Smaagrener, der hver bærer 6—7 Polyper, Fig. 1. 2. Grenene, der ere temmelig bløde med udprægede Længdekanaler, ere ligesom Smaagrenerne og den øverste Del af Stammen uden Kalk. Polyperne ere lidt langstrakte, kolbeformige, 4^{mm} lange med en omtrent lige lang For- som Bagkrop. Polypkroppen, der er 2,5^{mm} lang, er rigt forsynet med Spikler, som paa Forkroppen ordne sig i regelmæssige Rækker, der ophøre ved Tentaklernes Grund, Fig. 3. Paa Bagkroppen ligge de mere uregelmæssigt, og dennes Bugflade er enten uden Spikler, eller de ere her meget sparsomme. Tentaklerne ere omtrent halvt saa lange som Kroppen, og saavel de som Pinnulerne ere uden Spikler. I Polypernes Mavehulhed samt tildels i dennes Forlængelse i Smaagrenerne sees fuldt udviklede Æg.

Basaldelen er ikke særdeles rig paa Spikler; de ligge ei i flere Lag, men støde dog tæt til hverandre og paa enkelte Steder endog ligge paa hverandre. De hyppigste Former, hvorunder de optræde, ere sammensatte Stjerner og Spindler. De første ere tildels saa komplicerede, at man kun ved Hjælp af lidt Fantasi kan faa Stjerneformen frem; men brydes de i flere Stykker, lykkes det stundom

come several times ramified; the outermost branchlets carry 3—6 polyps on their extremities; of these, sometimes 2, and sometimes 3, are concreted together at the base. The stems, and the branches with their ramifications, are non-calcareous; only the basal part possesses spicules, of which, the bistellate is the most frequent form. The polyps are rather short, and are furnished with spicular series which, on the dorsal side, occupy the entire length of the body, but on the ventral side, occupy only the uppermost half part of it. The spicules have, principally, the form of spicate fuscées, subclavates, twins, and quadruplets. Colour, the stem and the branches violet, shading a little towards yellow. The polyps, intense violet.

Duva flava, n. sp.

Pl. V. Figs. 1—33.

The Zoanthodem measures up to 35^{mm} in height. The stem is cylindrical, longitudinally grooved, pretty soft, and it measures 20—25^{mm} in circumference at the base. The basal part is thin, firm, and membranaceously dilated. The stem diminishes a little in thickness upwards, and, right from the base to the summit, is closely beset with short, relatively thick, branches, of which, a few, a couple of millimetres beyond their root, ramify into two smaller branches, which, again, ramify into several branchlets, each carrying several polyps; but most of the branches ramify, a little further from their root, into 3—4 smaller ones, which, again, ramify into as many branchlets, each carrying 6—7 polyps (figs 1. 2). The branches are rather soft, and have prominent longitudinal ducts; they are, like the branchlets and the uppermost part of the stem, non-calcareous. The polyps are slightly elongate, and claviform; they measure 4^{mm} in length; the anterior and posterior body are about uniform in length. The body of the polyp measures 2,5^{mm} in length, and is richly furnished with spicules, which, upon the anterior body, arrange themselves in regular series; these cease, however, at the root of the tentacles (fig. 3). On the posterior body they are placed more irregularly, and its ventral surface is, either, devoid of spicules, or they are, here, very sparingly seen. The tentacles are about half the length of the body, and both, they as well as the pinnules, are devoid of spicules. In the ventral cavity of the polyps, and also, partly, in its prolongation into the branchlets, fully developed ova are visible.

The basal part is not particularly rich in spicules; they are not placed in numerous layers, but still abut close upon each other, and, in a few places are even placed upon each other. The most frequent forms in which they appear, are complex stellates and fuscées. The first mentioned are, partly, so complicated, that, only by a stretch of fancy can we succeed in making out the stellate form;

at fremkalde den. De variere i Størrelse fra 0.092—0.146^{mm} lange og fra 0.060—0.076^{mm} brede; meget ofte have de et nøgent Midtparti, der i Regelen er halvt saa bredt som Enderne, Fig. 4. 5. Spindlerne ere i Almindelighed besatte med Vorter og som oftest lige, men forekomme ogsaa mere eller mindre krumme; deres Ender ere dels tilspidsede, dels afstumpede, ja kunne endog være tvers afskaarne og nærme sig da meget Valseformen; de ere fra 0.084—0.128^{mm} lange og fra 0.036—0.052^{mm} brede, Fig. 6—11. Imellem de nævnte Spikler sees smukke Dobbeltstjerner, der ere 0.080^{mm} lange, 0.052^{mm} brede i Enderne og omtrent 0.020^{mm} bred i det glatte Midtbelte, Fig. 12. 13. 14; enkelte, stilkede Stjerner, sammensatte som Firlinger, 0.084^{mm} lange, 0.060^{mm} brede, Fig. 15; enkelte, bladede Køller med langt, tyndt Haandgreb, 0.156^{mm} lange, 0.060^{mm} brede opad, Fig. 16; bladede Klubber med kort Skaft, 0.096^{mm} lange, 0.056^{mm} brede foroven, Fig. 17, samt forskjelligt formede Firlinger, 0.088^{mm} lange, 0.080^{mm} brede, Fig. 18. 19. 20.

Paa den nederste Del af Stammen ligge Spiklerne mere spredte end paa Basaldelen, og man træffer der omtrent de samme Former som paa denne; den øverste Del er, som forhen omtalt, spikelfri.

Paa Polypkroppen, der er rig paa Spikler, forekommer Spindelformen hyppigst. Det er væsentligst takkede, lige eller krumme, vortede Spindler, dels med stumpede, dels med tilspidsede Ender, som danne de før beskrevne Rækker paa Forkroppen, og det er lignende Spindler, som udgjør Hovedmassen af Spiklerne paa Bagkroppen, Fig. 3. De ere af forskjellig Størrelse, fra 0.100—0.266^{mm} lange og fra 0.036—0.056^{mm} brede, Fig. 21—25; og der, hvor Spiklerækken afsluttes ved Tentakelgrunden, ere Spiklerne meget smaa, næsen flade og have en forskjellig Form; nogle nærme sig Køllens, andre Klubbens; de ere fra 0.080—0.100^{mm} lange og fra 0.032—0.068^{mm} brede i den tykke Ende; Skaftet er paa enkelte langstrakt og 0.012^{mm} bredt, Fig. 26—29. Imellem Spindlerne sees mere eller mindre udprægede Valser, fra 0.111—0.160^{mm} lange og fra 0.064—0.072^{mm} brede, Fig. 30. 31, samt særegne, stærkt takkede eller bladede Køller med kort, takket Haandgreb, Fig. 32; den ene Form af disse Køller er især stærkt indskaaren langs den ene Side, Fig. 33; de ere fra 0.152—0.168^{mm} lange og fra 0.056—0.076^{mm} brede foroven.

when broken up into several pieces however, it sometimes happens that we are fortunate enough to obtain it. They vary in size, from 0.092—0.146^{mm} in length, and from 0.060—0.076^{mm} in breadth; very frequently they have a bare mesial part, which, as a rule, is half the breadth of the extremities (figs. 4. 5). The fusees are, usually, beset with warts, and are, most frequently straight, but appear, also, more or less bent; their extremities are, partly, acuminate, partly, blunted, indeed, may also, even, be transversely truncated, and in that case they approach much to the roller-form; they measure from 0.084—0.128^{mm} in length, and from 0.036—0.052^{mm} in breadth (figs. 6—11). Between the spicules mentioned, beautiful bistellates are seen, which measure 0.080^{mm} in length, and 0.052^{mm} in breadth at the extremities, and about 0.020^{mm} in breadth at the smooth mesial belt (figs. 12. 13. 14); also a few pedunculated stellates, complex like the quadruplets, and measuring 0.084^{mm} in length, and 0.060^{mm} in breadth (fig. 15); a few foliaceous subclavates, with long thin shaft, and measuring 0.156^{mm} in length and 0.060^{mm} in breadth above (fig. 16); foliaceous clavates, with short shaft, and measuring 0.096^{mm} in length, and 0.056^{mm} in breadth above (fig. 17), also, variously formed quadruplets, measuring 0.088^{mm} in length, and 0.080^{mm} in breadth (figs. 18. 19. 20).

In the lowest part of the stem, the spicules are placed, more dispersed than in the basal part, and, here, we meet about the same forms as in the latter. The uppermost part is, as before mentioned, devoid of spicules.

On the body of the polyp, which is rich in spicules, the fusi-form is the most frequent. It appears, principally as spicate, straight or bent, warted fusees, partly, with blunt, partly, with acuminate extremities, and forms, the previously described series on the anterior body, and it is similar spicules which compose the principal bulk of spicules on the posterior body (fig. 3). They are of various sizes, measuring from 0.100—0.266^{mm} in length, and from 0.036—0.056^{mm} in breadth (figs. 21—25) and, in the situation where the spicular series ceases, at the root of the tentacles, the spicules are very minute, almost flat, and have a variable form; some approach forming of the subclavate, others that of the clavate; they measure, from 0.080—0.100^{mm} in length, and from 0.032—0.068^{mm} in breadth at the thick extremity. In a few of them, the shaft is elongate and measures 0.012^{mm} in breadth (figs. 26—29). Between the fusees, more or less distinct, rollers are seen, measuring from 0.111—0.160^{mm} in length, and from 0.064—0.072^{mm} in breadth (figs. 30. 31) also, peculiar, strongly spicate or foliaceous subclavates, with short, spicate shaft (fig. 32). The one form of these subclavates is especially distinctly indented along the one side (fig. 33). They measure from 0.152—0.168^{mm} in length, and from 0.056—0.076^{mm} in breadth above.

Farven.

Stærk gul.

Findested.

Station 192. Flere Exemplarer.

Artskarakter.

Zoanthodemet indtil 35^{mm} høit. Stammen rund, furet paalangs, 20—25^{mm} i Omfang ved Grunden, aftagende lidt i Tykkelse opad. Basaldelen tynd, membranagtigt udvidet. Stammen lige fra Grunden og til Toppen besat med korte, tykke Grene, der i Regelen dele sig nogle Millimeter fra Udspringet i 3—4 mindre Grene, som atter dele sig i mange Smaagrene, der hver bærer 6—7 Polyper. Disse ere kolbeformige, 4^{mm} lange. Polypkroppen 2,5^{mm} lang, rigt forsynet med Spikler, som paa Forkroppen ordne sig i Rækker, der ophøre ved Tentaklernes Grund. Tentaklerne næsten ligesaa lange som Kroppen, uden Spikler. Spiklerne paa Basaldelen og den nederste Del af Stammen optræde væsentlig under Form af takkede, vortede, krumme og lige Spindler, samt meget sammensatte Stjerner; imellem dem enkelte Dobbeltstjerner, Køller og Firlinger. Paa Polypkroppen er Spindelform hyppigst. Farven stærk straagul.

Duva cinerea, n. sp.

Tab. V, Fig. 82—93. Tab. VI, Fig. 1—29.

Zoanthodemet indtil 28^{mm} høit. Stammen rund, furet paalangs, dens Omkreds ved Grunden 20^{mm}. Basaldelen tyk, fast, haard, noget udvidet. Stammen aftager lidt i Tykkelse op imod Toppen, hvor den deler sig i to Grene, der hver forgrene sig i flere Smaagrene, som bærer Grupper af Polyper, 6—7 i hver. Kun nogle Millimeter ovenfor Basaldelen og indtil Toppen er Stammen rundt om forsynet med Grene, der staa temmelig langt fra hverandre, ere korte, tykke, og hvoraf flere lige ved Udspringet dele sig i 2 mindre Grene, som igjen afgive mange Smaagrene, der hver bære 6—7 Polyper, medens andre i et Par Millimeters Afstand fra Stammen dele sig i mange Smaagrene, som hver bærer omtrent et lignende Antal Polyper. Smaagrenene ere meget korte, temmelig sammentrængte og skjules ganske af de tæt grupperede Polyper, Fig. 82. 83.

Colour.

Strong yellow.

Habitat.

Station No. 192. Several specimens.

Specific characteristics.

The Zoanthodem measures up to 35^{mm} in height. The stem cylindrical, longitudinally furrowed, 20—25^{mm} in circumference at the base, diminishing a little in thickness upwards. The basal part thin, and membranaceously dilated. The stem, right from the base and to its summit, beset with short, thick branches, which, as a rule, ramify, a few millimetres beyond their root, into 3—4 smaller branches, which, again, ramify into many branchlets, each of which carries 6—7 polyps. These latter are clavate-formed and measure 4^{mm} in length. The body of the polyp measures 2,5^{mm} in length, and is richly furnished with spicules which, upon the anterior body, arrange themselves in series that terminate at the root of the tentacles. The tentacles are almost as long as the body, and are devoid of spicules. The spicules in the basal part, and the lowest part of the stem, appear, principally, in the form of spicate, warted, bent and straight, fusees, also, as very complex stellates. Between them occasional bistellates, subelavates and quadruplets are visible. On the body of the polyp the fusi-form is most frequent. Colour, strong straw-yellow.

Duva cinerea, n. sp.

Pl. V, figs. 82—93. Pl. VI, figs. 1—29.

The Zoanthodem measures up to 28^{mm} in height. The stem is cylindrical, longitudinally grooved, and measures, at the base, 20^{mm} in circumference. The basal part is thick, firm, hard, and somewhat dilated. The stem diminishes a little in thickness up towards the summit, at which point it ramifies into two branches, each of which again ramify into several branchlets carrying groups of polyps, 6—7 polyps in each group. From only a few millimetres above the basal part, and up to the summit, the stem is, round about it, furnished with branches, which are placed pretty far apart from each other, and are short and thick; several of these ramify, right at the root, into 2 smaller branches, which, again, ramify into numerous branchlets, each of which carries 6—7 polyps; whilst others, at a couple of millimetres distance from their root, ramify into many branchlets, each of which carries about a similar number of polyps. The branchlets are very short, rather

Polyperne ere bægerformede, 3^{mm} lange med en kort, smal Bagkrop, Fig. 84. Polypkroppen, som er omtrent 2^{mm} lang, er temmelig bred op imod Mundskiven og meget rig paa Spikler, der paa Forkroppen ordne sig i Rækker, Fig. 84; kun den nederste Del af Bagkroppens Bugflade er spikelfri. Tentaklerne ere 1.3^{mm} lange, forsynede som sædvanligt med Pinnuler og have paa deres aborale Side en Længderække Spikler, der naa omtrent til Tentakelens Midte, men herfra ligge de paatvers lige til Enden, Tab. VI, Fig. 26. Basaldelen og den nederste Del af Stammen har Spikler; den øvrige Del af Stammen, Grenene og Smaagrenene ere uden saadanne.

Basaldelen er meget rig paa Spikler, som optræde her under meget forskellige Former. Den hyppigste synes at være mere eller mindre sammensatte Stjerner, hvis Straaler ere tykke med takkede Ender; de største have af og til et smalt, nøgent Midtbelte, ere 0.116^{mm} lange, 0.104^{mm} brede; de mindre ere fattigere paa Straaler, fra 0.080—0.180^{mm} lange og fra 0.056—0.064^{mm} brede, og mange ere kun i Udvikling, Fig. 85—90. Ikke fuldt saa hyppigt som den sammensatte Stjerne med dens Udviklingsformer forekommer dels vingeformigt udvidede, takkede Spindler med mere eller mindre indskaarne Rande, fra 0.068—0.112^{mm} lange og fra 0.036—0.060^{mm} brede, Fig. 91, dels lige, takkede Spindler fra 0.060—0.076^{mm} lange og fra 0.012—0.024^{mm} brede, Fig. 92, 93; disse sidste ere dog langt sjældnere end hine. — Imellem de ovennævnte Spikler iagttages af og til Firlinger, hvoraf enkelte ikke ere fuldt udviklede og nærme sig Formen af sammensatte Stjerner, ere 0.112^{mm} lange, 0.068^{mm} brede, men lidt smalere paa Midten, Tab. VI, Fig. 1, 2, imedens andre nærme sig Timeglasformen, ere 0.080^{mm} lange, 0.044^{mm} brede paa Midten, men lidt bredere i Enderne, Fig. 3. Foruden disse mindre udprægede Firlinger findes der andre fuldt udviklede, der have Korsformen; den ene af disse korsformede Firlinger er 0.112^{mm} lang og lige saa bred, besat med Knuder, Fig. 4; den anden, der er meget rigt ornamenteret med Løvværk, er 0.152^{mm} lang, 0.120^{mm} bred, Fig. 5; denne pragtfulde Spikelform er dog sjelden. Endelig træffes flere Former af Klubber; den ene Form er kun svagt besat med smaa Knuder, har temmelig bugtede Rande og er 0.116^{mm} lang, 0.064^{mm} bred foroven, Fig. 6; den anden er næsten ganske glat med skarpere Rand og lidt indkneben paa Midten, er 0.100^{mm} lang, 0.040^{mm} bred, Fig. 7, og den tredje Form er bladet med et kort, tilspidset Skaft, 0.144^{mm} lang, 0.080^{mm} bred foroven, Fig. 8.

crowded, and are, completely, concealed by the closely grouped polyps (Pl. V, figs. 82, 83).

The polyps are chalice-formed, measure 3^{mm} in length, and have a short narrow posterior body (Pl. V, fig. 84). The body of the polyp, which is about 2^{mm} in length, is rather broad up towards the oral disk, and very rich in spicules, which, upon the anterior body, arrange themselves in series (Pl. V, fig. 84). The lowest part of the ventral surface of the posterior body is, alone, devoid of spicules. The tentacles measure 1.3^{mm} in length, and are furnished, as usual, with pinnules; on their aboral side there is a longitudinal series of spicules which extend to about the middle of the tentacle, but from this point they are placed transversally, right out to the extremity (Pl. VI, fig. 26). The basal part, and the lowest part of the stem, have spicules; the rest of the stem, the branches, and the branchlets are devoid of them.

The basal part is very rich in spicules, and they appear, here, in very different forms. The most frequent form appears to be, more or less complex, stellates, whose rays are thick and have spicate extremities. The largest have, now and then, a narrow, bare, mesial belt, and measure 0.116^{mm} in length and 0.104^{mm} in breadth. The smaller ones are not so rich in rays, and measure from 0.080—0.180^{mm} in length and from 0.056—0.064^{mm} in breadth; many of them are only in process of development (Pl. V, figs. 85—90). Not quite so frequent as the complex stellate with its evolving forms, there appear, partly, pennate dilated spicate fusees, with, more or less indented margins, and measuring from 0.068—0.112^{mm} in length, and from 0.036—0.060^{mm} in breadth (Pl. V, fig. 91) partly, straight spicate fusees, measuring from 0.060—0.076^{mm} in length, and from 0.012—0.024^{mm} in breadth (Pl. V, figs. 92, 93); these last are, however, far more rare than the others. Between the above mentioned spicules, quadruplets may, now and then, be observed, of which, a few are not fully developed, and these approach in form to complex stellates, and measure 0.112^{mm} in length, and 0.068^{mm} in breadth, but are a little narrower at the middle (Pl. VI, figs. 1, 2); whilst, others approach to the hour-glass form, and measure 0.080^{mm} in length, and 0.044^{mm} in breadth at the middle, but are a little broader at the extremities (Pl. VI, fig. 3). Besides these less distinguished quadruplets, other ones, fully developed, are found, and these have the cruci-form; the one of these cruci-form quadruplets measures, 0.112^{mm} in length, and the same in breadth, and is beset with knots (Pl. VI, fig. 4). The other, which is very richly embellished with fretwork, measures 0.152^{mm} in length, and 0.120^{mm} in breadth (Pl. VI, fig. 5), this brilliant spicule-form is, however, rare; finally, several clavate-forms are met with; the one form is, only, sparingly beset with small knots, and has rather indented margins; it measures 0.116^{mm} in length, and 0.064^{mm} in breadth above (Pl. VI, fig. 6). The second form is almost quite smooth, has a more defined margin, and is also a little constricted at the middle; it measures 0.100^{mm} in length, and 0.040^{mm} in breadth (Pl. VI, fig. 7); the third form

Nederst paa Stammen ligge Spiklerne meget spredte og optræde her som stærkt takkede, lige og krumme Spindler, der ere fra 0.104—0.168^{mm} lange og fra 0.028—0.048^{mm} brede, Fig. 9. 10, som vortede Klubber og Koller; de første 0.096^{mm} lange, 0.056^{mm} brede foroven med et kort Skaft, Fig. 11, de sidste 0.112^{mm} lange, 0.044^{mm} brede foroven, Fig. 12, og endelig som tornet Firling, der nærmer sig Korsformen, 0.112^{mm} lang, 0.052^{mm} bred, Fig. 13.

Paa Polypkroppen er det væsentlig Spindelformen, som er den fremtrædende. Her træffes takkede, mere eller mindre krumme Spindler med tilspidsede Ender, fra 0.200—0.212^{mm} lange og fra 0.036—0.040^{mm} brede, Fig. 14. 15; lige, takkede Spindler med enten den ene eller begge Ender afstumpede, fra 0.192—0.224^{mm} lange og fra 0.024—0.048^{mm} brede, Fig. 16—19; imellem disse sees enkeltvis mindre, takkede Koller, fra 0.112—0.152^{mm} lange og 0.036^{mm} brede foroven, Fig. 20. 21, samt yderst sjældent en korsformet, bladet Firling med en Længdestok, 0.248^{mm} og en Tverstok, 0.076^{mm}, Fig. 22.

Paa Tentaklernes nederste Halvdel findes foruden enkelte, lig de store Spindler paa Kroppen, mindre, dels tungformede, takkede Spindler, der strække sig udover Pinnulerne og ere 0.118^{mm} lange, 0.032^{mm} brede, Fig. 23, dels takkede Valser, 0.060^{mm} lange, 0.028^{mm} brede, Fig. 24, dels enkelte Stjerner, 0.032^{mm} i Gjennemsnit, Fig. 25. Paa den øverste Halvdel, hvor Spiklerne ligge paatvers, ere de fladere, mere eller mindre krumboiede, takkede; de nederste ere 0.112^{mm} lange, 0.036^{mm} brede, Fig. 26. 27, og de øverste 0.072^{mm} lange, 0.024^{mm} brede, Fig. 28. 29.

Farven.

Stammen graagrøn. Polyperne graalige. Spiklerne tildels svagt graalige.

Findested.

Station imellem 173 og 174. 300 Favne. Temperat. + 4 C. 1 Exemplar.

is foliaceous, has a short acuminate shaft, and measures 0.144^{mm} in length, and 0.080^{mm} broad above (Pl. VI, fig. 8).

At the lowest part of the stem, the spicules are placed much dispersed and, in this situation, they appear as, strongly spicate, straight, and bent, fusees, measuring from 0.104—0.168^{mm} in length, and from 0.028—0.048^{mm} in breadth (Pl. V, figs. 9. 10); also, as warted clavates and subclavates; the first mentioned measuring 0.096^{mm} in length, and 0.056^{mm} in breadth above, and having a short shaft (Pl. VI, fig. 11); the last mentioned measuring 0.112^{mm} in length, and 0.044^{mm} in breadth above (Pl. VI, fig. 12); and finally, also, as aculeated quadruplets, which approach to the cruciform, and measure 0.112^{mm} in length, and 0.052^{mm} in breadth (Pl. VI, fig. 13).

On the body of the polyp, the fusiform is the one that is most generally prominent. Here, spicate, more or less bent, fusees, with acuminate extremities, and measuring from 0.200—0.212^{mm} in length, and from 0.036—0.040^{mm} in breadth, (Pl. VI, figs. 14. 15) are met with; and, also, straight spicate fusees with, either, one or both extremities obtuse, and measuring from 0.192—0.224^{mm} in length, and from 0.024—0.048^{mm} in breadth (Pl. VI, figs. 16 - 19). Between these are seen, occasionally, smaller spicate subclavates, measuring from 0.112—0.152^{mm} in length, and 0.036^{mm} in breadth above, (Pl. VI, figs. 20. 21); also, but extremely rarely, a cruciform foliaceous quadruplet, with a longitudinal arm measuring 0.248^{mm}, and a transversal arm measuring 0.076^{mm} (Pl. VI, fig. 22).

On the lowest half part of the tentacles there are found; besides a few like the large fusees on the body; small partly, linguat, spicate fusees, which extend themselves over the pinnules, and measure 0.118^{mm} in length and 0.032^{mm} in breadth (Pl. VI, fig. 23); partly, spicate rollers, measuring 0.060^{mm} in length and 0.028^{mm} breadth (Pl. VI, fig. 24); partly, a few stellates measuring 0.032^{mm} in diameter (Pl. VI, fig. 25); on the uppermost half part, where the spicules are placed transversally, they are flatter, more or less curved, and spicate, and, of these, the lowest ones measure, 0.112^{mm} in length, and 0.036^{mm} in breadth (Pl. VI, figs. 26. 27), and the uppermost ones measure 0.072^{mm} in length, and 0.024^{mm} in breadth (Pl. VI, figs. 28. 29).

Colour.

The stem is greyish-green. The polyps greyish. The spicules, partly, faint-greyish.

Habitat.

Station, between Nos. 173 and 174. Depth. 300 fathoms. Temp. + 4 C. One specimen.

Artskarakter.

Zoanthodemet indtil 28^{mm} høit. Stammen rund, furet, omtrent 20^{mm} i Omfang ved Grunden, aftager i Tykkelse op imod Toppen, hvor den deler sig i 2 Grene, der igjen danne Smaagrene, som hver bærer Grupper af Polyper. Basaldelen tyk, fast, noget udvidet. Strax ovenfor denne og til Toppen er Stammen rundt om forsynet med korte, tykke Grene, staaende temmelig langt fra hverandre, og hvoraf flere, lige ved Udspringet, dele sig i to, som atter dele sig i mange Smaagrene, der hver bærer 6—7 tætstaaende Polyper; andre Grene, og det de fleste, dele sig et Par Millimeter fra Stammen i mange korte og sammentrængte Smaagrene, som hver bærer et lignende Antal Polyper. Disse ere bagerformede, 3^{mm} lange, med en kort, smal Bagkrop, noget udvidet Forkrop, hvor Spiklerne ordne sig i Længderækker. Tentaklernes aborale Side forsynet med Spikler, der paa den nederste Halvdel ligge paalangs, paa den øverste paatvers. Paa Basaldelen ere sammensatte Stjerner og vingeformigt udvidede, takkede Spindler de almindeligste. Den nederste Del af Stammen fattig paa Spikler; den øvrige Del af Stammen samt Grenene med deres Forgreninger spikelfri. Polypkroppen rig paa Spikler, der væsentligst fremtræde under Spindel-formen. Farven: Stammen og Grenene graagrønne, Polyperne graalige.

Drifa¹ hyalina, n. g. et sp.

Tab. VII, Fig. 1—44.

Zoanthodemet er indtil 80^{mm} høit. Stammen er rund, glat, omtrent 40^{mm} i Omkreds ved Grunden og aftager kun lidet i Tykkelse op til Toppen, der udvider sig noget og bærer 2—3 Grupper Polyper. Paa selve Stammen udspringe dels enkelte, dels Klynger af Polyper; de enkelte Polyper gaa umiddelbart over i Stammen; men førend hver Klynge gaar over i samme, samle de sig i en yderst kort Stilk. Basaldelen er nøgen, furet paalangs, læderagtig og omtrent 15^{mm} høi. Stammen er rundtom forsynet med flere Grene, der alle ere meget tykke, — ja et Par af dem have endog næsten samme Tykkelse som Stammen, men Længden er meget forskjellig, især er en, som sidder omtrent midt paa Stammen, meget lang, indtil 40^{mm}. Grenene ere lige fra deres Udspring optagne dels af enkelte Polyper, dels af Grupper paa 3—5, men fornemmelig af Smaagrene, der overalt ere saa rigt forsynede med Polyper, at de som

¹ Drifa = Snenymphe, Snestorm.**Specific characteristics.**

The Zoanthodem measures up to 28^{mm} in height. The stem is cylindrical, grooved, and measures about 20^{mm} in circumference at the base, but diminishes in thickness up towards the summit, at which point it ramifies into 2 branches which, again, ramify into branchlets, each of them carrying groups of polyps. The basal part is thick, firm, and somewhat dilated. Immediately above the basal part, and up to its summit, the stem is, round about it, furnished with short thick branches placed pretty far apart from each other, and of these several, quite at their root, ramify into two, that again ramify into numerous branchlets, each of which carries 6—7 closely-set polyps; other branches, and these the greater number, ramify, a couple of millimetres beyond their roots, into many short, and crowded, branchlets, each of which carries a similar number of polyps. These are chalice-formed, and measure 3^{mm} in length; they have a short, narrow, posterior body, and a somewhat dilated anterior body, on which the spicules arrange themselves in longitudinal series. The aboral side of the tentacles is furnished with spicules which, upon the lowest half part, are placed longitudinally, and on the uppermost part transversally. In the basal part, complex stellates, and pennate dilated, spicate fusees are the most frequent spicular forms. The lowest part of the stem is poor in spicules. The remainder of the stem and, also, the branches with their ramifications are devoid of spicules. The body of the polyp is rich in spicules which appear, principally, in the fusiform. The colour of the stem and the branches is greyish-green; the polyps greyish.

Drifa¹ hyalina, n. g. et sp.

Pl. VII, figs. 1—44.

The Zoanthodem measures up to 80^{mm} in height. The stem is cylindrical, smooth, and measures about 40^{mm} in circumference at the base; it diminishes only slightly towards the summit, where it becomes somewhat dilated, and carries 2—3 groups of polyps. On the stem itself, partly, single, partly, bunches of polyps shoot out; the single polyps become, immediately, produced into the stem, but before each bunch is produced into the stem it collects together into an extremely short stalk. The basal part is bare, longitudinally grooved, coriaceous, and measures about 15^{mm} in height. The stem is, round about it, furnished with several branches, all of which are very thick, indeed, a couple of them have, even, almost the same thickness as the stem; the length is, however, very variable; one especially, situated about the middle of the stem, is very long, and measures up to 40^{mm} in length.

¹ Drifa — Snow-nymph, Snowstorm.

oftest skjules ganske af disse. Grenene ende i Almindelighed i en bred Udvidning, der ligesom Stammens overste Ende bærer 2—3 Grupper Polyper. Imellem de fuldt udviklede Polyper træffes hyppig ganske smaa, som netop have gjenembrudt Coenenchymet. Baade Stammen, Grenene og Smaagrenene ere rige paa Kalkspikler, Fig. 1. 2.

Polyperne ere 8^{mm} lange, ikke retraktile, med en temmelig lang Bagkrop. Kroppen er 5^{mm} lang, cylindrisk, noget bredere op imod Tentakelskiven og forsynet med 8 fremragende Længderibber, dannede af Spikler. Tentaklerne ere 3^{mm} lange og have Spikler paa den aborale Side. Pinnulerne ere korte, uden Spikler, Fig. 3. 4.

Hele Zoanthodemmet, undtagen Basaldelen, er saa gjennemsigtigt, at man i levende Live kan iagttage Skillevæggene og Længdekanalerne i Stammen, Mesenterialfilamenterne og Svælget hos Polyperne.

Zoanthodemets Bygning.

Stammen, Grenene og Smaagrenene ere udvendigt beklædte med et Ectoderm, der bestaar af flere Lag polyædriske Celler, som have en tynd Membran, ere 0.007^{mm} store og have en rund, næsten central Kjerne, 0.003^{mm} , omgivet af yderst sparsomt Protoplasma, Fig. 5, a; men imellem disse polyædriske Celler sees, især i det dybere Lag, aflange Celler af omtrent samme Størrelse, med en rund Kjerne, rigere omgivet af Protoplasma, Fig. 5, b, samt desforuden kolbeformige Celler med en lang Hals, der strækker sig op til Ectodermets Overflade. Disse kolbeformige Celler ere stundom ganske tomme og se ud som Vacuoler, men hyppigt ere de fyldte med en yderst fintkornet Masse, som skjuler en næsten rund Kjerne, der ligger ned mod Bunden af Cellen. De ere upaatvivelig encellede Slimkjertler, 0.017^{mm} lange og 0.008^{mm} brede i den brede Ende, ere tilstede i stor Mængde og ligge dels enkeltvis, dels i Grupper, Fig. 5, c. Indenfor Ectodermet er et hyalint Bindevævslag, rigt paa Ernæringskanaler og Bindevævslegemer, Fig. 5, e; det er tykkere paa Stammen end paa Grenene, men er i det Hele taget forholdsvis tyndt, Fig. 5, d, og fra dets indre Flade udgaa Forlængelser, der straaleformigt konvergere indad mod Centrum og danne Coenenchymet med dets Kanaler.

Længdekanalerne ere meget vide, saa at Coenenchymet bliver temmelig sparsomt, ikke saa bredt som hos Slægterne

The branches are, quite from their root, occupied, partly, by single polyps, and partly, by groups of 3—5 polyps, but, principally, by branchlets, which are, everywhere, so richly beset with polyps, that they are, in general, quite concealed by them. The branches terminate, usually, in a broad dilation which, like the uppermost extremity of the stem, carries 2—3 groups of polyps. Between the fully developed polyps, quite minute ones are frequently met with, that have just recently emerged from the sarcosoma. Both, the stem, the branches and the branchlets, are rich, in calcareous spicules (figs. 1. 2).

The polyps measure 8^{mm} in length, are non-retractile, and have a tolerably long posterior body. The body measures 5^{mm} in length, is cylindrical, somewhat broadest up towards the tentacular disk, and it is furnished with 8 protuberant longitudinal ribs formed of spicules. The tentacles measure 3^{mm} in length, and are furnished with spicules on the aboral side. The pinnules are short and devoid of spicules (figs. 3. 4).

The entire Zoanthodem, except the basal part, is so translucent that, in the live state, the divisional walls and the longitudinal ducts in the stem, also the mesenterial filaments and gullet of the polyps, may be observed.

The structure of the Zoanthodem.

The stem, the branches, and the branchlets are clad, exteriorly, with an ectoderm, consisting of several layers of polyhedral cells with a thin membrane, and measuring 0.007^{mm} in diameter, and these contain a round, almost central nucleus, measuring 0.003^{mm} , enclosed by an extremely sparing protoplasm (fig. 5, a); but between these polyhedral cells there are seen, especially in the deeper layers, oblong cells of about the same size, which contain a round nucleus more richly enclosed by protoplasm (fig. 5, b), also, in addition, clavate-formed cells with a long neck, which extend themselves up to the outer surface of the ectoderm. These clavate-formed cells are sometimes quite empty and appear like vacuoli, but most frequently they are filled with an extremely minute granular substance that conceals a nearly round nucleus placed down towards the bottom of the cell. They are, without doubt, unicellular mucous glands, and measure 0.017^{mm} in length, and 0.008^{mm} in breadth at the broad extremity; they are present in great abundance, and are situated partly singly, partly in groups (fig. 5, c). Inside of the ectoderm there is a layer of hyaline connective tissue, rich in nutritory ducts and connective tissue corpuscles (fig. 5, e); this layer is thicker in the stem than in the branches, but, taken altogether, it is relatively thin (fig. 5, d); from its inner surface prolongations proceed, converging radially, inwards, towards the centre, and forming the sarcosoma with its ducts.

The longitudinal ducts are very wide, so that the sarcosoma becomes pretty sparing, and not so broad as in

Vøringia og Duva, og paa deres Vægge iagttages store, ovale Aabninger for hver tilstødende Gren, hvorved dennes Kanaler kommunikere med Stammen. Længdekanalernes Vægge, eller den indre Bindevævsflade, er beklædt som sædvanligt med Længde- og Tvermuskler, der have et Epithelovertræk, bestaaende af runde Celler, 0.010^{mm} store, med en rund Kjerne, omgivet af Protoplasma. Paa Bindevævs ydre Flade, imellem denne og Ectodermet, er overalt indleiret Kalkspikler, der ere forskellige i Form og Størrelse paa de forskellige Steder af Stammen og Grenene, og som senere skulle beskrives.

Polyperne ere paa deres ydre Flade beklædt med et Ectoderm, lig det, som findes paa Stammen og Grenene, — kun ere Cellelagene ikke saa mange, ligesom Cellerne i det indre Lag ere rundere og rigere paa Protoplasma-indhold end i de ydre Lag, Fig. 6, *a*. Ogsaa her findes lignende Slimkjertler som paa Stammen, Fig. 6, *b*. Indenfor Ectodermet er et bredt, hyalint Bindevævs lag, rigt paa Ernæringskanaler med deres Endothel, og paa dette Bindevævs ydre Flade, dækket af Ectodermet, er den store Mængde af Spikler indleiret, der omgiver hele Polypkroppen, Fig. 6, *c*. Fra Bindevævs indre Flade udgaa de 8 Septa, der fæste sig paa Svælget, Fig. 7, *a*, og derfra forlænge sig langs hele Mavehulheden under Navn af Septula. De bestaa af en Bindevævs lamel, paa hvis ene Side er fæstet longitudinelle og paa den anden Side transverselle Muskelfibre, Fig. 7, *b*, *c*. Disse Muskelfibre ere Fortsættelser af Muskellaget paa Bindevævs indre Flade, ligesom de gaa over paa Svælgets ydre Flade og udbrede sig deri, Fig. 7. Hele Mavehulheden med Septa og Septula er beklædt med et Epithel, der dannes af to Lag runde Celler, 0.009^{mm} store, som have en tynd Membran, en rund Kjerne, 0.004^{mm} stor, omgivet af kornet Protoplasma, Fig. 7, *d*.

Svælget er cylindrisk, foldet, temmelig langt og paa sin ydre Flade beklædt med Epithel af samme Beskaffenhed som det, der tapetserer hele Mavehulheden. Om det danner flere Lag af Celler kan ikke afgjøres med Sikkerhed; men paa enkelte Steder havde det Udseende af to Lag, paa andre af et. Dækket af dette Endothel udbrede de tidligere omtalte Retraktorer og Protraktorer sig paa et hyalint Bindevævs lag, der som sædvanligt er forsynet med Ernæringskanaler og Bindevævslegemer med Udløbere. Paa dette Bindevævs indre Flade er Svælgets egentlige Muskellag, der dannes af longitudinelle men væsentligst af paaskraas gaaende, cirkulære Fibre, og er beklædt med Epithel, som umiddelbart stoder til Svælghulheden. Dette Epithel er paa den øverste Trediedel og forøvrigt til Siderne en Fortsættelse af Kroppens Ectoderm, men er dog noget modificeret, idet Cellerne ere mere langstrakte, ikke saa kantede, og imellem disse sees

the genera *Vøringia* and *Dura*. On their walls, large oval apertures for each adjacent branch are observed, by which its ducts communicate with those of the stem. The walls of the longitudinal ducts, or the inner connective-tissue surfaces, are clad, as usual, with longitudinal and transversal muscles which have an epithelial covering, consisting of cylinder cells measuring 0.010^{mm} in diameter and containing a round nucleus enclosed by protoplasm. On the outer surface of the connective tissue, between it and the ectoderm, calcareous spicules are, everywhere, entrenched; these vary in form and size in the different parts of the stem and the branches, and will be, subsequently, described.

On their exterior surface, the polyps are clad with an ectoderm like that which is found upon the stem and the branches, only, the cellular layers are not so numerous, whilst, also, the cells in the inner layer are more cylindrical and richer in protoplasmic contents than those in the outer layer (fig. 6, *a*). Also, in this situation, mucous glands like those of the stem are found (fig. 6, *b*). Inside of the ectoderm, there is a broad layer of hyaline connective tissue, rich in nutritory ducts with their endothelium, and on the exterior surface of that connective tissue, covered by the ectoderm, the large mass of spicules which surround the entire body of the polyp are entrenched (fig. 6, *c*). From the inner surface of the connective-tissue proceed, the 8 septa, which are adherent to the gullet (fig. 7, *a*) and prolong themselves, thence, along the entire ventral cavity, under the form of septula. They consist of a connective-tissue lamella on whose one side, longitudinal, and on the other side transversal, muscular fibres are secured (fig. 7, *b*, *c*). These muscular fibres are continuations of the muscular layer of the inner surface of the connective-tissue, whilst, also, they are produced, over, into the exterior surface of the gullet and spread themselves there (fig. 7). The entire ventral cavity, with septa and septula, is clad with an epithelium, formed of two layers of cylinder cells measuring 0.009^{mm} in diameter, having a thin membrane, and containing a round nucleus measuring 0.004^{mm} , enclosed by granular protoplasm (fig. 7, *d*).

The gullet is cylindrical, folded, rather long, and, upon its exterior surface, it is clad with epithelium of the same character as that which lines the entire ventral cavity. Whether it forms several layers of cells cannot, with certainty, be decided; in a few places there was the appearance of two layers, but in others, again, only of one. Covered by this endothelium, the previously mentioned retractors and protractors spread themselves upon a hyaline connective-tissue-layer which, as usual, is furnished with nutritory ducts and connective-tissue corpuscles with prolongations. On the inner surface of this connective-tissue, the real muscular layer of the gullet appears; it is formed of longitudinal, but chiefly of diagonally running, circular fibres, and is clad with epithelium which connects immediately to the gullet cavity. This epithelium is, on its uppermost third part, and otherwise, also, on its sides, a continuation of the ectoderm of the body, but is,

en Mængde kolbeformige Slimkjertler med en langstrakt Hals, der som oftest udmunder paa Svælgets indre Flade, Fig. 7, e. Disse Kolbeceller ere ganske lig de førnævnte, encellede Slimkjertler i Ectodermet; men i Svælget ere de lettere at iagttage, ligesom Indholdet ofte ligger dels i, dels udenfor Udførselskanalens Aabning. Svælgets indre Flade er ofte overtrukket med en seig Slimmasse.

Svælgruben danner en oval Rende, der strækker sig nogle Millimeter fra den aflange Mundaabning og lige ned til Svælgets Ende, Fig. 7, f. Den er forsynet med lange, smale Pidskeceller, som hver bærer en lang Cilie, der flimrer frit i Hulheden, Fig. 7, g.

Gastralfilamenterne afvige ikke i sin Bygning fra dem, jeg omtalte hos Slægten *Væringia*, og hvorved jeg for en Del kan konstatere de af Englænderen Edm. Wilson gjorte Iagttagelser, betræffende de to lange Dorsal-mesenterialfilamenters Bygning. Hvorvidt disse to Organer udelukkende staa i Circulationens Tjeneste, kan jeg ikke afgjøre; men den Omstændighed, at de følge Mavehulheden i dens hele Længde og ere rigt beklædte med lange Cilier, synes at tale derfor.

Kjønnsprodukterne udvikle sig i den nederste Del af Mavehulheden paa Septula i særegne Kapsler. Kjønne ere adskilte. Paa det ene Exemplar, jeg har havt til Undersøgelse, ere Individerne Hunner.

Jeg har tidligere omtalt, at der overalt i Zoanthodemets ydre Hud findes en Mængde Spikler; jeg skal nu nærmere beskrive disse.

I Basaldelen ligge Spiklerne kompakt paa hverandre og danne dels bladede, dels vortede Klubber med yderst kort Haandgreb, fra 0.110—0.140^{mm} lange og fra 0.060—0.080^{mm} brede foroven, Fig. 8. 9. 10; korte, takkede Spindler med afstumpede Ender, fra 0.060—0.120^{mm} lange, og fra 0.025—0.040^{mm} brede; de mindste have faa Takker med et bredt, nøgent Midtbelte, Fig. 11; smaa Dobbeltstjerner, 0.052^{mm} lange, 0.020^{mm} brede i Enderne og 0.010^{mm} brede paa Midten, Fig. 12; større Dobbeltstjerner med et Midtbelte dels nøgent, dels besat med Takker og 0.112^{mm} lange, 0.060^{mm} brede i Enderne; hyppigt er den ene Ende bredere end den anden og rigere paa Takker, Fig. 13. 14. 15.

Paa Stammen ere Dobbeltstjerner den hyppigste Spikelform; de ere fra 0.060—0.088^{mm} lange og fra 0.040—0.060^{mm} brede i Enderne; det nøgne Midtbelte er fra 0.016—0.020^{mm} bredt, Fig. 16, 26; de træffes i forskjellige Udviklingsstadier og ere da af meget forskjellig Størrelse,

however, somewhat modified, inasmuch that the cells are more elongate and not so polyhedral and, between them, a multitude of clavate-formed mucous glands are observed, having an elongated neck which, most frequently, debouches on the inner surface of the gullet (fig. 7, e). These clavate cells are quite similar to the previously mentioned unicellular mucous glands in the ectoderm, but they are more easily observed in the gullet, whilst, also, the contents frequently lie, partly inside, and partly outside the aperture of the excretory duct. The inner surface of the gullet is, frequently, coated with a viscous mucous substance.

The gullet cavity forms an oval channel, which extends itself, a few millimetres from the oblong oral aperture, right down to the extremity of the gullet (fig. 7, f). It is furnished with, long, narrow, flagellated cells, each of which carries a long cilium that waves freely in the cavity (fig. 7, g).

The gastral filaments do not differ in their structure from those spoken of in connection with the genus *Væringia*, and from this I can, in a measure, confirm the observations made by the Englishman Edm. Wilson, in respect of the two long dorsal mesenterial filaments. How far these two organs operate, exclusively, in the service of the circulatory system, I am unable to decide, but the circumstance that they follow the ventral cavity throughout its entire length, and are richly clad with long cilia, seems to point to this.

The sexual products develop themselves in the lowest part of the ventral cavity, on the septula, in peculiar capsules. The sexes are separate. In the one specimen which I have had under examination the individuals are females.

I have previously stated that, everywhere, in the exterior integument of the Zoanthodem, a multitude of spicules are found; I shall now describe these more particularly.

In the basal part, the spicules are placed compactly upon each other, and form; partly, foliaceous, partly, warted clavates with extremely short shaft, and they measure from 0.110—0.140^{mm} in length, and from 0.060—0.080^{mm} in breadth above (figs. 8. 9. 10); short spicate fusees with blunted extremities, and measuring from 0.060—0.120^{mm} in length, and from 0.025—0.040^{mm} in breadth; the smallest ones have few spikes, and have a broad bare mesial belt (fig. 11); small bistellates, measuring 0.052^{mm} in length, and 0.020^{mm} in breadth at the extremities, and 0.010^{mm} in breadth at the middle (fig. 12); large bistellates, with a mesial belt, partly, bare, partly beset with spikes, and measuring 0.112^{mm} in length, and 0.060^{mm} in breadth at the extremities; very frequently, the one extremity is broader than the other, and richer in spikes (figs. 13. 14. 15).

On the stem, the bistellate is the most frequent spicular form, and measures from 0.060—0.088^{mm} in length, and from 0.040—0.060^{mm} in breadth at the extremities; its bare mesial belt measures from 0.016—0.020^{mm} in breadth (figs. 16. 26); they are met with in various stages

fra 0.018—0.060^{mm} lange og fra 0.010—0.024^{mm} brede i Enderne, medens Midtpartiet er fra 0.006—0.012^{mm} bredt. Paa enkelte af disse udviklede Dobbeltstjerner er der kun Antydninger til Takker, Fig. 17. 18. 19.

Imellem Dobbeltstjerneerne findes enkelte mere sammensatte Stjerner og enkelte Køller, besatte baade med Vorter og Blade, hvoraf nogle af de sidste have et meget kort Skaft, lig dem, der findes paa Basaldelen og ovenfor ere omtalte, medens andre ere meget lange, fra 0.180—0.200^{mm}, og Bredden i den øvre Ende er fra 0.060—0.080^{mm}, Fig. 20. Af og til sees en Dobbeltkugle, 0.076^{mm} lang, 0.052^{mm} bred i de afrundede, takkede Ender med et 0.020^{mm} bredt Midtbelte, Fig. 21. Imellem disse forskellige Former iagttages hist og her Firlinger, snart x-formede og næsten glatte, Fig. 22, snart mere eller mindre korsformede og forsynede baade med Blade og Vorter, Fig. 23. 24. De x-dannede Firlinger ere 0.048^{mm} lange, 0.016^{mm} brede paa Midten; de med Vorter og Blade besatte Firlinger ere omtrent lige lange som brede, deres Gjennemsnit er 0.060^{mm}, og de med udpræget Korsform og kun lidt besatte med Vorter have en Længdestok, 0.048^{mm}, og en Tverstok, 0.040^{mm}, Fig. 25.

Paa Grenene findes vortede Spindler med tilspidsede Ender, 0.200^{mm} lange, 0.060^{mm} brede, Fig. 27; bladede Køller, dels med kort Haandgreb, 0.130^{mm} lange, 0.060^{mm} brede foroven, Fig. 28, dels med langt, smalt, takket Haandgreb, 0.178^{mm} lange, 0.040^{mm} brede foroven, Fig. 29; eiendommelige, korsformede, bladede Firlinger, hvis Længdestok er 0.092^{mm} og Tverstok 0.060^{mm}, Fig. 30, samt hist og her nogle vingeformigt udvidede Spikler med takkede Rande, Fig. 31. 32.

Paa Polypens Forkrop er Kølleformen almindeligst. De vortede Køller ere 0.200^{mm} lange, 0.060^{mm} brede foroven og have paa den øverste Del en nøgen Indsnøring (Hals), der ligesom skiller den korte Klubbe fra det lange Haandgreb, Fig. 33; af de bladede Køller gives der enkelte, som ere spaltede foroven, 0.180^{mm} lange, 0.068^{mm} brede i øverste Ende og tildels forsynede med en nøgen Hals, Fig. 34. 35. Imellem Køllerne træffes enkelte særegne Firlinger med et Midtparti, 0.060^{mm} bredt, hvorfra udgaa 2 lange, takkede Arme, hver 0.120^{mm} lang og to meget korte, 0.008^{mm} lange, Fig. 36. Disse sidste ere meget sjældne. Op imod Tentakelskiven sees dels krumme, dels lige, takkede Spindler med tilspidsede Ender, hvilke ere 0.222^{mm} lange, 0.040^{mm} brede, Fig. 37.

of development and are, then, of very variable size, measuring from 0.018—0.060^{mm} in length, and from 0.010—0.024^{mm} in breadth at the extremities, whilst the mesial part measures from 0.006—0.012^{mm} in breadth. In a few of these partially developed bistellates there are only indications of spikes (figs. 17. 18. 19).

Between the bistellates, a few more complex stellates, and a few subclavates beset with, both, warts and leaves are found, and of the last mentioned, a few have a very short shaft like that which is found in the basal part and which is described above, whilst others are very long, and measure from 0.180—0.200^{mm} in length, and from 0.060—0.080^{mm} in breadth at the superior extremity (fig. 20). Now and then, a double sphere is seen, measuring 0.076^{mm} in length, and 0.052^{mm} in breadth at the rounded spicate extremities, with a broad mesial belt measuring 0.020^{mm} in breadth (fig. 21). Between these different forms, quadruplets are, here and there, observed, sometimes, x-formed, and almost smooth (fig. 22), sometimes, more or less cruci-form and furnished with, both, leaves and warts (figs. 23. 24). The x-formed quadruplets measure 0.048^{mm} in length, and 0.016^{mm} in breadth at the middle; those quadruplets which are beset with warts and leaves are about as long as they are broad, and their diameter is 0.060^{mm}; and those of distinguished cruci-form, and only, slightly beset with warts, have a longitudinal arm measuring 0.048^{mm}, and a transversal arm measuring 0.040^{mm} (fig. 25).

On the branches, warted fusees with acuminate extremities are found, measuring 0.200^{mm} in length and 0.060^{mm} in breadth (fig. 27); also foliaceous clavates, partly, with short shaft, and measuring 0.130^{mm} in length, and 0.060^{mm} in breadth above (fig. 28), partly, with narrow, long spicate shaft, and measuring 0.178^{mm} in length, and 0.040^{mm} in breadth above (fig. 29); peculiar cruci-form foliaceous quadruplets, whose longitudinal arm measures 0.092^{mm}, and the transversal arm 0.060^{mm} (fig. 30); also, here and there, a few pennate dilated spicules with spicate margins (figs. 31. 32).

On the anterior body of the polyp, the subclavi-form is the most frequent. The warted subclavates measure 0.200^{mm} in length, and 0.060^{mm} in breadth above, and they have, on the uppermost part, a bare contraction (Neck) which, as it were, separates the short club from the long shaft (fig. 33); of the foliaceous subclavates, a few are met with which are fissured above, and measure 0.180^{mm} in length, and 0.068^{mm} in breadth at the uppermost extremity, and are, partly, furnished with a bare neck (figs. 34. 35). Between the subclavates, a few peculiar quadruplets are met with, having a mesial part measuring 0.060^{mm} in breadth, and from which two long spicate arms proceed, each measuring 0.120^{mm} in length, and, also, two very short ones, measuring 0.008^{mm} in length (fig. 36). These last are, however, very rare. Up towards the tentacular disk, partly bent, partly straight, spicate fusees with acuminate extremities are seen, measuring 0.222^{mm} in length, and 0.040^{mm} in breadth (fig. 37).

Paa Bagkroppen iagttages lignende Spikler som paa Forkroppen, kun ere Spindlerne her meget hyppigere, mere takkede og tildels meget mindre, Fig. 38. 39. Desforuden træffes her en næsten glat, liden Firling, noget lig et Andreaskors med 0.060^{mm} lange Arme, Fig. 40.

Paa Tentaklerne er det væsentligst bladede, dels krumme, dels lige Koller, som ere ordnede saaledes, at den tykke, bladede Del af Kollen vender mod Midten af Tentakelens aborale Side; de ere fra $0.140-0.200^{mm}$ lange og 0.036^{mm} brede foroven, Fig. 41; opimod den øverste Ende af Tentakelen sees en Del næsten flade, i Randen udskaarne Spikler, som ere fra $0.060-0.080^{mm}$ lange og fra $0.014-0.024^{mm}$ brede, Fig. 42; endelig iagttages enkelte smaa Rosetter, der ere omtrent lige lange som brede og noget indknebne paa Midten, nærmende sig en liden Dobbeltstjerne og 0.020^{mm} i Udstrækning, Fig. 43, samt smaa, bladede Klubber, Fig. 44.

Farven.

Bleg rosenrød.

Findested.

Station 315. Et Exemplar.

Slægtskarakter.

Zoanthodemet trædannet, forgrenet. Hovedgrenene tykke, og fra dem udspringe overalt Smaagrene, tæt besatte med Polyper. Polyperne ikke retraktile, langstrakte, med vel udviklet Bagkrop. Stammen, Grenene, Smaagrenene og Polyperne rige paa Kalkspikler, hvoraf Kolleformen er den mest fremherskende. Septa uden Kalk.

Artskarakter.

Zoanthodemet indtil 80^{mm} høit. Stammen furet paa langs, forgrenet, 40^{mm} i Omkreds ved Grunden. Basaldelen fast, læderagtig, ikke udvidet. Stammen jævntyk overalt, udvider sig lidt i Toppen, hvor den bærer 3 Grupper Polyper. Hovedgrenene overalt rige paa Smaagrene, tæt besatte med Polyper. Stammen og samtlige Grene rige paa Kalkspikler. Polyperne indtil 8^{mm} lange, ikke retraktile, med en lang Bagkrop og ligesom indkapslede i kolleformede Spikler. Tentaklerne meget rige paa lignende Spikler. Farven bleg rosenrød.

On the posterior body, similar spicules to those of the anterior body are observed, only, in this situation, the fusees are much more frequent, more spicate, and partly, also, much smaller (figs. 38. 39). There is, further, met with, here, an almost smooth, small, quadruplet, somewhat like a St Andrews Cross, with arms measuring 0.060^{mm} in length.

On the tentacles, it is, principally, foliaceous, partly bent, partly straight, subclavates that are met with, arranged in such manner, that the thick foliaceous part of the club faces towards the middle of the aboral side of the tentacle; these measure from $0.140-0.200^{mm}$ in length, and 0.036^{mm} in breadth above (fig. 41). Up towards the uppermost extremity of the tentacle, a number of, almost flat, spicules with indented margins are seen, measuring from $0.060-0.080^{mm}$ in length, and from $0.014-0.024^{mm}$ in breadth (fig. 42); finally, a few small rosettes are observed, which are about as long as they are broad, and somewhat constricted at the middle, and measuring 0.020^{mm} in extent (fig. 43); also, small foliaceous clavates (fig. 44).

Colour.

Pale rose-red.

Habitat.

Station No. 315. One specimen.

Generic characteristics.

The Zoanthodem arborescent, ramous. The main branches thick, and from them shoot out, everywhere, branchlets closely beset with polyps. The polyps non-retractile, elongate, with well developed posterior body. The stem, the branches, the branchlets and the polyps rich in calcareous spicules, of which, the subclavi-form is the most predominant. Septa non-calcareous.

Specific characteristics.

The Zoanthodem measures up to 80^{mm} in height. The stem longitudinally grooved, ramous, and 40^{mm} in circumference at the base. The basal part firm, coriaceous, and not dilated. The stem uniform in thickness throughout, but dilates a little at the summit, where it carries 3 groups of polyps. The main branches, everywhere, rich in branchlets closely beset with polyps. The stem, and all of the branches, rich in calcareous spicules. The polyps measure up to 8^{mm} in length, are non-retractile, have a long posterior body and are, as it were, encapsuled in subclavi-formed spicules. The tentacles richly furnished with similar spicules. The colour pale rose-red.

Drifa islandica, n. sp.

Tab. VI, Fig. 30—71.

Zoanthodemet indtil 60^{mm} høit. Stammen, der ved Grunden er 45^{mm} i Omkreds, er rund, riflet efter Længden af de stærkt udprægede Længdekanaler og ender opad i 3 Grene. Basaldelen er fast, læderagtig og skiveformigt udvidet. Lige fra Basaldelen og til Toppen er Stammen rundt om rigt forsynet med Grene, der kun ved nogle Millimeters Mellemlumme er skilte fra hverandre. Grenene have forskjellig Længde og opnaa indtil Halvdelen af Stammens Tykkelse, ere runde med udprægede Længdekanaler og i Regelen lige fra deres Udspring tæt besatte dels med Smaagrene, dels med enkelte Polyper. Smaagrenene ere korte, tykke, fra 4—6^{mm} lange og bære overalt Polyper, som ere ordnede i tætte Grupper. Enkelte Smaagrene, men disse ere sjeldne, ere ved Grunden omgivne af enkeltstående Polyper og bære paa Enden en hel Samling af saadanne. Smaagrenene ligne paa Grund af den Masse Polyper, de bære, Drucklaser og dække som oftest ganske Hovedgrenen. Saavel Grenene som Smaagrenene ere bløde, bøielige og forsynede med Spikler, der vanskelig sees med blotte Øie, men meget let ved en svag Loupeforstørrelse; de vise sig da som smaa, lysende Kommaer, der ligge temmelig langt fra hverandre. Paa Stammen, som er fastere end Grenene, sees overalt imellem disse dels enkelte Polyper, dels Grupper, der ere samlede i en liden Stilk, som gaar direkte over i Stammen. Ogsaa paa denne iagttages mere eller mindre spredte Spikler, som tildels ere ordnede i Længderækker, der følge Længdekanalerne, men ligesaa hyppigt samle sig i smaa Klumper, som kunne sees med blotte Øie, Fig. 30. 31.

Polyperne ere traktformige, 8—9^{mm} lange. For-kroppen med Tentakelranden stærkt udvidet, 3—4^{mm} bred. Bagkroppen forholdsvis smal, 3^{mm} lang, Fig. 32. Hele Kroppen er stærkt inkrusteret af Spikler, naar undtages op imod Tentakelranden, hvor der imellem Tentaklerne er et triangulært Spatium, som er blottet for Kalk, Fig. 33, a. Paa Kroppens forreste Del op imod Tentaklerne ordne Spiklerne sig i Længderækker og danne Ribber, der gaa over paa Tentaklernes aborale Side lige til deres Ende, Fig. 32. 33. Paa Kroppens Bugside ligge Spiklerne ikke saa tæt sammen som paa den øvrige Del af Kroppen¹. Tentaklerne ere omtrent 3^{mm} lange med korte, tykke Pinnuler, der ere uden Spikler. Mundskiven er lidt hvælvet, og i dens Midte sees den aflange Mund, fra hvis Læber udløbe

¹ Dette er forresten Tilfældet med de fleste Polyper hos de Slægter, jeg har undersøgt. Hyppigt er der endogsaa et større eller Den norske Nordhavsexpedition. D. C. Danielssen: Aleyonida.

Drifa islandica, n. sp.

Pl. VI, figs. 30—71.

The Zoanthodem measures up to 60^{mm} in height. The stem, which at the base measures 45^{mm} in circumference, is cylindrical, longitudinally grooved by the strongly prominent longitudinal ducts, and terminates, above, in 3 branches. The basal part is firm, coriaceous, and discoidally dilated. Quite from the basal part and up to the summit, the stem is, round about it, furnished with branches, which are only separated from each other by a space of a few millimetres. The branches are of variable lengths, and attain a thickness of up to half that of the stem; they are cylindrical, have prominent longitudinal ducts and, as a rule, are, quite from their root, closely beset with, partly, branchlets, partly with single polyps. The branchlets are short and thick, measuring from 4—6^{mm} in length, and everywhere carry polyps arranged in close-set groups. A few of the branchlets, but they are rare, are, at the root, encompassed by isolately situated polyps, but on the extremity carry a whole collection of them. The branchlets resemble, by reason of the mass of polyps that they carry, clusters of grapes, and, most frequently, quite cover the main branch. Both, the branches and the branchlets, are soft and flexible, and are furnished with spicules that can with difficulty be observed with the naked eye but are quite easily observed on slight magnification; they appear then, as minute, glancing commas, placed pretty far apart from each other. On the stem, which is firmer than the branches, there is seen between these, everywhere, partly single polyps, partly groups which are collected into a small stalk that is produced direct into the stem. More or less dispersed spicules can also be observed on it, which, partly, are arranged in longitudinal series that follow the longitudinal ducts, but quite as frequently, they collect themselves into small clumps which may be observed with the naked eye (figs. 30. 31).

The polyps are infundibuliform, and measure, 8—9^{mm} in length. The anterior body, towards the tentacular margin, is strongly dilated, and measures 3—4^{mm} in breadth. The posterior body is relatively narrow, and measures 3^{mm} in length (fig. 32). The entire body is strongly encrusted with spicules, with exception of the part up towards the tentacular margin, where, between the tentacles, there is a triangular space devoid of calcium (fig. 33, a). On the anterior part of the body, up towards the tentacles, the spicules arrange themselves in longitudinal series and form ribs which are produced to the aboral side of the tentacles, right to their extremity (figs. 32. 33). On the ventral side of the body, the spicules are not situated so closely together as on the rest of the body¹. The ten-

¹ This is also the case with most of the polyps in the genera which I have observed. Most frequently, there is, even, a larger

radiært 8 Striber henimod Tentakelranden og vise Insertionerne paa Mundskiven for de 8 Septa, Fig. 32.

Hele Zoanthodemet er ligesom overstrøet med Nematocyster, der dog ere i størst Mængde tilstede paa Polyperne. De kunne sees med Loupen, ere pæreformige, brune, 0.007^{mm} lange, 0.003^{mm} brede; de fleste ere forsynede med en overordentlig lang Spiraltraad, Fig. 33, a. 34, medens andre, der ere sjældnere, ikke have nogen saadan Spiraltraad, men ende i en lang, stiv, yderst fin Spids.

Den anatomisk-histologiske Bygning er ikke væsentlig forskjellig fra den, jeg har beskrevet hos *Drifa hyalina*, kun er der i det ydre Epithellag (Ectodermet) paa hele Zoanthodemet en Mængde brune Pigmentceller, der giver dette sin Farve, og som ikke findes hos *Drifa hyalina*.

Kjønnsprodukterne udvikle sig som sædvanligt paa Septula i den bagerste Del af Mavehulheden; men da de i Smaagrenenes Peripheri siddende Polyper forlænge sin Mavehulhed ned i dem, saa sees Smaagrenene ofte ganske opfyldte med Æg (Exemplaret, som jeg havde til Undersøgelse, var nemlig en Hun). Lignende iagttages ogsaa for Hovedgrenenes Vedkommende, hvor Polypernes Mavehulhed forlænger sig ned i Grenen.

Basaldelen er overmaade rig paa Spikler, der ligge tildels pakkede paa hverandre og forekomme under følgende Former: bladede Klubber med kort, tilspidset Skaft; de ere meget almindelige, 0.180^{mm} lange, 0.080^{mm} brede foroven, Fig. 35; bladet og vortet Klubbe, 0.160^{mm} lang, 0.100^{mm} bred med et kort, bredt Skaft, Fig. 36; Firling i Form af en Blomsterkvast, bærende Korstegn paa Midten, 0.200^{mm} lang, 0.120^{mm} bred, Fig. 37; takkede og vortede Dobbeltstjerner, fra 0.100—0.140^{mm} lange og fra 0.030—0.060^{mm} brede, Fig. 38. 39, og endelig enkle, stilkede Stjerner, 0.060^{mm} lange, Stjernen 0.040^{mm} bred, Stilken kort og næsten glat, Fig. 40. 41. 42.

Paa Stammens nedre og midterste Del og paa Hovedgrenene ligge Spiklerne flere Steder samlede i smaa Klumper, ellers nærme de sig meget til hverandre uden at være sammenpakkede, som Tilfældet er paa Basaldelen. De optræde her hyppigst som bladede og vortede Klubber, 0.140^{mm} lange, 0.118^{mm} brede med et yderst kort, smalt Skaft, lig dem paa Basaldelen, Fig. 35; imellem dem sees

mindre Rum paa Bugsiden, der er ganske blottet for Spikler. Det er sandsynligvis denne Eiendommelighed der gjør, at næsten alle Polyper, især efter Døden, ere noget krumbøjede paa Bugsiden.

tacles measure about 3^{mm} in length, and have short thick pinnules devoid of spicules. The oral disk is a little arcuate, and in its middle the oblong oral aperture appears, from whose labiæ 8 stripes spring, radially, towards the tentacular margin, and show the insertions of the 8 septa upon the oral disk (fig. 32).

The entire Zoanthodem is, as it were, overstrewn with nematocysts which, however, are present in greatest abundance on the polyps. They may be observed with the assistance of a polyoptrum, and are piriform, brown in colour, and measure 0.007^{mm} in length, and 0.003^{mm} in breadth; most of them are furnished with an extremely long spiral filament (fig. 33, a. 34); whilst others, which are more rare, have no such spiral filament, but terminate in a long, stiff, extremely fine point.

The anatomo-histological structure is not, essentially, different from that which I have described as pertaining to *Drifa hyalina*; only, there is in the exterior epithelial layer (the ectoderm) of the entire Zoanthodem, a multitude of brown pigment-cells, which impart to it its colour, and these are not found in *Drifa hyalina*.

The sexual products develop themselves on the septula as usual, in the posterior part of the ventral cavity, but as the polyps situated in the periphery of the branchlets prolong their ventral cavity down into them, the branchlets are, frequently, seen quite filled with ova. (The specimen which I had, for observation, was a female). The same is observed in respect, also, of the main branches, where, the ventral cavity of the polyps prolongs itself down into the branch.

The basal part is superabundantly rich in spicules, which are placed, partly, packed upon each other, and appear in the following forms: foliaceous clavates with short acuminate shaft; these are very frequent, and measure 0.180^{mm} in length and 0.080^{mm} in breadth above, (fig. 35); foliaceous and warted clavates, measuring 0.160^{mm} in length, and 0.100^{mm} in breadth, with a short broad shaft (fig. 36); quadruplet in form of a flower-tuft, carrying a crucial sign in the middle, and measuring 0.200^{mm} in length and 0.120^{mm} in breadth (fig. 37); spicate and warted bistellates, measuring from 0.100—0.140^{mm} in length, and from 0.030—0.060^{mm} in breadth (figs. 38. 39); and, finally, single pedunculated stellates, measuring 0.060^{mm} in length; the star measuring 0.040^{mm} across. The stalk short and almost smooth (figs. 40. 41. 42).

On the lower and mesial parts of the stem, and also, on the main branches, the spicules are placed, in some places, collected in small clumps, or they approach much to each other, without, however, becoming packed together such as is the case on the basal part. They appear, here, most frequently, as foliaceous and warted clavates, measuring 0.140^{mm} in length, and 0.118^{mm} in

or smaller space on the ventral side, that is perfectly devoid of spicules. It is, presumably, that peculiarity which causes almost all of the polyps, especially after death, to become somewhat curved on the ventral side.

Firlinger i Form af Timeglas, besatte med Vorter, 0.060^{mm} lange, 0.048^{mm} brede i Enderne, 0.020^{mm} brede paa Midten, Fig. 43; stjernedannede Firlinger, besatte med Vorter og med indskaarne Armeender, 0.080^{mm} i Gjennemsnit, Fig. 44; mangestraalede, sammensatte Stjerner, 0.062^{mm} lange, 0.040^{mm} brede mod Enderne, 0.018^{mm} brede paa Midten, Fig. 45. 46. 47; en yderst sammensat Stjernespikel med bladede Straaler, Fig. 48, og Dobbeltstjerner, 0.104^{mm} lange, 0.060^{mm} brede i Enderne og det nøgne Midtbelte 0.020^{mm} bredt, Fig. 49.

Øverst paa Stammen ligge Spiklerne mere spredte; de danne kortskaftede, bladede Køller, 0.180^{mm} lange, 0.100^{mm} brede foroven, Fig. 50; takkede eller vortede Valser med dels tversafskaarne Ender, 0.100^{mm} lange, 0.050^{mm} brede, Fig. 51, dels mere afrundede Ender, 0.220^{mm} lange, 0.056^{mm} brede, Fig. 52; skjævskaftede, takkede Køller, 0.128^{mm} lange, 0.060^{mm} brede, Fig. 53, og vortede Klubber med kort Skaft, 0.120^{mm} lange, 0.080^{mm} brede foroven, Fig. 54.

Paa Smaagrenene ligge Spiklerne endnu mere spredte, og ligesom man paa Stammen gjenfinder Spikler lig dem paa Basaldelen, saaledes findes ogsaa paa Smaagrenene Spikler, der ere hyppigst paa Stammen og Hovedgrenene. Men foruden dem er der andre varierende Former, som hovedsagelig tilhører Smaagrenene, og disse ere: halvt bladede, halvt vortede Valser, 0.240^{mm} lange, 0.092^{mm} brede med stærkt takkede Ender, Fig. 55; bladede Klubber, 0.118^{mm} lange, 0.080^{mm} brede foroven, Fig. 56; Dobbeltstjerner og sammensatte Stjerner, 0.112^{mm} lange, 0.056^{mm} brede mod Enderne, og Dobbeltstjernernes Midtbelte, 0.030^{mm} bredt, Fig. 57. 58, og faatakkede Spindler med tilspidsede Ender, 0.160^{mm} lange, 0.040^{mm} brede, Fig. 59.

Paa Polypernes Forkrop findes hyppigst bladede Køller, dels med lige, dels med noget krummet Haandgreb. De lige Køller ere de største, 0.288^{mm} lange, 0.128^{mm} brede opad, Fig. 60; de krumme ere 0.220^{mm} lange, 0.120^{mm} brede og nærme sig noget Korsformen, Fig. 61; imellem disse sees spinkle, takkede Køller med et langt, tilspidset Haandgreb, 0.200^{mm} lange, 0.032^{mm} brede, Fig. 62, og yderst sjældent enkelte, takkede Spindler, 0.200^{mm} lange, 0.040^{mm} brede, Fig. 63.

Paa Bagkroppen iagttages dels bladede, dels vortede Køller med temmelig kort Haandgreb og fra 0.100—0.200^{mm} lange og fra 0.060^{mm} brede, Fig. 64. 65; saavel

bredder, having an extremely short, narrow, shaft like those on the basal part (fig. 35). Between them are seen quadruplets, in the form of an hour-glass, beset with warts and measuring 0.060^{mm} in length, 0.048^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the middle (fig. 43); stellate-formed quadruplets beset with warts, having inlaid brachial extremities, and measuring 0.080^{mm} in diameter (fig. 44); multi-radiate complex stellates, measuring 0.062^{mm} in length, 0.040^{mm} in breadth at the extremities, and 0.018^{mm} in breadth at the middle (figs. 45. 46. 47); an extremely complex stellate-spicule with foliaceous rays (fig. 48); and bistellates, measuring 0.104^{mm} in length, and 0.060^{mm} in breadth at the extremities, with a bare mesial belt measuring 0.020^{mm} in breadth (fig. 49).

Uppermost on the stem, the spicules are placed more dispersed; they form foliaceous subclavates with short shafts, and measure 0.180^{mm} in length, and 0.100^{mm} in breadth above (fig. 50); spicate or warted rollers with, partly, transverse truncated extremities, and measuring 0.100^{mm} in length, and 0.050^{mm} in breadth (fig. 51) or partly, with more rounded extremities, and measuring 0.220^{mm} in length, and 0.056^{mm} in breadth (fig. 52); spicate subclavates with twisted shafts, measuring 0.128^{mm} in length and 0.060^{mm} in breadth (fig. 53); and warted clavates with short shaft, measuring 0.120^{mm} in length, and 0.080^{mm} in breadth above (fig. 54).

On the branchlets, the spicules are placed still more dispersed, and just as we recognise in the stem spicules like those of the basal part, do we, also, find on the branchlets, similar spicules to those which are most frequent on the stem and the main branches. But besides these, there are other varying forms which pertain, principally, to the branchlets; these are semi-foliaceous, semi-warted rollers measuring 0.240^{mm} in length, and 0.092^{mm} in breadth, with strongly spicate extremities (fig. 55); foliaceous clavates, measuring 0.118^{mm} in length, and 0.080^{mm} in breadth above (fig. 56); bistellates, and complex stellates, measuring 0.112^{mm} in length, and 0.056^{mm} in breadth towards the extremities, the mesial belt of the bistellates measuring 0.030^{mm} in breadth (figs. 57. 58); and thinly spicated fusees with acuminate extremities, measuring 0.160^{mm} in length, and 0.040^{mm} in breadth (fig. 59).

On the anterior body of the polyps, foliaceous subclavates are most frequently met with, partly with straight, partly with somewhat bent, shaft; the straight subclavates are the largest, and measure 0.288^{mm} in length, and 0.128^{mm} in breadth above (fig. 60); the bent ones measure 0.220^{mm} in length, and 0.120^{mm} in breadth, and approach, somewhat, to the cruciform (fig. 61); between these, slender spicate subclavates are seen, which have a long acuminate shaft, and measure 0.200^{mm} in length, and 0.032^{mm} in breadth, (fig. 62); and, extremely rarely, a few spicate fusees measuring 0.200^{mm} in length, and 0.040^{mm} in breadth, (fig. 63).

On the posterior body, partly foliaceous, partly warted subclavates may be observed; these have a rather short shaft and measure from 0.100—0.200^{mm} in length, and

lige som krumme Spindler, der ere dels takkede, dels vortede, fra 0.260—0.300^{mm} lange og fra 0.035—0.060^{mm} brede, Fig. 66; særegne korte, bladede Klubber med et kort, bredt Skaft, Fig. 67. Imellem disse Spikler findes paa enkelte Flækker af Bagkroppen, især paa Bugsiden, Samlinger af smaa, meget forskjelligt formede, mere eller mindre flade Spikler, der ere fra 0.003—0.070^{mm} lange og fra 0.002—0.020^{mm} brede, Fig. 68.

Tentaklerne have paa Midten af deres aborale Sides nederste Halvdel en tyk Ribbe af Spikler, der dannes væsentligst af krumme og lige, takkede og vortede Køller, som ere 0.200^{mm} lange, 0.040^{mm} brede, Fig. 69. 70. Ovenfor og til Siderne af disse Køller sees meget mindre Spikler i Form af Køller, Spindler, Klubber og Firlinger; flere af dem ere meget smaa, fornemmelig de, som ligge op imod Tentakelens Ende, men de fleste ere dog fra 0.050—0.080^{mm} lange og fra 0.016—0.032^{mm} brede, Fig. 71.

Farven.

Stammen og Grenene havannabrune. Smaagrenene og Polyperne lys kastaniebrune, men Tentaklerne og især Pinnulerne intens mørkebrune.

Findested.

Station 48. Et Exemplar.

Artskarakter.

Zoanthodemet 60^{mm} høit. Stammen ved Grunden 45^{mm} i Omfang, furet paalangs og fra Basaldelen til Toppen rundt om forsynet med tætstaaende Grene. Basaldelen læderagtig, skiveformigt udvidet. Grenene tykke, runde, furede og fra deres Udspring tæt besatte dels med Smaagrene, dels med enkeltstaaende Polyper. Smaagrenene korte, tykke, bære overalt Polyper, ordnede i tætte Grupper af Udseende som Drueklaser. Stammen, Grenene og Smaagrenene rige paa Kalkspikler. Polyperne traktformige, 8—9^{mm} lange. Forkroppen mod Tentakelranden stærkt udvidet; Bagkroppen smal, lang. Hele Kroppen rig paa Spikler, bestaaende væsentligst af bladede Køller, men opimod Tentakelranden er der imellem Tentaklerne et triangulært Spatium uden Spikler. Tentaklerne vel forsynede med Spikler af forskjellig Form, Pinnulerne uden saadanne. Zoanthodemet overalt tæt besat med Nematocyster. Farven lys kastaniebrun med intens mørkebrune Pinnuler.

0.060^{mm} in breadth (figs. 64. 65); also, both, straight and bent fusees which, partly, are spicate, partly warted, and measure from 0.260—0.300^{mm} in length, and from 0.035—0.060^{mm} in breadth (fig. 66); peculiar short foliaceous clavates having a short broad shaft (fig. 67). Between these spicules, on some spots of the posterior body, especially on the ventral side, collections of minute, very variously formed, more or less flat, spicules may be seen, which measure from 0.003—0.070^{mm} in length, and from 0.002—0.020^{mm} in breadth (fig. 68).

In the middle of the lowest half part of their aboral side, the tentacles have a thick spicular rib formed, principally, of bent and straight, spicate and warted subclavates, which measure 0.200^{mm} in length, and 0.040^{mm} in breadth (figs. 69. 70). Above, and to the sides of these subclavates, much smaller spicules are seen, having the forms of subclavates, fusees, clavates and quadruplets; many of them are very minute, especially those that are situated up towards the extremity of the tentacle, but most of them, however, measure from 0.050—0.080^{mm} in length, and from 0.016—0.032^{mm} in breadth, (fig. 71).

Colour.

The stem and the branches are Havana-brown. The branchlets and the polyps, light chestnut-brown; but the tentacles, and especially the pinnules, are intense dark-brown.

Habitat.

Station No. 48. One specimen.

Specific characteristics.

The Zoanthodem measures up to 60^{mm} in height. The stem, at its base, measures 45^{mm} in circumference, is longitudinally grooved, and from the basal part to the summit is furnished, round about it, with closely-set branches. The basal part is coriaceous and discoidally dilated. The branches thick, cylindrical, grooved, and, quite from their root, are closely beset, partly, with branchlets, partly, with isolated polyps. The branchlets short, thick, and, everywhere, carry polyps arranged in closely-set groups having the appearance of clusters of grapes. The stem, the branches, and the branchlets, rich in calcareous spicules. The polyps are infundibuliform and measure 8—9^{mm} in length. The anterior body, towards the tentacular margin, is strongly dilated. The posterior body is long, and narrow. The entire body rich in spicules consisting, principally, of foliaceous subclavates, but up towards the tentacular margin there is, between the tentacles, a triangular space devoid of spicules. The tentacles well furnished with spicules of variable form, whilst the pin-

Nannodendron¹ elegans, n. g. et sp.

Tab. VII, Fig. 45—47. Tab. VIII.

Zoanthodemet er 35^{mm} høit. Stammen er rund, haard, læderagtig, furet efter Længden, omtrent 40^{mm} i Omkreds ved Grunden og aftager successivt lidt i Tykkelse op til Toppen, hvor den deler sig i 3—4 Grene. Basaldelen er tyk, fast, bred og skiveformigt udvidet. Stammen er fra Grunden og til dens Ende rundtom tæt besat med Grene, der ere af noget forskjellig Længde; de længste findes omtrent midt paa Stammen, ere indtil 15^{mm} lange, 5^{mm} brede ved deres Udspring og dobbelt saa brede henimod Enden; de ere kolbeformige, Tab. VIII, Fig. 1. a, og fra Siden udskyder dels en enkelt, dels indtil 3 Grene, der have samme Form som Hovedgrenen og ere saa tæt indpressede til denne, at de ligesom smelte sammen med den og give sig kun tilkjende ved en fin Fure, Tab. VII, Fig. 45.

Grenene, der ere haarde, stive, slutte sig næsten taglagte til hverandre og saa tæt til Stammen, at denne ganske skjules; de ere overalt, naar undtages i en Strækning af et Par Millimeter fra Udspringet, besatte med Polyper, som staa meget tætte, knapt en halv Millimeter fra hverandre, Tab. VII, Fig. 45. 46. Tab. VIII, Fig. 1.

Polyperne ere retraktile, cylindriske, omtrent 5^{mm} lange med en temmelig kort Bagkrop, som er noget smalere end Forkroppen, idet den gaar over i Coenenchymcellen. Hele Polypkroppen, der er 3^{mm} lang, er tæt besat med Spikler, som paa Forkroppen ligge pyramideformigt i Længderækker, mellem hvilke sees ogsaa tætliggende Spikler, Tab. VII, Fig. 47; paa den korte Bagkrop ligge Spiklerne mere paaskraas. Tentaklerne ere omtrent 2^{mm} lange og have paa deres aborale Side Spikler, der ligge paaskraas i to Rækker, Fig. 47. Pinnulerne ere uden Spikler.

Paa hele Zoanthodemet iagttages ægformede Nematocyster uden Spiraltraad.

Paa Stammen og Grenene sees runde, lidt ophøjede, hvidgule Legemer med en rund Aabning i Midten,

¹ νάννος = en Dværg; δένδρον = et Træ.

nules are devoid of any such. The Zoanthodem is, everywhere, closely beset with nematocysts. The colour light chestnut-brown, with the pinnules intense dark-brown.

Nannodendron¹ elegans, n. g. et sp.

Pl. VII, figs. 45—47. Pl. VIII, figs. 1—76.

The Zoanthodem measures 35^{mm} in height. The stem is cylindrical, hard, coriaceous, and longitudinally grooved; it measures about 40^{mm} in circumference at the base, and diminishes gradually in thickness up to the summit, where it ramifies into 3—4 branches. The basal part is thick, firm, broad, and discoidally dilated. The stem, from the base up to its summit, is, round about it, beset with branches, which are of somewhat variable length; the longest ones are met with about the middle of the stem, and these measure up to 15^{mm} in length, and 5^{mm} in breadth at their root, but are twice as broad towards the extremity. They are clavate-formed (Pl. VIII, fig. 1, a), and from the side there spring, partly, a single branch, partly, up to 3 branches, which have the same form as the parent branch and are so closely adpressed to it that they, as it were, become absorbed into it and are only recognisable by a minute groove (Pl. VII, fig. 45).

The branches, are hard, and stiff; they close almost imbricately upon each other, and so closely to the stem that it is almost concealed; they are, everywhere, except for a distance of a couple of millimetres from the root, beset with polyps, which are placed very close, scarcely half a millimetre from each other (Pl. VII, figs. 45. 46. Pl. VIII, fig. 1).

The polyps are retractile, cylindrical, and measure about 5^{mm} in length; they have a rather short posterior body, which is somewhat narrower than the anterior body owing to its production into the sarcosoma-cell. The entire body of the polyp, measuring 3^{mm} in length, is closely beset with spicules that, upon the anterior body, are placed pyramidically in longitudinal series, between which are, also, observed closely-set spicules (Pl. VII, fig. 47). On the short posterior body, the spicules are placed more diagonally. The tentacles are about 2^{mm} in length, and are furnished with spicules on their entire aboral side, placed in two diagonal series (Pl. VII, fig. 47). The pinnules are devoid of spicules.

On the entire Zoanthodem, ovate formed nematocysts, without spiral filament, are observed.

On the stem and the branches, cylindrical, slightly elevated, whitish-yellow corpuscles, are observed; these have a circular aperture in the middle, zooids; they are placed

¹ νάννος, a dwarf; δένδρον, a tree.

Zooider; de staa tæt sammen, og paa Grenene er det især omkring Polyperne, at de sees tydeligst, Tab. VIII, Fig. 1, *b*.

Zoanthodemets anatomisk-histologiske Bygning.

Stammen og Grenene ere paa den ydre Flade beklædte med et bredt Ectoderm, der bestaar af flere Lag polyædriske Celler, 0.008^{mm} med en rund, næsten central Kjerne, 0.002^{mm} med Kjernelegeme, Tab. VIII, Fig. 2, *a*. I de dybere Lag ere Cellerne tildels mere aflange og Protoplasmaindholdet rigere. Imellem Ectodermcellerne sees hist og her næsten pæreformede Celler med et kornet Indhold, encellede Slimkjerter, fuldkommen lig dem, jeg har beskrevet hos Slægten *Drifa*. I dette tykke Ectoderm-lag ere Spiklerne indleirede, saaledes at hver Spikel er ligesom indkapslet af Ectodermcellerne. Naar man har fjernet Spiklerne sees dette bedst, idet enhver Spikel efterlader et tomt Rum i Epithelet, Fig. 2, *b*.

I Almindelighed ere i Alcyonidernes ydre Hud Spiklerne placerede i Bindevævet og dækkede af Ectodermet; men hos *Nannodendron* er det som paa vist helt anderledes, og hvor enkelte Spikler hos denne ligge i Bindevævet, der er Ectodermet forlænget ned i den Bindevævshulhed, som optages af Spikelen og omgiver denne ganske. Hos denne Slægt synes Spikeldannelsen at være udelukkende afhængig af Ectodermet og er visselig et Produkt af dette.

Indenfor Ectodermet er et bredt, hyalint Bindevævs-lag, hvori sees Ernæringskanaler med deres Epithel, Fig. 2, *c*, samt Bindevævsceller med to eller flere Udløbere, Fig. 2, *d*, som korrespondere med de finere Nutritionskanaler. Fra dette Bindevævs indre Væg udgaa en Mængde tykkere eller smalere Forlængelser, der anastomosere med hverandre og danne, ikke alene de Længde- og Tverkanaler, der udgjøre Coenchymet, som her er meget bredt, Fig. 2, *e*, men ogsaa Hovedkanalerne, hvori Polyperne aabne sig. Det er dette Bindevæv, der udgjør Stokværket i Kolonibygningen. Samtlige Kanaler ere beklædte med et Endothel, dannet af lidt aflange Celler med en næsten rund Kjerne og Kjernelegeme, samt et rigt Protoplasmaindhold, Fig. 2, *e*.

I disse Bindevævsforlængelser sees, foruden de almindelige Bindevævslegemer, større og mindre Ernæringskanaler, beklædte med aflange Endothelceller, der ganske udfylde de fineste af disse Kanaler, Fig. 2, *f*.

close together, and, on the branches, it is especially round about the polyps that they are distinctly observed (Pl. VIII, fig. 1, *b*).

Anatomo-histological structure of the Zoanthodem.

The stem and the branches are clad, on the exterior surface, with a broad ectoderm consisting of several layers of polyhedral cells measuring 0.008^{mm} , and containing a round, almost central nucleus, measuring 0.002^{mm} , with a nucleus body (Pl. VIII, fig. 2, *a*). In the deeper layers the cells are, partly, more oblong, and the protoplasmic contents are richer. Between the ectoderm cells, piriform cells are, here and there, observed, which contain a granular substance, unicellular mucous glands exactly like those I have described as pertaining to the genus *Drifa*. In this thick ectoderm-layer, the spicules are entrenched in such manner, that each spicule is, as it were, encapsuled by the ectoderm-cells. That is best observed when we remove the spicules, because each spicule leaves then, behind it, a vacant space in the epithelium (Pl. VIII, fig. 2, *b*).

Usually, in the exterior integument of the Alcyonoids, the spicules are placed in the connective-tissue, and are covered by the ectoderm; but in *Nannodendron*, the case is, as we have shown, quite different; where, in it, a few spicules are placed in the connective-tissue, the ectoderm is, there, prolonged down into the connective-tissue cavity, which is occupied by the spicule and quite encompasses it. In this genus, the spicular formation appears to be exclusively dependent on the ectoderm, and is evidently its product.

Inside of the ectoderm, there is a broad layer of hyaline connective-tissue in which nutritory ducts with their epithelium are observed (Pl. VIII, fig. 2, *c*) also, connective-tissue cells with two or more prolongations (Pl. VIII, fig. 2, *d*), which correspond with the more minute nutritory ducts. From the inner wall of this connective-tissue, a multitude of thicker, or narrower, prolongations proceed; these anastomose with each other, and form, not only the longitudinal and transversal ducts that compose the sarcosoma, which is, here, very broad (Pl. VIII, fig. 2, *e*) but, also, the main ducts into which the polyps discharge themselves. It is this connective tissue that composes the framework of the structure of the colony. All of the ducts are clad with an endothelium formed of slightly oblong cells containing an almost round nucleus and nucleus body, and a rich protoplasmic substance (Pl. VIII, fig. 2, *e*).

In these connective tissue prolongations, there are observed, besides the usual connective-tissue corpuscles, also, larger, and smaller, nutritory ducts, lined with oblong endothelial cells that completely fill the minutest of the ducts (Pl. VIII, fig. 2, *f*).

Polyperne ere udvendigt beklædt med et Ectoderm, der har den samme Bygning som Stammens og Grenenes, — kun er det mindre bredt; ogsaa her iagttages encellede Slimkjertler, liggende temmelig tæt imellem Ectodermcellerne. I Ectodermet ere Spiklerne indleirede ligesom Tilfældet er paa Stammen.

Svælget er cylindrisk, foldet, og paa dets ydre Flade er indleiret i Epithelet 2 Rækker Spikler, en paa hver Side; de ere fra 0.068—0.120^{mm} lange og fra 0.040—0.048^{mm} brede, — kun en Firling fandtes paa det hele Svælg, forresten Spindler, Fig. 3. Paa Svælgets indre Flade sees langs Bugsiden en næsten triangulær Rende, der tager sin Begyndelse nogle Millimeter nedenfor Mundaabningen og strækker sig ned imod Svælgets fri Ende. Svælgrenden er beklædt med lange Pidskeceller, hvis Svøber rage langt op i Svælgkøllheden og adskille sig ikke fra dem, der ere omtalte hos Slægterne *Væringia* og *Drifa*. Den øvrige Del af Svælgets indre Flade er beklædt med aflange Celler, forsynede med Cilier, der dog langt fra ere saa lange og stive som Pidskecellernes. Imellem de nævnte Celler sees en Mængde aflange, encellede Slimkjertler, ikke væsentlig afvigende fra dem, jeg har omtalt hos *Væringia* og *Drifa*. I Svælgrenden fandtes ingen Slimkjertler; men lige under Epithelet paa dens øverste Del saaes nogle store, pæreformede Celler med en stor Kjerne, omgivet af Protoplasma, og som lignede de Ganglieceller, der fandtes hos *Væringia* just paa samme Sted.

Generationsorganerne udvikle sig paa flere Septula, dels i den bagre Del af Mavekøllheden, dels i dennes Forlængelse ned i Grenen. Æg i forskellige Udviklingsstadier iagttoges hos en hel Del Polyper.

Zooiderne, hvoraf der gives en stor Mængde, ere langstrakte, have en temmelig tynd Kropshud, en rund Mundaabning og et cylindrisk Svælg, fra hvis nedre Ende udgaa to yderst korte, fine Forlængelser (Gastralfilamenter?), der kun iagttoges hos nogle faa, imedens de fleste Zooider syntes at være uden saadanne. Da Svælget laa meget tæt til Kropshuden, uden at det var muligt at se nogen Skillevej, havde disse Zooider megen Lighed med Tentakelrørene hos Søstjerneerne, og deres Function tør være den samme, Fig. 2, *g*.

Spiklerne paa Basaldelen ligge kompakt paa hverandre og ere meget vanskelige at isolere. De hyppigste Former ere Dobbeltstjerner og mere sammensatte Stjerner. Dobbeltstjerneerne ere fra 0.076—0.124^{mm} lange og fra 0.048—0.068^{mm} brede og have som oftest et nøgent Midtbelte, Fig. 4—6. De mere sammensatte Stjernespikler ere tildels temmelig uregelmæssige og deres Straaler snart bladformede, snart vortede i Enderne; de ere fra 0.104—

The polyps are, exteriorly, clad with an ectoderm that has the same structure as that of the stem and the branches, only not quite so broad, and, here, unicellular mucous glands are also observed, placed, pretty closely, between the ectoderm cells. The spicules are entrenched in the ectoderm, in same manner as in the stem.

The gullet is cylindrical, folded, and, on its exterior surface, 2 series of spicules are entrenched in the epithelium, one series on each side; these measure from 0.068—0.120^{mm} in length, and from 0.040—0.048^{mm} in breadth; one quadruplet only was found on the entire gullet, otherwise, fusees (Pl. VIII, fig. 3). On the inner surface of the gullet there is observed, along the ventral side, an almost triangular channel, which has its origin a few millimetres below the oral aperture, and extends down towards the free extremity of the gullet. The gullet channel is clad with long flagelliform-cells whose whips reach far up into the gullet cavity, and they do not differ from those which are mentioned in connection with the genera *Væringia* and *Drifa*. The remainder of the inner surface of the gullet is clad with oblong cells furnished with ciliae which, however, are far from being so long and stiff as those of the flagelliform-cells. Between the cells mentioned, a multitude of oblong unicellular mucous glands are observed, not differing, materially, from those I have described in connection with *Væringia* and *Drifa*. In the gullet channel, no mucous glands are found, but just below the epithelium, on its uppermost part, a few large, piriform cells were seen, containing a large nucleus surrounded by protoplasm, and these resembled the ganglial-cells which were found in *Væringia* exactly in the same situation.

The generative organs develop themselves upon several septula, partly, in the posterior part of the ventral cavity, partly, in its prolongations down into the branch. Ova in different stages of development were observed in a large number of polyps.

The Zooids, of which there are a great multitude, are elongate, and have a rather thin integument on the body, a circular oral aperture, and a cylindrical gullet from whose lower extremity two, extremely short, slender prolongations proceed (gastral filaments?); these are only seen in a few, whilst the greater number of Zooids appear to be without any such. As the gullet lay very close to the integument of the body, without it being possible to detect any divisional wall, these Zooids had much resemblance to the tentacular tubes of the Asteroideæ, and their function may, perhaps, be the same (Pl. VIII, fig. 2, *g*).

The spicules on the basal part are placed compactly upon each other, and are very difficult to isolate. The most frequent forms are bistellates, and more complex stellates. The bistellates measure, from 0.076—0.124^{mm} in length, and from 0.048—0.068^{mm} in breadth, and have, most frequently, a bare mesial belt (Pl. VIII, figs. 4—6). The more complex stellate-spicules are, partly, rather irregular; their rays are sometimes foliaceous,

0.160^{mm} lange og fra 0.060—0.104^{mm} brede, Fig. 7—10. Imellem disse Spikler sees Firlinger i Form af Timeglas, besatte med Knuder, 0.108^{mm} lange, 0.070^{mm} brede, Fig. 11, eller i Korsform, tildels rigt ornamenterede, 0.128^{mm} lange, 0.120^{mm} brede, Fig. 12, eller besatte med et større eller mindre Antal Vorter; disse sidste ere omtrent lige lange som brede, 0.120^{mm} i Gjennemsnit, Fig. 13. 14; Klubber, som ere kun lidet besatte med Vorter, fra 0.092—0.124^{mm} lange og fra 0.052—0.056^{mm} brede foroven, Fig. 15. 16, eller bladede med et kort, enten tornet eller nøgent Skaft, fra 0.100—0.128^{mm} lange og fra 0.052—0.088^{mm} brede foroven, Fig. 17. 18; endelig hist og her nogle Spikler, der nærme sig Korsformen og ere enten næsten glatte eller tornede; de ere fra 0.084—0.112^{mm} lange og fra 0.056—0.060^{mm} brede, Fig. 19. 20.

Paa Stammen, der ligeledes er meget rig paa Spikler, ligge dog disse ikke egentlig paa hverandre, men slutte sig tæt sammen, især paa dens nederste Del. De almindeligste ere sammensatte Stjerner, Dobbeltstjerner, bladede Klubber, Rosetter og Firlinger.

De sammensatte Stjerner ere meget forskellige i Form og, som tidligere berørt, er det kun ved at sønderlemme dem, at Stjerneformen fremkommer altid mere eller mindre tydeligt; de ere fra 0.104—0.176^{mm} lange og fra 0.060—0.108^{mm} brede, Fig. 21—23. Dobbeltstjerneerne ere i Regelen forsynede med et nøgent Midtparti og Straalerne ofte brede, bladformede; de ere fra 0.092—0.136^{mm} lange og fra 0.052—0.092^{mm} brede, Midtbeltet er fra 0.016—0.036^{mm} bredt, Fig. 24—28. Klubberne have nogen Lighed med en Blomsterbuket, Skaftet er i Almindelighed kort og bredt; de ere fra 0.060—0.108^{mm} lange og fra 0.052—0.080^{mm} brede, Fig. 29—31. Rosetterne ere meget forskelligt formede og strøede indimellem Stjerne-spiklerne; de ere omtrent lige lange som brede, i Gjennemsnit variere de fra 0.024—0.080^{mm}, Fig. 32—36. Firlingerne findes overalt paa Stammen, dog kun enkeltvis, og ere fra 0.060—0.104^{mm} lange og fra 0.064—0.124^{mm} brede, Fig. 37—40; enkelte af Firlingerne have udpræget Korsform; deres Længdestok er fra 0.196—0.216^{mm} og Tverstokken fra 0.096—0.152^{mm}, Fig. 41. 42. Kun yderst sjældent sees en Spikel, der nærmer sig Dobbeltkuglen; begge de afrundede Ender ere besatte med Torne og Midtpartiet er nøgent; de ere 0.096^{mm} lange, 0.068^{mm} brede i Enderne; Midtbeltet er 0.024^{mm} bredt, Fig. 43.

sometimes warted, at the extremities; they measure from 0.104—0.160^{mm} in length, and from 0.060—0.104^{mm} in breadth (Pl. VIII, figs. 7—10). Between these spicules, quadruplets, of hour-glass form, are observed, beset with knots and measuring 0.108^{mm} in length, and 0.070^{mm} in breadth (Pl. VIII, fig. 11); or cruciform, partly, richly embellished, and measuring 0.128^{mm} in length, and 0.120^{mm} in breadth (Pl. VIII, fig. 12); or, beset with a larger, or smaller, number of warts; the last mentioned are about as long as they are broad, and measure 0.120^{mm} in diameter (Pl. VIII, figs. 13. 14); also, clavates, which are only slightly beset with warts, and measure from 0.092—0.124^{mm} in length, and from 0.052—0.056^{mm} in breadth above (Pl. VIII, figs. 15. 16); or, they are foliaceous, with a short, either aculeated or bare, shaft, and measure from 0.100—0.128^{mm} in length, and from 0.052—0.088^{mm} in breadth above (Pl. VIII, figs. 17. 18); finally, there are seen here and there a few spicules which approach to the cruciform, are, either, almost smooth, or aculeated, and which measure from 0.084—0.112^{mm} in length, and from 0.056—0.060^{mm} in breadth, (Pl. VIII, figs. 19. 20).

On the stem, which is likewise very rich in spicules, they are not, however, exactly placed upon each other, but they close together, especially upon its lowest part. The most frequent forms are, complex stellates, bistellates, foliaceous clavates, rosettes, and quadruplets.

The complex stellates are very variable in form, and, as previously alluded to, it is only upon breaking them up that the stellate form appears, always more or less distinctly; they measure from 0.104—0.176^{mm} in length, and from 0.060—0.108^{mm} in breadth (Pl. VIII, figs. 21—23). The bistellates are, as a rule, furnished with a bare mesial part, and the rays are, frequently, broad and foliaceous; they measure, from 0.092—0.136^{mm} in length, and from 0.052—0.092^{mm} in breadth. The mesial belt measures from 0.016—0.036^{mm} in breadth (Pl. VIII, figs. 24—28). The clavates have much resemblance to a bouquet of flowers; the shaft is, usually, short and broad, and they measure from 0.060—0.108^{mm} in length, and from 0.052—0.080^{mm} in breadth (Pl. VIII, figs. 29—31). The rosettes are very various in form, and are strewn in amongst the stellate spicules; they are about as long as they are broad, and their diameter varies from 0.024—0.080^{mm} (Pl. VIII, figs. 32—36). The quadruplets are met with everywhere on the stem, but only singly; they measure from 0.060—0.104^{mm} in length, and from 0.064—0.124^{mm} in breadth (Pl. VIII, figs. 37—40); a few of the quadruplets have distinguished cruciform; their longitudinal arm measures from 0.196—0.216^{mm}, and the transversal arm from 0.096—0.152^{mm} (Pl. VIII, figs. 41. 42). Only very rarely is a spicule seen which approaches to the double sphere in form; both of its rounded extremities are beset with aculeæ, and its mesial part is bare; it measures from 0.096^{mm} in length, and 0.068^{mm} in breadth at the extremities. The mesial belt measures 0.024^{mm} in breadth (Pl. VIII, fig. 43).

Paa Grenene ere sammensatte Stjerner og Rosetter de almindeligste Spikelformer. De sammensatte Stjerner have brede, bladede Straaler og ere fra 0.080—0.208^{mm} lange og fra 0.060—0.096^{mm} brede, Fig. 44—46. Rosetterne ere forskjellige i Form fra dem, der findes paa Stammen, ligesom de ere temmelig mørk gulbrunfarvede og fra 0.060—0.080^{mm} lange og fra 0.056—0.068^{mm} brede, Fig. 47—50. Imellem disse Spikler, men temmelig sjældent, sees Klubber, hvoraf enkelte ere saagodtsom ganske glatte, medens andre ere bladede med et næsten 'glat Skaft; de ere fra 0.104—0.224^{mm} lange og fra 0.060—0.112^{mm} brede foroven, Fig. 51. 52. Dobbeltstjernerne ere her yderst sjeldne, 0.120^{mm} lange, 0.068^{mm} brede mod Enderne og med et nøgent Midtbelte, der er 0.016^{mm} bredt, Fig. 53; men sjeldnest er dog en pyramideformet, takket Spikel med en bred Basis, 0.148^{mm} lang, 0.100^{mm} bred ved Grunden, Fig. 54.

Paa Polypkroppen er det fornemmelig Spindel- og Tapformen, der gjør sig gjældende. Spindlerne ere takkede, dels lige, dels krumme, fra 0.188—0.420^{mm} lange og fra 0.028—0.076^{mm} brede, Fig. 55—58; paa enkelte af disse Spindler sees den begyndende Korsdannelse, der dog er sjelden. Tapperne ere takkede, stundom lidt krummede; de mindste ere 0.096^{mm} lange og 0.040^{mm} brede foroven, men de største, som ere de almindeligste, ere 0.220^{mm} lange, 0.048^{mm} brede foroven, hvor de ere næsten tvers afskaarne, Fig. 59—62. Imellem disse Spikler sees krumme, takkede og vortede Koller, tildels med et tyndt, tilspidset Haandgreb; de ere fra 0.084—0.132^{mm} lange og fra 0.036—0.052^{mm} brede, Fig. 63. 64, samt enkelte, men sjeldne, tornede Klubber, fra hvis øverste Ende udgaa lange, tykke Takker, Fig. 65.

Paa den nederste Halvdel af Tentaklernes aborale Side findes lignende store, takkede Spindler og Tapper som de, der ere omtalte paa Kroppen, Fig. 56—60; men dels til Siderne, dels ovenfor dem sees Rækker af mindre Spikler, der ere noget fladere og have en meget forskjellig Form, hvoriblandt korsformede Firlinger. Disse Spikler ere takkede, tornede og variere meget i Størrelse, fra 0.024—0.088^{mm} lange og fra 0.016—0.036^{mm} brede; de korsformede Firlinger have en Længdestok fra 0.056—0.080^{mm} og en Tverstok fra 0.024—0.056^{mm} Fig. 66—76.

Farven.

Gul, spillende lidt i det Brune.

Den norske Nordhavsekspektion. D. C. Daniellssen: Alcyonida.

On the branches, the complex stellates and rosettes are the most frequent spicular forms. The complex stellates have broad foliaceous rays, and measure from 0.080—0.208^{mm} in length, and from 0.060—0.096^{mm} in breadth (Pl. VIII, figs. 44—46). The rosettes are different in form from those that are found on the stem, whilst, also, they are pretty dark yellowish-brown in colour; they measure from 0.060—0.080^{mm} in length, and from 0.056—0.068^{mm} in breadth (Pl. VIII, figs. 47—50). Between these spicules, but rather rarely, clavates are observed, of which a few are nearly quite smooth, whilst others are foliaceous and have an almost smooth shaft; they measure from 0.104—0.224 in length, and from 0.060—0.112^{mm} in breadth above (Pl. VIII, figs. 51. 52). The bistellates are, in this situation, extremely rare, and measure 0.120^{mm} in length, and 0.068^{mm} in breadth towards the extremities, and they have a bare mesial belt measuring 0.016^{mm} in breadth (Pl. VIII, fig. 53); but the most rare of all is, the piri-form spicate spicule with a broad basis; it measures 0.148^{mm} in length, and 0.100^{mm} in breadth at the base, (Pl. VIII, fig. 54).

On the body of the polyp, it is principally fusiform and coniform spicules which are most prominent. The fusees are spicate, partly straight, partly bent, and measure from 0.188—0.420^{mm} in length, and from 0.028—0.076^{mm} in breadth (Pl. VIII, figs. 55—58). In a few of these fusees, the rudimentary crucial-formation is observed, but rarely however. The cones are spicate, occasionally they are a little bent; the smallest measure 0.096^{mm} in length, and 0.040^{mm} in breadth above; but the largest, which also are the most frequent, measure 0.220^{mm} in length, and 0.048^{mm} in breadth above, at which point they are almost transversely truncated (Pl. VIII, figs. 59—62). Between these spicules, bent, spicate and warted subclavates are seen, partly, with a thin acuminate shaft; they measure from 0.084—0.132^{mm} in length, and from 0.036—0.052^{mm} in breadth, (Pl. VIII, figs. 63. 64), also, but rarely, a few aculeated clavates from whose uppermost extremity long thick spikes proceed (Pl. VIII, fig. 65).

On the lowest half part of the aboral side of the tentacles, large spicate fusees and cones, similar to those spoken of in connection with the body, are found (Pl. VIII, figs. 56—60) but, partly to the sides of these, partly above them, series of smaller spicules are seen, which are somewhat flatter, and have very variable forms, amongst these being cruciform quadruplets. These spicules are spicate, or aculeated, and they vary much in size, measuring from 0.024—0.088^{mm} in length, and from 0.016—0.036^{mm} in breadth. The cruciform quadruplets have a longitudinal arm measuring from 0.056—0.080^{mm} in length, and a transversal arm measuring from 0.024—0.056^{mm} (Pl. VIII, figs. 66—76).

Colour.

Yellow, shading a little towards brown.

Findested.

Station No. 267. Et større og et mindre Exemplar.

Slægtskarakter.

Zoanthodemet trædannet. Stammen haard, furet, fra Grunden og til Toppen rundt om tæt besat med haarde, stive, lappede, kolbeformede Grene, der slutte sig tæt til hverandre og overalt rigt forsynede med Polyper. Basaldelen haard, læderagtig, skiveformigt udvidet. Saavel denne som Stammen og Grenene rige paa Spikler. Polyperne retraktile, cylindriske, rige paa Spikler. Tentaklerne omtrent halvt saa lange som Polypkroppen og hele deres aborale Side spikelrig. Zooider overalt paa Stammen og Grenene. Polypsvælget forsynet med Spikler.

Artskarakter.

Zoanthodemet indtil 35^{mm} høit. Stammen rund, haard, furet paalangs, omtrent 40^{mm} i Omkreds ved Grunden, aftagende successivt lidt i Tykkelse op til Toppen, hvor den deler sig i 3—4 Grene og er fra Grunden og til den øverste Ende rundt om tæt besat med kolbeformede, lappede, haarde Grene, der overalt ere rigt forsynede med Polyper. Grenene slutte tæt til hverandre, dække næsten ganske Stammen. Basaldelen haard, læderagtig, skiveformigt udvidet. Polyperne cylindriske med en temmelig kort Bagkrop. Overalt paa Stammen og Grenene Zooider, samt Nematocyster paa hele Zoanthodemet. Spiklerne paa Basaldelen danne almindeligst Dobbeltstjerner og sammensatte Stjerner; paa Stammen og Grenene ere sammensatte Stjerner, bladede Klubber og Rosetter hyppigst, og paa Polyperne ere lange, krumme og lige, takkede Spindler, samt takkede Tapper sædvanligst. Farven gul, spillende lidt i det Brune.

Fulla¹ Schiertzi², n. g. et sp.

Tab. X.

Zoanthodemet er 65—70^{mm} høit. Basaldelen er noget udvidet, svampet. Stammen, der er næsten rund og furet paalangs, er ved Grunden 30—35^{mm} i Omkreds, men af-

¹ Fulla, Friggas Terne, en af Asynierne.

² Arten er opkaldt efter Frantz Schiertz, der var Maler paa Expeditionen.

Habitat.

Station No. 267. One largish and one small specimen.

Generic characteristics.

The Zoanthodem arborescent. The stem hard, grooved; from its base to the summit, beset, round about it, with hard, stiff, lobate, clavate-formed branches that close compactly in to each other, and are, everywhere, richly beset with polyps. The basal part, hard, coriaceous, and discoidally dilated. It, as well as the stem and the branches, is rich in spicules. The polyps retractile, cylindrical, and rich in spicules. The tentacles about half the length of the body of the polyp, and their entire aboral side richly furnished with spicules. On the stem and the branches; Zooids everywhere. The gullet of the polyp furnished with spicules.

Specific characteristics.

The Zoanthodem measures up to 35^{mm} in height. The stem cylindrical, hard, longitudinally grooved, and measures about 40^{mm} in circumference at the base, diminishing, gradually, a little in thickness up towards the summit, at which point it ramifies into 3—4 branches; it is beset, round about it, from its base to its uppermost extremity, with clavate-formed, lobate, hard branches, which are, everywhere, furnished with polyps. The branches close compactly together and almost quite cover the stem. The basal part hard, coriaceous, and discoidally dilated. The polyps cylindrical, with a rather short posterior body. On the stem and the branches, Zooids every where, also, over the entire Zoanthodem, nematocysts. The spicules of the basal part form, most frequently, bistellates and complex stellates; on the stem and the branches, complex stellates, foliaceous clavates, and rosettes, are most frequent; and, in the polyps, long, bent or straight, spicate fusees, and spicate cones are the most frequent. Colour: yellow, shading a little to brown.

Fulla¹ Schiertzi², n. g. et sp.

Plate X.

The Zoanthodem measures 65—70^{mm} in height. The basal part is somewhat expanded and spongy. The stem is almost cylindrical, and is longitudinally grooved; it

¹ Fulla, Frigga's handmaiden, one of the Asyns.

² The species is named after Frantz Schiertz, the artist accompanying the Expedition.

tager successivt i Tykkelse op til Enden, hvor den knap er 8^{mm} tyk, før den deler sig i to Grene. Den er saagodtsom nøgen paa 2 Sider og dertil lidt fladtrykt, saa den kan betragtes som havende en Bug- og en Rygside. Bugsiden er for Størstedelen nøgen, kun ved dens nederste Parti, strax ovenfor Basaldelen og noget længere op paa Stammen, udspringe enkelte smaa Polypgrupper, der dog ved nøiere Betragtning staa noget til Siden, Fig. 58. Rygsiden er ganske nøgen, naar undtages dens nederste Del, hvor der er en liden, tynd Gren, som bærer nogle Polyper, Fig. 59, a. Paa begge Sider af Stammen derimod udspringe Grenene lige fra Basaldelen til Toppen, Fig. 59. Grenene staa temmelig langt fra hverandre, ere af forskjellig Længde, — de længste findes omtrent paa Midten af Stammen, — men alle ere furede paalangs, og paa den Side, der svarer til Stammens Rygside, ere de nøgne, Fig. 60. Paa de tyndere, yngre Grene ere begge Flader ligesom paa Stammen nøgne, saa at Polyperne udspringe fra Grenens Sider. Lige fra Grenens Udspring og til deres Ende ere de forsynede med Polyper, der dels udgaa enkeltvis og direkte, dels danne Grupper, som samle sig i en Stilk, der gaar over i Grenen, Fig. 58. 59. Paa Enden af de større Grene findes i Almindelighed en Samling af 6—8 Polyper, Fig. 60. Baade Stammen og Grenene ere temmelig bløde og bøjelige.

Polyperne ere retraktile, langstrakte, cylindriske, 8—9^{mm} lange med en temmelig lang Bagkrop og en noget mere udvidet Forkrop, Fig. 61. Polypkroppen er omtrent 5^{mm} lang og rig paa Spikler. Paa Bagkroppen ligge de paatvers i 8 Længderækker, Fig. 61, a, og der, hvor den gaar over i Forkroppen, omgive de denne som Guirlander; men paa selve Forkroppen antage Spiklerne en mere lodret Stilling og danne 8 Længderækker, imellem hvilke ligge mere paatversgaaende Spikler, Fig. 61. Tentaklerne ere omtrent halvt saa lange som Kroppen, og paa deres hele aborale Side sees Spikler; Pinnulerne ere temmelig lange og forsynede med Spikler, Fig. 61.

Den anatomisk-histologiske Bygning.

Stammen og Grenene ere udvendigt beklædte med et tykt Epithel, bestaaende af mange Lag væsentligst polyædriske Celler, der ere fra 0.006—0.008^{mm} store, have en temmelig skarpt begrændset Membran, som er ganske klar og træder kun frem ved Farvning, samt en rund Kjerne, 0.004^{mm} i Diameter med et, stundom to Kjernelegemer,

measures 30—35^{mm} in circumference at the base, but diminishes, gradually, in thickness up towards the summit, at which point it is barely 8^{mm} thick, when it ramifies into two branches. It is almost entirely bare on two sides, and is, besides, a little flattened, so that it may be considered as having, a ventral and also a dorsal side. The ventral side is, for the greater part, bare; on its lower part, alone, immediately above the basal part and somewhat further up the stem, a few small groups of polyps shoot out, but, upon closer examination, these are seen to be placed somewhat to the side (fig. 58). The dorsal side is quite bare with exception of its lowest portion, where, there is a small thin branch carrying a few polyps (fig. 59). On both sides of the stem, on the other hand, the branches spring throughout the whole length from the base to the summit (fig. 59). The branches are situated pretty far apart from each other and are of variable length. The longest branches are found about the middle of the stem, but all of them are longitudinally grooved, and upon the side that corresponds to the dorsal side of the stem they are bare (fig. 60). On the thin younger branches, both surfaces are bare, as in the case of the stem, so that the polyps shoot out from the sides of the branches. From the very root of the branches, and up to their extremities, they are furnished with polyps which, partly, shoot out individually and direct, partly, form groups which collect together into a stalk that is produced into the branch (figs. 58. 59). At the extremity of the larger branches there is, usually, a collection of 6—8 polyps (fig. 60). Both, the stem and the branches, are rather soft and flexible.

The polyps are retractile, elongate, and cylindrical; they measure 8—9^{mm} in length, have a rather long posterior body, and a somewhat more dilated anterior body (fig. 61). The body of the polyp measures about 5^{mm} in length, and is abundantly furnished with spicules. On the posterior body, the polyps are placed transversely in 8 longitudinal series, (fig. 61 a), and, at the point where it becomes produced into the anterior body, they surround it like garlands, but on the anterior body, itself, the spicules acquire a more vertical position and form 8 longitudinal series, between which, spicules, placed more transversally, appear (fig. 61). The tentacles are about half the length of the body, and spicules are visible along the entire aboral side. The pinnules are rather long and are furnished with spicules (fig. 61).

Anatomo-histological structure.

The stem and the branches are, exteriorly, clad with a thick epithelium consisting of many layers principally of polyhedral cells, measuring from 0.006—0.008^{mm} in diameter; these have a pretty sharply defined membrane, which is quite pellucid and only appears visible on staining; and further, a spherical nucleus measuring

Fig. 62, *a*. I de ydre Lag er Celleindholdet kun ringe, i de indre derimod rigere, fintkornet og skjuler tildels Kjernen, Fig. 62, *b*. I de indre Lag ere Cellerne hyppig mere aflange, ikke saa kantede, have et tættere Protoplasma-indhold, og her iagttages dels enkeltvis, dels mere samlede, kolbeformige Legemer med en lang Hals, der strækker sig op imellem de polyædriske Celler indtil Ectodermets Overflade, Fig. 62, *c*. Disse kolbeformige Legemer have et kornet Indhold, der hyppig skjuler ganske den temmelig store Kjerne; de ere encellede Slimkjertler med Udførselsgang. Det lykkes ikke saa ganske sjældent at kunne se Indholdet ligge dels i Udførselsgangens Aabning, dels udenfor samme, og da træder Kjernen meget tydelig frem, idet Cellen forresten er ganske tom. I de indre Lag af Ectodermet, lige paa Grændsen imellem dette og Bindevævet, sees Spiklerne indleirede; de ere omgivne af Epithet, hvilket bedst iagttages, naar de ere fjernede; paa Randen af de tomme Rum, som de efterlader, sees nemlig de mere aflange Ectodermceller med deres Kjerne, Fig. 62, *d*, og det er meget sandsynligt, at disse Celler have en væsentlig Andel i Spikeldannelsen. Indenfor Ectodermet er et overordentlig bredt, hyalint Bindevævslag, Fig. 62, *e*, hvori findes en Mængde Nutritionskanaler, forsynede med Epithel, Fig. 62, *f*, samt Bindevævslegemer med Udløbere, Fig. 62, *g*; ogsaa her korrespondere Bindevævslegemerne ikke alene med hverandre indbyrdes, men ogsaa med de fine Nutritionskanaler.

Fra Bindevævs indre Flade udgaa temmelig brede Forlængelser, der danne de store Kanaler, hvori Polyperne aabne sig. Disse Kanaler ere i Forhold til Polypernes Antal kun ringe; saaledes have de store Grene i Regelen kun 6—7 saadanne Kanaler, Fig. 63, *a*, imedens der paa Grenen kan sidde et halvt Hundrede og flere Polyper. Den bilaterale Symetri, som tidligere er omtalt, kommer ogsaa til syne i det hyaline Bindevævslag, idet Ryg- og Bugsiden paa Stammen har et overmaade bredt Bindevæv, hvori Kanalerne staa langt fra hverandre, imedens dette paa Sidedelene, hvor Grenene udspringe, er betydeligt smalere. Ligesaa forholder det sig med Grenene; her, hvor Polyperne i Regelen udspringe paa to Sider, er Bindevævet meget smalere, Fig. 64, *a*, end paa de Steder, der svare til Bug og Ryg paa Stammen, Fig. 64, *b*. Paa den indre Flade af det hyaline Bindevæv ligger Muskellaget, bestaaende af Længde- og Tverfibre, der ere ordnede paa den sædvanlige Maade, og som er beklædt med et Epithel, dannet af runde Celler, 0.008^{mm} i Diameter, med store Kjerner. Nutritionskanalerne ere ligeledes beklædte med et Epithel, hvis Celler ere mere aflange, og som ganske udfylde Lumenet i de fineste Kanaler.

0.004^{mm} in diameter, containing one, and sometimes two nucleolei (fig. 62, *a*). In the exterior layer the cellular contents is only thin; in the inner layer it is, on the other hand, richer, and minutely granular, and partly conceals the nucleus (fig. 62, *b*). In the interior layers the cells are, frequently, more oblong and not so polyhedral, and they contain a more dense protoplasmic substance. I observed here, partly single, and partly grouped together, clavate-formed bodies with a long neck, extending up between the polyhedral cells until they reach the outer surface of the ectoderm (fig. 62, *c*). These clavate-formed bodies contain a granular substance that frequently conceals the rather large nucleus; they are unicellular mucous glands with an excretory duct. It happened, not so very seldom, that the contents might be observed lying, partly, in the aperture of the excretory duct, and partly, outside of it, and when this was the case the nucleus appeared very distinctly, as the cell is otherwise quite empty. In the interior layers of the ectoderm, exactly at the margin between it and the connective-tissue, the spicules are seen to be entrenched, and are enclosed by the epithelium; this is best observed on removing them, because on the margin of the vacant space which they leave, the more oblong ectoderm cells with their nuclei may be observed, (fig. 62, *d*) and it is very probable that these cells play an essential part in the spicular formation. Inside of the ectoderm, there is an extremely broad layer of hyaline connective-tissue (fig. 62, *e*) in which a multitude of nutritory ducts furnished with epithelium are found, (fig. 62, *f*) and further, connective-tissue corpuscles with prolongations (fig. 62, *g*) and here, also, the connective-tissue corpuscles correspond, not only with each other reciprocally, but also with the minute nutritory ducts.

From the inner surface of the connective-tissue, rather broad prolongations proceed; these form the large ducts into which the polyps open. These ducts are, in relation to the number of the polyps, not numerous; the large branches have, for instance, usually, only 6—7 such ducts (fig. 63, *a*) whilst, there is space on the branch for a half hundred, or more, polyps as well. The bilateral symmetry, which has been, previously, mentioned, becomes, also, apparent in the layer of hyaline connective-tissue, because, the dorsal and ventral sides of the stem have an extremely broad connective-tissue, in which the ducts are situated far apart from each other, whilst, upon the lateral parts, where the branches have their roots, it is greatly narrower. A similar thing occurs in the case of the branches; in these, where the polyps project, the connective-tissue is usually, upon two sides, somewhat narrower (fig. 64, *a*) than it is on the other sides corresponding to the ventrum and dorsum of the stem (fig. 64, *b*). The muscular layer is situated on the inner surface of the hyaline connective-tissue and consists of longitudinal and transversal fibres, disposed in the usual manner and clad with an epithelium formed of cylinder-cells measuring 0.008^{mm} in diameter, and containing large nuclei. The nutritory ducts are, likewise, clad with an epithelium,

Polyperne ere paa deres ydre Flade omgivne af et Ectoderm, Fig. 65, *a*, der kun adskiller sig fra det, der beklæder Stammen og Grenene, ved at Cellerne danne færre Lag. Ogsaa her sees lignende Slimkjertler som de paa Stammen og Grenene, ligesom de fleste Spikler ligge i Ectodermets indre Cellelag, hvor Cellerne ere mere eller mindre aflange. Kun enkeltvis sees hist og her en Spikel nedsænket i Bindevævet, men da er denne Bindevævs-hulhed, hvori den ligger, beklædt med et Epithel, der er en Forlængelse af Ectodermet. Indenfor den ydre Epithelial-beklædning optræder et Lag hyalint Bindevæv, forsynet med Bindevævslegemer og Nutritionskanaler, og fra hvis indre Flade udgaa 8 Septa, Fig. 65, *b. c*, der fæste sig paa Svælget og danne Kamrene, Fig. 65. Paa Bindevævet indre Væg ligger Muskellaget, Fig. 65, *d*, der gaar over paa Septa saaledes nemlig, at de transverselle Muskler ligge paa den ene og de longitudinelle paa den anden Side af hvert Septum for at udbrede sig paa Svælget. Dette Muskellag er overtrukket med et Endothel, der bestaar af flere Lag runde Celler, lig dem, som ere omtalte ved de store Kanaler i Stammen og Grenene. Men foruden Endothelcellerne iagttages i Kamrene ligesom i Kanalerne, der tildels kunne betragtes som Fortsættelse af disse, isolerede, runde, klare Celler, indtil 0.010^{mm} i Gjennemsnit, og som har et fintkornet Protoplasmahold; de ligne meget hvide Blodlegemer hos de høiere Dyr og indeholdes i den Ernæringsvædske, som gennemstrømmer hele Polypkolonien. Hos enkelte Polyper forlænger Mavehulheden sig ned i de store Længdekanaler, og da sees Septa som Septula at følge Kanalerne lige til deres Bund; hvor dette er Tilfældet, findes Generationsorganerne at udvikle sig paa flere Septula i den øverste Del af Kanalerne, eller, om man vil, i den forlængede Mavehulhed, imedens hos andre, og det hos de fleste Polyper, forsnævrer Mavehulheden sig snart og danner en meget trang Kanal, der vel aabner sig i en af de store Længdekanaler, men som dog ganske udfyldes af Endothelceller, saa at ingen Septula findes der, — og hos disse Polyper udvikle Generationsorganerne sig i selve Mavehulheden.

Svælget er langstrakt, cylindrisk; dets udvendige Flade er beklædt med de tidligere omtalte Endothelceller, der støde til et hyalint Bindevævs-lag. Lige paa Grændsen af dette og Endothelet, men ligesom nedsænket i Bindevævet, sees paa hver Side en bred Længderække af Spikler — 3—4 lidt paaskraasgaende Spikler i hver Række — imedens Midtpartiet af Svælget saavel paa Bug- som Rygsiden er uden Spikler, Fig. 66. Fra Svælgets nederste

whose cells are more oblong, and quite fill out the channel in the minutest ducts.

The polyps are, on their exterior surface, surrounded by an ectoderm (fig. 65, *a*) differing, only, from that which clothes the stem and the branches, in that the cells are disposed in fewer layers. Here, also, similar mucous glands to those seen on the stem and the branches are observed, whilst, also, the greater number of the spicules are situated in the interior cellular layer of the ectoderm, where the cells are more or less oblong. Only occasionally is a spicule seen, here and there, embedded in the connective-tissue, but in that case the connective-tissue cavity in which it is situated is clad with an epithelium which is a prolongation of the ectoderm. Inside of the exterior epithelial covering, a layer of hyaline connective-tissue appears, furnished with connective-tissue corpuscles and nutritory ducts, and from whose inner surface 8 septa proceed; (fig. 65, *b. c*) these are secured to the gullet and form the chambers (fig. 65). The muscular layer is situated on the inner wall of the connective-tissue (fig. 65, *d*); this is produced into the septa in such manner, that the transversal muscles are placed on the one side, and the longitudinal muscles on the other side of each septum, so as to extend themselves on the gullet. This muscular layer is clothed with an endothelium consisting of several layers of cylinder-cells like those spoken of in connection with the large ducts in the stem and the branches. But besides the endothelial cells, there are observed in the chambers, as well as in the ducts which in a measure may be considered to be continuations of them, solitary, pellucid, cylinder-cells, measuring up to 0.010^{mm} in diameter, and occupied by a minute granular, protoplasmic substance, much resembling the white blood-corpuscles pertaining to the higher-class animals; these cells are contained in the nutritory fluids which permeate the entire colony of polyps. In a few polyps, the ventral cavity is prolonged, downwards, into the large longitudinal duct, and, there, septa are seen in the shape of septula to follow the ducts right down to their bottom. Where that is the case, the generative organs are found to develop themselves on several septula in the uppermost part of the ducts, or, as it may be called, in the ventral cavity, whilst in others, and that the greater number of the polyps, the ventral cavity rapidly contracts, and forms a very constricted duct, which, sure enough, opens into one of the large longitudinal ducts, but is, however, quite occupied by endothelial cells, so that no septula are observed there; in those polyps the generative organs develop themselves in the ventral cavity itself.

The gullet is elongate and cylindrical; its exterior surface is clad with the endothelial cells previously spoken of, which connect to a layer of hyaline connective-tissue. Exactly at the margin of this and the endothelium, but as if embedded in the connective-tissue, a broad longitudinal series of spicules is seen on each side — 3—4, somewhat diagonally running, spicules in each series — whilst the mesial part of the gullet, both on the ventral and the

Ende udgaa Gastralfilamenterne, som ere spikelfri, og dets øverste Ende gaar over i den aflange Mundspalte med tykke Læber. Svælgets indre Flade er beklædt med et cilierende Epithel, og paa Bugfladen indtages omtrent to Trediedele af dens Længde af en oval Fordybning (Svælgrenden), som er beklædt med lange Pidskeceller, Fig. 65, e, fuldkommen lig dem, som jeg tidligere har omtalt i Beskrivelsen af *Væringia mirabilis*. Udenfor Svælgrenden sees den største Del af Svælget at være beklædt med Cylinderepithel, forsynet med Cilier, og imellem Cylindercellerne findes en Mængde kolbeformige, encellede Slimkjerter, der savnes i Svælggruben; ovenfor denne antager Epithelet Ectodermets Karakter, saaledes som jeg tidligere har paavist. Just paa det Sted af Svælgets indre Flade, hvor jeg hos *Væringia mirabilis* fremstillede en Del af Nervesystemet, findes lignende store, unipolære Ganglieceller med deres store Kjerne og rige Protoplasmahold, men andre Nerveceller eller Nervefibre har jeg ikke seet hos Slægten *Fulla*.

Jeg nævnte tidligere, at Basaldelen er svampet; dette grunder sig paa, at Coenenchymet her er meget udviklet, og i dette Coenenchym findes Spikler, der ligge meget spredte, have en gul Farve og nærme sig noget Dobbeltstjernen i Form; de ere fra 0.080—0.088^{mm} lange og fra 0.040—0.052^{mm} brede i Enderne, paa Midten ere de fra 0.012—0.016^{mm} brede, Fig. 1—3.

Basaldelens Hud er rig paa Spikler, som ligge i flere Lag og ere omgivne af Ectodermet; ogsaa her viser det sig, at hvor de ere leirede i Bindevævet, beklæder Ectodermceller de Hulrum, Spiklerne indtage; men altid ere Cellerne aflange, saaledes som de ofte findes i Ectodermets indre Lag. Spiklerne optræde næsten udelukkende under Form af Dobbeltstjernen; de ere dog noget forskellige, imedens Grundformen er den samme. I Almindelighed have de et nøgent Midtparti, kun sjældent er dette besat med Takker, Fig. 4. 5; fra Enderne udgaa paa de fuldt udviklede Spikler brede Straaler, der ende i 4—5 Takker, som danne en Stjerne, Fig. 6—9. Paa de mindre udviklede ere Straalerne smalere og enklere, ligesom det nogne Midtparti er meget længere, Fig. 10. Disse samtlige Dobbeltstjerner variere noget i Størrelse; de ere fra 0.052—0.140^{mm} lange, fra 0.032—0.116^{mm} brede i Enderne og fra 0.024—0.048^{mm} brede paa Midten. Kun hist og her, men sjældent, findes imellem Dobbeltstjernerne Firlinger, hvoraf enkelte nærme sig Korsformen og ere ornamenterede, 0.108^{mm} lange med en Tverstok 0.088^{mm} Fig. 11; andre nærme sig Dobbeltstjernen, ere 0.120^{mm} lange, 0.120^{mm} brede i Enderne og 0.080^{mm} brede paa Midten; Fig. 12.

dorsal sides, is devoid of spicules (fig. 66). From the lowest extremity of the gullet, the gastral filaments proceed, and these are devoid of spicules; the uppermost extremity is produced into the oblong oral fissure with thick labiæ. The inner surface of the gullet is clad with a ciliate epithelium, and about two-third parts of its ventral surface is occupied by an oval cavity (the gullet-groove) which is clad with long flagelliform cells (fig. 65. e) exactly like those which I have previously spoken of in the description of *Væringia mirabilis*. Outside of the gullet-groove, the greater part of the gullet is seen to be clad with cylinder-epithelium furnished with ciliæ. and, between the cylinder-cells, a multitude of clavate, unicellular, mucous glands are found, and these are wanting in the gullet cavity. Beyond it, the epithelium assumes the ectodermic character, as I have, already, shown. Just at the point of the inner surface of the gullet, where, in *Væringia mirabilis*, I presented a part of the nerve system, similar large unipolar ganglial cells, with their large nuclei and abundant protoplasmic contents are found, but I have detected no other nerve-cells, nor nerve-fibres in the genus *Fulla*.

I stated, previously, that the basal part is spongy; that is owing to the fact that the sarcosoma is, here, much developed, and in this sarcosoma spicules are seen, which are placed much dispersed, have a yellow colour, and approach somewhat to a bistellate in form. They measure from 0.080—0.088^{mm} in length, and from 0.040—0.052^{mm} in breadth at the extremities; whilst in the middle they measure from 0.012—0.016^{mm} in breadth (figs. 1—3).

The dermal covering of the basal part is rich in spicules, which are placed in numerous layers and are surrounded by the ectoderm. Here, also, it is observed, that where they are found entrenched in the connective tissue, the ectoderm-cells clothe the cavities which the spicules occupy, but the cells are, invariably, oblong, like what is frequently found in the inner layer of ectoderm. The spicules, appear, almost exclusively, in the bistellate form, but they are somewhat variable, although the rudimentary form is the same in them all. Usually, they have a bare mesial part, it being only occasionally beset with spikes (figs. 4. 5); from the extremities of the fully developed spicules, broad rays proceed, which terminate in 4—5 spikes that form a star (figs. 6—9). On the less developed spicules the rays are narrower and plainer, whilst, also, the mesial part is much longer (fig. 10). The whole of these bistellates vary somewhat in size, and measure from 0.052—0.140^{mm} in length, and from 0.032—0.116^{mm} in breadth at the extremities, and from 0.024—0.048^{mm} in breadth at the middle. Here and there, only, but seldom, quadruplets are seen between the bistellates; of these a few approach the cruci-form, and are embellished; they measure 0.108^{mm} in length, with a transverse arm 0.088^{mm} long (fig. 11) others, approach the bistellate in form, and measure 0.120^{mm} in length, and 0.120^{mm} in breadth at the extremities, and 0.080^{mm} in breadth at the middle (fig. 12).

Nederst paa Stammen ligge Spiklerne tæt sammen uden at ligge paa hverandre; almindeligst er her Dobbeltstjernen, kun yderst sjelden træffes en Spindel. Dobbeltstjernerne ere her rigere paa Straaler end de paa Basaldelen, ligesom Midtpartiet oftere er besat med Vorter eller Takker; de ere fra 0.128—0.140^{mm} lange, fra 0.104—0.112^{mm} brede i Enderne; Midtpartiet er dels 0.032^{mm} bredt, Fig. 13, dels er det saa optaget af Vorter, at det er næsten lige saa bredt som Enderne, Fig. 14. Spindlerne ere meget takkede med afstumpede, brede Ender; de ere lige og krumme om hinanden og ere 0.128^{mm} lange, 0.048^{mm} brede, Fig. 15. Midt paa Stammen ligge Spiklerne ikke saa tæt sammen som paa den nederste Del; Dobbeltstjernerne med mange Straaler og et nøgent Midtbelte ere de almindeligste; yderst sjældent sees en Firling. Dobbeltstjernerne ere fra 0.088—0.136^{mm} lange, fra 0.068—0.096^{mm} brede i Enderne, og fra 0.032—0.044^{mm} brede paa Midten, Fig. 16—19. Firlingerne nærme sig ligesom paa Stammens nederste Del enten Korsformen eller Dobbeltstjernen, Fig. 20. 21; de ere fra 0.096—0.128^{mm} lange, fra 0.080—0.088^{mm} brede. Jo længere op paa Stammen, man kommer, jo mere spredte ligge Spiklerne, men Dobbeltstjerneformen er ogsaa her gennemgaaende.

Paa Grenene, især de tykkeste, ligge Spiklerne lige saa tæt som paa Stammens Midtparti. Stjerneformen er den hyppigste, men noget forskellig fra den, jeg tidligere har omtalt. Spiklerne ere i det Hele taget betydelig mindre, fra 0.048—0.082^{mm} lange, fra 0.028—0.044^{mm} brede i Enderne og fra 0.008—0.024^{mm} brede paa Midten; Straalerne ere enklere, Midtpartiet i Regelen mere langstrakt, Fig. 22—26. En Firling, nærmende sig Dobbeltstjernen, er meget sjelden; den er omtrent lige lang som bred med et tornet Midtparti, Fig. 27.

Paa Smaagrenene eller Stilkene ere Spiklerne yderst sparsomme; de ere enkle i Formen, meget smaa og have en mørkegul Farve. De hyppigste ere Klubber, næsten glatte; de ere omtrent lige store, 0.056^{mm} lange, 0.028^{mm} brede i den tykke Ende. Skaffet er kort og afrundet, Fig. 28—30. Foruden disse sees en, der ligner en Dobbeltstjerne, 0.076^{mm} lang, 0.044^{mm} bred i Enderne, 0.024^{mm} bred paa Midten, Fig. 31; men saa fattig Spikeldannelsen er paa disse Smaagrener, saa meget rigere bliver den, strax Polyperne optræde.

Paa Polypens Bagkrop ligge Spiklerne paatvers i Længderækker og vise sig under Form af Spindler, Valser og Dobbeltstjerner. Spindlerne ere meget takkede, have afstumpede, takkede Ender og ere for det meste lige; de ere fra 0.104—0.120^{mm} lange og fra 0.040—0.044^{mm} brede,

At the foot of the stem, the spicules are placed close together without, however, lying upon each other; in this situation, the bistellate form usually appears; only extremely rarely is the fusee met with. The bistellates are, here, richer in rays than those of the basal part, whilst, the mesial part is frequently occupied by warts or spikes; they measure from 0.128—0.140^{mm} in length, and from 0.104—0.112^{mm} in breadth at the extremities; the middle part measures 0.032^{mm} in breadth (fig. 13), and is, partly, so occupied by warts, that it is almost as broad as the extremities (fig. 14). The fusees are much spiculated, have obtusely rounded, broad, extremities, and are, sometimes straight, and sometimes bent; they measure 0.128^{mm} in length, and 0.048^{mm} in breadth (fig. 15). In the middle of the stem, the spicules are not placed so closely together as upon the lowest part; the bistellates with numerous rays and a bare mesial belt are the most usual forms; only very rarely is a quadruplet seen. The bistellates measure from 0.088—0.136^{mm} in length, from 0.068—0.096^{mm} in breadth at the extremities, and from 0.032—0.044^{mm} in breadth at the middle (figs. 16—19). The quadruplets approach, like those of the lowest part of the stem, either to the cruciform, or to the bistellate form (figs. 20. 21); they measure from 0.096—0.128^{mm} in length, and from 0.080—0.088^{mm} in breadth. The further up the stem we approach, the more dispersed do the spicules become, but the bistellate form is, also, here, met with throughout.

Upon the branches, especially the thickest ones, the spicules are as close-set as upon the middle part of the stem. The stellate form is the most frequent, but somewhat different from that I have previously spoken of. The spicules are, altogether, considerably smaller, measuring from 0.048—0.082^{mm} in length, from 0.028—0.044^{mm} in breadth at the extremities, and from 0.088—0.024^{mm} in breadth at the middle. The rays are plainer, and the middle part is, usually, more elongate (figs. 22—26). A quadruplet approaching to the bistellate form is but rare; it measures about as long as it is broad, and has an aculeated mesial part (fig. 27).

On the small branches or stalks, the spicules appear extremely sparingly; they are plain in form, and have a dark yellow colour; they are most frequently clavates, are almost smooth, and about uniform in size, measuring 0.056^{mm} in length and 0.028^{mm} in breadth at the thick extremity. The shaft is short and rounded (figs. 28—30). Besides these, one resembling a bistellate is observed, and it measures 0.076^{mm} in length, 0.044^{mm} in breadth at the extremities, and 0.024^{mm} in breadth at the middle (fig. 31); but however poor the spicular formation is upon these small branches, so much the richer does it become whenever the polyps appear.

On the posterior body of the polyps, the spicules are situated transversally, in longitudinal series, and appear in the form of fusees, rollers, and bistellates. The fusees are very spicate, and have blunted spicate extremities; they are usually straight and measure from 0.104—0.120^{mm}

Fig. 32. 33. Valserne ere takkede med brede, takkede Ender, 0.092^{mm} lange, 0.040^{mm} brede, Fig. 34. 35; af Dobbeltstjerneerne er der nogle, som nærme sig Dobbeltkuglen med takkede, afrundede Ender, Fig. 36, disse ere 0.100^{mm} lange, 0.056^{mm} brede i Enderne og 0.028^{mm} brede paa Midten, — imedens andre ere mere sammensatte og 0.084^{mm} lange, 0.048^{mm} brede, Fig. 37. 38.

Hvor Bagkrop gaar over i Forkrop ligge Spiklerne i svage Tverbuer, Fig. 61, og bestaa af lange, tynde, dels lige, dels krumme, takkede Spindler, der ere fra 0.240—0.344^{mm} lange og fra 0.016—0.024^{mm} brede, Fig. 39—40.

Paa Forkroppen, hvor Spiklerne ligge næsten perpendikulært, er Spindelformen den fremherskende, men imellem Spindlerne sees hyppigt tapformede Spikler. Spindlerne ere takkede, krumme og lige, med tilspidsede Ender, fra 0.172—0.256^{mm} lange og fra 0.032—0.036^{mm} brede, Fig. 41. 42. Tapperne ere takkede, 0.240^{mm} lange, 0.040^{mm} brede toroven, Fig. 43.

Paa Tentaklerne sees langs Midten af den aborale Flade Spindler, der ere takkede med afskaarne, takkede Ender, lige og krumme om hverandre; de ere fra 0.080—0.200^{mm} lange og fra 0.020—0.044^{mm} brede, Fig. 44. 45; men til Siderne og i Pinnulerne ere Spindlerne mindre og antage stundom Naaleformen; de variere i Størrelse, fra 0.048—0.100^{mm} lange og fra 0.004—0.028^{mm} brede, Fig. 46—51.

Spiklerne paa Svælget ere forskjelligt formede og optræde snart som Spindler, takkede, lige eller krumme, Fig. 52. 53, snart som Firling i Korsform, Fig. 54, og snart under andre særegne Former, Fig. 55—57, der have omtrent samme Størrelse, omkring 0.080^{mm} i Længde. Bredden er meget forskjellig.

Farven.

Stammen og Grenene gule, spillende lidt i det Røde. Polyperne svagt rosenrøde.

Findested.

Station 237. Et Exemplar.

Slægtskarakter.

Zoanthodemet træformet. Stammen lidt fladtrykt, udpræget bilateral symmetrisk, nøgen paa to Sider (Bug og Ryg); fra de andre to Sider (laterale) udspringe Grene, der alle ere nøgne paa den til Ryggen svarende Side. Polyperne, der udgaa dels enkeltvis, dels i Grupper

in length, and from 0.040—0.044^{mm} in breadth (figs. 32—33). The rollers are spicate, with broad spicate extremities, and measure 0.092^{mm} long, and 0.040^{mm} broad (figs. 34—35). Of the bistellate form, there are some which approach to the bi-spherical form with spicate rounded extremities (fig. 36); these measure 0.100^{mm} in length, and 0.056^{mm} in breadth at the extremities, and 0.028^{mm} in breadth at the middle, whilst others are more complex, and measure 0.084^{mm} in length, and 0.048^{mm} in breadth (figs. 37. 38).

At the point where the posterior body is produced into the anterior body, the spicules are placed in slightly transverse curves (fig. 61) and consist of long, thin, partly straight, partly bent, spicate fusees, measuring from 0.240—0.344^{mm} in length, and from 0.016—0.024^{mm} in breadth (figs. 39. 40).

On the anterior body, where the spicules are placed almost perpendicularly, the fusees are the most predominant, but between the fusees, coniform spicules are frequently seen. The fusees are spicate, bent and straight, with acuminate extremities, and measure from 0.172—0.256^{mm} in length, and from 0.032—0.036^{mm} in breadth (figs. 41. 42). The cones are spicate, and measure 0.240^{mm} in length, and 0.040^{mm} in breadth above (fig. 43).

Along the middle of the aboral surface of the tentacles, fusees are seen; these are spicate, with truncated spicate extremities, sometimes straight, sometimes bent; they measure from 0.080—0.200^{mm} in length, and from 0.020—0.044^{mm} in breadth (figs. 44. 45) but, to the sides, and in the pinnules, the fusees are smaller, and occasionally assume the needle-form. They vary in size, measuring from 0.048—0.100^{mm} in length, and from 0.004—0.028^{mm} in breadth (figs. 46—51).

The spicules on the gullet are variable in form, and appear, sometimes as fusees, spicate, straight, or bent, (figs. 52. 53) sometimes as quadruplets of cruciform (fig. 54), and sometimes in other peculiar forms (figs. 55—57) of about the same size, measuring about 0.080^{mm} in length, with the breadth very variable.

Colour.

The stem and the branches are yellow, shading a little towards red. The polyps are pale rose-red.

Habitat.

Station No. 237. One specimen.

Generic characteristics.

The Zoanthodem is arborescent. The stem somewhat flattened, has a distinct bilateral symmetry, is bare on two sides (the ventrum and the dorsum) from the other two sides (lateral) branches spring, all of which are bare on the side corresponding to the dorsum. The

væsentligst fra Grenenes Sider, ere retraktile, langstrakte. Zoanthodemet er overalt i Huden vel forsynet med Spikler, der gjennemgaaende optræde under Form af Dobbeltstjernen, — kun paa Polypernes Forkrop optræder Spindel-formen. Svælget spikelholdigt.

Artskarakter.

Zoanthodemet 60—70^{mm} høit med en noget udvidet, svampet Basaldel. Stammen næsten rund, furet paalangs, 30—35^{mm} i Omkreds ved Grunden, aftagende successivt til Toppen, hvor den deler sig i to Grøne, og saagodtsom nøgen paa to Sider (Bug og Ryg). Grenene udspringe langs Stammens Sider fra Basaldelen til Toppen, staa temmelig langt fra hverandre, ere alle nøgne paa den til Ryggen svarende Side, imedens dog enkelte have to nøgne Sider, lig Stammen; de længste Grøne findes paa Midten af Stammen. Ligefra Grenenes Udspring og til deres Ende ere de forsynede med Polyper, der udspringe dels enkeltvis og direkte, dels danne Grupper, som samle sig i en Smaagren. Paa Enden af Grenene er der i Almindelighed en Samling af 6—8 Polyper. Polyperne ere cylindriske, 8—9^{mm} lange, med en temmelig lang Bagkrop, hvor Spiklerne ligge paatvers i Længderækker, og en noget kortere Forkrop, hvor Spiklerne danne 8 Længderækker. Tentaklerne halvt saalange som Kroppen. Hele Zoanthodemet forsynet med Spikler, der gjennemgaaende optræde under Form af Dobbeltstjerner, kun paa Polypens Forkrop optræder Spindel-formen. Svælget har paa hver Side en bred Længderække Spikler; dets Bug- og Rygside er uden Spikler. Farven rødlig-gul. Polyperne svagt rosenrøde.

Nephtya flavescens, n. sp.

(*Ammothea*, Lam.¹).

Pl. XI.

Zoanthodemet er indtil 30^{mm} høit. Stammen haard, rund, furet paalangs, omtrent 7^{mm} tyk ved Grunden, men

¹ Navnet *Ammothea* er givet til en Crustace-Slægt af Leach 1814. Lamarek, som sandsynligvis har været ubekjendt dermed, har givet det samme Navn til en Alcyonide i 1816. I 1818 beskrev Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

polyps which shoot out, partly singly, and partly in groups, principally from the sides of the branches, are retractile and elongate. The dermal covering of the Zoanthodem is, everywhere, well furnished with spicules, which appear, throughout, in the bistellate form. On the anterior body of the polyps alone does the fusi-form appear. The gullet contains spicules.

Specific characteristics.

The Zoanthodem measures 60—70^{mm} in height, and has a somewhat dilated spongy basal part. The stem is almost cylindrical, longitudinally grooved, and measures 30—35^{mm} in circumference at the base, diminishing gradually towards the summit, where it ramifies into two branches, and it is almost bare on two sides — (the ventrum and the dorsum). The branches shoot out along the sides of the stem, from the basal part to the summit, and are placed pretty far apart from each other; they are all bare on the side corresponding to the dorsum, whilst a few, however, have two bare sides like the stem. The longest branches are found at the middle of the stem. Quite from the root of the branches and up to their extremities, they are furnished with polyps which appear, partly singly and direct, and partly forming groups that collect themselves into a branchlet. On the extremities of the branches, there is, usually, a collection of 6—8 polyps. The polyps are cylindrical, 8—9^{mm} long, have a rather long posterior body, where the spicules are situated transversally, in longitudinal series; and a somewhat shorter anterior body, where the spicules form 8 longitudinal series. The tentacles are half the length of the body. The whole of the Zoanthodem is furnished with spicules which appear, throughout, in the form of bistellates; on the anterior body of the polyps alone does the fusi-form appear. The gullet has on each side, a broad longitudinal series of spicules, whilst its ventral and dorsal sides are devoid of spicules. The colour is reddish yellow. The polyps, faint rose-red colour.

Nephtya flavescens, n. sp.

(*Ammothea*, Lam.¹).

Pl. XI.

The Zoanthodem measures up to 30^{mm} in height. The stem is hard, cylindrical, and furrowed longitudinally

¹ The designation *Ammothea* is applied to a crustaceous genus, by Leach, in 1814. Lamarek, who was probably ignorant of this fact, has given the same designation to an Alcyonoid, in 1816. In

aftager successivt lidt i Tykkelse op til Toppen, der deler sig i flere Grene. Dens nederste Trediedel er i Regelen nøgen, imedens de øvrige to Trediedele ere tæt besatte med Grene, der slutte sig temmelig nær til Stammen, Fig. 1. Basaldelen er fast, tildels skiveformigt udvidet. Grenene sidde rundt Stammen, ere mere eller mindre lange, de midterste paa Stammen ere længst; de ere furede paalangs og som oftest lige fra deres Udspring rigt besatte med Polyper, som ere ordnede i Grupper, saa at 3—6—8 Polyper kunne forene sig i en liden Gren, der gaar over i Hovedgrenen, Fig. 1. 2. Disse Polypgrupper sidde tæt paa og rundtom Grenen, og imellem dem sees af og til enkelte Polyper, der bidrage end mere til ganske at dække Grenen, Fig. 1. 2. Ogsaa fra selve Stammen udspringer paa nogle Exemplarer dels enkelte, dels en liden Gruppe af 3—4 Polyper; de isolerede Polyper ere da altid længere end de, som sidde i Grupper. Grenene ende i tætte Polypgrupper og faa derved et mere eller mindre kolbeformigt Udseende, Fig. 1. 2.

Polyperne ere bægerformede, ikke retraktile; de ere 6—8^{mm} lange; Bagkroppen er 2^{mm}, Forkroppen 2^{mm} og Tentaklerne 2—4^{mm}. De have paa den udvendige Side af Kroppen 8 Ribber, dannede af Spikler, Fig. 3, hvilke især ere stærkt fremtrædende paa Forkroppens Rygside og gaa over paa Tentaklernes aborale Flade lige til deres Ende, Fig. 3. 4. Imellem Ribberne er der temmelig dybe Furer, som ligeledes ere rige paa Kalkspikler, Fig. 3. Hele Kroppen med Tentaklerne er saaledes bepantsret med Kalk, kun paa Bugsiden ligge Spiklerne mindre tæt, hvorfor Polyperne, især paa Spiritusexemplarer, stadig ere bøiede imod denne. Pinnulerne ere lange, smale, staa temmelig langt fra hverandre, og ved deres Grunddel sees en Spikel, der udgaar fra Tentakelens Sidedel; men forresten ere de uden Kalk, Fig. 4.

I flere af Polypgrupperne iagttages en eller flere stærkt opsvulmede Polyper, der have antaget Formen af en Hjelmusk, Fig. 5; det er hele Kroppen, men fornemmelig dens forreste Del, som er udvidet og indtager

Savigny en til Lamarcks Ammothea nærstaaende Alcyonide, som han antog for en ny Slægt og kaldte Nephthya. Det har imidlertid vist sig, at disse to Slægter ikke kunne opretholdes som saadanne; Slægtskaraktererne gaar saa over i hverandre, at de passe lige godt paa begge, hvorfor de bør slaas sammen til en Slægt. Ifølge Alderen skulde altsaa Lamarcks Navn, Ammothea, bibeholdes; men da Leach et Par Aar tidligere har givet dette Navn til en Crustace-Slægt, anser jeg det for rigtigst, at Savigny's Benævnelse, Nephthya, opstilles som Slægtsnavn for Slægterne Ammothea og Nephthya.

and, at its base, measures about 7^{mm} in thickness, but diminishes gradually, a little, in thickness, towards its summit, which, again, becomes ramified into several branches. The inferior third-part is, usually, bare, whilst the remaining two-third parts is closely beset with branches which keep themselves pretty close to the stem (fig. 1). The basal part is firm and, partly, discoidally dilated. The branches are situated around the stem, and are more or less long, those situated in the medial part of the stem being the longest. They are grooved longitudinally, and are, most frequently, richly beset with polyps, commencing quite at the branchial root. The polyps are so arranged in groups, that from 3 to 6 or 8 polyps may unite into a branchlet that passes over into the chief branch (fig. 1. 2). These polyp groups sit closely on, and around, the branch, and between them some single polyps are occasionally seen, which contribute still further to completely conceal the branch (fig. 1. 2). In a few specimens there also spring, from the stem itself, sometimes single, sometimes a small group of 3—4 polyps; in this case the isolated polyps are always longer than those situated in groups. The branches terminate in compact polyp groups, and acquire thus, a more or less sub-claviform appearance (figs. 1. 2).

The polyps are chalice-formed and non-retractile; they measure 6—8^{mm} in length, the posterior body measuring 2^{mm}, the anterior body 2^{mm}, and the tentacles 2—4^{mm}. On the exterior side of the body, they are furnished with 8 ribs, formed of spicules (fig. 3), which are, especially, strongly prominent on the dorsal side of the anterior body, and pass over to the aboral surface of the tentacles, quite to their extremity (figs. 3. 4). Between the ribs, there are pretty deep grooves which are also rich in calcareous spicules (fig. 3). The entire body and the tentacles are thus protected with a calcareous sheathing, and only on the ventral side do the spicules lie more openly, for which reason, the polyps, especially in specimens preserved in alcohol, are constantly curved towards it. The pinnules are long and slender, and are placed pretty far apart from each other; a spicule is seen at their basal part which issues from the lateral part of the tentacle, but otherwise they are devoid of calcium (fig. 4).

In several of the groups of polyps, there may be observed one, or more, strongly tumefied polyps which have assumed the form of a helmet-plume (fig. 5). The entire body, and especially its anterior part, is dilated and, here,

1818, Savigny described an Alcyonoid approximating to Lamarck's Ammothea, and which he took to be a new genus, and called Nephthya. It has, however, been ascertained that these two genera cannot be maintained independently of each other; the generic characteristics become so much absorbed, the one in the other, that they apply equally well to both, for which reason they ought to be classed together as one genus. According to seniority, therefore, Lamarck's designation Ammothea should be retained, but as Leach a couple of years previously, has applied this designation to a Crustaceous genus, I consider it preferable that Savigny's designation, Nephthya, be applied, and established as the generic designation for the genera Ammothea and Nephthya.

en Bredder af 3—4^{mm}, imedens de øvrige, almindelige Polyper indtage paa samme Sted lidt over 1^{mm}. Tentaklerne ere sammenlimede, og deres Ender indbøiede, hvorved Adgangen til Mundaabningen er fuldstændigt spærret. Ribberne og Furerne paa den ydre Kropsvæg ere stærkt fremtrædende, Fig. 5. Disse svangre Polyper, der siden skulle nærmere omtales, gaa umiddelbart over i Grenen uden at forene sig med nogen anden Polyp.

Anatomisk-histologisk Undersøgelse.

Stammen har en ydre Beklædning, Ectodermet, dannet af flere Lag polyædriske Celler. I det indre Lag sees imellem Ectodermcellerne flaskeformede Celler med en Udløber og en aflang Kjerne, omgivet af et fintkornet Indhold — encellede Slimkjertler —; desforuden er i Ectodermet affeiret en Mængde Spikler, der ogsaa findes i det indenfor værende hyaline Bindevæv, men altid omgivet af Ectodermceller.

I Bindevævslaget findes Bindevævslegemer med en eller flere Udløbere, der korrespondere med hverandre, samt Ernæringskanaler. Ved at undersøge de svangre Polyper viser det sig, at Mundaabningen er tillukket ved en slimet Masse, at Svælget er i høj Grad udvidet, dets Vægge fortykkede, Fig. 6, *a*, og Hulheden opfyldt af Embryoner i forskellige Udviklingsstadier, — dog ere de, der ligge nærmest Mundspalten, videst komne, hvorfor ogsaa den øverste Del af Svælget er mest udvidet, Fig. 6, *b*. I Mavehulheden sees endnu enkelte uudviklede Æg, indesluttede i de stilkede Kapsler, der tage deres Udspring fra Septula.

Det er et mærkeligt Forhold, som her optræder, idet Svælget virkelig omdannes til en Uterus, hvori Ungerne udvikle sig. Paa flere Polyper iagttages, at den bagerste Kropsdel, just der, hvor den gaar over i Grenen, er opsvulmet, imedens den forreste Del endnu er normal; men Tentaklerne ere begyndte at lime sig sammen, og deres Ender ere indkrængede. Naar disse Polyper aabnes, findes Æg i forskellige Stadier, men alle indesluttede i deres stilkede Kapsler, sædvanlig et Æg i hver Kapsel. Svælget er ikke udvidet og er enten tomt eller indeholder nogle Foraminiferer, Rester af de indtagne Fødemidler. Mange af Æggene have gennemgaaet Furingen, ere altsaa befrugtede, men den egentlige Fosterdannelse er neppe begyndt. Saasnart denne tager sin Begyndelse, forlader Larven, endnu indesluttet i Ægget, Kapselen, og Svælget er nu præpareret til at modtage Ungen, for at den der kan gennemgaa sin videre Udvikling. Mundaabningen er ganske lukket ved det omtalte Slim, saa Polyphen kun kan faa sin Næring igennem den i Gren eller Stamme forlængede

it attains a breadth of 3—4^{mm}, whilst the rest of the general body of the polyps attain, in the same situation, only a little more than 1^{mm} in breadth. The tentacles are glued together, and their extremities are curved inwards, causing the access to the oral aperture to be completely closed. The ribs and the grooves on the exterior wall of the body are strongly prominent (fig. 5). These fructified polyps, which later on shall be further discussed, pass directly over into the branch without uniting themselves to any other polyp.

Anatomo-histological Examination.

The stem has an exterior covering — the ectoderm — formed of several layers of polyhedral cells. In the inner layer, between the ectodermal cells, bottle-shaped cells are seen, with a prolongation, and an oblong nucleus surrounded by a minute granular substance — unicellular mucous glands — there is, besides, entrenched in the ectoderm, a multitude of spicules; these are also found in the hyaline connective-tissue situated on its inner side, but always surrounded by ectodermal cells.

In the connective-tissue layer, connective-tissue corpuscles having one or more prolongations which correspond with each other, and also nutritory ducts, are found. On an examination of the fructified polyps, it is seen that the oral aperture is closed by a mucous mass; that the gullet is, in a high degree, dilated, its walls tumefied (fig. 6, *a*), and the cavity occupied by embryos in various stages of development, whilst those of them, however, which are situated closest to the oral fissure are most developed; consequently, therefore, the uppermost part of the gullet is most dilated (fig. 6, *b*). In the gastral cavity there are, further, observed, a few undeveloped ova, enclosed in the pedunculated capsules which issue from septula.

It is a very remarkable state of relations which, here, exists, because the gullet really becomes transformed into a uterus in which the young develop themselves. In several polyps, it may be observed that the posterior part of the body, just at the point where it passes over into the branch, is tumefied, whilst the anterior part still remains in the normal condition, but its tentacles have begun to become glued together, and their extremities to be curved inwards. When these polyps are opened, ova are found in various stages of development, but all of them enclosed in their pedunculated capsules, usually one ovum in each capsule. The gullet is not dilated, and is, either, empty, or contains some foraminifera, remnants of the nutritive substances absorbed. Many of the ova have undergone the segmentation and are therefore impregnated, but the true fetal-formation has scarcely commenced. As soon as it commences, the larva — still enclosed in the ovum — relinquishes the capsule, and the gullet is now prepared for the reception of the young, to undergo, there, their

Mavehulhed, der korresponderer med Koloniens store Kanal-system, hvorigjennem Ernæringsvædskerne flyde. Under Svangerskabet bliver saaledes den svangre Polyp ernæret paa Koloniens Bekostning, og det er formodentlig af den Grund, at et forholdsvis lidet Antal af Stammens Polyper samtidigt ere svangre. Hvorvidt disse Moderpolyper dør ud, efter at de have udført sin Ammetjeneste, eller de fortsætte sit Liv for atter at befrugtes, har jeg ikke havt Anledning til at iagttage.

Paa Basaldelen ligge Spiklerne pakkede paa hverandre og bestaa væsentligst af Dobbeltstjerner, sammensatte Stjerner, der dog tildels ere mindre udviklede, samt takkede Spindler. Klubber ere sjeldne, men endnu sjeldnere Firlinger. Dobbeltstjernerne have i Regelen et nøgent Midtbelte, og Straalerne ere ofte brede, bladformede med tandede Rande; de ere fra 0.084—0.096^{mm} lange, og fra 0.044—0.048^{mm} brede med et 0.016^{mm} bredt Midtbelte, Fig. 7—9. De sammensatte Stjerner have ogsaa bladformede Straaler med tandede Rande; de ere fra 0.132—0.148^{mm} lange og fra 0.056—0.088^{mm} brede, Fig. 10. 11. Klubberne ere næsten fra deres nederste, smale Ende og til Toppen besatte med Blade, hvis Rande ere tandede; de ere fra 0.124—0.164^{mm} lange, og fra 0.068—0.084^{mm} brede i Toppen, Fig. 12—14. En enkelt Firling, næsten timeglasformet, er lige lang som bred, 0.084^{mm}, og kun sparsomt besat med Papiller, Fig. 15. Foruden disse findes ogsaa, men meget sjældent, et Par andre Spikelformer, saaledes en, der nærmer sig Timeglasformen og har en svag Tverlinie, der kan antyde en Tvilling, forsynet med nogle Papiller; den er 0.068^{mm} lang, 0.060^{mm} bred i Enderne og 0.020^{mm} bred paa Midten, Fig. 16; en anden nærmer sig Korset med en Længdestok, der er 0.088^{mm}, og en klumpet Tverstok, 0.056^{mm}, Fig. 17, — og endelig en tredie, der nærmer sig Soilen, 0.096^{mm} lang, 0.056^{mm} bred Basaldel og 0.016^{mm} bred paa Midten, Fig. 18.

Paa Stammens nederste Del ligge Spiklerne ikke saa pakkede paa hverandre som paa Basaldelen; de hyppigste Former ere Dobbeltstjernens og Klubbens, noget sjældnere den takkede Spindels. Dobbeltstjernerne have bredbladede Straaler med takkede Rande og nærme sig meget de paa Basaldelen; de ere fra 0.084—0.112^{mm} lange, og fra 0.068—0.072^{mm} brede i Enderne; det nøgne Midtbelte er fra 0.028—0.036^{mm} bredt, Fig. 19—21. Klubberne ere fast overalt besatte med tandede Blade; de ere 0.188^{mm} lange og 0.088^{mm} brede foroven, Fig. 23.

further development. The oral aperture is quite closed by the mucous already spoken of, so that the polyp can only obtain its sustenance by means of the prolonged gastral cavity of the branch or stem, which communicates with the large ductiferous system of the colony, through which the nutritory fluids flow. During its pregnancy, the fructified polyp is, thus, nourished at the expense of the colony, and it is, probably, for this reason, that a relatively small number of polyps of the stem are pregnant at one and the same time. Whether these maternal polyps die off after they have performed their maternal service, or whether they continue to exist for renewed impregnation, I have not had an opportunity of observing.

In the basal part, the spicules lie packed upon each other, and consist, principally, of bi-stellates, complex stellates — which however, are, partly, imperfectly developed, — and also spicate fusees. Clavates are rare, and quadruplets are still more rare. The bi-stellates have, usually, a bare mesial stripe, and the rays are, often, broad and foliaceous, with indented margins; they measure from 0.084—0.096^{mm} in length, and from 0.044—0.048^{mm} in breadth, with a 0.016^{mm} broad mesial stripe (fig. 7—9). The complex stellates have, also, foliaceous rays with indented margins, and they measure from 0.132—0.148^{mm} in length, and from 0.056—0.088^{mm} in breadth (figs. 10. 11). The clavates are, from nearly their lowest narrow extremity to their summit, beset with leaves whose margins are indented; they measure from 0.124—0.164^{mm} in length, and from 0.068—0.084^{mm} in breadth at the summit (fig. 12—14). A solitary quadruplet of nearly sand-glass form, which is as broad as it is long, measures 0.084^{mm}, and is only sparingly beset with papillæ (fig. 15). Besides these, but very rarely, there are also found a couple of other spicular forms, for instance, one form approaching to the sand-glass form, and which shows a faint transverse line that may indicate a twin, and is furnished with a few papillæ; it measures 0.068^{mm} in length, 0.060^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the middle (fig. 16). Another form approaches to the cruciform, and has a longitudinal arm measuring 0.088^{mm} in length, and a protuberated transversal arm measuring 0.056^{mm} in length (fig. 17) and, finally, a third form which approaches to the columnar form, and measures 0.096^{mm} in length, 0.056^{mm} in breadth at the basal part, and 0.016^{mm} in breadth at the middle (fig. 18).

In the inferior part of the stem, the spicules do not lie so closely packed upon each other as in the basal part; the most frequent spicular forms are bi-stellates and clavates, and somewhat more rarely, the spicate fusees. The bi-stellates have broad foliaceous rays with spicate margins, and approximate, much, to those of the basal part; they measure from 0.084—0.112^{mm} in length, and from 0.068—0.072^{mm} in breadth at the extremities; the bare mesial belt measuring from 0.028—0.036^{mm} in breadth (fig. 19—21). The clavates are constantly, everywhere, beset with indented leaves; they measure 0.188^{mm} in length, and 0.088^{mm} in breadth above (fig. 23).

Øverst paa Stammen ligge Spiklerne noget mindre tæt end nedenfor, men dog paa hverandre. Her er det fornemmelig Køller, Klubber og Spindler, som ere almindeligst. Køllerne ere overalt besatte med tandede Blade, ere 0.252^{mm} lange, 0.100^{mm} brede i den tykke Ende, Fig. 24. Klubberne have ligeledes tandede Blade, men sparsommere end Køllerne; de ere 0.124^{mm} lange, 0.056^{mm} brede foroven, Fig. 25. Spindlerne ere dels krumme, dels lige, have forholdsvis faa bladformede Takker, ere fra 0.144—0.160^{mm} lange, og fra 0.052—0.056^{mm} brede paa Midten, Fig. 26. 27; endelig sees, men yderst sjeldent, en fordreiet Dobbeltstjerne, eller monstrøs Firling, 0.120^{mm} lang, 0.068^{mm} bred i Enderne, 0.032^{mm} bred paa Midten, Fig. 28.

Grenene ere ligesaa rige paa Spikler som Stammen, og jo nærmere man kommer Polypernes Udspring, desto tættere bliver Spikelbeklædningen. Paa Grenene ere store Spindler og Klubber de hyppigste; sjeldnere ere sammensatte Stjerner og endnu sjeldnere Dobbeltstjernerne. Spindlerne ere overalt besatte med i Randen tandede Blade, 0.268^{mm} lange, 0.084^{mm} brede paa Midten, Fig. 29. Klubberne ere ligeledes bladede, fra 0.128—0.172^{mm} lange, og fra 0.056—0.084^{mm} brede foroven, Fig. 30. 31.

Paa Polypernes Bagkrop ligge Spiklerne saa tæt, at de ganske indkapsle den, og her er det væsentlig Køller og Klubber, der ere de hyppigste. Køllerne ere snart lige, snart mere eller mindre krumme, besatte med brede, tandede Blade, som staa temmelig langt fra hverandre; de ere fra 0.228—0.308^{mm} lange, og fra 0.056—0.100^{mm} brede foroven, Fig. 32—34; enkelte Køller ere næsten glatte og krumme; de ere 0.264^{mm} lange, 0.056^{mm} brede, Fig. 35; men langt sjeldnere end disse ere nogle næsten glatte Spindler, 0.128^{mm} lange, 0.032^{mm} brede paa Midten, Fig. 36.

Paa Forkroppen er det især Rygsiden, der er stærkt bepantsret med Spikler, blandt hvilke den store Kølle er mest fremtrædende, mindre hyppig ere takkede Spindler. Køllerne ere enten lige eller krumme; men de lige ere dog de almindeligste og overordentlig store. Køllerne ere forsynede med større eller mindre, brede, tandede Blade, fra 0.252—0.392^{mm} lange og fra 0.076—0.160^{mm} brede foroven, Fig. 37. 38. Spindlerne have ogsaa tandede Blade, ere 0.224^{mm} lange og 0.060^{mm} brede paa Midten, Fig. 39.

Paa Tentaklerne findes lignende Spikler som de, der ere paa Forkroppen; men desforuden sees enkelte mindre Klubber liggende imellem de krumme Køller og ligesom udfyldende de Rum, som Krumningen fremkalder.

In the uppermost part of the stem, the spicules are placed somewhat less closely than in the lower part, but still upon each other. In this situation, it is principally clavates, subclavates and fusees which are most frequent. The subclavates are, everywhere, beset with indented leaves, and measure 0.252^{mm} in length, and 0.100^{mm} in breadth at the thick extremity (fig. 24). The clavates have also indented leaves, but more sparingly than the sub-clavates; they measure 0.124^{mm} in length, and 0.056^{mm} in breadth, above (fig. 25). The fusees are, partly curved, partly straight, and have, relatively, few foliaceous spikes; they measure from 0.144—0.160^{mm} in length, and from 0.052—0.056^{mm} in breadth at the middle (fig. 26. 27). Finally, there is seen — but extremely rarely — a twisted bi-stellate, or monstrous quadruplet, measuring 0.120^{mm} in length, 0.068^{mm} in breadth at the extremities, and 0.032^{mm} in breadth at the middle (fig. 28).

The branches are quite as rich in spicules as the stem, and the nearer we approach to the root of the polyps, the more compact does the spicular covering become. In the branches, large fusees and clavates are the most frequent spicular forms; complex stellates are less frequent, and bistellates are still more rare. The fusees are, everywhere, beset with leaves indented in the margins; they measure 0.268^{mm} in length, and 0.084^{mm} in breadth at the middle (fig. 29). The clavates are also foliated, and measure 0.128—0.172^{mm} in length, and from 0.056—0.084^{mm} in breadth above (fig. 30. 31).

In the posterior body of the polyps, the spicules are situated so closely that they quite encapsule it, and, in this situation, it is, principally, clavates, and sub-clavates that are most frequent. The sub-clavates are, sometimes straight, and sometimes more or less curved; they are beset with broad indented leaves, placed pretty far apart from each other, and measure from 0.228—0.308^{mm} in length, and from 0.056—0.100^{mm} in breadth above (figs. 32—34). A few sub-clavates are almost quite smooth, and bent; these measure 0.264^{mm} in length, and 0.056^{mm} in breadth (fig. 35), but far more rare than these, are a few almost smooth fusees that measure 0.128^{mm} in length, and 0.032^{mm} in breadth at the middle (fig. 36).

In the anterior body, it is, its dorsal side, especially, that is strongly sheathed with spicules, amongst which the large sub-clavates are the most prominent, and the spicate fusees less frequent. The sub-clavates are, either, straight or curved, but the straight ones are, however, the most frequent, and they are extraordinarily large. The sub-clavates are furnished with, larger or smaller, broad, indented leaves, and measure from 0.252—0.392^{mm} in length, and from 0.076—0.160^{mm} in breadth above (figs. 37—38). The fusees have also indented leaves, and measure 0.224^{mm} in length, and 0.060^{mm} in breadth in the middle (fig. 39).

Similar spicules to those of the anterior body are also found in the tentacles, but there are seen, besides, a few small clavates, situated between the curved sub-clavates, and, as it were, filling out the space produced by the curvature.

Embryonerne ere allerede tidligt meget rige paa Spikler, og paa de fra Ægget frigjorte Unger, hvor Spikeldannelsen er meget stærk, saa at Spiklerne ligge paa hverandre, iagttages mange og forskjelligtformede Firlinger, Fig. 40. De fleste nærme sig Korsformen, ere fra 0.072—0.132^{mm} lange, med en Tverstok fra 0.044—0.116^{mm}, Fig. 41—51; kun enkelte nærme sig Timeglasformen og ere 0.112^{mm} lange, 0.052^{mm} brede mod Enderne og 0.020^{mm} brede paa Midten; men hyppigere end Firlingerne ere dog Spindlerne, som ere kun svagt takkede og fra 0.056—0.164^{mm} lange og fra 0.020—0.040^{mm} brede paa Midten, Fig. 52—55. Ind imellem Spindlerne sees Køller og enkeltvis Klubber, hvilke dog ere mindre udviklede. Køllerne ere takkede, fra 0.124—0.160^{mm} lange og 0.040^{mm} brede foroven, Fig. 56. 57. Klubberne ere sparsomt besatte med Vorter, 0.104^{mm} lange, 0.032^{mm} brede foroven, Fig. 58.

Hvad der maa tiltrække sig Opmærksomheden ved Spikelformerne hos Embryonerne, er den Rigdom paa Firlinger, som findes hos disse; thi hos det voxne Dyr findes Firlingerne kun sparsomt og under andre Former, end de hos Larven. Det synes derfor, som om en Hudskiftning her finder Sted, hvorved Firlingerne blive for Størstedelen udelukkede, medens andre Former indtage deres Plads. En saadan Hudskiftning ved vi jo foregaar hos flere Holothurielarver, og Sandsynligheden bliver saameget desto større, naar der tages Hensyn til, at en stor Del af de øvrige Spikelformer, som findes hos Larverne, ikke gjenfindes hos det voxne Dyr. Sagtens er det saa, at Spiklerne uden nogen saadan Hudskiftning undergaa Formforandringer, alt eftersom Dyret udvikler sig; men saafremt et saadant Forhold eksisterer, maa man iblandt de lidet udviklede Spikelformer hos den Voxne finde tilsvarende Former hos Larven, hvilket i Regelen ikke er Tilfældet.

Farven.

Stammen, Grenene og Polyperne ere straagule; Tentaklerne og Mundskiven noget mørkere gule.

Station.

Station 275. Nogle faa Exemplarer.
Station 315. Mange Exemplarer.

Artskarakter.

Zoanthodemet indtil 30^{mm} høit. Stammen rund, furet paalangs; dens nederste Trediedel nøgen, den øvrige Del

The embryos are, already at an early stage, very rich in spicules, and in the young, liberated from the ovum, the spicular formation is very prominent, so much so, that the spicules lie upon each other, and many and variously formed quadruplets may be observed (fig. 40). Most of them approach to the cruciform, and measure from 0.072—0.132^{mm} in length, with a transversal arm measuring from 0.044—0.116^{mm} (figs. 41—51); only a few approach to the sand-glass form, and these measure 0.112^{mm} in length, 0.052^{mm} in breadth towards the extremities, and 0.020^{mm} in breadth at the middle; but more frequent than the quadruplets are, however, the fusees; these are only faintly spicate, and measure from 0.056—0.164^{mm} in length, and from 0.020—0.040^{mm} in breadth at the middle (figs. 52—55). In between the fusees, subclavates, and occasionally clavates, are seen; the last are however imperfectly developed. The subclavates are spicate, and measure from 0.124—0.160^{mm} in length, and 0.040^{mm} in breadth above (figs. 56. 57). The clavates are sparingly beset with warts, and measure 0.104^{mm} in length, and 0.032^{mm} in breadth above (fig. 58).

What must attract attention, with regard to the spicular forms in the embryos, is the wealth of quadruplets found in them, because, in the adult animal quadruplets are only sparingly found and in other forms than those of the larvæ. It appears, therefore, as if a casting of the integumental covering occurs, here, by which the quadruplets are, for the greater part, excluded, whilst other forms occupy their place. A similar casting of the dermal covering, we are already well aware, takes place in several of the larvæ of Holothurians, and the probability is so much the greater, when it is observed that a large part of the remaining spicular forms found in the larvæ are not, subsequently, recognised in the adult animal. It is true enough that the spicules undergo transformations in form, according to the progress of development in the animal, without any casting of the dermal covering, but if such a state of relations exists, we would, amongst the little-developed spicular forms in the adult animal, find corresponding forms in the larvæ, and this is, usually, not the case.

Colour.

The stem, the branches, and the polyps straw-yellow; the tentacles, and the oral disk, somewhat darker yellow.

Habitat.

Station No. 275. A few specimens.
Station No. 315. Numerous specimens.

Specific characteristics.

The Zoanthodem measures up to 30^{mm} in height. The stem cylindrical, longitudinally grooved; its inferior

rundtom besat med tætstaaende Grene. Basaldelen fast, som oftest skiveformigt udvidet. Grenene i Regelen ligefra deres Udspring rigt besatte med Polyper, ordnede i Grupper, der enkeltvis samle sig i en liden Stilk, som gaar over i Hovedgrenen. Imellem Grupperne hist og her enkelte Polyper, der gaa umiddelbart over i Grenen. Grenene ende i tætte Polypgrupper og faa derved et kolbeformet Udseende. Polyperne bægerformede, 6—8^{mm} lange, have 8 stærkt fremspringende Ribber, som gaa over paa Tentaklerne, der ere lange med lange Pinnuler. Spiklerne paa Basaldelen ere væsentligst Dobbeltstjerner og sammensatte Stjerner. Nederst paa Stammen Dobbeltstjerner, Klubber og Spindler; øverst paa Stammen og Grenene, Køller, Klubber og Spindler; paa Polyperne store Køller, Klubber og Spindler. Farven lys straagul; Tentaklerne og Mundskiven noget mørkere, spillende noget i det Brune.

Nephtya rosea, n. sp.

Tab. XII. Tab. XIII, Fig. 1.

Zoanthodemet er omtrent lige bredt som høit, indtil 40^{mm}. Stammen er rund, 40^{mm} i Omkreds ved Gruuden, men smalner betydeligt af mod Toppen og er overalt lige fra Basaldelen og til Spidsen tæt besat med Grene, der paa Spiritusexemplarer ligge tæt op til Stammen og skjule den ganske, Tab. XII, Fig. 1. Basaldelen breder sig membranagtigt udover de Gjenstande, hvortil Kolonien er fæstet, Fig. 1. Grenene staa ikke langt fra hverandre, men omgive Stammen kredsformigt og ere rigt forsynede med Smaagrene, der bære en større eller mindre Mængde Polyper. I Regelen begynde Smaagrenene lige ved Grenenes Udspring, og paa dem gruppere Polyperne sig saa tæt, at de skjule aldeles Grenen, som derved faar Udseende af en eneste, afrundet Polypgruppe, Fig. 1. 2. I levende Live staa Grenene lidt ud fra Stammen, og naar saa Polyperne strække sig ud, kommer Grupperingen tydeligt frem, idet hver enkelt Smaagren bærer en Gruppe Polyper. Paa enkelte Grene begynde Smaagrenene et Stykke fra Grenens Udspring, og da sees enkelte Polyper at udspringe direkte fra Grenen, ganske nær ved Stammen, ligesom der ogsaa paa dennes nederste Del findes dels enkeltstaaende Polyper, dels 2 og 3, der staa sammen. Saavel Stammen som Grenene ere kalkholdige.

third part bare, the remaining part beset, round about, with closely situated branches. The basal part firm, most frequently, discoidally dilated. The branches, usually, quite from their root, richly beset with polyps arranged in groups, which, now and then, unite together into a small stalk which passes over into the chief branch. Between the groups, there are, here and there, a few polyps which pass directly over into the branch. The branches terminate in compact groups of polyps, and acquire, thus, a sub-claviform appearance. The polyps chalice-formed, 6—8^{mm} in length, have 8 strongly prominent ribs which pass over to the tentacles. These are long, with long pinnules. The spicules in the basal part are, principally, bi-stellates and complex stellates. In the lowest part of the stem, bistellates, clavates, and fusees. In the uppermost part of the stem, and the branches, sub-clavates, clavates, and fusees. In the polyps large sub-clavates, clavates, and fusees. Colour, light straw-yellow; the tentacles and oral disk somewhat darker, shading somewhat to brown.

Nephtya rosea, n. sp.

Pl. XII. Pl. XIII, fig. 1.

The Zoanthodem is about as broad as it is long, and measures up to 40^{mm}. The stem is cylindrical, and measures 40^{mm} in circumference at the base, diminishing considerably, upwards, towards the summit, and everywhere, right from the base up to the top, it is closely beset with branches which, in specimens preserved in alcohol, lie close in to the stem and completely conceal it (Pl. XII, fig. 1). The basal part spreads itself, membranaceously, over the objects to which the colony is attached (Pl. XII, fig. 1). The branches are placed, not far apart from each other, and surround the stem in rings; they are richly furnished with branchlets which carry a larger or smaller multitude of polyps. The branchlets, usually, begin to appear quite at the root of the branches, and polyps are grouped so closely upon them that they quite conceal the branch, which consequently, acquires the appearance of a single, obtusely rounded polyp group (Pl. XII, figs. 1. 2). In the live state, the branches stand a little out from the stem, and when the polyps then extend themselves, the grouping arrangement becomes distinctly prominent, because each single branchlet carries a group of polyps. On a few of the branches, the branchlets commence a little way from the root of the branch, and then a few polyps are seen to spring direct from the branch quite close to the stem; whilst, also, upon the lowest part of it are found, partly, single solitary polyps, partly, 2 and 3 placed together. Both, the stem, and the branches, are calcareous.

Polyperne ere bægerformede, 8^{mm} lange. Bagkroppen er 2,5^{mm} lang, cylindrisk, smal forneden, men udvider sig noget op imod Forkroppen og forsynet med 8 temmelig fremspringende Ribber; baade disse og Furerne imellem dem ere rige paa Spikler. Fig. 3. 4. Forkroppen er omtrent lige lang som Bagkroppen og udvider sig traktformigt mod Skiven, hvor den bliver 3^{mm} bred. Bagkroppens Ribber fortsætte sig paa Forkroppen med samme Spikelrigdom, imedens Furerne blive mindre dybe op imod Tentakelranden og ganske spikelfri, hvorved der imellem Tentaklernes Grunddel dannes triangulære Felter, der ere ganske nøgne og tæt besatte med Nematocyster, Fig. 4, a. Mundskiven er noget hvælvet, 3^{mm} bred, uden Kalk og har paa Midten en aflang Mundaabning med tykke Læber, Fig. 3. Tentaklerne ere temmelig tykke, omtrent 3^{mm} lange og paa hele deres aborale Side forsynede med Spikler. Pinnulerne ere uden saadanne, Fig. 3. 4.

Af de to indsamlede Exemplarer udgjorde det ene en Koloni af Hunner, det andet af Hanner. Paa Hunn-exemplaret saaes en Mængde Polyper, hvis Forkrop var stærkt opsvulmet og krummet med Tentaklerne indbøiede mod Munden, saa hele Polypkroppen havde antaget næsten Kugleformen, Fig. 2, a, hvilket havde sin Grund i, at en stor Del af Svælget var opfyldt af Larver i forskellige Udviklingsstadier.

Anatomisk-histologisk Undersøgelse.

Stammen er som sædvanligt omgivet af et Ectoderm, der dannes af flere Lag polyædriske Celler, indenfor hvilket er et temmelig tykt, hyalint Bindevævslag med sine Bindevævslegemer og Nutritionskanaler, og fra hvis indre Flade udgaa Forlængelser, der danne Kanalsystemet, som har en Epithelbeklædning (Endothel), bestaaende af runde Celler med Kjerne og Kjernelegeme. De fine Ernæringskanaler ere ganske fyldte af lidt aflange Endothelceller, hvilket oftere er omtalt. I Ectodermets dybere Cellelag, ligesom i det til dette stødende Bindevæv, er en Mængde Spikler leirede.

Paa Basaldelen er bladede Klubber og mere eller mindre sammensatte Stjerner almindeligst. Klubberne have et kort Skaft, der er takket, undertiden kløvet i Enden og kunne stundom have et nøgent Midtparti; de ere fra 0.140—0.168^{mm} lange og fra 0.072—0.084^{mm} brede foroven, Fig. 5—8. De sammensatte Stjerner variere meget i Form og have tildels et nøgent Midtparti; de ere fra 0.120—0.164^{mm} lange og fra 0.064—0.080^{mm}

The polyps are chalice-formed, and measure 8^{mm} in length. The posterior body measures 2,5^{mm} in length; is cylindrical, narrow below, but becomes somewhat dilated up towards the anterior body, and is furnished with 8 rather protuberant ribs. These, as well as the grooves between them, are rich in spicules (Pl. XII, figs. 3. 4). The anterior body is about the same length as the posterior body, and, towards the disk, becomes dilated in infundibuliform, and is, there, 3^{mm} broad. The ribs of the posterior body are continued into the anterior body, and have the same spicular wealth, whilst the grooves become less deep up towards the tentacular margin, and are quite devoid of spicules, owing to which cause there is formed, between the bases of the tentacles, triangular areas, which are quite bare and closely occupied by nematocysts (Pl. XII, fig. 4, a). The oral disk is somewhat arcuate; is 3^{mm} broad, and noncalcareous; in the middle, it has an oblong oral aperture with thick labiae (Pl. XII, fig. 3). The tentacles are pretty thick, and about 3^{mm} in length; they are furnished, on the entire aboral side, with spicules. The pinnules have no spicules (Pl. XII, figs. 3. 4).

Of the two specimens obtained, the one was composed of a colony of females, the other one of males. In the female specimen, a multitude of polyps was observed, whose anterior body was strongly swollen out and curved, the tentacles being curved, inwards, towards the oral aperture, so that the entire body had assumed an almost globular form (Pl. XII, fig. 2. a). This was caused by a large part of the ventral cavity being full of larvæ in various stages of development, a subject I shall, subsequently, speak of.

Anatomo-histological Examination.

The stem is, as usual, surrounded by an ectoderm formed of several layers of polyhedral cells, inside of which there is a pretty thick layer of hyaline connective-tissue with its connective-tissue corpuscles and nutritory ducts, and from whose inner surface prolongations proceed, which form the ductiferous system; this has an epithelial covering (Endothelium) consisting of globular cells with nucleus and nucleus-body. The minute nutritory ducts are quite filled by slightly oblong endothelial cells, which have, frequently, been previously spoken of. In the deeper cellular layers of the ectoderm, and, also, in the connective-tissue which abuts upon it, a multitude of spicules is entrenched.

On the basal part, the most frequent spicules are foliaceous clavates, and more or less complex stellates. The clavates have a short shaft which is spicate, and occasionally furcate in the extremity, and sometimes they have a bare mesial part. They measure from 0.140—0.168^{mm} in length, and from 0.072—0.084^{mm} in breadth above (Pl. XII, figs. 5—8). The complex stellates vary much in form, and have, partly, a bare mesial part. They

brede; hvor der er et nøgent Midtparti, er dette i Regelen fra 0.020—0.028^{mm} bredt, Fig. 9—15. Dobbeltstjernerne ere smaa og sjeldnere, have som oftest et nøgent Midtparti, men paa enkelte sees Midtpartiet at være besat med smaa Torne; de ere fra 0.088—0.116^{mm} lange og omtrent 0.080^{mm} brede i Enderne, medens Midtpartiet er 0.040^{mm} bredt, Fig. 16. 17. Noget hyppigere end Dobbeltstjerner findes Firlinger af forskjellig Form; enkelte danne et Kors, hvis Længdestok er 0.180^{mm} og Tverstok 0.100^{mm}, og som er rigt besat med Blade, andre danne Rosetter, 0.148^{mm} lange, 0.140^{mm} brede, og atter andre nærme sig Timeglasformen, ere 0.084^{mm} lange, 0.080^{mm} brede i Enderne og 0.036^{mm} paa Midten, Fig. 18—20. Imellem disse forskellige Spikler sees hist og her enkelte, mindre udviklede, der synes ikke at have antaget nogen bestemt Form; de ere fra 0.072—0.092^{mm} lange, fra 0.032—0.036^{mm} brede op imod Enderne og paa Midten fra 0.012—0.020^{mm} brede, Fig. 21. 22.

Paa Stammen ere Dobbeltstjerner, sammensatte Stjerner, samt Klubber almindeligst. Dobbeltstjernerne have brede, næsten bladformige Straaler, hvis Ender dele sig, og hvis nøgne Midtparti er meget langt; de ere fra 0.104—0.120^{mm} lange og fra 0.060—0.096^{mm} brede i Enderne med et Midtparti, der er fra 0.016—0.024^{mm} bredt, Fig. 23—25. De sammensatte Stjerner have saa brede og takkede Straaler, at det har sine Vanskeligheder at gjenfinde Stjerneformen paa mange af dem; de ere fra 0.121—0.160^{mm} lange og fra 0.072—0.128^{mm} brede, enkelte ere lidt smalere paa Midten, og paa dem viser der sig da et tyndt, nøgent Belte, Fig. 26—29. Klubberne ere stærkt bladede, have et temmelig kort Skaft og ere forskellige fra dem paa Basaldelen, hvilket bedst sees ved at sammenligne Figurerne; de ere fra 0.108—0.144^{mm} lange og fra 0.060—0.120^{mm} brede foroven, Fig. 30—33. Imellem Klubberne sees enkelte, skaftede Stjerner, der muligens ere ei fuldt udviklede Dobbeltstjerner, da der paa Skaftets Ende er Takker, som kunne være endnu ikke udvoxede Straaler; de ere 0.180^{mm} lange, 0.080^{mm} brede i den egentlige Stjerne, medens Skaftet er kun 0.024^{mm} bredt, Fig. 34. Endelig findes, men yderst sjeldent, en mindre udviklet Dobbeltstjerne, der er 0.088^{mm} lang, 0.044^{mm} bred i Enderne og 0.020^{mm} bred paa det nøgne Midtparti, Fig. 35.

Paa Grenene optræder Dobbeltstjernen som den hyppigste Repræsentant, sjeldnere er den sammensatte Stjerne, imedens Klubberne ere temmelig almindelige. Dobbeltstjernerne have brede, bladformige Straaler, som ere mere eller mindre takkede i Enderne og have et nøgent Mid-

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

measure from 0.120—0.164^{mm} in length, and from 0.064—0.080^{mm} in breadth. The mesial part, when bare, usually measures from 0.020—0.028^{mm} in breadth (Pl. XII, figs. 9—15). The bistellate spicules are small and more rare, and, most frequently, have a bare mesial part but, in a few, the mesial part is observed to be beset with minute aculeæ. They measure from 0.088—0.116^{mm} in length, and about 0.080^{mm} in breadth at the extremities, whilst the mesial part measures 0.040^{mm} in breadth (Pl. XII, figs. 16. 17). Somewhat more frequently than the bistellates, quadruplets of a variable form occur; a few form a crucifix, whose longitudinal arm measures 0.180^{mm}, and the transversal arm 0.100^{mm} in length, and these are richly beset with leaves; others form rosettes measuring 0.148^{mm} in length, and 0.140^{mm} in breadth, and, again, others approach in form to a sand-glass, and measure 0.084^{mm} in length, 0.080^{mm} in breadth at the extremities, and 0.036^{mm} in the middle (Pl. XII, figs. 18—20). Between these various spicules, a few imperfectly developed ones are, here and there, observed, which do not appear to have acquired any definite form. They measure from 0.072—0.092^{mm} in length, from 0.032—0.036^{mm} in breadth, up towards the extremities, and from 0.012—0.020^{mm} in breadth at the middle (Pl. XII, figs. 21. 22)

Bistellates, complex stellates, and clavates are the most frequent spicular forms on the stem. The bistellates have broad, almost foliate, rays whose extremities divide, and whose bare mesial part is very long. They measure from 0.104—0.120^{mm} in length, from 0.060—0.096^{mm} in breadth at the extremities, the mesial part measuring from 0.016—0.024^{mm} in breadth (Pl. XII, figs. 23. 25). The complex stellates have such broad and spicate rays that, it is with difficulty the stellate form can be recognised in many of them. They measure from 0.121—0.160^{mm} in length, and from 0.072—0.128^{mm} in breadth; a few are a little narrower in the middle, and, in them, a thin, bare, stripe shows itself (Pl. XII, figs. 26—29). The clavates are strongly foliated, have a rather short shaft, and they differ from those of the basal part; this is best observed by comparing the illustrative figures. They measure from 0.108—0.144^{mm} in length, and from 0.060—0.120^{mm} in breadth above (Pl. XII, figs. 30—33). Between the clavates, a few shafted stellates are observed, which are, possibly, partially developed bistellates, because, on the extremity of the shaft, spikes appear, which may probably be rays not yet developed. They measure 0.108^{mm} in length, and 0.080^{mm} in breadth through the star itself, whilst the shaft only measures 0.024^{mm} in breadth (Pl. XII, fig. 34). Finally, but extremely rarely, an imperfectly developed bistellate is found, which measures 0.088^{mm} in length, 0.044^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the bare mesial part (Pl. XII, fig. 35).

On the branches, the bistellate form appears as the most frequent spicular representative, more rarely do complex stellates occur, whilst the clavates are rather frequent. The bistellates have broad foliate rays which are more or less spicate at the extremities, and they have a bare mesial

parti; de ere fra 0.102—0.136^{mm} lange og fra 0.060—0.076^{mm} brede i Enderne, paa Midten ere de fra 0.016—0.020^{mm} brede, Fig. 36. 37. Enkeltvis sees mindre udviklede Dobbeltstjerner, der ere 0.072^{mm} lange, 0.032^{mm} brede i Enderne og 0.012^{mm} brede paa Midten, Fig. 38. De sammensatte Stjerner ere mere eller mindre udviklede; de mest udviklede ere 0.124^{mm} lange, 0.076^{mm} brede, Fig. 39. 40; de mindre udviklede ere fra 0.096—0.104^{mm} lange og 0.044^{mm} brede, Fig. 41. 42. Klubberne ere fuldkommen lig dem, der findes paa Stammen.

Polyperne ere paa deres ydre Flade beklædte med et meget bredt Ectoderm, dannet af flere Lag polyædriske Celler, der have en næsten central, rund Kjerne med et Kjernelegeme, Tab. XIII, Fig. 1, a; i de dybere Lag ere Cellerne mere ovale, og iblandt dem sees lignende, encellede Slimkjertler, som de, der tidligere ere omtalte og afbildede; det er fornemmelig i det dybere Cellelag, at Spiklerne ere leirede. Indenfor Ectodermet er et hyalint Bindevævs-lag, som er smalt i Forhold til Ectodermet, Tab. XIII, Fig. 1, b, og fra det udgaa som sædvanligt de 8 Septa, der fæste sig paa Svælget, Tab. XIII, Fig. 1, c. Dette er uden Kalk, og paa dets indre Flade sees langs Bugsiden en halvrund Rende (Svælggruben), som begynder nogle Millimeter nederfor Mundaabningen og ender lige ved Svælgets nederste, fri Ende. Denne Svælggrube er beklædt med lange, smale Celler, der paa deres fri Rand ere forsynede med en lang, svingende Cilie (Geissel), Tab. XIII, Fig. 1, d. Den øvrige Del af Svælget er beklædt med et almindeligt, cilierende Epithel, hvis Celler ere lidt aflange i den øvre Ende, hvor de ere Fortsættelser af Ectodermet, imedens de blive ganske runde i den nedre Del, hvor de ligne Endothelcellerne, der tapetsere Kamrene. Forøvrigt frembød den histologiske Bygning af Svælget intet Særegent, uden forsaavidt, at hos opsvulmede Hunpolyper var det udvidet betydeligt og dannede en Hulhed, hvori Ungerne udviklede sig; netop det samme Forhold, som omtaltes under Beskrivelsen af *Nephtya flavescens*.

Paa Polypkroppen ligge Spiklerne tæt paa hverandre, især gjælder dette Rygsiden og dennes Ribber, Tab. XII, Fig. 3. 4; paa Bugsiden ligge de mindre kompakte. Den almindelige Form, hvorunder Spiklerne optræde, er Køllen; meget sjældnere er Spindelen og overordentlig sjældent Firlingen. Køllerne ere mere eller mindre rigt besatte med Blade og stundom lidt krummede; Skaflet er i Regelen langt og takket, men paa enkelte er det kort og mindre udviklet; de ere fra 0.108—0.300^{mm} lange og fra 0.040—0.080^{mm} brede i den øvre Ende, Fig. 43—47. Spindlerne ere meget takkede og have enten afrundede eller takkede Ender; de ere fra 0.224—0.228^{mm} lange og fra 0.044—0.052^{mm} brede, Fig. 48. 49. Imellem Køllerne og Spindlerne sees hist og her mindre Spikler, der variere

part. They measure from 0.102—0.136^{mm} in length, and from 0.060—0.076^{mm} in breadth at the extremities, and at the middle they measure from 0.016—0.020^{mm} in breadth (Pl. XII, figs. 36. 37). Occasionally, partially developed bistellates are observed, and these measure 0.072^{mm} in length, 0.032^{mm} in breadth at the extremities, and 0.012^{mm} in breadth in the middle (Pl. XII, fig. 38). The complex stellates are more or less developed; the best developed measuring 0.124^{mm} in length, and 0.076^{mm} in breadth (Pl. XII, figs. 39. 40); the less developed ones measure from 0.096—0.104^{mm} in length, and 0.044^{mm} in breadth (Pl. XII, figs. 41. 42). The clavates are exactly similar to those found on the stem.

The polyps are, on their exterior surface, covered with a very broad ectoderm, formed of several layers of polyhedral cells which contain an almost central globular nucleus with a nucleus body (Pl. XIII, fig. 1, a). In the deeper layers the cells are more ovate and, amongst them, there are seen unicellular mucous glands similar to those that have been previously spoken of and illustrated. It is principally in the deeper cellular layers that the spicules are entrenched. Inside of the ectoderm, there is a hyaline connective-tissue layer which is narrow in proportion to the ectoderm (Pl. XIII, fig. 1, b), and from it proceed, as usual, the 8 septa, which attach themselves to the gullet (Pl. XIII, fig. 1, c). This is noncalcareous, and on its inner surface, along the ventral side, a semi-circular channel is seen (the gullet-groove) which commences a few millimetres below the oral aperture and terminates exactly at the gullet's lowest free extremity. This gullet-groove is clothed with long narrow cells which, upon their free margin, are furnished with a long waving cilium (Geissel) (Pl. XIII, fig. 1, d). The remaining part of the gullet is clad with a common ciliate epithelium, whose cells are slightly oblong in the superior extremity where they are continuations of the ectoderm, whilst, in the inferior part they are quite cylindrical and resemble the endothelial cells that coat the chambers. The histological structure of the gullet does not, otherwise, present any peculiarity, except, in so far, that in swollen female polyps it was dilated considerably, and formed a cavity in which the young were developed; exactly the same relation spoken of in describing *Nephtya flavescens*.

On the body of the polyp, the spicules are situated close upon each other. This is specially the case on the dorsal side and its ribs (Pl. XII, figs. 3. 4). They are situated less compactly on the ventral side. The most frequent form, in which the spicules appear, is that of the subclavates; they appear more rarely in the fusiform, and as quadruplets, extremely rarely. The subclavates are more or less richly beset with leaves, and are occasionally a little curved; the shaft is, usually, long and spicate, but in a few it is short and imperfectly developed; they measure from 0.108—0.300^{mm} in length, and from 0.040—0.080^{mm} in breadth at the superior extremity (Pl. XII, figs. 43—47). The fusees are very spicate, and have, either, rounded or spicate extremities. They measure from 0.224—0.228^{mm}

temmeligt i Form; enkelte nærme sig den sammensatte Stjerne og ere 0.104^{mm} lange og 0.044^{mm} brede, Fig. 50. 51; andre ligne en Tap, ere 0.092^{mm} lange, 0.040^{mm} brede foroven, Fig. 52, og atter andre nærme sig dels Kølledels Spindelformen; de første ere 0.112^{mm} lange, 0.040^{mm} brede foroven, Fig. 53; de sidste ere fra 0.088—0.104^{mm} lange og fra 0.024—0.028^{mm} brede; alle disse smaa Spikler ere mere eller mindre takkede og træffes hyppigst paa Tentaklernes Side, Fig. 54—56, imedens der op imod Tentaklernes Spidse sees nogle smaa, fladtrykte, takkede Spikler, som ere 0.072^{mm} lange og 0.024^{mm} brede, Fig. 57. 58. Endelig sees en Firling i Korsform, lig den paa Basaldelen, men den er paa Polypkroppen saa sjelden, at hos flere Individuer fandtes den ikke, Fig. 59.

Farven.

Farven er smuk rosenrod

Findested.

Station 315. Et Exemplar.
Station 359. To Exemplarer.

Artskarakter.

Zoanthodemet buskformet, indtil 40^{mm} høit. Basaldelen membranagtigt udvidet. Stammen rund, omgivet af tætstaaende Grene lige fra Grunden til Toppen. Grenene rigt besatte med Smaagrener, som bære en større eller mindre Mængde Polyper, der grupper sig saa tæt omkring Smaagrenen, at ikke alene denne, men ogsaa selve Grenens kjules, som derved faar Udseende af at bestaa af en eneste Polypgruppe. Polyperne 8^{mm} lange, bægerformede, med en udpræget Bagkrop og forsynede med 8 spikelrige Ribber, der fortsættes over paa Tentaklerne. Imellem disses Grunddel et triangulært; nøgent Spatium, besat med Nematocyster. Pinnulerne uden Kalk. Paa Basaldelen ere bladede Klubber og sammensatte Stjerner almindeligst; sjældnere Firlinger. Paa Stammen optræde Dobbeltstjerner, sammensatte Stjerner samt Klubber hyppigst og paa Grenene er Dobbeltstjernen den almindeligste Form. Paa Polyperne ere store, bladede Køller den hyppigste Spikelform. Farven rosenrod.

in length, and from 0.044—0.052^{mm} in breadth (Pl. XII, figs. 48. 49). Between the subclavates and the fusees, smaller spicules are, here and there, observed, which vary considerably in form. A few approach, in form, to the complex stellate, and measure 0.104^{mm} in length, and 0.044^{mm} in breadth (Pl. XII, figs. 50. 51). Others resemble a cone, and measure 0.092^{mm} in length, and 0.040^{mm} in breadth above (Pl. XII, fig. 52), and, again, others approach, partly to the subclavate, partly to the fusiform. The first-named measure 0.112^{mm} in length, and 0.040^{mm} in breadth above (Pl. XII, fig. 53), and the last-named measure from 0.088—0.104^{mm} in length, and from 0.024—0.028^{mm} in breadth. All these small spicules are more or less spicate, and are, most frequently, met with on the sides of the tentacles (Pl. XII, figs. 54—56), whilst, up towards the points of the tentacles a few, small, flattened, spicate spicules are seen, which measure 0.072^{mm} in length, and 0.024^{mm} in breadth (Pl. XII, figs. 57. 58). Finally, a cruciform quadruplet is seen, which resembles that on the basal part, but it is so rare on the polyp-body that in many individuals it was not found (Pl. XII, fig. 59).

Colour.

The Colour is beautiful rose-red.

Habitat.

Station No. 315. One specimen.
Station No. 359. Two specimens.

Specific characteristics.

The Zoanthodem bushy, measures up to 40^{mm} in height. The basal part membranaceously dilated. The stem cylindrical, surrounded by closely-set branches right from the base to the summit. The branches richly beset with branchlets that carry a larger or smaller multitude of polyps which group themselves so closely around the branchlet, that not only is it concealed, but also the branch itself, which consequently acquires the appearance of consisting of a single group of polyps. The polyps are 8^{mm} long, chalice-formed, have a prominent posterior body, and are furnished with 8 spicular ribs that are continued into the tentacles. Between the bases of these, there is a bare triangular area occupied by nematocysts. The pinnules noncalcareous. On the basal part, foliaceous clavates and complex stellates are the most frequent spicular forms, more rarely quadruplets. On the stem, bistellates and complex stellates, also clavates, are the most frequent forms, and upon the branches, the bistellate form is the most frequent. On the polyps, large foliaceous subclavates are the most frequent spicular form. Colour: rose-red.

Nephthya polaris, n. sp.

Tab. XIII, Fig. 2--45.

Zoanthodemet indtil 35^{mm} høit. Stammen rund, blod, omtrent 20^{mm} i Omfang ved Grunden, men aftager lidt i Tykkelse op imod Toppen, der er tæt besat med Polyper. Den nederste Trediedel — paa enkelte Exemplarer den nederste Halvdel — blottet for Grenene, og her er den mere eller mindre tæt besat med Globigeriner i forskjellig Størrelse, Fig. 2. 3. 4. Paa enkelte Steder staa disse Foraminiferer saa tæt, at det ser ud, som om Stammen var sandstrøet, Fig. 2; de ligge ligesom indgravede i Sarcosomaet, saa at de efterlade en Grube, naar de fjernes og kunne visselig ikke frivillig komme bort, da de maa graves ud med fine Naale. Der er en hel Del ganske smaa, der staa som hvide Punkter i Sarcosomaet, men til lige sees en Mængde alt større og større Individuer, der, eftersom de tiltage i Størrelse, voxe sig dybere ind i Huden, hvor de vistnok forblive som Pseudoparasiter hele Livet igjennem. Det er vel at lægge Mærke til, at disse Foraminiferer findes paa alle Exemplarer, der dog ere fra tre langt fra hinanden liggende Lokalteter. Kun paa et Par yderst smaa Exemplarer sees de ikke. Basaldelen er skiveformigt udvidet, temmelig tyk og læderagtig; paa et Exemplar deler Stammen sig i to strax ovenfor Basaldelen, men hver af Stammerne ere grenløse paa den nederste Trediedel, Fig. 2. Grenene staa rundt Stammen, ere temmelig tykke og tæt besatte med Polyper, der give dem et kugleformet Udseende, Fig. 5. Baade Basalen, Stammen og Grenene ere rige paa Kalk.

Polyperne udspringe direkte fra Grenen og ere tildels stillede kredsformigt rundt om samme, — som oftest ere de isolerede, men af og til sees to og tre Polyper at være sammenvoxede ved Grunden, Fig. 6. De ere 4^{mm} lange, traktformige, med en yderst kort Bagkrop, en bred Forkrop og med temmelig flad Mundskive, Fig. 6. 7, i hvis Midte sees en lang Mundaabning. Tentaklerne ere 1.5^{mm} lange med stumpe Ender; Pinnulerne korte, tykke.

Hele Polypkroppen er rig paa Kalkspikler; især er dette Tilfældet med Rygsiden og de aborale Flader af Tentaklerne, hvor de danne næsten et Kalkpantser, Fig. 7; paa Bugsiden ere Spiklerne derimod sparsommere, hvorfor Polyperne gjerne bøie sig imod denne Side, Fig. 6; Pinnulerne ere uden Kalk.

Stammen og Grenene ere halv gjennemsigtige. Polyperne ere saa gjennemsigtige, at saavel Svælget, der er uden Spikler, som Mesenterialfilamenterne ere synlige,

Nephthya polaris, n. sp.

Pl. XIII, figs. 2--45.

The Zoanthodem measures up to 35^{mm} in height. The stem is cylindrical, soft, and about 20^{mm} in circumference at the base, but diminishes a little in thickness up towards the summit, which is closely beset with polyps. The lowest third part — in a few specimens the lowest half part — is devoid of branches, and it is, here, more or less closely, beset with globigerina of variable size (Pl. XIII, figs. 2. 3. 4). In a few places these foraminifera are placed so close, that the stem acquires a granular appearance (Pl. XIII, fig. 2). They appear as if embedded in the sarcosoma, so that when they are removed a cavity is left, and they could evidently not voluntarily come away, as they require to be dug out with fine needles. There are a great many very minute ones, which appear as white points in the sarcosoma, but, besides these, a multitude of individuals of progressive size are seen, which, as they progress in size, grow deeper into the integument, and where they most certainly remain as pseudo-parasites all throughout life. It must be carefully borne in mind that these foraminifera are found in all the specimens, which are, however, from three localities at a great distance apart from each other. It is only in a couple of extremely small specimens that they are not observed. The basal part is discoidally dilated, and is pretty thick and coriaceous. The stem, in one specimen, ramifies into two parts, immediately above the basal part, but each of these stems is branchless on the lowest third part (Pl. XIII, fig. 2). The branches are placed around the stem and are pretty thick; they are closely beset with polyps, which gives to them a globular appearance (Pl. XIII, fig. 5). Both, the base and the stem with its branches, are rich in calcium.

The polyps spring direct from the branch and are, partly, situated in rings round it; they are most frequently isolated, but, now and then, two and three polyps are seen, concreted together at the base (Pl. XIII, fig. 6). They measure 4^{mm} in length, and are infundibuliform; they have an extremely short posterior body, a broad anterior body, and a rather flat oral disk (Pl. XIII, fig. 6. 7) in whose middle an oblong oral aperture is visible. The tentacles measure 1.5^{mm} in length, and have blunt extremities. The pinnules are short.

The entire polyp-body is rich in calcareous spicules; this is particularly the case on the dorsal side and the aboral surfaces of the tentacles, where they form, almost, a calcareous shield (Pl. XIII, fig. 7). On the ventral side, on the other hand, the spicules are more sparing, for which reason the polyps are inclined to curve to that side (Pl. XIII, fig. 6). The pinnules are noncalcareous.

The stem and the branches are semi-transparent. The polyps are so transparent that, both, the gullet, which is devoid of spicules, and the mesenterial filaments are

naar Dyrene ere udstrakte. Kjønsorganerne findes dels i selve Kropshulheden, dels i dennes Forlængelser ned i Grenen. Hos Hunnen fandtes i Regelen 3—5 mere eller mindre udviklede Embryoner i det udvidede Svælg.

Stammen, Grenene, Polypkroppen og den nederste Halvdel af Tentaklerne er farvet svag brunrød, imedens den øverste Halvdel og Pinnulerne ere mørk kastaniebrune.

Paa Basaldelen ligge Spiklerne temmelig kompakte paa hverandre og fremtræde hyppigst under Form af Dobbeltstjerner, som dog variere adskilligt, saaledes at enkelte nærme sig de mere sammensatte Stjerner; de ere fra 0.092—0.140^{mm} lange og fra 0.060—0.080^{mm} brede i Enderne; det nøgne Midtparti er fra 0.020—0.028^{mm} bredt, Fig. 8—11. Iblandt Dobbeltstjerne seer en og anden Spikel, der nærmest maa henføres til dem, men som afviger ved, at der fra den ene Ende udgaar en Mængde bladformede Straaler, som ere mere eller mindre takkede; disse Spikler ere fra 0.116—0.152^{mm} lange og fra 0.060—0.096^{mm} brede i den tykke, bladede Ende, imedens det nøgne Midtparti er fra 0.020—0.024^{mm} bredt, Fig. 12. 13. Øverst paa Stammen og paa Grenene ligge Spiklerne mere spredte; her findes vel Dobbeltstjerner, som ere fra 0.124—0.132^{mm} lange og fra 0.072—0.084^{mm} brede i Enderne, og det nøgne Midtparti fra 0.024—0.028^{mm} bredt, Fig. 14—16; men langt hyppigere end dem seer mere enkle, næsten spindelformede, takkede Spikler med afstumpede, tildels takkede Ender, som ere 0.108^{mm} lange og 0.052^{mm} brede, Fig. 17. 18; imellem disse findes ikke saa ganske sjældent smaa Spikler, der dels ere delte i den ene Ende, 0.092^{mm} lange, 0.044^{mm} brede, Fig. 19, dels have takkede Ender og et nøgent Midtpunkt, hvorved de nærme sig Dobbeltstjernen, og som ere 0.056^{mm} lange, 0.032^{mm} brede i Enderne, med et nøgent, 0.012^{mm} bredt Midtbelte, Fig. 20.

Paa Polyperne ere Køller og Klubber de almindeligste. Køllerne ere dels lige, dels noget krummede og mere eller mindre takkede; de ere fra 0.214—0.260^{mm} lange og fra 0.080—0.084^{mm} brede i den tykke Ende, Fig. 21—24. Klubberne ere paa den øverste, tykke Del besatte med Blade, der ere takkede; de ere fra 0.176—0.224^{mm} lange og fra 0.068—0.107^{mm} brede i den tykke Ende, Fig. 25—29. Imellem de nævnte Spikler seer Spindler, dels krumme, dels lige med større eller mindre Takker og med spidse eller afstumpede Ender; de ere fra 0.200—0.220^{mm} lange og fra 0.036—0.053^{mm} brede omtrent paa Midten, Fig. 30—34.

visible when the animals are extended. The genital organs are situated, partly in the body cavity itself, and partly in its prolongations down into the branch. In the female were found, usually, 3—5, more or less developed embryos.

The stem, the branches, the polyp-body, and the lowest half-part of the tentacles, are coloured pale brown-red, whilst the upper half-part, and the pinnules are dark chestnut-brown.

In the basal part, the spicules are situated rather compactly upon each other, and most frequently appear in the form of bistellates, which, however, vary considerably, so that a few approach to the more complex stellates. They measure from 0.092—0.140^{mm} in length, and from 0.060—0.080^{mm} in breadth at the extremities; the bare mesial part measuring from 0.020—0.028^{mm} in breadth (Pl. XIII, figs. 8—11). Amongst the bistellates, an occasional spicule is observed, that must, in essential features, be classed along with them, although it is different, in so far, that from the one extremity a multitude of more or less spicate foliaceous rays proceed. These spicules measure from 0.116—0.152^{mm} in length, and from 0.060—0.096^{mm} in breadth at the thick foliate extremity, whilst the bare mesial part measures from 0.020—0.024^{mm} in breadth (Pl. XIII, figs. 12. 13). In the superior part of the stem, and on the branches, the spicules are situated more scatteredly. In this situation were observed, it is true, bistellates, measuring from 0.124—0.132^{mm} in length, from 0.072—0.084^{mm} in breadth at the extremities, and the mesial part measuring 0.024—0.028^{mm} in breadth (Pl. XIII, figs. 14—16); but far more frequently than them, plainer, almost fusiform, spicate spicules, with blunted, partly spicate, extremities were observed; these measured 0.108^{mm} in length, and 0.052^{mm} in breadth (Pl. XIII, figs. 17. 18) and between these are found, not so very rarely, small spicules which are, sometimes, divided at the one extremity; these last measure 0.092^{mm} in length, and 0.044^{mm} in breadth (Pl. XIII, fig. 19), sometimes they have spicate extremities and a bare mesial point, and thus approach the bistellate form; these measure 0.056^{mm} in length, and 0.032^{mm} in breadth at the extremities, and have a bare mesial stripe 0.012^{mm} broad (Pl. XIII, fig. 20).

On the polyps, subclavates and clavates are the most frequent spicular forms. The subclavates are partly straight, partly somewhat curved, and more or less spicate. They measure from 0.214—0.260^{mm} in length, and from 0.080—0.084^{mm} in breadth at the thick extremity (Pl. XIII, figs. 21—24). The clavates are, on the superior thick part, beset with leaves which are spicate, and they measure from 0.176—0.224^{mm} in length, and from 0.068—0.107^{mm} in breadth at the thick extremity (Pl. XIII, figs. 25—29). Between the aforementioned spicules, fuscæ are observed, partly curved, partly straight, having larger or smaller spikes, and with acuminate or truncate extremities; they measure from 0.200—0.220^{mm} in length, and from 0.036—0.053^{mm} in breadth at about the middle (Pl. XIII, figs. 30—34).

Findested.

Station 237. Nogle meget smaa Exemplarer.
 Station 267. 2 Exemplarer.
 Station 275. 4 Exemplarer.

Habitat.

Station No. 237. A few very small specimens.
 Station No. 267. Two specimens.
 Station No. 275. Four specimens.

Artskarakter.

Zoanthodemet indtil 35^{mm} høit, busket. Basaldelen skiveformigt udvidet, fast, meget kalkholdig. Stammen rund, den nederste Halvdel blottet for Grenene, men tæt besat med Foraminiferer. Grenene tykke, rigt besatte med Polyper, ordnede saaledes, at hver Gren danner næsten en Kugle. Stammen og Grenene spikelrige. Polyperne, der udspringe direkte fra Grenene, ere 4^{mm} lange, traktformige med en kort Bagkrop. Tentaklerne 1.5^{mm} lange, tykke og noget afstumpede. Polypkroppen, især paa Rygsiden og paa Tentaklerne, er meget rig paa Kalk; Pinnulerne uden denne. Paa Basaldelen og nederst paa Stammen er Dobbeltstjernen almindeligst. Paa Stammens øvrige Del og Grenene er Dobbeltstjernen meget sjældnere, men her er enklere, næsten spindelformige Spikler hyppigst; paa Polyperne ere Koller og Klubber almindeligst.

Farven.

Stammen, Grenene, Polypkroppen og den nederste Halvdel af Tentaklerne svag brunrod; den øverste Halvdel samt Pinnulerne mørk kastaniobrun.

Embryologiske Undersøgelser.

De ovenfor beskrevne Arter af Slægten *Nephtya* foder levende Unger, hvilket forøvrigt er det Almindeligste blandt Alcyoniderne. Hos alle fandtes forskellige Udviklingsstadier af de i Mave- og Svælghulheden indesluttede Æg og Embryoner; men da Exemplarerne vare opbevarede i Spiritus, er det selvsagt, at Undersøgelserne maa blive mangelfulde og ikke mindst derved, at det er ugjortligt at fremstille en sammenhængende Række i Udviklingen. Paa Nordhavsexpeditionen havde jeg hverken Tid, ei heller var Soen saa rolig, at jeg kunde anstille embryologiske Undersøgelser; imidlertid tor de paa Spiritusexemplarer foretagne Iagttagelser have nogen Interesse derved, at de udfylder enkelte Huller i Alcyonidernes Embryogeni og for en Del konstaterer de af Kowalevsky og Marion¹ anstillede Observationer over Alcyonidernes Udvikling.

¹ A. Kowalevsky et A. F. Marion: Documents pour l'histoire embryogénique des Alcyonaires. Annales du Musée d'histoire naturelle de Marseille. — Zoologie. Tome I. Memoire No. 4. Marseille 1883.

Specific characteristics.

The Zoanthodem measures up to 35^{mm} in height, fruticose; the basal part discoidally dilated, hard, very calcareous. The stem cylindrical, the lowest half part devoid of branches but closely occupied by foraminifera. The branches thick, richly beset with polyps, arranged so that each branch forms, almost, a ball. The stem, and the branches, rich in spicules. The polyps spring direct from the branches, measure 4^{mm} in length, are infundibuliform, with a short posterior body. The tentacles measure 1.5^{mm} in length, are thick and somewhat truncated. The polyp-body, especially on the dorsal side and upon the tentacles, is very rich in calcium. The pinnules noncalcareous. In the basal part, and lowest part of the stem, the bistellate spicular form is the most frequent. On the rest of the stem, and the branches, the bistellate form is much rarer, and, here, plainer, nearly fusiform, spicules are the most frequent. On the polyps, subclavates, and clavates, are the most usual forms.

Colour.

The stem, the branches, the polyp-body, and the inferior half-part of the tentacles are faint brownish-red. The superior half-part, and the pinnules, dark chestnut-brown.

Embryological Examination.

Both the above described species of the genus *Nephtya* give birth to living young, which is, also, the usual case amongst the Alcyonoids. In both of them, different developed stages in the ova and embryos contained in the ventral cavity were found, but as the specimens were preserved in alcohol, it is a matter of course that the examinations must be imperfect, none the less so, that it is impracticable to procure a continuous series in development. On the North-Atlantic Expedition, neither had I time, nor was the ocean so calm that I could undertake embryological examinations. However, the observations made, upon the specimens preserved in alcohol, may have some interest, because they serve to fill up some voids in the embryogeny of the Alcyonoids, and to some extent they confirm the observations made by Kowalevsky and Marion¹ upon the development of the Alcyonoids.

¹ A. Kowalevsky et A. F. Marion: Documents pour l'histoire embryogénique des Alcyonaires. Annales du Musée d'histoire naturelle de Marseille. — Zoologie. Tome I. Memoire No. 4. Marseille 1883.

Det er hovedsagelig paa *Clavularia crassa* og *petri-
cola* samt *Sympodium coralloides* de to nævnte Natur-
forskere have anstillet deres Iagttagelser, og da *Clavularia*
crassa er æglæggende have de kunnet forfølge Udviklingen
Skridt for Skridt, indtil Ungerne have sat sig fast. Den
Omstændighed, at Alcyoniderne i Regelen føde levende
Unger, og at Blommedelingen foregaar i yderst kort Tid,
— allerede efter en halv Times Forløb er Morbærstadiet
indtraadt hos *Clavularia crassa* — har hidtil lagt de største
Hindringer iveien for at kunne observere de første Stadier
af Udviklingen. Det er derfor, at *Clavularia crassa* har
leveret et yderst brugbart Materiale, idet Æggene, netop
befrugtede og indesluttede i en seig Slim, udgydte gennem
Munden, strax kunne iagttages, og altsaa fra den Stund
Observationerne kunne anstilles fra Minut til Minut.

Af de mangfoldige Æg, jeg havde til Undersøgelse,
var en god Del ikke undergaaet nogen Deling, og hvor
denne var indtraadt, havde den naaet Morbærformen,
Tab. XII, Fig. 60; de mellem denne og det begyndende
Embryo liggende Stadier kunde ikke opdages uden hos
nogle faa Æg, hvor Delingen var fuldendt og et periphe-
risk Cellelag, Ectoblast, dannet, Tab. XIII, Fig. 35, *a*.
Indenfor dette ydre Kimblad saaes paa Tversnit en Samling
af Blommehælle uden Ordning, Fig. 35, *b*. I det peri-
phere Cellelag havde Cellerne en noget aflang Form og
vare forsynede med en tydelig, næsten rund Kjerne, der
fremtraadte skarpt ved Farvning af Hamanns eddikesure
Karmin, Fig. 35, *a*. Paa et lidt mere udvoxet Embryo,
hvis hele Overflade bar Cilier, Tab. XII, Fig. 62, viste
Tversnittet en dobbelt Række periphære Celler med Kjerner,
en tydelig Ectodermdannelse, Tab. XIII, Fig. 36, 37, *a*,
samtidig med, at en skarp, gjennemsigtig Linie var op-
staaet, Tab. XIII, Fig. 37, *b*, 38, *a*, inden for hvilken
saaes dannet en Cellerække, bestaaende af runde Celler
med Kjerne, Entoderm (indre Kimblad), Fig. 38, *b*. Efter
dette at domme ser det ud, som om den nævnte Linie,
der repræsenterer den saakaldte *Membrana propria*, er et
Sekret af Ectodermet og ikke, som af Kowalevsky og Marion
antaget, af Entodermet; thi paa et Par Æg saa det ud,
som om den var dannet før det indre Kimblad. Imidlertid
maa det erindres, at jeg kun har havt med Spiritusexem-
plarer at gøre, imedens de nævnte Forskere have anstillet
sine Undersøgelser paa levende Individuer og have saaledes
kunnet forfølge Udviklingen ganske anderledes, end jeg har
været istand til. Men hvorom Alting er, saa er denne
Fundamentalmembran (*Membrana propria*) et virkeligt
Sekret af et af de to Kimblade og kan ikke betragtes som
et tredie, oprindeligt opstaaet, cellulært Kimblad (Meso-
derm, Mesenchym); den undergaar heller ikke nogen
væsentlige Forandringer, men adskiller strængt de to Kim-
blade fra hinanden og synes endog senere hen i Udvik-
lingen at kunne delvis forsvinde. Hos ældre Larver, Tab.
XII, Fig. 63, 65, saaes paa Tversnit et smalt, hyalint,
gelatinøst Belte, der ufeilbarligt var afsondret af Ectoderm-
cellerne og havde skudt Fundamentalmembranen indad

It is, principally, upon *Clavularia crassa* and *petri-
cola*, also *Sympodium coralloides*, that the two Naturalists,
above-named, have made their observations, and as *Clavu-
laria crassa* is oviparous, they have been able to follow up
the development, stage by stage, until the young have be-
come firmly adherent. The circumstance that the alcyon-
oids, usually, produce living young, and that the segmenta-
tion takes place with extreme rapidity — in the course of
half an hour, even, the morula stage is attained in *Clavu-
laria crassa* — has, hitherto, placed the greatest difficulties
in the way of observing the first stages of development.
It is for this reason, therefore, that *Clavularia crassa* has
furnished an extremely useful material, because the ova
just impregnated, and enclosed in a tough mucous discharged
through the oral aperture, may immediately be observed
and, consequently, from that moment, observations may be
made from minute to minute.

Of the innumerable ova which I had for examina-
tion, a large number had undergone no segmentation, and
when this had appeared, it had attained the morula
form (Pl. XII, fig. 60). The stages between that and the
initial embryonal stage could not be detected, except in a
few ova where the segmentation was completed and a
peripheral cellular layer (epiblast) formed (Pl. XIII,
fig. 35, *a*). Inside of this epiblast was seen, upon transver-
sal section, a collection of yoke-substance devoid of arrange-
ment (Pl. XIII, fig. 35, *b*). In the peripheral cellular
layer, the cells had a somewhat oblong form, and were
furnished with a distinct, almost globular, nucleus, which
came prominently out on colouration by Hamanns acetic
carmin (Pl. XIII, fig. 35, *a*). In a somewhat more devel-
oped embryo, whose entire surface was covered with ciliae
(Pl. XII, fig. 62), the transversal section showed a double
series of peripheral cells with nuclei, a distinct ectoderm-
formation (Pl. XIII, fig. 36, 37, *a*), and at same time, also,
a clearly defined, translucent, line had appeared (Pl. XIII,
fig. 37, *b*, 38, *a*) inside of which a cellular series was
seen to be formed, consisting of globular cells with nucleus
(hypoblast) (Pl. XIII, fig. 38, *b*). To judge from this, it
appears as if the line referred to, which represents the
so-called *membrana propria*, is a secretion of the ectoderm,
and not of the hypoblast as supposed by Kowalevsky and
Marion, because, in a couple of ova it appeared as if it had
been formed previous to the hypoblast. However, it must
be remembered that I have only had to do with specimens
preserved in alcohol, whilst the Naturalists above-named
have made their observations on living individuals, and have
thus been in a position to follow up the development in a
perfectly different manner from what I have been able to
do. But however the case may be, this fundamental mem-
brane (*membrana propria*) is a genuine secretion of the
germinative bladder and can not be considered to be a third
original cellular germ (Mesoblast, Mesenchym); neither
does it undergo any essential changes, but sharply separ-
ates the epiblast from the hypoblast, and seems, even at
a later stage of the development, capable of partially dis-
appearing. In older larvæ (Pl. XII, figs. 63 65), there

Tab. XIII, Fig. 39. 40, *a*. I dette Belte, der er Bindevævs laget, iagttoges paa et temmeligt udviklet Embryo, der forresten endnu laa indesluttet i Ægget, enkelte nedsænkede Ectodermceller, samt i Ectodermet spredte, smaa, glindsende Kalkkorn og enkelte Aabninger for udfaldne Spikler, Tab. XIII, fig. 40, *b*. Kowalevsky og Marion have observeret, at Spikeldannelsen foregaar indeni selve Ectodermcellerne, hvilket ikke har været muligt for mig at konstatere.

Allerede hos det ganske unge Embryo, der i Regelen havde en oval Form, saaes Midtpartiet at være meget mindre opakt end Peripherien, og i den ene Ende iagttoges en liden Indsænkning af Ectodermet, Tab. XII, Fig. 61. Paa Tversnit af et saadant Embryo viste der sig indenfor Endodermet en begyndende Mund og en Hule, hvori laa Blommekorn, altsaa en Gastrula: paa ældre Embryoner viste der sig en tydelig Gastrulamund, omgivet af Celler, Tab. XII, fig. 68—70, ligesom der kunde iagttages Antydninger til Skillevæggene, Tab. XIII, fig. 40, *c*, 41, *a*. Med Hensyn til disse finder man her den samme mærkelige Udviklingsmaade, som Kowalevsky og Marion har paavist at finde Sted hos *Clavularia petricola*, hvor der, forend Mund og Svælg er dannet, sees i Bunden af Mavehulheden indtil 26 Skillevægge. Saasart Svælget er dannet, formindskes Antallet, indtil det regulære bliver tilbage. Hos de tre Arter af Slægten *Nephthya*, som ovenfor ere beskrevne, fandtes Embryonerne, paa nogle faa Undtagelser nær, indesluttede i Ægget; intet Svælg var dannet hos nogen af dem, selv ikke hos de enkelte, der havde forladt Ægget, men fra Mavehulens Væg udgik hos de mest udviklede en Mængde Skillevægge, som ragede langt ind i Hulheden, Tab. XIII, Fig. 40. 41. Disse Skillevægge, Mesenterier, bestode af en gelatinøs, halvgjennemsigtig Masse, afsondret af begge Kimbladene med Fundamentalmembranen som Støtte og vare beklædte med et Endothel, Tab. XIII, fig. 41, *b*, dannet af Endodermcellerne. Paa det mest udviklede Embryo, der laa frit i Mavehulheden, Tab. XII, Fig. 70, havde Ectodermcellerne, især omkring Mundpartiet, antaget en meget langstrakt Form og vare forsynede med lange Cilier, Tab. XIII, Fig. 42.

Ligesom Udviklingen var den samme hos alle 3 Arter, saaledes var ogsaa Embryonernes Form den samme; kun Spikelformerne viste sig noget forskellige. I Begyndelsen var Embryonet noget kantet, Tab. XII, Fig. 61, senere blev det ægformet og var meget tidligt beklædt med Cilier, Fig. 62. Naar den ovale Form blev noget mere langstrakt, saaes hist og her enkelte Spikler i Ectodermet; kun paa Midten laa de noget tættere sammen, forresten vare de overalt yderst spredte, enkelte vare meget smaa, saa de vanskeligt kunde maales, saaes kun med meget

was seen, on transversal section, a narrow, hyaline, gelatinous stripe, which was infallibly excreted from the ectoderm cells and had pushed the fundamental membrane inwards (Pl. XIII, figs. 39. 40, *a*). In this stripe, which is the connective tissue layer, there was observed upon a pretty well developed embryo which, otherwise, lay, still enclosed in the ovum, a few deeply embedded ectoderm cells, and in the ectoderm, scattered, small, shining calcareous grains, and a few gaps left by spicules fallen out (Pl. XIII, fig. 40, *b*). Kowalevsky and Marion have remarked that the spicular formation takes place inside the ectoderm cells themselves, but this it has been impossible for me to confirm.

Already in the quite young embryo which, as a rule, had an ovate form, the mesial part was observed to be much less opaque than the periphery, and in the one extremity a small depression of the epiblast was observed. (Pl. XII, fig. 61). In the transversal section of such an embryo, inside of the hypoblast, a rudimentary oral aperture, and a cavity in which lay yoke-grains, showed themselves — a gastrula therefore. In older embryos, a gastrula aperture surrounded by cells showed itself (Pl. XII, figs. 68—70) whilst, also, indications of the divisional walls could be observed (Pl. XIII, figs. 40, *c*, 41, *a*). With regard to these, we find, here, the same remarkable mode of development which Kowalevsky and Marion have pointed out takes place in *Clavularia petricola*, where, previous to the formation of the oral aperture and gullet, as many as 26 divisional walls are seen at the bottom of the ventral cavity. As soon as the gullet is formed, the number becomes diminished, until only the usual number remains. In both the two species of the genus *Nephthya* which are above described, the embryos were found, with a few exceptions, enclosed in the ovum; no gullet was formed in any of them, not even in the few that had abandoned the ovum, but from the wall of the ventral cavity in the most developed ones, numerous divisional walls proceeded, and these stretched far into the ventral cavity (Pl. XIII, figs. 40. 41). These divisional walls (mesenteries) consisted of a gelatinous, semitransparent, substance, excreted from both the epiblast and hypoblast, with the fundamental membrane as support, and were clad with an endothelium (Pl. XIII, fig. 41, *b*) formed by the endodermic cells. On the most developed embryo, which lay loose in the ventral cavity (Pl. XII, fig. 70), the ectoderm cells, especially about the oral portion, had assumed a very elongated form, and were furnished with long cilia (Pl. XIII, fig. 42).

Just as the development was, in the 3 species, the same, so also was the embryonal form the same; the spicular forms alone showed themselves to be somewhat different. At the commencement, the embryo was somewhat angular (Pl. XII, fig. 61), subsequently it became oviform, and was very early covered with cilia (Pl. XII, fig. 62). When the oval form became somewhat more elongate, a few spicules were seen, here and there, in the ectoderm, and only in the middle did they lie somewhat closer together, otherwise, they were, everywhere, extremely scattered; a few were so

stærk Forstørrelse og da som korte, fine Linier eller Punkter; andre havde næsten antaget Spindelformen, vare svagt tornede og naaede indtil 0.080^{mm} i Længde og 0.008^{mm} i Bredde, Tab. XII, Fig. 63. 64. De optraadte saa tidligt, at kun Ectoderm- og Endoderm laget var dannet med den disse Lag skarpt adskillende Fundamentalmembran. Spiklerne laa aabenbart i Ectoderm laget, imellem dettes Celler og ligesom afsondret af dem. Alt eftersom Embryonet voxede, antog det først Pæreformen. Cilierne vare længere i den brede Ende, ligesom Spiklerne vare større, tiltagne i Mængde og viste sig mere udprægede som tornede og bladede Spindler, Tab. XII, Fig. 68—71; senere under Væksten havde Embryonet bøiet sig indeni Ægget og fik Formen af en Halvmaane, Tab. XII, Fig. 65; toges det ud af Æggehylsteret, havde det i sit Ydre overmaade megen Lighed med en ung Planarie, Tab. XII, Fig. 66; Spiklerne laa nu tættere og havde antaget flere Former, saaledes foruden Spindelens, timeglas- og korsdannede Firlingers, Fig. 67. Men jo mere Embryonet havde voxet i Længden, jo mere bøiet var det, Tab. XII, Fig. 69, saa at det tilsidst dannede et indeni Ægget sammentrykt S, Tab. XIII, Fig. 43. 44. Spiklerne havde tiltaget noget i Størrelse, saa at de naaede en Længde af 0.095^{mm}, laa tæt sammen, havde mere udprægede Former, Tab. XII, Fig. 72, og ved Tversnit viste det sig, at enkelte Spikler laa nedsænkede i den af Ectoderm et afsondrede, gelatinøse Masse, Tab. XIII, Fig. 39, b. Foruden de nævnte Spikelformer saaes ogsaa enkelte meget smaa Dobbeltstjerner og Køller, samt begyndende sammensatte Stjerner, Tab. XII, Fig. 72, a. b. c. Det vilde blive for vidtløftigt at beskrive hver enkelt Spikelform hos disse Embryoner, hvorfor jeg maa henvise til Tegningerne. De her omtalte Spikelformer gjælde væsentligt for *Nephthya rosea*; hos den anden Art, *Nephthya polaris*, viste Spiklerne sig saa forskjellige, at jeg paa dem let kunde skjelne et Embryo af denne fra et af *Neph. rosea*, og det samme var Tilfældet med den tredje Art. Spiklerne hos Embryonet af *Neph. polaris* varierede ikke saa stærkt i Former; de vare ikke saa stærkt tornede, men mere vingeformede; og Firlinger manglede ganske, Tab. XIII, Fig. 45. Jeg havde til Sammenligning Embryoner fra begge Arter, hvilke havde opnaaet det samme Udviklingstrin og havde samme Form, men paa Spiklerne kunde jeg allerede paa dette Stadium, medens de endnu laa i Ægget, bestemme Arten. Paa de stærkt sammenbøiede Embryoner saaes altid i den brede Ende en oval Aabning, omgivet af lange Cilier, og som førte ned til en aflang Hulhed, Tab. XIII, Fig. 43. 44, hvori ved Tversnit viste sig et storkornet Indhold (Blommekorn).

Paa et Embryo, der havde forladt Ægget, men opholdt sig i Mavehulheden og var næsten ganske udstrakt, havde Larvemunden en trekantet Form med temmelig brede Læber, Tab. XII, Fig. 70. Om hvorledes det gaar disse

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

very small that they could with difficulty be measured, and were only visible on powerful magnification, and then they appeared as minute lines or points; others had almost assumed the fusi-form, and were faintly aculeated, and attained up to 0.080^{mm} in length, and 0.008^{mm} in breadth (Pl. XII, figs. 63. 64). They appeared so early that only the ectoderm- and the endoderm layers were formed, along with the fundamental membrane which so sharply divides these layers. The spicules lay disclosed in the ectoderm layer, between its cells and as if excreted from them. As the embryo advanced in growth it first assumed the piriform. The ciliae were longer in the broad extremity, whilst, also, the spicules were larger and increased in number, and they showed themselves more distinctly as aculeated and foliated fusees (Pl. XII, figs. 68. 71). Subsequently, during its growth, the embryo had curved itself inside the ovum and taken the form of a crescent (Pl. XII, fig. 65). When removed from the ovum-covering it had, in its external appearance, very great resemblance to a young *Planaria* (fig. 66). The spicules, now, lay closer, and had assumed several forms, such as, besides the fusiform, also, hourglass, and cruciform quadruplets (Pl. XII, fig. 67). But the more the embryo had increased in length, the more curved was it (Pl. XII, fig. 69), so that it, eventually, formed, inside the ovum, a compressed S (Pl. XIII, fig. 43. 44). The spicules had increased, somewhat, in size, so that they attained a length of 0.095^{mm}, lay close in to each other and had more clearly defined forms (Pl. XII, fig. 72), and on transversal section it was seen that a few spicules lay embedded in the gelatinous substance excreted from the ectoderm (Pl. XIII, fig. 39, b). Besides the spicular forms named, there were, also, seen, a few very small bistellates and subelavates, also rudimentary complex stellates (Pl. XII, fig. 72, a. b. c.) It would be too prolix to describe, here, each individual form of spicule in these embryos, and I must, therefore, refer the reader to the illustrations. The spicular forms spoken of, here, refer especially to *Nephthya rosea*. In the other species, *Nephthya polaris*, the spicules showed themselves so different that, in it, I was able to distinguish, easily, an embryo of it from one of *Neph. rosea*, and the same with the third species. The spicules of the embryo of *Nephthya polaris* did not differ so greatly in form. They were not so strongly aculeated, but were more pennate, and quadruplets were quite absent (Pl. XIII, fig. 45). I had, for comparison, embryos of both the species, which had attained the same stage of development, and had the same form, but from the spicules I could, even at this stage, whilst they were still in the ovum, determine the species. In the strongly curved-together embryos there was always seen, at the broad extremity, an oval aperture surrounded by long ciliae, and which led down to an oblong cavity (Pl. XIII, fig. 43. 44) in which, on transversal section, a coarse granular substance (Yoke-granules) appeared.

In an embryo which had abandoned the ovum, but still remained in the ventral cavity, and was almost quite extended, the larva mouth had a triangular form with rather broad labia (Pl. XII, fig. 70). What happens to these

Unger, efterat de have forladt Moderen, kan jeg ingen Besked give; thi jeg har ikke kunnet følge dem saa langt. Men Kowalevsky og Marion have iagttaget, at Ungerne hos de Arter, de have observeret, altid satte sig fast ved den brede Ende, som de forresten vare tilbøielige til at antage for Ungens Hovedparti (region céphalique), naar de toge Hensyn til den Maade, paa hvilken den bevægede sig, nemlig altid med den brede Del foran. De angive ikke, at der i den brede Ende var en Mundaabning, men tværtimod, at Mundaabningen dannede sig i den smale Del, først efter at Ungerne havde fæstet sig. Dersom de af mig iagttagne Unger skulde fæste sig ved den brede Ende, maatte Larvemunden forsvinde og en ny Mund dannes, en Forvandling, der jo ikke er fremmed for de lavere Dyr, men endog temmelig almindelig hos de fra Coelenteraterne ikke saa fjernt staaende Echinodermer. De nysnævnte Forskeres Udtalelser med Hensyn til Befæstningsmaade staa forresten i Strid med Kowalevsky's tidligere gjorte Iagttagelser over Udviklingen af *Symphodium coralloides*; thi i hans Athandling: „Zur Entwicklungsgeschichte der Alcyoniden“¹ udtrykker han sig saaledes: „Während der Verwandlung heftet sich die Larve bekanntlich mit ihrem vorderen zugespitzten Ende an und zieht den hinteren mehr ausgebreiteten Pol ein, wobei aus demselben der Magen entsteht.“ — Jeg er dog tilbøielig til at antage, at mine Larver fæster sig ved den smale Ende, at Larvemunden bliver permanent, og at, idet den tidligere omtalte Indkrængning af Ectodermet forlænger sig og danner Svælg, fæste Skillevæggene (Mesenterierne) sig paa dette. Jeg paaviste, at i et temmelig fremrykket Larvestadium udgik der fra Mavehulheden en Mængde listeførmige Forlængelser: de begyndende Mesenterier. Enten smelter flere af disse sammen, eller flere af dem forsvinde (absorberes), saa at Antallet bliver det regulære, nemlig 8. Det er jo netop i Larvens brede Ende, at disse Skillevægge optræde, og det tør ogsaa af den Grund være antageligt, at Ungen fæster sig ved den smale Ende og altsaa ikke undergaar den Metamorphose, som vilde være Tilfældet, om Befæstelsen skede ved den tykke Del (Hoveddelen).

Det er ganske mærkeligt, at Spikeldannelsen hos disse Arter optræder saa overordentlig tidligt, længe før Larven har forladt Ægget, hvilket ikke tidligere har været observeret; thi ifølge Kowalevsky's og Marions iagttagelser indtræder Spikeldannelsen, først efter at den fritsvømmende Unge har sat sig fast. Men den Omstændighed, at Spiklerne optræde saa tidligt hos den i Ægget indesluttede Larve, kort Tid efter Ectodermet er dannet, og førend nogen Antydning til Bindevæv kunde iagttages er, saa forekommer det mig, et stærkt Bevis for, at Spiklerne ere Produkter af Ectodermcellerne og ikke af Bindevævet.

¹ Zoologischer Anzeiger. 2 Jahrg. pag. 491.

young ones, after they have abandoned the parent animal, is a subject upon which I can give no information, as I have been unable to follow them so far. But Kowalevsky and Marion have remarked, that the young of the species which they have observed always became adherent by the broad extremity, which, however, they were disposed to assume to be the cephalic part of the young one (region céphalique), when they regarded the manner in which it moved itself, that is, always with the broad extremity in advance. They do not state that there was an oral aperture in the broad extremity but, on the contrary, that the oral aperture was formed in the narrow part, and not till after the young ones had secured themselves fast. If the young ones, observed by me, were to secure themselves fast by the broad extremity, the larva mouth would necessarily disappear and a new mouth be formed, a change which, indeed, is not unknown in the lower animals, but is, even, rather common in the *Echinodermata*, not so very distantly related to the *Coenteralata*. The report of the Naturalists just named, with reference to the mode of attachment stands, however, in opposition to the observations previously made by Kowalevsky, on the development of *Symphodium coralloides*, because in his Memoir „Zur Entwicklungsgeschichte der Alcyoniden“¹ he thus expresses himself. „Während der Verwandlung heftet sich die Larve bekanntlich mit ihrem vorderen zugespitzten Ende an und zieht den hinteren mehr ausgebreiteten Pol ein, wobei aus demselben der Magen entsteht.“ I am, however, disposed to assume that my larvæ fasten themselves by the narrow extremity, and that the larva mouth is permanent; further, that whilst the depression in the ectoderm, previously spoken of, becomes prolonged and forms the gullet, the divisional walls (Mesenteries) secure themselves to it. I showed that, in a tolerably advanced larva-stage, there proceeded from the ventral cavity a number of fillet-formed prolongations — the rudimentary mesenteries. Either, several of these pass into each other, or several of them disappear (are absorbed) so that the number becomes the usual one, that is 8. It is just in the broad extremity of the larva that these divisional walls appear, and it may, for that reason, be presumed that the young one fastens itself by the narrow extremity and, therefore, does not undergo such a metamorphosis as would be the case if the attachment was made by the thick part (the cephalic part).

It is quite remarkable that the spicular formation in these species appears so extremely early, long before the larva has abandoned the ovum, a fact which has not been previously observed; according to Kowalevsky and Marions observations, the spicular formation does not appear, till after the freely-swimming young one has secured itself fast. But the circumstance that the spicules appear so early in the larva enclosed in the ovum, a short time after the formation of the ectoderm, and previous to any indication of connective-tissue being observed is, it appears to me, a strong proof that the spicules are products of the ectoderm cells, and not of the connective-tissue.

¹ Zoologischer Anzeiger. 2 Jahrg., pag. 491.

Gersemiopsis arctica, n. g. et n. sp.

Tab. XIV. Tab. XV, Fig. 1—13.

Zoanthodemet er indtil 40^{mm} høit. Stammen er grenet, rund, temmelig haard, riflet efter Længden og omtrent 20^{mm} i Omkreds ved Grunden, men smalner successivt af imod Toppen, hvor den neppe er 5^{mm} i Omfang, og hvor den ender med en større eller mindre Gruppe Polyper, Fig. 1. Paa et Exemplar er Stammen rig paa Grene lige fra Grunden og op til Toppen, Fig. 1; paa to andre er den nederste Del af Stammen nøgen, saa at Grenene først begynde omtrent 15^{mm} ovenfor Besaldelen, Fig. 2. Denne er fast, membranagtigt udvidet og omfatter dels døde Korallstumper, dels Grus eller Smaastene. Grenene staa rundt Stammen, temmelig langt fra hverandre og ere af forskjellig Længde og Tykkelse; de længste ere fra 12—15^{mm} lange og omtrent 2^{mm} brede ved Grunden, de ere runde, svagt riflede og bære paa Enden en Gruppe Polyper; de udsende flere Smaagrener, der ere korte, tynde og ende hver i 3—6 Polyper, hvoraf dels 2, dels 3 ere sammenvoxede ved Grunden, Fig. 3, imedens ved Siden af disse hyppigt sees en enkelt, isoleret Polyp, Fig. 3, a. Hos det ene Exemplar iagttages paa de fleste Grene, næsten lige ved deres Ud-spring, dels en enkelt Polyp, dels to, der forene sig ved Grunden, for at gaa over i Grenen, ligesom der fra selve Stammen udspringe dels enkelte, dels 2 eller 3 samlede Polyper, Fig. 1. Paa de to Exemplarer, hvor den nederste Del af Stammen er nøgen, udspringe ingen Polyper direkte fra dem¹. Baade Stammen og Grenene ere rige paa Spikler.

Polyperne ere cylindriske, men udvide sig noget mod Tentakelskiven, Fig. 4; de ere ikke retraktile, 8—9^{mm} lange med en udpræget Bagkrop, der er 4^{mm} lang; Forkroppen er 2,5^{mm} lang og Tentaklerne omtrent 3^{mm} lange. Paa Kroppen, der er temmelig rig paa Spikler, ordne disse sig i Længderækker, som fortsættes over paa Tentaklernes aborale Flade, hvor de danne en tyk Kjøl, Fig. 4, imedens Side- randene, ligesom Pinnulerne, ere uden Spikler, men derimod besatte med Nematocyster, der ogsaa findes paa den noget hvælvede Mundskive. Munden er aflang med tykke Læber.

¹ Der findes næsten hos hver Art denne Slags Variationer og ofte endnu større, som i de fleste Tilfælde gjør det vanskeligt, for ikke at sige umuligt, alene efter Zoanthodemets Ydre at kunne bestemme Arten.

Gersemiopsis arctica, n. g. et n. sp.

Pl. XIV. Pl. XV, figs. 1—13.

The Zoanthodem measures up to 40^{mm} in height. The stem is ramous, cylindrical, pretty hard, grooved longitudinally, and measures about 20^{mm} in circumference at the base, but diminishes, gradually, in thickness towards the summit, at which point it measures, barely, 5^{mm} in circumference, and terminates in a larger or smaller group of polyps (Pl. XIV, fig. 1). In one specimen the stem is rich in branches, quite from the base and up to its summit (Pl. XIV, fig. 1). In two other specimens the inferior part of the stem is bare, and the branches appear, first, about 15^{mm} above the basal part (Pl. XIV, fig. 2). This part is hard and membranaceously dilated, and it includes, partly, moribund coral lumps, partly, coarse sand or gravel. The branches are placed around the stem, pretty far apart from each other, and are of variable length and thickness; the longest ones measure from 12—15^{mm} in length, and about 2^{mm} in thickness at the base. They are cylindrical, faintly grooved, and carry on the extremity a group of polyps. They send out several branchlets, which are short, and slender; each of these, again, terminates in 3—6 polyps, of which, sometimes 2, and sometimes 3, are concreted together at the base (Pl. XIV, fig. 3); whilst, at the side of these, there is frequently seen a single isolated polyp (Pl. XIV, fig. 3, a). In the one specimen there is observed, upon most of the branches, almost quite at their root, sometimes a single polyp, sometimes two which unite together at the base in order to become produced into the branch, whilst, also, their spring from the branch itself, sometimes a few, sometimes 2 or 3 polyps placed together (Pl. XIV, fig. 1). In the two specimens, where the inferior part of the stem is bare, no polyps spring direct from it¹. Both the stem and the branches are rich in spicules.

The polyps are cylindrical, but become somewhat dilated towards the tentacular disk (Pl. XIV, fig. 4). They are non-retractile, and measure 8—9^{mm} in length; they have a well marked posterior body measuring 4^{mm} in length, and an anterior body measuring 2.5^{mm} in length. The tentacles are about 3^{mm} in length. Upon the body, which is pretty rich in spicules, the spicules are arranged in longitudinal series continued over into the aboral surface of the tentacles, where they form a thick ridge (Pl. XIV, fig. 4), whilst the lateral margins, as also the pinnules, are devoid of spicules but, on the other hand, are beset with nematocysts, which also are observed upon the somewhat arcuate oral disk. The oral aperture is oblong, and has thick labiæ.

¹ There are found in almost every species variations of this nature, and frequently still greater variations, which, in most cases, makes it difficult, if not impossible, to determine the species from the exterior of the Zoanthodem alone.

Paa Spiritusexemplarer antage Polyperne en mere langstrakt Form og ere stærkt bøiede efter Bugen.

Anatomisk-histologisk Undersøgelse.

Stammen og Grenene ere beklædte med et Ectoderm, der bestaar af flere Lag polyædriske Celler, Fig. 5, *a*, indenfor hvilket der er et temmelig bredt, hyalint Bindevævs-lag, Fig. 5, *b*, imedens selve Coenenchymet er tyndt, Fig. 5, *c*, hvorved Længdekanalerne blive forholdsvis meget vide, Fig. 5, *d*.

Paa Basaldelen ligge Spiklerne tæt pakkede paa hverandre, ere temmelig smaa, og de hyppigste Former, hvorunder de optræde, ere sammensatte Stjerner og Klubber. De sammensatte Stjerner variere noget, idet enkelte ere mindre udviklede, medens andre have et nøgent Belte; de ere fra 0.100—0.132^{mm} lange og fra 0.048—0.084^{mm} brede; det nøgne Belte er 0.039^{mm} bredt, Fig. 6—9. Klubberne ere enten stærkt takkede eller bladede og have et kort, tildels takket Skaft; de ere fra 0.088—0.140^{mm} lange og fra 0.048—0.096^{mm} brede i den tykke Ende, Fig. 10—13. Imellem de nævnte to Former sees hyppigt mere eller mindre udviklede Dobbeltstjerner med et nøgent Midtbelte; de ere fra 0.076—0.112^{mm} lange og fra 0.032—0.060^{mm} brede, og Midtbeltet er fra 0.012—0.020^{mm} bredt, Fig. 14—17; men yderst sjældent træffes en næsten korsformet Firling, 0.084^{mm} lang, 0.092^{mm} bred, Fig. 18, samt en vortebesat, bredend, takket Spikel, nærmende sig noget Dobbeltstjernen, 0.132^{mm} lang, 0.080^{mm} bred i Enderne og 0.048^{mm} paa Midten, Fig. 19.

Stammen er ikke i den Grad pakket med Spikler som Basaldelen, men de ligge dog, især paa dens nederste Del, tæt sammen. Det er fornemmelig Klubbeformen, som er den fremtrædende, men den varierer temmelig meget. Klubberne ere mere eller mindre stærkt bladede og have et kort, dels nøgent, dels takket Skaft; de ere fra 0.100—0.160^{mm} lange og fra 0.060—0.108^{mm} brede i den tykke Ende, Fig. 20—25. Imellem Klubberne sees Dobbeltstjerner, enkeltvis mere eller mindre udviklede, sammensatte Stjerner med eller uden nøgent Midtbelte, enkelte smaa, takkede Køller, samt nogle næsten kuglerunde, bladede Rosetter. Dobbeltstjernerne ere fra 0.076—0.084^{mm} lange, fra 0.044—0.048^{mm} brede i Enderne og Midtbeltet fra 0.016—0.020^{mm} bredt, Fig. 26—28; de sammensatte Stjerner ere fra 0.112—0.148^{mm} lange og fra 0.052—0.076^{mm} brede og Midtbeltet fra 0.020—0.028^{mm} bredt, Fig. 29—31. Køllerne ere 0.092^{mm} lange, 0.036^{mm} brede foroven, Fig. 32. Rosetterne ere stærkt indballerede i Ectodermcellerne, fra hvilke det

In specimens preserved in alcohol the polyyps assume a more elongate form, and are strongly curved along the ventrum.

Anatomo-histological examination.

The stem and the branches are clad with an ectoderm, consisting of several layers of polyhedral cells (Pl. XIV, fig. 5, *a*), inside of which there is a rather broad, hyaline connective-tissue layer (Pl. XIV, fig. 5, *b*), whilst the sarcosoma, itself, is thin (Pl. XIV, fig. 5, *c*) owing to which, the longitudinal ducts become, relatively, very wide (Pl. XIV, fig. 5, *d*).

In the basal part, the spicules are situated closely packed upon each other, and they are rather small. The most frequent forms in which the spicules appear, are complex stellates and clavates. The complex stellates differ somewhat, inasmuch, that a few are imperfectly developed, whilst others have a bare stripe. They measure from 0.100—0.132^{mm} in length, and from 0.048—0.084^{mm} in breadth. The bare stripe is 0.039^{mm} broad (Pl. XIV, figs. 6—9). The clavates are, either, strongly spicate, or foliated, and have a short, partly spicate, shaft; they measure from 0.088—0.140^{mm} in length, and from 0.048—0.096^{mm} in breadth at the thick extremity (Pl. XIV, figs. 10—13). Between the two forms named, there are seen, frequently, more or less developed bistellates with a bare mesial stripe; these measure from 0.076—0.112^{mm} in length, and from 0.032—0.060^{mm} in breadth, and the mesial belt measures from 0.012—0.020^{mm} in breadth (Pl. XIV, figs. 14—17); and, extremely rarely, an almost cruciform quadruplet is met with, measuring 0.084^{mm} in length, and 0.092^{mm} in breadth; (Pl. XIV, fig. 18) also a warty, spicate, spicule with broad extremity, approaching in form somewhat to the bistellate, and which measures 0.132^{mm} in length, 0.080^{mm} in breadth at the extremities, and 0.048^{mm} in breadth at the middle (Pl. XIV, fig. 19).

The stem is not packed with spicules to the same extent as the basal part, but they are situated, however, especially upon its inferior part, close together. It is principally the claviform which is here prominent, but it varies very much. The clavates are, more or less strongly, foliated, and have a short, sometimes bare, sometimes spicate, shaft; they measure from 0.100—0.160^{mm} in length, and from 0.060—0.108^{mm} in breadth at the thick extremity (Pl. XIV, figs. 20—25). Between the clavates, bistellates are seen; sometimes, more or less developed complex stellates, with or without a bare mesial stripe; a few, small, spicate subclavates, also; a few, almost globular, foliated rosettes. The bistellates measure from 0.076—0.084^{mm} in length, and from 0.044—0.048^{mm} in breadth at the extremities, and their mesial belt measures from 0.016—0.020^{mm} in breadth (Pl. XIV, fig. 26—28). The complex stellates measure from 0.112—0.148^{mm} in length, and from 0.052—0.076^{mm} in breadth, and have a mesial stripe measuring from 0.020—0.028^{mm} in breadth

er meget vanskeligt at befri dem; de ere 0.108^{mm} lange, 0.084^{mm} brede, Fig. 33.

I Grenene og Smaagrenene ligge Spiklerne mere spredte og ere her betydeligt større end paa Stammen. Køller, Klubber og Spindler ere de hyppigste. Køllerne ere som oftest tornede, af og til træffes en bladet; de ere fra 0.240—0.364^{mm} lange og fra 0.060—0.132^{mm} brede i den tykke Ende, Fig. 34—36. Klubberne ere tornede, fra 0.116—0.144^{mm} lange og fra 0.056—0.060^{mm} brede i den tykke Ende, Fig. 37. 38. Spindlerne ere temmelig forskellige; enkelte smaa, lidet udviklede, ere takkede, fra 0.068—0.144^{mm} lange og fra 0.024—0.028^{mm} brede, Fig. 39. 40, og ligge som oftest ved Siden af Køllerne og de store Spindler, hvilke sidste ere jævnlige noget krummede og bladede med afstumpede Ender; de ere 0.296^{mm} lange, 0.080^{mm} brede, Fig. 41; imellem de nævnte Spikler sees enkelte sammensatte Stjerner, der ere fra 0.112—0.120^{mm} lange og fra 0.048—0.064^{mm} brede, Fig. 42. 43.

Paa Polypens Bagkrop findes væsentligst Køller og Spindler, sjældnere sees her Klubber. Køllerne ere dels lige, dels krumme, bladede, fra 0.192—0.296^{mm} lange og fra 0.068—0.100^{mm} brede i den tykke Ende, Tab. XV, Fig. 1—3. Spindlerne ere takkede med mere eller mindre tilspidsede Ender, fra 0.116—0.268^{mm} lange og fra 0.028—0.052^{mm} brede, Fig. 4. 5. Klubberne ere bladede, nærme sig noget Køllen, ere fra 0.148—0.160^{mm} lange og fra 0.048—0.072^{mm} brede i den tykke Ende, Fig. 6. 7.

Paa Polypens Forkrop er det, foruden de paa Bagkroppen omtalte Spikler, især store, smukke, bladede Køller, der ere mest fremtrædende; de danne hovedsagelig den tykke Kam paa Tentaklernes aborale Flade. Disse Køller ere 0.400^{mm} lange, 0.108^{mm} brede i den tykke Ende og have et langt Skaft, Fig. 8. Imellem disse sees enkelte krumme, bladede eller takkede Klubber, der ere 0.148^{mm} lange, fra 0.036—0.056^{mm} brede i den tykke Ende, Fig. 9, og, fornemmelig paa Tentaklerne, forskjelligtformede, mere eller mindre flade, takkede Spikler, hvoraf yderst faa nærme sig Korsformen; de ere fra 0.048—0.148^{mm} lange, og fra 0.016—0.048^{mm} brede, Fig. 10—13.

Polyperne ere paa deres ydre Væg beklædte med et Ectoderm, bestaaende af to Lag polyædriske Celler, Tab. XIV, Fig. 44, a, indenfor hvilket findes et bredt, hyalint

(Pl. XIV, figs. 29—31). The subclavates measure from 0.092^{mm} in length, and 0.036^{mm} in breadth above (Pl. XIV, fig. 32). The rosettes are strongly enveloped in the ectoderm cells, from which it is very difficult to release them; they measure 0.108^{mm} in length, and 0.084^{mm} in breadth (Pl. XIV, fig. 33).

In the branches and branchlets, the spicules are placed more scattered, and are, here, considerably larger than on the stem. Subclavates, clavates, and fusees are the most frequent forms. The subclavates are, most frequently, aculeated; now and then a foliated one is met with; they measure from 0.240—0.364^{mm} in length, and from 0.060—0.132^{mm} in breadth at the thick extremity (Pl. XIV, figs. 34—36). The clavates are aculeated, and measure from 0.116—0.144^{mm} in length, and from 0.056—0.060^{mm} in breadth at the thick extremity (Pl. XIV, figs. 37. 38). The fusees are rather variable in form; some small imperfectly developed ones are spicate, and measure from 0.068—0.144^{mm} in length, and from 0.024—0.028^{mm} in breadth (Pl. XIV, figs. 39. 40), and, most frequently, lie alongside the subclavates and the large fusees, which last are, usually, somewhat curved and foliated, and have truncate extremities; they measure 0.296^{mm} in length, and 0.080^{mm} in breadth (Pl. XIV, fig. 41). Between these spicules, occasional complex stellates are seen, measuring from 0.112—0.120^{mm} in length, and from 0.048—0.064^{mm} in breadth (Pl. XIV, figs. 42. 43).

On the posterior body of the polyp, subclavates and fusees are, principally, found. Clavates are seen, here, less frequently. The subclavates are, sometimes straight, sometimes curved and foliated, and they measure from 0.192—0.296^{mm} in length, and from 0.068—0.100^{mm} in breadth at the thick extremity (Pl. XV, figs. 1—3). The fusees are spicate, and have more or less acuminate extremities; they measure from 0.116—0.268^{mm} in length, and from 0.028—0.052^{mm} in breadth (Pl. XV, figs. 4—5). The clavates are foliated, and approach in form somewhat to the subclavate; they measure from 0.148—0.160^{mm} in length, and from 0.048—0.072^{mm} in breadth at the thick extremity (Pl. XV, figs. 6—7).

The spicules of the anterior body of the polyp, besides those spoken of as pertaining to the posterior body, which are most prominent, are, especially, large, beautiful, foliated subclavates. They form, principally, the thick ridge on the aboral surface of the tentacles. These subclavates measure 0.400^{mm} in length, and 0.108^{mm} in breadth at the thick extremity, and have a long shaft (Pl. XV, fig. 8). Between them, a few curved, foliate, or spicate clavates are seen; these measure 0.148^{mm} in length, and from 0.036—0.056^{mm} in breadth at the thick extremity (Pl. XV, fig. 9); and there are seen, especially upon the tentacles, variously formed, more or less flat, spicate spicules, of which extremely few approach the cruci-form; they measure from 0.048—0.148^{mm} in length, and from 0.016—0.048^{mm} in breadth (Pl. XV, figs. 10—12).

The polyps, upon their exterior wall, are clad with an ectoderm, consisting of two layers of polyhedral cells (Pl. XIV, fig. 44, a), inside of which, there is found a

Bindevævslag, hvori Spiklerne ere indleirede, Fig. 44, *b*; men de Hulheder, hvori Spiklerne ligge, ere forsynede med Ectodermceller, Fig. 44, *c*, der som oftest omslutte Spiklerne saa intimt, at de gjerne følge med dem, naar de fjernes. Indenfor Bindevævet er det almindelige Muskellag, der beklædes af et Endothel, dannet af et Lag runde Celler med Kjerne og Kjernelegeme, Fig. 44, *d*, hvilket Endothel ogsaa tapetserer Septa og Svælgets ydre Flade, Fig. 44, *e*.

Hvad der især maa tiltrække sig Opmærksomheden, er Svælgets særegne Bygning, som nu nærmere skal beskrives¹. Strax nedenfor Mundaabningen begynder paa Bug siden Svælgrenden, der har en oval Form og strækker sig lige ned til Svælgets frie Ende, Fig. 44, *f*. Saavel Svælgrenden som den øvrige Del af Svælget er beklædt med Epithel; men medens Svælgrendens Epithel dannes af meget lange, smale Celler, der ere forsynede med Kjerne og Kjernelegeme, og som have paa deres fri Ende en lang Pidsk (Cilie), Fig. 44, *g*, dannes den øvrige Del af Svælg-epithelet af kortere Celler med almindelige Cilier, ligesom der i dette Epithel er indleiret kolbeformede, encellede Slimkjertler, Fig. 44, *h*.

Strax ovenfor Svælgrendens Begyndelse udgaar i en skraa Retning fra højre Væg, nærmere Rygsiden, et listeformigt, ovalt, omtrent 2^{mm} langt Fremspring. Dets øverste Del er meget høit, tykt og rager langt ind i Svælget mod dettes venstre Væg, Tab. XV, Fig. 13, *a*, men bliver alt lavere og lavere, jo længere det strækker sig ned, Tab. XV, Fig. 13, *b*. Det er dannet af en fortykkelse af Svælg-epithelet, hvis Celler paa dette Sted antager en overordentlig Længde, Tab. XIV, Fig. 45, *a*. Noget Bindevæv synes ikke at være tilstede, derimod sees spredte Muskelfibre at gaa over fra Svælgvæggen ind i Fremspringet. Lidt nedenfor dette Fremspring sees et lignende, der udgaar ogsaa fra højre Væg, men gaar strax over Rygsiden til venstre Væg, hvor det antager næsten S-Formen og forlænger sig næsten lige ned til Svælgets Ende. Opad ved dets Begyndelse er dette Fremspring meget lavt og smalt, Tab. XV, Fig. 13, *c*, men bliver højere og højere jo længere det strækker sig ned og rager da langt ind i Svælget, saa at det naar dettes højre Væg, Tab. XV, Fig. 13, *d*.

Disse mærkelige Fremspring synes at virke som Klapper, der ikke godt kan have nogen anden Bestemmelse end at lukke for Svælgrenden, hvorved Svælget i dets største Længde deles i to Kanaler, saaledes nemlig, at den ene Kanal kan virke som Spiserør, hvorigjennem Føde-

¹ For bedre at kunne orientere sig inddeler jeg Svælget i en Bug- og Rygside, i en højre og venstre Side.

broad, hyaline connective-tissue layer, in which the spicules are entrenched (Pl. XIV, fig. 44, *b*), but the cavities in which the spicules are placed are furnished with ectoderm cells (Pl. XIX, fig. 44, *c*) which, usually, inclose the spicules so tightly that these often remain attached to them when they are removed. Inside of the connective-tissue layer, the usual muscular layer is found; this is covered by an endothelium, formed of a layer of globular cells with nucleus and nucleus body (Pl. XIV, fig. 44, *d*); this endothelium also coats the septa and the gullet's external surface (Pl. XIV, fig. 44, *e*).

What must attract special attention, is the peculiar structure of the gullet, which I shall now describe more particularly¹. Immediately below the oral aperture, on the ventral side, the gullet-passage begins; it has an ovate form, and extends right down to the free extremity of the gullet (Pl. XIV, fig. 44, *f*). The gullet-passage, as well as, also, the remainder of the gullet, is clad with epithelium, but whilst the epithelium of the gullet-passage is formed of very long narrow cells, furnished with nucleus and nucleus-body and carrying on their free extremities a long whip (Cilium) (Pl. XIV, fig. 44, *g*), the remainder of the gullet-epithelium is formed of shorter cells with the usual cilia, whilst, also, there are entrenched in this epithelium, sub-claviform, unicellular mucous glands (Pl. XIV, fig. 44, *h*).

Immediately above the commencement of the gullet-passage, there proceeds, in a diagonal direction, from the dextral wall nearest to the dorsal side, a fillet-formed oval protuberance about 2^{mm} in length. Its uppermost part is very high and thick, and it projects far into the gullet, towards its sinistral wall (Pl. XV, fig. 13, *a*), but becomes less and less in height the further down it extends (Pl. XV, fig. 13, *b*). It is formed by a tumefaction of the epithelium of the gullet, whose cells, in this situation, acquire an extreme length (Pl. XIV, fig. 45, *a*). There does not appear to be any connective-tissue present, but, on the other hand, scattered muscular fibres are seen to proceed from the gullet-wall into the protuberance. Slightly below this protuberance a similar one is visible, which, also, proceeds from the dextral wall, but passes immediately across the dorsal side to the sinistral wall, where it almost assumes the S-form, and becomes prolonged nearly right down to the extremity of the gullet. Upwards, at its commencement, this protuberance is very low and narrow, (Pl. XV, fig. 13, *c*) but becomes higher and higher the further it extends down, and it then projects far into the gullet, so that it reaches to its dextral wall (Pl. XV, fig. 13, *d*).

These remarkable prominences appear to operate as flaps, and they can scarcely have any other purpose than to close the gullet-passage, causing the gullet, for the greater part of its length, to be divided into two canals, in such manner, that the one canal can serve as an alimentary

¹ In order to simplify the description, I divide the gullet, into ventral and dorsal sides, and dextral and sinistral sides.

midlerne og Søvandet føres fra Munden igjennem Svælgrenden ned i Mavehulheden, den anden som Tarm. Det synes, som om her er paabegyndt et Arbeide mod en høiere Organisation; hvor langt det vinder sig frem, faar staa derhen, men yderst mærkeligt er under alle Omstændigheder dette Forhold. For at gjøre dette nogenlunde forstaaeligt, følge Tversnittene under hverandre i den Orden, de ere fremstillede. Tab. XIV, Fig. 45, er et Tversnit fra den øverste Del af Polyphen med sit Svælg, strax ovenfor Svælgrendens Begyndelse; her sees det listeformige, ovale Fremspring fra høire Væg, Fig. 45, *a*, hvilket, idet det slutter sig til venstre Væg, dækker Svælgrenden, Fig. 45, *b*, imedens den øvrige Del af Svælget er aaben. Fig. 46 fremstiller et lignende Tversnit noget under det første, paa hvilket ikke alene Fremspringet fra høire Væg sees, Fig. 46, *a*, men ogsaa Begyndelsen af det 2det Fremspring, Fig. 46, *b*. Fig. 47 fremstiller et Tversnit lidt under det foregaaende, hvilket viser begge Fremspringene i deres største Udbredning, saaledes at høire Fremspring, Fig. 47, *a*, slutter sig tæt til venstre Væg, imedens venstre Fremspring, Fig. 47, *b*, naar næsten hen til høire Væg. Fig. 48 fremstiller et Tversnit endnu længere nede, og her sees kun den nederste, smale Del af Fremspringet fra høire Væg, Fig. 48, *a*, imedens det fra venstre Væg endnu har sin fulde Høide og rager lige hen til høire Væg, Fig. 48, *b*. Fig. 49 fremstiller et Tversnit fra Svælgets nederste Ende, paa hvilket der endnu sees en liden Rand af Fremspringet paa venstre Væg, Fig. 49, *a*, imedens det paa høire Væg er ganske forsvundet, Fig. 49, *b*. De mange mellemliggende Tversnit har jeg ikke fundet nødvendigt at gjengive, da de egentlig intet yderligere oplyser.

Farven.

Farven er gul, spillende noget i det Røde, især gjælder dette sidste Polyperne, som udstrakte ere meget klare.

Findested.

Station 312. 3 Exemplarer.

Slægtskarakter.

Zoanthodemet træformet. Stammen grenet. Grenene dele sig i flere Smaagrener. Coenenchymet sparsomt. Kanalerne vide. Polyperne cylindriske med en lang Bagkrop, ikke retraktile. Svælget forsynet med to listeformige Fremspring (Klapper). Stammen, Grene, Smaagrener og Polyper rige paa Spikler, hvoraf Kølle- og Klubbeformen er mest fremtrædende.

tube, by which the food and seawater are led from the oral aperture, through the gullet-passage, down into the ventral cavity; and the other as an intestine and rectum. It appears as if there was, here, originated a step towards a higher organisation; how far it proceeds remains unsolved, but this relation is, under all circumstances, very remarkable. In order to make this the more intelligible, the sections are arranged, under each other, in the order that they are presented. Pl. XIV, fig. 45 is a transverse section, from the uppermost part of the polyp, with its gullet, immediately above the commencement of the gullet-passage. Here is seen the fillet-formed oval protuberance from the dextral wall (Pl. XIV, fig. 45, *a*) which, as it passes up to the sinistral wall, covers the gullet-passage (Pl. XIV, fig. 45, *b*) whilst the remaining part of the gullet is open. Pl. XIV, fig. 46 shows a similar transverse section, from a little below the first one; on it is seen, not only the protuberance from the dextral wall (Pl. XIV, fig. 46, *a*) but also the commencement of the second protuberance (Pl. XIV, fig. 46, *b*). Pl. XIV, fig. 47 shows a protuberance a little below the preceding one, and shows both the protuberances in their greatest width, so that the dextral protuberance (Pl. XIV, fig. 47, *a*) closes tight to the sinistral wall, whilst the sinistral protuberance (Pl. XIV, fig. 47, *b*) reaches almost to the dextral wall. Pl. XIV, fig. 48 shows a transverse section still lower down, and here, is seen only the lowest narrow part of the protuberance from the dextral wall (Pl. XIV, fig. 48, *a*) whilst that from the sinistral wall still retains its entire height and projects quite up to the dextral wall (Pl. XIV, fig. 48, *b*). Pl. XIV, Fig. 49 shows a transverse section from the lowest extremity of the gullet, upon which there is still seen a small margin of the protuberance on the sinistral wall (Pl. XIV, fig. 49, *a*), whilst upon the dextral wall it has quite disappeared (Pl. XIV, fig. 49, *b*). I have not found it necessary to supply the numerous intermediate sections as they do not, really, give any further information.

Colour.

The colour is yellow, shading somewhat to red. This is especially the case with the polyps, which, when extended, are very pellucid.

Habitat.

Station No. 312. Three specimens.

Generic characteristics.

The Zoanthodem arboraceous. The stem ramous. The branches ramify into several branchlets. The Sarcosoma sparing. The ducts wide. The polyps cylindrical, with a long posterior body, non-retractile. The gullet furnished with two fillet-formed protuberances (Flaps). The stem, branches, branchlets, and polyps, rich in spicules, of which subclavates and clavates are the most prominent forms.

Artskarakter.

Zoanthodemet indtil 40^{mm} høit. Basaldelen membranagtig udvidet, fast. Stammen rund, riflet paalangs, grenet. Grenene staa langt fra hverandre, ere temmelig lange og dele sig i flere, korte Smaagrene, der hver bære 3—6 Polyper, hvor dels 2, dels 3 ere sammenvoxede ved Grunden. Polyperne ere cylindriske, noget udvidede mod Tentakelskiven, ikke retraktile, med en lang Bagkrop og forsynede med Spikler. Tentaklerne have paa Midten af den aborale Side en tyk Kjøle af Spikler; Siderandene og Pinnulerne ere uden Spikler, men tæt besatte med Nematocyster, som ogsaa findes paa den hvælvede Mundskive. Basaldelen særdeles rig paa Spikler, der optræde væsentlig som Klubber og sammensatte Stjerner. Stammen, Grenene og Smaagrenene ligeledes spikelrige; Formerne ere her hovedsagelig Klubber, Dobbeltstjerner og Køller. Paa Polyperne optræde fornemmelig store Køller og Klubber som karakteristiske Former. Farven gul, spillende noget i det Røde.

Barathrobium¹ digitatus, n. g. et sp.

Tab. XV, Fig. 14—70. Tab. XVI, Fig. 1—41.

Zoanthodemet indtil 70^{mm} høit. Stammen er rund, stærkt riflet efter Længden, grenet og ved Grunden omtrent 45^{mm} i Omfang, men aftager successivt i Tykkelse op til Toppen, hvor den i Regelen deler sig i flere tykke Grene, Tab. XV, Fig. 14. 15. Kun sjældent sees Stammen at være udelt lige til dens øverste Ende; naar dette er Tilfældet, er den besat med en større eller mindre Gruppe Polyper. Basaldelen er fast, udvider sig membranagtigt og danner hyppigt et Rør, der er udfyldt med Ler eller Grus, alt efter Beskaffenheden af Bunden, hvortil den er fæstet; til dels udgaar der fra denne Basaldel en eller to Stoloner, der ligeledes ere fyldte med samme Masse som Basalen, og ved hvis Hjælp Kolonien yderligere befæster sig til Bunden. Grenene udspringe som oftest rundt Stammens to øverste Trediedele, staa temmelig langt fra hverandre, ere meget tykke og dele sig ofte i to eller flere mindre Grene, der enten dele sig i Enden i flere Smaagrene, der hver bære 2—4 Polyper, eller hvor Enden er udelt, er denne optaget af flere Polyper, Tab. XV, Fig. 14. 15. 16. Den nederste Trediedel af Stammen er hyppigst nøgen, naar undtages, at en eller et Par Polyper kunne af og til sees der. Fra Grenene udgaar dels enkelte Polyper, dels Smaagrene, der staa meget tætte, ere korte men brede og bære

¹ βάραθρον = en Afgrund, ζιόω = lever.

Specific characteristics.

The Zoanthodem measures up to 40^{mm} in height. The basal part membranaceously dilated, hard. The stem cylindrical, longitudinally furrowed, ramous. The branches placed far apart from each other, are pretty long, ramify into several short branchlets, each of which carries 3—6 polyps, of which, sometimes two, sometimes three are conerected together at the base. The polyps cylindrical, somewhat dilated towards the tentacular disk, non-retractile, have a long posterior body, and are furnished with spicules. The tentacles have, in the middle of the aboral side, a thick ridge of spicules. The lateral margins, and the pinnules, devoid of spicules but closely beset with nematocysts, which, also, are found upon the arcuate oral disk. The basal part particularly rich in spicules, appearing, most frequently, as clavates and complex stellates. The stem, the branches, and the branchlets, also, rich in spicules. The forms in this situation are, principally, clavates, bistellates, and subclavates. On the polyps, the characteristic forms which occur, are large subclavates, and clavates. The colour yellow, shading a little to red.

Barathrobium¹ digitatus, n. g. et sp.

Pl. XV, figs. 14—70. Pl. XVI, figs. 1—41.

The Zoanthodem measures up to 70^{mm} in height. The stem is cylindrical, strongly furrowed longitudinally, ramous, and it measures about 45^{mm} in circumference at the base, but diminishes, gradually, in thickness towards the summit, where, as a rule, it ramifies into several thick branches (Pl. XV, figs. 14. 15). Only rarely is the stem seen to be undivided throughout its length right up to its summit. When that is the case, the summit is beset with a, smaller or larger, group of polyps. The basal part is hard, and is membranaceously dilated, and often forms a tube that is stuffed with clay or coarse sand, according to the nature of the sea-bottom to which it is attached. Sometimes there proceed, from this basal part, one or two stolons which are, likewise, filled with the same material as the base, and by the aid of which the Zoanthodem still further secures itself to the sea-bottom. The branches shoot out, most frequently, round about the superior two-third parts of the stem, and are placed pretty far apart from each other; they are very thick, and frequently ramify into two or more smaller branches that, again, either ramify at the extremity into several branchlets, each of them carrying 2—4 polyps, or, which, in the case of the extremity remaining unramified, is occupied by several polyps

¹ βάραθρον = a precipice, ζιόω = lives.

dels 2, dels 4 Polyper, der som oftest ere sammenvoxede ved Grunden og antage derved et fingerformet Udseende, Fig. 15. 16. Fra Stammen udspringe stundom en enkelt, stundom 2 Polyper, men hyppigere mindre Polypgrupper, bestaaende af 3—6 Polyper, som forene sig i en kort, temmelig tynd Stilk, Fig. 15. Stammen, Grenene og Smaagrenene ere rige paa Spikler.

Polyperne ere cylindriske, retraktile, 10—12^{mm} lange, temmelig klare med en 5^{mm} lang Forkrop og 3^{mm} lang Bagkrop, Fig. 17. Hele Kroppen er inkrusteret af Spikler, der paa Bagkroppen ligge paatvers, men paa Forkroppen paalangs, hvor de danne stærkt fremspringende Ribber, som gaa over paa Tentaklerne, der ere omtrent 4^{mm} lange og forsynede med Pinnuler, som ligeledes ere rige paa Spikler, Fig. 18. Munden danner en Tverspalte; Mundskiven næsten flad. Naar Polypen trækker sig ind, danner Bagkroppen dens Celle, der sees da som en halvrund Forhoining over Stammens eller Grenens Niveau, Fig. 16, a.

Anatomisk-histologiske Undersøgelser.

Stammen og Grenene ere udvendigt beklædte med et Ectoderm, der bestaar af flere Lag store, polyædriske Celler med en stor, aflang Kjerne og et rundt Kjernelegeme, Fig. 19, a; imellem disse Cellers inderste Lag iagttages aflange, encellede Sliinkjertler. Indenfor Ectodermet er et bredt, hyalint Bindevævslag, Fig. 19, b, der sender sine Forlængelser indad, og som, idet de anastomose med hverandre, danne Skillevægge for Kanalerne, Fig. 20, a. Saavel det ydre Bindevævslag som Skillevæggene ere ualmindelig rige paa store Ernæringskanaler, beklædte og tildels ganske udfyldte af noget langstrakte Epithelceller, Fig. 19, c. 20, b. Paa Bindevævet indre Flade, ligesom paa Skillevæggene, ligger som sædvanligt Muskellaget forsynet med cilierende Endothel. I Ectodermets dybere Lag, i Bindevævet og dets Forlængelser, der danne Skillevæggene (det egentlige Coenenchym), findes Spikelafleiringer. I Ectodermet ligge Spiklerne tæt paa hverandre, omsluttede af Ectodermceller, og i selve Bindevævet, hvor Spiklerne ligge mere enkeltvis, ere de ligeledes omgivne af Ectodermceller, Fig. 19, d; dette sees kun, efterat Stammen eller Grenen er afkalket, og fine Tversnit ere udpræparerede og farvede. Det hele Coenenchym viser sig da at være forsynet med Spikler, Fig. 20, c.

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

(Pl. XV, figs. 14. 15. 16). The lowest third part of the stem is most frequently bare, with the exception that occasionally one or a couple of polyps may be seen there. From the branches there proceed, partly, a few polyps, partly branchlets placed very close to each other; these branchlets are short, but thick, and carry, sometimes 2, and sometimes 4, polyps which, most frequently, are concreted together at the base, and thus acquire a digital appearance (Pl. XV, figs. 15. 16). From the stem there proceed, occasionally, a single, sometimes two polyps, but more frequently small groups of polyps, consisting of 3—6 polyps which unite together into a short, pretty thin stalk (Pl. XV, fig. 15). The stem, the branches, and the branchlets are rich in spicules.

The polyps are cylindrical, retractile, and measure 10—12^{mm} in length; and they are rather pellucid. They have an anterior body 5^{mm} in length, and a posterior body 3^{mm} in length (Pl. XV, fig. 17). The entire body is encrusted with spicules which, on the posterior body, are placed transversally, but on the anterior body longitudinally, where they form strongly protuberant ribs which pass over to the tentacles; these latter measure about 4^{mm} in length, and are furnished with pinnules which are also rich in spicules (Pl. XV, fig. 18). The oral aperture forms a transversal fissure, and the oral disk is almost flat. When the polyps retract themselves, the posterior body forms the cell for them, and they then appear as a convex projection beyond the surface of the stem or branch (Pl. XV, fig. 16, a).

Anatomo-histological Examination.

The stem and the branches are, exteriorly, clad with an ectoderm, consisting of several layers of large polyhedral cells containing a large oblong nucleus, and a globular nucleus body (Pl. XV, fig. 19, a). Between the innermost layers of these cells, there are observed oblong unicellular mucous glands. Inside the ectoderm, there is a broad hyaline connective-tissue layer (Pl. XV, fig. 19, b) which sends its prolongations inwards, and which, whilst they anastomose with each other, form the divisional walls of the ducts (Pl. XV, fig. 20, a). Both, the exterior connective-tissue layer as well as the divisional walls, have the usual wealth of large nutritory ducts; these are clad, and in some cases quite stuffed, with somewhat elongated epithelial cells (Pl. XV, fig. 19, c. 20, b). On the inner surface of the connective-tissue, as well as, also, upon the divisional walls, is placed, as usual, the muscular layer, which is furnished with ciliating endothelium. In the deeper layers of the ectoderm, in the connective-tissue, and also in its prolongations forming the divisional walls (the sarcosoma proper), spicular deposits are found. In the ectoderm, the spicules are situated close to each other enclosed by the ectoderm cells, and in the connective-tissue itself, where the spicules are found more

Paa Basaldelen fremtræde Spiklerne hyppigt under Form af Dobbeltstjernen og den sammensatte Stjerne. Dobbeltstjernerne ere meget varierende, ofte ere Enderne delte og Straalerne takkede, hvorved de næsten tabe Stjerneformen; de have i Almindelighed et nøgent Midtbelte og ere fra $0.088-0.096^{mm}$ lange og fra $0.044-0.072^{mm}$ brede i Enderne; Midtbeltet er fra $0.012-0.024^{mm}$ bredt, Fig. 21—23. De sammensatte Stjerner ere mere eller mindre udviklede; ogsaa paa disse ere undertiden Enderne delte og meget takkede; de ere fra $0.096-0.116^{mm}$ lange og fra $0.048-0.060^{mm}$ brede i Enderne; flere af de sammensatte Stjerner have et smalt Midtparti, der som oftest er nøgent, Fig. 24—26. Næsten ligesaa hyppigt som de to nævnte Spikelformer træffes Firlinger, hvoraf de fleste have en mere eller mindre udpræget Korsform. Størrelsen er yderst forskjellig; enkelte ere meget smaa, kun lidet besatte med Kalkpapiller, 0.044^{mm} lange og brede, Fig. 27; andre ere rigt ornamenterede med Takker og Blade, fra $0.080-0.112^{mm}$ lange og fra $0.056-0.124^{mm}$ brede, Fig. 28—30. Imellem samtlige disse Spikler sees enkelte smaa, tynde Spindler med faa Takker, 0.080^{mm} lange, 0.012^{mm} brede, Fig. 31.

Nederst paa Stammen er Dobbeltstjernen og Klubben den almindeligste Spikelform. Dobbeltstjernerne ere dog noget forskjellige fra dem, som findes paa Basaldelen; de ere fra $0.064-0.100^{mm}$ lange og fra $0.048-0.060^{mm}$ brede i Enderne; Midtbeltet er som oftest nøgent og fra $0.012-0.020^{mm}$ bredt, Fig. 32—34. Klubberne have en forunderlig Form; nogle have ligesom et Kors i den ene Ende, andre ere stærkt bladede og nærme sig adskilligt til den sammensatte Stjerne; Skaflet er paa dem alle besat med Takker; de ere fra $0.064-0.112^{mm}$ lange, og fra $0.048-0.056^{mm}$ brede i den tykke Ende, Fig. 35—39. Imellem disse Spikler findes enkelte, takkede Spindler fra $0.092-0.120^{mm}$ lange og 0.036^{mm} brede, Fig. 40. 41.

Øverst paa Stammen finder man hyppigst sammensatte Stjerner og takkede Spindler, sjældnere Dobbeltstjerner og endnu sjældnere Firlinger, takkede Køller og Klubber. De sammensatte Stjerner ere af og til spaltede i Enderne og stærkt takkede, noget lig dem, som findes paa Basaldelen; stundom ere de meget langstrakte og nærme sig Spindlerne; de ere fra $0.112-0.140^{mm}$ lange og fra $0.048-0.060^{mm}$ brede, Fig. 42—44. Dobbeltstjernerne have bladede Straaler og et nøgent Midtbelte, ere 0.084^{mm}

dispersed, they are also surrounded by ectoderm cells (Pl. XV, fig. 19, d). This is not seen until the stem, or the branch, has been freed of calcium and minute dissections made and coloured. The entire sarcosoma, then, shows itself to be furnished with spicules (Pl. XV, fig. 20, c).

In the basal part, the spicules appear, most frequently, in the form of the bistellate and the complex stellate. The bistellates are very various in form; the extremities are frequently split, and the rays spicate, so that they almost lose the stellate form. They, usually, have a bare mesial stripe, and measure from $0.088-0.096^{mm}$ in length, and from $0.044-0.072^{mm}$ in breadth at the extremities; the mesial stripe measures from $0.012-0.024^{mm}$ in breadth (Pl. XV, figs. 21—23). The complex stars are more or less developed, and, also in these, the extremities are, sometimes, split and very spicate; they measure from $0.096-0.116^{mm}$ in length, and from $0.048-0.060^{mm}$ in breadth at the extremities. Several of the complex stellates have a narrow mesial stripe which, most frequently, is bare (Pl. XV, figs. 24—26). Almost as frequently as the two spicular forms just mentioned, quadruplets are met with, of which the greater number have a more or less marked cruciform. The size is extremely variable, some are very small, and only sparingly beset with calcareous papillæ; these measure 0.044^{mm} in length and breadth (Pl. XV, fig. 27). Others are richly embellished with spikes, and leaves; and these measure from $0.080-0.112^{mm}$ in length, and from $0.056-0.124^{mm}$ in breadth (Pl. XV, figs. 28. 30). Between all these spicules, a few small thin spicules, with only few spikes, are seen; these measure 0.080^{mm} in length, and 0.012^{mm} in breadth (Pl. XV, fig. 31).

On the lowest part of the stem, the bistellate, and clavate are the most common spicular forms. The bistellates are, however, somewhat different from those that are found on the basal part; they measure from $0.064-0.100^{mm}$ in length, and from $0.048-0.060^{mm}$ in breadth at the extremities. The mesial stripe is generally bare, and measures from $0.012-0.020^{mm}$ in breadth (Pl. XV, figs. 32—34). The clavates have a strange form; some have, as it were, a cross in the one extremity; others are strongly foliated, and approach, considerably, to the complex stellates in form. In all of them, the shaft is beset with spikes; they measure from $0.064-0.112^{mm}$ in length, and from $0.048-0.056^{mm}$ in breadth at the thick extremity (Pl. XV, figs. 35—39). Between these spicules, a few spicate fusees are found, measuring from $0.092-0.120^{mm}$ in length, and 0.036^{mm} in breadth (Pl. XIV, figs. 40. 41).

In the uppermost part of the stem, complex stellates, and spicate fusees are the spicules most frequently met with, more rarely bistellates, and, still more rarely, quadruplets, spicate subclavates, and clavates. The complex stellates are, now and then, fissured at the extremities, and are strongly spicate, somewhat like those found in the basal part; sometimes they are very elongated, and approach to the fusiform; they measure from $0.112-0.140^{mm}$ in length, and from $0.048-0.060^{mm}$ in breadth (Pl. XV, figs. 42. 44).

lange, 0.056^{mm} brede i Enderne og 0.020^{mm} brede paa Midten, Fig. 45. Spindlerne ere ofte stærkt takkede og temmelig udvidede paa Midten; de ere fra 0.080—0.144^{mm} lange og fra 0.028—0.048^{mm} brede, Fig. 46—48. Klubberne ere takkede næsten lige ned til Enden af Skaftet; de ere fra 0.080—0.132^{mm} lange og fra 0.040—0.064^{mm} brede i den tykke Ende, Fig. 49—52. Køllerne ere smale, 0.104^{mm} lange, 0.036^{mm} brede i den tykke Ende; Skaftet er temmeligt langt og sparsomt besat med Takker, Fig. 53. Af de enkelte Firlinger, som findes, er den ene Form 0.092^{mm} lang, 0.060^{mm} bred og kun lidet forsynet med Takker, Fig. 54; den anden er meget rig paa Takker, Fig. 55, omtrent lige lang som bred og nærmer sig meget enkelte korsformede Firlinger, der findes paa Basaldelen, Fig. 29.

Paa Grenene træffes hyppigst Klubber, kun sjældent en Firling og en enkelt, stilket, trearmet Stjerne, samt en monstrøs Dobbeltstjerne. Klubberne ere dels takkede, dels bladede med takket Skaft; de ere fra 0.116—0.142^{mm} lange og fra 0.040—0.056^{mm} brede i den tykke Ende, Fig. 56—60. Firlingen danner et smukt ornamenteret Kors med en Længdestok, 0.132^{mm}, og en Tverstok, 0.064^{mm} lang, Fig. 61. Den stilkede, trearmede Stjerne er omtrent lige lang som bred, Fig. 62. Dobbeltstjernen er 0.072^{mm} lang, 0.040^{mm} bred i Enderne og 0.012^{mm} bred paa Midten, Fig. 63.

Overalt i Coenenchymet findes udbredte Spikelafleiringer. Det er i Skillevejggene langs de store Saftkanaler, Spiklerne ere afsatte, og her ligge de som oftest i Rækker nærmest Epithelialbeklædningen, Fig. 20, c. Det Epithel, der beklæder Saftkanalerne, dannes som tidligere omtalt af nogle aflange Celler, som stundom antager Ellipseformen, have en stor Kjerne og ere sandsynligvis en noget omdannet Form af Ectodermcellerne.

I Coenenchymet nederst paa Stammen ere Firlinger og takkede Spindler almindeligst, imellem dem findes enkeltvis gaffelformede Klubber, samt monstrøse Dobbeltstjerner. Firlingerne ere meget forskellige, men de fleste nærme sig dog mere eller mindre Korsformen og ere besatte snart med Vorter, snart med Takker; deres Længdestok er fra 0.120—0.148^{mm} lang og Tverstok fra 0.088—0.148^{mm} bred, Fig. 64—67; enkelte Firlinger, der forresten ere yderst sjældne, have Timeglasformen, ere næsten glatte, 0.068^{mm} lange, 0.044^{mm} brede i Enderne, og 0.020^{mm} brede paa Midten, Fig. 68. Spindlerne ere overordentlig stærkt takkede; Takkerne ere ofte delte og faa da et bladet Udseende,

The bistellates have foliated rays and a bare mesial stripe; they measure from 0.084^{mm} in length, 0.056^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the middle (Pl. XV, fig. 45). The fusees are, frequently, strongly spicate, and pretty much dilated in the middle; they measure from 0.080—0.144^{mm} in length, and from 0.028—0.048^{mm} in breadth (Pl. XV, figs. 46, 48). The clavates are spicate almost right down to the extremity of the shaft; they measure from 0.080—0.132^{mm} in length, and from 0.040—0.064^{mm} in breadth at the thick extremity (Pl. XV, figs. 49—52). The subclavates are narrow, and measure 0.104^{mm} in length, and 0.036^{mm} in breadth at the thick extremity; their shaft is pretty long, and sparingly beset with spikes (Pl. XV, fig. 53). Of the few quadruplets which are found, the one form measures 0.092^{mm} in length, and 0.060^{mm} in breadth, and is only sparingly supplied with spikes (Pl. XV, fig. 54). The other form is very rich in spikes (Pl. XV, fig. 55); it measures about the same in length as in breadth, and approaches, much, in form to a few cruciform quadruplets that are found in the basal part (Pl. XV, fig. 29).

On the branches, clavates are most frequently met with; only rarely is a quadruplet and a solitary pedunculated three-rayed stellate met with, also an immense bistellate. The clavates are, partly, spicate, partly foliate, with a spicate shaft; they measure from 0.116—0.142^{mm} in length, and from 0.040—0.056^{mm} in breadth at the thick extremity (Pl. XV, figs. 56—60). The quadruplet forms a beautifully embellished crucifix, with a longitudinal arm measuring 0.132^{mm} in length, and a transversal arm measuring 0.064^{mm} in length (Pl. XV, fig. 61). The pedunculated three-rayed stellate is about as long as it is broad (Pl. XV, fig. 62). The bistellate measures 0.072^{mm} in length, 0.040^{mm} in breadth at the extremities, and 0.012^{mm} in breadth at the middle (Pl. XV, fig. 63).

Everywhere, in the sarcosoma, spicular deposits are found spread out. It is in the divisional walls along the course of the large nutritory ducts that the spicules are deposited, and they are, there, most frequently, situated in series next the epithelial covering (Pl. XV, fig. 20, a). The epithelium which clothes the nutritory ducts is formed, as previously spoken of, of somewhat oblong cells which, sometimes, assume elliptic form and contain a large nucleus; they are probably a somewhat altered form of the cells of the ectoderm.

In the sarcosoma, lowest down on the stem, quadruplets and spicate fusees are commonest; between them, occasional furcate clavates are found, also immense bistellates. The quadruplets are very various, but most of them, however, approach more or less to the cruciform, and are beset, sometimes, with warts, sometimes with spikes. Their longitudinal arm measures from 0.120—0.148^{mm} in length, and their transversal arm from 0.088—0.148^{mm} in length (Pl. XV, figs. 64—67). A few quadruplets, but they are very rare however, have the sand-glass form, and are almost smooth; they measure 0.068^{mm} in length, 0.044^{mm} in breadth at the extremities, and

Fig. 69. 70. Den gaffelformige Klubbe er takket, 0.136^{mm} lang, 0.056^{mm} bred foroven, Tab. XVI, Fig. 1, og den monstrøse Dobbeltstjerne med lange Udløbere er 0.124^{mm} lang, 0.081^{mm} bred i Enderne og 0.020^{mm} bred paa Midten, der næsten er nøgen, Tab. XVI, Fig. 2.

Øverst i Stammens Coenenchym sees væsentligst meget store, takkede Køller og Spindler; de første ere 0.236^{mm} lange, 0.076^{mm} brede foroven, Tab. XVI, Fig. 3, de sidste ere 0.212^{mm} lange, 0.064^{mm} brede, Tab. XVI, Fig. 4. I Grenenes Coenenchym sees yderst sparsomt en Firling i fordreiet Korsform men rigt ornamenteret, hvis Længdestok er 0.140^{mm} og Tverstok 0.092^{mm} , Fig. 5, enkelte tynde, takkede Spindler, 0.132^{mm} lange, 0.036^{mm} brede, Fig. 6, samt enkelte Dobbeltstjerner med bladede Straaler, 0.132^{mm} lange, 0.092^{mm} brede i Enderne, 0.028^{mm} brede paa Midten, Fig. 7.

Polyperne have paa deres udvendige Side et Ectoderm, ligt det, som findes paa Stammen, kun danne Cellerne neppe mere end to Lag; indenfor Ectodermet er det sædvanlige Bindevævslag, fra hvis indre Flade udgaa Septa, der fæste sig paa Svælgets ydre Flade. Paa Septa iagttages de almindelige Muskler, saaledes nemlig, at paa den ene Flade sidde Længdemuskler og paa den anden Tvermuskler, hvilke begge Muskellag gaa over paa Svælget. Hele den indre Flade af Bindevævet, Septa og Svælgets ydre Side er beklædt med Endothel, bestaaende af runde Celler med en rund Kjerne og Kjernelegeme, Tab. XV, Fig. 19, e. Tab. XVI, Fig. 29, a.

I Ectodermet og tildels nedsænket i Bindevævet er en meget rig Spikelafsætning, Tab. XVI, Fig. 29, c. Paa Bagkroppen findes hovedsagelig Spindler og Klubber. Spindlerne ere i Almindelighed lige og takkede, kun enkelte ere næsten glatte, ligesom en og anden er krummet; de ere fra 0.060 — 0.184^{mm} lange og fra 0.008 — 0.036^{mm} brede, Tab. XVI, Fig. 8—12. Klubberne ere stærkt takkede, dels lige, dels krummede; de ere fra 0.120 — 0.196^{mm} lange og fra 0.048 — 0.076^{mm} brede foroven, Tab. XVI, Fig. 13—15. Forkroppen har stor Størstedelen baade krumme og lige, takkede Spindler, samt enkelte takkede Køller, forøvrigt nærme Spindlerne sig af og til Køllefornen. Spindlerne ere fra 0.136 — 0.264^{mm} lange og fra 0.028 — 0.044^{mm} brede paa Midten, Tab. XVI, Fig. 16—20. Køllerne ere 0.328^{mm} lange, 0.044^{mm} brede foroven, Fig. 21.

0.020^{mm} in breadth at the middle (Pl. XV, fig. 68). The fusees are extremely spicate; the spikes are frequently split, and then acquire a foliated appearance (Pl. XV, figs. 69. 70). The furcate clavates are spicate, and measure 0.136^{mm} in length, and 0.056^{mm} in breadth above (Pl. XVI, fig. 1); the immense bistellate, with long projections, measures 0.124^{mm} in length, 0.081^{mm} in breadth at the extremities, and 0.020^{mm} in breadth at the middle, which is almost bare (Pl. XVI, fig. 2).

In the sarcosoma of the uppermost part of the stem, very large, spicate subclavates and fusees are the forms principally met with; the subclavates measure 0.236^{mm} in length, and 0.076^{mm} in breadth above (Pl. XVI, fig. 3); the fusees measure 0.212^{mm} in length, and 0.064^{mm} in breadth (Pl. XVI, fig. 4). In the sarcosoma of the branches there is observed, very rarely, a quadruplet having a twisted cruciform, but richly embellished; its longitudinal arm measures 0.140^{mm} , and its transversal arm 0.092^{mm} in length (Pl. XVI, fig. 5); also, some thin spicate fusees measuring 0.132^{mm} in length, and 0.036^{mm} in breadth (Pl. XVI, fig. 6) and, further, some bistellates with foliate rays, measuring 0.136^{mm} in length, 0.092^{mm} in breadth at the extremities, and 0.028^{mm} in breadth at the middle (Pl. XVI, fig. 7).

The polyps have, on their exterior side, an ectoderm similar to that found on the stem, except that the cells form scarcely more than two layers. Inside of the ectoderm, there is the usual connective-tissue layer, from whose inner surface septa proceed, which secure themselves to the outer surface of the gullet. On the septa, the usual muscles are observed thus, on the one surface the longitudinal muscles are placed, and on the other surface the transversal muscles, both of which muscular layers pass over to the gullet. The entire inner surface of the connective-tissue, the septa, and the outer surface of the gullet, is clothed with endothelium, consisting of globular cells containing a globular nucleus and nucleus body (Pl. XV, fig. 19, e. Pl. XVI, fig. 29, a).

In the ectoderm, and partly embedded in the connective tissue, there is a very abundant spicular deposit (Pl. XVI, fig. 29, c). The spicules found on the posterior body are, principally, fusees and clavates. The fusees are generally straight and spicate, only a few of them are almost smooth, whilst, also, now and again, there is a curved one; they measure from 0.060 — 0.184^{mm} in length, and from 0.008 — 0.036^{mm} in breadth (Pl. XVI, figs. 8—12). The clavates are strongly spicate, partly straight, partly curved; they measure from 0.120 — 0.196^{mm} in length, and from 0.048 — 0.076^{mm} in breadth above (Pl. XVI, fig. 13—15). The greater part of the anterior body has both curved and straight spicate fusees, also a few spicate subclavates; the fusees in other respects approach, occasionally, to the subclaviform. The fusees measure from 0.136 — 0.264^{mm} in length, and from 0.028 — 0.044^{mm} in breadth at the middle (Pl. XVI, figs. 16—20). The subclavates measure 0.328^{mm} in length, and 0.044^{mm} in breadth above (Pl. XVI, fig. 21).

Paa Tentaklerne findes foruden Spindler, lig dem paa Forkroppen, men mindre, takkede Klubber og enkelte andre, noget fladere, takkede Spikler, der ere fra 0.048—0.088^{mm} lange og fra 0.012—0.024^{mm} brede, Tab. XVI, Fig. 22—24. Klubberne ere fra 0.064—0.096^{mm} lange og fra 0.020—0.036^{mm} brede foroven, Fig. 25—28.

Foruden Kropsvæggen er Septa og Svælget udstyret med Spikler. I Septa ligge Spiklerne omtrent i Midten af Bindevævsbladet, følge Ernæringskanalerne og ere omgivne af Celler, lig dem, der beklæde Kanalerne, Tab. XVI, Fig. 29. Formen af Spiklerne er noget forskjellig; hyppigst sees smaa, takkede Spindler og Klubber, Fig. 29, *b*.

Svælget er cylindrisk og forsynet med 6 Dobbelt-rækker og to Enkeltrækker Spikler, Fig. 30. Det er mod Bugsiden, at de to enkle Rækker findes, og i disse ligge Spiklerne langt fra hverandre, Fig. 30, *a*. Spiklerne paa Svælget have Formen af Spindler, Klubber, Tapper, Druerklaser og Kors. Spindlerne ere fra 0.096—0.168^{mm} lange og fra 0.020—0.028^{mm} brede, Fig. 31—34. Klubberne ere fra 0.112—0.116^{mm} lange og fra 0.040—0.056^{mm} brede foroven, Fig. 35—38. Druerklaserne ere 0.160^{mm} lange, 0.064^{mm} brede paa Midten, Fig. 39. Tapperne ere 0.086^{mm} lange, 0.036^{mm} brede foroven, Fig. 40, og Korsene, der ere yderst sjeldne, have en Længdestok, som er 0.104^{mm} og en Tverstok, 0.056^{mm}, Fig. 41.

Paa Svælgets indre Flade, der er foldet paatvers, findes langs Bugsiden Svælgrenden, som er temmelig vid, forsynet med Pidskeceller, Tab. XVI, Fig. 29, *d*. Den øvrige Del af Svælget er beklædt med et cilierende Epithel, der for Størstedelen er Fortsættelse af Ectodermet, og imellem hvis Celler sees aflange, encellede Slimkjertler, som tidligere ere omtalte for Svælgets Vedkommende.

Farven.

Farven gul, spillende lidt i det Brune.

Findested.

Station 35. Mange Exemplarer.

Slægtskarakter.

Zoanthodemet træ- eller buskformet. Stammen grenet. Grenene dels udelte, dels delte i Smaagrene. Polyperne cylindriske, retraktile, med en lang og spikelrig Forkrop. Stammen og Grenene samt deres Coenenchym

On the tentacles there are found, besides fusees like those of the anterior body but smaller, also, spicate clavates, and a few other, somewhat flatter, spicate spicules; they measure from 0.048—0.088^{mm} in length, and from 0.012—0.024^{mm} in breadth (Pl. XVI, figs. 22—24). The clavates measure from 0.064—0.096^{mm} in length, and from 0.020—0.036^{mm} in breadth above (Pl. XVI, figs. 25—28).

Besides the wall of the body, the septa and the gullet are also furnished with spicules. In the septa, the spicules are placed about the middle of the connective-tissue membrane and follow the course of the nutritory ducts, and they are surrounded by cells like those that cloth the ducts (Pl. XVI, fig. 29). The form of the spicules is somewhat variable, but is most frequently spicate fusi- and clavi-form (Pl. XVI, fig. 29, *b*).

The gullet is cylindrical, and it is furnished with 6 double series, and 2 single series of spicules (Pl. XVI, fig. 30). It is towards the ventral side that the 2 single series are found, and, in these, the spicules are placed far apart from each other (Pl. XVI, fig. 30, *a*). The spicules on the gullet have the forms of fusees, clavates, cones, racemates, and crucifixes. The fusees measure from 0.096—0.168^{mm} in length, and from 0.020—0.028^{mm} in breadth (Pl. XVI, figs. 31—34). The clavates measure from 0.112—0.116^{mm} in length, and from 0.040—0.056^{mm} in breadth above (Pl. XVI, figs. 35—38). The racemates measure 0.160^{mm} in length, and 0.064^{mm} in breadth at the middle (Pl. XVI, fig. 39). The cones measure 0.086^{mm} in length, and 0.036^{mm} in breadth above (Pl. XVI, fig. 40) and the crucifixes, which are very rare, have a longitudinal arm which measures 0.104^{mm}, and a transversal arm which measures 0.056^{mm} in length (Pl. XVI, fig. 41).

On the inner surface of the gullet, which is transversally folded, the gullet-groove is found along the ventral side; it is pretty wide, and is furnished with flagelliform-cells (Pl. XVI, fig. 29, *d*). The remainder of the gullet is clad with a ciliating epithelium which, for the greater part, is a continuation of the ectoderm, and between whose cells oblong unicellular mucous glands are observed, which, as regards the gullet, have already been referred to.

Colour.

The colour is yellow, shading a little to brown.

Habitat.

Station No. 35. Many specimens.

Generic characteristics.

The Zoanthodem, arboraceous, or fruticose. The stem ramous. The branches, partly, unramified, partly, ramified into branchlets. The polyps cylindrical, retractile, with a long anterior body rich in spicules. The stem and

rige paa Spikler. Septa spikelholdige. Svælget forsynet med Spikelrækker.

Artskarakter.

Zoanthodemet indtil 70^{mm} høit. Stammen rund, grenet. Basaldelen fast, membranagtig udvidet, dannende ofte et Rør, udfyldt med Grus, og fra hvilket stundom Stoloner udgaa. Grenene sidde i Regelen paa Stammens to øverste Trediedele, staa langt fra hverandre, bære til dels enkelte Polyper og dele sig i flere Smaagrener, der hver bære flere Polyper, sammenvoxede ved Grunden. Polyperne retraktile, cylindriske med en lang Forkrop og rige paa store, takkede, spindelformede Spikler. Tentaklerne ere paa deres aborale Side ligesom Pinnulerne forsynede med Spikler. Basaldelen pakket med Spikler, hvor Dobbeltstjernen og den sammensatte Stjerne er den hyppigste Form. Stammen og Grenene spikelrige, hvor de samme Former ere almindeligst. I Stammens og Grenenes Coenenchym forskjelligt formede Spikler, af hvilke Firlinger ere hyppigst. I Septa Spikler, og paa Svælget 6 Dobbelttrækker og 2 Enkelt-rækker Spikler. Farven gul, spillende noget i det Brune.

Barathrobium palmatus, n. sp.

Tab. XVI, Fig. 42—94.

Zoanthodemet er busket, indtil 25^{mm} høit. Stammen er rund, furet paalangs, lidt tykkere ved Grunden end i øverste Ende, rigt besat med Grene ligefra Basaldelen og op til Toppen, der optages af 3—4 Polypgrupper. Basaldelen er fast, tynd, membranagtig og skiveformigt udvidet, Fig. 42. Grenene ere korte, tykke og i Regelen tykkere i Enden end ved deres Udspring, Fig. 42. 43. De staa tæt sammen, ere udelte og bære paa deres Ende enten enkeltvis 5—7 Polyper, Fig. 43, eller flere Polypgrupper med 3—4 Polyper i hver, Fig. 42. Ikke saa sjældent udspringe midt paa Grenen en enkelt Polyp, og hist og her fra Stammen, ja endogsaa fra selve Basaldelen, sees en enkelt Polyp at tage sit Udspring, Fig. 42.

Polyperne ere retraktile, cylindriske, omkring 10^{mm} lange med en 4^{mm} lang Forkrop, der er forsynet med 8 Længderibber, som gaa over paa Tentaklernes aborale Side. Bagkroppen er omtrent 3^{mm} lang, og her ligge Spiklerne paatvers. Tentaklerne ere mellem 3— 4^{mm} lange

the branches, and also their sarcosoma, rich in spicules. The septa contain spicules. The gullet furnished with spicular series.

Specific characteristics.

The Zoanthodem measures up to 70^{mm} in height. The stem cylindrical, ramous. The basal part hard, membranaceously dilated, often forming a tube stuffed with coarse sand, and from which stolons sometimes proceed. The branches, as a rule, situated on the uppermost two-third parts of the stem, placed far apart from each other, carry, partly, a few polyps, ramify into several branchlets, each of which carries several polyps concreted together at the base. The polyps retractile, cylindrical, with a long anterior body, and rich in large spicate fusiform spicules. The tentacles, on their aboral side, as also the pinnules, are furnished with spicules. The basal part packed with spicules, of which the bistellate, and the complex stellate are the most frequent forms. The stem and the branches rich in spicules, and here also the same forms are the most common ones. In the sarcosoma of the stem and the branches, variously formed spicules, of which quadruplets are most frequent. In the septa spicules, and on the gullet, 6 double series and 2 single series of spicules. The colour yellow, shading somewhat to brown.

Barathrobium palmatus, n. sp.

Pl. XVI, figs. 42—94.

The Zoanthodem is fruticose, and measures up to 25^{mm} in height. The stem is cylindrical, furrowed longitudinally, and somewhat thicker at the base than at the superior extremity; it is richly beset with branches, quite from its basal part up to the summit, which is occupied by 3—4 groups of polyps. The basal part is hard, thin, and membranaceous, and it is discoidally dilated (fig. 42). The branches are short and thick, and are, usually, thicker at their extremity than at their root (figs. 42. 43). They are placed closely together, are non-ramous, and on their extremities they carry, either, 5—7 isolated polyps (fig. 43); or several groups of polyps, with 3—4 polyps in each group (fig. 42). Not infrequently, a single polyp springs from the middle of the branch, and, here and there, from the stem, even from the basal part itself, a single polyp is seen to spring (fig. 42).

The polyps are cylindrical and retractile; they measure about 10^{mm} in length. They have an anterior body 4^{mm} long, furnished with 8 longitudinal ribs which pass over into the aboral side of the tentacles. The posterior body is about 3^{mm} long, and the spicules are, here, placed

med temmelig lange Pinnuler, der have Spikler. I Bagkroppen og i Grenene Æg i forskjellig Udvikling. Hele Zoanthodemet spikelrigt.

Paa Basaldelen ligge Spiklerne pakkede paa hverandre, og her træffes hyppigst smukke, sammensatte Stjerner, hvis Straaler ere brede og indskaarne i Randen; de ere fra 0.100—0.144^{mm} lange og fra 0.056—0.088^{mm} brede; imellem hver 2 Straalekrandse er der som oftest et smalere, nøgent Belte, der er fra 0.020—0.040^{mm} bredt, Fig. 44—46. Foruden de sammensatte Stjerner sees bladede Spindler, der ere 0.232^{mm} lange og 0.036^{mm} brede, Fig. 47, samt yderst sjældent enkle Stjerner med brede, i Randen indskaarne Straaler og omtrent lige saa lange som brede, 0.072^{mm} i Gjennemsnit, Fig. 48.

Paa Stammen ligge Spiklerne ikke saa tæt som paa Basaldelen, og paa dens midterste Del ere takkede Klubber almindeligst; de ere fra 0.056—0.156^{mm} lange og fra 0.032—0.072^{mm} brede foroven, Fig. 49—51. Imellem disse sees lidt knudede Spindler, 0.104^{mm} lange og 0.028^{mm} brede, Fig. 52, samt enkelte, besynderlige, bladformede Firlinger, der ere 0.096^{mm} lange og 0.056^{mm} brede i den ene Ende, den anden Ende danner en tynd Stilk, Fig. 53.

Øverst paa Stammen optræde atter de sammensatte Stjerner hyppigst, men ere dog forskellige fra dem, som findes paa Basaldelen; de ere fra 0.100—0.200^{mm} lange og fra 0.048—0.084^{mm} brede, Fig. 54. Næsten ligesaa hyppigt som de sammensatte Stjerner sees særegne, timeglasformede Spikler, der nærme sig noget Dobbeltstjernen, og som synes egentlig at være Firlinger; de ere 0.072^{mm} lange, 0.060^{mm} brede i Enderne og 0.024^{mm} brede paa Midten, Fig. 55. Imellem de to nævnte Former findes store, bladede Klubber fra 0.184—0.200^{mm} lange og fra 0.048—0.072^{mm} brede foroven, Fig. 56—58, samt meget sjældent enkelte, korsformede Firlinger, hvis Længdestok er 0.100^{mm} og Tverstok 0.084^{mm}, Fig. 59.

Paa Grenene sees om hverandre bladede Valser og Spindler, sammensatte Stjerner og Klubber. Valserne ere 0.236^{mm} lange, 0.084^{mm} brede paa Midten, Fig. 60. Spindlerne ere temmelig tykke, nærme sig Valseformen, 0.184^{mm} lange og 0.060^{mm} brede paa Midten, Fig. 61. De sammensatte Stjerner have brede Straaler med indskaarne Rande; de ere fra 0.140—0.204^{mm} lange og fra 0.060—0.068^{mm} brede; imellem Straaleringene findes nøgne Belter, Fig. 62. 63. Klubberne ere ogsaa besatte med Blade, indskaarne i Randen; de ere 0.132^{mm} lange, 0.048^{mm} brede foroven, Fig. 64.

transversally. The tentacles measure between 3—4^{mm} in length, and have long pinnules containing spicules. Ova in various stage of development are met with in the posterior body and in the branches. The entire Zoanthodem is rich in spicules.

In the basal part, the spicules lie packed upon each other and, here, we most frequently meet with beautiful complex stellates, with broad rays which are indented in the margins; they measure from 0.100—0.144^{mm} in length, and from 0.056—0.088^{mm} in breadth. Between each two radiating annuli, there is, most frequently, a narrowish bare stripe, measuring from 0.020—0.040^{mm} in breadth (figs. 44—46). Besides the complex stellates, foliaceous fusees are seen, measuring 0.232^{mm} in length, and 0.036^{mm} in breadth (fig. 47); also, extremely rarely, a few stellates having broad rays indented in their margins; these measure about the same in length as in breadth, and are 0.072^{mm} in diameter (fig. 48).

In the stem, the spicules are not situated so closely as in the basal part, and in its mesial part spicate clavates are most frequent; they measure from 0.056—0.156^{mm} in length, and from 0.032—0.072^{mm} in breadth above (fig. 49—51). Between these are seen somewhat protuberated fusees, measuring 0.104^{mm} in length, and 0.028^{mm} in breadth (fig. 52); also, a few, strange, foliate quadruplets, measuring 0.096^{mm} in length, and 0.056^{mm} in breadth at the one extremity, whilst the other extremity forms a thin stalk (fig. 53).

In the uppermost part of the stem, the complex stellates again make their appearance as the most frequent form, but are, however, different from those found in the basal part; they measure from 0.100—0.200^{mm} in length, and from 0.048—0.084^{mm} in breadth (fig. 54). Almost quite as frequently as the complex stellates, peculiar sand-glass formed spicules are seen; these approach somewhat to the bistellate, and appear to be really quadruplets; they measure 0.072^{mm} in length, 0.060^{mm} in breadth at the extremities, and 0.024^{mm} in breadth at the middle (fig. 55). Between the two spicular forms just mentioned, large foliaceous clavates are found, measuring from 0.184—0.200^{mm} in length, and from 0.048—0.072^{mm} in breadth above (figs. 56—58); also, but very rarely, a few cruciform quadruplets, whose longitudinal arm measures 0.100^{mm} and the transversal arm 0.084^{mm} (fig. 59).

In the branches, foliaceous rollers and fusees, complex stellates, and clavates, are seen mixed together. The rollers measure 0.236^{mm} in length, and 0.084^{mm} in breadth at the middle (fig. 60). The fusees are rather thick, and approach to the roller form; they measure 0.184^{mm} in length, and 0.060^{mm} in breadth at the middle (fig. 61). The complex stellates have broad rays with indented margins; they measure from 0.140—0.204^{mm} in length, and from 0.060—0.068^{mm} in breadth; bare stripes are visible between their radiating annuli (figs. 62. 63). The clavates are also beset with leaves which are indented in the margin; they measure 0.132^{mm} in length, and 0.048^{mm} in breadth above (fig. 64).

I Stammens og Grenenes Coenenchym findes i Skillevæggene langs Ernæringskanalerne. ligesom paa den foregaaende Art, Spikler afsatte, hvoraf de sammensatte Stjerner synes at være de hyppigste, imedens der dog imellem disse sees forskjelligtformede, dels Spindler, dels andre Spikler med bladede Besætninger. De sammensatte Stjerner have bredbladede Straaler med tungede Rande og nøgne Midtblæter, ere fra 0.172—0.192^{mm} lange og fra 0.076—0.088^{mm} brede, Fig. 65. 66. Spindlerne ere i Almindelighed lidt krummede, enten knudede eller bladede og dels med afskaarne, dels med mere eller mindre tilspidsede Ender; de ere fra 0.092—0.184^{mm} lange og fra 0.032—0.056^{mm} brede, Fig. 67—71. Iblandt de andre Spikler er der enkelte, yderst sjældne, langstrakte Firlinger, der nærme sig Korsformen, ere stærkt takkede, 0.120^{mm} lange, 0.048^{mm} brede omtrent paa Midten, Fig. 72, og andre, som nærme sig Dobbeltstjernen, med brede, bladformede Straaler, 0.076^{mm} lange og 0.044^{mm} brede, Fig. 73.

Paa Polypens Bagkrop ligge Spiklerne temmelig tæt og danne Tverrækker med smale Mellemlum. Det er fornemmelig Spindel- og Klubformen, som her er fremtrædende — kun længst bag, hvor den gaar over i Grenen, findes sammensatte Stjerner. Spindlerne ere lige eller krumme, kun svagt takkede, fra 0.152—0.216^{mm} lange og fra 0.016—0.018^{mm} brede, Fig. 74—76. Klubberne ere heller ikke meget takkede, enkelte nærme sig Tapformen; de ere fra 0.136—0.220^{mm} lange og fra 0.040—0.048^{mm} brede foroven, Fig. 77—79.

Paa Forkroppen findes omtrent lignende Spikler som paa Bagkroppen; de ere her længere og tildels mere takkede og mere krummede. Spindlerne ere fra 0.136—0.336^{mm} lange og fra 0.028—0.036^{mm} brede, Fig. 80—82. Paa Tentaklerne og deres Pinnuler ere Spiklerne hyppigt glattere, mindre end paa Kroppen og lidt forskellige i Form; de ere fra 0.088—0.224^{mm} lange og fra 0.024—0.036^{mm} brede, Fig. 83—86.

Svælget har 4 Rækker Spikler, Fig. 87. En stor Del af disse ere saa stærkt takkede i den ene Ende, at de faa et grenet Udseende; enkelte have Formen af smaa Køller, kun lidet takkede. De stærkt takkede Spikler ere fra 0.080—0.160^{mm} lange, og fra 0.028—0.044^{mm} brede, Fig. 88—93. Køllerne ere 0.068^{mm} lange, 0.020^{mm} brede i den tykke Ende, Fig. 94.

Overalt i Zoanthodemet have Spiklerne en svagt brunlig Farve.

Farven.

Farven hvidgul med et svagt brunligt Skjær.

In the divisional walls of the sarcosoma of the stem and the branches, alongside the nutritory ducts, as in the preceding species, spicules are found deposited; of these the complex stellate-form appears to be the most frequent, whilst, however, there are seen between them, variously formed spicules, sometimes fusees, sometimes other spicules with foliate ornations. The complex stellates have broad foliaceous rays with linguat margins and bare mesial stripes; they measure from 0.172—0.192^{mm} in length, and from 0.076—0.088^{mm} in breadth (figs. 65. 66). The fusees are generally a little curved, and are either protuberated or foliated, and have partly, truncate, partly more or less acuminate, extremities; they measure from 0.092—0.184^{mm} in length, and from 0.032—0.056^{mm} in breadth (fig. 67—71). Between the other spicules, there are a few — extremely rarely — elongate quadruplets, which approach to the cruciform and are greatly spicate; they measure 0.120^{mm} in length, and 0.048^{mm} in breadth near the middle (fig. 72); and, again, others which approach to the bistellate-form, with broad foliate rays; these measure 0.076^{mm} in length, and 0.044^{mm} in breadth (fig. 73).

In the posterior body of the polyp, the spicules are placed pretty closely, and form transverse series with small intervals. It is principally the fusiform and claviform spicules that predominate here, and it is, only, in the anterior-posterior extremity, where it passes into the branch, that complex stellates are found. The fusees are straight or curved, and only faintly spicate; they measure from 0.152—0.216^{mm} in length, and from 0.016—0.018^{mm} in breadth (figs. 74. 76). Neither are the clavates much spicate; a few of them approach to the cruciform, and they measure from 0.136—0.220^{mm} in length, and from 0.040—0.048^{mm} in breadth above (fig. 77—79).

In the anterior body, spicules of nearly the same kind as in the posterior body are found, but they are here, longer, and, partly, more spicate and more curved. The fusees measure, from 0.136—0.336^{mm} in length, and from 0.028—0.036^{mm} in breadth (figs. 80—82). In the tentacles and their pinnules, the spicules are generally smoother and smaller than on the body, and a little different in form; they measure from 0.088—0.224^{mm} in length, and from 0.024—0.036^{mm} in breadth (figs. 83—86).

The gullet has 4 series of spicules (fig. 87). A large number of these are so strongly spicate at the one extremity that they acquire a ramous appearance; a few have the form of small subclavates, only slightly spicate. The strongly spicate spicules measure from 0.080—0.160^{mm} in length, and from 0.028—0.044^{mm} in breadth (figs. 88—93). The subclavates measure 0.068^{mm} in length, and 0.020^{mm} in breadth at the thick extremity (fig. 94).

Everywhere, in the Zoanthodem, the spicules have a pale brownish colour.

Colour.

The colour is whity-yellow, with a faint-brownish tinge.

Findested.

Station 192. To Exemplarer, hvoraf det ene er kun lidet udviklet.

Artskarakter.

Zoanthodemet busket, indtil 25^{mm} høit. Stammen rund, furet, haard, grenet. Basaldelen membranagtig, skiveformet udvidet. Grenene indtage hele Stammen lige fra Grunden til Toppen, ere korte, tykke, udelte og bære paa deres Ende flere Polyper, som dels staa enkeltvis, dels i Grupper. Polyperne ere cylindriske, retraktile; paa For-kroppen 8 Længderibber, dannede af lange, smale, næsten glatte, spindelformede Spikler, der gaa over paa Tentaklerne; saavel disse som Pinnulerne spikelholdige. Bagkroppen kortere; Spiklerne ligge her paatvers, og Spindel- og Klubformen er mest fremtrædende. Basalens Spikler ere yæsentlig sammensatte Stjerner med bladformede Straaler, samt bladede Spindler. Stammen og Grenene ere ligeledes rige paa Spikler, og her findes almindeligst takkede Klubber, sammensatte Stjerner, bladede Valser og Spindler. I Stammens og Grenenes Coenchym (paa Skillevæggene) Spikelafsætninger, bestaaende af sammensatte Stjerner med bredbladede Straaler med tungede Rande, bladede Spindler og Køller. Septa spikelholdige og paa Svælget 4 Rækker Spikler. Farven hvidgul med et svagt brunligt Skjær.

Sarakka¹ crassa, n. g. et sp.

Tab. XVII. Fig. 1—54.

Zoanthodemet er indtil 25^{mm} høit. Basaldelen er membranagtigt udvidet og omfatter de Gjenstande, hvortil den fæster sig, Fig. 1. Stammen er fast, furet paalangs, læderagtig og henved 30^{mm} i Omfang ved Grunden, men smalner successivt af op imod Midten, hvorfra den udvider sig lidt op til Toppen, der er næsten kolbeformig og tæt besat med Polyper, Fig. 2. Den nederste Del af Stammen er nøgen; men omtrent 8^{mm} fra Basaldelen sees paa den ene Side en Række af 5—6 enkeltstaaende Polyper, Fig. 1; lidt længere oppe begynde Grenene, som staa uregelmæssigt og langt fra hverandre, ere meget tykke, korte og have næsten kugleformede Ender, der ere en god Del tykkere end Udspringet og temmelig tæt besatte med Polyper, Fig. 2. 3 Der er kun faa Grene, 3—4, og disse tage sit

¹ Sarakka kaldes af Lapperne Underverdenens Gudinde.

Habitat.

Station No. 192. Two specimens, of which one is only slightly developed.

Specific characteristics.

The Zoanthodem fruticose, measures up to 25^{mm} in height. The stem cylindrical, furrowed, hard, ramous. The basal part, membranaceous, discoidally dilated. The branches occupy the entire stem, right from the base to the summit; they are short, thick, non-ramous, and carry on their extremity several polyps, which are situated, partly singly, partly in groups. The polyps are cylindrical, retraktile. In the anterior body, 8 longitudinal ribs, formed of long, narrow, almost smooth fusiform spicules, which pass over into the tentacles; these as well as the pinnules contain spicules. The posterior body shorter; the spicules, here, placed transversally, and the fusiform and claviform most predominant. The spicules of the basal part are, principally, complex stellates with foliated rays, also foliated fusees. The stem and the branches are, likewise, rich in spicules and, here, the forms most frequently found are, spicate clavates, complex stellates, foliated rollers and fusees. In the divisional walls of the sarcosoma of the stem and the branches, spicular deposits, consisting of complex stellates, with broad foliate rays having linguat margins, also foliate fusees and subclavates. Septa spicular, and in the gullet 4 series of spicules. Colour whity-yellow, with a faint brownish tinge.

Sarakka¹ crassa, n. g. et sp.

Pl. XVII. figs. 1—54.

The Zoanthodem measures up to 25^{mm} in height. The basal part is membranaceously dilated, and encloses the objects to which it attaches itself (fig. 1). The stem is hard, longitudinally grooved, and coriaceous, and it measures about 30^{mm} in circumference at the base, but diminishes, gradually, up towards the middle, from whence it again dilates a little up towards the summit, which is almost claviform and closely beset with polyps (fig. 2). The lowest part of the stem is bare, but about 8^{mm} from the basal part, upon one of the sides, there is seen a series of 5—6 polyps, placed separately (fig. 1). A little further up the stem, the branches begin to occur, and these are placed irregularly, and far apart from each other. They are very thick and short, and have almost globular extremities which are

¹ Sarakka is the designation given by the Laps to the Goddess of the infernal regions.

Udspring nærmere Stammens Sideparti, saa at en Del af denne synes at være nøgen i en lang Strækning, Fig. 2.

Polyperne ere langstrakt-cylindriske, retraktile, 8—10^{mm} lange. Forkroppen omtrent 3^{mm} lang, har 8 stærke Længderibber, dannede af Kalkspikler og imellem disse Ribber sees ligesaa mange, noget nedsænkede Felter, i hvis nedre Del Spiklerne ligge temmelig tætte, imedens de ere noget mere spredte i den øvre, lidt bredere Del; men Spiklerne i disse Felter ligge ikke tættere, end at Mavehulheden meget godt kan sees, hvilket ikke er Tilfældet med Ribberne, Fig. 4. Bagkroppen er noget længere end Forkroppen, og her ligge Spiklerne paatvers og danne ligesom Guirlander omkring den, Fig. 4. Tentaklerne ere 3—4^{mm} lange; hele deres aborale Side er bepantsret med Kalkspikler, Fortsættelse fra Kroppens Ribber, Fig. 4. Pinnulerne ere korte, tykke og ligeledes forsynede med Spikler, Fig. 4.

Polypcellen er oval; naar Polypen er stærkt indtrukket, næsten rund; den har 8 Ribber, der giver den et i Randen tandet Udseende, naar Polypen er halvt indtrukket, Fig. 4, a, men danner en ottestraalet Stjerne, naar den er fuldt indesluttet i Cellen, Fig. 3. Hvor den ene Polypcelle støder til den anden, er der en saa intim Sammenvoxning af Cellernes Vægge, at der imellem dem er sparsomt Coenenchym, og da Polyperne staa i Regelen i Grupper, er der i det Hele taget paa de Steder, de indtage, yderst lidet Coenenchym, der dog, hvor det findes, er forsynet med Spikler, Fig. 5.

Anatomisk-histologiske Undersøgelser.

Stammen og Grenene ere udvendigt beklædte med et Epithel, der dannes af flere Lag polyædriske Celler, som have en næsten central Kjerne, et rundt Kernelegeme og et fintkornet, temmelig tyndt Protoplasmahold. I det yderste Lag ere Cellerne næsten klare, meget fattige paa Protoplasma, men ere dunklere og rigere paa dette i det indre Lag, hvor der iagttages hist og her imellem Epithelcellerne aflange, kolbeformige, encellede Slimkjertler med en temmelig lang Udløber, lig dem, som oftere have været omtalte. Indenfor dette Ectoderm er et Lag af hyalint Bindevæv, hvori findes Ernæringskanaler samt Bindevævslegemer med en eller flere Udløbere, — og fra hvis indre Væg udgaa de sædvanlige Forlængelser, der danne Skillevæggene for de store Kanaler. I Ectodermet ligesom i det ydre Bindevævs-lag ere Spiklerne leirede saaledes, at den største Mængde findes i de indre Cellelag af Epithellet, — hvor de ere tilstede i Bindevævet, er der altid en Sænkning af Ectodermets Celler, saa at disse omgive dem.

much thicker than the root, and are pretty closely beset with polyps (figs. 2. 3). There are only a few branches — 3—4 in all — and these have their root nearer to the lateral part of the stem, so that a part of the stem appears as if bare for a considerable extent (fig. 2).

The polyps are elongato-cylindrical, retractile, and measure 8—10^{mm} in length. The anterior body measures about 3^{mm} in length, and has 8 strong longitudinal ribs formed of calcareous spicules, and between these ribs a similar number of somewhat depressed areas are seen, in whose lower part spicules lie pretty compactly, whilst they are somewhat more scattered in the upper, somewhat broader, part; but the spicules in these areas do not lie closer, than that the gastral cavity can very well be observed, which is not the case with the ribs (fig. 4). The posterior body is somewhat longer than the anterior body, and the spicules, here, lie transversally and, as it were, form garlands about it (fig. 4). The tentacles measure 3—4^{mm} in length, and their entire aboral side is ensheathed with calcareous spicules, which are a continuation of the ribs of the body (fig. 4). The pinnules are short, thick, and likewise furnished with spicules (fig. 4).

The polyp-cell is oval, but when the polyp is strongly retracted it is almost round; it has 8 ribs, which impart to it a dentated appearance in the margin when the polyp is semi-retracted (fig. 4, a), but when the latter is quite enclosed in the cell (fig. 3) it forms an eight-rayed star. Where the one polyp-cell joins to the other, there is such an intimate concreting of the walls of the cells that, there is only a thin sarcosoma visible between them, and as the polyps are placed in groups, as a rule, there is, upon the whole, at the places where they occur, extremely little sarcosoma, which however is furnished with spicules at the places where it is found (fig. 5).

Anatomo-histological Examination.

The stem and the branches are exteriorly clad with an epithelium, formed of several layers of polyhedral cells, which contain an almost central nucleus, a round nucleolus, and a minutely granular, pretty thin, protoplasmic substance. In the outermost layer, the cells are almost pellucid, and very poor in protoplasm, but they are less pellucid and richer in protoplasm in the inner layer, where, also, there are, here and there, observed between the epithelial cells, oblong, claviform, unicellular mucous glands with a pretty long prolongation, resembling those that have, already, frequently been referred to. Inside of this ectoderm, there is a layer of hyaline connective-tissue in which nutritory ducts are found, also connective-tissue corpuscles having one or more prolongations, and from whose inner wall issue, the usual prolongations which form the divisional walls of the large ducts. In the ectoderm, as well as in the outer connective-tissue layer, the spicules are embedded in such manner, that the greatest number are

I Kanalernes Skillevægge er der Længderækker af Spikler, som ere i størst Mængde tilstede, der hvor Skillevæggen tager sit Udspring fra den indre Væg af Bindevævet; men ogsaa paa Midten af Skillevæggen sees smaa, spredte Spikler. Polyperne ere paa deres ydre Flade beklædte med et Epithel, som bestaar af 2—3 Lag polyædriske Celler, Fig. 6, *a*, lig dem, som findes paa Stammen og Grenene, og imellem disse Celler iagttages encellede Slimkjertler, der dog ere temmelig sparsomme. Indenfor Ectodermet er et hyalint Bindevævslag med sine Bindevævslegemer samt Nutritionskanaler, og fra hvis indre Væg udgaa de sædvanlige 8 Septa, der fæste sig paa Svælgets ydre Væg, Fig. 7, *a*. I Ectodermet og det ydre Lag af Bindevævet ere Spiklerne leirede, Fig. 6, *b*; i Septa er ingen saadanne.

Svælget er næsten cylindrisk; dets ydre Flade er beklædt med Epithel, dannet af et Lag runde Celler med en rund Kjerne og Kernelegeme, Fig. 6, *c*; fuldkommen lig disse Celler, der ogsaa beklæde Kamrene, sees andre Celler, liggende isolerede indeni Kamrene, og som synes at tilhøre den Ernæringsaft, der gennemstrømmer Kanalerne, Fig. 6, *d*. Jeg har næsten bestandig iagttaget, at den Vædske, som findes i Kamrene og i de store Kanaler, indeholder Celler, der have saa særdeles meget tilfælles med de Endothelceller, som beklæde dem, at de synes at være et Produkt af dem, med andre Ord, at Saftcellerne dannes af Endothelet. Indenfor Epithelet er et hyalint Bindevævslag, som paa Bugsiden danner flere listeformige Fremspring, der rage ind i Svælghulheden, Fig. 6, *e*, 7, *b*; saavel disse, som den øvrige Del af Bindevævet indre Flade, er beklædt med Epithel, der er Svælgets Epithel og som bestaar af et Lag lange, cylindriske Celler, forsynede med Cilier, Fig. 7, *c*. Langs Svælgets Bugside er Svælgrenden, der her har flere Fremspring eller Folder, som rage temmelig langt ind i Hulheden, og der, hvor Svælggruben til Siderne ophører, er en Indsnøring, der ligesom deler Svælget i to Længdehulheder, Fig. 7, *d*; den ene, som følger Bugsiden, er Svælggruben med sine store Folder, Fig. 7, *e*, og den anden, som følger Rygsiden, er uden synderlige Folder og kan, naar Svælgrenden er lukket, betragtes som Tarm, Fig. 7, *f*. Svælgrenden har meget lange Cylinderceller, der hver er forsynet med en lang Pidsk, Fig. 6, *f*, fuldkommen lig dem, som tidligere have været beskrevne.

Det synes ikke at være tvivlsomt, at Svælggruben her virker som virkelig Øsophagus og lukker sig, saasnart den har ført ind i Maven de til Ernæringen nødvendige Fødemidler, imedens den anden Del af Svælget, Rygpartiet,

found in the inner cellular layer of the epithelium. Where spicules are present in the connective-tissue, there is always a depression of the cells of the ectoderm, so that these surround them.

In the divisional walls of the ducts, there are longitudinal series of spicules, which are present in greatest number at the point where the divisional walls issue from the inner wall of the connective-tissue, but scattered spicules are, also, observed in the middle of the divisional wall. The polyps are, upon their exterior surface, clad with an epithelium which consists of 2—3 layers of polyhedral cells (fig. 6, *a*) similar to those found on the stem and the branches, and, between these cells, unicellular mucous glands are observed, which however are rather rare; inside of the ectoderm, there is a layer of hyaline connective-tissue, with its connective-tissue corpuscles and nutritory ducts, from whose inner wall the usual 8 septa issue and attach themselves to the external wall of the gullet (fig. 7, *a*). The spicules are embedded (fig. 6, *b*) in the ectoderm and the outer layer of connective-tissue. There are no spicules in the septa.

The gullet is almost cylindrical; its outer surface is clad with epithelium, formed of a layer of cylinder-cells containing a round nucleus and nucleolus (fig. 6, *c*); other cells, exactly similar to those cells which, also, clothe the chambers, are seen, placed isolatedly, within the chambers, and these appear to pertain to the nutritory fluid that flows through the ducts (fig. 6, *d*). I have, almost invariably, observed that the fluid which is found in the chambers, and in the large ducts, contains cells which have such very particular resemblance to the endothelial cells that clothe the ducts, that they appear to be a product of them — in other words, that the cells of the fluid are formed from the endothelium. Inside of the epithelium, there is a hyaline connective-tissue layer which, on the ventral side, forms several fillet-formed prominences that project into the gullet-cavity; (fig. 6, *e*, 7, *b*) both, these, as well as the remaining part of the inner surface of the connective tissue, are clad with an epithelium, which is the epithelium of the gullet, and consists of a layer of long, cylindrical cells, furnished with cilia (fig. 7, *c*). The gullet-passage appears along the ventral side of the gullet, and has, here, several prominences, or folds, which extend pretty far into the cavity, and at the point where the gullet-cavity, at the sides, ceases, there is a constriction which, as it were, divides the gullet into two longitudinal cavities (fig. 7, *d*) — the one, of these, which runs along the ventral side is the gullet-cavity with its large folds (fig. 7, *e*), and the other, which runs along the dorsal side, has no particular folds, and may, when the gullet-passage is closed, be considered as an intestine (fig. 7, *f*). The gullet-passage has very long cylinder-cells, each of which is furnished with a long flagellum (fig. 6, *f*) exactly like those which have been previously described.

It does not appear to be doubtful, that the gullet cavity, here, operates as a genuine α sophagus, and closes itself as soon as it has passed the necessary nourishment into the stomach, whilst the other division of the gullet —

aabner sig for at udføre Excrementerne. — I Svælg-epithelet, nærmest Bindevævslaget, er der 4 Dobbelttrækker Spikler, Fig. 8.

Kjønprodukterne udvikle sig i Mavehulheden; de fleste Polyper havde mere eller mindre udviklede Æg, og hos en Polyp var Fosterdannelsen begyndt. Embryonerne havde en langagtig Form, i hvis ene, brede Ende saaes en temmelig dyb Indsænkning, Gastralmundten, der førte ned til en Hulhed. Ingen Spikeldannelse var endnu at opdage, saa Spikler dannes, ifølge dette, senere end hos *Nephtya-Stægten*.

Paa Basaldelen, der er temmelig haard af den sammenpakkede Kalk, fremtræde Spiklerne almindeligst under Form af elliptiske Spindler, Dobbeltstjerner og Druerklaser; sjældnere som Klubber og sammensatte Stjerner, men yderst sjældent som en Firling. Spindlerne ere stærkt takkede, og hver Tak har en temmelig bred Ende, der enten er tandet eller straalet; de ere som oftest tilspidsede i Enderne, men disse kunne ogsaa være lidt afstumpede; de ere fra 0.140—0.184^{mm} lange og fra 0.060—0.084^{mm} brede paa Midten, Fig. 9. 10. Dobbeltstjerneerne have et nøgent Midtparti; Straalerne ere brede, ende som oftest i en liden, 4—5 straalet Stjerne; de ere fra 0.084—0.116^{mm} lange og fra 0.044—0.060^{mm} brede; det nøgne Parti er fra 0.016—0.028^{mm} bredt, Fig. 11. 12. 13. 14. Druespiklerne dannes af et Konglomerat af Kalkkugler, der stundom hviler paa en bred Basis, stundom synes at være uden nogen saadan; enkelte ere næsten runde, andre aflange; de første ere 0.052^{mm} i Bredde og Længde, Fig. 15; de sidste ere fra 0.080—0.096^{mm} lange og fra 0.048—0.056^{mm} brede paa Midten, Enderne ere noget smalere, Fig. 16. 17. Klubberne ere besatte snart med runde, fremragende Papiller med et næsten nøgent, kort Skaft, snart med bredbladede Papiller; de ere fra 0.124—0.144^{mm} lange og fra 0.056—0.072^{mm} brede i den øverste Ende, Fig. 18. 19. 20. De sammensatte Stjerner ere temmelig uregelmæssige og nærme sig tildels Spindelformen; de ere 0.152^{mm} lange og 0.068^{mm} brede, Fig. 21. Firlingerne nærme sig Korsformen, ere besatte med Papiller, 0.080^{mm} lange, 0.060^{mm} brede, Fig. 22.

Nederst paa Stammen ere lignende Druespikler og elliptiske Spindler, som ovenfor omtalt, de almindeligste. Ogsaa her ere de sammensatte Stjerner sjældnere, imedens Klubber og Dobbeltstjerner ere hyppigere, men dog ikke saa hyppige som paa Basaldelen. Desforuden findes enkelte Firlinger og ikke saa ganske sjældent runde Konglomerater af Kalkkugler samt lige Spindler besatte med Papiller. Af de faa Firlinger, som findes, ere enkelte korsformede og besatte med runde Papiller, 0.096^{mm} lange med en Tverstok, der er 0.088^{mm}, Fig. 23; andre have en meget uregelmæssig Form, ere besatte med store Takker og Knuder og 0.096^{mm}

the dorsal portion — opens itself to expel the excrementa. In the epithelium of the gullet, next to the layer of connective-tissue, there are 4 double series of spicules (fig. 8).

The sexual products develop themselves in the gastral-cavity; most of the polyps had more or less developed ova, and in one polyp the foetal formation had commenced. The embryos have an elongated form; and a pretty deep depression — the gastrula mouth — was visible in the one, broad extremity, leading down to a cavity. No spicular formation was as yet to be observed, so that it would appear, as if the spicules are formed at a later stage than in the *Nephtya* genus.

In the basal part, which is pretty hard owing to the packing together of the calcium, the spicules most frequently appear in the form of elliptic fusees, bistellates and racemates (grape-like clusters) more rarely, as clavates and complex stellates, and as a quadruplet extremely rarely. The fusees are strongly spicate, and each spike has a pretty broad extremity which is, either, dentated or rayed. Most frequently, they are acuminate at the extremities, but these may also be a little obtuse; they measure from 0.140—0.184^{mm} in length, and from 0.060—0.084^{mm} in breadth at the middle (figs. 9—10). The bistellates have a bare mesial part; their rays are broad and, most frequently, terminate in a small 4—5 rayed star; they measure from 0.084—0.116^{mm} in length, and from 0.044—0.060^{mm} in breadth; the bare portion measures from 0.016—0.028^{mm} in breadth (figs. 11. 12. 13. 14). The spicules of the racemates are formed of a conglomeration of calcareous globules which, occasionally, rests upon a broad basis, and sometimes appears to be without any basis; a few are almost round, others are oblong: the first-named measure 0.052^{mm} in breadth and length (fig. 15), and the last-named measure from 0.080—0.096^{mm} in length, and from 0.048—0.056^{mm} in breadth at the middle. The extremities are somewhat narrower (figs. 16—17). The clavates are beset, sometimes, with round, projecting, papillæ which have an almost bare, short, shaft, and sometimes with broad foliaceous papillæ; they measure from 0.124—0.144^{mm} in length, and from 0.056—0.072^{mm} in breadth at the uppermost extremity (figs. 18. 19. 20). The complex stellates are rather irregular in form, and approach, partly, to the fusiform; they measure 0.152^{mm} in length, and 0.068^{mm} in breadth (fig. 21). The quadruplet approaches to the cruciform, and is beset with papillæ; it measures 0.080^{mm} in length, and 0.060^{mm} in breadth (fig. 22).

On the lowest part of the stem, racemates and elliptic fusees, similar to those spoken of above, are the most frequent forms. Here, also, the complex stellates are more rare, whilst clavates and bistellates are more frequent, but, yet, not so frequent as in the basal part. Besides these, a few quadruplets are found, and not so very rarely, also, globular conglomerations of calcareous spheres, and straight fusees beset with papillæ. Of the few quadruplets which are found, some are cruciform and beset with round papillæ; they measure 0.096^{mm} in length, and have a transversal arm measuring 0.088^{mm} (fig. 23); others have a very irre-

lange og 0.076^{mm} brede, Fig. 24. Kuglehobene ere 0.064^{mm} i Diameter, Fig. 25. De lige Spindler have afstumpede Ender; de Takker eller Knuder, hvormed de ere forsirede, ende hyppigst i en liden, firestraale Stjerne; de ere fra 0.104 — 0.128^{mm} lange og fra 0.032 — 0.064^{mm} brede, Fig. 26. 27.

Øverst paa Stammen ere sammensatte Stjerner og Dobbeltstjerner hyppigst, enkelte ere mindre udviklede. Klubber, rigt udstyrede med Papiller, tildels monstrøse i Formen, ere ikke saa ganske sjeldne; men overordentlig sjeldent sees her en Firling. De sammensatte Stjerner ere uregelmæssige; enhver Straale ender i en liden, firestraale Stjerne; de ere 0.096^{mm} lange, 0.060^{mm} brede, Fig. 28. Dobbeltstjerneerne have ogsaa paa deres Straaleender smaa Stjerner; de ere 0.088^{mm} lange, 0.044^{mm} brede med et nøgent Midtbelte, som er 0.016^{mm} bredt, Fig. 29. Klubberne ere smukt ornamenterede med store Papiller, der ende i firestraalede Stjerner; de ere fra 0.108 — 0.140^{mm} lange og fra 0.056 — 0.092^{mm} brede, Fig. 30. 31. 32. 33. Enkelte Klubber ere indsnørede paa Midten; de ere 0.124^{mm} lange, 0.068^{mm} brede foroven og 0.016^{mm} brede paa det nøgne, indsnørede Sted, Fig. 34. Firlingerne ere sparsomt besatte med Takker, men disse ende ligeledes i en firestraale Stjerne; de ere 0.008^{mm} brede og 0.092^{mm} lange, Fig. 35.

Paa Grenene ere Køller almindeligst; de ere dels krumme, dels lige og rigt besatte med store Takker eller Blade, som have snart afrundede, snart firestraalede Ender; de ere fra 0.090 — 0.216^{mm} lange og fra 0.036 — 0.080^{mm} brede foroven, Fig. 36. 37. 38. Yderst sjeldent sees en Firling, der nærmer sig Korsformen og er rigt besat med Knuder og Takker, hvoraf enkelte ende i en liden Stjerne og er 0.084^{mm} lang og 0.080^{mm} bred, Fig. 39.

Paa Polypernes Bagkrop ere Spindler og valseformede Spikler almindeligst. Spindlerne have dels tilspidsede, dels afstumpede Ender, ere takkede og fra 0.180 — 0.256^{mm} lange og fra 0.044 — 0.060^{mm} brede, Fig. 40. 41. 42. De valseformede Spikler synes at være noget fladtrykte med brede, afskaarne Ender og besatte med Takker; de ere fra 0.120 — 0.128^{mm} lange og fra 0.048 — 0.060^{mm} brede, Fig. 43. 44; desforuden sees en og anden næsten klubbeformet, takket Spikel, der er 0.104^{mm} lang og 0.020 — 0.040^{mm} bred, Fig. 45.

Paa Forkroppen og Tentaklerne ere Spindlerne mest fremherskende; de danne de omtalte Ribber og indtage for en stor Del Tentaklernes aborale Flade. Imellem Spindlerne sees tapformede Spikler og mindre, lidt fladtrykte, uregelmæssige Spikler; disse sidste findes dog hyppigst

gular form and are beset with large spikes and nodules; they measure 0.096^{mm} in length, and 0.076^{mm} in breadth (fig. 24). The spherical conglomerations measure 0.064^{mm} in diameter (fig. 25). The straight fusees have blunted extremities, and the spikes, or nodules, with which they are adorned, terminate, generally, in a small four-rayed star; they measure from 0.104 — 0.128^{mm} in length, and from 0.032 — 0.064^{mm} in breadth (figs. 26—27).

On the uppermost part of the stem, complex stellates and bistellates are the most frequent spicular forms, and a few of them are imperfectly developed. Clavates, richly adorned with papillæ, and sometimes monstrous in form, are not so very rare, but a quadruplet is extremely rarely observed here. The complex stellates are irregular, and each ray terminates in a small four-rayed star; they measure 0.096^{mm} in length, and 0.060^{mm} in breadth (fig. 28). The bistellates, also, have small stars on their radial extremities; they measure 0.088^{mm} in length, and 0.044^{mm} in breadth, and have a bare mesial stripe measuring 0.016^{mm} in breadth (fig. 29). The clavates are richly ornamented with large papillæ which terminate in four-rayed stars; they measure from 0.108 — 0.140^{mm} in length, and from 0.056 — 0.092^{mm} in breadth (figs. 30. 31. 32. 33). A few clavates are constricted at the middle; these measure 0.124^{mm} in length, 0.068^{mm} in breadth above, and 0.016^{mm} in breadth at the bare constricted part (fig. 34). The quadruplets are sparingly beset with spikes, but these also terminate in a four-rayed star; they measure 0.088^{mm} in breadth, and 0.092^{mm} in length (fig. 35).

On the branches, subclavates are the most frequent spicular form; they are sometimes curved, sometimes straight, and are richly beset with large spikes or leaves which, sometimes, have rounded, sometimes four-rayed extremities; they measure from 0.090 — 0.216^{mm} in length, and from 0.036 — 0.080^{mm} in breadth above (figs. 36. 37. 38). A quadruplet is seen, extremely rarely, which approaches in form to the cruciform, and is richly beset with nodules and spikes, of which some terminate in a small star; it measures 0.084^{mm} in length, and 0.080^{mm} in breadth (fig. 39).

On the posterior body of the polyps, fusees and cylindric spicules are the most common forms. The fusees have, partly acuminate, partly, blunted extremities, and are spicate; they measure from 0.180 — 0.256^{mm} in length, and from 0.044 — 0.060^{mm} in breadth (figs. 40. 41. 42). The cylindric spicules appear to be somewhat flattened, have broad truncate extremities, and are beset with spikes; they measure from 0.120 — 0.128^{mm} in length, and from 0.048 — 0.060^{mm} in breadth (fig. 43. 44). Besides these, an occasional claviform spicate spicule is seen, which measures 0.104^{mm} in length, and from 0.020 — 0.040^{mm} in breadth (fig. 45).

On the anterior body and the tentacles, fusees are the most predominant forms; they form the ribs spoken of, and occupy, in a great measure, the aboral surface of the tentacles. Between the fusees, coniform spicules are observed and, also, small, somewhat flattened, irregular,

paa Tentaklernes Sider og mod deres Ender. Pinnulerne have smaa, tynde, dels spatelformede, dels spindelformede Spikler. De store Spindler ere enten lige eller krummede og ere stærkt takkede. Krumningen har som oftest Baadform, kun sjeldent nærmer den sig S-Formen; men ogsaa paa disse ende stundom Takkerne i en liden Stjerne; de ere fra 0.236—0.272^{mm} lange og omtrent 0.040^{mm} brede paa Midten, Fig. 46. 47. 48. Tapperne have en tversafskaaren, tyk Ende og lignende Takker som Spindlerne; de ere 0.228^{mm} lange og 0.044^{mm} brede foroven, Fig. 49. De mindre Spikler, som findes imellem de nu nævnte, ere forskjellige i Form og Størrelse, ere alle takkede og fra 0.064—0.104^{mm} lange og fra 0.020—0.040^{mm} brede, Fig. 50. Paa Tentaklernes Pinnuler ere enkelte Spikler takkede og flade med indskaarne Rande, andre næsten glatte; de ere fra 0.052—0.072^{mm} lange og fra 0.008—0.016^{mm} brede, Fig. 51.

Svælgets Spikler ere takkede, lidt fladtrykte og have hyppigst Spindelformen. Imellem Spiklerne findes enkelte brede, temmelig flade Spikler med brede, takkede Ender; de ere 0.112^{mm} lange, 0.028^{mm} brede, Fig. 52. Spindlerne ere 0.080^{mm} lange og 0.020^{mm} brede, Fig. 53.

Spiklerne i Coenenchymet have næsten udelukkende Spindelformen og ere mere eller mindre stærkt takkede. Takkerne ende ofte i en liden Stjerne, en Ordning, der synes at være gjennemgaaende for Spiklerne hos dette Dyr. Coenenchymspiklerne ere fra 0.044—0.164^{mm} lange og fra 0.020—0.048^{mm} brede, Fig. 54.

Farven.

Farven er gullvid; Polyperne ere lidt mørkere end Stammen og spille lidt stærkere i det Gule.

Findested.

Station 31. To Exemplarer.

Slægtskarakter.

Stammen fattig paa Grene med en næsten køllefornet Top, rigt besat med Polyper. Grenene tykke, korte med næsten kugledannede Ender, tæt besatte med Polyper. Polyperne retraktile, cylindriske, rige paa Spikler, forsynede med stærke Ribber og en udpræget Celle. Polyp-cellerne korte, sammenvoxede, saa at der imellem dem

spicules; these last are, however, most frequently found on the sides and towards the extremities of the tentacles. The pinnules carry small, thin, partly spatulate, and partly fusiform spicules. The large fusees are, either, straight or curved, and are strongly spicate. The curve has, usually, the cymbiform, and only rarely does it approach to the S-form, but, also, in these the spikes occasionally terminate in a small star; they measure from 0.236—0.272^{mm} in length, and about 0.040^{mm} in breadth at the middle (figs. 46. 47. 48). The coniform spicules have a truncated, thick, extremity, and have spikes similar to those of the fusees; they measure 0.228^{mm} in length, and 0.044^{mm} in breadth above (fig. 49). The smaller spicules, which are observed amongst those that have just been spoken of, are variable in form and size, but are all spicate; they measure from 0.064—0.104^{mm} in length, and from 0.020—0.040^{mm} in breadth (fig. 50). On the pinnules of the tentacles, some spicules are spicate and flat, and have dentated margins, others, again, are almost smooth; they measure from 0.052—0.072^{mm} in length, and from 0.008—0.016^{mm} in breadth (fig. 51).

The spicules of the gullet are spicate, and a little flattened; most frequently they have the fusi-form. Between the fusees, there are a few broad, pretty flat, spicules, with broad, spicate, extremities; they measure 0.112^{mm} in length, and 0.028^{mm} in breadth (fig. 52). The fusees measure 0.080^{mm} in length, and 0.020^{mm} in breadth (fig. 53).

The spicules in the sarcosoma have, almost exclusively, the fusiform, and are, more or less strongly, spicate. The spikes frequently terminate in a small star, an arrangement which appears to be universal for the spicules of this animal. The spicules of the sarcosoma measure from 0.044—0.164^{mm} in length, and from 0.020—0.048^{mm} in breadth (fig. 54).

Colour.

The colour is yellowish white; the polyps are a little darker in colour than the stem and shade a little more towards yellow.

Habitat.

Station No. 31. Two specimens.

Generic characteristics.

The stem poor in branches, has an almost subclaviform summit richly beset with polyps. The branches thick, short, with nearly globular extremities closely beset with polyps. The polyps retractile, cylindrical, rich in spicules, furnished with strong ribs, and a prominent cell. The polyp-cells short, concreted together in such manner that,

findes lidet Coenenchym, der dog har Spikler. Stammen, Grenene og deres Coenenchym rigt paa Spikler. Svælget forsynet med Spikler.

Artskarakter.

Zoanthodemmet indtil 25^{mm} høit. Basaldelen membranagtigt udvidet. Stammen fast, furet, nøgen i større Strækninger. Grenene yderst faa, 3—4, korte, endende i en tyk Klump, rigt besat med Polyper. Disse ere langstrakte, cylindriske, staa tæt sammen og forsynede med 8 Længderibber, imellem hvilke 8 nedsænkede Felter. Tentaklerne, omtrent halvt saa lange som Kroppen, have Spikelbeklædning paa hele deres aborale Flade. Pinnulerne spikelholdige. Polypcellen halvrund, otteribbet og spikelrig. Svælget har 4 Dobbelttrækker Spikler. Paa Basaldelen almindeligst elliptiske, takkede Spindler, Dobbeltstjerner og Druespikler. Paa Stammen hyppigst sammensatte Stjerner, Dobbeltstjerner, Spindler og Druespikler. Paa Grenene takkede Køller. Paa Polypkroppen lige og krummede, takkede Spindler og takkede Valser. Svælg- og Coenenchymspiklerne væsentlig takkede Spindler.

Nidalia arctica, n. sp.

Tab. XXI, Fig. 29—66. Tab. XXII, Fig. 67—83.

Zoanthodemmet indtil 35^{mm} høit. Basaldelen membranøs, rørformigt udvidet, dannende en større eller mindre Hulhed, udfyldt med en mørk Lermasse, Fig. 29, *a*. Stammen, omtrent 25^{mm} høi og 6^{mm} bred ved Overgangen fra fra Basaldelen, er i en Strækning af 10^{mm} nøgen, rund, lidt furet paalangs, Fig. 29, *b*, men udvider sig nu til en Bredde af 10^{mm}, Fig. 29, *c*, imedens den mod Toppen smalner lidt af. Det er denne udvidede Del af Stammen, der bærer Polyperne, og som, naar disse ere lidt sammenfaldne, antage Formen af en Strobilus.

Polypcellerne staa tæt sammen, ere temmelig vide, runde, med 8 stærke Ribber, der aftage noget i Styrke, idet de gaa over paa Polypens Bagkrop og ere adskilte ved ligesaa mange spikelløse Furer, Fig. 30, *b*.

between them, little sarcosoma can be observed; it, however, contains spicules. The stem, the branches and their sarcosoma, rich in spicules. The gullet furnished with spicules.

Specific characteristics.

The Zoanthodem measures up to 25^{mm} in height. The basal part is membranaceously dilated. The stem hard, grooved, and bare over a considerable extent. The branches extremely few in number (3—4 short ones), terminate in a thick clump richly beset with polyps. These are elongato-cylindrical, placed closely together, and are furnished with 8 longitudinal ribs, between which there are 8 depressed areas. The tentacles about half the length of the body, and furnished with a spicular sheathing on their aboral surface. The pinnules contain spicules. The polyp-cell semi-circular, eight-ribbed, and contains spicules abundantly. The gullet has four double series of spicules. In the basal part, elliptic, spicate fusees, bistellates, and racemiform spicules are the most frequent. In the stem, complex stellates, bistellates, fusees, and racemate spicules are, most usually, observed. On the branches, spicate subclavates. On the polyp-body, straight, and curved, spicate fusees, and spicate cylinders. The gullet and sarcosoma spicules are principally spicate fusees.

Nidalia arctica, n. sp.

Pl. XXI, figs. 29—66. Pl. XXII, figs. 67—83.

The Zoanthodem measures up to 35^{mm} in height. The basal part is membranaceous, tubularly dilated, and forms a larger or smaller cavity filled with a dark-coloured aluminous substance (Pl. XXI, fig. 29, *a*). The stem measures about 25^{mm} in height, and 6^{mm} in breadth at the transition from the basal part. Through an extent of 10^{mm} the stem is bare; it is cylindrical, slightly grooved longitudinally (Pl. XXI, fig. 29, *b*), but then becomes dilated to a breadth of 10^{mm} (Pl. XXI, fig. 29, *c*), whilst, towards the summit it diminishes in thickness a little. It is upon this dilated part of the stem that the polyps occur, and when the polyps are a little retracted they acquire the form of a Strobilus.

The polyp-cells are placed closely together, and are pretty wide; they are cylindrical, and have 8 strong ribs which diminish in strength, somewhat, as they pass over to the posterior body of the polyp, and they are separated from each other by an equal number of spicule-free grooves (Pl. XXI, fig. 30, *b*.)

Polyperne ere omtrent 4^{mm} lange, cylindriske, retraktile, lidt udvidede op imod Tentakelskiven og forsynede med 8 Ribber, dannede af paatversliggende Spikler; imellem Ribberne sees en svag Linie, der synes at være nøgen, og som antyder Insertionerne for Septa, Fig. 30, b. Opimod Mundskiven antage Spiklerne en mere skraa Retning, og idet de gaa over paa Tentaklerne, dannes et triangulært, nøgent Felt, hvis spidse Vinkel vender nedad, og i hvis Midte ligger en Række Spikler, der deler Feltet i to Dele, Fig. 30, c. Tentaklerne ere omtrent halvt saalange som Kroppen, temmelig tykke ved Grunden og paa deres aborale Side rige paa Spikler. Pinnulerne ere forholdsvis korte, tykke og ligeledes forsynede med Spikler, Fig. 30.

Naar Polyphen med sin Celle er fuldt udstrakt, og Tentaklerne udslaaede, er Alt temmeligt gjennemsigtigt, og den indtager da en Længde af omtrent 8^{mm}, hvoraf mindst 3^{mm} kommer paa Cellen; men imellem denne og Polypens Bagkrop viser sig da ingen anden Grændse, end at Ribberne paa Cellen blive noget mindre fremtrædende ved Overgangen til Kroppen, ligesom denne i det Hele taget er noget mere gjennemsigtig.

Anatomisk-histologisk Undersøgelse.

Basalen og Stammen er beklædt med et Ectoderm, der dannes af mange Lag polyædriske Celler, som ere 0.007^{mm} i Gjennemsnit med en rund, lidt excentrisk Kjerne, 0.002^{mm} med sit Kjernelegeme, og omgivet af en næsten klar Protoplasmamasse, Fig. 31, a. Cellemembranen er tynd, og i disse Cellelag ere talrige Spikler leirede, Fig. 31, b. Indenfor Ectodermet er et temmelig bredt, hyalint Binde vævslag, Fig. 31, c, hvori Binde vævslegemer og Saftkanaler, og fra hvis indre Flade udgaa Forlængelser, som danne Kanalernes Skille vægge, og hvorved det egentlige Coenenchym, der er spikelløst, fremstaar. Kanalerne ere tapetserede med et Lag Endothelceller, der ere runde med rund Kjerne.

Polypcellerne, ligesom Polyperne, have et Ectoderm, der bestaar af lignende Celler, som de paa Stammen, men som her synes at ligge i kun to Lag, Fig. 32, a, hvori Spiklerne ligge, Fig. 32, b. Slimkjertler har det ikke været muligt at opdage, hverken paa Stammen eller Polyperne. Indenfor Ectodermet er et ikke meget bredt, hyalint Binde vævslag, Fig. 32, c, fra hvis indre Flade udgaa de 8 Septa, der fæste sig paa Svælget, Fig. 32, d. Septa have som sædvanligt Længde- og Tvermuskler, der gaa over paa Svælgrøret, ligesom Kammervæggene overalt ere beklædte med et Lag runde Endothelceller, lig dem i Stammens Kanaler, Fig. 32, e. Svælgrøret er meget vidt, cylindrisk, forsynet

The polyps measure about 4^{mm} in length; they are cylindrical, retractile, and somewhat dilated in the proximity of the tentacular disc; they are furnished with 8 ribs formed of transversally placed spicules; a faint line is observed between the ribs, which appears to be bare, and which indicates the insertions of the septa (Pl. XXI, fig. 30, b). In the proximity of the oral disk, the spicules assume a more diagonal direction and, as they pass over on to the tentacles, a triangular bare area is formed, whose acute angle faces downwards, and in whose middle there is placed a series of spicules that divides the area into two parts (Pl. XXI, fig. 30, c). The tentacles are about half the length of the body, and are pretty thick at the base; on their aboral side they are rich in spicules. The pinnules are relatively short, and thick, and are likewise furnished with spicules (Pl. XXI, fig. 30).

When the polyp, with its cell, is fully extended and the tentacles opened out, the whole is pretty transparent, and then has a length of about 8^{mm}, of which, at least 3^{mm} are taken up by the cell; but between the cell and the posterior body of the polyp there, then, appears no other margin than, that the ribs of the cell become somewhat less prominent at the transition to the body, whilst, also, the latter altogether becomes somewhat more transparent.

Anatomo-histological Examination.

The base and the stem are clad with an ectoderm that is formed of numerous layers of polyhedral cells measuring 0.007^{mm} in diameter, and which contain a globular, somewhat eccentrically placed nucleus, measuring 0.002^{mm}, their nucleus body being surrounded by an almost pellucid protoplasmic substance (Pl. XXI, fig. 31, a). The cellular membrane is thin, and in these cellular layers numerous spicules are embedded (Pl. XXI, fig. 31, b). Inside of the ectoderm, there is a pretty broad, hyaline connective-tissue layer (Pl. XXI, fig. 31, c), in which connective-tissue corpuscles and nutritory ducts are found, and from whose inner surface prolongations issue and form the divisional walls of the ducts, and by whose means the sarcosoma-proper — which is devoid of spicules — is presented. The ducts are coated with a layer of endothelial cells, which are globular and contain globular nuclei.

The polyp-cells, and the polyps as well, have an ectoderm composed of cells similar to those of the stem, but which appear, here, to be placed in only two layers (Pl. XXI, fig. 32, a) in which the spicules are situated (Pl. XXI, fig. 32, b). It has not been possible to detect mucous glands either upon the stem or the polyps. Inside of the ectoderm, there is a not very broad hyaline connective-tissue layer (Pl. XXI, fig. 32, c), from whose inner surface the 8 septa, which attach themselves to the gullet, issue (Pl. XXI, fig. 32, d). The septa have, as usual, longitudinal and transversal muscles which pass over on to the gullet-tube, whilst, also, the chamber-walls are

med 8 Rækker Spikler, Fig. 33, og paa dets indre Flade sees langs Bugsiden en temmelig smal, halvrund Svælgrube, der er beklædt med lange Pidskeceller, som ikke afvige i Form fra de ved saa mange Arter tidligere beskrevne Geisselceller, imedens de her dog synes at være noget kortere, Fig. 32, *f*. Der, hvor Svælgruben begrænses til Siderne, er en Fold, som danner et Fremspring i Svælg-hulheden, Fig. 32, *g*, hvorved denne under Svælgets Sammen-snrøring ligesom deles i to Længdehulheder, saaledes at den meget videre Hulhed følger Rygsiden og kan betragtes som Tarmrør, imedens den smalere udgjør Svælgruben eller det egentlige Spiserør (Oesophagus). I Mavehulheden er langs Septula Kjønorganerne, der som sædvanligt bestaa af stilkede Kapsler, hvori Kjønspillet udvikles, og som her bestod af Æg i forskellige Stadier, uden at nogen Embryodannelse synes at være begyndt.

Paa Basaldelen ligge Spiklerne pakkede tæt sammen. Dobbeltstjernen og Firlingen er den hyppigste Form, hvorunder de optræde, men imellem dem sees enkelte Spindler; Dobbeltstjernerne ere dels 3-, dels 4—6straalode; undertiden er den ene Ende af Spikelen mere udviklet end den anden. Straalerne ere mere og mindre brede, mere og mindre takkede i Enderne; de have som oftest et nøgent Midtbelte, men stundom kan dette ogsaa være indtaget af en Tak eller Straale; de ere fra 0.056—0.084^{mm} lange og fra 0.024—0.064^{mm} brede i Enderne med et fra 0.008—0.036^{mm} bredt Midtbelte, Fig. 34. 35. 36. 37. 38. 39. Firlingerne vise sig dels i mere eller mindre udpræget Korsform, dels som smukke Stjerner, hvis Straaler stundom ere delte, og dels som Rosetter; men alle ere besatte med større eller mindre Papiller; de korsformede ere fra 0.060—0.064^{mm} lange med en Tverstok fra 0.044—0.056^{mm}, Fig. 40. 41; de stjernedannede ere omtrent lige lange som brede, fra 0.056—0.080^{mm} i Tversnit, Fig. 42. 43, og Rosetterne ere 0.060^{mm} lange, 0.056^{mm} brede, Fig. 44. 45. Spindlerne ere uregelmæssige med som oftest afstumpede Ender og takkede, 0.112^{mm} lange og 0.060^{mm} brede, Fig. 46.

Paa Stammen ligge Spiklerne paa hverandre uden egentlig at være sammenpakkede som paa Basalen. Ogsaa her synes Dobbeltstjernen at være den hyppigste; Firlinger forekomme noget sjældnere, men langt sjældnere er den sammensatte Stjerne og Spindelen, og kun enkeltvis sees en Klubbe. Dobbeltstjernerne variere her meget; nogle have overordentlig

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

everywhere, clad with a layer of globular endothelial cells like those found in the ducts of the stem (Pl. XXI, fig. 32, *e*). The gullet-tube is very wide and cylindrical: it is furnished with 8 series of spicules (Pl. XXI, fig. 33), and on its inner surface, along the ventral side, there is seen a pretty narrow, semicircular, gullet-groove which is clad with long flagelliform cells not differing in form from those (Geissel-cells) previously described in connection with so many species, whilst they, here, however, appear to be somewhat shorter (Pl. XXI, fig. 32, *f*). At the point at the sides, where the gullet-groove ceases, there is a fold which forms a projection into the gullet-cavity (Pl. XXI, fig. 32, *g*), causing the latter, on the gullet contracting together, to be, as it were, divided into two longitudinal cavities, in such manner, that the very much widest of these two cavities runs along the dorsal side, and may be considered as an intestinal canal, whilst the smaller one serves as the gullet-passage, or the real alimentary-tube (Oesophagus). The reproductive organs are found along the septula, in the gastral cavity, and they, as usual, consist of pedunculated capsules in which the sexual product is developed, and which, here, consisted of ova in various stages of development without, however, any embryonal formation appearing to have begun.

On the basal part, the spicules are situated closely packed together. Bistellates and quadruplets are the most frequent forms in which they appear, but between these a few fusees are, also, seen. The bistellates are, partly 3-, partly 4—6 rayed; sometimes the one extremity of the spicule is more developed than the other, and the rays are more or less broad and more or less spicate in the extremities; they have most frequently a bare middle stripe but, sometimes, that may also be occupied by a spike or ray; these bistellates measure from 0.056—0.084^{mm} in length, and from 0.024—0.064^{mm} in breadth at the extremities, and they have a middle stripe measuring from 0.008—0.036^{mm} in breadth (Pl. XXI, figs. 34. 35. 36. 37. 38. 39). The quadruplets present themselves in more or less distinct cruciforms, partly, as beautiful stars whose rays are sometimes ramous, and partly as rosettes, but all of them are beset with larger or smaller papillæ; the cruciforms measure from 0.060—0.064^{mm} in length, and have a transversal arm which measures from 0.044—0.056^{mm} (Pl. XXI, fig. 40. 41); the stelliforms measure about the same in length as in breadth, being from 0.056—0.080^{mm} in diameter (Pl. XXI, figs. 42. 43) and the rosettes measure 0.060^{mm} in length, and 0.056^{mm} in breadth (Pl. XXI, figs. 44. 45). The fusees are irregular but, most usually, have blunted extremities, and are spicate; they measure 0.112^{mm} in length, and 0.060^{mm} in breadth (Pl. XXI, fig. 46).

On the stem, the spicules are placed upon each other without really being packed together, as is the case on the base. Also, here, the bistellate appears to be the most frequent spicular form met with. Quadruplets appear somewhat more rarely, but the complex stellate and fusee are far more rare, and quite exceptionally is a clavate

brede, bladformede Straaler med takkede Rande og i det nøgne Midtbelte et Kors, hvorved de nærme sig Firlingen; andre ere mere langstrakte med et længere, nøgent Midtbelte uden Kors; de ere fra 0.096—0.120^{mm} lange og fra 0.044—0.080^{mm} brede i Enderne med et Midtbelte, der er fra 0.024—0.040^{mm} bredt, Fig. 47. 48. 49. 50. Firlingerne danne dels Kors, dels Rosetter, dels Stjerner, ere rigt forsirede med Papiller og Blade, der ofte have takkede Rande; Korsene ere fra 0.092—0.104^{mm} lange med en Tverstok, fra 0.088—0.100^{mm}, Fig. 51. 52. 53. Stjernerne ere omtrent lige lange som brede; de ere 0.080^{mm} i Tversnit, Fig. 54. Rosetterne ere fra 0.108—0.112^{mm} lange og fra 0.088—0.110^{mm} brede, Fig. 55. 56. De sammensatte Stjerner have brede, bladformede Straaler med takkede Ender, ere 0.156^{mm} lange, 0.080^{mm} brede, Fig. 57. Spindlerne ere takkede med tildels takkede eller spaltede, brede Ender; de ere 0.152^{mm} lange, 0.048^{mm} brede, Fig. 58. Klubberne, der ere sjeldnest, ere besatte med Blade med takkede Rande og 0.080^{mm} lange, 0.060^{mm} brede foroven, Fig. 59.

Paa Cellen og Bagkroppen er det væsentligst sammensatte Stjerner, der ere hyppigst, noget sjeldnere ere Spindler, Køller og Klubber, men meget sjeldne ere her Firlinger. De sammensatte Stjerner have temmelig korte men brede Straaler med tandede Rande; de ere fra 0.148—0.164^{mm} lange og 0.064^{mm} brede, Fig. 60. 61. 62. Spindlerne ere dels krumme, dels lige, takkede med mere eller mindre tilspidsede Ender; de ere fra 0.168—0.360^{mm} lange og fra 0.020—0.052^{mm} brede, Fig. 63. 64. 65. 66. Køllerne ere næsten alle lige, kun enkelte sees krummede, men disse have ogsaa tabt Størstedelen af Kølleformen og nærme sig noget Spindelen; Køllerne ere dels bladede, dels takkede, med et mere eller mindre langt Skaft; de ere fra 0.188—0.308^{mm} lange og 0.044^{mm} brede foroven, Tab. XXII, Fig. 67. 68. 69. Klubberne ere bladede, enkelte have i den øverste Ende næsten en Korsform; de ere fra 0.120—0.144^{mm} lange og 0.052^{mm} brede foroven, Fig. 70. 71. Firlingerne have Rosetform, ere rigt forsirede med Blade og 0.152^{mm} lange, 0.092^{mm} brede, Fig. 72.

Paa Forkroppen ere Spindler og Køller hyppigst; sjelden sees her sammensatte Stjerner. Spindlerne ere baade krumme og lige med tilspidsede Ender og takkede; de ere fra 0.180—0.320^{mm} lange og fra 0.028—0.048^{mm} brede, Tab. XXII, Fig. 73. 74. 75. Køllerne ere besatte med Blade med tandede Rande og et forholdsvis kort

observed. The bistellates are, here, very variable; some have extremely broad, foliiform rays with spicate margins, and a cross in the bare middle stripe, in which features they approach to the quadruplet; others are more elongate and have a longish, bare, stripe in the middle, without any cross; they measure from 0.096—0.120^{mm} in length, and from 0.044—0.080^{mm} in breadth at the extremities, and have a middle stripe which measures from 0.024—0.040^{mm} in breadth (Pl. XXI, figs. 47. 48. 49. 50). The quadruplets form, partly cruciforms, partly rosetiforms, partly stellates; they are richly adorned with papillæ, and leaves which frequently have spicate margins; the cruciforms measure from 0.092—0.104^{mm} in length, and have a transversal arm which measures from 0.088—0.100^{mm} (Pl. XXI, figs. 51. 52. 53). The stellates measure about the same in length as in breadth, being 0.080^{mm} in diameter (Pl. XXI, fig. 54). The rosetiforms measure from 0.108—0.112^{mm} in length, and from 0.088—0.110^{mm} in breadth (Pl. XXI, figs. 55. 56). The complex stellates have broad, foliiform, rays with spicate extremities; they measure 0.156^{mm} in length, and 0.080^{mm} in breadth (Pl. XXI, fig. 57). The fusees are spicate, and have, partly, spicate or fissured, broad, extremities; they measure 0.152^{mm} in length, and 0.048^{mm} in breadth (Pl. XXI, fig. 58). The clavates, which are the rarest, are beset with leaves having spicate margins, and measure 0.080^{mm} in length, and 0.060^{mm} in breadth above (Pl. XXI, fig. 59).

Upon the cell and posterior body, it is, principally, complex stellates that are most frequently met with; fusees, sub-clavates, and clavates are somewhat rarer, and quadruplets are, here, very rarely met with. The complex stellates have rather short, but broad, rays with dentated margins; they measure from 0.148—0.164^{mm} in length, and 0.064^{mm} in breadth (Pl. XXI, figs. 60. 61. 62). The fusees are, partly curved, partly straight, and spicate, with more or less acuminate extremities; they measure from 0.168—0.360^{mm} in length, and from 0.020—0.052^{mm} in breadth (Pl. XXI, figs. 63. 64. 65. 66). The subclavates are nearly all straight, only a few of them are seen to be curved, but these ones have also lost the greater part of the sub-clavate form, and approach in form somewhat to the fusee; the subclavates are, partly, foliaceous, partly spicate, and have a more or less long shaft; they measure from 0.188—0.308^{mm} in length, and 0.044^{mm} in breadth above (Pl. XXII, figs. 67. 68. 69). The clavates are foliated, and a few have almost the cruciform at the uppermost extremity; they measure from 0.120—0.144^{mm} in length, and 0.052^{mm} in breadth above (Pl. XXII, figs. 70. 71). The quadruplets are rosetiform, and are richly adorned with leaves; they measure 0.152^{mm} in length, and 0.092^{mm} in breadth (Pl. XXII, fig. 72).

On the anterior body, fusees and subclavates are the most usual spicular forms; complex stellates are rare here. The fusees are, both, curved and straight, with acuminate extremities, and are spicate; they measure from 0.180—0.320^{mm} in length, and from 0.028—0.048^{mm} in breadth (Pl. XXII, figs. 73. 74. 75). The subclavates are beset

Skaft; de ere 0.172^{mm} lange og 0.048^{mm} brede foroven, Fig. 76. 77. De sammensatte Stjerner ere lidet udviklede; Straalerne ere bladformede og uregelmæssige; de ere fra 0.112—0.140^{mm} lange og 0.064^{mm} brede, Fig. 78. 79.

Paa Tentaklerne sees væsentligst Spindler, der især paa Pinnulerne ere meget tynde, næsten spydformige; imellem Spindlerne sees Køller, lig dem paa Forkroppen. Spindlerne ere dels krumme, dels lige, tandede, fra 0.116—0.144^{mm} lange og fra 0.012—0.028^{mm} brede, Fig. 80. 81. 82. Køllerne ere 0.196^{mm} lange, 0.056^{mm} brede foroven, Fig. 83.

Spiklerne paa Svælgrøret have for det meste Spindel-formen; af og til sees Firlinger i Korsform.

Farven.

Stammen er svag gulbrun. Polyperne gule, spillende lidt i det Røde.

Findested.

Station 273. 3 Exemplarer.

Artskarakter.

Zoanthodemet indtil 35^{mm} høit. Basaldelen membranøs, traktformigt udvidet. Stammen omtrent 25^{mm} hoi, 6^{mm} bred, hvor den udgaar fra Basalen, rund og nøgen i en Strækning af 10^{mm}, hvorefter den udvider sig til en Bredde af 10^{mm}, bærende paa denne udvidede Del Polyperne. Polypcellerne staa tæt sammen, ere temmelig vide med 8 stærke Ribber, adskilte ved ligesaa mange Furer. Polyperne omtrent 4^{mm} lange, cylindriske, retraktile, forsynede med 8 Ribber, imellem disse 8 svage Furer. Opimod Tentakelranden 8 triangulære, nøgne Felter, i hvis Midte en Spikelrække. Tentaklerne omtrent halvt saalange som Kroppen, temmelig korte og spikelrige. Pinnulerne forsynede med Spikler. Svælgrøret har 8 Rækker Spikler. Paa Basaldelen danne Spiklerne væsentligst Dobbeltstjerner og Firlinger. Paa Stammen er ligeledes Dobbeltstjernen hyppigst, medens Firlingerne ere noget sjeldnere. Paa Polypkroppen ere Spindler og Køller almindeligst. Farven gul. Polyperne spillende lidt i det Røde.

with leaves having dentated margins, and they have a relatively short shaft; they measure 0.172^{mm} in length, and 0.048^{mm} in breadth above (Pl. XXII, fig. 76. 77). The complex stellates are little developed, and their rays are foliiform and irregular; they measure from 0.112—0.140^{mm} in length, and 0.064^{mm} in breadth (Pl. XXII, figs. 78. 79).

Upon the tentacles fusees are principally seen, which, especially on the pinnules; are very thin and almost hastiform; between the fusees, subclavates, like those upon the anterior body, are seen. The fusees are, partly, curved, partly straight, and dentated; they measure from 0.116—0.144^{mm} in length, and from 0.012—0.028^{mm} in breadth (Pl. XXII, figs. 80. 81. 82). The subclavates measure 0.196^{mm} in length, and 0.056^{mm} in breadth above (Pl. XXII, fig. 83).

The spicules on the gullet-tube have, most of them, the fusiform, but now and then a cruciform quadruplet is observed.

Colour.

The stem is pale yellowish-brown; the polyps yellow shading towards red.

Habitat.

Station No. 273. Three specimens.

Specific characteristics.

The Zoanthodem measures up to 35^{mm} in height. The basal part membranaceous, dilated in infundibuliform. The stem measures about 25^{mm} in height, and 6^{mm} in breadth at the point where it issues from the base; it is cylindrical, and bare for an extent of 10^{mm}, becoming subsequently dilated to a breadth of 10^{mm}, and the dilated part is occupied by polyps. The polyp-cells are placed closely together and are pretty wide; they have 8 strong ribs separated by the same number of grooves. The polyps measure about 4^{mm} in length, are cylindrical, retractile, and furnished with 8 ribs; between these ribs there are 8 faint grooves. In the proximity of the tentacular margin, there are 8 triangular bare areas in whose middle a spicular series is placed. The tentacles measure about half the length of the body; they are rather short and rich in spicules. The pinnules are furnished with spicules. The gullet-tube has 8 series of spicules. Upon the basal part, the spicules met with are, principally, bistellates and quadruplets. Upon the stem, bistellates are also the most frequent spicular form, whilst quadruplets are somewhat rarer. On the polyp-body, fusees and subclavates are the most common. The colour yellow; the colour of the polyps shading a little towards red.

Krystallofanés¹ polaris, n. g. et sp.

Tab. XIX, Fig. 1—45.

Zoanthodemet indtil 20^{mm} højt. Stammen omtrent 12^{mm} i Omkreds ved Grunden, men udvider sig næsten kolleformigt i Toppen, der er godt besat med Polyper, blød og gjennemsigtig, svagt riflet paalangs af de store Længdekanaler og paa dens nederste Del nøgen i en Høide af 5^{mm} fra Basaldelen, Fig. 1. Denne er tynd, fast, membranagtig og kun lidet udvidet. Grenene danne tykke, korte, meget brede, gjennemsigtige Lapper, der omgive Stammen næsten krandsformigt med store Melletrum, idet nemlig hver Krands, hvoraf der er høist 3, staa langt fra hverandre, saa at Stammen stykkevis bliver blottet, Fig. 1. Enhver Gren er nøgen og noget smal ved sit Udspring, men bliver bredere mod Enden og bærer en Samling af 6—8 Polyper, hvis Celler staa tæt i hverandre uden at være sammenvoxede, idet et smalt Coenenchym adskiller dem.

Polypcellerne ere halvkugledannede, tæt besatte med Kalk, og naar Polypen begynder at trække sig ind, ser det ud, som om Cellens Rand har 8 Tænder; er Polypen fuldt udstrakt, sees vanskelig nogen Grændse mellem dens Bagkrop og Cellen; thi de gaa saagodtsom umærkeligt over i hinanden; kun derved, at Spiklerne paa Cellen ligge tættere til eller paa hverandre, end paa Bagkroppen, kan de ved Hjælp af Loupe eller stærkere Forstørrelse adskilles, Fig. 2, a.

Polyperne ere retraktile, cylindriske, omtrent 10—12^{mm} lange, med en udviklet Bagkrop. Denne er omtrent 5^{mm} lang, forsynet med 8 Længderækker Spikler, som ere vel adskilte ved et nøgent, gjennemsigtigt Melletrum. I hvert Spikelfelt er der i Regelen 3 Rækker Spikler, som ligge lidt paaskraas, Fig. 2, b. Forkroppen er 3—4^{mm} lang og lidt indkneben, hvor den gaar over i Bagkroppen, men udvider sig op mod Tentakelskiven og er vel forsynet med Spikler, der her ligge paatvers i Begyndelsen, men skraane stærkt af mod Tentakelskiven, hvor de ordne sig i Rækker, som førend de gaa over paa Tentaklerne, vige fra hverandre og danne triangulære Felter, fra hvis spidse Vinkel udgaar en kort Række Spikler, Fig. 2, c. Mundskiven er næsten flad med en aflag Mundspalte. Tentaklerne 3—4^{mm} lange, temmelig tykke ved Grunden og paa deres aborale Side pantsret med Spiklerne; Pinnulerne staa temmelig tæt, ere tykke og forsynede med Spikler, Fig. 2.

¹ Af κρύσταλλος, en Krystal og φανός, lysende. Paa Tavle XIX staa Chrysofanés, skal være Krystallofanés.

Krystallofanés¹ polaris, n. g. et sp.

Pl. XIX, figs. 1—45.

The Zoanthodem measures up to 20^{mm} in height. The stem measures about 12^{mm} in circumference, at the base, but becomes somewhat dilated, in subclaviform, at the top, which is well covered with polyps. It is soft and transparent, slightly grooved longitudinally, by the large longitudinal ducts, and, in its lowest part, is bare for a height of 5^{mm} from the base (fig. 1). The basal part is thin, hard, and membranaceous, and it is only slightly dilated. The branches occur as short, thick, very broad, transparent excrescences, which surround the stem almost in wreaths, having wide intervals between them owing to each wreath, of which there are 3 at the most, being situated far apart from the adjacent one, causing the stem, in portions, to be exposed (fig. 1). Every branch is bare, and rather narrow at its root, but becomes broader towards the extremity and bears a collection of 6—8 polyps, whose cells are placed close up to each other without, however, being concreted together, as a slender sarcosoma separates them.

The polyp-cells are semispherical in form, and are closely covered with calcium; when the polyp begins to retract itself, it appears as if the margin of the cell has 8 teeth, but when the polyp is fully extended, it is with difficulty that any margin can be seen between its posterior body and the cell, because they pass into each other, or are absorbed the one into the other, almost imperceptibly. The transition or margin can only be recognised with the assistance of a magnifier, or on considerable magnification, from the fact that the spicules of the cell lie closer to, or upon, each other than on the posterior body (fig. 2, a).

The polyps are retractile, cylindrical, and measure about 10—12^{mm} in length, and they have a developed posterior body which measures about 5^{mm} in length, and is furnished with 8 longitudinal series of spicules, well separated by a bare, transparent, interval. In each spicular area there are, as a rule, 3 series of spicules, which are placed a little diagonally (fig. 2, b). The anterior body measures 3—4^{mm} in length, and is a little constricted at the point where it passes over into the posterior body, but it becomes dilated in the proximity of the tentacular disc, and is well supplied with spicules which, here, are placed, at the commencement, transversally, but slope quickly off towards the tentacular disk, where they become arranged in series which, before they pass over to the tentacles, diverge from each other and form triangular spaces, from whose acute angle a short series of spicules issues (fig. 2, c). The oral disk is almost flat.

¹ From κρύσταλλος = a crystal — φανός = gleaming.

Erratum: Owing to a clerical error, the appellation *Chrysofanés* is erroneously printed on Pl. XIX instead of the correct one, *Krystallofanés*.

Anatomisk-histologisk Undersøgelse.

Stammen og Grenene ere paa deres udvendige Flade forsynede med Epithel, der bestaar af 2 Lag polyædriske Celler, som med sin Kjerne og Kjernelegeme indeholder kun sparsomt en halvgjennemsigtig, næsten homogen Protoplasmamasse, Fig. 3, a. 4, a. Imellem Ectodermcellerne sees, foruden Spikler, isolerede, pæreformige, encellede Slimkjertler, dels med et kornet Indhold, der omgiver Kjernen, dels ganske tomme, af Udseende som Vacuoler. Indenfor Ectodermet er et ganske eiendommeligt, hyalint Bindevæv, hvis ydre Lag danner et fuldstændigt Næt med store Masker, hvori Spikler ere affeirede, Fig. 3, b. 4, b, og hvis indre Lag udgjør et temmeligt bredt Belte, hvori sees fine Ernæringskanaler og Bindevævslegemer, og fra hvis indre Flade udsendes Forlængelser, der danne Skillevæggene for Kanalsystemet eller det egentlige Coenenchym, og hvori findes en hel Del Spikler, Fig. 3, d. De store Maskers Vægge ere beklædte med Ectodermceller, saaledes at Spiklerne, som udfylde Maskerne, ere omgivne af dem, Fig. 4, c. Paa den indre Flade af Bindevævet, der danner de store Kanaler, findes paaskraas- og paalangsgaaende Muskelfibre, som paa Septula samle sig til Muskelbunter, der paa den ene Side danne Længde- og paa den anden Tvermuskler, hvilke følge Septula i deres hele Længde for at gaa over paa Septa hos de Polyper, som staa i umiddelbar Forbindelse med saadanne Kanaler, der i saa Tilfælde udgjøre Polypernes forlængede Mavehulheder. Der er kun faa af disse Kanaler, og ret ofte findes langt nede i dem Generationsorganerne med fuldt udviklede Kjønsprodukter.

Stammens og Grenenes Længdekanaler ere i det Hele taget faa i Forhold til Polypernes Antal; saaledes samler den øverste Polypgruppe sig i 4 meget vide Hovedkanaler, ligesom Grenenes Polyper samle sig i 2—3, alt efter Grenens Tykkelse og Polypernes Antal, Fig. 3. For hver Krands af Grene faar Stammen en Tilvæxt af Længdekanaler, som dog blive trangere og trangere, jo mere de nærme sig Basaldelen. Kanalerne ere tapetserede med et Endothel, der bestaar af et Lag runde Celler med Kjerne og Kjernelegeme. De runde Legemer, som indeholdes i den i Kanalerne cirkulerende Ernæringsvædske, have dels samme Form, Størrelse og Indhold som Endothelcellerne, dels ere de noget forskellige fra disse, idet de ere fyldte med en

and has an oblong oral fissure. The tentacles measure 3—4^{mm} in length, and are pretty thick at the base, and, on their aboral side, are sheathed with spicules. The pinnules are placed pretty close to each other, and they are thick and furnished with spicules (fig. 2).

Anatomo-histological Examination.

The stem and the branches are — upon their exterior surfaces — furnished with an epithelium which consists of 2 layers of polyhedral cells, that besides their nucleus and nucleolar corpuscles, contain, but sparingly, a semi-transparent, almost homogeneous protoplasmic mass (figs. 3, a. 4, a). Between the ectoderm-cells there is, also, observed, besides spicules, isolated, piriform, unicellular mucous glands containing, partly, a granular substance which surrounds the nucleus, and, partly quite empty, and which have the appearance of vacuoli. Inside of the ectoderm, there is a quite peculiar hyaline connective-tissue, whose exterior layer forms a complete reticulation of large meshes in which the spicules are embedded (fig. 3, b. 4, b), and whose inner layer forms a pretty broad stripe, in which minute nutritory ducts and connective-tissue corpuscles are observed, and from whose inner surface prolongations issue forming the divisional walls of the ductiferous system, or the sarcosoma-proper, and in which there is found a great number of spicules (fig. 3, d). The walls of the large meshes are clad with ectodermic cells in such a manner, that the spicules which fill out the meshes are surrounded by them (fig. 4, c). On the inner surface of of the connective-tissue which forms the large ducts, muscular fibres are found, running diagonally, and longitudinally, and which, on the septula, collect into bundles of muscles, that on the one side form longitudinal, and on the other side transversal, muscles, accompanying the septula throughout their entire length and then passing over to the septa of such polyps as are placed in immediate connection with those ducts, and in that case they compose the prolonged gastric cavities of the polyps. There are not many of these ducts, and very frequently, far down in them, the reproductive organs are met with, containing fully developed sexual products.

The longitudinal ducts of the stem and the branches are, upon the whole, few in number in proportion to those of the polyps; for instance, the uppermost polyp group collects itself into 4 very wide main ducts, whilst, also, the polyps of the branches collect themselves into 2—3 ducts, according to the thickness of the branches and the number of the polyps (fig. 3). For every wreath of branches the stem acquires an addition of longitudinal ducts, which however become narrower and narrower the nearer they approach to the basal part. The ducts are lined with an epithelium, consisting of a layer of round cells containing nucleus and nucleolus. The globular corpuscles which are contained in the nutritory fluids circulating in

kornet Masse, uden at nogen Kjerne kan iagttages i dem og ligne meget de hvide Blodlegemer hos de høiere Dyrklasser.

Polypkroppen er udvendigt beklædt med et Ectoderm, meget ligt det, som findes paa Stammen og Grenene, Fig. 4, *a*, og hvori encellede Slimkjertler og Spikler ere leirede. Indenfor Ectodermet er et Bindevævslag, Fig. 4, *e*, der svarer fuldkomment til det, som er beskrevet ved Stammen. Det samme Maskenæt findes her; Maskernes Vægge ere overtrukne med Ectodermceller, Fig. 4, *c*, og Hulhederne fyldte med Spikler. Fra Bindevævet indvendige Flade udgaa 8 Septa, der fæste sig paa Svælget og danne Kamrene. Muskelanordningen paa Septa er som sædvanlig; ligeledes ere Kamrene overalt forsynede med et Lag runde Celler med Kjerne og Kernelegeme, Fig. 4, *f*.

Svælget er langt, cylindrisk, uden Spikler, Fig. 5, *a*; paa dets indre Flade er langs Bugsiden en temmelig vid, halvrund Svælgrende, forsynet med lange Pidskeceller, Fig. 4, *g*; den øvrige Del af Svælget er beklædt med cilierende Celler, hvoraf de i den øverste Del nærme sig meget Ectodermcellerne uden at være saa kantede, imedens de i den nedre Del maa betragtes som Cylinderceller. Overalt i Svælgepithelet, naar undtages Svælgrenden, er indplantet dels pæreformige, dels ægformige, encellede Slimkjertler i temmelig stor Mængde; Fig. 4, *h*. Disse Slimkjertler have en smal Udførselsgang, der munder ud i Svælgulheden.

Kjønnsorganerne sidde langt nede i Mavehulheden og, som tidligere nævnt, træffes de ogsaa i Kanalerne saavel i Stammen som i Grenene og have den samme Bygning, som oftere er omtalt. Kjønnen er adskilt. Hos flere Polyper vare Embryonerne endnu indesluttede i Ægget, hvor de laa stærkt bøiede, Fig. 6; hos andre havde de forladt Ægget, laa frit i Mavehulheden, vare temmelig lange, ormformige, overalt beklædte med Cilier og forsynede med Gastrulamaye og Mund. Hos disse frigjorte Embryoner iagttoges endnu ikke nogen Spikeldannelse, saaledes som Tilfældet var hos Embryonerne af Slægten *Nephthya*, og der er Grund til at antage, at Spiklerne først optræde, efter at Ungen har forladt Moderen for at føre et selvstændigt Liv; thi hos en Polyp var netop en saadan spikelløs Unge ifærd med at passere igjennem det trange Svælg for at paabegynde sit individuelle Liv, Fig. 5, *b*.

Paa Basaldelen ligge Spiklerne pakkede paa hverandre, og de hyppigste Former, hvorunder de her optræde, ere Firlinger, Dobbeltstjerner og Spindler. Firlingerne ere meget forskellige, kors-, timeglas- eller rosetformede; de ere dels glatte, dels svagt besatte med Papiller, dels rigt

the ducts have, partly, the same form, size, and substance as the endothelial cells or, partly, they are a little different from them, owing to their being filled up with a granular mass in which no nuclei can be detected, and much resembling the white blood-corpuscles found in the higher classes of animals.

The polyp-body is, externally, clad with an ectoderm much resembling that found on the stem and the branches, (fig. 4, *a*), and in which unicellular mucous glands and spicules are embedded. Inside of the ectoderm, there is a connective-tissue layer (fig. 4, *e*) which exactly corresponds with that described in connection with the stem. The same reticulation of meshes is found here; the walls of the meshes are coated with ectodermic cells (fig. 4, *c*), and the cavities are filled with spicules. From the interior surfaces of the connective-tissue, 8 septa issue and attach themselves to the gullet, and form the ducts. The muscular arrangement on the septa is the usual one, and the chambers are, also, everywhere supplied with a layer of globular cells containing nucleus and nucleoli (fig. 4, *f*).

The gullet is long, cylindrical, and devoid of spicules (fig. 5, *a*). On its inner surface, along the ventral side, there is a pretty wide, semi-circular, gullet-passage furnished with long flagelliform cells (fig. 4, *g*). The remaining part of the gullet is clad with ciliated cells, of which, those in the uppermost part approach much, in form, to the ectodermic cells, without, however, being so angular, whilst those in the lower part must be considered to be cylinder-cells. Everywhere, in the epithelium of the gullet, with exception of the gullet-passage, there are planted, partly piriform, partly oviform, unicellular mucous glands in pretty great abundance (fig. 4, *h*). These mucous glands have a narrow excretory duct which opens into the gullet-cavity.

The generative organs are placed far down in the gastral cavity, and, as previously stated, they are also met with in the ducts of, both, the stem and the branches, and have the same structure as that already frequently spoken of. The sexes are separated. In many polyps, the embryos were still enclosed in the ovum, where they lay strongly curved (fig. 6). In others, they had emerged from the ovum and lay loose in the gastral cavity, appearing pretty long, flat and vermiform, and clad all over with cilia; and also furnished with a true gastrula stomach and mouth. In these independent embryos, no spicular formation was yet visible, like the case of the embryos of the genus *Nephthya*, and there is reason to suppose that the spicules first appear after the young one has abandoned the mother in order to lead its independent life, because, in one polyp, one of these spicule-free young ones was just engaged in passing through the narrow gullet in order to start upon its individual existence (fig. 5, *b*).

In the basal part, the spicules are placed packed upon each other, and the most frequent forms in which they appear, here, are quadruplets, bistellates and fusees. The quadruplets are very various in form, as they are met with in cruciform, sand-glass form, or rosetiform; they

ornamenterede; de korsformede ere fra 0.080—0.084^{mm} lange med en Tverstok fra 0.064—0.076^{mm} Fig. 7—8; de timeglasformede ere de hyppigste; de ere fra 0.072—0.128^{mm} lange og fra 0.044—0.084^{mm} brede ved Enderne og fra 0.028—0.044^{mm} brede paa Midten, Fig. 9. 10. 11. 12; de rosetformede ere de sjeldneste, 0.076^{mm} lange, 0.088^{mm} brede, Fig. 13. Dobbeltstjernerne ere mere eller mindre udviklede; enkelte nærme sig mere sammensatte Stjerner, Straalerne ere brede, bladede med takkede Ender; de ere fra 0.016—0.128^{mm} lange, fra 0.042—0.072^{mm} brede mod Enderne og fra 0.020—0.036^{mm} brede paa Midten, der stundom er nøgen, stundom besat med enkelte Papiller, Fig. 14. 15. Spindlerne ere ikke meget takkede, enkelte ere ganske tynde med takkede Ender, 0.084^{mm} lange, 0.032^{mm} brede, Fig. 16; andre ere tykkere, have vingeformede Udvæxter, ere fra 0.088—0.104^{mm} lange og fra 0.036—0.052^{mm} brede, Fig. 17. 18. 19.

Paa Stammen og Grenene ligge Spiklerne meget mere spredte end paa Basalen, og her ere Valsen, Køller og Spindler de hyppigste, sjeldnere Klubber og Dobbeltstjerner, men yderst sjeldent Firlinger. Valsen have brede, næsten paatvers afskaarne, takkede Ender og ere overalt temmelig tæt besatte med brede, bladformige, i Randen udskaarne Takker; de ere 0.212^{mm} lange, 0.084^{mm} brede, Fig. 20. Køllerne ere ligeledes overalt prydede med meget brede, bladformede, i Randen stærkt indskaarne Takker; indimellem disse sees Takker, der ende i en liden Stjerne; de ere 0.308^{mm} lange, og 0.088^{mm} brede foroven, Fig. 21. Spindlerne ere snart lige, snart krummede, næsten haadformede, takkede, og paa enkelte ere Takkerne brede med indskaarne Rande; de ere fra 0.176—0.244^{mm} lange og fra 0.028—0.060^{mm} brede paa Midten, og Enderne ere mere eller mindre tilspidsede, Fig. 22. 23. 24. Klubberne ere meget varierende; Skaftet er kort, tildels takket, men den øvrige Del er rigt forsiret med store, fremragende, brede Blade, hvis Rande ere mere eller mindre tandede; enkelte af Klubberne nærme sig noget Valsen, andre sammensatte Stjerner; de ere fra 0.156—0.196^{mm} lange og fra 0.088—0.096^{mm} brede foroven, Fig. 25. 26. 27. Dobbeltstjernerne ere temmelig uformelige, da de ulige stillede Straaler ere brede med takkede Ender; de ere fra 0.124—0.140^{mm} lange og fra 0.052—0.076^{mm} brede med et Midtbelte, der tildels har smaa Papiller og er fra 0.024—0.036^{mm} bredt, Fig. 28. 29. Endelig er den paa dette Sted saa sjeldne Firling rigt ornamenteret og staa imellem Kors- og Timeglasformen, nærmest den sidste; den er 0.092^{mm} lang, 0.080^{mm} bred i Enderne og 0.036^{mm} bred paa Midten, Fig. 30.

are, partly, smooth, partly faintly beset with papillæ, and are sometimes richly ornamented. The cruciforms measure from 0.080—0.084^{mm} in length, and have a transversal arm measuring from 0.064—0.076^{mm} (figs. 7. 8). The sand-glass forms are the most frequent; they measure from 0.072—0.128^{mm} in length, from 0.044—0.084^{mm} in breadth at the extremities, and from 0.028—0.044^{mm} in breadth at the middle (figs. 9. 10. 11. 12). The rosetiform are the rarest, and they measure 0.076^{mm} in length, and 0.088^{mm} in breadth (fig. 13). The bistellates are more or less developed; a few approach more in form to the complex stellates; the rays are broad and foliaceous, and have spicate extremities; they measure from 0.116—0.128^{mm} in length, from 0.042—0.072^{mm} in breadth, towards the extremities, and from 0.020—0.036^{mm} in breadth at the middle, which occasionally is bare, or is, occasionally, beset with a few papillæ (figs. 14. 15). The fusees are not much spicate, some are quite thin and have spicate extremities; these measure 0.084^{mm} in length, and 0.032^{mm} in breadth (fig. 16). Others, again, are thicker, and have pennate excrescences; those measure from 0.088—0.104^{mm} in length, and from 0.036—0.052^{mm} in breadth (figs. 17. 18. 19).

On the stem and the branches, the spicules are placed much more scatteredly than on the basal part and, here, cylinders, subclavates, and fusees are the most frequent forms met with; clavates and bistellates are met with more rarely, and quadruplets extremely rarely. The cylinders have broad, almost transversely-truncated spicate extremities and are, everywhere, pretty closely beset with broad, foliaceous spikes, having dentated margins; they measure 0.212^{mm} in length, and 0.084^{mm} in breadth (fig. 20). The subclavates are, also, everywhere adorned with very broad foliform spikes strongly dentated in the margins, and between these spikes others, terminating in a small star, are seen; these subclavates measure 0.308^{mm} in length, and 0.088^{mm} in breadth above (fig. 21). The fusees are, sometimes straight, and sometimes curved, almost cymbiform, and spicate, and in a few of them the spikes are broad, with dentated margins; they measure from 0.176—0.244^{mm} in length, and from 0.028—0.060^{mm} in breadth at the middle. The extremities are more or less acuminate (figs. 22. 23. 24). The clavates are very various in form; the shaft is short and partly spicate, but the remaining part is richly adorned with large, projecting, broad leaves whose margins are more or less dentated. A few of the clavates approach, somewhat, in form to that of the cylinders, others to that of the complex stellates; they measure from 0.156—0.196^{mm} in length, and from 0.088—0.096^{mm} in breadth above (figs. 25. 26. 27). The bistellates are rather misshapen, and the irregularly placed rays are broad and have spicate extremities; they measure from 0.124—0.140^{mm} in length, and from 0.052—0.076^{mm} in breadth, and have a mesial stripe partly occupied by small papillæ, which measures from 0.024—0.036^{mm} in breadth (fig. 28. 29). Finally, the quadruplet so rarely met with in this situation, is richly ornamented, and appears to be

Paa Polypernes Bagkrop og Celle ere Køller og sammensatte Stjerner almindeligst; Spindler og Klubber ere sjeldnere, men sjeldnest Firlinger, — dog træffes disse sidste hyppigere end paa Stammen og Grenene. Køllerne ligne særdeles meget de paa Stammen; de ere kanske noget rigere paa bladformede Takker, ligesom de stjerneformede Takker ere mere fremtrædende; de ere fra 0.252—0.348^{mm} lange og fra 0.064—0.084^{mm} brede foroven, Fig. 31. 32. Men imellem disse Køller sees andre, der ere kun sparsomt smaatakkede; de have et næsten glat Udseende, nærme sig noget Spindelformen og ere 0.256^{mm} lange og 0.048^{mm} brede foroven, Fig. 33. De sammensatte Stjerner have brede, i Enderne takkede Straaler og imellem Straalerne som oftest et smalt, nøgent Belte; de ere 0.156^{mm} lange, 0.064^{mm} brede, og Midtbeltet 0.032^{mm} bredt, Fig. 34. Klubberne ere ikke saa rige paa Bladbesætning som de paa Stammen; Bladene ere mere bugtede end tandede og staa længere fra hverandre; de ere 0.140^{mm} lange, 0.084^{mm} brede foroven, Fig. 35. Firlingerne ere her to Slags; det ene har Korsformen, er overordentligt smukt prydet med Blade og Stjerner, 0.224^{mm} langt og har en Tverstok, der er 0.180^{mm} og ligesom Længdestokken meget bred, Fig. 36; det andet nærmer sig Timeglasformen, er besat med temmelig smaa Papiller og er 0.092^{mm} langt, 0.064^{mm} bredt i Enderne og 0.028^{mm} bredt paa Midten, Fig. 37.

Paa Forkroppen ere Spindlerne og Køllerne almindeligst, Klubber og Dobbeltstjerner sjeldnere. Spindlerne ere dels lige, dels mere eller mindre krummede og takkede; men Takkerne ere baade smaa og staa temmelig langt fra hverandre; de ere fra 0.192—0.224^{mm} lange og fra 0.024—0.028^{mm} brede, Fig. 38. 39. Køllerne ere enten lige, hvilket er det hyppigste, eller noget krumme; de lige ere tæt besatte med smaa Takker, 0.260^{mm} lange, 0.056^{mm} brede foroven, Fig. 40; de krumme ere kun svagt besatte med smaa Takker, som staa temmelig langt fra hverandre, ere 0.188^{mm} lange, 0.044^{mm} brede foroven, Fig. 41. Klubberne have et kort, takket Skaft og ere forresten forsynede med brede, bladformede Takker, der staa temmelig langt fra hverandre; Rummene mellem Bladene ere tildels nøgne; de ere fra 0.124—0.164^{mm} lange og fra 0.064—0.072^{mm} brede foroven, Fig. 42. 43. Dobbeltstjernerne have næsten kugledannede Ender, hvis 4—6 Takker danne Stjernen; Takkerne (Straalerne) ende tildels i en liden Stjerne og Midtpartiet er nøgent. De nærme sig meget Dobbeltkuglen, ere 0.096^{mm} lange og 0.068^{mm} brede i Enderne med et 0.036^{mm} bredt Midtbelte, Fig. 44.

intermediate between the cruciform and the sand-glass form, but nearest to the latter; it measures 0.092^{mm} in length, and 0.080^{mm} in breadth at the extremities, and 0.036^{mm} in breadth at the middle (fig. 30).

On the posterior body of the polyps and cell, subclavates and complex stellates are the most frequent forms; fusees and clavates are more rare, and quadruplets are the rarest of all, but these last are met with, however, more frequently than is the case on the stem and the branches. The subclavates particularly resemble those of the stem; they are perhaps a little richer in foliiform spikes, whilst, also, the stelliform spikes are more prominent; they measure from 0.252—0.348^{mm} in length, and from 0.064—0.084^{mm} in breadth above (figs. 31. 32). But between these subclavates others are seen which are only sparingly supplied with small spikes; they have an almost smooth appearance, and approach in form somewhat to the fusiform; they measure 0.256^{mm} in length, and 0.048^{mm} in breadth above (fig. 33). The complex stellates have broad rays, spicate in the extremities, and between their rays they generally have a narrow bare stripe; they measure 0.156^{mm} in length, and 0.064^{mm} in breadth, the mesial stripe measuring 0.032^{mm} in breadth (fig. 34). The clavates are not so rich in foliaceous ornamentation as those of the stem, the leaves are more linguated than dentated, and are placed further apart from each other; they measure 0.140^{mm} in length, and 0.084^{mm} in breadth above (fig. 35). The quadruplets are, here, of two kinds; the one is cruciform, and is extremely beautifully adorned with leaves and stars; it measures 0.224^{mm} in length, and has a transversal arm which measures 0.180^{mm}, and which, like the longitudinal arm, is very broad (fig. 36); the other kind approaches in form to the sand-glass form, and is beset with rather small papillæ; it measures 0.092^{mm} in length, 0.064^{mm} in breadth at the extremities, and 0.028^{mm} in breadth at the middle (fig. 37).

On the anterior body, the fusees and subclavates are the most frequent forms met with; clavates and bistellates are more rare; the fusees are, partly straight, and partly more or less curved and spicate, but the spikes are, both, small and placed pretty far apart from each other; they measure from 0.192—0.224^{mm} in length, and from 0.024—0.028^{mm} in breadth (figs. 38. 39). The subclavates are either straight — which is the most usual form — or they are somewhat curved; the straight ones are closely beset with small spikes, and measure 0.260^{mm} in length, and 0.056^{mm} in breadth above (fig. 40); the curved ones are only faintly beset with small spikes, which are placed pretty far apart from each other; they measure 0.188^{mm} in length, and 0.044^{mm} in breadth above (fig. 41). The clavates have a short spicate shaft, and are, otherwise, furnished with broad foliaceous spikes which are placed pretty far apart from each other; the spaces between the leaves are, partly, bare; they measure from 0.124—0.164^{mm} in length, and from 0.064—0.072^{mm} in breadth above (figs. 42. 43). The bistellates have almost globular extremities whose 4—6 spikes form the star. The spikes

Paa Tentaklerne sees almindeligst lignende Køller og Spindler som paa Forkroppen; men desforuden træffes især til Siderne og op mod Enden mindre, mere fladtrykte, takkede Spikler, der ere fra 0.120--0.160^{mm} lange og fra 0.020—0.036^{mm} brede, Fig. 45. Paa Pinnulerne ere Spiklerne mest spindelformede og smaa.

De Spikler, som forekomme i Coenenchymet, ere for Størstedelen takkede Spindler.

Med Undtagelse af et vare alle de Exemplarer, som bleve fundne paa Expeditionen, fæstede til døde Skaller af *Astarte crenata*, Gray.

Farven.

Farven er hvid, men naar Polyperne ere fuldt udstrakte, er Zoanthodemet vandklart, spillende lidt i det Gule

Findested.

Station 338. 5 Exemplarer.

Slægtskarakter.

Stammen har faa, men udprægede Længdekanaler; dens Top er rig paa Polyper. Grenene korte, stillede i Krands omkring Stammen med nøgne Mellemrum, bærende paa de udvidede Ender Polyperne. Polypcellerne adskilte ved et bredt Coenenchym. Polyperne retraktile. Stamme, Grene, Coenenchym og Polyper spikelholdige. Svælget uden Spikler.

Artskarakter.

Zoanthodemet indtil 20^{mm} høit, gjennemsigtigt. Stammen blød, omtrent 12^{mm} i Omkreds ved Grunden, udvidende sig kølleformigt i Toppen, der er tæt besat med Polyper; dens nederste Del nøgen. Basaldelen lidt udvidet, fæstet til døde Skaller. Grenene korte, tykke, brede ved Grunden, udvidende sig mod Enderne, som hver bærer 6—8 Polyper og stillede kransformigt om Stammen med nøgne Mellemrum. Polypcellerne halvrunde, vel adskilte ved Coenenchym. Polyperne retraktile, cylindriske, 10—12^{mm} lange med 8 adskilte Længderækker Spikler, samt en udviklet Bagkrop. Opimod Tentakelranden et triangulært, nøgent Felt imellem hver 2 Tentaklers Grund, hvori 2—3 Spikler. Tentaklerne 3—4^{mm} lange. pantsrede med Spikler. Pinnulerne staa tæt

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

(the rays) terminate, partly, in a small star, and the middle part is bare. They approach, much, in form to the double-sphere, and measure 0.096^{mm} in length, and 0.068^{mm} in breadth at the extremities, and have a mesial stripe 0.036^{mm} in breadth (fig. 44).

On the tentacles, clavates and fusees similar to those of the anterior body are, most frequently, observed, but, besides these, especially to the sides and in proximity to the extremities, small, more flattened, spicate spicules are met with, which measure from 0.120—0.160^{mm} in length, and from 0.020—0.036^{mm} in breadth (fig. 45). On the pinnules, the spicules are principally fusiform, and small.

The spicules which occur in the sarcosoma are, for the greater part, spicate fusees.

With the exception of a single one, all the specimens which were obtained on the expedition were adherent to the dead shells of *Astarte crenata*, Gray.

Colour.

The colour is white, but when the polyps are fully extended the Zoanthodem is pellucid, shading a little towards yellow.

Habitat.

Station No. 338. Five specimens.

Generic characteristics.

The stem has few, but distinct, longitudinal ducts; its summit is rich in polyps. The branches short, placed in wreaths around the stem so as to leave bare intervals, and they carry the polyps on their dilated extremities. The polyp-cells are separated by a broad sarcosoma. The polyps retractile. The stem, branches, sarcosoma, and polyps contain spicules. Gullet devoid of spicules.

Specific characteristics.

The Zoanthodem measures up to 20^{mm} in height, transparent. The stem soft, measures about 12^{mm} in circumference at the base, becomes dilated in subclaviform at the summit, which is closely beset with polyps; the lowest part bare. The basal part a little dilated and adherent to dead shells. The branches short, thick, broad at the root, become dilated towards the extremities, each of which carries 6—8 polyps, and they are placed in wreaths, around the stem, so as to leave bare intervals. The polyp-cells semi-circular, well separated by sarcosoma. The polyps retractile, cylindrical, 10—12^{mm} in length, have 8 separated longitudinal series of spicules, and a dilated posterior body. Up towards the tentacular margin, a triangular

sammen, ere tykke og forsynede med Spikler. Paa Basaldelen er Spikelformen hyppigst Firlinger, Dobbeltstjerner og Spindler; paa Stammen, Valser og Køller; paa Polyperne Køller, Spindler, Klubber og i Coenenchymet Spindler.

Underfamilie Organinæ, mihi.

Organidus¹ Nordenskjöldi, n. g. et sp.

Tab. XIX, Fig. 46—70. Tab. XX, Fig. 1—44.

Zoanthodemmet indtil 20^{mm} høit. Stammen er lige tyk overalt, omtrent 25^{mm} i Omfang og dannet af en Samling Polyper, hvis lange, rørformige Celler ere sammenvoxede efter hele Længden, hvorved det Hele faar nogen Lighed med en Samling Orgelpiber, Tab. XIX, Fig. 46. Ikke alle Celler (Calyx) ere lige lange, hvorved der dannes ligesom Afsatser paa Stammen; men hvad enten de ere korte eller lange, løbe de lige ned til Basaldelen. De længste og videste Celler ere noget indknebne paa Midten, omtrent der, hvor de korte Celler ende foroven, Fig. 46, *a*, men udvide sig meget snart igjen, for senere at beholde sin tidligere Vidde.

Cellerne, der ere cylindriske, glatte og glindsende, løbe ikke ganske parallelle ved Siden af hverandre, men bugte sig tildels temmelig meget, uden dog at den ene Celle omslynger den anden. De ere i udstrakt Tilstand fuldkommen vandklare og saa gjennemsigtige, at Septula sees tydeligt i hele Længden; de kunne trække sig lidt sammen og blive da mindre klare; men naar Polyperne ere fuldt udstrakte, svulme Cellerne stærkt op, og da er hele Zoanthodemmet gjennemsigtigt; kun ved Hjælp af Loupen sees Kalkafsætningerne i Huden, hvilke ordne sig i Rækker. Cellens øverste Ende gaar over i Polypen, eller, om man vil, denne gaar over i Cellen, og der, hvor Overgangen finder Sted, er en liden Indsnøring, idet Polypkroppen her udvider sig noget; men nogen tydelig Grændse er der ikke, Fig. 46, *b*. Cellen kan derfor betragtes som Polypens Bagkrop; thi i den forlænger Mavehulheden sig lige ned til Basalen. Cellernes Antal er væsentligt afhængigt af Koloniens Størrelse. Paa de største Exemplarer er der henved 40.

¹ ὄργανον = Orgel.

bare area between the bases of each 2 tentacles, occupied by 2—3 spicules. The tentacles 3—4^{mm} in length, sheathed with spicules. The pinnules placed close to each other, thick and furnished with spicules. On the basal part, the spicular forms which are most frequent are quadruplets, bistellates, and fusees; the most frequent forms on the stem are cylinders and subclavates. On the polyps, the most frequent spicular forms are subclavates, fusees, and clavates; and in the sarcosoma fusees.

Sub-Section Organinæ, mihi.

Organidus¹ Nordenskjöldi, n. g. et sp.

Pl. XIX, figs. 46—70. Pl. XX, figs. 1—44.

The Zoanthodem measures up to 20^{mm} in height. The stem is uniform in thickness throughout, and measures about 25^{mm} in circumference; it is formed of a collection of polyps whose long tubular cells are concreted together throughout their entire length, giving to the whole structure, somewhat, the appearance of a collection of organ pipes (Pl. XIX, fig. 46). The cells (Calyx) are not all uniform in length, forming, thus, as it were, terraces upon the stem, but whether they are short or long they extend quite down (to the basal part. The longest and widest cells are somewhat constricted at the middle, at about the point where the short cells terminate above (Pl. XIX, fig. 46, *a*), but they very soon become dilated again so as to, subsequently, retain their previous width.

The cells, which are cylindrical, smooth, and shining, do not run quite parallel alongside of each other, but bulge out, sometimes, a good deal, without, however, the one cell entwining the other. In the extended state they are quite pellucid and are, then, so transparent that the septula can be distinctly observed throughout the entire length; they are capable of contracting together a little, and are, then, not quite so pellucid, but when the polyps are fully extended the cells swell strongly up and, then, the entire Zoanthodem is transparent; with the assistance of a magnifying glass, alone, can the calcareous deposits in the integument be observed; these are arranged in series. The uppermost extremity of the cell passes over into the polyp, or it may be said that the latter passes over into the cell, and at the point where the transition occurs there is a small constriction, caused by the body of the polyp becoming somewhat dilated there, but there is no distinct margin (Pl. XIX, fig. 46, *b*). The cell may, therefore,

¹ ὄργανον = Organ.

Polyperne ere med Tentaklerne 10—12^{mm} lange, retraktile, cylindriske, glatte og aldeles gjennemsigtige, saa at Svælget, Gastralfilamenterne, Septa og Generationsorganerne kunne sees; de ere temmelig udvidede, der hvor Bagkroppen gaar over i Cellen; men smalner af opimod Tentakelskiven, Tab. XIX, Fig. 47. Polypkroppen er forsynet med 8, vel adskilte Længderibber, der fortsættes over paa Cellen og ere dannede af Kalkspikler; imellem disse Ribber er en temmelig bred Fure, som er uden Kalk, Fig. 47. Opimod Tentakelskiven vige Ribberne længere fra hverandre, hvorved dannes trekantede Felter, der ere bredest mod Mundskiven, men har en spids Vinkel nedad; fra denne udgaar en Pyramide af Spikler, der indtager Feltets Midtparti, imedens den øvrige Del er nøgen, men besat med Nematocyster, Fig. 47, a. Tentaklerne ere 5—6^{mm} lange, meget brede ved Grunden, men tilspidse sig traadformigt, have paa deres aborale Side en Kjøl af Spikler, Fortsættelse af Kroppens Ribber, og ere forsynede med tætstaaende, temmeligt tynde Pinnuler, som ere spikelholdige, Fig. 47, 48. Mundskiven, der i Forhold til Kroppens bagre Del er smal, kun lidet hvælvet, har en tverspaltet Mundaabning og er overalt besat med Nematocyster, hvilket ogsaa er Tilfældet med Tentaklernes adorale Side.

Ved Grunden af enkelte Polyper, just der, hvor to saadanne støde sammen, sees yderst smaa Polyper, som ere dannede ved Udbugtning (Knopskydning) af Polypvæggen og staar saaledes i Forbindelse med Mavehulheden, Fig. 46, c; ligesaa iagttages ved Stammens Grund flere temmelig smaa Polyper med deres Celler, der synes at være skudte op af Basaldelen, Fig. 46. Naar Polypen trækker sig ind i sin Celle, krænger den øverste Del af denne sig ind, og da faar Randen et ottetandet Udseende, som Følge af de 8 Spiklerækker, der findes i Cellens Væg, — og naar Polypen er fuldkommen indtrukket, er Cellen noget forkortet, lidt rynket og frembyder da paa sin øverste, afrundede Ende en ottestraalet Stjerne, i hvis Midte sees en yderst fin, rund Aabning, Fig. 46. En enkelt Polyp kan ikke trække sig fuldkommen ind i sin Celle, uden at dennes Nabocelle forkortes lidt; men have samtlige Polyper trukket sig sammen, er hele Stammen forkortet paa Grund af Cellernes intime Sammenvoxning, hvorom vi senere skulle faa Besked.

be considered as the posterior body of the polyp, as in it the gastral cavity becomes prolonged right down to the base. The number of the cells is principally dependent on the size of the colony. In the largest specimens there are nearly 40 of them.

The polyps, with their tentacles, measure 10—12^{mm} in length; they are contractile, cylindrical, smooth, and perfectly transparent, so that the gullet, gastral filaments, septa and generative organs, may be observed; at the point where the posterior body passes over into the cell, they are pretty much dilated, but diminish in thickness, again, up towards the tentacular disk (Pl. XIX, fig. 47). The polyp-body is furnished with 8, well-separated, longitudinal ribs which are continued over upon the cell, and are formed of calcareous spicules; between these ribs there is a pretty broad groove devoid of calcium (Pl. XIX, fig. 47). In the proximity of the tentacular disk, the ribs diverge considerably from each other, causing triangular areas to be formed, which are broadest towards the oral disk and have an acute angle downwards; from that, a pyramid of spicules issues, which occupies the mesial part of the area, whilst the remaining part is bare, but beset with nematocysts (Pl. XIX, fig. 47, a). The tentacles measure 5—6^{mm} in length, and are very broad at the base but become filamentously acuminate; on their aboral side they have a carina of spicules which are a continuation of the ribs of the body, and they are furnished with closely-placed, rather thin, pinnules containing spicules (Pl. XIX, fig. 47, 48). The oral disk, which, in proportion to the posterior part of the polyp, is narrow, is only slightly arcuate, and it has a transversally-fissured oral aperture; it is everywhere beset with nematocysts, which is, also, the case with the adoral side of the tentacles.

At the base of some polyps, just at the point where two of them join each other, extremely minute polyps are seen, formed by budding of the polyp wall and therefore in connection with the gastral cavity (Pl. XIX, fig. 46, c). There is observed, also, at the base of the stem, several rather small polyps with their cells, which appear to have sprouted up from the basal part (Pl. XIX, fig. 46). When the polyp retracts into its cell, the uppermost part of the cell curves inwards, and the margin then acquires an octodentate appearance, owing to the 8 spicular series which are found in the wall of the cell; and when the polyp is completely retracted, the cell is somewhat shortened and becomes a little wrinkled, and then it presents an eight-rayed star upon its uppermost rounded extremity, in whose middle an extremely minute circular aperture (Pl. XIX, fig. 46) is observed. A single polyp can not retract itself completely, into its cell without the neighbouring cell, also, becoming a little shortened, but if all the polyps have contracted themselves together, the entire stem then becomes shortened, owing to the intimate concretion of the cells, and of this we will subsequently speak.

Anatomisk-histologisk Undersøgelse.

Stammen, det vil sige de sammenvoxede Polypceller, er udvendigt beklædt med et Epithel, bestaaende af 2—3 Lag polyædriske Celler, der ere 0.006^{mm} og have en lidt excentrisk Kjerne med Kjernelegeme, omgivet af en temmelig sparsom Protoplasmamasse, Tab. XX, Fig. 1, *a*. Imellem disse Ectodermceller sees hist og her pæreformede, encellede Slimkjertler, lig dem, der tidligere ere beskrevne, samt en Mængde Spikler, Tab. XX, Fig. 1, *a*. Dette gjælder dog kun de ydre Vægge af Polypcellerne. De indre ere sammenvoxede og uden Ectoderm, Tab. XIX, Fig. 49. Sammenvoxningen er saa intim mellem 2 og 2 Cellers Binde-vævslag, Fig. 49, *a*, at dette ikke er tykkere, men endog noget tyndere end den ydre Vægs Bindevæv, Fig. 49, *b*, hvori der iagttages Bindevævslegemer med Udlobere og fine Ernæringskanaler, forsynede med Epithel; Bindevævet er hyalint. Der, hvor 5—6 Celler støde sammen, er gjerne et noget bredere, hyalint Bindevæv, hvori sees 2 større, runde Ernæringskanaler, beklædt med Epithel, hvilke gaa igjennem hele Stammen og synes at danne det egentlige Coenenchym eller Forstøtningsmateriale for Kolonien, Fig. 49, *c*. Betragter man hele Zoanthodemet som bestaaende af en Stamme, hvorfra Polyperne udspringe, saa svare de sammenvoxede Vægge af Polypcellerne til Skillevæggene, der danne Hovedkanalerne hos Alcyoniderne i Almindelighed; men som man ved, er der altid hos disse et større eller mindre udbredt Coenenchym imellem Kanalerne, imedens her intet saadant findes. Det er ogsaa denne store Mangel paa Coenenchym som gjør, at hele Zoanthodemet, naar Polyperne ere fuldt udstrakte, er ganske gjen-nemsigtigt og meget bøjeligt.

Paa den indre Flade af Polypcellens hyaline Binde-væv sees i hele Længden 8 listeformige Fremspring, som ere de fra Polypkroppen udgaaende Septula, der strække sig lige til Cellens (den forlængede Mavehulheds) Bund, Fig. 49, *d*. Til 2 af disse Septulers Rand ere de dorsale Gastralfilamenter fæstede. Septula ere forsynede med Muskelfibre, som ere saaledes ordnede, at de paa den ene Side danne Længde- og paa den anden mere paaskraas gaaende Muskler; begge Muskellag, ligesom hele den indvendige Flade af Polypcellerne, er beklædt med et Endothel, der dannes af et Lag meget smaa, runde, temmelig klare Celler med Kjerne og Kjernelegeme. Paa enkelte Tver-snit syntes det, som om hele den indre Flade havde Muskelfibre, der vare meget spredte, men som paa Septula samlede sig til Længde- og Skraamusklers, og det tør vel hælde, at dette Forhold er det rette. Enhver Celle strækker sig ned til Basaldelen, der danner dens Bund, og imedens den øverste Del er ganske afsluttet, saa er

Anatomo-histological Examination.

The stem, that is to say the concreted polyp cells, is externally clad with an epithelium, consisting of 2—3 layers of polyhedral cells measuring 0.006^{mm}, and containing a somewhat eccentric nucleus with nucleolus, surrounded by a pretty thin protoplasmic mass. Between these ectoderm cells there are, here and there, seen, pyriform, unicellular, mucous glands like those which have been previously described, and also a multitude of spicules (Pl. XX, fig. 1, *a*). That refers, however, only to the external walls of the polyp-cells: the inner walls are concreted together and have no ectoderm (Pl. XIX, fig. 49). The concretion is so intimate between the connective-tissue layer of double pairs of cells (that is 2 and 2 cells) (Pl. XIX, fig. 49, *a*), that the layer is no thicker, but even somewhat thinner, than the connective-tissue of the outer wall (Pl. XIX, fig. 49, *b*), in which there are observed, connective-tissue corpuscles with prolongations, and minute nutritory ducts furnished with epithelium. The connective-tissue is hyaline. At the point where 5—6 cells join together, there is, sometimes, a somewhat broader hyaline connective-tissue, in which 2, large, round, nutritory ducts are seen, clad with epithelium, traversing the entire stem and appearing to form the true sarcosoma or structural material of the colony (Pl. XIX, fig. 49, *c*). If we consider the entire Zoanthodem as consisting of a stem from which the polyps spring, the concreted walls of the polyp-cells will, then, correspond to the divisional walls which form the chief ducts of the Alcyonoids in general, but, as we know, there is always, in these, a more or less extensive sarcosoma between the ducts, whilst there is none found here. It is, consequently, this great deficiency in sarcosoma which causes the entire Zoanthodem, when the polyps are fully extended, to be quite transparent and very flexible.

On the inner surface of the hyaline connective-tissue of the polyp-cell, 8 fillet-formed prominences are seen throughout the entire length; these are the septula issuing from the polyp-body, and they extend right down to the bottom of the cell (that of the prolonged gastral cavity) (Pl. XIX, fig. 49, *d*). To the margins of 2 of these septula, the dorsal gastral filaments are attached. The septula are furnished with muscular fibres, so arranged, that on the one side they form longitudinal, and on the other side more-diagonally placed muscles. Both the muscular layers, as well as, also, the entire inner surface of the polyp-cells, are clad with an endothelium, formed of a layer of very small, round, rather pellucid, cells containing a nucleus and nucleolus. In a few sections it appeared as if the entire inner surface had muscular fibres which were much scattered, but which, upon the septula, collected together into longitudinal and diagonal muscles, and it may, perhaps, be that that is the true relation. Each

der i Cellens nedre Del fine Spalter i de sammenvoxede Vægge, hvorved samtlige Celler kommunikere med hverandre.

Polypkroppen er udvendig beklædt med et Epithel, bestaaende af to Lag polyædriske Celler, fuldkommen lig dem, som findes paa Polypcellerne, Tab. XX, Fig. 1, *a*, og her findes i det indre Lag af Ectodermet pæreførmige, encellede Slimkjertler. Indenfor Ectodermet er et tyndt, hyalint Bindevæv, hvori sees yderst fine Ernæringskanaler, udfyldte med Epithel, samt spredte Bindevævslegemer med Udløbere. Imellem Ectodermcellernes indre Lag er en rig Spikelafsætning, ligesom inde i selve Bindevævet sees hist og her Spikler, men altid omgivne af Ectodermceller, Tab. XX, Fig. 1, *b*. Fra den indre Væg af Bindevævet udgaa de 8 Septa, der dannes af Bindevævsforlængelser, og der, hvor de tage sit Udspring, ligesom der, hvor de fæste sig paa Svælgrøret, er Bindevævet triangulært udvidet, Fig. 1, *c*. 2, *a*. Septa ere paa den ene Side forsynede med næsten transverselle Muskelfibre, Fig. 2, *b*, imedens den modsatte Side har longitudinelle Muskler, Fig. 2, *c*; begge gaa ikke alene over paa Svælget, men ogsaa paa omtrent Halvdelen af Mavehulhedens indre Væg (Kammervæg), Fig. 1, *e*. 2, *d*. Muskellagene, Svælget og hele Kammer-væggen har et Epithelovertræk, Endothel, bestaaende af et Lag temmelig smaa, runde Celler med Kjerne og Kjernelegeme, Fig. 1, *d*. 2, *e*. Forholdet er her omtrent det samme, som omtales under Polypcellernes Organisation. Septa ere forholdsvis meget lange, hvorved Kamrene blive usædvanligt store, Tab. XX, Fig. 2 *A*, *a*.

Svælgrøret er temmelig langt, næsten cylindrisk, forsynet med 6 enkle Længderækker Spikler, 3 paa hver Side, og har paa sin ydre Flade, foruden Endothelet, et hyalint Bindevævslag, der er meget bredt paa de Steder, hvor Septa støder til, Tab. XX, Fig. 2, *f*; paa Svælgets indre Flade iagttages langs Bugsiden den brede, ovale Svælgenrede, der har en Indbugtning just paa det Sted, hvor Dorsalsiden tager sin Begyndelse, Tab. XX, Fig. 2, *g*. 2 *A*, *b*. Svælget kan her snøre sig saaledes sammen, at Svælgrenden danner en Hulhed for sig selv, som sandsynligvis bliver uberørt af de Excrementer, der udføres af Mavehulheden, og som passerer igjennem den anden større Hulhed langs Rygsiden. Paa flere Exemplarer viste denne Indsnøring af Svælget sig meget tydeligt paa Tversnit, hvorved det ligesom deltes i 2 cylindriske Hulheder. Svælgrenden er beklædt med et Epithel, bestaaende af et Lag lange Cylinderceller, paa hvis Ende er et langt, svingende Haar. (Pidsk, Geissel), Tab. XX, Fig. 2, *h*. 2 *A*, *c*; den øvrige Del af Svælghulheden er ligeledes beklædt med Epithel, men her ere Cellerne kortere, ligesom Cilierne ere baade finere og kortere, Fig. 2, *i*. Imellem disse Epithelceller

cell extends down to the basal part, which serves as the cellular bottom, and, whilst the uppermost part is completely closed, there are, in the lower part of the cell, minute fissures in the concreted walls, by means of which all the cells communicate with each other.

The polyp-body is clad, externally, with an epithelium, consisting of two layers of polyhedral cells exactly resembling those found on the polyp-cells (Pl. XX, fig. 1, *a*) and, here, in the inner layer of the ectoderm, piriform, unicellular mucous glands are found. Inside of the ectoderm, there is a thin hyaline connective-tissue in which extremely minute nutritory ducts filled with epithelium are seen, and, also, scattered connective-tissue corpuscles with prolongations. Between the inner layers of the ectoderm-cells there is an abundant spicular deposit, whilst, also, in the connective-tissue itself spicules are, here and there, seen, but always surrounded by ectoderm-cells (Pl. XX, fig. 1, *b*). From the inner wall of the connective-tissue 8 septa issue, which are formed of connective-tissue prolongations, and at the point where they issue, and also at the point where they attach themselves to the gullet-tube, the connective-tissue is triangularly dilated (Pl. XX, figs. 1, *c*. 2, *a*). The septa are furnished, on the one side, with, nearly transversal, muscular fibres (Pl. XX, fig. 2, *b*) whilst the opposite side has longitudinal muscles (Pl. XX, fig. 2, *c*); both pass, not only over on to the gullet, but, also, on to about a half part of the inner wall (chamber wall) of the gastral cavity (Pl. XX, figs. 1, *e*. 2, *d*). The muscular layers, the gullet, and the entire chamber-wall have an epithelial covering (endothelium), consisting of a layer of, pretty minute, round, cells, each containing a nucleus and nucleolus (Pl. XX, figs. 1, *d*. 2, *e*). The relations, here, are much the same as those spoken of in reference to the structure of the polyp-cells. The septa are, relatively, very long, causing the chambers to be unusually large (Pl. XX, fig. 2 *A*, *a*).

The gullet-tube is rather long, almost cylindrical, and it is furnished with 6, single, longitudinal series of spicules, 3 on each side; on the exterior surface, it has, besides the endothelium, a layer of hyaline connective-tissue, which is very broad in the situations where the septula join it (Pl. XX, figs. 2, *f*). On the inner surface of the gullet, along its ventral side, the broad, oval, gullet-passage is observed; it has a concavity, just at the point where the dorsal side commences (Pl. XX, figs. 2, *g*. 2 *A*, *b*). The gullet is, here, capable of so constricting itself, that the gullet-passage forms a cavity for itself, which, probably, is not affected by the excremента expelled from the gastral cavity, and which pass through the other large cavity along the dorsal side. In several specimens, this constriction of the gullet showed itself very distinctly in the section, by which it was, as it were, divided into 2 cylindrical cavities. The gullet passage is clad with an epithelium, consisting of a layer of long cylinder cells on whose extremities there is a long waving filament (flagellum-geissel) (Pl. XX, fig. 2, *h*, 2 *A*, *c*); the remaining part of the gullet cavity is, likewise, clad with epithelium but, here, the cells are shorter,

sees temmelig regelmæssigt anordnede, pæreformige, encellede Slimkjertler, som med deres smale Udførselsgang munder ud i Svælghulheden, Fig. 2, *k*. I Svælgrenden saaes yderst sjældent Slimkjertler hos de mange Arter, jeg har undersøgt, men der fandtes dog enkelte.

Paa den næsten papirtynde Basaldel ligge Spiklerne tæt paa hverandre og optræde under Form af sammensatte Stjerner og Dobbeltstjerner, hvilke ere de almindeligste, af Spindler og Klubber, der ere sjældnere, samt af Firlinger, som ere yderst sjældne. De sammensatte Stjerner have takkede Straaleender; stundom danner en Straale en liden Stjerne for sig selv; de ere fra 0.132—0.140^{mm} lange og fra 0.056—0.076^{mm} brede, Tab. XIX, Fig. 50. 51. Dobbeltstjernerne ere smaa, have et nøgent Midtbelte, ere fra 0.080—0.088^{mm} lange og fra 0.040—0.060^{mm} brede i Enderne, med et Midtbelte fra 0.020—0.032^{mm} bredt, Fig. 52. 53. 54. Spindlerne ere forskellige, nogle smaa og kun lidet takkede, 0.080^{mm} lange, 0.044^{mm} brede, Fig. 55, andre ere stærkt takkede og Takkerne brede, næsten som Blade; de ere 0.160^{mm} lange og 0.064^{mm} brede, Fig. 56. Klubberne have ligeledes bladformede, tandede Takker, ere fra 0.080—0.148^{mm} lange og fra 0.056—0.076^{mm} brede foroven, Fig. 57. 58. Firlingerne ere smaa, nærme sig Korsformen og mere eller mindre besatte med Knuder; de ere fra 0.056—0.084^{mm} lange og fra 0.044—0.072^{mm} brede, Fig. 59. 60. 61.

Paa Polypcellerne ligge Spiklerne mere spredte i Rækker; her er det især de sammensatte Stjerner og Dobbeltstjernerne, der ere de almindeligste. Spindler og Firlinger ere ikke sjældne. Af de sammensatte Stjerner ere enkelte lidt krumme, men alle have meget brede, bladformede Straaler med indskaarne Rande; de ere fra 0.116—0.184^{mm} lange og fra 0.060—0.092^{mm} brede, Fig. 62. 63. Dobbeltstjernerne ere særdeles smukt ornamenterede; hver Straale ender i en liden Stjerne, ligesom der paa Midten, som ellers pleier at være nøgen, sees smaa Stjerner; de ere fra 0.060—0.140^{mm} lange, og fra 0.028—0.080^{mm} brede i Enderne; Midtpartiet er fra 0.028—0.036^{mm} bredt, Fig. 64. 65. Spindlerne ere ogsaa temmelig hyppige, men dog ikke som de foregaaende, og takkede overalt. Takkerne have Bladform og ere tandede i Randen; enkelte Spindler ere lidt tykkere i den ene Ende og nærme sig Køllefornen; de ere fra 0.056—0.192^{mm} lange og fra 0.024—0.060^{mm} brede, Fig. 66. 67. 68. 69. Firlingerne ere de sjældneste; de have Roset- eller Stjerneform, ere smukt prydede med Blade og Takker og 0.152^{mm} lange, 0.112^{mm} brede, Fig. 70.

whilst, also, the ciliae are both slenderer and shorter (Pl. XX, fig. 2, *i*). Between those epithelial cells there are seen, pretty regularly arranged, piriform, unicellular, mucous glands, which open by their narrow excretory duct into the gullet cavity (Pl. XX, Fig. 2, *k*). In the gullet-passage of the many species which I have examined, mucous glands were extremely rarely observed, but here, however, a few were found.

On the paper-like thin basal part, the spicules are placed closely upon each other, and appear in the forms of complex stellates and bistellates, which are the most frequent; of fusees and clavates, which are less frequent; and of quadruplets, which are extremely rare. The complex stellates have spiked radial extremities, and sometimes a ray forms a small star for itself; they measure from 0.132—0.140^{mm} in length, and from 0.056—0.076^{mm} in breadth (Pl. XIX, figs. 50—51). The bistellates are small, and have a bare mesial stripe; they measure from 0.080—0.088^{mm} in length, and from 0.040—0.060^{mm} in breadth at the extremities, and have a mesial stripe measuring from 0.020—0.032^{mm} in breadth (Pl. XIX, figs. 52. 53. 54). The fusees are variable, a few being small and only little spicate; they measure 0.080^{mm} in length, and 0.044^{mm} in breadth (Pl. XIX, figs. 55); others are strongly spicate, the spikes being broad, almost like leaves; they measure 0.160^{mm} in length, and 0.064^{mm} in breadth (Pl. XIX, fig. 56). The clavates likewise, have, foliiform, dentated spikes; they measure from 0.080—0.148^{mm} in length, and from 0.056—0.076^{mm} in breadth above (Pl. XIX, fig. 57. 58). The quadruplets are small, and approach in form to the cruciforms; they are, more or less beset with nodules, and measure from 0.056—0.084^{mm} in length, and from 0.044—0.072^{mm} in breadth (Pl. XIX, figs. 59. 60. 61).

In the polyp-cells, the spicules are placed more spread in series, and here, it is especially the complex stellates and bistellates that are the most frequent forms, although fusees and quadruplets are not rare. Of the complex stellates, a few are a little curved but they all have very broad foliiform rays with indented margins; they measure from 0.116—0.184^{mm} in length, and from 0.060—0.092^{mm} in breadth (Pl. XIX, figs. 62. 63). The bistellates are particularly beautifully ornamented; each ray terminates in a small star, whilst, also, in the middle, which otherwise is usually bare, small stars are observed; these bistellates measure from 0.060—0.140^{mm} in length, and from 0.028—0.080^{mm} in breadth at the extremities, and at the middle part from 0.028—0.036^{mm} in breadth (Pl. XIX, figs. 64. 65). The fusees are, also, pretty frequently met with, but not so often, however, as the preceding forms; they are spicate all over, the spikes being foliiform and indented in the margins; a few fusees are a little thicker at the one extremity than at the other, and approach in form to the subclaviform; they measure from 0.056—0.192^{mm} in length, and from 0.024—0.060^{mm} in breadth (Pl. XIX figs. 66. 67. 68. 69). The quadruplets are the rarest; they are rosetiform or stelliform, and are richly adorned with

Paa Polypens Bagkrop træffes hyppigst sammensatte Stjerner, mere eller mindre udviklede Dobbeltstjerner, samt Spindler og Valser, sjeldnere Klubber og yderst sjældent Firlinger. De sammensatte Stjerner ere temmelig uregelmæssige og tildels forskellige fra dem paa Polypcellen; Straalerne ere ogsaa her brede og tandede; de ere 0.168^{mm} lange, 0.052^{mm} brede, Tab. XX, Fig. 3. Dobbeltstjerne nærme sig tildels de sammensatte Stjerner, men adskille sig dog ved det nøgne Midtparti; Straalerne ere omtrent som paa de sammensatte Stjerner, og selv paa de mindre udviklede gjentager dette sig; de ere fra 0.088—0.100^{mm} lange og fra 0.040—0.052^{mm} brede, med et 0.028^{mm} bredt Midtbelte, Fig. 4. 5. 6. Spindlerne ere dels krumme, dels lige, dels med tilspidsede, dels med afstumpede Ender og stærkt takkede; Takkerne ere brede og tandede; de ere fra 0.076—0.320^{mm} lange og fra 0.028—0.076^{mm} brede, Fig. 7. 8. 9. 10. 11. 12. 13. Valserne have tversafskaarne, takkede Ender, overalt besatte med bladformede, tandede Takker og ere 0.164^{mm} lange og 0.052^{mm} brede, Fig. 14. Klubberne ere rige paa bladformede, tandede Takker og have et yderst kort Skaft; de ere fra 0.080—0.172^{mm} lange og fra 0.036—0.080^{mm} brede foroven, Fig. 15. 16. De faa Firlinger, som findes, have Korsformen, ere smaa, men overalt forsynede med bladformede Papiller; de have en Længdestok fra 0.056—0.080^{mm} og en Tverstok, der er 0.068^{mm}, Fig. 17 18.

Paa Polypens Forkrop er Spindelformen den dominerende; Dobbeltstjerner og Valser ere sjeldnere, men hyppigere end disse er dog Køllerne, sjældnest ere Firlinger. Spindlerne ere snart krumme, snart lige, tæt besatte med bladformede, tandede Takker, undertiden spaltede i den ene Ende, der da altid er noget tykkere; de ere fra 0.108—0.396^{mm} lange og fra 0.028—0.056^{mm} brede, Fig. 19. 20. 21. 22. 23. Dobbeltstjerne have brede, takkede Straaler og et nøgent Midtbelte; de ere 0.092^{mm} lange, 0.044^{mm} brede med et 0.020^{mm} bredt Midtbelte, Fig. 24. Køllerne have som oftest en tversafskaaren Ende og nærme sig derved Tapformen; de ere stundom lidt krummede og mere eller mindre tæt besatte med bladformede, tandede Takker; de ere fra 0.104—0.244^{mm} lange og fra 0.028—0.060^{mm} brede foroven, Fig. 25. 26. Valserne ere her noget krummede, forresten lig dem paa Bagkroppen, men noget mindre; de ere 0.112^{mm} lange, 0.044^{mm} brede, Fig. 27. Firlingerne ere korsformede og forskellige baade indbyrdes og fra de tidligere omtalte; den ene Form er tæt besat med Papiller og har en Tverstok, hvoraf den ene Arm er liden og tilspidset, den anden bred og tversafskaaren for Enden; Længdestokken er 0.204^{mm}, Tverstokken 0.128^{mm}, Fig. 28; den anden Form er noget mere regelmæssig; men ogsaa her er Tverstokken paa den ene Arm bredere end paa den anden; hele Korset er prydet med tætstaaende, blad-

leaves and spikes; they measure 0.152^{mm} in length, and 0.112^{mm} in breadth (Pl. XIX. fig. 70).

On the posterior body of the polyp, complex stellates are most frequently met with, and, also, more or less developed bistellates, as well as fusees and cylinders; more rarely clavates; and quadruplets extremely rarely. The complex stellates are pretty irregular, and are, to a certain extent, different from those of the polyp-cell; the rays are, here, broad and dentated; these complex stellates measure 0.168^{mm} in length, and 0.052^{mm} in breadth (Pl. XX, fig. 3). The bistellates approach in form, in a measure, to the complex stellates, but are distinguished however by their bare middle part; the rays are nearly similar to those of the complex stellates; even on the imperfectly developed ones this is, also, the case; they measure from 0.088—0.100^{mm} in length, and from 0.040—0.052^{mm} in breadth, and have a middle stripe measuring 0.028^{mm} in breadth (Pl. XX, figs. 4. 5. 6). The fusees are, sometimes curved, sometimes straight, and sometimes they have acuminate, sometimes blunt extremities; they are strongly spicate, the spikes being broad and dentated; they measure from 0.076—0.320^{mm} in length, and from 0.028—0.076^{mm} in breadth (Pl. XX, figs. 7. 8. 9. 10. 11. 12. 13). The cylinders have truncate, spicate, extremities beset, everywhere, with foliiform, dentated, spikes; they measure 0.164^{mm} in length, and 0.052^{mm} in breadth (Pl. XX, fig. 14). The clavates are rich in foliiform, dentated, spikes, and have an extremely short shaft; they measure from 0.080—0.172^{mm} in length, and from 0.036—0.080^{mm} in breadth above (Pl. XX, figs. 15. 16). The few quadruplets that are found have the cruciform, but are small, and furnished, everywhere, with foliiform papillæ; they have a longitudinal arm measuring from 0.056—0.080^{mm}, and a transversal arm measuring 0.068^{mm} (Pl. XX, figs. 17. 18).

On the anterior body of the polyps, the fusiform is the most predominant form, bistellates and cylinders are rarer, subclavates are more frequent than them, but quadruplets are more rare. The fusees are, sometimes curved, sometimes straight, and are closely beset with foliiform, dentated, spikes occasionally fissured in the one extremity, which, then, is always somewhat thicker; they measure from 0.108—0.396^{mm} in length, and from 0.028—0.056^{mm} in breadth (Pl. XX, figs. 19. 20. 21. 22. 23). The bistellates have broad spicate rays and a bare mesial stripe; they measure 0.092^{mm} in length, 0.044^{mm} in breadth, and have a middle stripe 0.020^{mm} in breadth (Pl. XX, fig. 24). The subclavates have, most frequently, a truncated extremity, and approach somewhat, from that cause, to the coniform; they are sometimes a little curved, and are, more or less closely beset with foliiform, dentated, spikes; they measure from 0.104—0.244^{mm} in length, and from 0.028—0.060^{mm} in breadth above (Pl. XX, figs. 25. 26). The cylinders are, here, somewhat curved, but they are, otherwise, like those on the posterior body, only somewhat smaller; they measure 0.112^{mm} in length, and 0.044^{mm} in breadth (Pl. XX, fig. 27). The quadruplets are cruciform, and differ, both, amongst themselves, and from those pre-

formede, tandede Takker; Længdestokken er 0.168^{mm} og Tverstokken 0.100^{mm}, Fig. 29.

Tentaklerne ere vel bepantsrede med Spikler, og her er Spindelformen den hyppigste; men imellem Spindlerne sees baade Køller, Klubber og enkelte Firlinger. Spindlerne ere stærkt takkede og ofte forsynede med lange Takker i en eller begge Ender, hvorved de faa et grenet Udseende; de ere fra 0.196—0.216^{mm} lange og fra 0.028—0.040^{mm} brede, Fig. 30. 31. 32. Køllerne ere som Spindlerne vel forsynede med Takker, der her ere bredere og mere tandede, forresten gaa Spindlerne og Køllerne meget over i hverandre. Køllerne ere fra 0.176—0.188^{mm} lange og fra 0.036—0.040^{mm} brede foroven, Fig. 33. 34. Firlingerne ere korsformede, meget smaa, næsten glatte; Længdestokken er 0.044^{mm}, Tverstokken 0.036^{mm}. Fig. 35. Paa Pinnulerne ere Spiklerne meget mindre; de ere dels tynde, sparsomt takkede Spindler, fra 0.084—0.116^{mm} lange og fra 0.016—0.020^{mm} brede, Fig. 36. 37; dels smaa, takkede, fladtrykte Klubber fra 0.080—0.116^{mm} lange og fra 0.036—0.040^{mm} brede foroven, Fig. 38. 39.

Paa Svælget er 6 enkle Spikelrækker, 3 paa hver Side med et bredt, spikelfrit Mellemrum, der danner Ryg- og Bugpartiet, Fig. 40. Spiklerne ere temmelig flade, have mest Spindelformen, ere mere eller mindre takkede og stundom spaltede i den ene Ende; de ere fra 0.056—0.188^{mm} lange og fra 0.012—0.044^{mm} brede, Fig. 41. 42. 43. 44.

Farven.

Hele Zoanthodemet er hvidt og fuldstændigt vandklart.

Findested.

Station 363. Nogle Exemplarer, siddende paa Rørene af *Onuphis conchylega*, hvori Dyret levede, og i Regelen paa den Del af Røret, hvor Analenden vendte hen, uden at Basaldelen dækkede for Rørets Aabning. Ved at observere Polypkolonien i et Glaskar viste det sig, at efter nogen Tids Forløb begyndte Anneliden at krybe et Stykke

viøst spoken of; the one form is closely beset with papillæ, and has a transversal arm of which the one half is small and acuminate and the other broad and truncate at the extremity. The longitudinal arm measures 0.204^{mm}, and the transversal arm 0.128^{mm} (Pl. XX, fig. 28). The other form is somewhat more regular but, here, also, the transversal arm has its one half broader than the other half. The entire cross is adorned with closely placed, foliform, dentated spikes. The longitudinal arm measures 0.168^{mm} and the transversal arm 0.100^{mm} (Pl. XX, fig. 29).

The tentacles are well sheathed with spicules and, here, the fusiform is the most frequent spicular form, but between the fusees, both subclavates and clavates are seen, and also a few quadruplets. The fusees are strongly spicate and, often, are furnished with long spikes in one or both of the extremities, which imparts to them a ramous appearance; they measure from 0.196—0.216^{mm} in length, and from 0.028—0.040^{mm} in breadth (Pl. XX, figs. 30. 31. 32). The subclavates are, like the fusees, well supplied with spikes which are, here, broader and more dentated; the fusees and subclavates pass, otherwise, very much into each other. The subclavates measure from 0.176—0.188^{mm} in length, and from 0.036—0.040^{mm} in breadth above (Pl. XX, figs. 33. 34). The quadruplets are cruciform, very small, and almost smooth; the longitudinal arm measures 0.044^{mm}, and the transversal arm 0.036^{mm} (Pl. XX, fig. 35). On the pinnules the spicules are much smaller, they are, partly, thin, sparingly-spicate, fusees, measuring from 0.084—0.116^{mm} in length, and from 0.016—0.020^{mm} in breadth (Pl. XX, figs. 36. 37) and partly, small, spicate, flattened clavates measuring from 0.080—0.116^{mm} in length, and from 0.036—0.040^{mm} in breadth above (Pl. XX, figs. 38. 39).

On the gullet, there are 6 single spicular series, 3 on each side, with a broad intermediate space devoid of spicules, which forms the dorsal and ventral part (Pl. XX, fig. 40). The spicules are pretty flat and, generally, are of fusiform; they are more or less spicate, and are occasionally fissured in the one extremity; they measure from 0.056—0.188^{mm} in length, and from 0.012—0.044^{mm} in breadth (Pl. XX, figs. 41. 42. 43. 44).

Colour.

The entire Zoanthodem is white and completely pellucid.

Habitat.

Station No. 363. A few specimens seated on the tubes of *Onuphis conchylega*, in which the animal lived, and, in general, on that part of the tube where the anal extremity pointed, without the aperture of the tube being however obstructed by the basal part. On observing the polyp-colony in a glass vessel, it appeared, that on the

ud af sit Rør, formodentlig for at søge Føde, og da maatte Alcyoniden spadsere med, alt eftersom Røret blev draget henover Karrets Bund, uden at den paa nogen Maade syntes at generes deraf; thi Polyperne vedbleve at være fuldt udstrakte. Det falder ellers ikke i denne Dyreforms Lod at kunne bevæge sig fra Sted til Sted; men *Organidus Nordenskjöldi* synes at høre til de faa Lykkelige.

Af den givne Beskrivelse viser det sig, at *Organidus Nordenskjöldi* ikke alene maa danne en ny Slægt, men at den ikke godt kan henføres til nogen af de Underfamilier, hvoraf den store Alcyonidefamilie bestaar. Den synes at nærme sig noget Underfamilien *Tubiporinæ* ved de lange, i Knipper sammenvoxede Polypceller, men den adskiller sig næsten i alle andre Henseender fra den, saa dertil kan den ikke henføres, men maa grunde en ny Underfamilie, *Organinæ*.

Underfamilie *Organinæ*.

Zoanthodemet fattigt paa Coenenchym. Polypcellerne lange, sammenvoxede til en Stamme.

Slægtskarakter.

Zoanthodemets Stamme dannes af de sammenvoxede Polypceller. Disse ere lange, cylindriske, bløde, kalkholdige, havende Basaldelen til Bund. Polyperne retraktile; baade Polypkrop og Tentakler vel forsynede med Spikler. Svælget kalkholdigt. Kjønnene adskilte.

Artskarakter.

Zoanthodemet indtil 20^{mm} høit. Stammen lige tyk overalt, omtrent 25^{mm} i Omfang. Basaldelen tynd, membranagtig, men kun lidet udvidet. Stammen indkneben paa Midten. Polypcellerne, sammenvoxede ved deres indre Væg i hele deres Længde, ere meget lange, gjennemsigtige, cylindriske, bløde og forsynede med Spikler, der ordne sig i Rækker. En stor Del af Polypcellerne indtage Stammens hele Længde; andre naa kun halvt op paa Stammen, hvorved denne faar Udseende af at have Afsatser. Polyperne med Tentaklerne 10—12^{mm} lange, kontraktile, cylindriske, men noget udvidede, hvor de gaa over i Celler, glatte og fuldstændigt gjennemsigtige. Polypkroppen forsynet med 8 adskilte Længderibber, dannede af Kalkspikler; imellem Ribberne en bred, nøgen Fure, der opimod Tentakelskiven udvides til trekantede Felter, hvis Midtparti indtages af en Pyramide af Spikler. De nøgne Partier, Mundskiven og Tentaklernes adorale Side, rige paa Nematocyster. Tentaklernes aborale Side og Pinnulerne rige paa Spikler. Ved

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

expiry of some time, the annelid commenced to creep a little distance out of its tube, probably in search of nourishment and, then, the alcyonoid was compelled to accompany it accordingly as the tube was drawn along the bottom of the glass vessel without it appearing to be in any way inconvenienced thereby as the polyps continued to be fully extended. It does not, generally, pertain to the lot in life of this animal species to be capable of migrating from place to place, but *Organidus Nordenskjöldi* appears to belong to the few fortunate ones.

From the description given, it is evident that not only must *Organidus Nordenskjöldi* form a new genus, but that it cannot well be assigned to any of the sub-sections of which the large family of Alcyonoids consists. It appears to be related, somewhat, to the sub-section *Tubiporinæ*, from its long, in bunches, concreted polyp-cells, but it distinguishes itself in almost all other respects from that sub-section so that it cannot be assigned to it but must serve as the type of a new sub-section, *Organinæ*.

The Sub-section *Organinæ*.

The Zoanthodem poor in sarcosoma. The polyp-cells long, concreted together into a stem.

Generic characteristics.

The stem of the Zoanthodem is formed of the concreted polyp-cells. These are long, cylindrical, soft, calcareous, and the basal part of the stem serves as their bottom. The polyps retractile; both, polyp-body and tentacles well supplied with spicules. The gullet calcareous. The sexes separated.

Specific characteristics.

The Zoanthodem measures up to 20^{mm} in height. The stem is uniform in thickness throughout, and measures about 25^{mm} in circumference. The basal part, thin, membranaceous, and only slightly dilated. The stem constricted at the middle. The polyp-cells concreted together along the entire length of their inner wall; are very long, transparent, cylindrical, soft, and furnished with spicules arranged in series. A large number of the polyp-cells occupy the whole length of the stem; others extend only half way up the stem imparting to it thus, the appearance of being terraced. The polyps with their tentacles measure 10—12^{mm} in length, contractile, cylindrical, but somewhat dilated at the point where they pass over into the cell, smooth and quite transparent. The polyp-body furnished with 8 separated longitudinal ribs formed of calcareous spicules; between the ribs, a broad bare groove which in proximity of the tentacular disk becomes dilated, forming triangular areas whose middle portion is occupied by a pyramid of spicules.

Grunden af to Polyper hyppig en liden Polyp, dannet ved Knopkydning. Spiklerne paa Basaldelen ere almindeligst sammensatte Stjerner og Dobbeltstjerner, sjeldnere takkede Spindler; disse blive hyppigere paa Stammen (Polypcellerne) og endnu hyppigere paa Polypkroppen, især dennes forreste Del, hvor ogsaa særegne, korsformede Firlinger træffes, der dog ere temmelig sjeldne. Hele Zoanthodemmet, naar det er fuldt udstrakt, aldeles vandklart og egentlig uden Farve; naar Polyperne trække sig ind, og Cellerne forkortes, er Farven hvid. Svælget har 6 Spikelrækker.

Underfamilie Cornularinæ.

Clavularia frigida, n. sp.

Tab. XXII, Fig. 1—35.

Zoanthodemmet uden Stamme. Basaldelen, der er tynd, halvgjennemsigtig, udbreder sig baandformigt over de Gjenstande, hvortil den er fæstet, Fig. 1, *a*. Fra Basaldelen reise sig isolerede Polyper med deres Celler med større eller mindre Mellemrum. Cellerne ere 3—4^{mm} lange, noget udvidede ved deres Grund, forsynede med 8 temmelig stærke Ribber, dannede af Spikler, samt imellem Ribberne dybe Furer, som ligeledes ere spikelholdige, Fig. 1, 2, *a*. Hvor Cellen gaar over i Polypkroppen, smalner den lidt af, Ribberne blive mindre fremtrædende, og der sees en afrundet Rand, Fig. 2, *b*, der betegner Overgangen, og som især bliver tydelig, naar Polypen er begyndt at trække sig lidt sammen.

Polypkroppen er 3^{mm} lang; den bagerste Del er smal, cylindrisk, rig paa Spikler, som ligge paatvers; den forreste Del udvider sig næsten traktformigt op imod Tentakelranden og er forsynet med 8 Ribber, imellem hvilke sees en meget smal Fure; baade denne og Ribberne ere særdeles rige paa Spikler, der opimod Mundskiven ligge paalangs, idet de gaa over paa Tentaklerne, Fig. 2. Disse ere omtrent 2^{mm} lange og paa deres aborale Side beklædte med Spikler. Pinnulerne ere ogsaa forsynede med Spikler.

Anatomisk-histologisk Undersøgelse.

Polypcellerne ere beklædte med et Ectoderm, dannet af flere Lag polyædriske Celler, der have en aflang Kjerne

The bare portions, the oral disk and adoral side of the tentacles, rich in nematocysts. The aboral side of the tentacles and the pinnules rich in spicules. At the base of two polyps there is, frequently, a small polyp formed by budding. The spicules on the basal part are generally complex stellates and bistellates, and more rarely spicate fusees: these become more numerous on the stem (the polyp-cells) and still more numerous on the polyp-body, especially on its anterior part, where, also, peculiar cruciform quadruplets are met with, but rather rarely. The entire Zoanthodem, when it is fully extended, is perfectly pellucid and is really colourless; when the polyps retract, and the cells are shortened, the colour is white. The gullet has 6 spicular series.

Sub-Section Cornularinæ.

Clavularia frigida, n. sp.

Pl. XXII, figs. 1—35.

The Zoanthodem has no stem. The basal part is thin and semi-transparent, and it extends itself, in bands, over the objects to which it is attached (fig. 1, *a*). Isolated polyps, with their cells, stand up from the basal part, having larger or smaller intervals between them. The cells measure 3—4^{mm} in length, and are somewhat dilated at their base; they are furnished with 8, pretty strong, ribs formed of spicules; and deep furrows, which also contain spicules (fig. 1, 2, *a*), occur between the ribs. At the point where the cell passes over into the polyp-body it diminishes a little in thickness, the ribs become less prominent, and a rounded margin is observed (fig. 2, *b*) which indicates the transition, and which is specially distinct when the polyp has commenced to contract itself a little together.

The polyp-body measures 3^{mm} in length; its posterior part is narrow and cylindrical, and is, also, richly supplied with spicules which are placed transversally; the anterior part becomes dilated, in almost infundibuliform, in the neighbourhood of the tentacular margin, and is furnished with 8 ribs between which a very narrow furrow is observed; both, it as well as the ribs, are particularly richly supplied with spicules which, in the proximity of the oral disk, are placed longitudinally as they pass over to the tentacles (fig. 2). The tentacles measure about 2^{mm} in length and, on their aboral side, they are clad with spicules. The pinnules are, also, furnished with spicules.

Anatomo-histological Examination.

The polyp-cells are clad with an ectoderm, formed of several layers of polyhedral cells which contain an oblong

med Kjernelegeme, omgivet af en finkornet, temmelig mørk Protoplasmamasse, Fig. 3, *a*. Imellem Cellerne ere, især i de dybere Lag, Kalkspikler leirede. Indenfor Ectodermet er et bredt, hyalint Bindevævslag, forsynet med Bindevævslegemer med Udløbere og fine Ernæringskanaler, Fig. 3, *b*. Paa den indvendige Flade af Bindevævet sees de 8 Septula med sine Muskellag, samt et Endothelovertræk, der bestaar af runde Celler, forsynede med store Kjerner med deres Kjernelegemer, hvilke ere omgivne af Protoplasma, Fig. 4. Svælgrøret er cylindrisk, har 8 uregelmæssige Spikelrækker, der dog ere ordnede saaledes, at Midtpartiet paa Bug- og Rygsiden er spikelfrit, Fig. 5. Paa dets indre Væg langs Bugsidens sees Svælgruben, forsynet med sine lange Pidskeceller. Kjønsorganerne udvikles paa 6 Septula og dannes som sædvanligt af stilkede Kapsler, hvori Kjønsprodukterne udvikles.

Paa Basaldelen findes hyppigst særegne Dobbeltstjerner, Spindler og Klubber; sjældnere Firlinger. Dobbeltstjernerne have brede, noget krummede Straaler med indskaarne Rande og et kort Midtparti, der stundom er besat med Blade; de ere fra 0.080—0.088^{mm} lange og 0.044^{mm} brede; Midtpartiet er fra 0.016—0.024^{mm} bredt, Fig. 6. 7. 8. Spindlerne have mere eller mindre spidse Ender, ere næsten regelmæssigt besatte med takkede Blade og nærme sig noget de sammensatte Stjerner; de ere fra 0.132—0.172^{mm} lange og fra 0.048—0.064^{mm} brede, Fig. 9. 10. Klubberne ere korte, rigt udstyrede med Takker, 0.096^{mm} lange, og fra 0.048—0.060^{mm} brede foroven, Fig. 11. 12. Firlingerne indtage snart Korsformen, ere besatte med Papiller og fra 0.072—0.088^{mm} lange med en Tverstok fra 0.060—0.068^{mm} lang, Fig. 13. 14. 15. 16, — snart nærme de sig Timeglasformen, ere ligelædes besatte med Papiller og fra 0.076—0.100^{mm} lange, 0.064^{mm} brede i Enderne med et omkring 0.020^{mm} bredt Midtparti. Fig. 17.

Paa Polypcellerne ere elliptiske Spindler, der tildels nærme sig de sammensatte Stjerner, hyppigst; Klubber ere sjældnere, ligesaa Firlinger, og enkeltvis sees nogle Spikler, der ere ganske særegne. Spindlerne ere rigt besatte med tandede Blade; dette er især Tilfældet med dem, der nærme sig de sammensatte Stjerner; de have afrundede Ender og ere fra 0.116—0.156^{mm} lange og fra 0.044—0.068^{mm} brede, Fig. 18. 19; de øvrige Spindler ere takkede med tilspidsede Ender; disse ere 0.128^{mm} lange og 0.044^{mm} brede, Fig. 20. Klubberne ere temmelig tæt besatte med Blade, ere fra 0.136—0.156^{mm} lange og fra 0.060—0.088^{mm} brede foroven, Fig. 21. 22. Firlingerne ere dels i Form af Kors, besatte med Blade og fra 0.076—0.092^{mm} lange, med en 0.072^{mm} lang Tverstok. Fig. 23. 24, dels nærme de sig Formen af Time-

nucleus with its nucleus-corpuscle, surrounded by a minutely granular, rather dark, protoplasmic substance (fig. 3, *a*). Between the cells, especially in the deeper layers, calcareous spicules are found embedded. Inside of the ectoderm there is a broad, hyaline, connective-tissue layer, furnished with connective-tissue corpuscles having prolongations, and also with minute nutritory ducts (fig. 3, *b*). On the exterior surface of the connective-tissue, 8 septula, with their muscular layers, are observed, and, also, an endothelial covering consisting of round cells containing large nuclei, with their nucleus-corpuscles, which are surrounded by protoplasm (fig. 4). The gullet-tube is cylindrical, and has 8 irregular series of spicules which are, however, arranged in such manner that the mesial part of the ventral and dorsal sides is devoid of spicules (fig. 5). On the inner wall of the gullet-tube, along the ventral side, the gullet-cavity, furnished with its long flagelliform cells, is seen. The reproductive organs are developed upon the 6 septula, and are formed, as usual, of pedunculated capsules in which the sexual products are developed.

Upon the basal part, the spicular forms which are most frequently met with are peculiar bistellates, fusees, and clavates; quadruplets are more rare. The bistellates have broad, somewhat curved, rays with indented margins, and a short mesial part which, occasionally, is beset with leaves; they measure from 0.080—0.088^{mm} in length, and 0.044^{mm} in breadth; the mesial part measures from 0.016—0.024^{mm} in breadth (figs. 6. 7. 8). The fusees have more or less acuminate extremities, are, almost regularly, beset with spicate leaves, and approach in form somewhat to the complex stellates; they measure from 0.132—0.172^{mm} in length, and from 0.048—0.064^{mm} in breadth (figs. 9. 10). The clavates are short, and richly furnished with spikes; they measure 0.096^{mm} in length, and from 0.048—0.060^{mm} in breadth above (figs. 11. 12). The quadruplets sometimes assume the cruciform, and are beset with papillæ; they measure from 0.072—0.088^{mm} in length, and have a transversal arm, measuring from 0.060—0.068^{mm} in length (figs. 13. 14. 15. 16) sometimes they approach to the sand-glass form, and are, also, in this case beset with papillæ; they measure from 0.076—0.100^{mm} in length, 0.064^{mm} in breadth at the extremities, and have a mesial part measuring about 0.020^{mm} in breadth (fig. 17).

Upon the polyp-cells, the spicular forms most frequently met with are elliptic fusees, which, in a measure, approach in form to the complex stellates; clavates are more rarely met with, and that is, also, the case as regards quadruplets; a few occasional quite peculiar spicules are also observed. The fusees are richly beset with dentated leaves, and this is specially the case with those that approach the complex stellates in form; they have rounded extremities, and measure from 0.116—0.156^{mm} in length, and from 0.044—0.068^{mm} in breadth (figs. 18. 19); the remaining fusees are spicate, and have acuminate extremities; they measure 0.128^{mm} in length, and 0.044^{mm} in breadth (fig. 20). The clavates are pretty closely beset with leaves; they measure from 0.136—0.156^{mm} in length, and from 15*

glasset og ere 0.080^{mm} lange, 0.052^{mm} brede i Enderne, og 0.028^{mm} brede paa Midten, Fig. 25. De meget sjeldnere, særegne Spikler, der findes hist og her imellem de øvrige Spikler, nærme sig noget Klubben, ere rigt ornamenterede med store, stærkt fremspringende Blade, der ere dybt indskaarne i Randen; de ere 0.176^{mm} lange, 0.080^{mm} brede omtrent paa Midten, Fig. 26.

Paa Polypkroppen er det fornemmelig Spindelformen, der er fremherskende; imellem Spindlerne sees hist og her Køller og Klubber, samt enkelte Valser. Spindlerne ere dels lige, dels krummede og have mere eller mindre tilspidsede Ender; de krummede ere rigt besatte med Blade og indtil 0.332^{mm} lange og 0.072^{mm} brede, Fig. 27; de lige Spindler ere sparsommere besatte med temmelig smaa Papiller og have tilspidsede Ender, ere 0.160^{mm} lange, 0.036^{mm} brede, Fig. 28. Køllerne ere mere eller mindre krummede, stundom rigt prydede med store Blade, men ellers besatte med smaa, takkede Papiller; de ere fra 0.160—0.240^{mm} lange og fra 0.036—0.052^{mm} brede foroven, Fig. 29. 30. Klubberne ere forskjelligt formede; enkelte nærme sig Dobbeltstjernen, andre Tapiformen, atter andre have to Udløbere i den tykke Ende, men alle ere takkede; de ere fra 0.100—0.124^{mm} lange og fra 0.032—0.064^{mm} brede foroven, Fig. 31. 32. 33. Valserne ere takkede, 0.160^{mm} lange, 0.040^{mm} brede, Fig. 34.

Paa Spiserøret ere takkede Spindler hyppigst, Fig. 35.

Farven.

Farven svagt gul, spillende i det Brune.

Findested.

Station 363. Et Exemplar med yderst faa Polyper, siddende paa Røret af *Onuphis conchylega*.

Artskarakter.

Zoanthodemet uden Stamme. Basaldelen krybende baandformigt henover den Gjenstand, hvortil den er fæstet. Fra Basaldelen reiser sig faa Polyper med deres Celler. Disse staa mere eller mindre langt fra hverandre, ere 3—4^{mm} lange, cylindriske, noget udvidede ved Grunden, med 8 Ribber, hvorimellem temmelig dybe Furer. Saavel Ribber

0.060—0.088^{mm} in breadth above (fig. 21. 22). The quadruplets are, partly, of cruciform, and are beset with leaves; they measure from 0.076—0.092^{mm} in length, and have a transversal arm measuring 0.072^{mm} in length (figs. 23. 24); partly, they approach in form to the sand-glass, and measure 0.080^{mm} in length, 0.052^{mm} in breadth at the extremities, and 0.028^{mm} in breadth at the middle (fig. 25). The, more rare, peculiar spicules, which are here and there found between the other spicules, approach somewhat to the clavates in form, and are richly adorned with large, strongly projecting, leaves which are deeply indented in the margin; they measure 0.176^{mm} in length, and 0.080^{mm} in breadth about the middle (fig. 26).

Upon the polyp-body, it is principally the fusiform spicule that is predominant; between the fusees, subclavates and clavates are, here and there, observed, and also a few cylinders. The fusees are sometimes straight, sometimes curved, and have more or less acuminate extremities; the curved ones are richly beset with leaves, and measure up to 0.332^{mm} in length, and 0.072^{mm} in breadth (fig. 27); the straight fusees are sparingly beset with rather small papillæ, and have acuminate extremities; they measure 0.160^{mm} in length, and 0.036^{mm} in breadth (fig. 28). The subclavates are more or less curved, and are, occasionally, richly adorned with large leaves, but, otherwise, they are beset with small spicate papillæ; they measure from 0.160—0.240^{mm} in length, and from 0.036—0.052^{mm} in breadth above (figs. 29. 30). The clavates are variously formed; a few approach in form to the bistellates, others to the coniform; others, again, have two prolongations at the thick extremity, and all of them are spicate; they measure from 0.100—0.124^{mm} in length, and from 0.032—0.064^{mm} in breadth above (figs. 31. 32. 33). The cylinders are spicate, and measure 0.160^{mm} in length, and 0.040^{mm} in breadth (fig. 34).

On the gullet-tube, the spicate fusee is the most frequent spicular form (fig. 35).

Colour.

The colour is pale yellow, shading towards brown.

Habitat.

Station, Nr. 363. One specimen with extremely few polyps, seated on the tube of *Onuphis conchylega*.

Specific characteristics.

The Zoanthodem without stem. The basal part extended in bands over the object to which it is attached. From the basal part, a few polyps with their cells stand up; these are placed, more or less far, apart from each other, and measure 3—4^{mm} in length; they are cylindrical, somewhat dilated at the base, have 8 ribs, with rather deep

som Furer ere spikelholdige. Polypkroppen 3^{mm} lang, dens bagre Del smal, cylindrisk; dens forreste Del udvider sig traktformigt imod Tentakelskiven og er forsynet med 8 Ribber, imellem hvilke et lignende Antal smale Furer. Tentaklerne omtrent 2^{mm} lange, rige paa Spikler; Pinnulerne have ogsaa Spikler. Paa Basaldelen ere Dobbeltstjerner, Spindler og Klubber hyppigst. Paa Polypcellerne ere elliptiske Spindler og paa Polyperne større og mindre Spindler, samt Køller almindeligst. Svælgrøret har 8 Spiklerækker. Farven gul, spillende i det Brune.

Symphodium abyssorum, n. sp.

Tab. XXIII.

Zoanthodemet er uden Stamme. Basaldelen er fast, membranøs og indkapsler ganske i omtrent 150^{mm}'s Længde den 200^{mm} lange Stilk af *Bathycrinus Carpenteri*, Dan. & Kor., Fig. 1. Selve Roden med dens Forgreninger er omspændt af Basalmembranen, Fig. 1, a. Fra denne reiser Polyperne med deres Celler sig dels i Grupper, dels enkeltvis, Fig. 1. Hvor Polypgrupperne findes, er Basalmembranen flere Millimeter tyk, imedens den forøvrigt er tynd, ikke synderligt over 1^{mm} i Tykkelse. I Grupperne sidde Polyperne meget tæt sammen og ligne Drueklaser, og hyppigt ere Cellerne lige ved Grunden sammenvoxede.

Polypcellerne ere fuldstændigt retraktile, cylindriske, 5—6^{mm} lange og forsynede med 8 stærke Længderibber, dannede af paatversliggende Spikler, og ligesaamange Furer, der synes at være nøgne, Fig. 2, a. Hvor Cellen gaar over i Polypkroppen, blive Ribberne mindre fremtrædende, og naar den er noget indtrukken, fremstaar paa dens Rand 8 Tænder, der kun antyde de indbøiede Ribber foroven, Fig. 2, b; er Cellen ganske indtrukken, danner den enten en skarp, tyk Rand omkring Polypen, eller naar denne ogsaa er indtrukken, lukker Cellen sig ganske og danner da en liden, halvkuglerund Ophøining i Form af en Stjerne, i hvis Midte sees en yderst liden, rund Aabning. Naar saaledes en hel Gruppe af Polyper med deres Celler ere indtrukne, tabes Drueformen, og den ligner da en Samling af stjerneformede Halvkugler, Fig. 1, b.

Polyperne ere cylindriske, retraktile, 6^{mm} lange; paa deres Bagkrop, nærmest Cellen, sees kun svage Ribber, hvor Spikler ligge endnu paatvers, Fig. 2, c, men noget mere fremover træde Ribberne stærkere frem, saa at Forkroppen har 8 Ribber, hvori Spiklerne ligge paalangs; imellem

furrows between them. Both, the ribs and the furrows, contain spicules. The polyp-body measures 3^{mm} in length; its posterior part is narrow and cylindrical; its anterior part becomes dilated, in infundibuliform, in the neighbourhood of the tentacular disk, and is furnished with 8 ribs, between which there are a similar number of narrow furrows. The tentacles measure about 2^{mm} in length, and are rich in spicules. The pinnules have, also, spicules. On the basal part, bistellates, fusees, and clavates, are the most frequent forms. On the polyp-cells, elliptic fusees, and on the polyps, larger and smaller fusees, and subclavates, are the most frequent spicular forms. The gullet-tube has 8 spicular series. Colour yellow, shading towards brown.

Symphodium abyssorum, n. sp.

Pl. XXIII.

The Zoanthodem has no stem. The basal part is hard and membranaceous, and it completely encloses, for about 150^{mm} of its length, the 200^{mm} long stalk of *Bathycrinus Carpenteri*, Dan. & Kor. (fig. 1). The root itself, with its branches, is encompassed by the basal membrane (fig. 1, a). From the membrane, the polyps with their cells, stand up, partly in groups, and partly singly (fig. 1). Where the polyp-groups occur, the basal membrane is several millimetres in thickness, but, otherwise, it is thin, being not much in excess of 1^{mm} in thickness. In the groups, the polyps are placed very closely together and resemble clusters of grapes, and, frequently, the cells are concreted together close to the base.

The polyp-cells are completely retractile; they are cylindrical, and measure 5—6^{mm} in length; they are furnished with 8, strong, longitudinal ribs, formed of spicules placed transversally, and a similar number of furrows which appear to be bare (fig. 2, a). At the point where the cell passes over into the polyp-body, the ribs become less prominent, and when the polyp is somewhat retracted 8 teeth appear upon its margin, but these solely indicate the curving inwards of the ribs above (fig. 2, b). When the cell is quite retracted it forms, either, a sharp thick margin around the polyp, or when the polyp, also, is retracted, the cell completely shuts itself, and then forms a semi-globular prominence in the form of a star, in whose middle an extremely minute circular aperture is observed. When an entire group of polyps with their cells are thus retracted the racemous form disappears, and it then resembles a collection of stelliform semi-spheres (fig. 1, b).

The polyps are cylindrical and retractile, and measure 6^{mm} in length; on their posterior body, nearest to the cell, faint ribs only are observed, whose spicules are still placed transversally (fig. 2, c), but a little further forward the ribs become more prominent, so that the anterior

Ribberne sees en yderst smal Fure, Fig. 2, *d. 3, a*, der udvider sig noget opimod Tentakelranden og danner her et langagtigt, trekantet Rum, der er nøgent til Siderne, men i hvis Midte er en Længdestribe af Spikler, Fig. 3, *b*. Tentaklerne ere 2.5^{mm} lange, tykke ved Grunden og paa deres aborale Side vel bepantsrede med Spikler; ogsaa Pinnulerne ere forsynede med saadanne.

Anatomisk-histologisk Undersøgelse.

Hele Zoanthodemet er beklædt med et Ectoderm, der bestaar af polyædriske Celler med en temmelig stor, næsten rund, lidt excentrisk liggende Kjerne med sit Kjernelegeme, og omgivet af et fintkornet, halv gjennemsigtigt Protoplasme. Indenfor Ectodermet er et hyalint Bindeævslag, fra hvis ydre Flade udgaar en Mangfoldighed af fine Udlobere, der danne et Net, hvis Masker ere beklædte med Ectodermceller og optagne af Spikler, saaledes at i hver Maske ligger en Spikel, Fig. 4, *a*. Fra dette Bindeævs indre Flade udgaa Forlængelser imellem Cellerne og danne her et smalt Coenenchym, hvori ikke alene sees Bindeævslegemer og Ernæringskanaler med deres Epithel, men ogsaa Spikelafleiringer, Fig. 4, *b*.

Paa Polypcellernes indre Væg sees de 8 Septula at strække sig ned til Cellens Bund; paa de 6 af dem iagttages Kjønsganerne, der bestaa som sædvanligt af stilkede Kapsler, hvori sees Æg i forskellige Udviklingsstadier, Fig. 4, *c*.

Polypernes ydre Beklædning adskiller sig fra den øvrige Del af Zoanthodemet kun derved, at Ectodermet har to Lag polyædriske Celler, og at disse synes at være rigere paa Protoplasmaindhold, Fig. 5, *a*. Indenfor Ectodermet er et lignende Bindeæv med sit Maskenet; Maskerne ere her større, Fig. 5, *c*. Ectodermcellerne, der beklæde Maskevæggene, ere tydeligere, Fig. 5, *b*, og det seer ud, som om der i nogle Masker ligge flere Spikler sammen. Fra den indvendige Flade af Bindeævset udgaa de 8 Septa, som fæste sig paa Svælgrørets ydre Side og ere forsynede med Tver- og Længdemuskler, samt beklædte med et Lag runde, temmelig klare Endothelceller, der ogsaa give Svælgrøret sin ydre Beklædning, Fig. 5, *d*.

Svælgrøret har 8 tæt liggende Spikelrækker, Fig. 6, *a*, dog saaledes ordnede, at 4 Rækker ligge paa hver Side af Bugfladen, som er spikelfri, Fig. 6, *b*. Paa Svælgets indre Væg, langs Bugsidens, sees en halvrund, temmelig dyb Grube (Svælgruben), der er beklædt med lange Pidskeceller, Fig. 5, *e*; den øvrige Del af Svælget er beklædt med kortere Celler med temmelig korte Cilier. Imellem disse Celler sees hist og her isolerede, pæreformede, encellede Slimkjerter

body has 8 ribs on which the spicules are placed longitudinally; between the ribs, an extremely minute furrow is seen (fig. 2, *d. 3, a*), which becomes somewhat dilated in the proximity of the tentacular margin, and forms, there, an elongate triangular space which is bare at the sides, but in whose middle there is a longitudinal stripe of spicules (fig. 3, *b*). The tentacles measure 2.5^{mm} in length at the base; on their aboral side they are well sheathed with spicules; the pinnules are also furnished with spicules.

Anatomo-histological Examination.

The entire Zoanthodem is clad with an ectoderm, which consists of polyhedral cells containing a pretty large, almost globular, somewhat eccentrically placed, nucleus and nucleus-corpusele, surrounded by a minutely granular, semi-transparent protoplasm. Inside of the ectoderm there is a hyaline connective-tissue layer, from whose outer surface a multitude of prolongations issue forming a reticulation whose meshes are clad with ectoderm-cells, and are occupied by spicules in such a manner, that one spicule is situated in each mesh (fig. 4, *a*). From the inner surface of this connective-tissue prolongations issue between the cells, and form here a narrow sarcosoma, in which are observed, not only connective-tissue corpuseles and nutritory ducts with their epithelium, but also spicular deposits (fig. 4, *b*).

On the inner wall of the polyp-cells, 8 septula are observed to extend down to the bottom of the cell; on 6 of these the reproductive organs are seen, consisting, as usual, of pedunculated capsules in which ova in various stages of development are observed (fig. 4, *c*).

The outer covering of the polyps is distinguished from the rest of the Zoanthodem, only by the fact that the ectoderm has two layers of polyhedral cells, and that these appear to be richer in protoplasmic substance (fig. 5, *a*). Inside of the ectoderm there is a similar connective-tissue with its reticulation; in this the meshes are larger (fig. 5, *c*), the ectoderm-cells which clothe the walls of the meshes are more distinct (fig. 5, *b*), and it appears as if in several meshes numerous spicules lie together. From the inner surface of the connective-tissue issue the 8 septa which attach themselves to the outer side of the gullet-tube, and these are furnished with transversal and longitudinal muscles, and are clad with a layer of globular, pretty pellucid, endothelial cells which also serve as the outer covering of the gullet-tube (fig. 5, *d*).

The gullet-tube has 8, closely placed, spicular series (fig. 6, *a*) arranged, however, in such a manner, that 4 series lie on each side of the ventral surface, which is devoid of spicules (fig. 6, *b*). On the inner wall of the gullet, along the ventral side, a semi-circular, rather deep, groove, (the gullet-groove) is observed, which is clad with long flagelliform cells (fig. 5, *e*). The remaining part of the gullet is clad with shorter cells which have rather short

med deres korte Udførselskanaler, der munde ud i Svælg-hulheden.

Spiklerne i Coenenchymet optræde i Form af Spindler, Klubber og Firlinger. Spindlerne ere de hyppigste, men variere stærkt i Formen, idet nogle nærme sig Dobbeltstjernerne, ere 0.140^{mm} lange, 0.060^{mm} brede mod Enderne og have et nøgent Midtparti, 0.012^{mm} bredt, Fig. 7, andre nærme sig de sammensatte Stjerner, have en Længde af 0.196^{mm} og en Bredde af 0.060^{mm}, Fig. 8, men de fleste have dog den lige Spindelform, ere mere eller mindre besatte med Takker, og fra 0.104—0.160^{mm} lange og fra 0.028—0.044^{mm} brede, Fig. 9. 10. 11. Firlingerne ere meget sjældnere og have Korsformen; enkelte ere næsten glatte, 0.064^{mm} lange, 0.056^{mm} brede, Fig. 12, andre ere rigt besatte med Papiller og 0.148^{mm} lange med en 0.096^{mm} lang Tverstok, Fig. 13. Klubberne ere sjældnest og besatte med Blade, der ere takkede i Randen; de ere 0.148^{mm} lange, 0.072^{mm} brede foroven, Fig. 14.

Paa Basaldelen ligge Spiklerne tæt paa hverandre, men danne neppe mange Lag, da den er halv gjennemsigtig. Dobbeltstjerner ere almindeligst, sjældnere Køller og Klubber og yderst sjældent en Firling. Dobbeltstjernerne have brede Straaler med som oftest takkede Ender og et nøgent Midtbelte, men mange af dem have Straaler af ulige Længde med stjerneformede Ender; de tørste Former ere fra 0.080—0.092^{mm} lange og fra 0.048—0.052^{mm} brede i Enderne med et 0.020^{mm} bredt Midtbelte, Fig. 15. 16; de sidste ere fra 0.112—0.128^{mm} lange og fra 0.068—0.076^{mm} brede Midtbeltet er 0.028^{mm} bredt, Fig. 17. 18. 19. Klubberne ere mere eller mindre besatte med Blade, der have takkede Rande, ere fra 0.100—0.120^{mm} lange og fra 0.060—0.076^{mm} brede foroven, Fig. 20. 21. Køllerne ere almindeligere end Klubberne; ogsaa de ere forsynede med Blade, der ere meget brede, sidde næsten krandsformigt paa Køllen og have tandede Rande; de ere fra 0.124—0.176^{mm} lange og fra 0.052—0.064^{mm} brede opad, Fig. 22. 23. 24. Firlingerne have Timeglasform, ere prydede med Papiller og 0.068^{mm} lange, 0.060^{mm} brede i Enderne og 0.024^{mm} brede paa Midten, Fig. 25.

Paa Cellen ligge Spiklerne tæt paa hverandre i de 8 Ribber; her ere Spindler, Klubber og Køller hyppigst, sjældnere Firlinger. Spindlerne ere lige med dels afstumpede, dels tilspidsede Ender og forsynede enten med Blade eller mindre Takker; de ere fra 0.132—0.224^{mm} lange og fra 0.028—0.044^{mm} brede, Fig. 26. 27. 28. 29. Klubberne ere temmelig forskellige; enkelte nærme sig Dobbeltstjernen, andre Spindelen, samtlige ere takkede og fra

cilia. Between these cells, isolated, piriform unicellular mucous glands are observed, with their short excretory ducts opening into the gullet-cavity.

The spicules of the sarcosoma appear in the form of fusees, clavates, and quadruplets. The fusees are most frequent, and they vary greatly in their form; some approach in form to the bistellate, and measure 0.140^{mm} in length, and 0.060^{mm} in breadth at the extremities, with a bare mesial part measuring 0.012^{mm} in breadth (fig. 7); whilst others approach in form to the complex stellates, and measure 0.196^{mm} in length, and 0.060^{mm} in breadth (fig. 8); but most of them have, however, the straight fusiform and are more or less beset with spikes; they measure from 0.104—0.160^{mm} in length, and from 0.028—0.044^{mm} in breadth (fig. 9. 10. 11). The quadruplets are much more rare, and have the cruciform; a few of these are almost smooth, and measure 0.064^{mm} in length, and 0.056^{mm} in breadth (fig. 12); others, of them, are richly beset with papillæ, and measure 0.148^{mm} in length, and have a transversal arm measuring 0.096^{mm} in length (fig. 13). The clavates are the rarest spicular form and they are beset with leaves which are spicate in the margin; they measure 0.148^{mm} in length, and 0.072^{mm} in breadth above (fig. 14).

On the basal part, the spicules lie close upon each other but can scarcely form many layers, as it is semi-transparent. Bistellates are the most frequent spicular form, more rarely do subclavates and clavates appear, and still more rarely does a quadruplet appear. The bistellates have broad rays, and, usually, have spicate extremities and a bare mesial part, but many of them have rays of unequal length, with stelliform extremities; the first named forms measure, from 0.080—0.092^{mm} in length, and from 0.048—0.052^{mm} in breadth at the extremities, and their mesial part measures 0.020^{mm} in breadth (figs. 15. 16); the lastnamed measure, from 0.112—0.128^{mm} in length, and from 0.068—0.076^{mm} in breadth, the mesial part measuring 0.028^{mm} in breadth (figs. 17. 18. 19). The clavates are more or less beset with leaves, having spicate margins, and measure from 0.100—0.120^{mm} in length, and from 0.060—0.076^{mm} in breadth above (figs. 20. 21). The subclavates are met with more frequently than the clavates, and they, also, are furnished with leaves, which are very broad and are placed almost in wreath-form on the bulb, furnished also with dentated margins; they measure from 0.124—0.176^{mm} in length, and from 0.052—0.064^{mm} in breadth above (fig. 22. 23. 24). The quadruplets have the sand-glass form, and are adorned with papillæ; they measure 0.068^{mm} in length, 0.060^{mm} in breadth at the extremities, and 0.024^{mm} in breadth at the middle (fig. 25).

On the cell, the spicules lie close upon each other in the 8 ribs. In this situation, fusees, clavates, and subclavates, are the most frequent spicular forms; quadruplets are more rare. The fusees are straight, and have, partly blunted, partly acuminate extremities, and they are furnished, either with leaves or small spikes; they measure from 0.132—0.224^{mm} in length, and from 0.028—0.044^{mm} in breadth (fig. 26. 27. 28. 29). The clavates are rather various; a

0.108—0.156^{mm} lange og fra 0.048—0.064^{mm} brede, Fig. 30. 31. 32. 33. 34. 35. Køllerne ere besatte med brede Blade, der ere takkede i Randen; de ere 0.176^{mm} lange, 0.048^{mm} brede opad, Fig. 36. De enkelte Firlinger have dels Korsformen, dels nærme de sig Timeglasformen; de korsformede ere besatte med Blade og 0.132^{mm} lange med en i Enderne noget udskaaren Tverstok, som er 0.100^{mm} lang, Fig. 37; de timeglasformede ere besatte med Papiller, i den ene Ende 0.072^{mm} og i den anden 0.084^{mm} lange og 0.040^{mm} brede paa Midten, Fig. 38.

Paa Polypkroppen ere Spindler og Køller almindeligst, sjældnere ere Valses og Klubber og yderst sjældent Firlinger. Spindlerne ere takkede med dels stumpe, dels spidse Ender og fra 0.188—0.196^{mm} lange og fra 0.024—0.028^{mm} brede, Fig. 39. 40. Køllerne ere sparsomt besatte med Takker og 0.184^{mm} lange, 0.032^{mm} brede foroven, Fig. 41. Valserne ere mere eller mindre takkede; enkelte af dem ere særdeles lange og rigt forsynede med tandede Blade; de ere fra 0.128—0.292^{mm} lange og fra 0.032—0.052^{mm} brede, Fig. 42. 43. 44. Klubberne ere smaa og besatte med Blade; de ere 0.080^{mm} lange og 0.036^{mm} brede foroven, Fig. 45. Firlingerne have Korsform, ere besatte med Takker og 0.256^{mm} lange med en næsten rudimentær Tverstok, der er 0.072^{mm}, Fig. 46.

Paa Svælgrøret findes væsentligst Spindler og Køller. Spindlerne have tilspidsede Ender, ere takkede og have en Længde af 0.132^{mm} og en Bredde af 0.032^{mm}, Fig. 47. Køllerne ere bladede, stundom lidt krummede, 0.140^{mm} lange og 0.044^{mm} brede foroven, Fig. 48. 49.

Farven.

Gul, spillende svagt i det Røde.

Findested.

Station 295. Mange Exemplarer.

Artskarakter.

Zoanthodemet uden Stamme. Basaldelen membranøst udbredt i større og mindre Udstrækning over Stilken af *Bathycrinus Carpenteri*, Dan. & Kor. Fra Basaldelen reiser Polyperne med deres Celler sig dels i Grupper, dels enkeltvis. I Grupperne sidde Polyperne tæt sammen og ligne

few approach in form to the bistellate, whilst others approach the fusiform; they are all spicate, and measure from 0.108—0.156^{mm} in length, and from 0.048—0.064^{mm} in breadth (figs. 30. 31. 32. 33. 34. 35). The subclavates are beset with broad leaves which are spicate in the margin: they measure 0.176^{mm} in length, and 0.048^{mm} in breadth above (fig. 36). The few quadruplets have, partly, the cruciform, or they, partly, approach in form to the sand-glass; the cruciform ones are beset with leaves, and measure 0.132^{mm} in length, and their transversal arm, which measures 0.100^{mm} in length (fig. 37), has its extremities somewhat indented. The sand-glass formed ones are beset with papillæ, and at the one extremity measure 0.072^{mm}, and at the other extremity 0.084^{mm} in breadth; at the middle they measure 0.040^{mm} in breadth (fig. 38).

Upon the polyp-body, fusees and subclavates are the most frequent spicular forms; cylinders and clavates are more rare, and quadruplets very rare. The fusees are spicate, and have, partly, blunted, partly, acuminate extremities; they measure from 0.188—0.196^{mm} in length, and from 0.024—0.028^{mm} in breadth (fig. 39. 40). The subclavates are sparingly beset with spikes, and measure 0.184^{mm} in length, and 0.032^{mm} in breadth above (fig. 41). The cylinders are more or less spicate; a few of them are particularly long, and are richly furnished with dentated leaves; they measure from 0.128—0.292^{mm} in length, and from 0.032—0.052^{mm} in breadth (figs. 42. 43. 44). The clavates are small, and are beset with leaves; they measure 0.080^{mm} in length, and 0.036^{mm} in breadth above (fig. 45). The quadruplet is of cruciform, and is beset with spikes; it measures 0.256^{mm} in length, and has an almost rudimentary transversal arm which measures 0.072^{mm} (fig. 46).

Upon the gullet-tube, fusees and subclavates are the spicular forms most frequently met with. The fusees have acuminate extremities; they are spicate, and measure 0.132^{mm} in length, and 0.032^{mm} in breadth (fig. 47). The subclavates are foliated, and sometimes they are a little curved; they measure 0.140^{mm} in length, and 0.044^{mm} in breadth above (figs. 48. 49).

Colour.

Yellow, shading faintly towards red.

Habitat.

Station No. 295. Numerous specimens.

Specific characteristics.

The Zoanthodem has no stem. The basal part is membranaceously extended, for a greater or smaller extent, over the stalk of *Bathycrinus carpenteri* Dan. & Kor. The polyps, with their cells, rise up from the basal part, partly in groups, and partly singly. In the groups, the polyps

Drueklaser; stundom er Cellernes ydre Væg sammen-
 voxet nederst ved Grunden. Polypcellerne ere cylindriske,
 fuldstændigt retraktile, 5—6^{mm} lange, forsynede med 8 stærke
 Længderibber, imellem hvilke dybe Furer. Polyperne
 cylindriske, retraktile, 6^{mm} lange, med 8 Ribber, især frem-
 trædende paa Kroppens forreste Del, hvor der opimod
 Tentakelskiven er imellem hver to Tentaklers Grund et
 langagtigt, triangulært Felt, nøgent til Siderne, men i Midten
 en Spikelrække. Tentaklerne ere 2,5^{mm} lange, forsynede med
 Spikler paa den aborale Side; Pinnulerne have ligeledes
 Spikler. Paa Basaldelen er Dobbeltstjerner almindeligst;
 mange af disse ere særegne. Paa Polypcellen ere Spindler,
 Køller og Klubber hyppigst, paa Polyperne Spindler og
 Køller. Coenenchymet rigt paa Spikler. Spindelformen
 den almindeligste her. Svælgrøret har 8 Rækker Spikler.
 Farven gul, spillende i det Røde.

are placed closely together and resemble clusters of grapes;
 sometimes the outer wall of the cells is concreted together
 close to the base. The polyp-cells are cylindrical, completely
 retractile, and 5—6^{mm} in length; they are furnished with
 8 strong longitudinal ribs with deep furrows between them.
 The polyps are cylindrical, retractile, and 6^{mm} in length;
 they have 8 ribs, and these are specially prominent in the
 anterior part of the body, where, in proximity to the ten-
 tacular disk, between the base of every two tentacles, there
 is an elongate, triangular area, bare at the sides but with
 a series of spicules in the middle. The tentacles are 2,5^{mm}
 in length, and are furnished with spicules on the aboral
 side. The pinnules have also spicules. On the basal part,
 bistellate spicules are the most frequent, many of them
 being peculiar. On the polyp-cell, fusees, subclavates, and
 clavates are the most frequent spicular forms; and on the
 polyps, fusees and subclavates are the most frequent forms.
 The sarcosoma is rich in spicules, and the fusiform is,
 here, the most frequent one. The gullet-tube has 8 series
 of spicules. Colour: yellow, shading to red.

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Forklaring over Figurerne.

- Tab. I. Fig. 1. *Vøringia mirabilis* i naturlig Størrelse.
 — 2. En liden Gren af samme, forstørret.
 — 3. En Polyp, forstørret.
 — 4. En Tentakel, forstørret.
 — 5. Polyædriske Ectodermceller, forstørret.
 — 6. Aflange Ectodermceller, forstørret.
 — 7. Bindevævslegemer, forstørret.
 — 8—10. Spikler paa Stammen, forstørret.
 — 11. 12. Spikler paa Basaldelen, forstørret.
 — 13. Tversnit af en liden Gren, forstørret.
 — 14. Spikel paa Grenene, forstørret.
 — 15. Tversnit af en Polyp, forstørret. *a*, Ectoderm; *b*, Bindevæv, hvori Spikler; *c*, Muskellaget; *d*, Bindevæv; *e*, Svælgrube.
 — 16—18. Spikler paa Forkroppen, forstørret.
 — 19. 20. Spikler paa Midtkroppen, forstørret.
 — 21—24. Spikler paa Bagkroppen, forstørret.
 — 25. Et Tversnit af den øverste Del af Svælget, tegnet under Camera lucida, 550 Gange forstørret. *a*, Endothelceller; *b*, Gangliaceller; *c*, Nerveceller.
 — 26. Endothelceller, fremstillet ved Maceration og tegnet under Camera lucida, 550 Gange forstørret.
 — 27. Pidskeceller (Geisselcellen) fra Svælgruben, fremstillet ved Maceration, forstørret.
 — 28. Sammenhængende Pidskeceller fra Svælgruben, fremstillet ved Maceration, forstørret.
 — 29. En isoleret Pidskecelle med sin Svøbe, fremstillet ved Maceration, alt tegnet under Camera lucida, 550 Gange forstørret.

Explanation of the Plates.

- Pl. I. Fig. 1. *Vøringia mirabilis*; natural size.
 — 2. A small branch of the same; magnified.
 — 3. A polyp; magnified.
 — 4. A tentacle; magnified.
 — 5. Polyhedral ectoderm cells; magnified.
 — 6. Oblong ectoderm cells; magnified.
 — 7. Connective-tissue corpuscles; magnified.
 — 8—10. Spicules of the stem; magnified.
 — 11. 12. Spicules of the basal part; magnified.
 — 13. Section of a small branch; magnified.
 — 14. Spicule of the branches; magnified.
 — 15. Transversal section of a polyp; magnified. *a*. Ectoderm. *b*. Connective-tissue containing spicules. *c*. The muscular layer. *d*. Connective-tissue. *e*. Gullet-cavity.
 — 16—18. Spicules of the anterior body; magnified.
 — 19. 20. Spicules of the mesial body; magnified.
 — 21—24. Spicules of the posterior body; magnified.
 — 25. Transversal section of the uppermost part of the gullet, drawn under the *camera-lucida*; magnified by 550 powers. *a*. Endothelial-cells. *b*. Ganglial-cells. *c*. Neural-cells.
 — 26. Endothelial cells, obtained on maceration; drawn under the *camera-lucida*; magnified by 550 powers.
 — 27. Flagelliform cells (the geissel-cell) of the gullet-groove, obtained on maceration; magnified.
 — 28. Continuous flagelliform cells of the gullet-groove, obtained on maceration; magnified.
 — 29. An isolated flagelliform cell with its flagellum, obtained on maceration; drawn under the *camera-lucida*; magnified by 550 powers.

- Tab. I. Fig. 30. En encellet Slimkjertel, fremstillet ved Maceration, tegnet under Camera lucida, 550 Gange forstørret.
- 31. En Gangliecelle med Udløber, fremstillet ved Maceration, tegnet under Camera lucida, 550 Gange forstørret.
 - 32. Et Tversnit af en Tentakel, forstørret. *a*, Ectodermceller; *b*, Bindevæv, hvori Spikler; *c*, Muskellag; *d*, Endothelceller.
 - 33. Spikler paa Tentaklerne, forstørret; *a*, et simpelt Kors.
 - 34—39. Spikler paa Tentaklerne, stærkere forstørret.
 - 40. Svælget med Spikelrækker, opskåret efter Længden og udslaaet, forstørret. *a*, Spikler.

Tab. II. Fig. 1. Tversnit af en Gren af *Væringia mirabilis*, forstørret. *a*, Ernæringskanal med sit Epithel; *b*, en mindre Saftkanal, der korresponderer med en Bindevævscelles Udløber; *c*, *d*, Bindevævsceller med Udløbere.

- 2. Tversnit af Svælgets Midtparti hos *Væringia mirabilis*, forstørret. *a*, Svælgruben; *b*, den sammenlignede Rand af Pidskecellernes fri Ende, hvorfra Pidsken udgaar; *c*, Pidskecellerne med deres Kjerne; *d*, encellede Slimkjertler; *e*, Slimkjertelens Udførselsgang.
- 3—10. Spikler fra Polypkroppen og Tentaklerne hos *Væringia fruticosa*, forstørret.
- 11. En Tentakel af *Væringia fruticosa*, forstørret.
- 12. Svælget af *Væringia fruticosa*, spaltet efter Længden og udslaaet med sine 4 Spikelrækker, forstørret.
- 13. Spiklerne paa Svælget, forstørret.
- 14. *Væringia abyssicola*, naturlig Størrelse.
- 15. En Gren af samme, forstørret.
- 16. Endel af Polypkroppen med 3 Tentakler, forstørret. *a*, den nederste Del af Kroppen; *b*, Forkroppen; *c*, Tentakel.
- 17. En Tentakel, forstørret.
- 18—25. Spikler paa Stammen, Grenene og tildels paa Polypens Bagkrop, forstørret.
- 26. 27. Spikler paa Polypens Bagkrop, forstørret.
- 28—33. Spikler paa Polypens Forkrop, forstørret.
- 34—36. Spikler paa Tentaklerne, forstørret.
- 37—40. Spikler paa Pinnulerne, forstørret.

- Pl. I. Fig. 30. A unicellular mucous gland, obtained on maceration; drawn under the *camera-lucida*; magnified by 550 powers.
- 31. A ganglial cell with prolongation, obtained on maceration; drawn under the *camera-lucida*; magnified by 550 powers.
 - 32. A transversal section of a tentacle; magnified. *a*. Ectoderm cells. *b*. Connective-tissue containing spicules. *c*. Muscular layer. *d*. Endothelial-cells.
 - 33. Spicules of the tentacles; magnified. *a*, A plain cruciform.
 - 34—39. Spicules of the tentacles; considerably magnified.
 - 40. The gullet, with spicular series, dissected longitudinally and folded back; magnified. *a*. Spicules.

Pl. II. Fig. 1. Transversal section of a branch of *Væringia mirabilis*; magnified. *a*. Nutritory duct with its epithelium. *b*. A minute nutritory duct, which corresponds with a connective-tissue cells prolongation. *c*, *d*. Connective-tissue cells with prolongations.

- 2. Section of the mesial part of the gullet in *Væringia mirabilis*; magnified. *a*. The gullet-cavity. *b*. The concreted margin of the free extremity of the flagelliform cells from which the flagellum proceeds. *c*. The flagelliform cells with their nuclei. *d*. Unicellular mucous glands. *e*. Excretory duct of the mucous gland.
- 3—10. Spicules of the body of the polyp, and of the tentacles, in *Væringia fruticosa*; magnified.
- 11. A tentacle of *Væringia fruticosa*; magnified.
- 12. The gullet of *Væringia fruticosa*, split longitudinally and folded back, with its 4 spicular series; magnified.
- 13. The spicules of the gullet; magnified.
- 14. *Væringia abyssicola*; natural size.
- 15. A branch of same; magnified.
- 16. A portion of the polyp-body, with 3 tentacles; magnified. *a*. The lowest part of the body. *b*. The anterior body. *c*. A tentacle.

Fig. 17. A tentacle; magnified.

- 18—25. Spicules of the stem, the branches, and also, partly, of the posterior polyp-body; magnified.
- 26. 27. Spicules of the posterior body of the polyp; magnified.
- 28—33. Spicules of the anterior body of the polyp; magnified.
- 34—36. Spicules of the tentacles; magnified.
- 37—40. Spicules of the pinnules; magnified.

- Tab. II. Fig. 41. Svælget med sine Spikelrækker, forstørret.
 — 42—45. Spikler paa Basaldelen hos *Duva arborescens*, forstørret.
 — 46—48. Spikler paa Stammens nedre Del hos *Duva arborescens*, forstørret.
 — 49. Spikel fra Stammens Midtparti hos *Duva arborescens*, forstørret.
 — 50. Spikel fra Stammens øverste Del hos *Duva arborescens*, forstørret.
 — 51—54. Spikler paa Polypkroppen hos *Duva arborescens*, forstørret.

- Tab. III. Fig. 1. *Duva arborescens*, naturlig Størrelse.
 — 2. En Gren af samme, forstørret.
 — 3. To Polyper af samme, forstørret.
 — 4—8. Spikler fra Stammens øverste Del og tildels fra Hovedgrenene hos den samme, forstørret.
 — 9—11. Firlinger og Dobbeltstjerne fra Grenene hos den samme, forstørret.
 — 12—17. Spikler fra Smaagrene hos den samme, forstørret.
 — 18. *Duva spitsbergensis* i naturlig Størrelse.
 — 19. En Polyp af den samme, forstørret.
 — 20—25. Spikler fra Basaldelen af den samme, forstørret.
 — 26—29. Spikler fra Polypkroppen af den samme, forstørret.
 — 30. *Duva violacea*, naturlig Størrelse.
 — 31. En Gren af samme, lidt forstørret.
 — 32. En Gruppe af 3 Polyper, hvoraf den ene seet fra Rygsiden, forstørret.
 — 33. En Polyp seet fra Bugsiden, forstørret.
 — 34—41. Spikler fra Basaldelen af den samme, forstørret.
 — 42—52. Spikler fra Polypkroppen, forstørret.

- Tab. IV. Fig. 1. *Duva aurantiaca*, naturlig Størrelse.
 — 2. En Gren af samme, lidt forstørret.
 — 3. To Polyper, sammenvoxede ved Grunden idet de gaa over i Stilken, opskaarne efter Længden og forstørret. Ved Grunden af den ene Polyp sees Æg.
 — 4. En Polyp, seet fra Bugen, forstørret.
 — 5—13. Spikler fra Basaldelen, forstørret.
 — 14—19. Spikler fra Stammen, forstørret.
 — 20—28. Spikler paa Grene, Smaagrene og Stilke, forstørret.
 — 29—41. Spikler fra Polypkroppen og Tentaklerne, forstørret.
 — 42. *Duva frigida*, noget forstørret.

- Pl. II. Fig. 41. The gullet with its spicular series; magnified.
 — 42—45. Spicules of the basal part in *Duva arborescens*; magnified.
 — 46—48. Spicules of the lower part of the stem in *Duva arborescens*; magnified.
 — 49. Spicule of the mesial part of the stem in *Duva arborescens*; magnified.
 — 50. Spicule of the uppermost part of the stem in *Duva arborescens*; magnified.
 — 51—54. Spicules of the body of the polyp in *Duva arborescens*; magnified.

- Pl. III. Fig. 1. *Duva arborescens*, natural size.
 — 2. A branch of the same; magnified.
 — 3. Two polyps of the same; magnified.
 — 4—8. Spicules of the uppermost part of the stem and, partly, of the main branches of the same; magnified.
 — 9—11. Quadruplets, and bistellates of the branches of the same; magnified.
 — 12—17. Spicules of the branchlets of the same; magnified.
 — 18. *Duva spitzbergensis*; natural size.
 — 19. A polyp of the same; magnified.
 — 20—25. Spicules of the basal part of the same; magnified.

- Fig. 26—29. Spicules of the body of the polyp of the same; magnified.
 — 30. *Duva violacea*; natural size.
 — 31. A branch of the same; somewhat magnified.
 — 32. A group of 3 polyps, of which one is viewed from the dorsal side; magnified.
 — 33. A polyp, viewed from the ventral side; magnified.
 — 34—41. Spicules of the basal part of the same; magnified.
 — 42—52. Spicules of the body of the polyp; magnified.

- Pl. IV. Fig. 1. *Duva aurantiaca*; natural size.
 — 2. A branch of the same; somewhat magnified.
 — 3. Two polyps concreted at the base where they become produced into the stem, dissected longitudinally; magnified. At the base of one of the polyps ova are visible.
 — 4. A polyp viewed ventrally; magnified.
 — 5—13. Spicules of the basal part; magnified.
 — 14—19. Spicules of the stem; magnified.
 — 20—28. Spicules of the branches, branchlets, and stems; magnified.
 — 29—41. Spicules of the body of the polyp and the tentacles; magnified.
 — 42. *Duva frigida*; somewhat magnified.

- Tab. IV. Fig. 43. 3 Polyper, sammenvoxede ved Grunden, forstørret.
- 44—54. Spikler fra Basaldelen, forstørret,
 - 55—59. Spikler fra Stammen, forstørret.
 - 60, a, Spikler fra Tentaklernes Grund og Forkrop; b, Spikler paa den øvrige Del af Tentaklernes aborale Side, forstørret.
 - 61—64. Spikler fra Forkroppen, forstørret.
 - 65. 66. Spikler fra Tentaklerne, forstørret.
 - 67—69. Spikler fra Bagkroppen, forstørret.

- Tab. V. Fig. 1. *Duva flava*, naturlig Størrelse.
- 2. En Gren af samme, forstørret.
 - 3. En Polyp af samme, forstørret.
 - 4—16. Spikler fra Basaldelen og den nederste Del af Stammen, forstørret.
 - 17—20. Spikler fra Stammens øverste Del, forstørret.
 - 21—33. Spikler fra Polypkroppen, forstørret.
 - 34. *Duva glacialis*, naturlig Størrelse.
 - 35. En Gren af samme, forstørret.
 - 36. En Polyp af samme, seet fra Ryggen, forstørret.
 - 37. En Polyp af samme, seet halvt fra Bugen, halvt fra Siden, forstørret.
 - 38—49. Spikler fra Basaldelen, forstørret.
 - 50—58. Spikler fra Stammen, forstørret.
 - 59—66. Spikler fra Stammens øvre Del, forstørret.
 - 67—75. Spikler fra Polypkroppen, forstørret.
 - 76—81. Spikler fra Tentaklerne, forstørret.
 - 82. *Duva cinerea*, forstørret. Den ved Siden staaende Linie betegner den naturlige Høide.
 - 83. En Gren af samme, forstørret.
 - 84. En Gruppe Polyper, forstørret; i den ene Polyps forlængede Mavehulhed sees et Æg.
 - 85—93. Spikler fra Basaldelen, forstørret.

- Tab. VI. Fig. 1—8. Spikler fra Basaldelen af *Duva cinerea*, forstørret.
- 9—13. Spikler fra den nederste Del af Stammen hos *Duva cinerea*, forstørret.
 - 14—22. Spikler fra Polypkroppen, forstørret.
 - 23—29. Spikler fra Tentaklerne, forstørret.
 - 30. *Drifa islandica*, naturlig Størrelse.
 - 31. En Gren af samme, forstørret.

- Pl. IV. Fig. 43. 3 polyps concreted together at the base; magnified.
- 44—54. Spicules of the basal part; magnified.
 - 55—59. Spicules of the stem; magnified.
 - 60. a. Spicules of the base and anterior body of the tentacles. b. Spicules of the remaining parts of the aboral side of the tentacles; magnified.
 - 61—64. Spicules of the anterior body; magnified.
 - 65. 66. Spicules of the tentacles; magnified.
 - 67—69. Spicules of the posterior body; magnified.

- Pl. V. Fig. 1. *Duva flava*; natural size.
- 2. A branch of the same; magnified.
 - 3. A polyp of the same; magnified.
 - 4—16. Spicules of the basal part and lowest part of the stem; magnified.
 - 17—20. Spicules of the uppermost part of the stem; magnified.
 - 21—33. Spicules of the body of the polyp; magnified.
 - 34. *Duva glacialis*; natural size.
 - 35. A branch of the same; magnified.
 - 36. A polyp of the same, viewed dorsally; magnified.
 - 37. A polyp of the same, viewed semi-ventrally and semi-laterally; magnified.
 - 38—49. Spicules of the basal part; magnified.
 - 50—58. Spicules of the stem; magnified.
 - 59—66. Spicules of the upper part of the stem; magnified.
 - 67—75. Spicules of the body of the polyp; magnified.
 - 76—81. Spicules of the tentacles; magnified.
 - 82. *Duva cinerea*; magnified. The line which is placed at the side indicates the natural height.
 - 83. A branch of the same; magnified.
 - 84. A group of polyps; magnified. In the prolonged abdominal cavity an ovum is visible.
 - 85—93. Spicules of the basal part; magnified.
- Pl. VI. Fig. 1—8. Spicules of the basal part of *Duva cinerea*; magnified.
- 9—13. Spicules of the lowest part of the stem in *Duva cinerea*; magnified.
 - 14—22. Spicules of the body of the polyp; magnified.
 - 23—29. Spicules of the tentacles; magnified.
 - 30. *Drifa islandica*; natural size.
 - 31. A branch of the same; magnified.

- Tab. VI. Fig. 32. Polyper af samme, forstørret.
- 33. En Del af en Polyp, opskaaren efter Længden; *a*, det triangulære Spatium uden Spikler men rigt paa Nematocyster, forstørret.
 - 34. Isolerede Nematocyster.
 - 35—42. Spikler fra Basaldelen, forstørret.
 - 43—49. Spikler fra Stammen, forstørret.
 - 50—54. Spikler fra Stammens øverste Del og Grenene, forstørret.
 - 55—59. Spikler fra Smaagrenene, forstørret.
 - 60—63. Spikler fra Polypens Forkrop, forstørret.
 - 64—68. Spikler fra dens Bagkrop, forstørret.
 - 69—71. Spikler fra Tentaklerne, forstørret.

- Tab. VII. Fig. 1. *Drifa hyalina*, naturlig Størrelse.
- 2. En Gren af samme, forstørret.
 - 3. En Polyp af samme; ved dens Grund to unge Polyper, forstørret.
 - 4. En Polyp af samme, opskaaret efter Længden og udslaaet, forstørret.
 - 5. Et Tversnit af en Gren, forstørret. *a*, Ectodermceller; *b*, det indre Lag af samme; *c*, encellet Slimkjertel med Udførselsgang; *d*, Bindevæv; *e*, Bindevævslegemer; *f*, Spikel.
 - 6. Et Tversnit af Polypkroppens Hud, forstørret. *a*, Ectodermceller; *b*, encellede Slimkjertler; *c*, Spikel.
 - 7. Et Tversnit af en Polyp, forstørret. *a*, Septum imellem Kropsvæggen og Svælget; *b*, Længdemuskler paa Septum; *c*, Tvermuskler paa samme; *d*, Endothelceller paa den ydre Svælgvæg; *e*, encellede Slimkjertler paa Svælgets indre Væg; *f*, Svælghulheden; *g*, Svælggruben med sine Pidskeceller.
 - 8—15. Spikler paa Basaldelen, forstørret.
 - 16—26. Spikler paa Stammens øvre Del, forstørret.
 - 27—32. Spikler paa Grenene, forstørret.
 - 33—37. Spikler paa Polypens Forkrop, forstørret.
 - 38—40. Spikler paa Bagkroppen, forstørret.

- Pl. VI Fig. 32. Polyper of the same; magnified.
- 33. A portion of a polyp, dissected longitudinally. *a*. The triangular space devoid of spicules, but abundantly furnished with nematocysts; magnified.
 - 34. Isolated nematocysts.
 - 35—42. Spicules of the basal part; magnified.
 - 43—49. Spicules of the stem; magnified.
 - 50—54. Spicules of the uppermost part of the stem and the branches; magnified.
 - 55—59. Spicules of the branchlets; magnified.
 - 60—63. Spicules of the anterior body of the polyp; magnified.
 - 64—68. Spicules of the posterior body of the polyp; magnified.
 - 69—71. Spicules of the tentacles; magnified.

- Pl. VII. Fig. 1. *Drifa hyalina*; natural size.
- 2. A branch of the same; magnified.
 - 3. A polyp of the same; at its base two young polyps visible; magnified.
 - 4. A polyp of the same, dissected longitudinally and folded back; magnified.
 - 5. A section of a branch; magnified. *a*. Ectoderm-cells. *b*. The interior layer of same. *c*. Unicellular mucous gland with excretory duct. *d*. Connective-tissue. *e*. Connective-tissue corpuscles. *f*. Spicule.
 - 6. A transversal section of the dermal covering of the body of the polyp; magnified. *a*. Ectoderm-cells. *b*. Unicellular mucous glands. *c*. Spicule.
 - 7. Transversal section of a polyp; magnified. *a*. Septum between the wall of the body and the gullet. *b*. Longitudinal muscles of the septum. *c*. Transversal muscles of the same. *d*. Endothelial cells of the exterior gullet-wall. *e*. Unicellular mucous gland of the interior wall of the gullet. *f*. The gullet-cavity. *g*. The gullet-cavity with its flagelliform cells.
 - 8—15. Spicules of the basal part; magnified.
 - 16—26. Spicules of the remaining parts of the stem; magnified.
 - 27—32. Spicules of the branches; magnified.
 - 33—37. Spicules of the anterior body of the polyp; magnified.
 - 38—40. Spicules of the posterior body of the polyp; magnified.

Tab. VII. Fig. 41—44. Spikler paa Tentaklerne, forstørret.

- 45. *Nannodendron elegans*, forstørret.
- 46. En Gruppe næsten indtrukne Polyper af samme, forstørret.
- 47. En Polyp af samme, forstørret.

Tab. VIII. Fig. 1. Et Stykke af Stammen af *Nannodendron elegans* med flere Grene, forstørret. *a*, en kolbeformig Gren med Polyper; *b*, Zooider.

- 2. Et Stykke af et Tversnit af en Gren, berøvet sin Kalk, forstørret. *a*, Ectodermceller; *b*, Hulrum i Ectodermet, hvori Spiklerne ligge; *c*, Ernæringskanal i det hyaline Bindevæv; *d*, Bindevævslegeme med Udlobere; *e*, Saftkanaler med sit Epithel; *f*, Ernæringskanaler i Bindevævsforlængelserne; *g*, Zooide.

- 3. Svælget med sine to Rækker Spikler, forstørret.
- 3'3'3'. Spiklerne paa Svælget, forstørret.
- 4—20. Spikler paa Basaldelen, forstørret.
- 21—43. Spikler paa Stammen, forstørret.
- 44—54. Spikler paa Grenene, forstørret.
- 55—65. Spikler paa Polypkroppen, forstørret.
- 66—76. Spikler paa Tentaklerne, forstørret.

Tab. IX. Fig. 1. *Veringia polaris*, naturlig Størrelse; *a*, Stolon.

- 2. En Gruppe Polyper af samme, forstørret.
- 3—9. Basaldelens Spikler, forstørret.
- 10. 11. Spikler paa Stammen, forstørret.
- 12—22. Spikler paa Grenene, forstørret.
- 23—28. Spikler paa Polypkroppen, forstørret.
- 29—33. Spikler paa Tentaklerne og deres Pinnuler, forstørret.
- 34. Svælget med dets 8 Rækker Spikler, forstørret.
- 35—40. Svælgets Spikler, forstørret.
- 41. *Veringia pygmæa*, naturlig Størrelse.
- 42. En Polyp af samme, forstørret.
- 43. En Tentakel af samme, forstørret.
- 44. 45. Sammensatte Stjerner fra Basaldelen, forstørret.
- 46. Dobbeltstjerne fra Basaldelen, forstørret.

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

Pl. VII. Fig. 41—44. Spicules of the tentacles; magnified.

- 45. *Nannodendron elegans*; magnified.
- 46. A group of almost retracted polyps of the same; magnified.
- 47. A polyp of the same; magnified.

Pl. VIII. Fig. 1. A portion of the stem of *Nannodendron elegans*, with several branches; magnified. *a*. A claviform branch with polyps. *b*. Zoooids.

- 2. A portion of the section of a branch, freed of its calcium; magnified. *a*. Ectoderm-cells. *b*. Cavity in the ectoderm, in which the spicules are placed. *c*. Nutritory duct of the hyaline connective-tissue. *d*. Connective-tissue corpuscles with prolongations. *e*. Nutritory ducts with their epithelium. *f*. Nutritory ducts in the connective-tissue prolongations. *g*. Zoooids.

- 3. The gullet with its two series of spicules; magnified.
- 3'3'3'. Spicules of the gullet; magnified.
- 4—20. Spicules of the basal part; magnified.
- 21—43. Spicules of the stem; magnified.
- 44—54. Spicules of the branches; magnified.
- 55—65. Spicules of the body of the polyp; magnified.
- 66—76. Spicules of the tentacles; magnified.

Pl. IX. Fig. 1. *Veringia polaris*; natural size. *a*. The stolon.

- 2. A group of polyps of the same; magnified.
- 3—9. Spicules of the basal part; magnified.
- 10. 11. Spicules of the stem; magnified.
- 12—22. Spicules of the branches; magnified.
- 23—28. Spicules of the body of the polyp; magnified.
- 29—33. Spicules of the tentacles and their pinnules; magnified.
- 34. The gullet with its 8 series of spicules; magnified.
- 35—40. Spicules of the gullet; magnified.
- 41. *Veringia pygmæa*, life size.
- 42. A polyp of the same; magnified.
- 43. A tentacle of the same; magnified.
- 44. 45. Complex stellates of the basal part; magnified.
- 46. Bistellates of the basal part; magnified.

- Tab. IX. Fig. 47. 48. *Vøringia pygmæa*. Mindre udviklede Dobbeltstjerner fra Basaldelen, forstørret.
- 49. En takket Kolle fra Basaldelen, forstørret.
 - 50. Bladet Klubbe fra Basaldelen, forstørret.
 - 51—57. Firlinger fra Basaldelen, forstørret.
 - 58—61. Dobbeltstjerner fra Stammen og Grenene, forstørret.
 - 62—64. Firlinger fra Stammen og Grenene, forstørret.
 - 65. 66. Spindler fra Stammen og Grenene, forstørret.
 - 67. Klubformet Firling fra Stammen og Grenene, forstørret.
 - 68—72. Spikler paa Overgangen fra Gren til Polyp, forstørret.
 - 73—75. Spikler fra Polypens Bagkrop, forstørret.
 - 76. 77. Spikler fra Polypens Forkrop, forstørret.
 - 78—83. Spikler fra Tentaklerne, forstørret.
 - 86—88. Spikler fra Tentaklernes Sider, forstørret.
 - 89. Svælget med dets 4 Spikelrækker, aabnet efter Længden og slaet til Side, forstørret.
 - 84. 85. 90. Spikler fra Svælget, forstørret.

- Tab. X. *Fulla Schiertzi*.
Fig. 1—3. Spikler fra Basaldelens Coenenchym, forstørret.
- 4. 5. Dobbeltstjerner, seet dels fra oven, dels paaskraas fra Basaldelen, forstørret.
 - 6—9. Fuldt udviklede Dobbeltstjerner fra Basaldelen, forstørret.
 - 10. Mindre udviklede Dobbeltstjerner fra Basaldelen, forstørret.
 - 11. 12. Firlinger fra Basaldelen, forstørret.
 - 13—15. Spikler fra Stammens nederste Del, forstørret.
 - 16—21. Spikler fra Stammens midterste Del, forstørret.
 - 22—27. Spikler fra Grenene, forstørret.
 - 28—31. Spikler fra Smaagrenene, forstørret.
 - 32—38. Spikler fra Polypernes Bagkrop, forstørret.
 - 39. 40. Spikler paa Grændsen imellem For- og Bagkrop, forstørret.
 - 41—43. Spikler paa Forkroppen, forstørret.

- Pl. IX. Fig. 47. 48. *Vøringia pygmæa*. Partially developed bistellates of the basal part; magnified.
- 49. A spicate subclavate of the basal part; magnified.
 - 50. Foliated clavate of the basal part; magnified.
 - 51—57. Quadruplets of the basal part; magnified.
 - 58—61. Bistellates of the stem and branches; magnified.
 - 62—64. Quadruplets of the stem; and branches; magnified.
 - 65. 66. Fusees of the stem and branches; magnified.
 - 67. Claviform quadruplet of the stem and branches; magnified.
 - 68—72. Spicules on the transition from the branch to the polyp; magnified.
 - 73—75. Spicules of the posterior body of the polyp; magnified.
 - 76. 77. Spicules of the anterior body of the polyp; magnified.
 - 78—83. Spicules of the tentacles; magnified.
 - 86—88. Spicules of the sides of the tentacles; magnified.
 - 89. The gullet with its 4 spicular series, dissected longitudinally and folded aside; magnified.
 - 84. 85. 90. Spicules of the gullet; magnified.

- Pl. X. *Fulla Schiertzi*.
Figs. 1—3. Spicules of the sarcosoma of the basal part; magnified.
- 4. 5. Bistellates of the basal part, viewed partly superiorly, partly diagonally; magnified.
 - 6—9. Fully developed bistellates of the basal part; magnified.
 - 10. Partially developed bistellates of the basal part; magnified.
 - 11. 12. Quadruplets of the basal part; magnified.
 - 13—15. Spicules of the lowest part of the stem; magnified.
 - 16—21. Spicules of the mesial part of the stem; magnified.
 - 22—27. Spicules of the branches; magnified.
 - 28—31. Spicules of the branchlets; magnified.
 - 32—38. Spicules of the posterior body of the polyp; magnified.
 - 39. 40. Spicules of the margin between the the anterior and posterior body; magnified.
 - 41—43. Spicules of the anterior body; magnified.

- Tab. X. Fig. 44—51. Spikler paa Tentaklerne og deres Pinnuler, forstørret.
- 52—57. Spikler paa Svælget, forstørret.
 - 58. *Fulla Schiertzi*, seet halvt fra Bugen, halvt fra Siden, naturlig Størrelse.
 - 59. Den samme, seet fra Ryggen, forstørret.
 - 60. En Gren af den samme, forstørret.
 - 61. En Polyp, forstørret. *a*, Spiklerne paa Bagkroppen.
 - 62. Tversnit af Stammens Hud, forstørret. *a*, Polyædriske Ectodermceller; *b*, aflange Ectodermceller i det dybere Lag; *c*, encellede Slimkjertler; *d*, Rum, hvori Spikler ligge, og paa hvis Rand aflange Ectodermceller kan sees; *e*, det brede, hyaline Binde-vævslag; *f*, Nutritionskanaler med deres Epithel; *g*, Bindevævslegemer med Udløbere.
 - 63. En Gren, overskaaret for at vise Kanalerne, forstørret. *a*, 7 Kanaler.
 - 64. Et Tversnit af en stor Gren, forstørret. *a*, det smale Bindevævslag paa Siderne, hvorfra Polyperne udgaa; *b*, det brede Bindevævslag paa Bug- og Rygside.
 - 65. Et Tversnit af en Polyp, omtrent paa Midten, forstørret. *a*, Ectoderm; *b*, hyalint Bindevæv; *c*, Septa; *d*, Musklerne paa samme; *e*, Svælggruben.
 - 66. Svælget med sine Spikler, forstørret.
- Tab. XI. Fig. 1. *Nephtya flavescens*, forstørret. Stregen ved Siden betegner den naturlige Størrelse.
- 2. En Gren, forstørret.
 - 3. En Polyp, forstørret.
 - 4. En Tentakel, forstørret.
 - 5. En Polyp, hvor Forkroppen er betydeligt opsvulmet, Tentaklerne sammenlimede og deres Ender nedbøiede, forstørret.
 - 6. Tversnit af en saadan Polyps Forkrop. *a*, den fortykkede Svælgvæg; *b*, Embryoner i forskjellig Udvikling, opholdende sig i Svælg hulheden.
 - 7—18. Spikler fra Basaldelen, forstørret.
 - 19—23. Spikler fra Stammens nederste Del, forstørret.
 - 24—28. Spikler fra Stammens øverste Del, forstørret.

- Pl. X. Fig. 44—51. Spicules of the tentacles and their pinnules; magnified.
- 52—57. Spicules of the gullet; magnified.
 - 58. *Fulla Schiertzi*, viewed semi-ventrally and semi-laterally; natural size.
 - 59. The same, viewed dorsally; magnified.
 - 60. A branch of the same; magnified.
 - 61. A polyp; magnified. *a*. Spicules of the posterior body.
 - 62. Transversal section of the dermal covering of the stem; magnified. *a*. Polyhedral ectoderm-cells. *b*. Oblong ectoderm-cells of the deeper layers. *c*. Unicellular mucous glands. *d*. Cavities in which spicules are placed, and on whose margins oblong ectoderm-cells are visible. *e*. The broad hyaline connective-tissue layer. *f*. Nutritory ducts with their epithelium. *g*. Connective-tissue corpuscles with prolongations.
 - 63. A branch cut across to show the ducts; magnified. *a*. 7 ducts.
 - 64. A transversal section of a large branch; magnified. *a*. The narrow connective-tissue layer on the sides from which the polyps shoot out. *b*. The broad connective-tissue layer of the ventral and dorsal sides.
 - 65. A transversal section of a polyp, about its mesial part; magnified. *a*. Ectoderm. *b*. Hyaline connective-tissue. *c*. Septa. *d*. Muscles of the same. *e*. The gullet-cavity.
 - 66. The gullet with its spicules; magnified.
- Pl. XI.
- 1. *Nephtya flavescens*; magnified. The line at the side indicates the natural size.
 - 2. A branch of same; magnified.
 - 3. A polyp of same; magnified.
 - 4. A tentacle of same; magnified.
 - 5. A polyp whose anterior body is considerably expanded; the tentacles glued together, and their extremities curved inwards; magnified.
 - 6. Transverse section of a similar polyps anterior body. *a*. The tumified gullet wall. *b*. Embryons, in various stages of development, located in the gullet-cavity.
 - 7—18. Spicules from the basal part; magnified.
 - 19—23. Spicules from the lowest part of the stem; magnified.
 - 24—28. Spicules from the uppermost part of the stem; magnified.

- 29—31. Spikler fra Grenene, forstørret.
- 32—36. Spikler fra Polypens Bagkrop, forstørret.
- 37—39. Spikler fra Polypens Forkrop, forstørret.
- 40. Et Embryo, forstørret.
- 41—58. Spikler fra Larvens Ectoderm, forstørret.

- Tab. XII. Fig. 1. *Nephtya rosea* i naturlig Størrelse.
- 2. En Gren af samme, forstørret. *a*, kugleformet Polyp, hvori Yngel.
 - 3. En Polyp, forstørret.
 - 4. En Polyp, seet fra Ryggen, forstørret. *a*, det nøgne, triangulære Spatium imellem Tentaklernes Grunddel.
 - 5—8. Spikler i Form af bladede Klubber fra Basaldelen, forstørret.
 - 9—15. Spikler i Form af sammensatte Stjerner fra Basaldelen, forstørret.
 - 16. 17. Spikler i Form af Dobbeltstjerner fra Basaldelen, forstørret.
 - 18—20. Spikler i Form af Firlinger fra Basaldelen, forstørret.
 - 21. 22. Mindre udviklede Spikler fra Basaldelen, forstørret.
 - 23—25. Dobbeltstjerner fra Stammen, forstørret.
 - 26—29. Sammensatte Stjerner fra Stammen, forstørret.
 - 30—33. Bladede Klubber fra Stammen, forstørret.
 - 34. Skaftet Stjerne fra Stammen, forstørret.
 - 35. Mindre udviklet Dobbeltstjerne fra Stammen, forstørret.
 - 36. 37. Dobbeltstjerner fra Grenene, forstørret.
 - 38. Mindre udviklede Dobbeltstjerner fra Grenene, forstørret.
 - 39. 40. Sammensatte Stjerner fra Grenene, forstørret.
 - 41. 42. Mindre udviklede, sammensatte Stjerner fra Grenene, forstørret.
 - 43—47. Bladede Køller fra Polypkroppen, forstørret.
 - 48. 49. Takkede Spindler fra Polypkroppen, forstørret.
 - 50. 51. Mindre Spikler fra Polypkroppen, forstørret.
 - 52—58. Spikler fra Tentaklerne, forstørret.
 - 59. Korsformet Spikel fra Polypkroppen, forstørret.

- Pl. XI. Fig. 29—31. Spicules from the branches; magnified.
- 32—36. Spicules from the posterior body of the polyp; magnified.
 - 37—39. Spicules from the anterior body of the polyp; magnified.
 - 40. An embryo; magnified.
 - 41—58. Spicules from the ectoderm of the larva; magnified.

- Pl. XII. Fig. 1. *Nephtya rosea*; natural size.
- 2. A branch of same; magnified. *a*. Globular polyp containing young.
 - 3. A polyp; magnified.
 - 4. A polyp, dorsal aspect; magnified. *a*. The bare triangular area between the bases of the tentacles.
 - 5—8. Foliaceous clavate spicules from the basal part; magnified.
 - 9—15. Complex stellate spicules from the basal part; magnified.
 - 16. 17. Bistellate spicules from the basal part; magnified.
 - 18—20. Quadruplet spicules from the basal part; magnified.
 - 21. 22. Imperfectly developed spicules from the basal part; magnified.
 - 23—25. Bistellate spicules from the stem; magnified.
 - 26—29. Complex stellate spicules from the stem; magnified.
 - 30—33. Foliaceous clavate spicules from the stem; magnified.
 - 34. Shafted stellate spicule from the stem; magnified.
 - 35. Imperfectly developed bistellate spicules from the stem; magnified.
 - 36. 37. Bistellate spicules from the branches; magnified.
 - 38. Imperfectly developed bistellate spicules from the branches; magnified.
 - 39. 40. Complex stellate spicules from the branches; magnified.
 - 41. 42. Imperfectly developed complex stellate spicules from the branches; magnified.
 - 43—47. Foliaceous subclavate spicules from the polyp-body; magnified.
 - 48. 49. Spicate fusiform spicules from the polyp-body; magnified.
 - 50. 51. Smaller spicules from the polyp-body; magnified.
 - 52—58. Spicules from the tentacles; magnified.
 - 59. Cruciform spicule from the polyp-body; magnified.

- Tab. XII. Fig. 60. Et Æg i Morbærstadiet fra *Nephtya rosea*, forstørret.
- 61. Et begyndende Embryo, forstørret.
 - 62. Antydning til Gastruladannelse, forstørret.
 - 63. En Larve, i hvis Ectoderm begyndende Spikeldannelse, behandlet med kaustisk Kalilud og Glycerin, forstørret.
 - 64. Spiklerne fra samme, forstørret.
 - 65. En noget videre udviklet Larve, der har krummet sig indeni Ægget, og i hvis Ectoderm sees en rigere Spikeludvikling, behandlet paa samme Maade, forstørret.
 - 66. En saadan Larve, udtagen af Ægget, forstørret.
 - 67. Spikler fra sammes Ectoderm, forstørret.
 - 68—70. Mere udviklede Larver med tydelig Gastrulamund, af hvilke Fig. 68 og 70 ere udtagne af Ægget, imedens 69 endnu ligger i samme. Spikelbeklædningen er meget rigere, Spiklerne større og have antaget bestemte Former, forstørret.
 - 71. 72. Spikler fra disse Larver, forstørret.

- Tab. XIII. Fig. 1. Tversnit fra omtrent den midterste Halvdel af en Polyp af *Nephtya rosea*, forstørret. *a*, Ectoderm, hvori Spikler ere indleirede; *b*, Bindevæv; *c*, Septum med sit Endothel; *d*, Svælgruben med sine Pidskeceller.
- 2. *Nephtya polaris*, forstørret. Den naturlige Størrelse betegnes ved den ved Siden angivne Linie.
 - 3. 4. To Exemplarer af den samme, naturlig Størrelse.
 - 5. En Gren af *Nephtya polaris*, forstørret.
 - 6. Tre sammenvoxede Polyper af den samme, seet fra Bugsiden, forstørret.
 - 7. En Polyp af den samme, seet fra Ryggen, forstørret.
 - 8—11. Dobbeltstjerner fra Basaldelen og den nederste Del af Stammen, forstørret.
 - 12. 13. Dobbeltstjerner fra Basaldelen, bladede i den ene Ende, forstørret.
 - 14—16. Dobbeltstjerner fra Stammens øverste Del, forstørret.

- Pl. XII. Fig. 60. An ovum in the mulberry stage, from *Ammothea rosea*; magnified.
- 61. A sprouting embryo; magnified.
 - 62. Indication of gastrula formation; magnified.
 - 63. A larva in whose ectoderm the spicular formation is commencing; treated with solution of caustic potash and glycerine; magnified.
 - 64. Spicules from the same; magnified.
 - 65. A somewhat more developed larva that has curved itself inside the ovum, and in whose ectoderm a richer spicular covering is seen; treated with solution of caustic potash and glycerine; magnified.
 - 66. A similar larva removed from the ovum; magnified.
 - 67. Spicules from its ectoderm; magnified.
 - 68—70. More-developed larvæ with distinct gastrula aperture; of these, figs. 68 and 70 illustrate larvæ removed from the ovum, whilst fig. 69 illustrates a larva in it. The spicular covering is much richer; the spicules larger, and have also attained definite forms; magnified.
 - 71. 72. Spicules from these larvæ; magnified.

- Pl. XIII. Fig. 1. Transversal section made at about the mesial half part of a polyp of *Nephtya rosea*; magnified. *a*. Ectoderm in which spicules are entrenched. *b*. Connective-tissue. *c*. Septum with its endothelium. *d*. Gullet-cavity with its flagelliform-cells.
- 2. *Ammothea polaris*; magnified. The natural size is shown by the line exhibited on the right hand side of the illustration.
 - 3. 4. Two specimens of the same; natural size.
 - 5. A branch of *Nephtya polaris*; magnified.
 - 6. Three concreted polyps of the same, ventral aspect; magnified.
 - 7. A polyp of the same, dorsal aspect, magnified.
 - 8—11. Bistellate spicules from the basal part, and the lowest part of the stem; magnified.
 - 12. 13. Bistellate spicules from the basal part, foliated at the one extremity; magnified.
 - 14—16. Bistellate spicules from the superior part of the stem; magnified.

Tab. XIII. Fig. 17. 18. Takkede Spindler fra Stammens øverste Del, forstørret.

- 19. 20. Spikler fra Stammens øverste Del, forstørret.
- 21—24. Køller fra Polypen, forstørret.
- 25—29. Klubber fra Polypen, forstørret.
- 30—34. Spindler fra Polypen, forstørret.
- 35. Tversnit af et begyndende Embryo, forstørret. *a*, Ectoblast; *b*, Blommekorn.
- 36. Tversnit af et lidt viderekommet Embryo, forstørret. *a*, Ectoderm.
- 37. Tversnit af et længere fremskredet Embryo, forstørret. *a*, Ectoderm; *b*, Fundamentalmembranen (*Membrana propria*).
- 38. Tversnit af et senere Stadium af et Embryo, forstørret. *a*, *Membrana propria*; *b*, Endoderm.
- 39. Tversnit af et Embryo, lidt længere fremskredet, forstørret. Her har Ectodermet kun et Lag Celler, men disse ere langt større. *a*, Bindevævslag; *b*, enkelte smaa Spikler; *c*, *Membrana propria*; *d*, Endoderm.
- 40. Tversnit af et Embryo endnu længere fremskredet i Udviklingen, forstørret. *a*, Bindevævslag; *b*, Ectoderm; *c*, Bindevævsforlængelser (*Mesenterier*); *d*, Endothel; *e*, Aabninger efter udfaldne Spikler.
- 41. Halvt Skraa-, halvt Tversnit af et mere udvoxet Embryo, forstørret. *a*, *Mesenterier*; *b*, Endothel.
- 42. Tversnit af Larvemunden hos et af de længst fremskredne Embryoner, forstørret. *a*, lange Ectodermceller med Cilier.
- 43. 44. Unger, liggende S formigt sammenbøiede i Ægget af *Nephthya polaris*, forstørret.
- 45. Spikler fra sammes Ectoderm, forstørret.

Tab. XIV. Fig. 1. *Gersemiopsis arctica*, noget forstørret; Linien betegner den naturlige Størrelse.

- 2. Et andet Exemplar af den samme, naturlig Størrelse.
- 3. En Gren af samme med sine Smaagrener, forstørret. *a*, en enkeltstaaende Polyp.

Pl. XIII. Fig. 17. 18. Spicate fusiform spicules from the superior part of the stem; magnified.

- 19. 20. Spicules from the superior part of the stem; magnified.
- 21—24. Subclavate spicules from the polyp; magnified.
- 25—29. Clavate spicules from the polyp; magnified.
- 30—34. Fusiform spicules from the polyp; magnified.
- 35. Transversal section of a sprouting embryo; magnified. *a*, Epiblast. *b*, Yoke-grains.
- 36. Transversal section of a somewhat more developed embryo; magnified. *a*, Ectoderm.
- 37. Transversal section of a further developed embryo; magnified. *a*, Ectoderm. *b*, Fundamental membrane (*Membrana propria*).
- 38. Transversal section in a later stage of the embryo; magnified. *a*, *Membrana propria*. *b*, Endoderm.
- 39. Transversal section of an embryo a little more developed; magnified. In this the ectoderm has only one cellular layer, but the cells are far larger. *a*, Connective-tissue layer. *b*, A few small spicules. *c*, *Membrana propria*. *d*, Endoderm.
- 40. Transversal section of an embryo still further advanced in development; magnified. *a*, Connective-tissue layer. *b*, Ectoderm. *c*, Connective-tissue prolongations (*Mesenteries*) *d*, Endothelium. *e*, Gaps left by spicules fallen out.
- 41. Semi-diagonal, semi-transversal section of a more developed embryo; magnified. *a*, *Mesenteries*. *b*, Endothelium.
- 42. Transversal section of the larva-mouth in one of the most advanced embryos; magnified. *a*, Long ectoderm-cells with cilia.
- 43. 44. Young of *Nephthya polaris* lying bent together in S-form in the ovum; magnified.
- 45. Spicules of the ectoderm of same; magnified.

Pl. XIV. Fig. 1. *Gersemiopsis arctica*; somewhat magnified. The line denotes the natural size.

- 2. Another specimen of the same; natural size.
- 3. A branch of the same, with its branchlets; magnified. *a*, An isolated polyp.

Tab. XIV. Fig. 4. Enden af en Smaagren med 4 Polyper, hvoraf de 3 ere sammenvoxede ved Grunden, forstørret.

- 5. Et Tversnit af en Gren, der viser Coenchymets Sparsomhed og Kanalernes Vidde. *a*, Ectoderm; *b*, Bindevæv; *c*, Bindevævsforlængelser, der danne Kanalernes Skillevægge; *d*, Kanal, hvori sees et Æg.
- 6—9. Sammensatte Stjernespicler, forstørret.
- 10—13. Takkede og bladede Klubber.
- 14—17. Dobbeltstjerner.
- 18. Firling.
- 19. Bredendet, vortebesat Spikel, forstørret.
- 20—25. Bladede Klubber med tildels takket Skaft, forstørret.
- 26—28. Dobbeltstjerner, forstørret.
- 29—31. Sammensatte Stjerner, forstørret.
- 32. En liden, takket Kølle, forstørret.
- 33. En Roset, forstørret.
- 34—36. Køller fra Smaagrenene, forstørret
- 37. 38. Tornede Klubber fra samme, forstørret.
- 39—41. Takkede Spindler fra samme, forstørret.
- 42. 43. Sammensat Stjerne fra samme, forstørret.
- 44. Tversnit af en afkalket Polyp, forstørret. *a*, Ectodermceller; *b*, Bindevæv, hvori sees Hulheder efter Spikler; *c*, Ectodermceller, der beklæde disse Hulheders Vægge; *d*, *e*, Endothelceller, der beklæde Kamrene, Septa og den udvendige Flade af Svælget; *f*, Svælgrenden; *g*, Svælgrendens Pidsceller; *h*, kolbeformede, encellede Slimkjertler.
- 45. Tversnit af den øverste Del af Polypen med sit Svælg, strax ovenfor Svælgrendens Begyndelse, forstørret. *a*, listeformigt, ovalt Fremspring fra høire Svælgvæg; *b*, Svælgrenden.
- 46. Tversnit lidt længere nede paa Polypen, forstørret. *a*, det ovale, listeformede Fremspring paa høire Svælgvæg; *b*, Begyndelsen af det andet

Pl. XIV. Fig. 4. Extremity of a branchlet carrying 4 polyps, of which 3 are concreted together at the base; magnified.

- 5. Transversal section of a branch, showing the poverty of the sarcosoma, and the width of the ducts. *a* Ectoderm. *b*. Connective-tissue. *c*. Connective-tissue prolongations forming the divisional walls of the ducts. *d*. Duct in which an ovum is visible.
- 6—9. Complex stellate spicules; magnified.
- 10—13. Spicate and foliated clavates.
- 14—17. Bistellates.
- 18. Quadruplet.
- 19. Nodulous spicule with broad extremity; magnified.
- 20—25. Foliated clavates, with partly spicate shaft; magnified.
- 26—28. Bistellates; magnified.
- 29—31. Complex stellates; magnified.
- 32. A small, spicate, subclavate; magnified.
- 33. A rosette; magnified.
- 34—36. Subclavates of the branchlets; magnified.
- 37. 38. Aculeated clavates of the same; magnified.
- 39—41. Spicate fusees of the same; magnified.
- 42. 43. Complex stellates of the same; magnified.
- 44. Transversal section of a polyp freed from calcium; magnified. *a*. Ectoderm cells. *b*. Connective-tissue, showing cavities left by spicules. *c*. Ectoderm cells which clothe the walls of these cavities. *d*, *e*. Endothelial cells which cloth the chambers, septa, and external surface of the gullet. *f*. The gullet-passage. *g*. Flagelliform-cells of the gullet-passage. *h*. Subclaviform unicellular mucous glands.
- 45. Transversal section of the uppermost part of the polyp with its gullet, immediately above the commencement of the gullet-passage; magnified. *a*. Fillet-formed oval protuberance from the dextral wall of the gullet. *b*. The gullet-passage.
- 46. Transversal section a little further down the polyp; magnified. *a*. The oval fillet-formed protuberance on the dextral wall of the gullet. *b*. The commencement of the second

listeformige Fremspring, der strax gaar over til venstre Side.

Tab. XIV. Fig. 47. Tversnit endnu længere nede paa Polypen, hvilket viser begge Fremspringene i deres største Udbredning, forstørret. *a*, Fremspringet fra høire Væg, der rager over Svælgrenden til venstre Væg; *b*, Fremspringet fra venstre Væg, der naar over til høire Væg.

— 48. Tversnit endnu længere nede paa Polypen, hvor kun den nederste, lave Del af Fremspringet fra høire Væg sees, medens det fra venstre Væg har sin fulde Høide, forstørret. *a*, den lave, nederste Ende af høire Fremspring; *b*, venstre Fremspring i sin fulde Høide.

— 49. Tversnit fra Svælgets nederste Ende, paa hvilket der endnu sees en liden Rand af Fremspringet paa venstre Væg, imedens det paa høire Væg er ganske forsvundet. *a*, Rest af venstre Fremspring.

Tab. XV. *Gersemiopsis arctica*.

Fig. 1—3. Køller fra Polypens Bagkrop, forstørret.

— 4. 5. Takkede Spindler fra samme, forstørret.

— 6. 7. Bladede Klubber fra samme, forstørret.

— 8. Stor, bladet Kølle fra Polypens Forkrop.

— 9. 10. Takkede Klubber fra samme, forstørret.

— 11. 12. Forskjelligtformede Spikler, dels fra Polypens Forkrop, dels fra Tentaklerne, forstørret.

— 13. En schematisk Fremstilling af Svælget med dets to Fremspring. Svælget tænkes aabnet langs Svælgrenden og slaaet til Side, saa at Hulheden træder frem. *a*, den øverste, høie Del af høire Fremspring; *b*, den nederste, lave Del af samme; *c*, den øverste, lave Del af venstre Fremspring; *d*, den nederste, høie Del af samme.

fillet-formed protuberance which immediately passes over to the sinistral side.

Pl. XIV. Fig. 47. Transversal section still further down the polyp, showing both protuberances in their greatest extent; magnified. *a*. The protuberance from the dextral wall, which projects across the gullet-passage to the sinistral wall. *b*. The protuberance from the sinistral wall, which reaches across to the dextral wall.

— 48. Transversal section still lower down the polyp, where only the inferior low part of the protuberance from the dextral wall is seen, whilst that from the sinistral wall retains its full height; magnified. *a*. The low inferior part of the dextral protuberance. *b*. The sinistral protuberance in its full height.

— 49. Transversal section from the lowest extremity of the gullet, on which there is still seen a small margin of the protuberance on the sinistral wall, whilst that on the dextral wall has quite disappeared. *a*. Remaining part of the sinistral protuberance.

Pl. XV. *Gersemiopsis arctica*.

Figs. 1—3. Subclavates of the posterior body of *Gersemiopsis arctica*; magnified.

— 4. 5. Spicate fusees of same; magnified.

— 6. 7. Foliated clavates of same; magnified.

— 8. Large foliated subclavate of the anterior body of the polyp.

— 9. 10. Spicate clavates of same; magnified.

— 11. 12. Various formed spicules, partly from the anterior body of the polyp and partly from the tentacles; magnified.

— 13. A diagrammatic representation of the gullet with its two protuberances. The gullet is supposed to be dissected along the gullet-passage and then folded back so that the cavity is brought into view. *a*. The superior high part of the dextral protuberance. *b*. The inferior low part of the same. *c*. The superior low part of the sinistral protuberance. *d*. The inferior high part of the same.

- Tab. XV. Fig. 14. *Barathrobium digitatus*, naturlig Størrelse.
- 15. Et andet Exemplar af den samme, forstørret.
 - 16. En Gren med dens Forgreninger af den samme, forstørret. *a*, en indtrukken Polyp.
 - 17. En Polyp af samme, forstørret.
 - 18. Halvdelen af en opskåret og udslaaet Polyp af den samme, forstørret.
 - 19. Et Stykke af et Tversnit af Stammen, forstørret. *a*, Ectodermceller; *b*, hyalint Bindevæv, hvori sees Ernæringskanaler med deres Epithel; *c*, Ernæringskanal; *d*, Ectodermceller, der beklæde et Rum i Bindevævet, hvori en Spikel har ligget; *e*, Endothelceller.
 - 20. Tversnit af en Del af Stammen, forstørret. *a*, Skillevæggene for Længdekanalerne; *b*, Ernæringskanaler i Bindevævet; *c*, Spikler i Skillevæggene.
 - 21—31. Spikler paa Basaldelen, forstørret.
 - 32—41. Spikler nederst paa Stammen, forstørret.
 - 42—55. Spikler øverst paa Stammen, forstørret.
 - 56—63. Spikler fra Grenene, forstørret.
 - 64—70. Spikler fra Coenenchymet nederst paa Stammen, forstørret.

Tab. XVI. Fig. 1—7. Spikler fra Coenenchymet øverst paa Stammen og Grenene af *Barathrobium digitatus*, forstørret.

- 8—15. Spikler fra Polypens Bagkrop, forstørret.
- 16—21. Spikler fra Polypens Forkrop, forstørret.
- 22—28. Spikler fra Tentaklerne, forstørret.
- 29. Tversnit af en Polyp, forstørret. *a*, Endothel, der beklæder Kamrene og Septa; *b*, Spikler i Septa; *c*, Spikler i Kropsvæggen; *d*, Svælgruben med sine lange Pidskeceller; *e*, Spikler fra Svælgets Bindevævslag.
- 30. Det halve Svælg med sine Spiklerækker, forstørret.
- 31—41. Spikler fra Svælget, forstørret.
- 42. *Barathrobium palmatus*, forstørret.

Den norske Nordhavsexpedition. D. C. Danielssen: Alcyonida.

Pl. XV. Fig. 14. *Barathrobium digitatus*; natural size.

- 15. Another specimen of the same; natural size.
- 16. A branch of the same, with its ramifications; magnified. *a*. A retracted polyp.
- 17. A polyp of the same; magnified.
- 18. Half of a dissected and folded back polyp of the same; magnified.
- 19. Portion of a transversal section of the stem; magnified. *a*. Ectoderm-cells. *b*. Hyaline connective-tissue, in which nutritory ducts with their epithelium are seen. *c*. Nutritory duct. *d*. Ectoderm-cells which clothe a cavity in the connective-tissue in which a spicule has lain. *e*. Endothelial cells.
- 20. Transverse section of a part of the stem; magnified. *a*. Divisional walls of the longitudinal ducts. *b*. Nutritory ducts. *c*. Connective-tissue. *e*. Spicules of the divisional walls.
- 21—31. Spicules of the basal part; magnified.
- 32—41. Spicules of the lowest part of the stem; magnified.
- 42—55. Spicules of the uppermost part of the stem; magnified.
- 56—63. Spicules of the branches; magnified.
- 64—70. Spicules of the sarcosoma from the lowest part of the stem; magnified.

Pl. XVI. Figs. 1—7. Spicules of the sarcosoma from the uppermost part of the stem and branches of *Barathrobium digitatus*; magnified.

- 8—15. Spicules of the posterior body of the polyp of same; magnified.
- 16—21. Spicules of the anterior body of the polyp of same; magnified.
- 22—28. Spicules of the tentacles; magnified.
- 29. Transversal section of a polyp; magnified. *a*. Endothelium which clothes the chambers and septa. *b*. Spicules of the septa. *c*. Spicules of the wall of the body. *d*. The gullet-passage with its long flagelliform cells. *e*. Spicules of the connective-tissue of the gullet.
- 30. The half gullet with its spicular series; magnified.
- 31—41. Spicules of the gullet; magnified.
- 42. *Barathrobium palmatus*, magnified.

- Tab. XVI. Fig. 43. Et Stykke af en Gren af den samme, forstørret.
- 44—48. Spikler fra Basaldelen, forstørret.
 - 49—53. Spikler fra Stammen, forstørret.
 - 54—59. Spikler fra den øvre Del af Stammen, forstørret.
 - 60—64. Spikler fra Grenene, forstørret.
 - 65—73. Spikler fra Coenenchymet i Stammen og Grenene, forstørret.
 - 74—79. Spikler fra Polypens Bagkrop, forstørret.
 - 80—82. Spikler fra Polypens Forkrop, forstørret.
 - 83—86. Spikler fra Tentaklerne og Pinnulerne, forstørret.
 - 87. Svælget med dets 4 Spiklerækker, forstørret.
 - 88—94. Spikler fra Svælget, forstørret.

- Tab. XVII. Fig. 1. *Sarakka crassa* i naturlig Størrelse.
- 2. Den samme, forstørret.
 - 3. Et andet Exemplar, hvor Polyperne ere mere indtrukne, forstørret.
 - 4. En Polyp, næsten udtraadt af sin Celle. *a*, Cellens tandede Rand; forstørret.
 - 5. Et Tversnit af en Gruppe Polypceller for at vise deres Sammenvoxning og det sparsomme Coenenchym imellem de sammenvoxede Celler med dets Spikler, forstørret.
 - 6. Et Tversnit af en Polyps Bugside, forstørret. *a*, ydre Epithelialbeklædning (Ectoderm); *b*, Spikler, omgivne af Ectodermceller, nedsænkede i Bindevævet; *c*, Endothelceller, der beklæde Mavehulheden; *d*, Celler af Ernæringsvædsken; *e*, Septa; *f*, listeformige Forlængelser af Svælgets Bindevævs indre Flade; *g*, Epithelet med sine Pidskeceller, som beklæde Svælgruben. I Svælgets Bindevæv sees Aabninger efter Spikler, der ere fjernede.
 - 7. Tversnit af en Polyp, forstørret. *a*, Septa, som fæste sig paa Svælget; *b*, Bindevæslister i Svælgruben; *c*, Epithel med Cilier, der beklæde en Del af Svælghulheden; *d*, Indsnøring paa Svælget, hvorved Svælgruben li-

- Pl. XVI. Fig. 43. Portion of a branch of same; magnified.
- 44—48. Spicules from the basal part; magnified.
 - 49—53. Spicules from the stem; magnified.
 - 54—59. Spicules from the upper part of the stem; magnified.
 - 60—64. Spicules from the branches; magnified.
 - 65—73. Spicules from the sarcosoma of the stem and the branches; magnified.
 - 74—79. Spicules from the posterior body of the polyp; magnified.
 - 80—82. Spicules from the anterior body of the polyp; magnified.
 - 83—86. Spicules from the tentacles and pinnules; magnified.
 - 87. The gullet with its 4 spicular series; magnified.
 - 88—94. Spicules from the gullet; magnified.

- Pl. XVII. Fig. 1. *Sarakka crassa*. Life size.
- 2. Another specimen; magnified.
 - 3. Another specimen, shewing the polyps more retracted; magnified.
 - 4. A polyp almost emerged from its cell. *a*. Dentated margin of the cell; magnified.
 - 5. A transversal section of a group of polyp-cells, shewing the concretion together, and the thin sarcosoma between the concreted cells with its spicules; magnified.
 - 6. A transverse section of the ventral side of a polyp; magnified. *a*. Exterior epithelial covering (ectoderm). *b*. Spicules, surrounded by ectodermic cells, depressed in the connective-tissue. *c*. Endothelial cells which coat the gastral cavity. *d*. Cells of the nutritory fluid. *e*. Septa. *f*. Fillet-formed prolongations of the inner surface of the connective-tissue of the gullet. *g*. The epithelium, with its flagelliform cells, which coats the gullet cavity. In the connective-tissue of the gullet, apertures left by spicules which have come away, may be seen.
 - 7. Transverse section of a polyp; magnified. *a*. Septa, that attach themselves to the gullet. *b*. Connective-tissue fillets in the gullet-cavity. *c*. Epithelium, with its cells, with clothes a part of the gullet-cavity. *d*. Constriction of

gesom skilles fra den øvrige Svælghulhed, *f*; *e*. Svælggruben med sit Pidskeepithel.

Tab. XVII. Fig. 8. Længdesnit af den halve Del af Svælget, der viser 2 Dobbelt-rækker Spikler, forstørret.

- 9—22. Spikler fra Basaldelen, forstørret.
- 23—27. Spikler fra Stammens nedre Del, forstørret.
- 28—35. Spikler fra Stammens øvre Del, forstørret.
- 36—39. Spikler fra Grenene, forstørret.
- 40—45. Spikler fra Polypens Bagkrop, forstørret.
- 46—50. Spikler fra Forkroppen med Tentaklerne, forstørret.
- 51. Spikler fra Pinnulerne, forstørret.
- 52. 53. Spikler fra Svælget, forstørret.
- 54. Spikler fra Stammens og Grenenes Coenenchym, forstørret.
- 55. *Væringia dryopsis*, n. sp., forstørret. Linien ved Siden angiver den naturlige Størrelse. *a*, en ung Koloni, hvor endnu ikke Grenene ere udviklede, lidt forstørret; *b*, en ung Polyp, der nylig har forladt Embryonalstadiet og fæstet sig paa Røret af *Tubularia imperialis*, lidt forstørret.
- 56—60. Spikler fra Basaldelen, forstørret.

Tab. XVIII. Fig. 1. En Polyp af *Væringia dryopsis*; den nederste Del viser Overgangen i Cellen, forstørret.

- 2. Svælget med sine Folder, samt Spikelrækkerne; fra den nederste Del udgaa 2 Gastralfilamenter, forstørret.
- 3. Svælget aabnet efter Længden og slaaet til Siden for at vise de 6 enkle Spikelrækker.
- 4—13. Spikler fra Basaldelen, forstørret.
- 14—26. Spikler fra Stammen, forstørret.
- 27. 28. Spikler fra Grenene, forstørret.
- 29—35. Spikler fra Polypens Bagkrop, forstørret.
- 36—43. Spikler fra Forkroppen, forstørret.
- 44—47. Spikler fra Tentakler og Pinnuler, forstørret.
- 48—54. Spikler fra Svælget, forstørret.

the gullet, by which the gullet-cavern is, as it were, divided from the rest of the gullet cavity, *f. e.* Gullet-cavern with its flagellate epithelium.

Pl. XVII. Fig. 8. *Sarakka crassa*. Longitudinal section of a half part of the gullet, shewing 4 double series of spicules; magnified.

- 9—22. Spicules of the basal part; magnified.
- 23—27. Spicules of the inferior part of the stem; magnified.
- 28—35. Spicules of the superior part of the stem; magnified.
- 36—39. Spicules of the branches; magnified.
- 40—45. Spicules of the posterior body of the polyp; magnified.
- 46—50. Spicules of the anterior body of the polyp with its tentacles; magnified.
- 51. Spicules of the pinnules; magnified.
- 52. 53. Spicules of the gullet; magnified.
- 54. Spicules of the sarcosoma of the stem and the branches; magnified.
- 55. *Væringia dryopsis*, n. sp.; magnified. The line at the side indicates the life size. *a*. A young colony where the branches are not yet developed; somewhat magnified. *b*. A young polyp which has lately emerged from the embryonal state and attached itself to the tube of *Tubularia imperialis*; somewhat magnified.
- 56—60. Spicules of the basal part; magnified.

Pl. XVIII. Fig. 1. *Væringia dryopsis*. A polyp; the lowest part shows the transition to the cell; magnified.

- 2. The gullet with its folds and spicular series; from its lowest part 2 gastral filaments issue; magnified.
- 3. The gullet, dissected longitudinally and folded to the side to shew the 6 single spicular series; magnified.
- 4—13. Spicules of the basal part; magnified.
- 14—26. Spicules of the stem; magnified.
- 27. 28. Spicules of the branches; magnified.
- 29—35. Spicules of the posterior body of the polyp; magnified.
- 36—43. Spicules of the anterior body; magnified.
- 44—47. Spicules of the tentacles and pinnules; magnified.
- 48—54. Spicules of the gullet; magnified.

Tab. XVIII. Fig. 55. *Væringia Jan Mayeni*, n. sp., forstørret. Linien ved Siden betegner den naturlige Størrelse.

- 56. En Polyp af den samme, forstørret.
- 56 A. Svælget med sine 8 Rækker Spikler, aabnet efter Længden, forstørret.
- 57—67. Spikler fra Basaldelen, forstørret.
- 68—71. Spikler fra Stammen, forstørret.
- 72—74. Spikler fra Grenene, forstørret.
- 75—81. Spikler fra Polypernes Bagkrop, forstørret.
- 82—85. Spikler fra Polypernes Forkrop, forstørret.
- 86—89. Spikler fra Tentaklerne, forstørret.
- 90. Spikler fra Svælget, forstørret.

Tab. XIX. Fig. 1. *Krystallofanés polaris*, n. g. et sp., forstørret. Linien ved Siden betegner den naturlige Størrelse.

- 2. En Polyp af den samme, forstørret. *a*, Polypcellen; *b*, Polypens Bagkrop; *c*, dens Forkrop.
- 3. Et Tversnit af en Gren, forstørret. *a*, Ectodermceller; *b*, Bindevævsnet, hvis Masker ere beklædte med Ectodermceller, og hvori tildels Spiklerne ere placerede; *c*, det indre Lag af Bindevævet; *d*, Skillevæggen imellem Kanalerne, hvori sees fine Saftkanaler og Spikler.
- 4. Et Stykke af et Tversnit af Polypens Bugside, forstørret. Præparatet er afkalket. *a*, Ectodermceller; *b*, det reticulære Bindevæv; paa Maskernes Vægge sees Ectodermceller; *c*, *d*, Ectodermceller; *e*, det indre Bindevævsnet; *f*, Endothelceller, der beklæde Svælget og Kamrene; *g*, Svælgrenden med Pidskeepithel; *h*, encellede Slinkjertler.
- 5. Svælgrøret, hvorigjennem en Unge er begyndt at passere, forstørret. *a*, Svælget; *b*, Ungen med sin Gastrulahule og Mund, samt overalt beklædt med Cilier.
- 6. En Unge, taget ud af Ægget, forstørret.
- 7—19. Spikler fra Basaldelen, forstørret.
- 20—30. Spikler fra Stammen, forstørret.

Pl. XVIII. Fig. 55. *Væringia Jan Mayeni*, n. sp.; magnified. The line at the side indicates the life size.

- 56. A polyp; magnified.
- 56 A. The gullet with its 8 series of spicules; dissected longitudinally; magnified.
- 57—67. Spicules of the basal part; magnified.
- 68—71. Spicules of the stem; magnified.
- 72—74. Spicules of the branches; magnified.
- 75—81. Spicules of the posterior body of the polyp; magnified.
- 82—85. Spicules of the anterior body of the polyps; magnified.
- 86—89. Spicules of the tentacles; magnified.
- 90. Spicules of the gullet; magnified.

Pl. XIX. Fig. 1. *Krystallofanés polaris*, n. g. et sp.; magnified. The line at the side indicates the life size.

- 2. A polyp; magnified. *a*. Polyp-cell. *b*. Posterior body of the polyp. *c*. Anterior body of the polyp.
- 3. Transverse section of a branch; magnified. *a*. Ectodermic cells. *b*. Connective-tissue reticulation, whose meshes are coated with ectodermic cells and, in which spicules are, partly, situated. *c*. The inner layer of connective-tissue. *d*. The divisional wall between the ducts, in which minute nutritory ducts and spicules are seen.
- 4. Fragment of a transverse section of the ventral side of the polyp; magnified. (The preparation is deprived of its calcium). *a*. Ectodermic cells. *b*. The reticulated connective-tissue, with ectodermic cells visible on the walls of the meshes. *c*, *d*. Ectodermic cells. *e*. The inner connective-tissue layer. *f*. Endothelial cells which coat the gullet and chambers. *g*. The gullet-passage with its flagelliform epithelium. *h*. Unicellular mucous glands.
- 5. The gullet-tube, through which a young one has begun to emerge; magnified. *a*. The gullet. *b*. The young one with its gastrula cavity and mouth covered, everywhere, with cilæ.
- 6. A young one taken from the ovum; magnified.
- 7—19. Spicules of the basal part; magnified.
- 20—30. Spicules of the stem; magnified.

Tab. XIX. Fig. 31—37. Spikler fra Polypens Bagkrop, forstørret.

- 38—45, Spikler fra Polypens Forkrop, forstørret.
- 46. *Organidus Nordenskiöldi*, n. g. et sp., siddende paa Røret af *Onuphis conchylega*, forstørret. Linien ved Siden betegner den naturlige Størrelse. *a*, Polypcelle; *b*, Polypens Overgang i Cellen; *c*, en ung Polyp.
- 47. Polyp af samme, forstørret. *a*, de triangulære Felter imellem Tentaklernes Grund, hvilke strække sig over paa Mundskiven, og paa hvis Midte sees en Pyramide af Spikler.
- 48. En Tentakel af samme, forstørret.
- 49. Et Tversnit af Stammen (en Gruppe af sammenvoxede Polypceller), forstørret. *a*, Væggen imellem to Celler; *b*, Cellernes ydre Væg, bestaaende af Ectoderm og hyalint Bindevæv; *c*, Bindevævslag, hvor fem Polypceller støde sammen, og hvori sees to udprægede Saftkanaler; *d*, Septula.
- 50—61. Spikler fra Basaldelen, forstørret.
- 62—70. Spikler fra Stammen (Polypcellerne), forstørret.

Tab. XX. Fig. 1. Tversnit af et Septum af *Organidus Nordenskiöldi*, idet dette udgaar fra Polypkroppens indre Væg. *a*, Ectoderm; *b*, Spikler; *c*, Bindevæv; *d*, Endothelceller, der beklæde Septumet; *e*, Muskler paa Kammervæggen.

- 2. Et Tversnit af Polypens Bugside, forstørret; den ydre Væg, hvorfra Septa udgaa, er borttaget. *a*, det triangulære Bindevævsparti af Septum, hvor dette fæster sig paa Svælgrøret; *b*, de transverselle Muskler paa Septum; *c*, de longitudinelle Muskler paa samme; *d*, Musklernes Forlængelse over paa Svælgrøret; *e*, Endothelceller paa Svælgets indre Væg; *f*, Svælgets Bindevævslag; *g*, Indbugtning paa Svælget, hvilken skiller Bug- fra Rygsiden; *h*, Svælgrendens Epithelbeklædning (lange Pidskeceller); *i*, Epithelbeklædningen paa Svælgets Rygside; *k*, encellede Slinkjertler.

Pl. XIX. Fig. 31—37. *Krystallofanés polaris*, n. g. et sp. Spicules of the posterior body of the polyp; magnified.

- 38—45. Spicules of the anterior body of the polyp; magnified.
- 46. *Organidus Nordenskiöldi*, n. g. et sp.; seated on the tube of *Onuphis conchylega*; magnified. The line at the side indicates the life size. *a*, Polyp-cell. *b*, The polyps transition to the cell. *c*, A young polyp.
- 47. A polyp; magnified; *a*, The triangular spaces between the tentacular bases, which extend over to the oral disk and in whose centre a pyramid of spicules is observed.
- 48. A tentacle; magnified.
- 49. Transverse section of the stem (a group of concreted polyp-cells); magnified. *a*, The wall between two cells. *b*, Exterior wall of the cells, composed of ectoderm and hyaline connective-tissue. *c*, Layer of connective-tissue where 5 polyp-cells join together, and in which two well defined nutritory ducts are seen. *d*, Septula.
- 50—61. Spicules of the basal part; magnified.
- 62—70. Spicules of the stem, (the polyp-cells); magnified.

Pl. XX. Fig. 1. *Organidus Nordenskiöldi*, n. g. et sp. Fragment of transverse section of a polyp; magnified. *a*, Ectoderm. *b*, Spicules. *c*, The triangular basal part of a septum as it issues from the inner wall of the polyp-body. *d*, Endothelial cells which cloth the septum. *e*, Muscles of the chamber-walls.

- 2. Transverse section of the ventral side of the polyp; magnified. The exterior wall from which the septa issue is removed. *a*, The triangular, connective-tissue portion of the septum, where it is attached to the gullet-tube. *b*, The transversal muscles of the septum. *c*, The longitudinal muscles of the septum. *d*, The muscular prolongation to the gullet-tube. *e*, Endothelial cells of the exterior wall of the gullet. *f*, Connective-tissue layer of the gullet. *g*, Concavity of the gullet which separates the ventral from the dorsal side. *h*, Epithelial covering of the gullet-passage. *i*, Long flagelliform cells in the epithelial coating of the dorsal

Tab. XX. Fig. 2 A. Et Tversnit af en Polyp, $\frac{1}{2}$ forstørret. *a.* Mavekamrene; *b.* Indbugtning paa Svælget mellem Bug- og Rygsiden; *c.* Svælgrenden med dens Pidskeepithel.

- 3—18. Spikler fra Polypernes Bagkrop, forstørret.
- 19—29. Spikler fra Polypernes Forkrop, forstørret.
- 30—39. Spikler fra Tentaklerne med deres Pinnuler, forstørret.
- 40. Svælgrøret, aabnet efter Længden fra Rygsiden og slaaet til Siden for at vise de 6 Rækker Spikler og det spikelfri Midtparti paa Bugsiden.
- 41—44. Spikler fra Bugsiden paa Svælgrøret, forstørret.
- 45. *Væringia clavata*, n. sp., noget forstørret. Linien ved Siden betegner den naturlige Størrelse.
- 46. En Polyp af samme, forstørret.
- 47. Svælgrøret af samme, aabnet efter Længden og slaaet til Side, forstørret.
- 48—56. Spikler fra Basalen, forstørret.
- 57—62. Spikler fra Stammen, forstørret.
- 63—67. Spikler fra Grenene, forstørret.
- 68—74. Spikler fra Polypkroppen, forstørret.
- 75—79. Spikler fra Tentaklerne, forstørret.
- 80—83. Spikler fra Svælgrøret, forstørret.

Tab. XXI. Fig. 1. *Væringia capitata*, n. sp., forstørret. Linien ved Siden angiver den naturlige Størrelse.

- 2. Den samme, hvor Polyperne ere indtrukne, forstørret.
- 3. En Polyp af den samme, forstørret. *a.* det nøgne, triangulære Rum paa Cellen; *b.* Cellens tandede Rand, naar Polypen er lidt indtrukken; *c.* det nøgne, triangulære Rum paa den forreste Del af Polypkroppen.
- 4. Svælgrøret med sine 2 Rækker Spikler, forstørret. Svælget aabnet efter Længden og slaaet til Siden.
- 5—12. Spikler fra Basalen, forstørret.
- 13—17. Spikler fra Stammen, forstørret.
- 18—21. Spikler fra Cellen, forstørret.

side of the gullet. *k.* Unicellular mucous glands.

Pl. XX. Fig. 2 A. *Organidus Nordenskiöldi*, n. g. et sp. Transverse section of a polyp; magnified. *a.* The gastral chambers. *b.* Concavity of the gullet between the ventral and dorsal sides. *c.* Gullet-passage with its flagelliform epithelium.

- 3—18. Spicules of the posterior body of the polyp; magnified.
- 19—29. Spicules of the anterior body of the polyp; magnified.
- 30—39. Spicules of the tentacles and their pinnules; magnified.
- 40. The gullet, dissected longitudinally from the dorsal side, and folded aside to shew the 6 series of tentacles and the middle part of the ventral side, which is devoid of spicules.
- 41—44. Spicules of the gullet-tube; magnified.
- 45. *Væringia clavata*, n. sp. somewhat magnified. The line at the side indicates the life size.
- 46. A polyp; magnified.
- 47. The gullet-tube, dissected longitudinally and folded to the side; magnified.
- 48—56. Spicules of the basal part; magnified.
- 57—62. Spicules of the stem; magnified.
- 63—67. Spicules of the branches; magnified.
- 68—74. Spicules of the polyp-body; magnified.
- 75—79. Spicules of the tentacles; magnified.
- 80—83. Spicules of the gullet-tube; magnified.

Pl. XXI. Fig. 1. *Væringia capitata* n. sp.; magnified. The line at the side indicates the life size.

- 2. Another specimen with the polyps retracted; magnified.
- 3. A polyp magnified. *a.* The bare triangular space on the cell. *b.* The cells dentated margin, when the polyp is a little retracted. *c.* The bare triangular space on the anterior part of the polyp-body.
- 4. The gullet-tube with its 2 series of spicules; magnified. The gullet is dissected longitudinally and folded to the side.
- 5—12. Spicules of the base; magnified.
- 13—17. Spicules of the stem; magnified.
- 18—21. Spicules of the cell; magnified.

- Tab. XXI. Fig. 22—25. Spikler fra Polypkroppen, forstørret.
- 26—28. Spikler fra Tentaklerne, forstørret.
 - 29. *Nidalia* (Gray) *arctica*, n. sp., forstørret. Linien ved Siden angiver den naturlige Størrelse. *a*, den rørformigt udvidede Basaldel; *b*, Stammen; *c*, dennes udvidede Del, bærende Polyperne.
 - 30. En Polyp med en Del af Polypcellen af den samme, forstørret. *a*, Polypcellen; *b*, Polypkroppen med dens Furer; *c*, det triangulære, nøgne Felt, i hvis Midte en Spikelrække.
 - 31. Tversnit af Polypcellens Ectoderm, forstørret. *a*, Ectodermceller; *b*, aabne Rum, som de borttagne Spikler have efterladt i Ectodermet; *c*, Bindevæv indenfor Ectodermet.
 - 32. Tversnit af den midterste Del af Polypkroppen, forstørret. *a*, Ectodermceller; *b*, Rum, hvori Spikler have ligget; *c*, Bindevævslag, indenfor Ectodermet; *d*, Septa; *e*, Endothelceller; *f*, Svælggruben med sine Pidskeceller; *g*, Fold paa Svælgørrets indre Flade, hvilken rager ind i Hulheden.
 - 33. Svælgørret med sine 8 Rækker Spikler, aabnet langs Rygsiden; det nøgne Rum er Bugsiden; forstørret.
 - 34—46. Spikler fra Basalen, forstørret. Fig. 37 og 39 er Dobbeltstjerner seet fra oven.
 - 47—59. Spikler fra Stammen, forstørret.
 - 60—66. Spikler fra Polypcellen og Bagkroppen, forstørret.

- Tab. XXII. Fig. 67—72. Spikler fra Polypens Bagkrop af *Nidalia arctica*, forstørret.
- 73—79. Spikler fra Polypens Forkrop, forstørret.
 - 80—83. Spikler fra Tentaklerne, forstørret.
 - 1. *Clavularia frigida*, n. sp., siddende paa Rør af *Onuphis conchylega*, forstørret. *a*, Basaldelens baandformige Udbredning.
 - 2. En Polyp med sin Celle, forstørret. *a*, Cellen med sine Ribber og Furer; *b*, Cellens Rand.
 - 3. Tversnit af en Polypcelle. *a*, Ectodermcelle; *b*, Bindevævslag, hvori

- Pl. XXI. Fig. 22—25. *Veringia capitata*, n. sp. Spicules of the polyp-body; magnified.
- 26—28. Spicules of the tentacles; magnified.
 - 29. *Nidalia* (Gray) *arctica*, n. sp.; magnified. The line at the side indicates the life size. *a*, The tubular dilated basal part. *b*, The stem. *c*, Dilated part of the stem carrying the polyps.
 - 30. A polyp with a portion of the polyp-cell; magnified. *a*, The polyp-cell. *b*, The polyp-body with its grooves. *c*, The triangular bare area with a spicular series in its middle.
 - 31. Transverse section of the ectoderm of the polyp-cell; magnified. *a*, Ectoderm cells. *b*, Open space which the removed spicules have left in the ectoderm. *c*, Connective-tissue inside of the ectoderm.
 - 32. Transverse section of the middle part of the polyp-body; magnified. *a*, Ectoderm-cells. *b*, Space in which the spicules have lain. *c*, Connective-tissue layer inside of the ectoderm. *d*, Septa. *e*, Endothelial cells. *f*, Gullet-groove with its flagelliform cells. *g*, Fold, on the inner surface of the gullet tube, which projects into the cavity.
 - 33. The gullet-tube, with its 8 series of spicules; dissected along the dorsal side; the bare space is the ventral side; magnified.
 - 34—46. Spicules of the base; magnified. Figs. 37 and 39 represent bistellates viewed from above.
 - 47—59. Spicules of the stem; magnified.
 - 60—66. Spicules of the polyp-cell and the posterior body; magnified.
- Pl. XXII. Fig. 67—72. Spicules of the posterior body of the polyp; magnified.
- 73—79. Spicules of the anterior body of the polyp; magnified.
 - 80—83. Spicules of the tentacles; magnified.
 - 1. *Clavularia frigida* n. sp., seated on the tube of *Onuphis conchylega*; magnified. *a*, The band-form extension of the basal part.
 - 2. A polyp with its cell; magnified. *a*, The cell with its ribs and furrows. *b*, Margin of the cell.
 - 3. Transverse section of a polyp-cell; magnified. *a*, Ectoderm cells. *b*, Con-

Bindevævslegemer med Udløbere, forstørret.

Tab. XXII. Fig. 4. Endothelceller, forstørret.

- 5. Svælgrøret, aabnet efter Længden, forstørret.
- 6—17. Spikler paa Basaldelen, forstørret.
- 18—26. Spikler paa Polypcellen, forstørret.
- 27—34. Spikler paa Polypkroppen, forstørret.
- 35. Spikler paa Svælgrøret, forstørret.

Tab. XXIII. Fig. 1. *Symphodium abyssorum*, n. sp., siddende paa *Bathycrinus Carpenteri*, Dan. & Kor., forstørret. *a*, Basaldelen, der har omspundet Roden af *Bathycrinus Carp.*; *b*, en Gruppe indtrukne Polyper.

- 2. En Polyp med sin Celle, forstørret. *a*, Cellen med dens Ribber og Furer; *b*, Cellens Rand; *c*, den bagerste Del af Polypkroppen; *d*, dennes forreste Del med sine Ribber og Furer.
- 3. Den forreste Del af Polypkroppen op imod Tentakelskiven, forstørret. *a*, Furen; *b*, det triangulære, nøgne Felt med en tynd Spikelrække i Midten.
- 4. Et Tversnit af en Gruppe Polypceller, forstørret. *a*, det ydre, retikulære Bindevæv; *b*, det indre Bindevæv, der danner det egentlige Coenenchym med Bindevævslegemer og Ernæringskanaler; *c*, Æg i forskellige Udviklingsstadier.
- 5. Et Tversnit af en Polyp, forstørret. *a*, Ectoderm; *b*, Ectodermceller, der beklæde Maskevæggene i det ydre, retikulære Bindevæv; *c*, Aabninger for Spikler, som ere fjernede; *d*, Endothelceller, der beklæde Kamrene; *e*, Svælgruben med dens lange Pidskeceller.
- 6. Svælgrøret, aabnet fra Rygsiden efter Længden, forstørret. *a*, de 4 Spikelrækker paa hver Side af Bugfladen; *b*, Bugfladen.
- 7—14. Spikler i Coenenchymet, forstørret.

nective-tissue layer, in which connective-tissue corpuscles with prolongations.

Pl. XXII. Fig. 4. *Clavularia frigida* n. sp. Endothelial cells; magnified.

- 5. Gullet-tube, dissected longitudinally; magnified.
- 6—17. Spicules of the basal part; magnified.
- 18—26. Spicules of the polyp-cell; magnified.
- 27—34. Spicules of the polyp-body, magnified.
- 35. Spicules of the gullet-tube; magnified.

Pl. XXIII. Fig. 1. *Symphodium abyssorum*, n. sp., seated on *Bathycrinus Carpenteri*, Dan. & Kor.; magnified. *a*, The basal part entwining the root of *Bathycrinus Carp.* *b*, A group of retracted polyps.

- 2. A polyp with its cell; magnified. *a*, The cell with its ribs and furrows. *b*, Margin of the cell. *c*, The posterior part of the polyp-body. *d*, The anterior part of the polyp-body with its ribs and furrows.
- 3. The anterior part of the polyp body in the proximity of the tentacular disk; magnified. *a*, The furrow. *b*, The bare triangular area with a thin spicular series in its middle.
- 4. Transverse section of a group of polyp-cells; magnified. *a*, The outer reticulated connective-tissue. *b*, The inner connective-tissue which forms the sarcosoma-proper, with its connective-tissue corpuscles and nutritory ducts. *c*, Ova in various stages of development.
- 5. Transverse section of a polyp; magnified. *a*, Ectoderm. *b*, Ectoderm cells which clothe the walls of the meshes in the outer reticulated connective-tissue. *c*, Apertures left by spicules which have been removed. *d*, Endothelial cells which clothe the chambers. *e*, The gullet-groove with its long flagelliform-cells.
- 6. The gullet-tube, dissected longitudinally from the dorsal side; magnified. *a*, The 4 spicular series on each side of the ventral surface. *b*, The ventral surface.
- 7—14. Spicules of the sarcosoma; magnified.

Tab. XXIII. Fig. 15—25. Spikler fra Basaldelen, forstørret.

— 26—38. Spikler fra Polypcellen, forstørret.

— 39—46. Spikler fra Polypen, forstørret.

— 47—49. Spikler fra Svælgrøret, forstørret.

Pl. XXIII. Fig. 15—25. *Sympodium abyssorum*, n. sp.,
Spicules of the basal part; magnified.

— 26—38. Spicules of the polyp-cell; magnified.

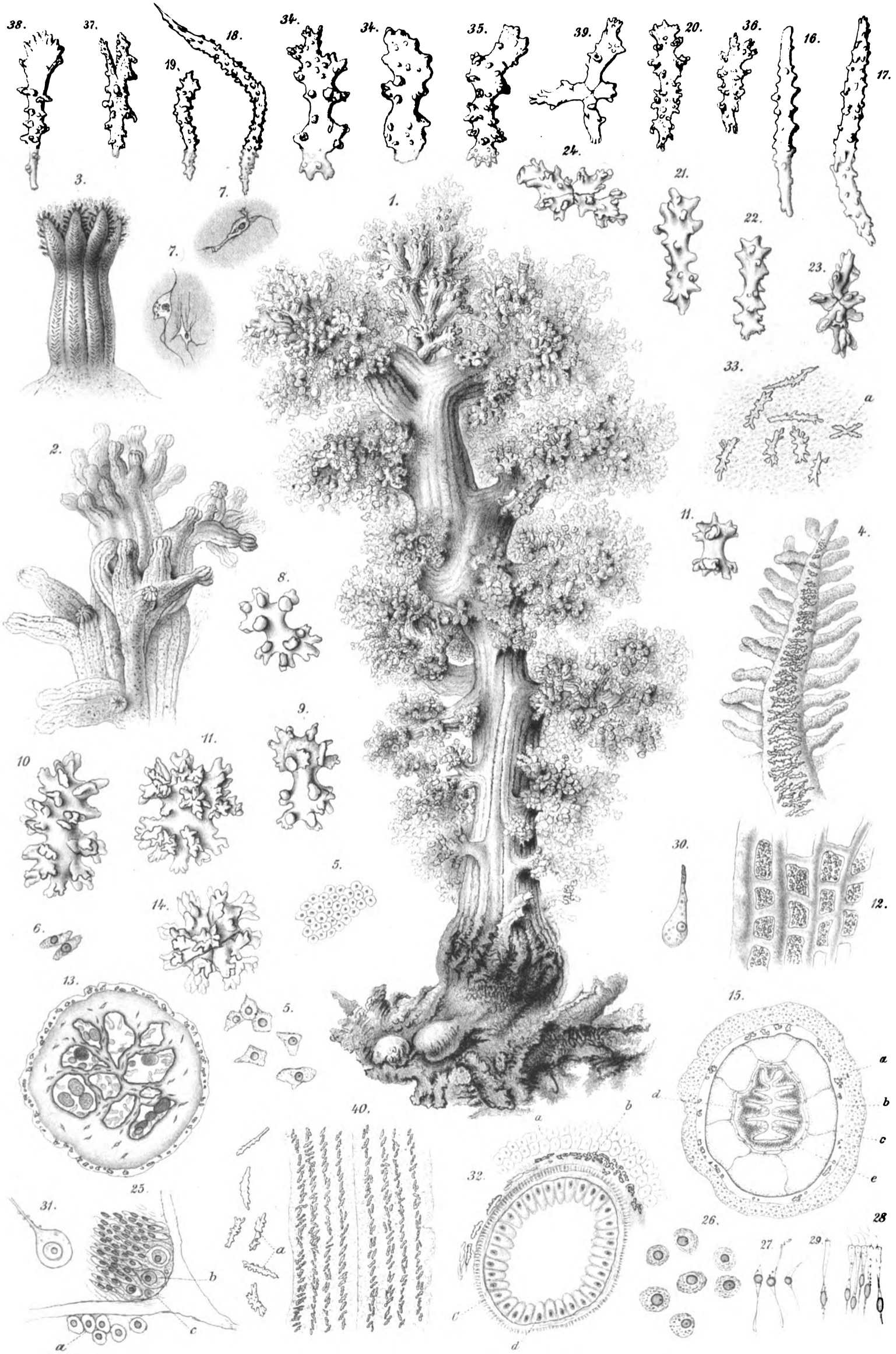
— 39—46. Spicules of the polyp; magnified.

— 47—49. Spicules of the gullet-tube; magnified.

Translated into English by **Thomas M. Wilson.**

P L A N C H E R.

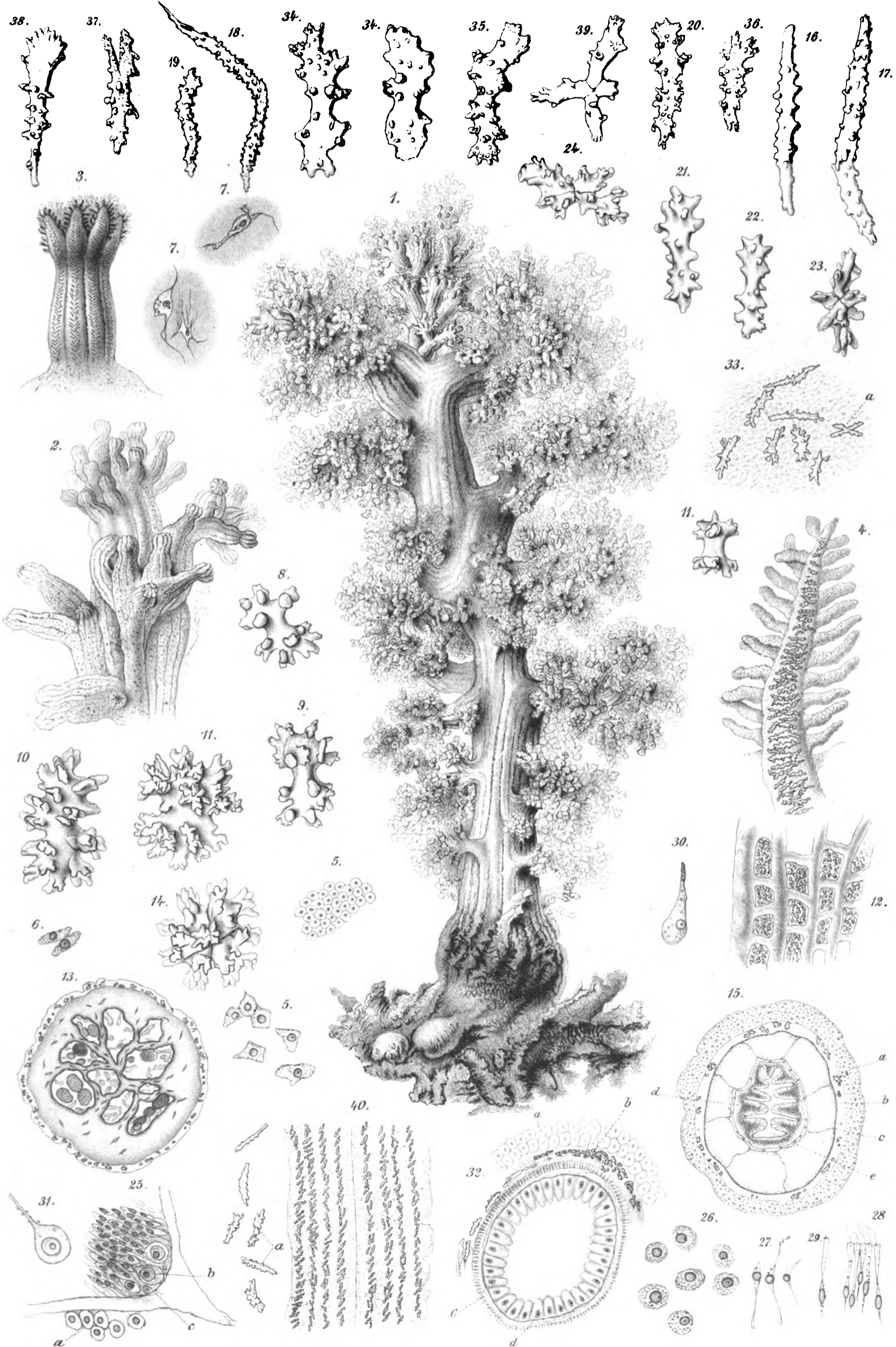
P L A T E S.



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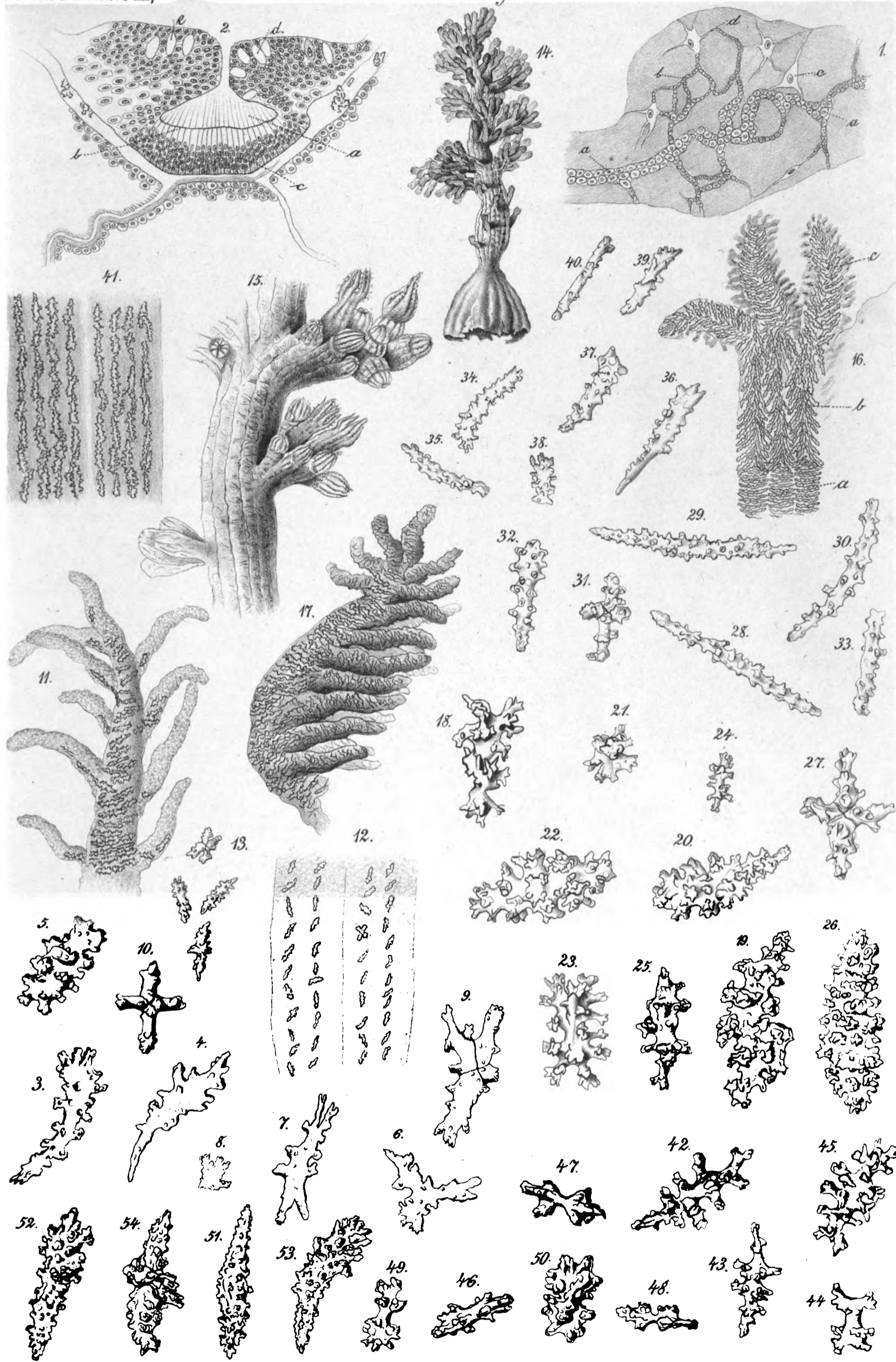
Vöringia mirabilis, n. g. et. sp.



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Vöringia mirabilis, n. g. et. sp.

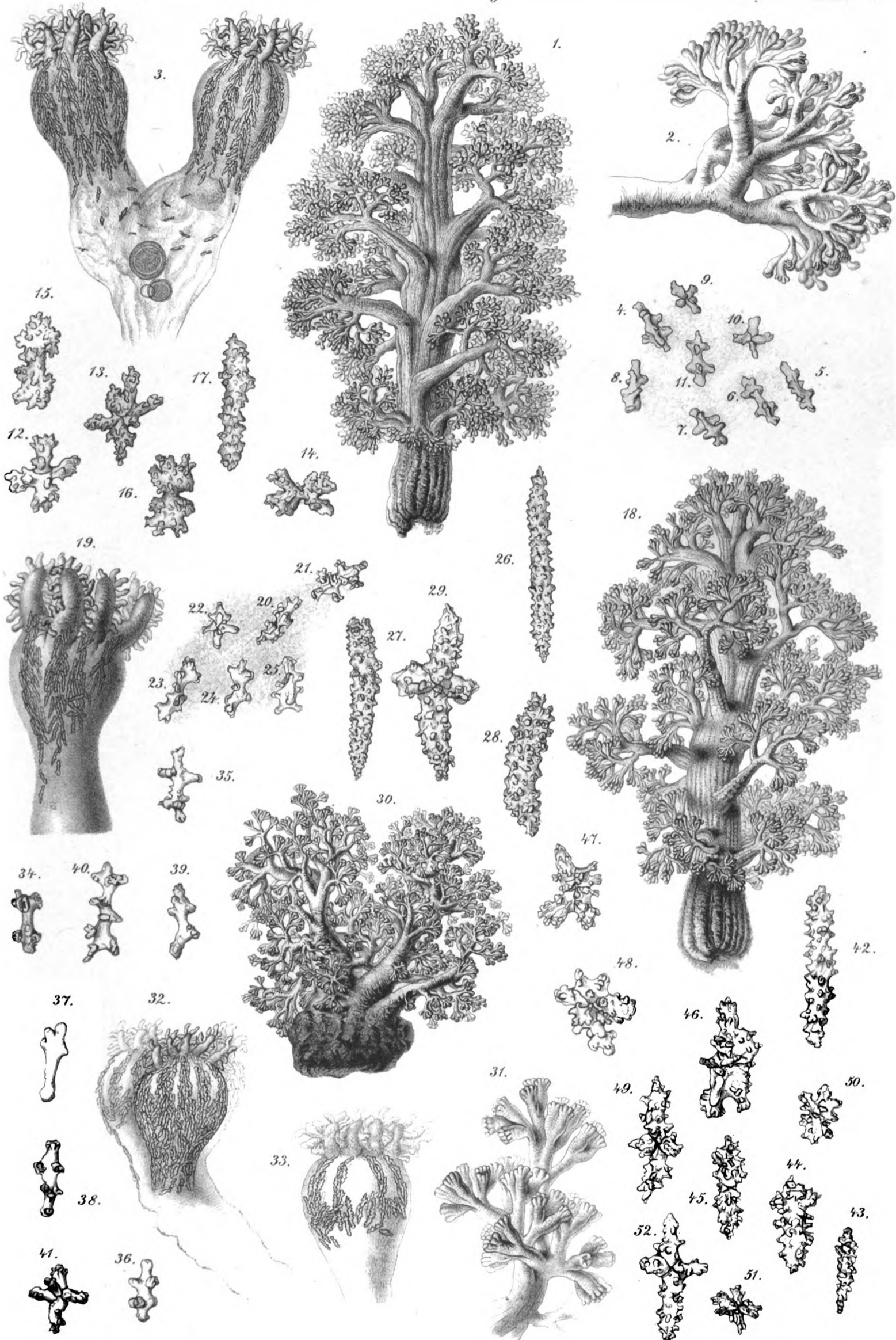


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Voringia mirab. n. g. et sp. 1-2. *Voringia fruticosa*, nob. 3-13. *Voringia abyssicola*. n. sp. 14-41.

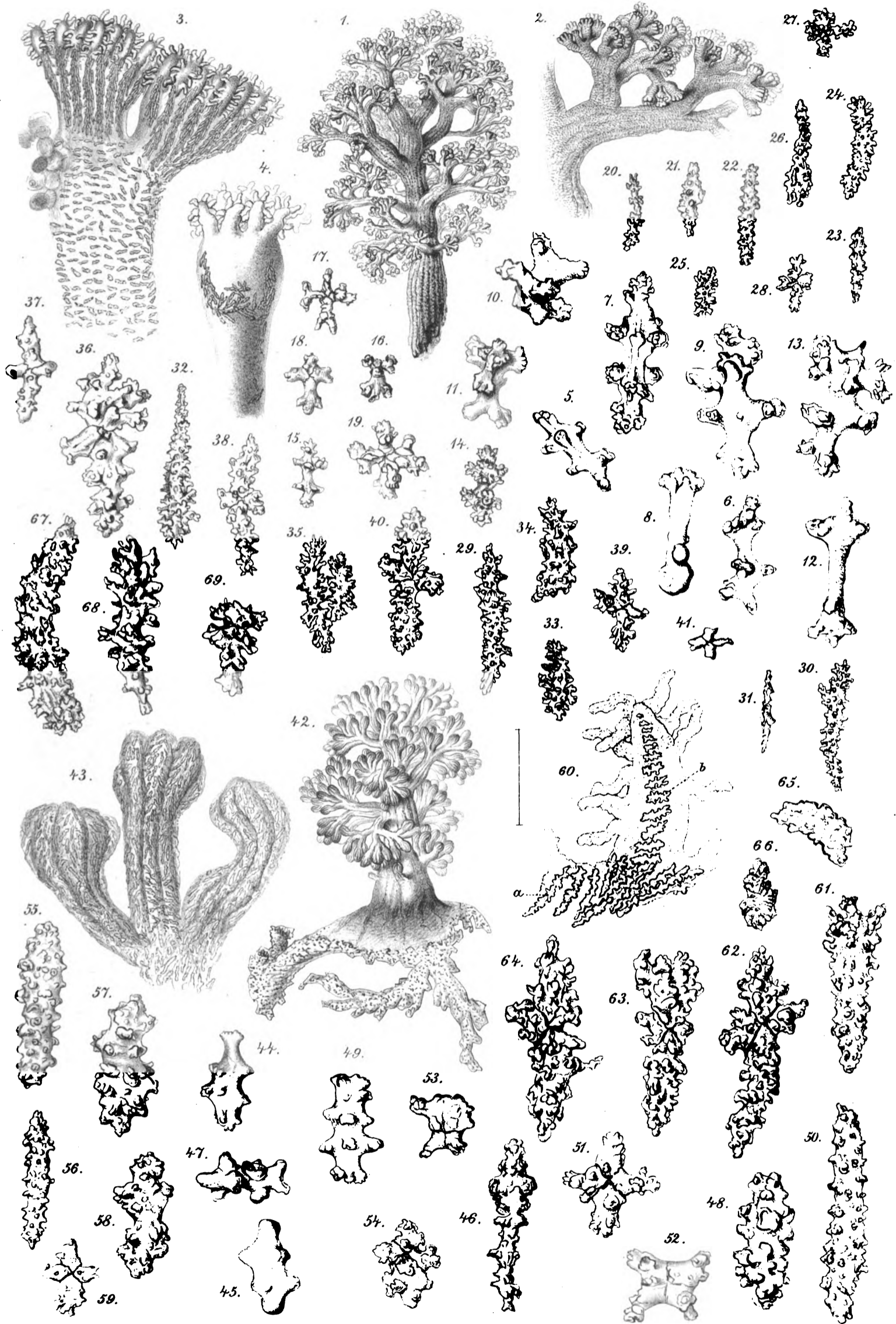
Dupa arborescens, n. sp. 42-54.



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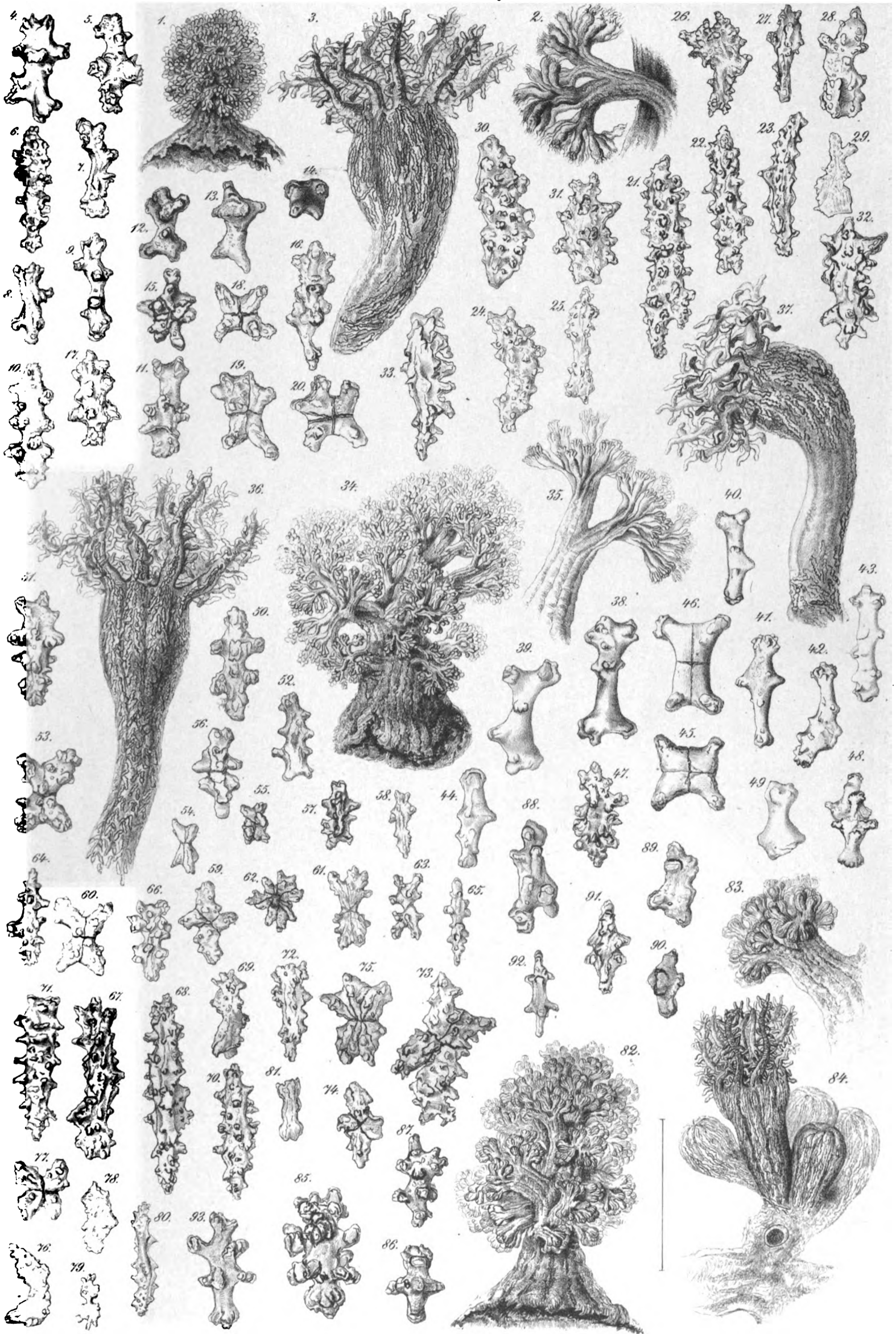
Dava arborescens, n. sp. 1-17. *Dava spitsbergensis*, n. sp. 18-29. *Dava violacea* n. sp. 30-52.



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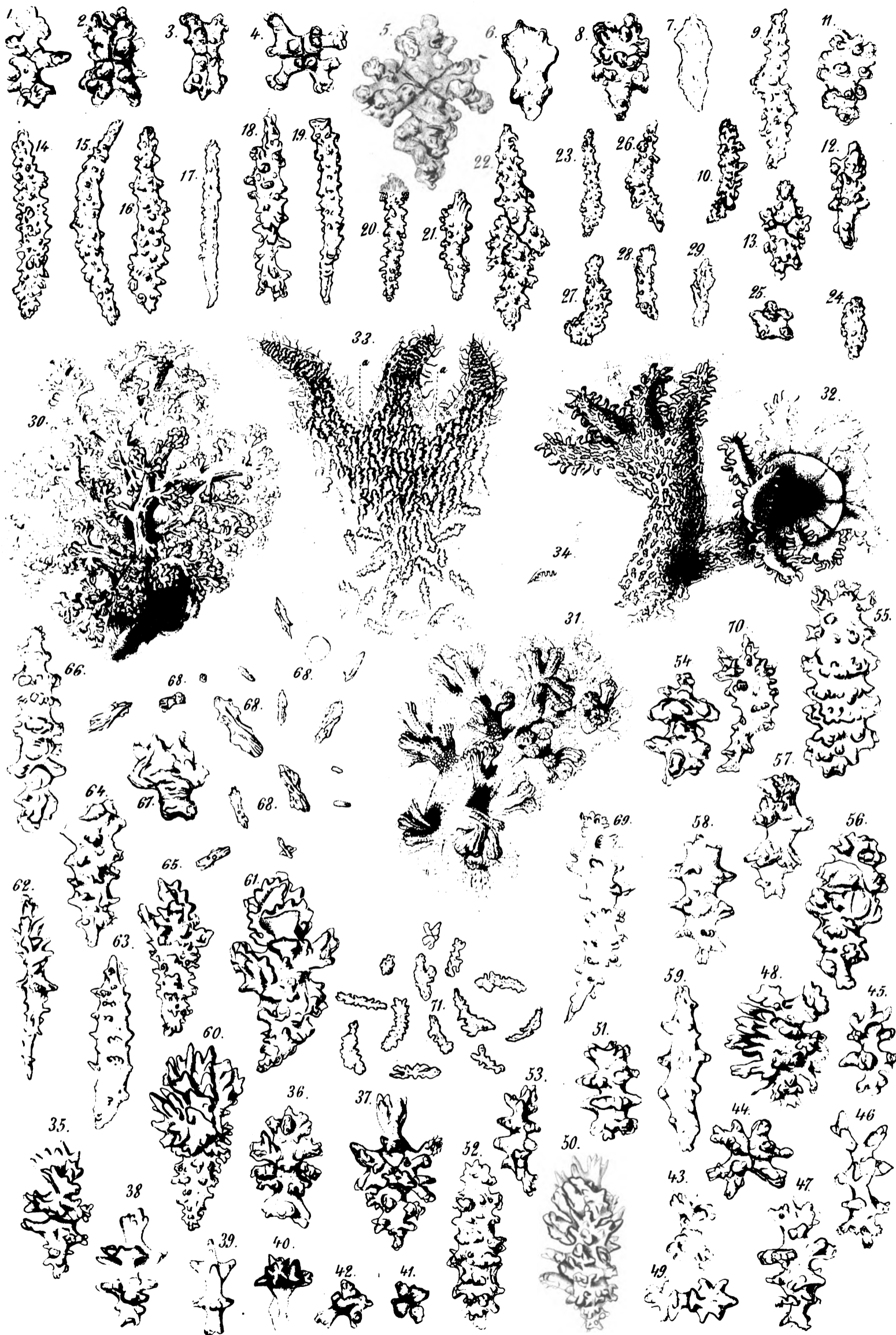
Dupa aurantiaca n. sp. 1-41. *Dupa frigida* n. sp. 42-69.



21 B. n. n. n. n.

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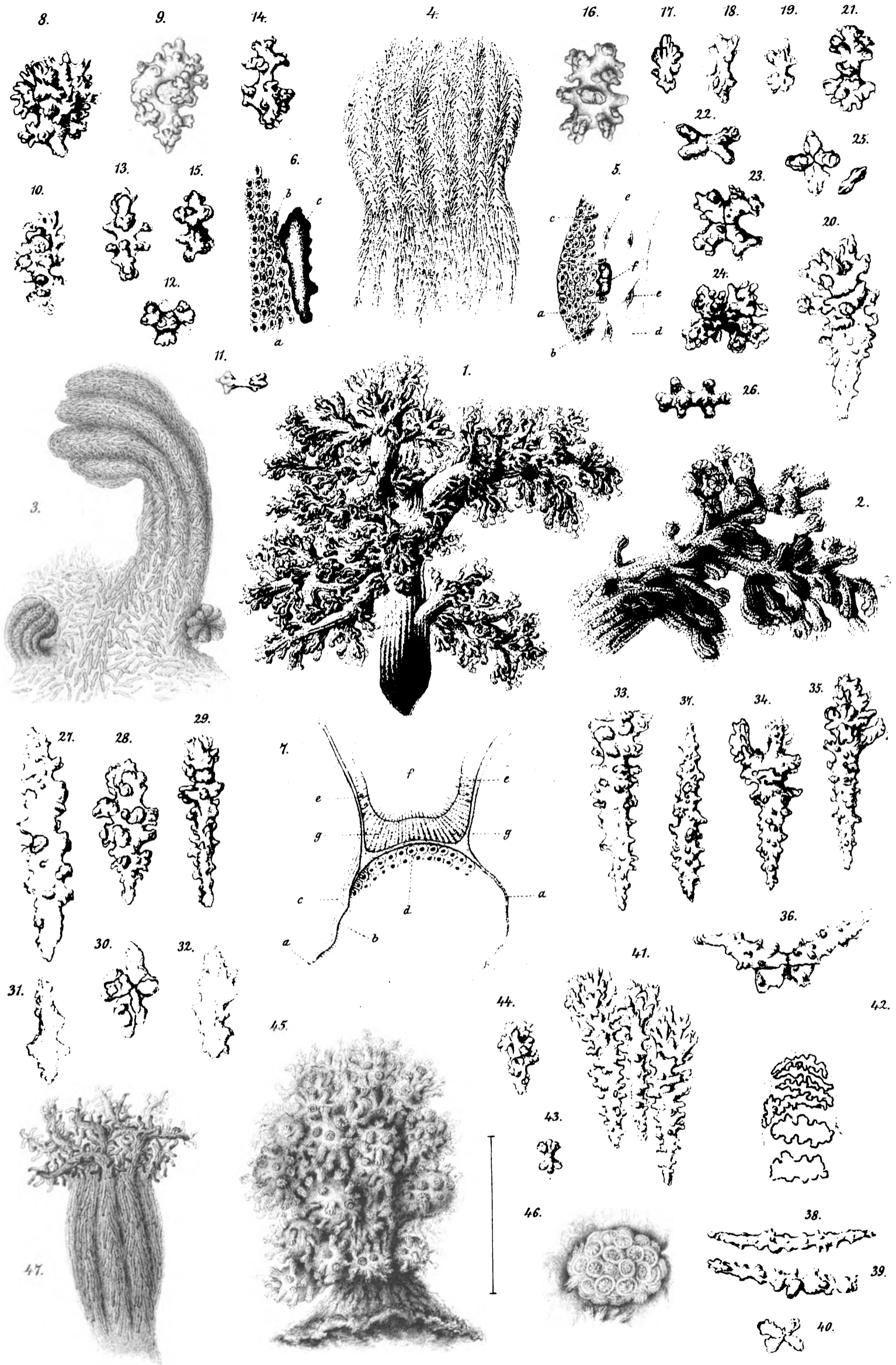
Duba flava, n. sp. 1-33. *Duba glacialis*, n. sp. 34-81. *Duba cinerea*, n. sp. 82-93.



H. Richter int. del.

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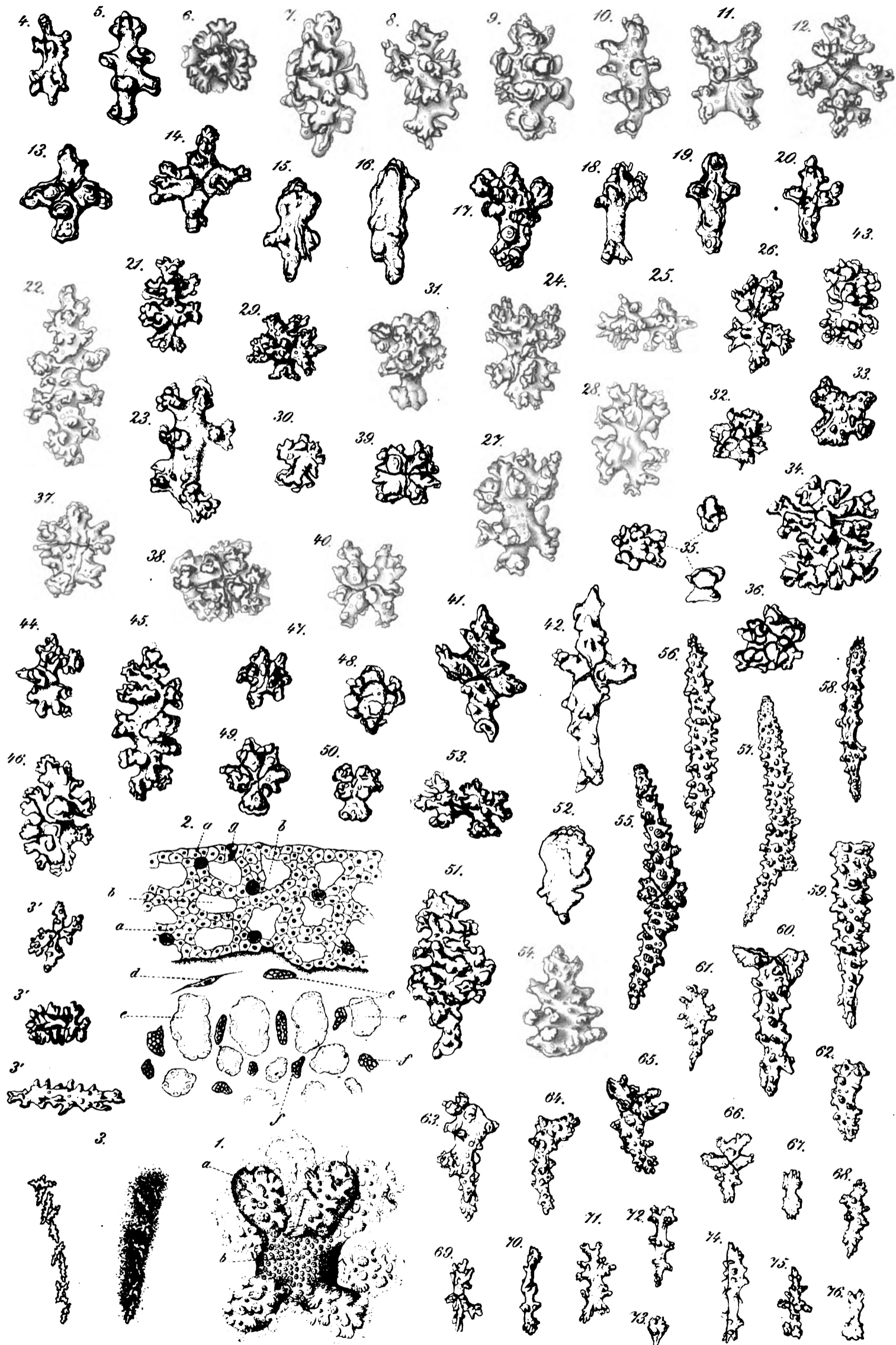
Duva cinerea n. sp. Fig. 1-29 *Drifa islandica* n. sp. Fig. 30-71.



H. Bucher jun del

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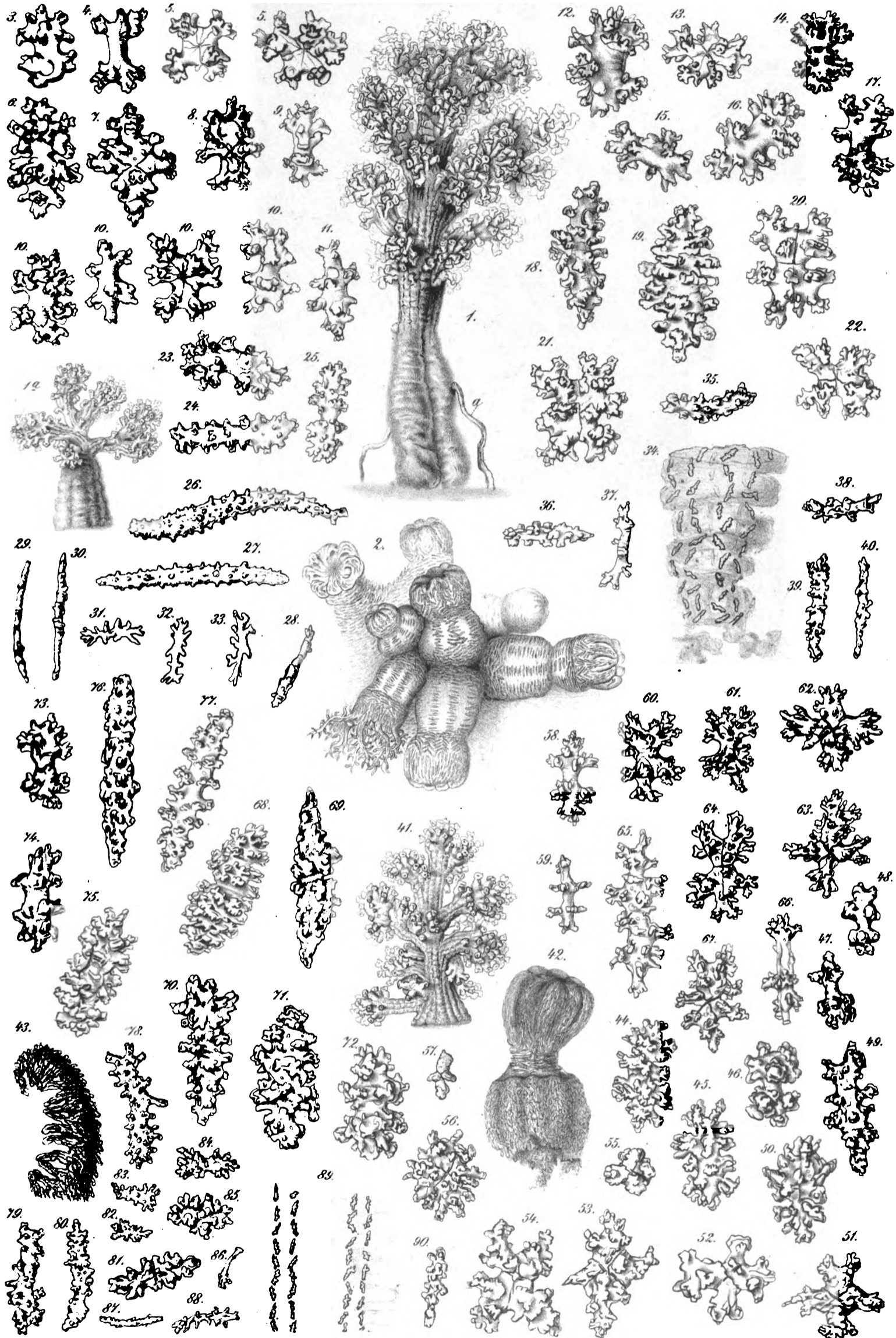
Drifa hyalina n.g. et. sp. 1-44. *Nannodendron elegans* n.g. et. sp. 45-47.



H. Fischer jurel.

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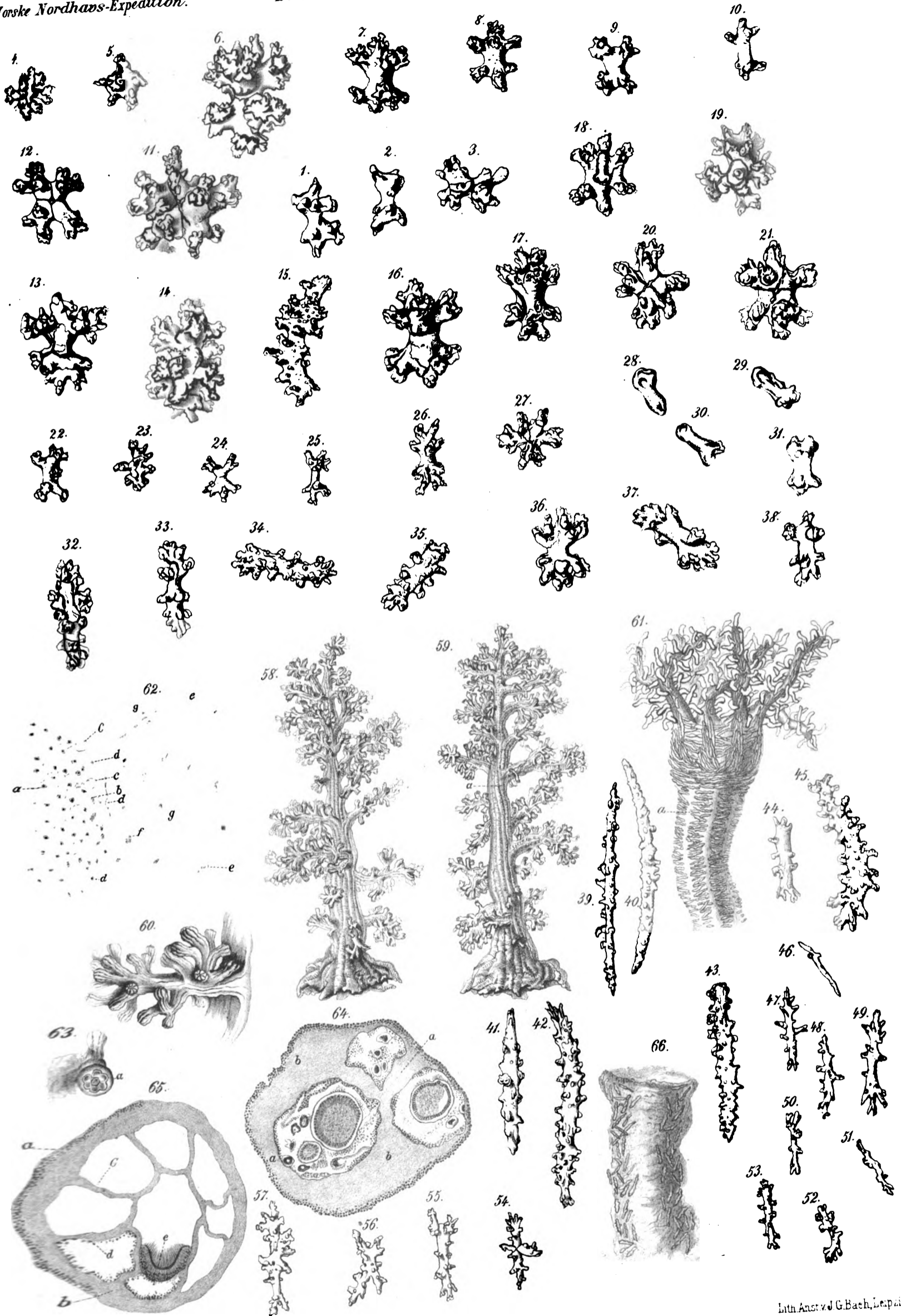
Nannodendron elegans n. g. et. sp.



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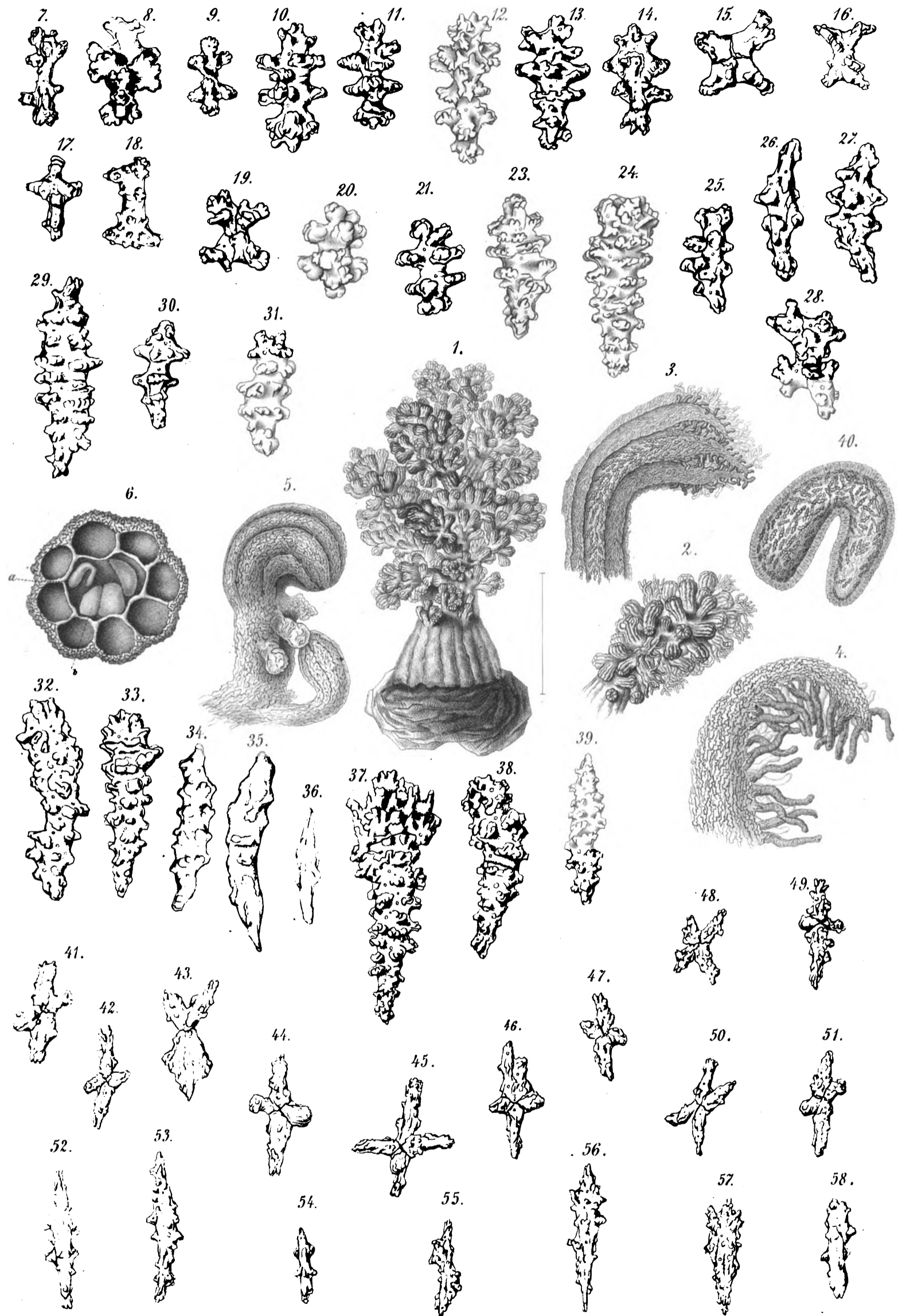
Vöringia polaris, n. sp. 1-40. *Vöringia pygmæa*, n. sp. 41-90.

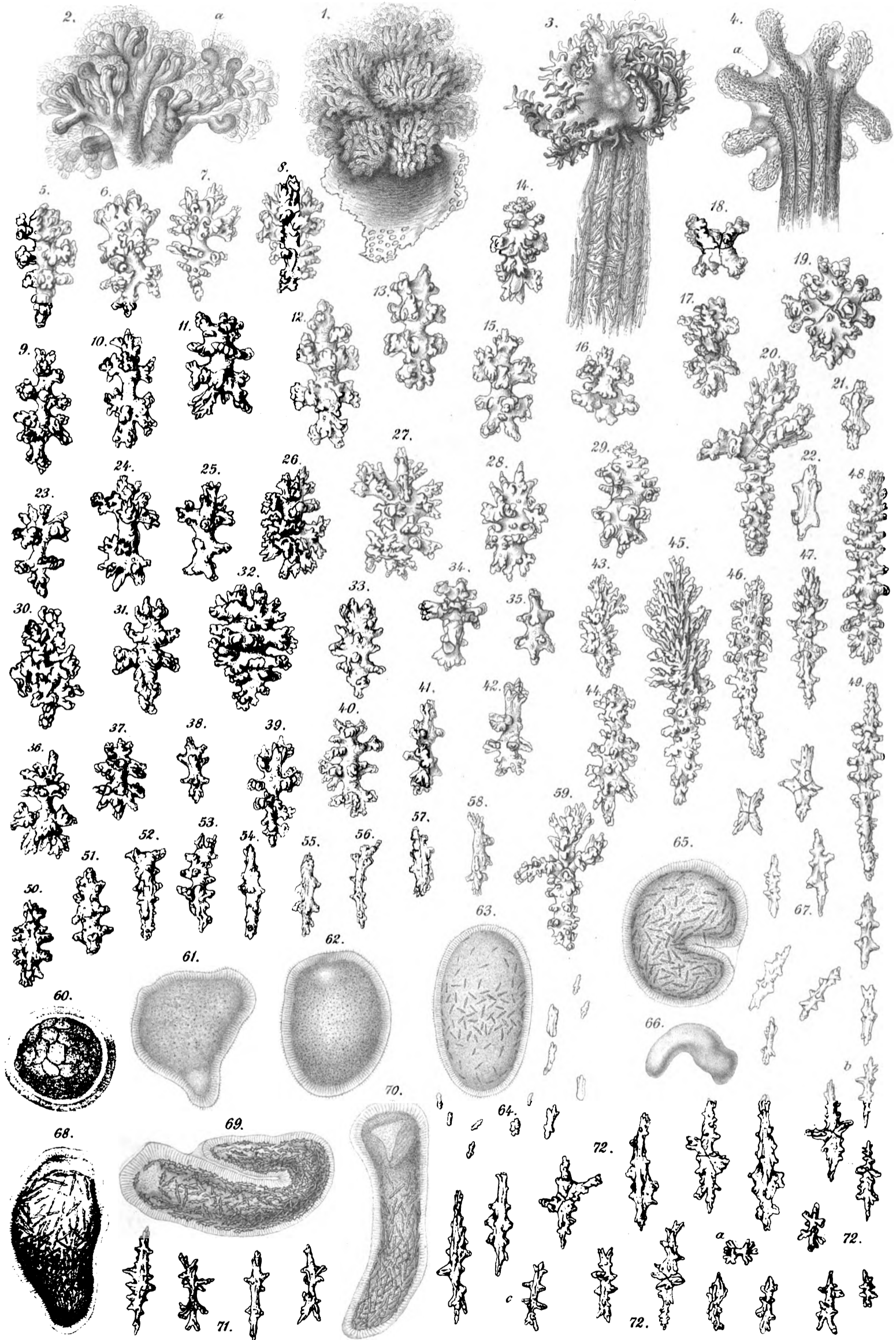


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H. Brucher, jun. del.

Fulla Schiertzi n. g. et. sp.

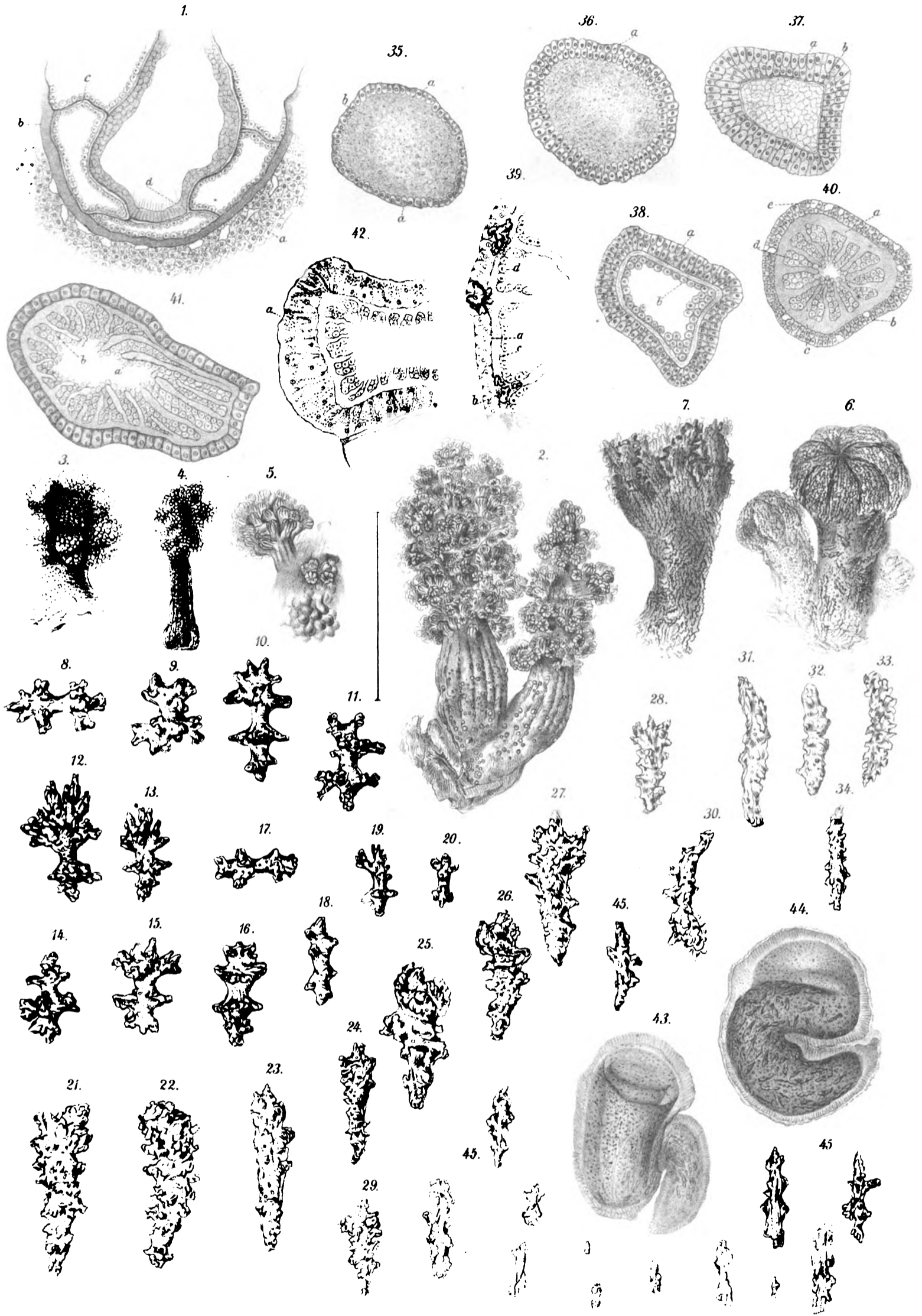




H. Buchen-jur del.

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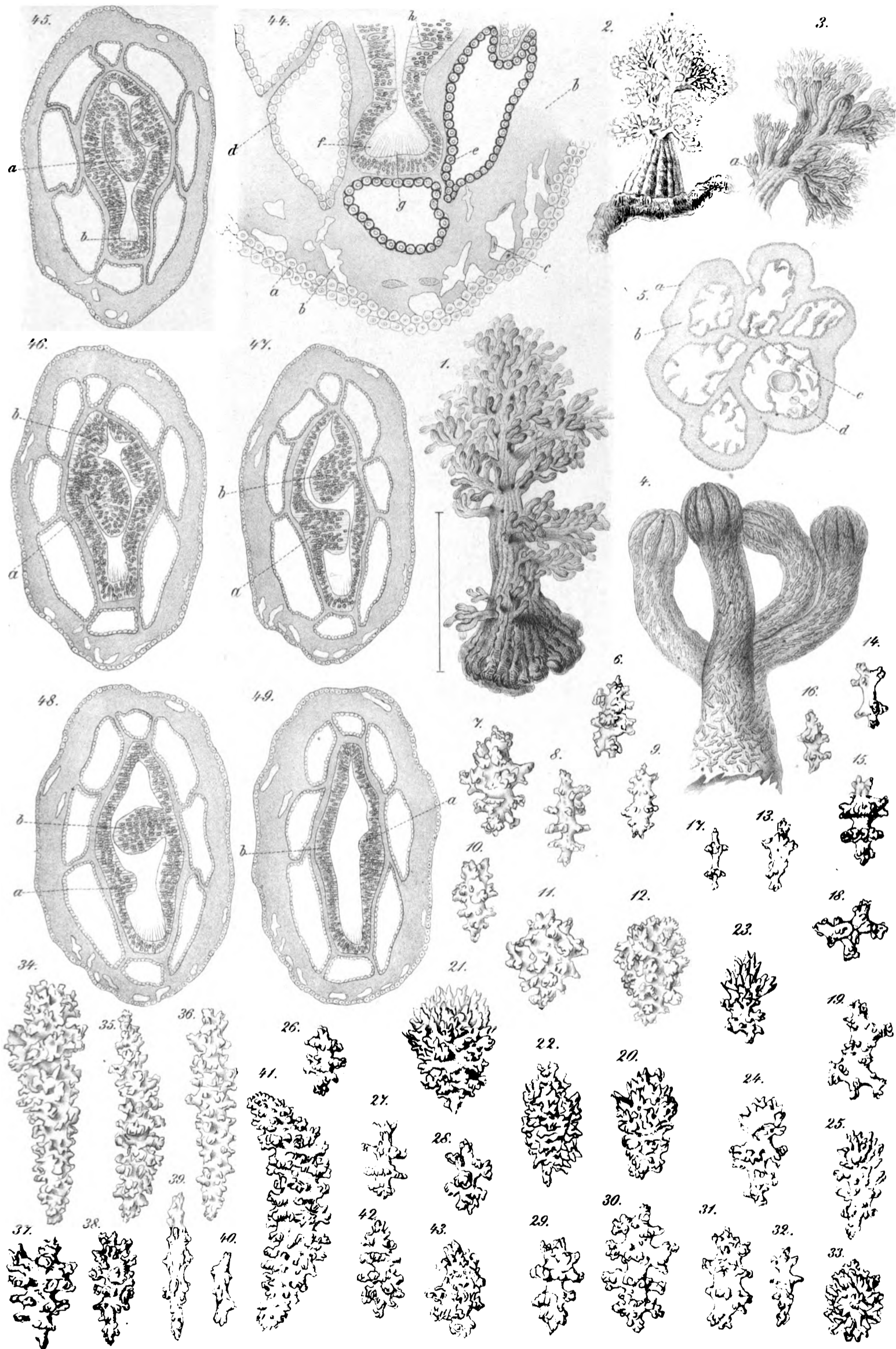
Nephthya rosea, n. sp.



F. Bucher, del.

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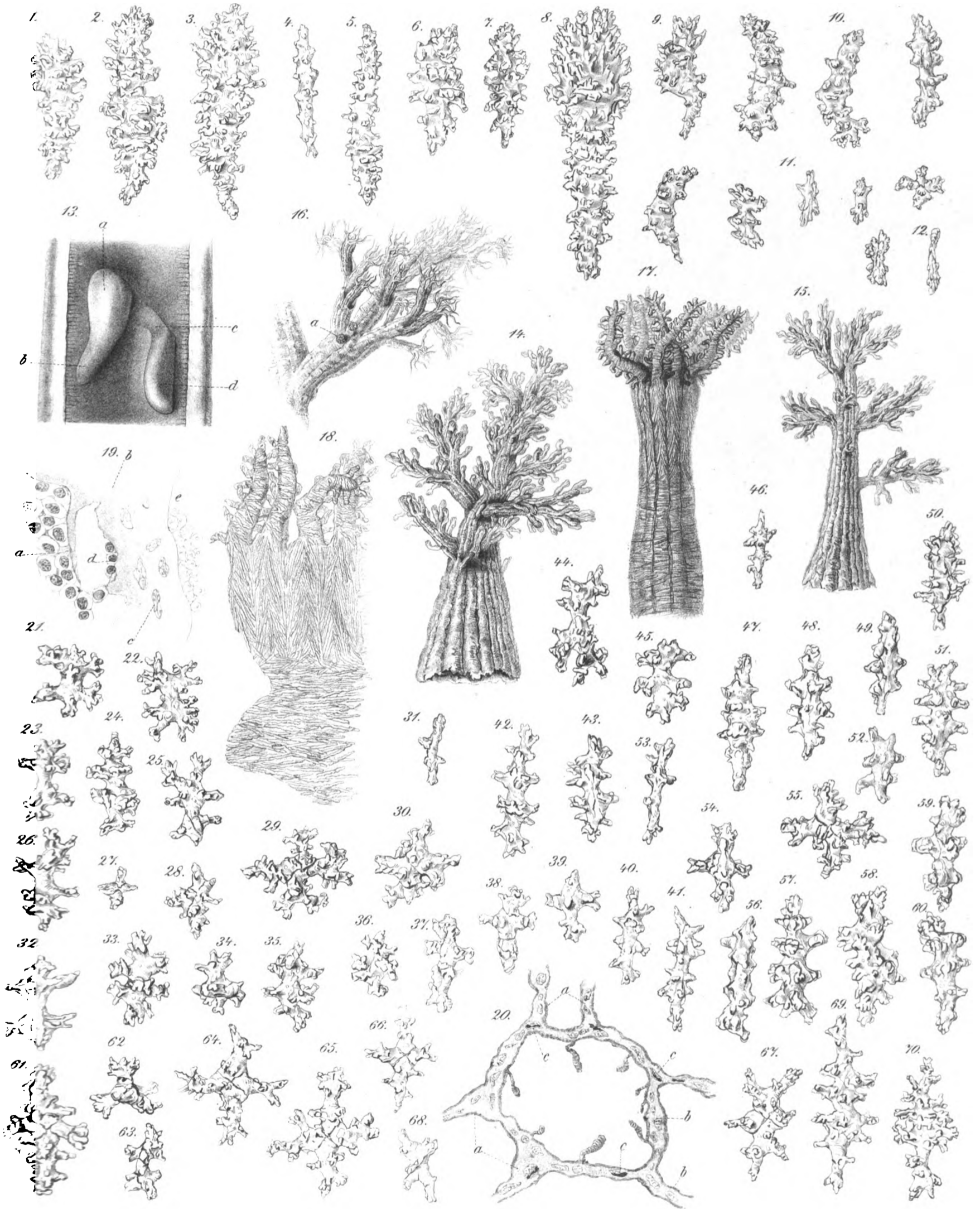
Nephthya rosea n.sp. 1. *Nephthya polaris* n.sp. 2-45.



H. Fischer jnr del

Tab. Anst. v. G. Bach, Leipzig

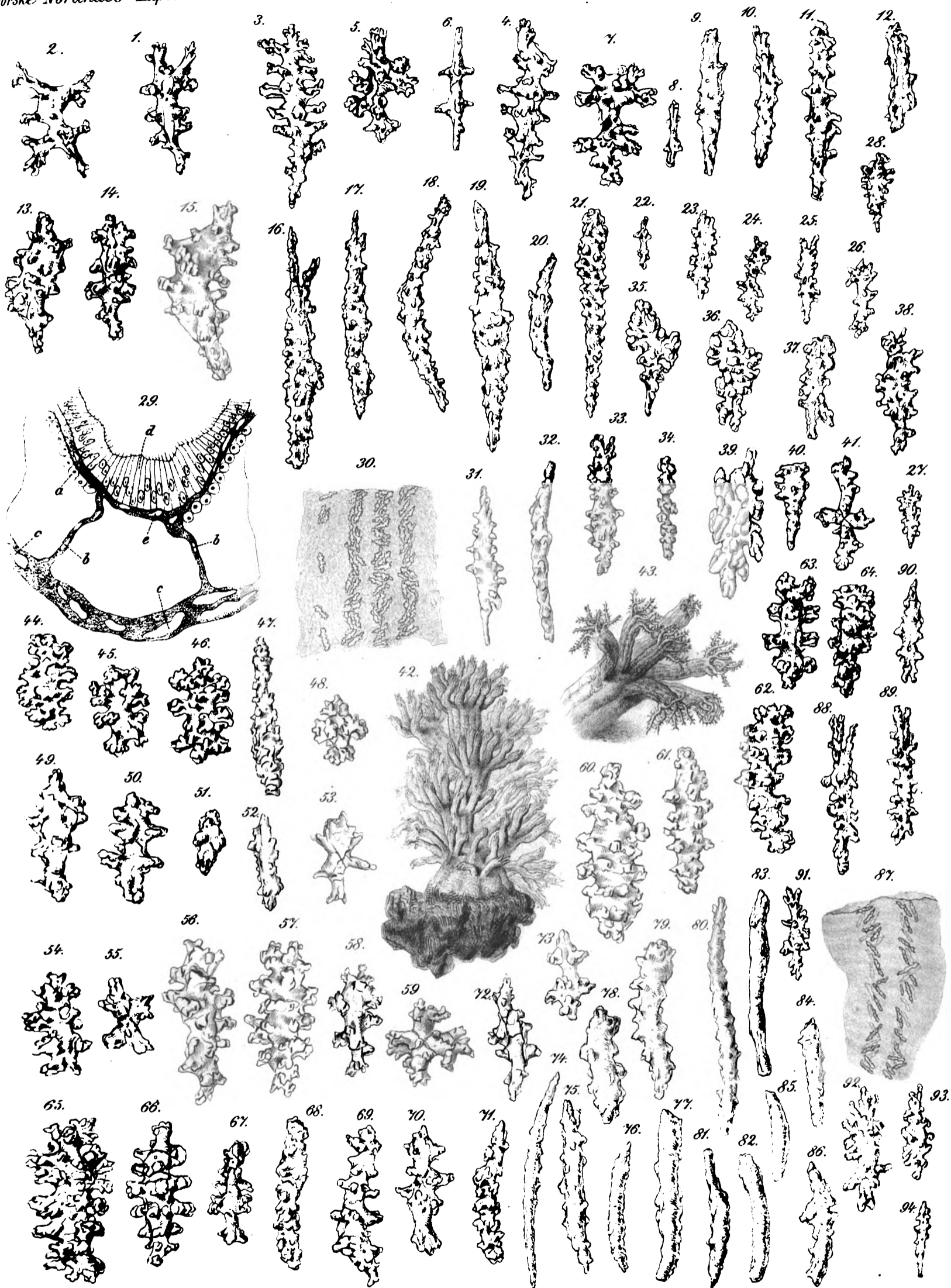
Gersemiopsis arctica n. g. et sp.



2. Fischer j. n. d. del.

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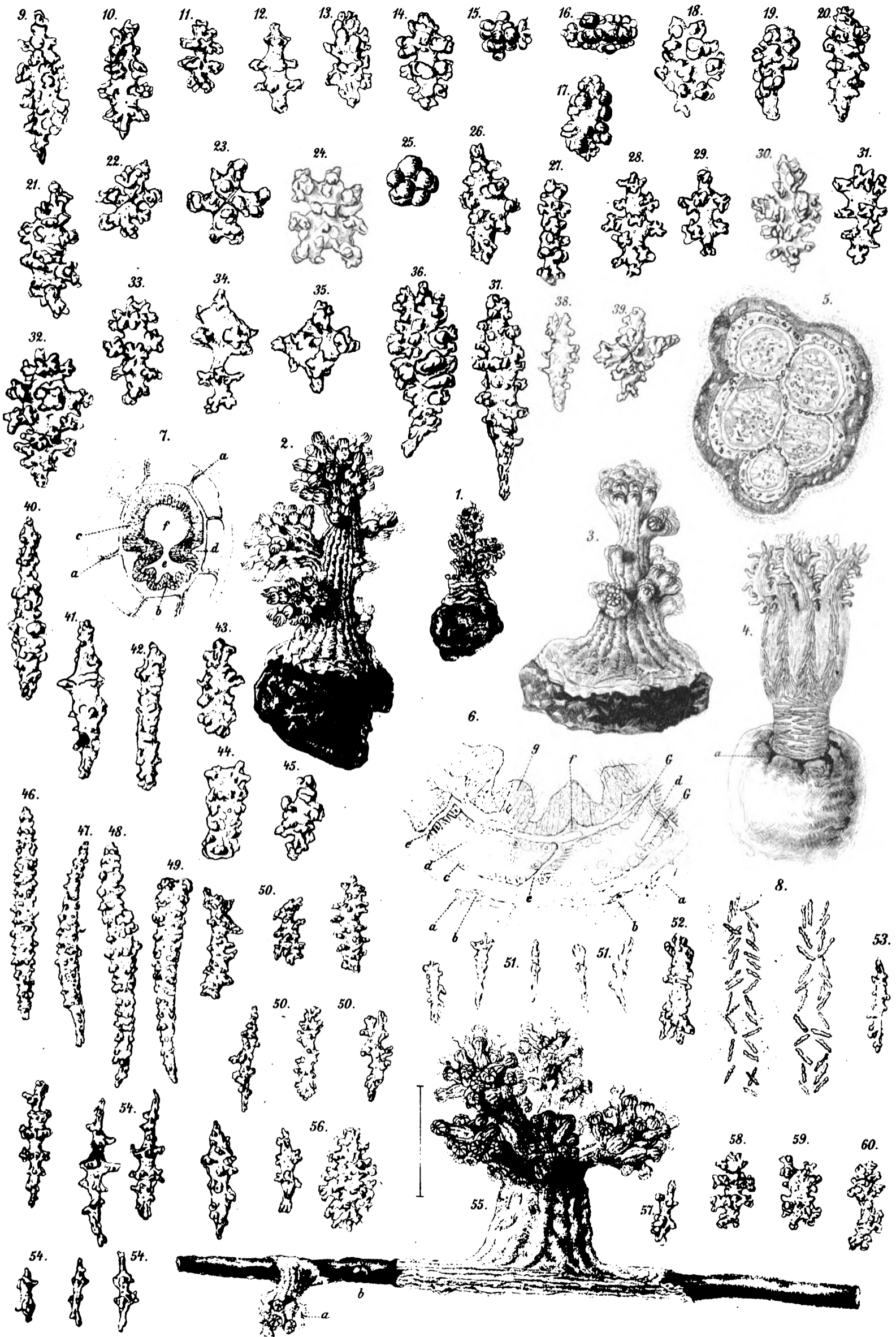
Gersemiopsis arctica n. g. et sp. 1-13. *Barathrobisus digitatus* n. g. et sp. 14-70.



H. Bucher jnr del.

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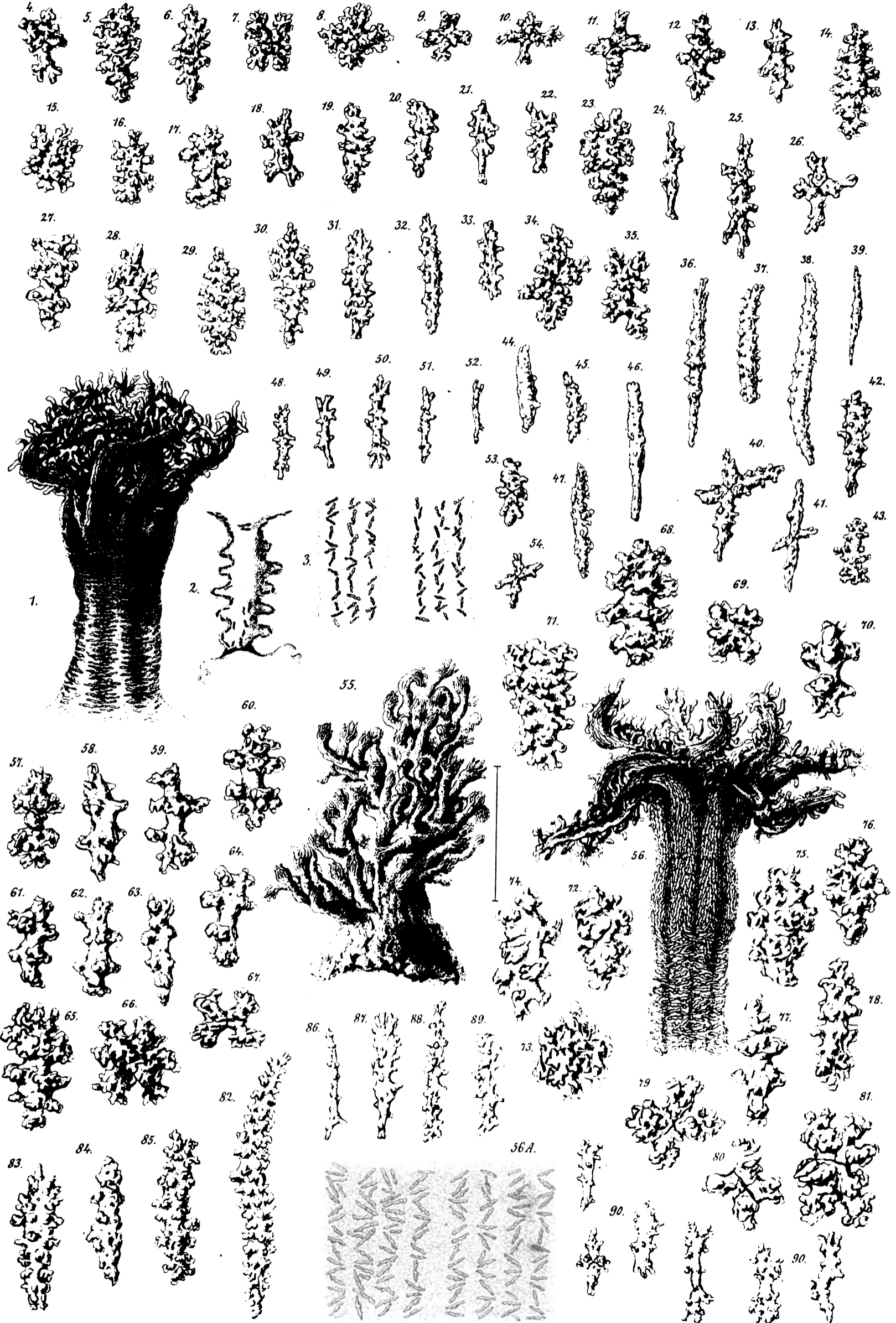
Barathrobium digitatus n.g. et sp. 1-41. *Barathrobium palmatus*, n.sp. 42-94.



H. Bucher jnr. del.

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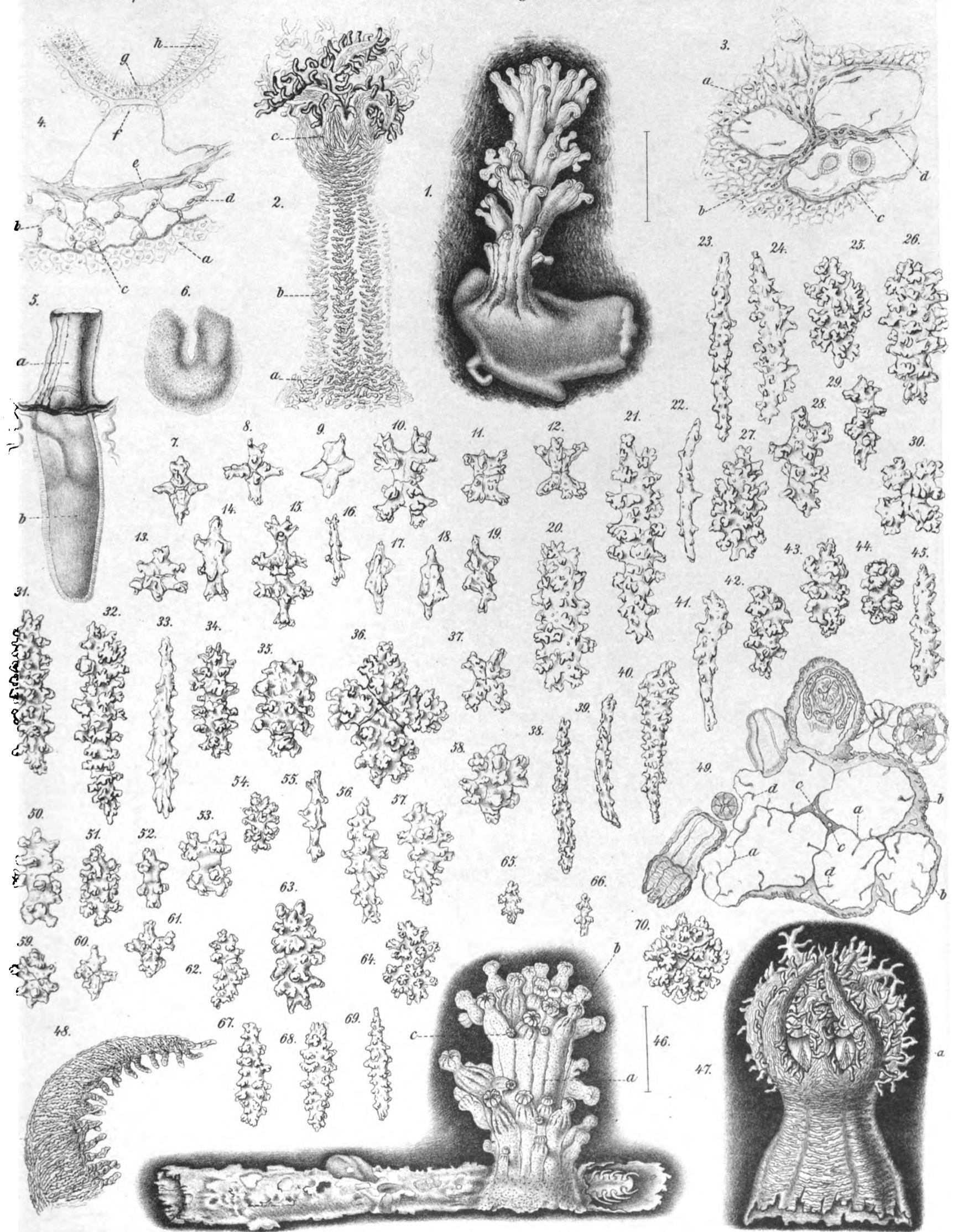
Sarakka crassa n. g. et. sp. Fig. 1-54. *Voringia dryopsis* n. sp. Fig. 55-60.



H. Bucher jnr del.

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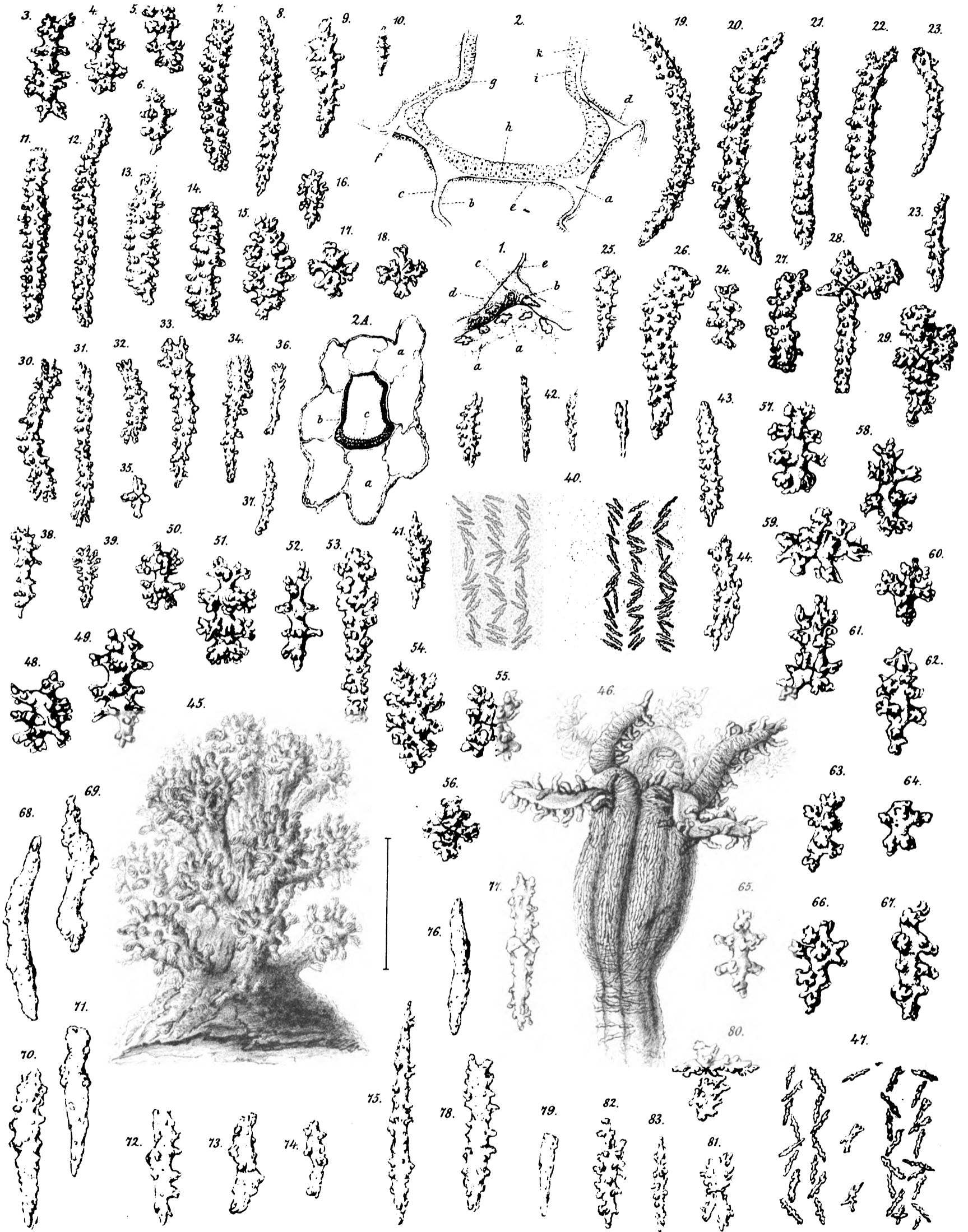
Voringia dryopsis n. sp. Fig. 1-54. *Voringia Jan-Mayeni* n. sp. Fig. 55-90.



H. Bucher jnr. del.

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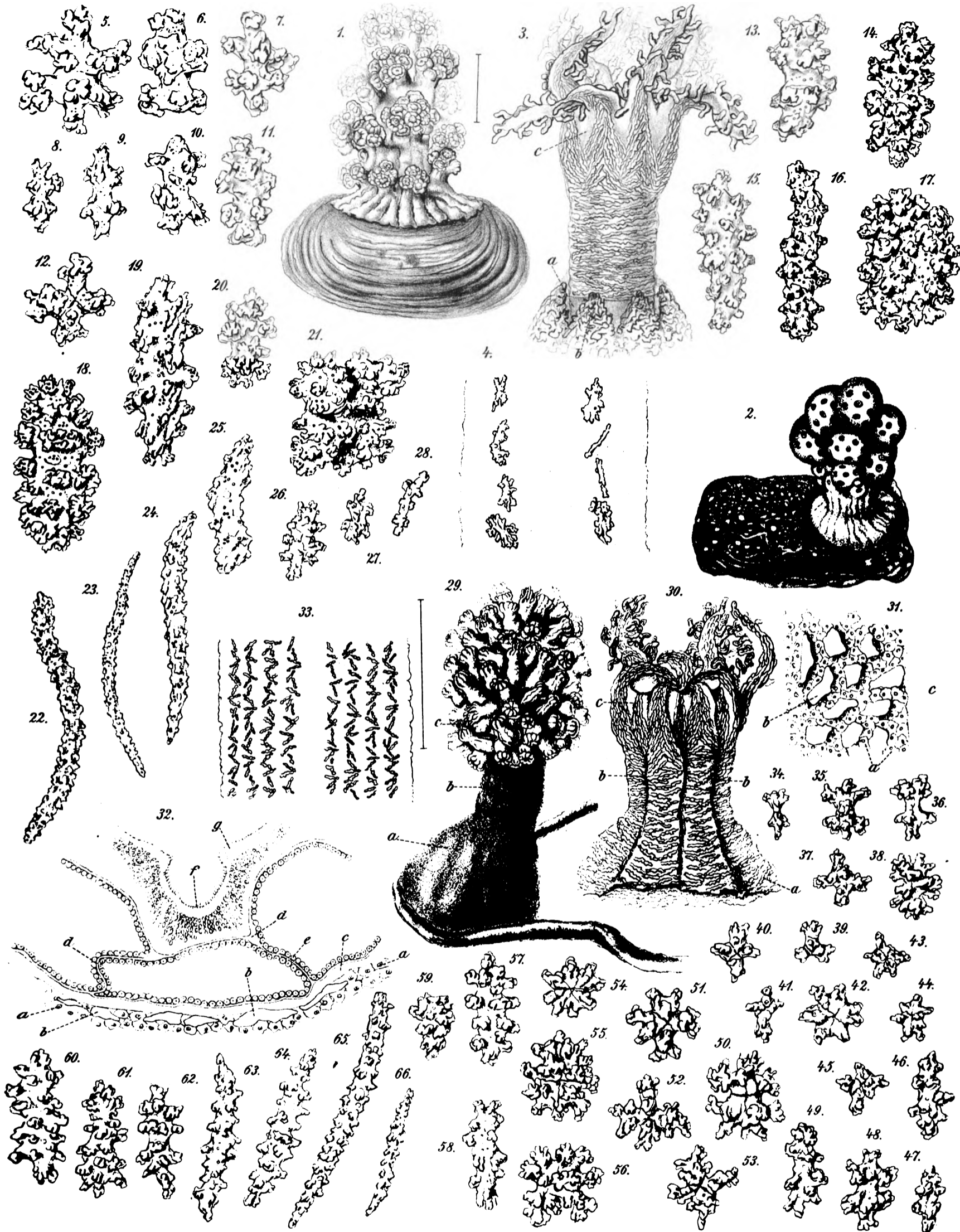
Chrysofanus polaris n. g. et. sp. Fig. 1-45.
Organidus Nordenskjöldi, n. g. et. sp. Fig. 46-70.



H. Bucher jnn. del.

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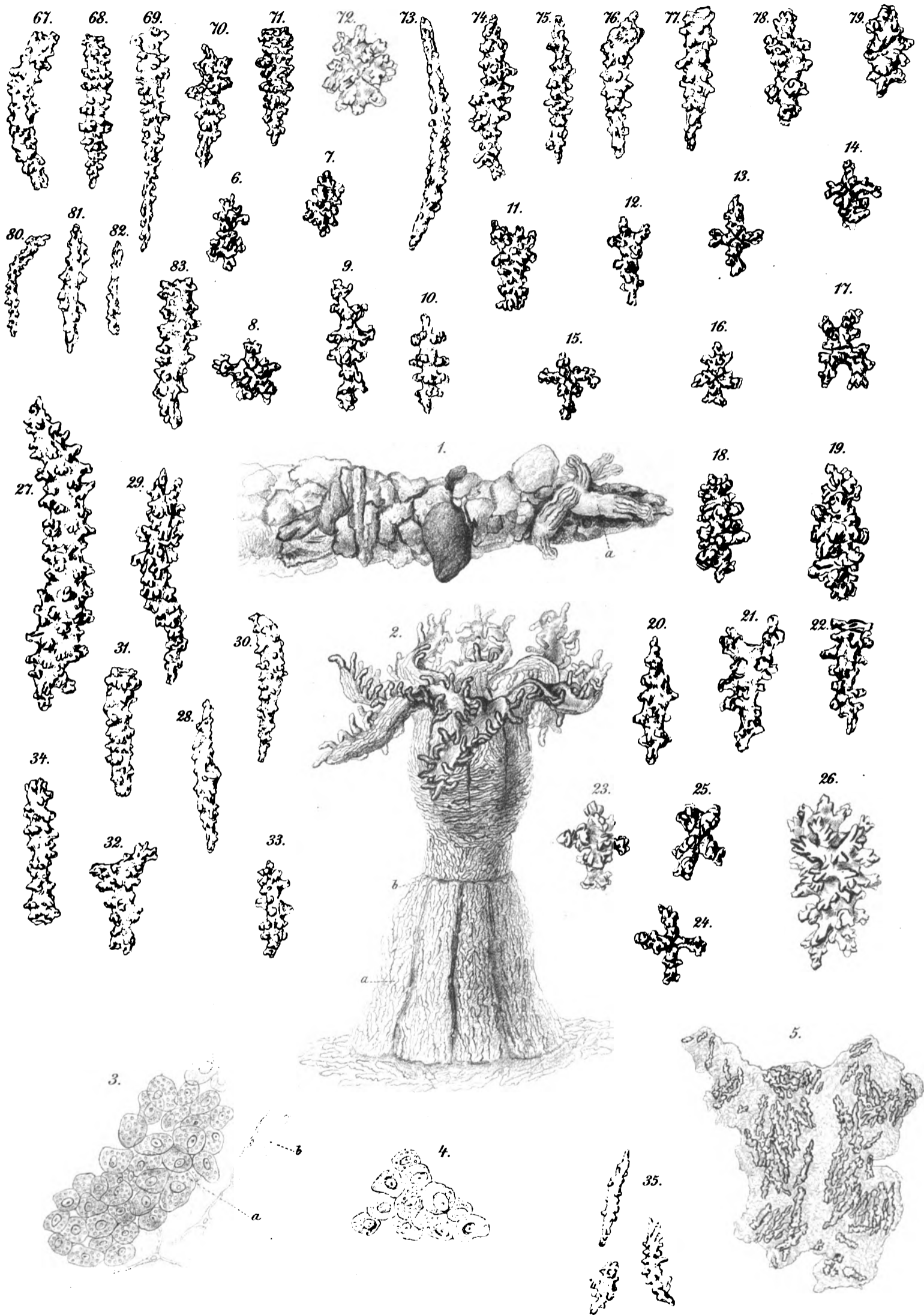
Organidus Nordenskjöldi n. g. et. sp. Fig. 1-44.
Vöring: clavata n. sp. Fig. 45-83.



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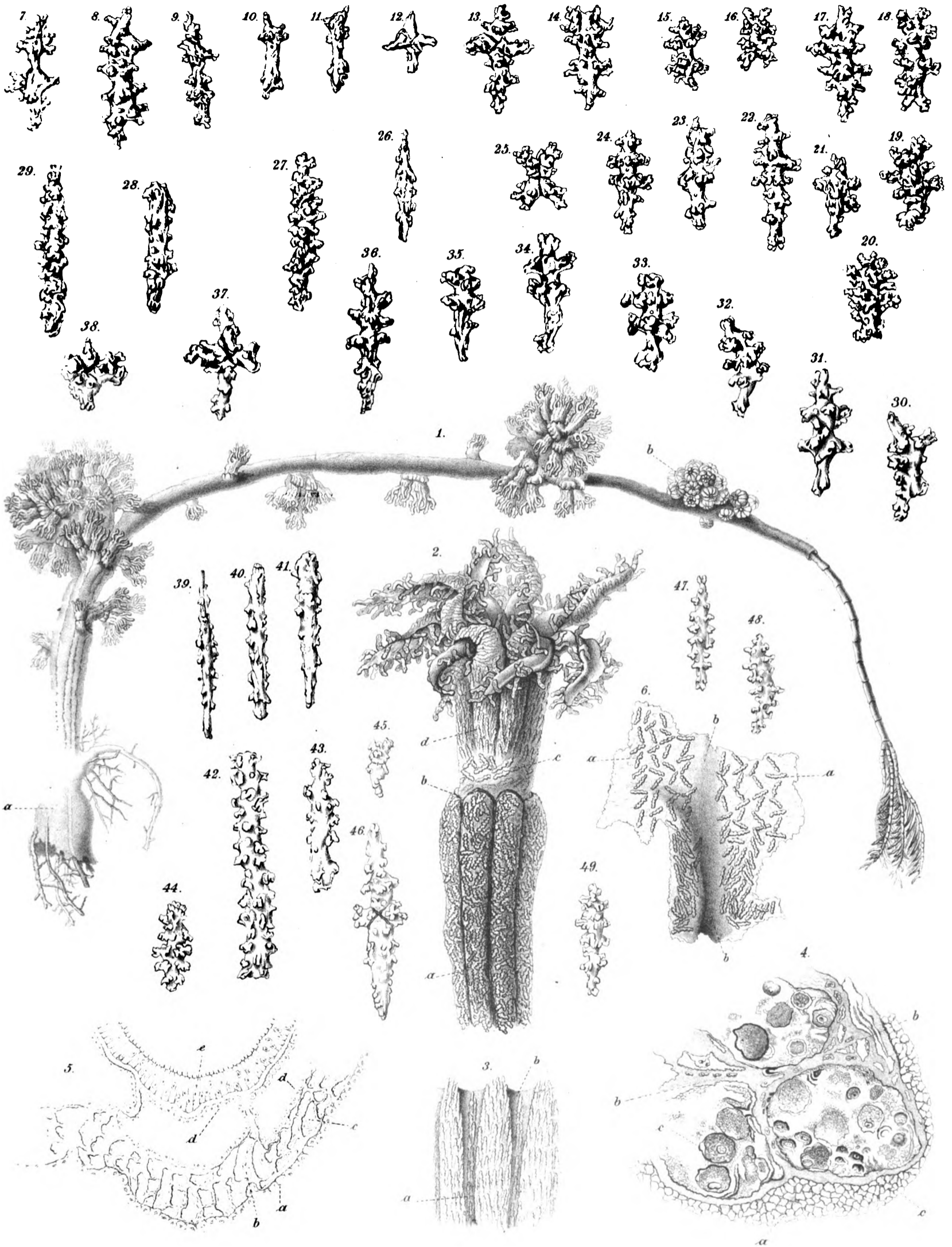
Vöring: capitata n. sp. Fig. 1-28.
Nidalia arctica n. sp. Fig. 29-66.



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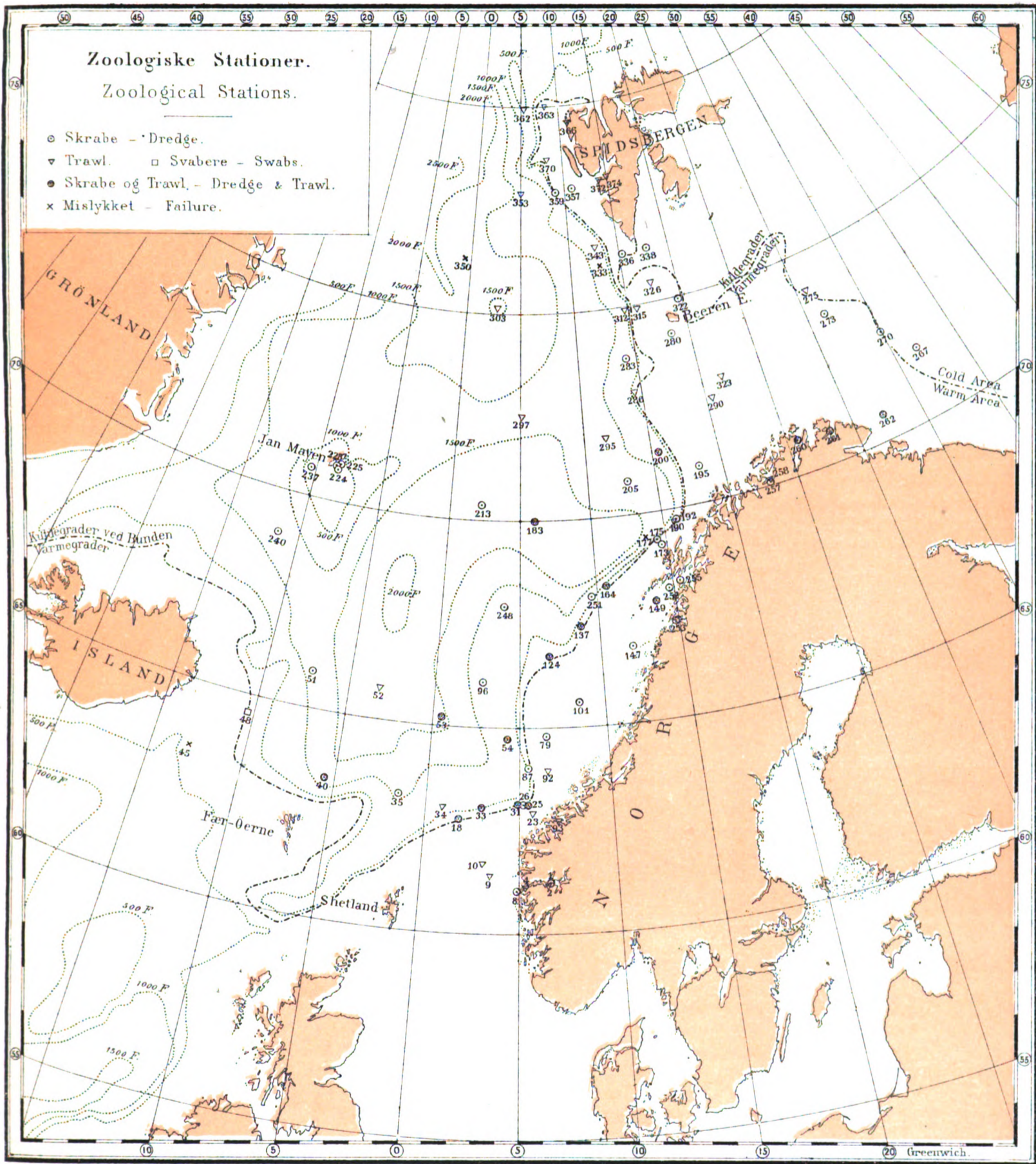
Nidalia arctica n. sp. Fig. 67.-83. *Clavularia frigida* n. sp. Fig. 1-35.



E. Boser for del.

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Sympodium abyssorum, n. sp.



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DEN NORSKE NORDHAVS-EXPEDITION

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1890.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

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1890.

Forord.

Samtlige de paa den norske Nordhavsexpedition indsamlede Actinida ere Dybvandsformer, og en stor Del af dem leve i den kolde Area.

Actinarierne ere i sin store Almindelighed seiglivede Dyr, der orientere sig temmelig let under forandrede baade Livs- og Temperaturforholde. Dette i Forening med, at jeg som Medlem af Expeditionen kunde ivaretage Indsamlingen og holde Dyrene længere Tid levende, hvorved de i Regelen akklimatiseredes saavidt, at de i fuld Vigør udfoldede Tentaklerne og foretog de Bevægelser, der ere dem eiendommelige, — gjorde, at jeg fik god Tid baade til at observere dem og lade dem tegne, trods den oprørte Sø, som Expeditionen ofte var udsat for.

I systematisk Henseende har jeg især fulgt den Inddeling, Professor Richard Hertwig har opstillet for de af ham beskrevne Actinaria fra Challenger-Expeditionen. Som bekjendt har han væsentligt lagt de anatomiske Kjendsgjeringer til Grund for sin Inddeling og for Størstedelen forladt den Methode, der af ældre Forskere er befulgt; nemlig saagodtsom udelukkende at tage Hensyn til de ydre Karakterer. — Imidlertid maa det erkjendes, at disse ydre Kjendemærker ikke ganske bør sættes udaf Betragtning, men at de meget mere maa ansees for at være ret gode Hjælpemidler til at systematisere, og da jeg har haft Anledning til at iagttage Dyrene levende, har jeg ogsaa benyttet disse ydre Karakterer, samtidig med de anatomiske Kjendemærker. Saavidt jeg har formaaet, har jeg taget tilbørligt Hensyn til Gosse's og Andres's Systematik, hvis Arbejder over Actinarierne ere i høi Grad fortjenstfulde. Men for mig har Hertwigs systematiske Inddeling været mere tiltalende, end nogen Andens, forsaavidt den hviler paa en mere stabil Grundvold, er ikke underkastet de mangfoldige Variationer, som Tilfældet er med de ydre Kjendemærker, saasom Størrelse, Hudens ydre Beskaffenhed, Farve, Tentakelantal etc., — imedens jeg fuldt ud maa indrømme, at endnu er Tiden ikke inde til at kunne opstille et i alle Henseender tilfredsstillende System. Dertil udfordres en mere omfattende anatomisk-histologisk Undersøgelse af Actinarierne, end der hidtil er bleven dem til Del.

Preface.

All the Actinida collected on the Norwegian North Atlantic Expedition are deep-water forms, and a great many of them dwell in the cold area.

In general, the great bulk of the Actinaria are animals very tenacious of life, which with considerable facility accommodate themselves to changes of habit and temperature. That circumstance — in conjunction with the fact, that as a member of the expedition I was in a position to personally care for their collection and maintain the animals for a considerable time in the animate state, by which they became so far acclimatized, that they in full active vigour unfolded the tentacles and exercised the movements characteristic of them — enabled me to obtain plenty of time, both to observe them as well as have them drawn in spite of the heavy rolling sea the expedition was frequently exposed to.

In regard to system, I have more particularly followed the classification Professor Richard Hertwig has established for the Actinaria from the Challenger Expedition which he has described. As is known, he has taken, principally, the anatomical features as the basis of his classification, and has abandoned, for the greater part, the method adopted by the older naturalists viz. to confine attention almost exclusively to the external characteristics. It must, however, be acknowledged, that those external characteristics should not be entirely disregarded, but should rather be regarded as particularly valuable auxiliaries in systematizing, and as I have had the opportunity of observing the animals while in the animate state, I have also considered those external characters along with the anatomical features. So far as it has been possible to do so, I have paid due regard to Gosse's and Andres's systematism — whose works on the Actinaria are in an eminent degree valuable — but Hertwig's systematic classification has had greater attractions for me than that of any other, in so far, that it rests on a more solid foundation and is not exposed to the numerous variations pertaining to external characteristics, such as size, nature of the external integument, colour, number of tentacles &c. whilst I must fully admit, that the time has not yet arrived at which we can establish a — in all respects — satisfactory system. For that, a wider and closer histo-

II

R. Hertwig siger: „Although the existing systems of the Actiniæ undeniably require a complete remodelling on a new foundation, I have refrained from this at present, as the material investigated by me was insufficient. I only considered it absolutely needful to form some larger divisions anew in order to express in some measure the conditions of relationship among the forms. I have taken the structure and arrangement of the septa as the fundamental principle, and distinguish six Tribes of Actinaria: 1. Hexactiniæ; 2. Paractiniæ; 3. Monauleæ; 4. Edwardsiæ; 5. Zoantheæ; 6. Ceriantheæ.“

Til 4 af de her nævnte Stammer (Tribus) har jeg kunnet henføre de paa den norske Nordhavsexpedition fundne Actinida; men desforuden har jeg været nødsaget til at opstille en ny Tribus, nemlig „Ægireæ“, hvortil jeg har hentørt to Slægter, som egentlig ikke ere Coelenterater, forsaavidt de ere udstyrede med et udpræget Coelom; men at danne en hel ny Klasse for disse to yderst mærkværdige Dyr har jeg søgt at undgaa, omendskjønt det vistnok havde været det systematisk korrekte; thi naar Hovedkarakteren for Klassen Coelenterata mangler, naar der nemlig intet Coelenteron er, har unægtelig Klassen tabt sin privilegerede Ret til at bemægtige sig disse Dyr.

Af de indsamlede Actinida ere der 18 nye Slægter og 40 nye Arter, hvilke ere henførte til 15 Familier, hvoraf 5 ere nye.

Bergen, December 1888.

D. C. Danielssen.

logical investigation of the Actinaria than has yet taken place is necessary.

R. Hertwig says: „Although the existing systems of the Actiniæ undeniably require a complete remodelling on a new foundation, I have refrained from this at present, as the material investigated by me was insufficient. I only considered it absolutely needful to form some larger divisions anew in order to express in some measure the conditions of relationship among the forms. I have taken the structure and arrangement of the septa as the fundamental principle, and distinguish six Tribes of Actinaria: 1. Hexactiniæ; 2. Paractiniæ; 3. Monauleæ; 4. Edwardsiæ; 5. Zoantheæ; 6. Ceriantheæ.“

I have been enabled to assign the Actinaria found on the Norwegian North Atlantic Expedition to 4 of the races (Tribus) above named, but I have been able, further, to establish a new Tribus viz. Ægireæ, to which I have relegated two genera that are really not Coelenterata, in so far that they are furnished with a distinguished coelome. I have endeavoured, however, to avoid forming an entirely new class for those two most interesting animals; although it would certainly have been the most systematically correct course to do so, because, when the chief characteristic of the Coelenterata class is absent, when there is thus no Coelenteron, the class has undeniably lost its claim to the privilege of acquiring those animals.

Of the Actinida collected, there are 18 new genera and 40 new species, which are assigned to 15 families, of which 5 are new ones.

Bergen, December 1888.

D. C. Danielssen.

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Rettelser.

(*Errata.*)

- Side (page) 17 staa: *Stelidiactis Mopsiæ*; — skal staa (read): *Stelidiactis Mopseæ*.
 Tab. 1 staa: *Sagartia repens* n. g. d. sp.; — skal staa (read): *Sag. rep.* n. sp.
 — 11 staa: *Calliactis Krøyeri*, n. g. et sp.; — skal staa (read): *Call. Kr.*, n. sp.
 — 11 staa: *Stilidiactis Mopsea*; — skal staa (read): *Stelidiactis Mopseæ*.
 — 11 staa: *Stel. Tubularia*; — skal staa (read): *Stelidiactis Tubulariæ*.

Actinida vel Malacodermata.

Tribus Hexactiniæ, Hertwig.

Familie Amphianthidæ, Hertwig.

*Korenia*¹ *margaritacea*, n. g. et sp.

Tab. I, Fig. 4. Tab. VII, Fig. 1—5.

De Exemplarer, som bleve fundne af *Korenia*, vare alle fæstede til Stilken af *Bathyrinus* Carpenteri, Dan. & Kor.

Paa ganske unge Exemplarer er Foddelen rund, næsten skiveformigt udvidet; efterhaanden som Dyret voxer, udvider Fodskiven sig efter Tvervidden og omklammer ikke ganske Stilken af *Bathyrinus* Carp.; thi der er altid paa enkelte Steder en Spalte, hvorigjennem Stilken kan sees, og denne Spalte er bredere ud imod begge, næsten lancetformede Ender af Fodskiven, Tab. VII, Fig. 3. Denne er paa de største Individuer udvidet indtil 25^{mm} i Længden, imedens Bredden kun er indtil 5^{mm}, Tab. VII, Fig. 1—3. Ved Fodskivens Bøining omkring Crinoidestilken fremkommer egentlig 2 Rande, der ere tykke, glatte, noget undulerende, uden at berøre hinanden, Tab. VII, Fig. 3. Imellem den ombøiede Fodskive og Stilken, hvorpaa den er fæstet, findes en hornagtig Masse, der indkapsler Stilken, og hvis ydre Flade er fast adhæreret til Fodskiven, hvorfra den upaatvivlelig er afsondret. Dyret kan saaledes neppe forandre Plads, men maa sandsynligvis blive sid-

¹ Slægten er opkaldt efter min afdøde Ven og Medarbejder, Dr. Johan Koren.

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

Actinida vel Malacodermata.

Tribus Hexactiniæ, Hertwig.

Family Amphianthidæ, Hertwig.

*Korenia*¹ *margaritacea*, n. g. et sp.

Pl. I, fig. 4. Pl. VII, figs. 1—5.

The specimens of *Korenia* which were found on the expedition, were all adherent to the stem of *Bathyrinus* Carpenteri, Dan. & Koren.

In perfectly young specimens, the inferior or pedal part is round, and almost discoidally expanded. As the animal grows, the pedal disc expands progressively, transversally, and embraces, but not completely, the stem of *Bathyrinus* Carp. there being always an opening left in a few places, through which the stem may be seen; this opening is broadest towards both of the nearly lanceolate extremities of the pedal disc (Pl. VII, fig. 3.). In the largest specimens, the pedal disc is expanded up to 25^{mm} in length, whilst it only measures up to 5^{mm} in breadth (Pl. VII, figs. 1—3). By the curving of the pedal disc round the stem of the Crinoid, 2 margins are really produced; these are thick, smooth, and somewhat undulating, without, however, touching each other (Pl. VII, fig. 3). Between the bent pedal disc and the stem to which it is adherent, a corneous mass is found encasing the stem, and whose exterior surface adheres firmly to the pedal

¹ The genus is designated after my deceased friend and collaborator, Dr. Johan Koren.

dende paa Bathyrcrinus-Stilken sit hele Liv igjennem, naar først Fodskiven har tilstrækkelig omklamret Stilken.

Et Par Exemplarer løsnede sig fra denne og havdes levende i omtrent 8 Dage; men omendskjønt Dyrene toge Næring til sig og bevægede sine Tentakler livligt, bleve de dog forresten liggende ganske uforandrede paa Bunden af Observationskarret. Den omboiede Fodskive udvidede sig ikke, kun den foromtalte, hornede Masse syntes at løsne sig lidt, idet en seig Vædske udsivede fra Fodskiven.

Med ganske unge Dyr forholder det sig noget anderledes; hos dem har Fodskiven kun i ringe Grad — ja hos meget unge endog slet ikke — omklamret Stilken, men er fæstet til denne kun ved en seig, slimet Masse, saa at de muligens kunne forandre Plads, Tab. VII, Fig. 1 a.

Kroppen (Kolumnen) er paa unge Exemplarer rund og ikke synderlig videre end den runde Fodskive, Tab. VII, Fig. 1 a, men anderledes forholder det sig med de voxne Dyr; hos dem er den nederste Del af Kroppen elliptisk udvidet i samme Retning som Fodskiven, og dens udvendige Væg er her glat, Tab. VII, Fig. 2, 3, imedens den øvrige Del er mindre aflang og stærkt ribbet efter Længden.

Ribberne ere 24 og mest fremspringende paa Kolumnens øverste Rand, der faar Udseende af en foldet Krave, Tab. I, Fig. 4, Tab. VII, Fig. 1, 2, men aftage efterhaanden nedad baade i Tykkelse og Bredde, Tab. VII, Fig. 2. Paa disse Ribber iagttages 3—4 smaa, runde Papiller, der staa i en Længderække og have paa deres fri, afrundede Ende en fin, rund Aabning, Tab. VII, Fig. 2.

Kolumnen er henved 10^m høi; dens øvre Rand er 10^m efter Længden, 7^m efter Bredden; dens nederste Del, hvor den gaar over i Fodskiven, er 22 — 24^m efter Længden og kun 5^m i Bredden. Kropsvæggen er meget fast, og naar Tentaklerne ere indtrukne, næsten bruskagtig saavel at føle paa som at gjennemskjære.

Mundskiven, der er næsten rund, er hvælvet og forsynet med fine Folder, som udgaa straaaleformigt fra Munden til Tentakelranden. Paa disse Folder (Ribber) sees hist og her enkelte smaa, runde Papiller, fuldkommen lig dem paa Kroppen, der ovenfor ere omtalte, Tab. VII, Fig. 2. Mundaabningen er aflang med stærkt foldede Læber; dens Længdeaxe krydser Kroppens Længdeaxe, og de to Svælgruber, der ere temmelig brede, findes som sædvanlig hos Actinierne i Mundvinklerne, og ikke som hos Stephanactis paa Mundens bredere Del (Læberne). Mundaabningen og den øverste Del af Svælget synes ikke at have fulgt med den elliptiske Udvidning af Fodskiven og Kroppen.

disc from which it has, undoubtedly, been deposited. The animal can, therefore, scarcely change its situation, but must, probably, remain seated on the Bathyrcrinus-stem all through its life, after the pedal disc has once sufficiently clasped the stem.

I detached a couple of specimens from the stem, and maintained them alive for about eight days; but although the animals imbibed nutrition and moved their tentacles actively, they yet remained, otherwise, perfectly motionless at the bottom of the glass vessel. The bent pedal disc did not become expanded; only the corneous mass, previously mentioned, seemed to loosen itself a little, whilst a viscous substance exuded from the pedal disc.

In perfectly young animals the relations are somewhat different; in them the pedal disc has only in a slight degree — indeed in very young ones even not at all — embraced the stem, and adheres to it only by a tough slimy mass, so that, possibly, they may be able to change their situation (Pl. VII, fig. 1 a).

The body (the column) is, in young specimens, round, and not very much wider than the round pedal disc (Pl. VII, fig. 1 a); the case is different however in the adult animals. In them the inferior part of the body is elliptically expanded in the same direction as the pedal disc, and its external wall is, here, smooth (Pl. VII, figs. 2, 3), whilst the remainder is less oblong, and strongly ribbed longitudinally.

The ribs are 24 in number, and are specially protuberant on the uppermost margin of the column, which acquires, thus, the appearance of a frilled collar (Pl. I, fig. 4, Pl. VII, figs. 1, 2) but, lower down, they diminish gradually, both in thickness and in breadth (Pl. VII, fig. 2). On these ribs 3—4 small round papillæ are observed, situated in a longitudinal series, and having, on their free rounded extremities, a minute round opening (Pl. VII, fig. 2).

The column is about 10^m in height; its superior margin measures 10^m longitudinally, and 7^m transversally; its inferior portion, where it passes into the pedal disc, measures 22 — 24^m longitudinally, and only 5^m transversally. The body-wall is very firm, and when the tentacles are retracted it is almost cartilaginous, both to the touch as well as to the knife.

The oral disc, which is almost circular, is arcuate, and is furnished with slender folds issuing radially from the mouth to the tentacular margin. On these folds (ribs) a few small, round, papillæ are here and there seen, exactly like those upon the body previously spoken of (Pl. VII, fig. 2). The oral aperture is oblong, with strongly folded labiæ; its longitudinal axis traverses the longitudinal axis of the body, and the two gonidial grooves, which are rather broad, are found, as usual in the Actinaria, in the oral angles, and not, as in Stephanactis, in the broadest part of the mouth (the labiæ). The oral aperture and the uppermost part of the œsophagus do not appear to have kept pace with the elliptical expansion of the pedal disc and the body.

Tentaklerne ere retraktile, sidde i to Rækker lige indenfor Kolumnens øverste Rand, 24 i hver Række; og ere temmelig korte. De inderste ere lidt tykkere og kanske lidt længere, end de i den ydre Række, Tab. I, Fig. 4, Tab. VII, Fig. 1. Hverken Mundskiven eller Tentaklerne kunne dækkes af Kroppens øverste Rand, der er yderst haard og lidet bevægelig; selv hos meget unge Individuer forblev Mundskiven blottet. Paa et Par Exemplarer var Mundaabningen aflang i samme Retning som Kroppen og Fodskiven; men ogsaa her udgik Svælgruberne fra Mundvigerne.

Kroppens Ectoderm adskiller sig ikke synderligt fra Actiniernes i Almindelighed. Det bestaar af lange Cylinder-celler, der bære Bundter af Cilier, og imellem Ectoderm-cellerne, Tab. VII, Fig. 4 a, sees temmelig tætstaaende, kolbeformige, encellede Slimkjertler, Tab. VII, Fig. 4 b, samt Nematocyster, der staa temmelig spredte, Tab. VII, Fig. 4 c. Indenfor Ectodermet er et Lag Længdemuskler, som især er fremtrædende paa Tentaklerne, Tab. VII, Fig. 4 d. Dette Muskellag ligger udenpaa det forholdsvis brede Bindevævslag, Tab. VII, Fig. 4 e, 5 b, i hvis Midte findes stærke, cirkulære Muskler, der danne tæt liggende Bundter, Tab. VII, Fig. 4 f, 5 c. Paa Kroppens øverste Del ligesom paa Mundskiven ere de stærkt udviklede og samle sig omkring Munden i en ringformig Sphincter, Tab. VII, Fig. 5 c, d. Bindevævet indre Flade er beklædt med lange Pidskeceller. Tab. VII, Fig. 4, g.

Svælget er stærkt foldet, temmelig langt og har to tydelige Svælgruber, der strække sig fra Mundvigerne og ned til dets Ende. Der er sandsynligvis 24 primære, fuldstændige Septa (det vil sige 12 Par), der fæste sig paa Svælget, Mund- og Fodskiven, og hvoraf flere strække sig ud i den forlængede Fod, saavidt jeg kunde iagttage, 3 Par paa hver Side. Af secundære, ufuldstændige Septa fandt jeg kun 21, og paa enkelte Tversnit fandt jeg heller ikke flere end 21 primære, fuldstændige Septa, saa jeg er i nogen Tvivl om, hvorvidt Tallet 24 for disse er ganske korrekt. Det er imidlertid tydeligt, at den indre Række Tentakler aabnede sig i de intraseptale Rum, imedens den ydre Række aabnede sig i de interseptale Rum, saa det er rimeligt, at Tallet 24 er det rigtige.

Gastralfilamenterne ere rigt besatte med Nematocyster og i Kjønnsorganerne sees de i tidligere Stadier.

Parieto-basilarmuskelen er smal, men tyk og strækker sig et Stykke henover Fodskivens indre Flade.

Farven.

Kroppen og Foden bleg rosenrød, næsten hvid med stærk Perlemorglands. Mundskiven mørkere rosenrød

The tentacles are retractile, and are placed in two series, just inside the uppermost margin of the column, 24 in each series; they are rather short. The innermost ones are a little thicker, and perhaps also a little longer than those in the outer series (Pl. I, fig. 4, Pl. VII, fig. 1). Neither the oral disc nor the tentacles can be covered by the superior margin of the body, which is extremely hard and but little mobile; even in very young individuals the oral disc remained uncovered. In a couple of specimens the oral aperture was oblong, in the same direction as the body and pedal disc, but here, also, the gonidial grooves issued from the oral angles.

The ectoderm of the body does not differ much from that of the Actinaria in general. It consists of long cylindrical cells carrying fasciculi of cilia, and between the ectoderm cells (Pl. VII, fig. 4 a) there are observed, claviform, unicellular mucous-glands, rather closely placed (Pl. VII, fig. 4 b); and also nematocysts which are placed rather dispersedly (Pl. VII, fig. 4 c). Inside of the ectoderm there is a layer of longitudinal muscles, which are specially prominent on the tentacles (Pl. VII, fig. 4 d). This muscular layer lies outside the relatively broad connective-tissue layer (Pl. VII, figs. 4 e, 5 b), in whose middle, strong, circular muscles forming compactly placed fasciculi are found (Pl. VII, figs. 4 f, 5 c). On the uppermost part of the body, as well as, also, on the oral disc, they are strongly developed, and collect together, around the mouth, in an annular sphincter (Pl. VII, fig. 5 c, d). The inner surface of the connective-tissue is clad with long flagelliform cells (Pl. VII, fig. 4 g).

The œsophagus is strongly folded, is rather long, and has two distinct gonidial-grooves which extend from the oral angles down to its extremity. There are, probably, 24 primary perfect septa (that is to say 12 pairs) which secure themselves to the œsophagus, mouth, and pedal disc, and several of which extend themselves out into the prolonged base; 3 pairs on each side so far as I could discover. Of secondary, imperfect septa I only found 21, and in a few sections neither did I find more than 21 primary perfect septa, consequently I am in some doubt whether the number 24 is, for these, quite correct. It was, however, certain that the inner series of tentacles opened into the intraseptal spaces, whilst the outer series opened into the interseptal spaces; it is, therefore, probable that the number 24 is correct.

The gastral filaments are richly beset with nematocysts, and in the reproductive organs ova are observable in early stages of development.

The parieto-basilar muscle is narrow, but thick, and extends itself a little way across the inner surface of the pedal disc.

Colour.

The body and base, pale rose-red, almost white, with strong mother-of-pearl lustre. The oral disc, a darker

med en lidt mørkere Ring omkring Munden. Tentaklerne noget mørkere rosenrød end Mundskiven.

Findested.

Station 35. 3 Exemplarer,
— 53. 2 voxne og 3—4 ganske smaa Exemplarer,
— 353. 1 voxent og nogle mindre,

alle siddende paa Stilker af Bathyrinus Carpenteri.

Slægtskarakter.

Fodskiven lancetformig udvidet, omklamrende saagodt-som ganske et tyndt, cylindrisk, fremmed Legeme (Stilken af Bathyrinus Carp.). Kroppen aflang, tærkt ribbet og forsynet med hule Papiller. Mundskiven blottet. Mange fuldstændige Septa; mesodermale Cirkulærmuskler. Tentaklerne faa, siddende i flere Rækker.

Artskarakter.

Den aflange Fodskive, der omklamrer Stilken af Bathyrinus Carpenteri, er indtil 25^{mm} lang og 5^{mm} bred. Kroppen (Kolumnen) er næsten ovoidformet, fast, næsten bruskagtig at føle paa, omtr. 10^{mm} høi; dens øverste Rand 10^{mm} lang, 7^{mm} bred; dens nederste Del er glat, dens øverste er forsynet med 24 stærke Ribber, som have efter Længden stillede smaa Papiller, paa hvis afrundede Ende en fin Aabning. Mundskiven hvælvet med 24 Folder, udstraalende fra Munden mod Kroppranden, og paa hvilke sees enkeltvis lignende Papiller som paa Kroppen. Mundaaabningen aflang, 2 Rækker Tentakler, 24 i hver; de indre lidt større, end de i ydre Række. Farven: Foden og Kroppen bleg rosenrød, næsten hvid med stærk Perlemorsglands. Mundskiven mørkere rosenrød. Tentaklerne noget mørkere rosenrød end Mundskiven.

Kylindrosactis¹ elegans, n. g. et sp.

Tab. II, Fig. 8. Tab. VIII, Fig. 4, 5. Tab. IX, Fig. 5, 6, 7.

Fodskiven er rund, omtrent 80^{mm} bred, noget videre end Kolumnen med en tyk, undulerende Rand. Underfladen, som er lidt nedsænket, er foldet fra Centrum mod Peripherien. Folderne blive tykkere mod Randen, og imellem dem sees en fin Fure, der angiver Insertionerne af Septa. Fodskiven fæster sig stærkt til Stene; den er meget

¹ κύλινδρος = en Valse.

rose-red, with a slightly darker annulus round the mouth. The tentacles, a somewhat darker rose-red than the oral disc.

Habitat.

Station No. 35. Three specimens.
— „ 53. Two adult, and 3—4 quite small specimens.
— „ 353. One adult, and a few small specimens.

All seated on the stems of Bathyrinus Carpenteri.

Generic characteristics.

The pedal disc is lanceolately expanded, embraces, nearly completely, a thin, cylindrical, foreign body (the stem of Bathyrinus Carp.). The body oblong, strongly ribbed, and furnished with hollow papillæ. The oral disc exposed. Many perfect septa. Mesodermal circular muscles. Few tentacles, placed in several series.

Specific characteristics.

The oblong pedal disc, which embraces the stem of Bathyrinus Carpenteri, measures up to 25^{mm} in length and 5^{mm} in breadth. The body (the column) is almost oviform, firm, feels almost cartilaginous to the touch, measures about 10^{mm} in height. Its uppermost margin is 10^{mm} in length, and 7^{mm} in breadth. Its inferior portion is smooth. Its uppermost part is furnished with 24 strong ribs having papillæ placed longitudinally on them, and these have a minute opening in their rounded extremities. The oral disc arcuate, with 24 folds radiating from the mouth towards the body-margin, upon which a few papillæ similar to those of the body are seen. The oral aperture oblong. Two series of tentacles — 24 in each; those of the inner series being a little larger than those of the outer series. *Colour.* The base and body, pale rose-red, almost white, with strong mother-of-pearl lustre. The oral disc, a darker rose-red. The tentacles, somewhat darker rose-red than the oral disc.

Kylindrosactis¹ elegans, n. g. et sp.

Pl. II, fig. 8. Pl. VIII, figs. 4, 5. Pl. IX, figs. 5, 6, 7.

The pedal disc is round, about 80^{mm} in breadth, somewhat wider than the column, and has a thick undulating margin. The under surface, which is somewhat depressed, is folded from the centre towards the periphery. The folds become thicker towards the margin, and between them a slender groove is seen, which indicates the insertions of

¹ κύλινδρος = A roller.

muskuløs, og naar den er sammentrukket, bliver den foldet baade paalangs og paatvers, hvilket især er stærkt fremtrædende, efterat Dyret er opbevaret paa Alkohol. Paa det eneste Exemplar, som haves, iagttages henimod Fodskivens Rand enkelte Acontier, der ved den stærke Kontraktion ere pressede igjennem Huden.

Kroppen er søileformet, cylindrisk, henved 70^{mm} bred strax ovenfor Fodskiven, men smalner lidt af op imod Mundskiven, og er ligesaa høi som bred. I udstrakt Tilstand er Kroppens Væg glat, halvt gjennefskinnende og forsynet med fine, lidt fordybede Længdestriber, som angive Insertionerne af Septa. Den ydre Kroppensflade har mange Sugevorter (Suckers), samt Cinclides. Sugevorterne sidde i Rækker imellem Længdestriberne, Tab. II, Fig. 8, og ere ikke meget fremtrædende. Cinclides sees hist og her som yderst fine Spalter imellem Sugevorterne. Hele Kroppens Overflade faar paa Grund af de gjennefskinnende Septa et fint foldet Udseende. Under Kontraktionerne opstaa baade Længde- og Tverfolder, og i de derved fremkomne Gruber ligge Sugevorterne, der tildels kunne være dækkede af Slim, hvortil Ler er klæbet. Vaskes denne Slim væk, varer det ikke længe, førend Kroppen paany overtrækkes dermed. Kroppens øverste Rand er tentakulær.

Mundskiven er lidt bredere end Kroppens midterste Del, men ikke bredere end Fodskiven; den er næsten plan, stærkt foldet, og Folderne udbrede sig straaformigt fra Munden mod Peripherien saaledes, at de ere smalest ved deres Udspring.

Tentaklerne sidde i 3 Rækker og ere meget retraktile. Den inderste Række har 6 meget tykke, lange Tentakler; den mellemste har 24, som ere noget mindre, og den yderste Række, der sidder lige i Randen, har ligeledes 24, om trent af samme Størrelse som de midterste.

Munden er aflang med tykke, foldede Læber og 2 Gonidiegruber; i enhver saadan sees to smaa Gonidieknuder.

Farven: Fodskiven næsten melkevid. Kroppen egentlig hvid, men stærkt opaliserende, hvorved den antager et dels gulagtigt, dels svagt violet Skjær. Sugevorterne have Kroppens Farve, kanske de ere lidt mørkere. Mundskiven er bleg brungul med mørkere Straaler, som udgaa fra Munden, omkring hvilken er en intensere, brunrød Ring, og strække sig hen til Tentaklerne. Noget udenfor denne brunrøde Ring findes atter en lignende, der dog er noget bredere. Gonidiegruberne ere næsten gule. Svælgrøret gulhvidt. De inderste 6 Tentakler ere brungule, men deres Grund er mørkere end den øvrige Del. De andre Tentakler ere blegere, Tab. II, Fig. 8.

septa. The pedal disc is firmly secured to stones, and is very muscular; when it is contracted, it becomes folded both longitudinally and transversally; this is especially noticeable when the animal has been preserved in alcohol. In the solitary specimen which was obtained, a few acontia may be observed in proximity to the margin of the pedal disc, and these are forced through the integument by the powerful contraction.

The body is columnar, cylindrical, and measures about 70^{mm} in breadth immediately above the pedal disc, but diminishes somewhat in breadth up towards the oral disc, and is the same in height as in breadth. In extended condition, the wall of the body is smooth, semi-transparent, and furnished with fine, slightly depressed, longitudinal stripes, which indicate the insertions of septa. The external surface of the body has numerous suckers, as well as cinclides. The suckers are seated in series, between the longitudinal stripes (Pl. II, fig. 8), and are not very prominent. The cinclides are, here and there, seen between the suckers, appearing as extremely fine fissures. The entire external surface of the body acquires a fine folded appearance, owing to the septa shining through the integument. Upon contraction, both longitudinal and transversal folds appear, and in the cavities thus formed the suckers are seated, appearing, sometimes, covered with mucous to which clay is adherent. If this mucous is washed off, it is not very long before the body is again covered with it. The uppermost margin of the body is tentacular.

The oral disc is a little broader than the medial part of the body, but not broader than the pedal disc. It is almost plane, strongly folded, and the folds distribute themselves, radially, from the mouth towards the periphery, in such manner that they are narrowest at their origin.

The tentacles are seated in 3 series, and are very retractile. The innermost series has 6, very thick, long tentacles; the intermediate series has 24, which are somewhat smaller; and the outermost series, which is seated quite in the margin, has also 24, of about the same size as the medial ones.

The mouth is oblong, with thick folded labiæ and 2 gonidial grooves, in each of which two small gonidial nodules are seen.

The colour. The pedal disc is almost milky-white, but strongly opalescent, and, owing to that, it assumes a partly yellow, partly faint-violet tinge. The suckers have same colour as the body, but, perhaps, a little darker in colour. The oral disc is pale brown-yellow, with darker coloured rays that issue from the mouth, round which there is a more intense-coloured brown-red annulus, and they extend themselves to the tentacles. A little outside of this brown-red annulus, there is yet another and similar one which, however, is somewhat broader. The gonidial grooves are almost yellow. The œsophagus is yellowish-white. The innermost 6 tentacles are brown-yellow, but their bases are darker than the remaining part. The other tentacles are paler in colour (Pl. II, fig. 8).

Hele Legemet er paa sin ydre Flade beklædt med et Epithel, der dannes af meget lange Cylinderceller, forsynede med Kjærne og Kjærnelegeme, samt særdeles lange Cilier, Tab. VIII, Fig. 4 a, 5 a. Imellem Cylindercellerne sees indleirede overalt encellede Slimkjertler og Nematocyster undtagen paa Fodskivens Underflade, hvor vel enkelte Slimkjertler iagttages, men ingen Nematocyster. Disse findes derimod i rigelig Mængde paa Mundskiven og Tentaklerne.

Indenfor Ectodermet er et fibrillært, ikke meget bredt Bindevævslag, Tab. VIII, Fig. 4 b, 5 b, Tab. IX, Fig. 5 b, 6 a; henimod dettes indre Flade er et bredt Belte af cirkulære Muskler, som beklædes af cylinderformede Endothelceller, Tab. VIII, Fig. 4 c, 5 c, Tab. IX, Fig. 5 c, 6 b, 7 d. De cirkulære Muskler dannes af stærke Fibriller; men om disse danne Bundter eller simpelthen ordne sig ved Siden af hinanden, er vanskeligt at afgjøre. Paa Tversnit ser det ud, som om det sidste er Tilfældet, Tab. IX, Fig. 5 c, 7 d, imedens Længdesnit giver Billedet af, at enkelte Fibriller lægge sig sammen til tynde Bundter, Tab. VIII, Fig. 4 c, Tab. IX, Fig. 6 b. Disse endodermale, cirkulære Muskler ere stærkt udviklede, saa at de ved at gjennemskjære Kropsvæggen viser sig for det blotte Øie som en gul, smal Stribe, imedens det tilstødende Bindevæv er ganske hvidt. Denne gule Stribe bliver bredere opimod Mundskiven, uden dog egentlig at rage ind i Gastralhulheden, saaledes som Tilfældet er med Slægten Tealia, Gosse, og som af Hertwig er fremhævet som et udpræget Karaktermærke for den af ham opstillede ny Familie: „Tealidæ“.

De principale Septa ere 6 Par, hvoraf 2 Par udgjør Retningsseptum. Det ene Par af disse danner en bred Spalte, da det ene Septum staar langt fra det andet. Paa Retningsseptum ere de transverselle Muskler, der danne en tyk, foldet Lamel, fæstede til den indre Flade af hvert Septum og vende altsaa mod hverandre, imedens de longitudinelle Muskler, som danne tykke Buske, beklæde den ydre Flade. Paa de øvrige 4 Septapar fæste de longitudinelle Muskler sig paa de indre Flader, vende altsaa mod hverandre i det intraseptale Rum. De transverselle Muskler beklæde de ydre Flader, der vende til de interseptale Rum. Med Hensyn til de longitudinelle Muskler paa de principale Septa, er det at bemærke, at de synes at ophøre omtrent paa Midten, eller at aftage ganske betydeligt i Tykkelse, saa at den inderste Halvdel, der fæster sig paa Svælgrøret, har en yderst ringe udviklet Muskulatur. De secundære Septa udgjøre 18 Par og have et stærkt Muskelapparat. Hos dem ere de longitudinelle Muskler placerede paa den indre Flade og vende saaledes mod hverandre i de intraseptale Rum; de transverselle Muskler beklæde den ydre Flade. De longitudinelle Muskler ere smukt buskformede og beklæde hele Fladen af Septum, dog saaledes, at Buskene ere tykkere, rigere og staa tættere til hinanden paa den Halvdel af Septum, der vender mod Gastralvæggen end paa den indre, som vender til Svælgrøret.

The entire body is, upon its exterior surface, clad with an epithelium formed of very long cylinder-cells furnished with nuclei and nucleoli and, also, particularly long cilia (Pl. VIII, figs. 4 a, 5 a). Between the cylinder-cells, unicellular mucous glands and nemato-cysts are seen to be everywhere entrenched, except on the under-surface of the pedal disc, where indeed a few mucous glands are observable but no nematocysts. Those last are however found, in rich abundance, on the oral disc and the tentacles.

Inside of the ectoderm there is a fibrillar, not very broad, connective-tissue layer (Pl. VIII, figs. 4 b, 5 b, Pl. IX, figs. 5 b, 6 a). Towards its inner surface there is a broad belt of circular muscles, which are clad with cylindrical endothelial cells (Pl. VIII, figs. 4 c, 5 c, Pl. IX, figs. 5 c, 6 b, 7 d). The circular muscles are formed of strong fibrils, but whether these form fasciculi, or simply arrange themselves adnatly it is difficult to decide. In transversal sections it appears as if the latter was the case (Pl. IX, figs. 5 c, 7 d), whilst longitudinal sections present the appearance as if some fibrils collect together into thin fasciculi (Pl. VIII, fig. 4 c, Pl. IX, fig. 6 b). These endodermal circular-muscles are strongly developed, so that on transsection of the wall of the body, they show themselves, to the naked eye, as a yellow, narrow stripe, whilst the adjacent connective-tissue is quite white. This yellow stripe becomes broader up towards the oral disc, without, however, extending into the gastric cavity, as is the case with the genus Tealia, Gosse, and which trait is accentuated by Hertwig as a distinct characteristic of the new family, Tealidæ, proposed by him.

There are 6 pairs of principal septa, of which 2 pairs compose the directive septa. The one of these pairs forms a broad fissure, as the one septum stands far apart from the other. On the directive septa, the transversal muscles, which form a thick, folded lamella, are secured to the inner surface of each septum, and face, therefore, towards each other; whilst the longitudinal muscles, which form thick frutici, clothe the external surface. On the other 4 pairs of septa the longitudinal muscles secure themselves to the inner surfaces, and, therefore, face towards each other in the intraseptal space. The transversal muscles clothe the external surfaces which face to the interseptal spaces. With regard to the longitudinal muscles on the principal septa, it is to be remarked that they appear to terminate at about the middle, or become quite reduced in thickness, so that the innermost half, which secures itself to the œsophagus, has an extremely little developed musculosity. The secondary septa consist of 18 pairs, and have a powerful muscular apparatus. In them, the longitudinal muscles are placed on the inner surface, and face, thus, towards each other in the intraseptal spaces. The transversal muscles clothe the outer surface. The longitudinal muscles are beautifully frutiform, and clothe the entire surface of the septum, but in such a manner that the frutici are thicker, richer, and placed more compactly in to each other

De transverselle Muskler ere temmelig udviklede og danne en foldet Lamel, der kan sees med blotte Øie. Saa-vel de primære som secundære Septa ere fuldstændige, — de inserere sig alle paa Svælgrøret, men flere af de 18 Par secundære Septa smelte sammen, idet de ere komne nogle Millimeter fra Svælgrøret, saaledes, at det her ser ud, som om der kun er et Septum og ikke et Par; samtlige ere golde. De tertiære Septa udgjør 72 Par; de ere ufuldstændige, fæste sig altsaa ikke paa Svælgrøret, men ere dog saa lange, at de naa næsten hen til samme. Deres Muskulatur er omtrent lige saa stærkt udviklet som den paa de secundære Septa. Ogsaa her beklædes den indre Flade af ethvert Septum med de buskformede, longitudinelle Muskler, Tab. IX, Fig. 7 a, imedens de ydre Flader indtages af de transverselle Muskler. Alle disse Septa bære Generationsorganer, der ere fuldt udviklede, saa ikke alene Æg findes i alle Udviklingsstadier, men ogsaa mange Embryoner kunne iagttages, Tab. IX, Fig. 7 b. De kvaternære Septa udgjør ligeledes 72; men her ere de enkelte, danne ikke Par og ere meget korte, neppe halvt saa lange som de tertiære. De ere placerede imellem hvert 2 Par af de tertiære, ere vel forsynede baade med longitudinelle og transverselle Muskler og bære ligesom de tertiære Septa Generationsorganer, som ere fulde af Æg og Embryoner Tab. IX, Fig. 7 c.

Testikler ere ikke at opdage, saa det sandsynligvis er en Hun, jeg har havt med at gjøre; derimod sees enkelte Acontier, der synes at være løsrevne fra de tertiære Septa. Men i det Hele taget ere de Acontier, som ere iagttagne, meget faa.

Man har kaldt de golde Septa for Muskelsepta, fordi Muskulaturen hos dem skulde være langt mere udviklet end Tilfældet skulde være hos de øvrige Septa, der ere blevne kaldte Generationssepta. Ja, der er enkelte Forfattere, som endog benægte Tilstedeværelsen af Muskler paa de Septa, der bære Kjønorganerne. Hos alle de Actinier, jeg har havt Anledning til at undersøge, har samtlige Septa, baade de golde og de kjøn bærende været forsynede med Muskler; men hos enkelte Arter har Muskulaturen været mindre udviklet paa de Septa, der bære Generationsorganerne, end paa de golde.

Parieto-basilarmuskelen er tyk, stærk og strækker sig et godt Stykke op over Kroppens indre Flade, ligesom den udbreder sig over Fodskiven.

Findested.

Station 260. Et Exemplar.

on the half of the septum that faces the gastric wall, than on the inner half that faces the œsophagus.

The transversal muscles are pretty well developed, and form a folded lamella which is visible to the naked eye. Both the primary and the secondary septa are perfect. They are all inserted in the œsophagus, but several of the 18 pairs of secondary septa run together, at a point a few millimetres after they pass from the œsophagus, so that, here, it appears as if there was only one septum, and not a pair. They are all sterile. The tertiary septa consist of 72 pairs; they are imperfect, and therefore do not attach themselves to the œsophagus, but are, yet, so long that they almost extend to it. Their musculosity is about as powerfully developed as that of the secondary septa. Here, also, the inner surface of each septum is clothed with the frutiform longitudinal muscles (Pl. IX, fig. 7 a), whilst the outer surfaces are occupied by the transversal muscles. All these septa carry reproductive organs that are fully developed, so that not only are ova found in all stages of development, but also many embryos may be observed (Pl. IX, fig. 7 b). The quaternary septa consist, also, of 72, but here they are single and do not form pairs, and are very short, scarcely half the length of the tertiary. They are placed between each 2 pairs of the tertiary septa, and are well supplied with longitudinal and transversal muscles; and, like the tertiary septa, they also carry reproductive organs which are filled with ova and embryos (Pl. IX, fig. 7 c).

Testicles can not be observed, so that it probably is a female I have had under investigation. On the other hand a few acontia are seen, which appear to be sundered from the tertiary septa, but, altogether, the acontia which are observable are very few in number.

The sterile septa have been termed muscle-septa, because the musculosity in them is said to be much more fully developed than is the case with the other septa, which have been termed reproductive septa. Indeed, there are some writers who even deny the presence of muscles on the septa that carry the sexual organs. In all the Actinaria which I have had an opportunity of examining, the whole of the septa, both the sterile ones and the reproductive ones, have been furnished with muscles, but in some species the musculosity has been less developed on the septa carrying the reproductive organs than on the sterile ones.

The parieto-basilar muscle is thick and strong, and extends itself a considerable way up over the inner surface of the body, whilst it also distributes itself over the pedal disc.

Habitat.

Station No. 260. One specimen.

Slægtskarakter.

Fodskiven rund med tyk, bølget Rand. Kroppen cylindrisk, glat med fine Længdestriber, Sugevorter og Cinclides. Mundskiven rund, straalet. Tentaklerne retraktile, lange, faatallige og i faa Rækker. Cirkulære Muskler udpræget endodermale. De principale og sekundære Septa fuldstændige, men golde. Mange tertiære og kvaternære ufuldstændige Septa, bærende Kjønnsorganer og Acontier.

Artskarakter.

Fodskiven rund, noget videre end Kolumnen, med en tyk, undulerende Rand og en foldet Underflade. Kroppen cylindrisk, omtrent lige høi som bred, men smalner lidt af imod Mundskiven; i udstrakt Tilstand er dens ydre Væg glat, halvt gjenemsigtig og forsynet med Længdestriber, samt Sugevorter og Cinclides. Sugevorterne danne Længderækker. Under Kontraktionen opstaa baade Længde- og Tverfolder, og i de derved fremkomne Gruber sidde Sugevorterne, en i hver. Kroppens øverste Rand er tentakulær. Mundskiven lidt bredere end Kroppens midterste Del, næsten plan, stærkt foldet. Tentaklerne retraktile, sidde i 3 Rækker; den inderste Række har 6 meget tykke, lange Tentakler; den mellemste 24, der ere meget mindre, og den 3die Række har ligeledes 24, som sidde lige i Kroppsranden og ere af Størrelse som de i 2den Række. Munden aflang med tykke, foldede Læber, 2 Gonidiegruber, og i enhver af disse 2 Gonidieknuder. Farven: Fodskiven næsten melkevid; Kroppen hvid, opaliserende med et gult og svagt violet Skjær. Sugevorterne have Kroppens Farve. Mundskiven bleg brungul med mørkere Straaler. Omkring Munden to brunrøde Ringe, hvoraf den ydre er bredest. Gonidiegruberne gule. Svælgrøret gulhvidt. De indre 6 Tentakler brungule med en mørkere Grunddel. De øvrige Tentakler blegere.

Familie Paractidæ, Hertwig.**Kadosactis¹ rosea, n. g. et sp.**

Tab. 1, Fig. 2. Tab. VII, Fig. 11. Tab. IX, Fig. 8.

Fodskiven, der er rund, 20^{mm} bred, skiveformigt udvidet, har temmelig brede Længdefolder og en lidt lappet Rand, Tab. VII, Fig. 11 a. Dens Underflade har fine

¹ κάδος = Urne.

Generic characteristics.

The pedal disc round, with thick undulating margin. The body cylindrical, smooth, with fine longitudinal stripes, suckers, and cinclides. Oral disc round, radiate. The tentacles retractile, long, not numerous, and in few series. Circular muscles distinctly endodermal. The principal and secondary septa perfect, but sterile. Numerous tertiary and quaternary imperfect septa, carrying reproductive organs and acontia.

Specific characteristics.

Pedal disc round, somewhat wider than the column, with a thick undulating margin and a folded under-surface. The body cylindrical, about as high as it is broad, but diminishing slightly in thickness towards the oral disc. In extended condition the outer wall is smooth, semi-transparent, and furnished with longitudinal stripes, as well as, also, suckers and cinclides. The suckers form longitudinal series. Upon contraction, both longitudinal and transversal folds appear, and in the cavities thus formed the suckers are seated, one in each cavity. The uppermost margin of the body is tentacular. The oral disc a little broader than the medial part of the body, almost plane, strongly folded. The tentacles retractile, placed in 3 series. The innermost series has 6 very thick long tentacles; the intermediate series 24, which are somewhat smaller; and the outermost series has also 24, placed quite in the margin of the body, and of similar size to those of the intermediate series. The mouth oblong, with thick folded labiæ and two gonidial grooves, in each of which two gonidial nodules. Colour: Pedal disc almost milk-white. The body white, opalescent, with a yellow and faint violet tinge. The suckers have the same colour as the body. The oral disc faint brown-yellow with darker coloured rays. Round the mouth two brown-red annuli, of which the outer one is the broadest. The gonidial grooves yellow. The œsophagus yellow-white. The inner 6 tentacles brown-yellow, with a darker base. The rest of the tentacles paler in colour.

Family Paractidæ, Hertwig.**Kadosactis¹, rosea, n. g. et sp.**

Pl. I, Fig. 2. Pl. VII, Fig. 11. Pl. IX, Fig. 8.

The pedal disc, which is round, measures 20^{mm} in breadth, and is discoidally expanded. It has rather broad longitudinal folds, and a somewhat lobate margin (Pl. VII,

¹ κάδος = An urn.

Folder, der straalet ud fra Centrum mod Peripherien og antyde Insertionerne af Septa.

Kroppen danner næsten en omvendt Kegel, er 22^{mm} høi, 15^{mm} bred opimod Mundskiven, men kun 8—10^{mm} bred strax ovenfor Fodskiven, Tab. I, Fig. 2; Tab. VII, Fig. 11. Den har stærke og temmelig brede Tverfolder og en dyb Indsnoring strax ovenfor Fodskiven, Tab. I, Fig. 2; Tab. VII, Fig. 11. Det er denne Kroppens Form, der i Forening med Fodskiven giver hele Dyret nogen Lighed med en Urne. Kroppens udvendige Flade har et rut Udseende, er tæt besat med yderst smaa Vorter, som har en liden, rund Fordybning i Midten, Tab. VII, Fig. 11 *b* (Suckers), hvortil hist og her er fæstet fremmede Legemer; dens øverste Rand er noget ujævn.

Mundskiven er omtrent 20^{mm} bred, kun lidet hvælvet og forsynet med fine Folder, der udgaa vifteformigt fra den noget aflange Mund, Tab. VII, Fig. 11. Denne har tykke, foldede Læber og 2 temmelig brede Gonidiegrober.

Tentaklerne ere retraktile, indtage Mundskivens Peripheri og danne 2 Rækker, 36 i hver, Tab. VII, Fig. 11. I den yderste Række ere de kortere og tykkere end i den indre Række, hvor de ere næsten en halv Gang saa lange og temmelig smale. Naar Dyret trækker sig sammen, ned-sænkes Mundskiven, og Kroppens øverste Rand trækker sig over den.

Farven. Fodskiven er næsten hvid med et svagt Rosenskjær. Kroppen er bleg rosenrød, noget mørkere i de Furer, som ere imellem Folderne. Mundskiven er smuk kastaniebrun med en mørkere Ring omkring Munden. Tentaklerne i den yderste Række have Kroppens Farve, imedens de i den indre Række have en noget intensere brun Farve end Mundskiven, Tab. I, Fig. 2.

Dyrets ydre Flade er beklædt med et Epithel, bestaaende af lange, cilierende Cylinderceller, Tab. IX, Fig. 8 *a*, hvorimellem sees en Mængde, dels Nematocyster, dels encellede Slimkjertler; Neldeorganerne ere dog i størst Mængde paa Tentaklerne. Indenfor Ectodermet er et ikke meget bredt, fibrillært Bindevæv, Tab. IX, Fig. 8 *b*, i hvis Midte er et bredt Belte af cirkulære Muskelfibre, der ligge i tykkere eller tyndere Bundter, Tab. IX, Fig. 8 *c*. Til begge Sider af de cirkulære Muskler er et smalt Baand af Bindevæv, hvori sees Bindevævslegemer, og som udad grændse til Ectodermet og indad til Endodermet, Tab. IX, Fig. 8 *b*. Dette er dannet af et Lag lange Cylinderceller, forsynede med en Pidske, Tab. IX, Fig. 8 *d'*, og den beklæder hele Dyrets indre Flade, Mavehulheden, den ydre Flade af Svælgrøret og Skillevæggene; ogsaa imellem Endodermcellerne iagttages baade Nematocyster og encellede Slimkjertler.

Fig. 11 *a*). Its under surface has fine folds which radiate from the centre towards the periphery, and indicate the insertions of septa.

The body forms an almost inverted cone, is 22^{mm} in height, and 15^{mm} in breadth up towards the oral disc, but is only 8—10^{mm} in breadth immediately above the pedal disc (Pl. I, fig. 2, Pl. VII, fig. 11). It has strong, and rather broad, transversal folds, and a deep constriction immediately above the pedal disc (Pl. I, fig. 2, Pl. VII, fig. 11). It is this form of the body which, in conjunction with the pedal disc, gives to the complete animal somewhat the resemblance of an urn. The external surface of the body has a rough appearance, and is closely beset with extremely minute mammillæ having a small, round depression in the middle (Pl. VII, fig. 11 *b*) (suckers) to which foreign bodies are here and there attached. Its uppermost margin is somewhat uneven.

The oral disc is about 20^{mm} in breadth and only slightly arcuate; it is furnished with fine folds which issue, in flabelliform, from the somewhat oblong mouth (Pl. VII, fig. 11). This has thick, folded labiæ, and two rather broad gonidial grooves.

The tentacles are retractile; they occupy the periphery of the oral disc, and form two series, 36 tentacles in each (Pl. VII, fig. 11). In the outermost series they are shorter and thicker than in the inner series, where they are almost half again as long, and rather narrow. When the animal contracts itself the oral disc becomes depressed, and the uppermost margin of the body draws itself over it.

The colour. The oral disc is almost white, with a faint rosy tinge. The body is pale rose-red, which becomes somewhat darker in the grooves that appear between the folds. The oral disc is a beautiful chestnut-brown, with a darker annulus round the mouth. The tentacles of the outermost series have the colour of the body, whilst those of the inner series have a somewhat more intense brown colour than that of the oral disc (Pl. I, fig. 2).

The exterior surface of the animal is clad with an epithelium consisting of long ciliating cylinder-cells (Pl. IX, fig. 8 *a*) between which there are seen a multitude, partly of nematocysts, and partly of unicellular mucous glands. The nematocysts are, however, found in greatest abundance on the tentacles. Inside of the ectoderm there is a not very broad fibrillar connective-tissue (Pl. IX, fig. 8 *b*), in whose middle there is a broad belt of circular muscle-fibres, placed in thicker or thinner fasciculi (Pl. IX, fig. 8 *c*). On both sides of the circular muscles there is a narrow ribbon of connective-tissue, in which connective-tissue corpuscles are seen, and which, externally, borders the ectoderm, and, internally, borders the endoderm (Pl. IX, fig. 8 *b*). This endoderm is formed of a layer of long cylinder-cells furnished with a flagellum (Pl. IX, fig. 8 *d'*), and it clothes the entire inner surface of the animal, the gastric cavity, the external surface of the oesophagus and the divisional-walls. Between the cells of the endoderm, there are also, observed both nematocysts and unicellular mucous glands.

Der er omkring 18 Par fuldstændige Septa, som alt-saa deler Gastralhulheden i 18 Hovedkamre. Disse Septa have saa stærkt udviklede Længdemuskler, at de saagodt-som ganske udfylde Kamrene. Længdemusklerne, der ligge paa den ene Side af hvert Septum (paa den indre Side, naar undtages de 2 Retningsseptas, hvor de ligge paa den ydre Side) danne her en Samling af fine Folder, som fremkomme derved, at der fra Septum udgaar en Mængde fine, forgrenede Bindevævsforlængelser, Tab. IX, Fig. 8 *d*, paa hvilke Musklerne ere fæstede, Tab. IX, Fig. 8 *e*. Længdemusklerne paa Kroppens indvendige Væg ere ogsaa temmelig stærkt udviklede og bidrage sandsynligvis til at danne de før beskrevne, brede Folder. Tvermusklerne paa Septa ere mindre udviklede, Tab. IX, Fig. 8 *f*.

Det er mig ikke muligt med Bestemthed at angive, hvormange Par Septa af 2^{den} Orden der findes, trods al anvendt Møje; men saavidt jeg har kunnet iagttage, er der 2 Par ufuldstændige Septa i hvert Hovedkammer, altsaa 36 i det Hele, hvilke ere yderst smale og temmelig korte. Om der er flere Septa, skal jeg ikke kunne sige, — jeg har ikke fundet flere.

Paa de principale, fuldstændige Septapar ere saavel Mesenterialfilamenter som Kjønnsorganer fæstede. Disse sidste ere kun lidet udviklede, indeholde enkelte Æg og sees kun paa enkelte Septa næsten nede imod Bunden af Gastralhulheden. Parieto-basilarmuskelen er meget bred og bestaar af stærke Muskelbundter, som strække sig op til Midten af Kroppen og nedover den dybe Indsnøring, der findes strax ovenfor Fodskiven, hvor den bliver tyndere, for vifteformigt at udbrede sig paa den indre Flade af Fodskiven. Den paa Kroppens ydre Flade omtalte Indsnøring har paa den indre Flade et tilsvarende Fremspring, der gjør Mavehulheden trang paa dette Sted.

Svælgrøret er meget langt, imellem 18—20^{mm}, har stærke Længdefolder og 2 forholdsvis brede Svælgruber. Udvendigt er det beklædt med Kamrenes Endothel, indenfor hvilket er et temmelig bredt Bindevæv, Tab. IX, Fig. 8 *g*. Fra dette udgaar listeformige Forlængelser, der ere beklædte med et bredt Lag lange, cilierende Cylinder-celler, lig Ectodermcellerne, Tab. IX, Fig. 8 *l*. Imellem dem sees en Mængde Pigmentceller, som indeholde intens brune Pigmentkorn, der give hele den indre Svælglade en mørk, kastaniebrun Farve, Tab. IX, Fig. 8 *h*; desforuden sees i Svælgepithelet en stor Mængde encellede, flaskeformede Slimkjertler, som dels ere ganske tomme, dels mere eller mindre fyldte med en finkornet Masse, der omgiver en temmelig stor Kjerne, Tab. IX, Fig. 8 *i*. Denne kommer først tilsyne, naar en stor Del af den kornede Masse er udtømt; endelig iagttages en Mængde Nematocyster, hvoraf de fleste ere kolbeformede med en sammenrullet Spiraltraad, imedens andre ere spydformede, Tab. IX, Fig. 8 *k*.

There are about 18 pairs of perfect septa, which consequently divide the gastric cavity into 18 principal chambers. These septa have such strongly developed longitudinal muscles that they almost entirely fill up the chambers. The longitudinal muscles which lie on the one side of each septum (on the inner side, except in the case of the 2 directive septa, where they lie on the outer side) form, here, a collection of fine folds, that are produced by the issuing from the septum of a multitude of fine, ramified, connective-tissue prolongations (Pl. IX, fig. 8 *d*) on which the muscles are secured (Pl. IX, fig. 8 *e*). The longitudinal muscles on the interior wall of the body are also rather strongly developed, and probably contribute to form the previously described broad folds. The transversal muscles on the septa are less developed (Pl. IX, fig. 8 *f*).

It is not possible for me to say, definitely, how many pairs of septa of the 2nd order there are, notwithstanding all possible labour, but, so far as I have been able to observe, there are two pairs of imperfect septa in each principal chamber, therefore 36 altogether, which are extremely narrow and rather short. Whether there are additional septa, I cannot say; I can only say that I have not found more.

On the principal, perfect, pairs of septa, both the mesenterial filaments as well as also the reproductive organs are attached. These last are only little developed, contain few ova, and are observable only on some septa, almost quite at the bottom of the gastric cavity. The parieto-basilar muscle is very broad, and consists of strong muscular fasciculi that extend themselves up to the middle of the body and down the deep constriction found immediately above the pedal disc, where it becomes thinner and distributes itself, in flabelliform, on the inner surface of the pedal disc. The constriction on the exterior surface of the body, previously mentioned, has, on its inner surface, a corresponding projection, which makes the gastric cavity contracted at that spot.

The œsophagus is very long, between 18—20^{mm}, has strong longitudinal folds, and 2 relatively broad gullet-grooves. Externally it is clad with the endothelium of the chambers, inside of which there is a rather broad connective-tissue (Pl. IX, fig. 8 *g*). From this, fillet-formed prolongations issue, which are clad with a broad layer of long ciliating cylinder-cells resembling the ectoderm-cells (Pl. IX, fig. 8 *l*). Between them a multitude of pigment-cells are observed, containing intense-brown pigment-granules, which give the entire inner surface of the gullet a dark chestnut-brown colour (Pl. IX, fig. 8 *h*). There are also seen in the gullet epithelium, a great multitude of unicellular, bottle-shaped, mucous glands, which are partly quite empty, partly more or less filled with a minutely granular mass surrounding a rather large nucleus (Pl. IX, fig. 8 *i*). This becomes first visible after a large part of the granular mass is emptied out. Finally, a multitude of nematocysts are observed, of which the greater number are claviform, with a coiled up spiral thread, whilst others again are hastiform (Pl. IX, fig. 8 *k*).

Findested.

Station 40. Et Exemplar.

Slægtskarakter.

Fodskiven rund, skiveformigt udvidet. Kroppen urnedannet med brede Tverfolder og en udpræget Indsnøring strax ovenfor Fodskiven; paa dens ydre Flade en stor Mængde smaa Sugevorter. Tentaklerne i faa Rækker (2), korte og retraktile. De fuldstændige Septa mange. Cirkulærmusklerne mesodermale.

Artskarakter.

Fodskiven rund, tynd, skiveformet; 20^{mm} bred med brede Længdefolder og en lidt lappet Rand. Kroppen urnedannet, 22^{mm} høi, 15^{mm} bred op imod Mundskiven, 8—10^{mm} bred strax ovenfor Fodskiven, med brede Tverfolder; en dyb Indsnøring lige ved Foden, og Kroppens flade tæt besat med Sugevorter. Mundskiven rund, næsten flad, 20^{mm} bred, forsynet med fine Folder, der straalet ud fra den aflange Mund, som har tykke, foldede Læber med 2 Gonidiegruber. Tentaklerne i Mundskivens Peripheri, 2 Rækker, korte, 36 i hver Række; de i den inderste Række ere længst. Farven: Fodskiven næsten hvid med et svagt Rosenskjær. Kroppen bleg rosenrød, lidt mørkere i Furerne, som ere imellem Folderne. Mundskiven smuk kastaniebrun med en mørkere Ring om Munden. Tentaklerne i den yderste Række have Kroppens Farve, i den indre Række have de en intensere brun Farve, end Mundskiven.

Kyathactis¹ hyalina, n. g. et sp.

Tab. I, Fig. 3. Tab. VII, Fig. 6—9.

Kyathactis hyalina har en temmelig udpræget Bægerform, er 12^{mm} høi, 16^{mm} bred forneden, Tab. I, Fig. 3; Tab. VII, Fig. 6—9.

Fodskiven er lidt aflang, 16^{mm} bred, meget tynd med en noget indbøiet Rand, der har 40 tykke Folder med ligesaamange Furer, Tab. VII, Fig. 8. Selve Skiven er lidt konkav og har til hver Side af den aflange Flade et halvmaaneformigt Indsnit, som hvert optager 2 af Randens Folder, Tab. VII, Fig. 8 a, og hvorved Randen ligesom deles saaledes, at der er 18 Folder paa hver af dens Sider

¹ *κυαδοσ* = et lidet Bæger.**Habitat.**

Station No. 40. One specimen.

Generic characteristics.

The pedal disc round, discoidally expanded. The body shaped like an urn, with broad transverse folds, and a prominent constriction immediately above the pedal disc; on its exterior surface a great multitude of minute suckers. The tentacles in few series (2), short and retractile. Numerous perfect septa. Mesodermal circular-muscles.

Specific characteristics.

The pedal disc round, thin, discoidal, 20^{mm} in breadth; with broad longitudinal folds, and a somewhat lobate margin. The body urn-shaped, 22^{mm} in height, 15^{mm} in breadth up towards the oral disc, and 8—10^{mm} in breadth immediately above the pedal disc; has broad transversal folds, and a deep constriction just at the base. The surface of the body closely beset with suckers. The oral disc round, almost flat, 20^{mm} in breadth, furnished with fine folds that radiate from the oblong mouth, which has thick folded labia with 2 gonidial grooves. The tentacles in the periphery of the oral disc, in 2 series, short, 36 in each series. Those in the inner series are longest. *Colour.* The pedal disc almost white, with a faint rosy tinge. The body pale rose-red, somewhat darker in colour in the grooves between the folds. The oral disc a beautiful chestnut-brown colour, with a darker annulus round the mouth. The tentacles in the outer series have the colour of the body. In the inner series they have an intenser brown colour than the oral disc.

Kyathactis¹ hyalina, n. g. et sp.

Pl. I, fig. 3, Pl. VII, figs. 6—9.

Kyathactis hyalina has a rather prominent crateriform; is 12^{mm} high, and 16^{mm} broad below (Pl. I, fig. 3, Pl. VII, figs. 6—9).

The pedal disc is somewhat oblong, 16^{mm} broad, very thin, and has a somewhat involved margin, with 40 thick folds and the same number of furrows (Pl. VII, fig. 8). The disc itself is slightly concave, and has, upon each side of its oblong surface, a semilunar incision; each of these incisions includes two of the marginal folds (Pl. VII, fig. 8 a) and they cause the margin to be divided,

¹ *κυαδοσ* = A small goblet.

og 4 i Indsnittene, Tab. VII, Fig. 8. Fra Randen udgaa straaformigt mod Centrum 40 temmelig skarpe Linier, der svare til Randens Furer, og som antyde Insertionerne af Septa.

Kroppen bægerformigt udvidet mod Mundskiven, næsten vandklar, forsynet med 40 Ribber, der ere bredest paa Midten, men blive smalere saavel ned imod Fodranden som op imod Mundskiven. Paa disse Ribber sees i perpendikulære Rækker temmelig tæt staaende smaa, isolerede, hvide, runde Punkter, der ikke rage op over Hudens Niveau, men have en Fordybning (Sugehuler, Suckers?), hvortil fremmede Legemer hæfte sig, Tab. VII, Fig. 6, 7. Flere af disse Sugehuler syntes at være perforerede, saa at de korresponderede med Kamrene. Imellem hver 2 Ribber er en yderst fin Fure, der svarer til Insertionerne af Septa paa Kroppens indvendige Flade, Tab. I, Fig. 3, Tab. VII, Fig. 6, 7. Hele Kropsvæggen er saa gjennemsigtig, at ikke alene Septa, men Svælget, Mesenterialfilamenterne og Kjønnsorganerne tydelig kunne sees.

Mundskiven er omtrent 45^m bred, svagt hvælvet og fint foldet. Folderne udgaa som divergerende Straaler fra Mundaabningen til Peripherien og tiltage i Tykkelse successivt, idet de synes at gaa over i Kroppens Ribber, Tab. VII, Fig. 6, 7. Imellem disse Folder findes fine Furer, hvori tydeligt kan sees Insertionerne af Septa, Tab. VII, Fig. 6, 7. Munden er aflang, lidt konisk fremtrædende med en smal Gonidiefure paa hver Side; Læberne temmelig tykke, foldede, Tab. I, Fig. 3; Tab. VII, Fig. 6. Mundvigene, hvorfra Gonidiefurerne udgaa, svare i Retning til de paa Fodskiven omtalte 2 halvmaaneformige Indsnit.

Tentaklerne sidde i to Rækker, 24 i hver. De ere retraktile, tykke og omtrent halvt saalange som Mundskivens Bredde. Den inderste Række indtager Mundskivens Peripheri og ere lidt længere end de, der danne yderste Række, og som sidde paa Kroppens øverste Rand, der ikke kan trækkes over Mundskiven, Tab. I, Fig. 3; Tab. VII, Fig. 6. Naar Dyret er sammentrasket, danner det en glat Halvkugle, hvoraf Mundskiven udgjør det øverste Hvælv.

Kroppens ydre Væg er som sædvanligt beklædt med et Ectoderm, bestaaende af lange Cylinderceller, forsynede med Cilier, Tab. VII, Fig. 9 a, og imellem hvilke sees aflange, encellede Slimkjertler. I det temmelig brede Binde-vævslag sees vel udviklede, cirkulære Muskelfibre, Tab. VII, Fig. 9 c, der ligge nærmere den entodermale end ectodermale Side, saa at der imellem Entodermet og Muskelfibrene er kun et smalt Belte af Bindevævslaget, imedens dette er meget bredt mod Ectodermet, og i denne brede Del iagttages Bindevævslegemer med en eller flere Udløbere, Tab. VII, Fig. 9 b. Paa Bindevævslets indre Flade er Endothelet med sine lange Pidskeceller, Tab. VII, Fig. 9 d.

as it were, in such manner, that there are 18 folds on each of its sides and 4 in the incisions (Pl. VII, fig. 8). From the margin their issue radially, towards the centre, 40 rather sharp lines which correspond to the furrows of the margin, and which indicate the insertions of the septa.

The body is expanded, in crateriform, towards the oral disc, is almost pellucid, and furnished with 40 ribs which are broadest at the middle, but become narrower both down towards the basal margin as well as up towards the oral disc. On these ribs, placed in vertical series and rather closely situated, small, isolated, white, round points are observed, which do not project beyond the integumental surface, but have a depression (loopholes, suckers) to which foreign bodies adhere (Pl. VII, figs. 6, 7). Several of these loopholes appeared to be perforated, so that they corresponded with the chambers. Between each 2 ribs there is an extremely slender furrow which corresponds to the insertions of septa on the interior surface of the body (Pl. I, fig. 3, Pl. VII, figs. 6, 7). The entire body-wall is so transparent, that not only the septa, but also the œsophagus, mesenterial filaments and reproductive organs may be distinctly seen.

The oral disc is about 45^m in breadth, faintly arcuate, and finely folded. The folds issue as diverging rays from the oral aperture to the periphery, and increase progressively in thickness, until they appear to pass over into the ribs of the body (Pl. VII, figs. 6, 7). Between these folds slender furrows are found, in which the insertions of septa can be distinctly seen (Pl. VII, fig. 6, 7). The mouth is oblong, a little conically projectant, with a narrow gonidial groove on each side. The labiæ are rather thick, and folded (Pl. I, fig. 3; Pl. VII, fig. 6); the oral angles from which the gonidial grooves issue, correspond in direction to the 2 semilunar incisions on the pedal disc previously mentioned.

The tentacles are placed in two series, 24 in each. They are retractile, thick, and about half the length of the breadth of the oral disc. The innermost series occupies the periphery of the oral disc, and these are a little longer than those that form the outermost series, and that are placed on the uppermost margin of the body, which is not capable of being drawn over the oral disc (Pl. I, fig. 3, pl. VII, fig. 6). When the animal is contracted it forms a smooth hemisphere whose arch is formed by the oral disc.

The exterior wall of the body is, as usual, clad with an ectoderm consisting of long cylinder-cells, furnished with ciliæ (Pl. VII, fig. 9 a) and between which oblong unicellular mucous-glands are observed. In the rather broad connective-tissue layer well developed circular muscle-fibres are seen, (Pl. VII, fig. 9 c) which lie closer to the endodermal than to the ectodermal side; so that between the endoderm and the muscle-fibres there is only a narrow belt of the connective-tissue layer, whilst it is very broad towards the ectoderm, and in this broad part connective-tissue corpuscles with one or more prolongations are observed (Pl. VII, fig. 9 b). On the inner surface of the connective-tissue,

Svælg er cylindrisk, indtager omtrent Halvdelen af Kroppens Høide og er paa sin indvendige Flade foldet og forsynet med to Svælggruber, som ere temmelig smale; paa dets ydre Flade fæster sig 40 (20 Par) fuldstændige Septa. Fra disse udgaa Mesenterialfilamenterne, imedens Generationsorganerne synes at være fæstede kun til enkelte Septa og da næsten nede ved Mavehulhedens Bund. I de intraseptale Rum aabne de indre Tentakler sig, imedens de ydre korrespondere med de interseptale Kamre. Mesenterialfilamenterne ere bedækkede med en overordentlig Mængde Nematocyster, der saagodtsom ganske skjule Epithelialbeklædningen. Antallet af de ufuldstændige Septa kan ikke angives med Sikkerhed, dog forekom de mig at være 40 Par, nemlig 2 Par i hvert primært interseptalt Rum.

Parieto-basilarmuskelen er overmaade tynd og strækker sig kun et lidet Stykke opover Kropsvæggen.

Naar Dyret vil flytte Sted, bliver Fodskiven næsten tapformig og bevæger sig søgende, førend den fæster sig. Farven bleg rosenrød. Fodskivens Rand gulrød; omkring Munden en gulrød Ring. Tentaklerne lidt mørkere rosenrøde end Fodskiven og Kroppen.

Findested.

Station 338. Et Exemplar.
— 359. Et sønderrevet Exemplar, der ikke lod sig konservere.

Slægtskarakter.

Fodskiven oval. Kroppen bægerformet med Længderibber, forsynede med Sugehuler (Suckers). Tentaklerne retraktile. Mange fuldstændige Septa. Mesodermale Cirkulærmuskler.

Artskarakter.

Fodskiven lidt aflang, 16^{mm} bred med 2 halvmaaneformige Indsnit og en lidt indbøiet Rand, forsynet med 40 Folder. Kroppen bægerformet, 12^{mm} høi, 16^{mm} bred med 40 Længdefolder og ligesaa mange Furer, hvori Insertionerne af Septa sees. Paa Længdefolderne sees Rækker af Sugehuler. Mundskiven omtrent 45^{mm} bred, lidt hvælvet. Fra Mundaabningen, der er konisk fremtrædende med tykke, foldede Læber, udgaa divergerende mod Skivens Peripheri omtrent 40 Folder, som gaa over Kroppen, og imellem disse ligesaa mange Furer. 2 Rækker korte, retraktile Tentakler, 24 i hver; de i den indre Række ere længst; de i den ydre staa paa Kroppens øverste Rand. Farven:

the endothelium with its long flagelliform cells appears (Pl. VII, fig. 9 d).

The œsophagus is cylindrical, and occupies about half of the height of the body; on its interior surface it is folded, and furnished with two gullet-grooves which are rather narrow. On its exterior surface there are 40 (20 pairs) perfect septa attached. From these the mesenterial filaments issue, whilst the reproductive organs appear to be attached only to a few septa, and those almost at the bottom of the gastric cavity. The inner tentacles open into the intraseptal spaces, whilst the outer ones correspond with the interseptal chambers. The mesenterial filaments are covered with an extraordinary abundance of nematocysts, which almost entirely conceal the epithelial covering. The number of the imperfect septa cannot be stated with certainty, but it appeared to me that there were 40 pairs, viz. 2 pairs in every primary interseptal space.

The parieto-basilar muscle is extremely thin, and extends only a short way up the wall of the body.

When the animal wishes to change its situation, the pedal disc becomes almost cone-formed, and moves itself seekingly before it attaches itself. *The colour*: pale rosy-red. The margin of the pedal disc yellowish-red; round the mouth a yellowish-red annulus. The tentacles a somewhat darker rosy-red than the pedal disc and the body.

Habitat.

Station No. 338. One specimen.
— „ 359. A torn specimen, which could not be preserved.

Generic characteristics.

The pedal disc oval. The body crateriform with longitudinal ribs furnished with perforations (suckers). The tentacles retractile. Numerous perfect septa. Mesodermal circular muscles.

Specific characteristics.

The pedal disc somewhat oblong, 16^{mm} in breadth, with two semilunar incisions, and a somewhat involved margin furnished with 40 folds. The body crateriform, 12^{mm} in height, and 16^{mm} broad; has 40 longitudinal folds and the same number of furrows, in which are seen the insertions of septa. On the longitudinal folds series of perforations (suckers) are observed. The oral disc about 45^{mm} in breadth, and slightly arcuate. From the oral aperture, which is conically projectant and has thick folded labiæ, about 40 folds issue, diverging towards the periphery of the disc and passing over into the body. Between the folds there are the same number of furrows. 2 series of short,

Bleg rosenrød. Fodens Rand gulrød; omkring Munden en gulrød Ring. Tentaklerne lidt mørkere rosenrøde end Fodskiven og Kroppen.

Familie Sideractidæ, mihi.

Actinaria med mange fuldstændige Septa. Faa Rækker korte, ikke retraktile Tentakler, hvoraf den inderste Række har 8. Mesodermale Cirkulærmuskler.

Sideractis glacialis, n. g. et sp.

Tab. I. Fig. 1; Tab. VII, Fig. 10, 12.

Jeg har fundet det nødvendigt at grunde en ny Familie for den Actinie, jeg nu er ifærd med at beskrive. I enkelte Henseender nærmer den sig vistnok til Slægten Bolocera, Gosse, som er underordnet Familien Bunodidæ; men den adskiller sig dog saa væsentlig fra denne, at den ikke godt kan henføres dertil.

Fodskiven er rund, tynd, membranøs, halv gjenemsigtig, henved 20^{mm} i Gjennemsnit med en undulerende Rand. Fra denne udgaa paa Underfladen radiære Linier henimod Midten, hvilke angive Insertionerne af Septa.

Kolumnen er yderst lav, knap 5^{mm} høi, og noget smalere end Fodskiven. Dens Væg er tynd og saa gjenemsigtig, at Svælgrør, Septa og Mesenterialfilamenter kunne sees, og paa den udvendige Flade iagttages 16 fine Længdelinier, Insertioner af Septa, samt smaa, runde, hvide Papiller, der staa temmelig tæt, men uregelmæssigt.

Mundskiven er noget bredere end den øverste Rand af Kroppen; men ikke fuldt saa bred som Fodskiven. Den er lidt hvælvet, har lignende hvide Papiller som Kroppen og paa Midten en aflang Mund med 8 koniske, hule Lapper, hvoraf 2 danne Mundvigene (Gonidiegruber), der føre ned til Svælggruberne, og de øvrige danne Læberne, nemlig 3 paa hver Læbe, Tab. I, Fig. 1; Tab. VII, Fig. 12. Fra Munden udgaa straaformigt henimod Skivens Rand 16 Linier, 2 fra hver Mundlap, hvilke antyde Septainserterne.

Tentaklerne ere ikke retraktile og danne 3 Rækker; de ere korte, tykke, konisk tilspidsede og synes at have en Aabning paa deres yderste Ende, Tab. I, Fig. 1, Tab. VII, Fig. 12. I den inderste Række, der er stillet lidt ind paa Skiven, er der 8 Tentakler; disse ere størst, baade tykkest og længst. Imellem dem og lidt udenfor dem, nærmere

retractile tentacles, 24 in each; those in the inner series are the longest, and those in the outer series are seated on the uppermost margin of the body. *Colour*: pale rosy-red; the pedal margin yellowish-red; round the mouth a yellowish-red annulus. The tentacles a somewhat darker rosy-red than the pedal disc and body.

Family Sideractidæ, mihi.

Actinaria with numerous perfect septa. Few series of short non-retractile tentacles, of which the innermost series contains 8. Mesodermal circular muscles.

Sideractis glacialis, n. g. et sp.

Pl. I. fig. 1. Pl. VII. figs. 10, 12.

I have found it necessary to establish a new family for the Actinia which I am now about to describe. In some respects, it is true, it approaches to the genus Bolocera, Gosse, which is ranged under the family Bunodidæ, but yet it differs so materially from that, that it cannot well be assigned to it.

The pedal disc is round, thin, membranous, semitransparent; measures about 20^{mm} from side to side, and has an undulating margin. On its under surface lines issue, radiating towards the middle, and indicating the insertions of septa.

The column is exceedingly low, scarcely 5^{mm} in height, and somewhat narrower than the pedal disc. Its wall is thin, and so transparent that the œsophagus, septa, and mesenterial filaments may be seen; and upon its exterior surface 16 slender longitudinal lines may be observed — insertions of septa — and, also, small round white papillæ, which are placed rather compactly, but irregularly.

The oral disc is somewhat broader than the uppermost margin of the body, but not quite so broad as the pedal disc. It is slightly arcuate, has the same kind of white papillæ as the body, and in its middle it has an oblong mouth with 8, conical, hollow lobes, of which two form the oral angles and lead down to the gullet-grooves, whilst the others form the labiæ, viz. 3 on each lobe (Pl. I, fig. 1, Pl. VII, fig. 12). Sixteen lines issue from the mouth and radiate towards the margin of the disc, 2 from each oral lobe, and they indicate the insertions of the septa.

The tentacles are non-retractile and form 3 series; they are short, thick, conically acuminate, and appear to have an aperture on their outermost extremity (Pl. I, fig. 1, Pl. VII, fig. 12). In the innermost series, which is placed somewhat back from the margin of the disc, there are 8 tentacles; these are the largest, being both the

Randen, er den 2^{den} Række, der ligeledes har 8, men noget mindre end de foregaaende, og endelig er den 3^{die} Række stillet imellem den 2^{den} Række og Kroppens øverste Rand, hvilken har 16 Tentakler, som ere meget mindre end de øvrige. Tentaklerne have paa hele deres ydre Væg tætstaaende, yderst smaa, hvidagtige Papiller, der dog kunne iagttages med blotte Øie og ere lig dem, som ovenfor ere omtalte ved Beskrivelsen af Kroppen og Skiven, Tab. VII, Fig. 12.

Kroppens udvendige Væg er beklædt med et Epithel, bestaaende af lange Cylinderceller, forsynet med Cilier, Tab. VII, Fig. 10 *a*, samt en stor Mængde Nematocyster, der staa i Grupper og danne de tidligere beskrevne smaa, hvide Papiller, Fig. 10 *b*. Nematocysterne synes kun at bestaa af et Slags, nemlig elliptiske, klare Kapsler, der indeslutte en stærk, spiralbunden Traad. Imellem Epithelcellerne findes encellede, flaskeformede Slimkjertler, som ikke synes at være i nogen stor Mængde tilstede. Indenfor Ectodermet er et bredt, hyalint Bindevævslag, i hvis Midte findes udbredte, cirkulære Muskler. Disse danne paa Tversnit eller rettere paa Skraasnit stjerneformige Figurer, der fremstille de enkelte Fibriller, og som nok kunne forveksles med Bindevævslegemer, rige paa Udløbere, men hvorfra de adskilles baade ved Farvningen og ved deres fibrillære Natur, Fig. 10 *c*, som dog tydeligst viser sig paa Længdesnit. Henimod Endothelbeklædningen er der et hyalint Belte, hvori ingen Muskelfibre findes, men hvor spindelformede Bindevævsceller med Udløbere sees hist og her, Fig. 10 *d*. Den indre Vægflade er tapetseret med et Endothel, der bestaar af meget lange Cylinderceller, forsynede med en aflang Kjerne og en lang Pidske, Fig. 10 *e*.

Der er 16 Par fuldstændige Septa, som ere yderst tynde og paa mange Steder perforerede; de gaa alle fra Fodskiven og den indre Kropsvæg og fæste sig paa Mundskiven og Svælgrøret. Disse Septa bære Mesenterialfilamenter og paa enkelte af dem sees længst ned imod Bunden af Gastralhulheden Generationsorganer. Imellem hver 2 Par af de fuldstændige, primære Septa iagttages 2 Par secundære, ufuldstændige Septa, der tage deres Udspring ved Randen af Fodskiven og danne ved deres Udspring et virkeligt Par, idet de bestaa af 2 Blade, men synes længere op paa Kroppen at smelte sammen til et Septum, der strækker sig et Stykke ind i Gastralhulheden uden at naa Svælgrøret. Ogsaa disse Septa synes at bære Generationsorganer.

Med Bestemthed kan dette ikke angives; thi Undersøgelserne have været yderst vanskelige, da der kun havde 1 Exemplar, som ikke maatte synderlig sønderlemmes.

Tver- og Længdemusklerne paa Septa ere ordnede paa den for Actinierne sædvanlige Maade. Muskellaget er

thickest and longest. Between them, and a little to the outside of them, nearer to the margin, the second series is placed, and also contains 8 tentacles, but somewhat smaller than the preceding ones; and, finally, the third series is placed between the second series and the uppermost margin of the body; it contains 16 tentacles of much smaller size than the others. The tentacles have, upon their entire exterior wall, compactly placed, extremely minute, whitish papillæ, which can, however, be observed with the naked eye, and resemble those spoken of above in connection with the body and the disc (Pl. VII, fig. 12).

The external wall of the body is clad with an epithelium consisting of long cylinder-cells furnished with ciliæ (Pl. VII, fig. 10 *a*); also a great multitude of nematocysts, which are situated in groups and form the previously described small white papillæ (Pl. VII, fig. 10 *b*). The nematocysts appear to consist of only one kind, viz. elliptical, pellucid capsules that enclose a strong, spirally coiled filament. Between the epithelial cells, unicellular, bottle-shaped mucous-glands are observed, but these do not appear to be present in any great abundance. Inside of the ectoderm, there is a broad hyaline connective-tissue layer, in whose middle circular muscles are found distributed. These, in transverse sections, or more correctly in diagonal sections, form stellate figures that represent the individual fibrils, and which, easily enough, might be mistaken for connective-tissue corpuscles rich in prolongations, but from which they may be distinguished both by the colouring and by their fibrillar nature (Pl. VII, fig. 10 *c*), which last, however, is most distinctly seen in longitudinal sections. Towards the endothelial covering there is a hyaline belt in which no muscle-fibres are found, but where fusiform connective-tissue cells with prolongations are here and there seen (Pl. VII, fig. 10 *d*). The inner mural surface is lined with an endothelium that consists of very long cylinder-cells, furnished with an oblong nucleus and a long flagellum (Pl. VII, fig. 10 *e*).

There are 16 pairs of perfect septa, which are extremely thin and in many places perforated. They all proceed from the pedal disc and wall of the body, and attach themselves to the oral disc and the œsophagus. These septa carry mesenterial filaments, and on a few of them reproductive organs are visible, placed far down near the bottom of the gastric cavity. Between every two pairs of the perfect, primary septa two pairs of secondary, imperfect septa are observed, having their origin in the margin of the pedal disc, but which form at their origin a real pair, as they are composed of 2 laminae, but appear farther up the body to merge into one septum that extends itself a little way into the gastric cavity, without however reaching to the œsophagus.

These septa also appear to carry reproductive organs. That can, however, not be said with certainty, as the investigations have been exceedingly difficult, there having only been a single specimen, which I dared not much dismember.

The transversal and longitudinal muscles on the septa are arranged in the manner common to the Actiniae. The

tyndt og glat, beklædt med Endothel, imellem hvis Celler sees Nematocyster. Parieto-basilar-muskelen er baade smal og tynd og strækker sig kun lidet op paa Kropsvæggen; i det Hele taget er Muskulaturen kun lidet udviklet.

Tentaklernes Ectoderm afviger ikke væsentligt fra Kroppens og have lignende Nematocystegrupper. Imellem de lange, cylinderformede Ectodermceller sees hist og her encellede Slimkjertler, men langt sparsommere end paa Kroppen.

Svelgrøret er temmelig kort og forsynet med 2 Svelgruber.

Farven. Hele Dyret er næsten vandklart. Kroppen og Tentaklerne spille yderst svagt i det Grønlig og Mundskiven lidt i det Bleggrøde; yderst paa Enden af Tentaklerne er en hvid Ring. Svelgrøret og Gastralfilamenterne bleggrøde.

Findested.

Station 237. Et Exemplar.

Slægtskarakter.

Fodskiven bred, forsynet med yderst fine Længdestriber. Kroppen glat med fine Længdefurer. Tentaklerne ikke retraktile, i flere Rækker. 1^{ste} indre Række 8. 16 Par fuldstændige Septa. Mesodermale Cirkulærmuskler.

Artskarakter.

Fodskiven bred, 20^{mm} i Gjennemsnit, membranøs med undulerende Rand. Kroppen omtrent 5^{mm} høi, smalere end Fodskiven og paa dens udvendige Væg 16 fine Længdefurer for Insertionerne af Septa, samt en Mængde Nematocyster, grupperede i smaa, hvide Papiller. Mundskiven næsten plan, bredere end Kroppen, men smalere end Fodskiven. Munden aflag, ottelappet. Tentaklerne korte, koniske, ikke retraktile, i 3 Rækker. I den inderste Række 8, der ere de største; i den mellemste Række ogsaa 8, som ere lidt mindre, og i den ydre Række 16, der ere meget mindre. Paa Tentaklernes ydre Flade en Mængde smaa, hvide, uregelmæssigt stillede Papiller (Nematocystegrupper). Hele Dyret temmelig gjennemsigtigt, spillende yderst svagt i det Grønlig. Mundskiven spillende lidt i det Bleggrøde og paa Enden af Tentaklerne en lille, hvidagtig Ring. Svelgrøret og Gastralfilamenterne bleggrøde. Septa vandklare.

muscular layer is thin and smooth, and is clad with endothelium between whose cells nematocysts are observed. The parieto-basilar muscle is both narrow and thin, and extends itself only a little way up the wall of the body. Altogether the musculosity is but slightly developed.

The ectoderm of the tentacles does not materially differ from that of the body, and has similar groups of nematocysts. Between the long cylindric ectoderm-cells, unicellular mucous glands are here and there visible, but far more scantily than on the body.

The œsophagus is rather short, and furnished with 2 gullet-grooves.

The colour. The entire animal is almost pellucid. The body and tentacles are very faintly, greenish tinged; and the oral disc is tinged slightly, pale red. At the outermost extremity of the tentacles there is a white annulus. The œsophagus and gastral filaments are pale red.

Habitat.

Station No. 237. One specimen.

Generic characteristics.

The pedal disc broad, furnished with extremely fine longitudinal stripes. The body smooth, with fine longitudinal furrows. The tentacles non-retractile, in few series. The first inner series contains 8 tentacles. 16 pairs of perfect septa. Mesodermal circular muscles.

Specific characteristics.

The pedal disc broad; measures 20^{mm} from side to side; membranous, with undulating margin. The body about 5^{mm} in height, narrower than the pedal disc, and has, on its exterior wall, 16 fine longitudinal grooves for the insertions of septa, also a multitude of nematocysts grouped in small white papillæ. The oral disc almost plane, broader than the body but narrower than the pedal disc. The mouth oblong, octo-lobate. The tentacles short, conical, non-retractile, placed in 3 series. In the innermost series 8 tentacles, which are the largest in size; in the intermediate series also 8, which are somewhat less in size, and in the outer series 16, which are much smaller. On the exterior surface of the tentacles there are a multitude of small, white, irregularly placed papillæ (groups of nematocysts). The entire animal is rather transparent, very faintly greenish tinged. The oral disc tinged slightly, pale-red, and upon the extremity of the tentacles there is a small whitish annulus. The œsophagus and gastral filament pale red. Septa pellucid.

Familie Sagartidæ.

Stelidiactis¹ Mopsiæ n. g. et sp.

Tab. II, Fig. 4, 5; Tab. VIII, Fig. 7—11.

Fodskiven er aflang, 34^{mm} lang, tyk og omklammer næsten ganske en Gren af *Mopsia borealis*, saa at der kun er en Spalte af et Par Millimeters Bredde, hvori Grenen ligger blottet, Tab. II, Fig. 4, 5. Den ombøiede Rand er foldet, og Folderne udgjør 12 paa hver Side af Grenen, Tab. VIII, Fig. 9. Imellem denne og Fodskivens Underflade er et tyndt, membranøst, stærkt klæbende Hudlag, der er afsondret af Fodskiven og omgiver endogsaa Størstedelen af den blottede Del af Grenen, som ligger i Foden.

Kroppen er omtrent 12^{mm} høi, cylindrisk; den har en fast Konsistens, er glat og glindsende med 24 stærke Længderibber, hvorimellem ligesaa mange dybe Furer, Tab. II, 4, 5; Tab. VIII, Fig. 7. I disse Furer sees hist og her uden nogen Regelmæssighed smaa, aflange Spalter, Cinclides, Tab. VIII, Fig. 8. Kroppen antager stundom en næsten elliptisk Form ved Dyrets Kontraktioner, og dens overste Rand er tyk og tentakulær.

Mundskiven er 12^{mm} i Gjennemsnit, rund, stærkt hvelvet, saa at den til enkelte Tider danner en Konus, paa hvis Ende den aflange Mundaabning sees, Tab. II, Fig. 5. Mundlæberne ere foldede og Mundvigene glatte, temmelig brede. Fra Munden og hen til Tentaklerne udgaa straaformigt 24 Folder, hvorimellem ligesaa mange Furer, Tab. II, Fig. 4; Tab. VIII, Fig. 7. Ogsaa Mundskivens Hud er tyk, fast og uigjennemsigtig.

Tentaklerne ere 24, retraktile, sidde i en Række paa Kroppens overste Rand, ere korte, konisk tilspidsede og tykke ved Grunden. Kroppens Rand kan trække sig over Mundskiven og skjule denne ganske.

Kolumnens Væg er temmelig tyk; dens ydre Flade har sit sædvanlige Cylinderepithel med Cilier, og imellem Cellerne findes flaskeformede, encellede Slimkjertler, samt Nematocyster. Indenfor Ectodermet er et fast, fibrillært Bindevæv, i hvis Midte sees cirkulære Muskelfibre, som ligge i Bundter, der paa Tversnit frembyde et smukt, netformigt Udseende. Paa Bindevævet indre Flade sees Længdemuskler, som strax gaa over paa Septa og ere beklædt med et Endothel, der ikke frembyder noget særegent.

De principale Septa, der fæste sig paa Svælget, ere 6 Par, imedens de secundære, ufuldstændige Septa ere

¹ στῆλι'δύον = en liden Soile.

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

Family Sagartidæ.

Stelidiactis¹ Mopsiæ, n. g. et sp.

Pl. II, figs. 4, 5; Pl. VIII, figs. 7—11.

The pedal disc is oblong, 34^{mm} in length, and almost completely enclasps a branch of *Mopsia borealis*, so much so that there is only a fissure of a couple of millimetres in breadth in which the branch is left exposed (Pl. II, figs. 4, 5). The bent margin is folded, and there are 12 folds on each side of the branch (Pl. VIII, fig. 9). Between it and the under-surface of the pedal disc there is a thin, membranous, strongly glutinous, integumental layer, which is deposited from the pedal disc, and even surrounds the greater part of the exposed portion of the branch contained in the base.

The body measures about 12^{mm} in height, and is cylindrical. It has a firm consistency, is smooth and shining, and has 24 strong longitudinal ribs between which there are a similar number of deep furrows (Pl. II, figs. 4, 5; Pl. VIII, fig. 7). In these furrows, but without any regularity, there are seen, here and there, small oblong fissures, cinclides (Pl. VIII, fig. 8). The body sometimes assumes an almost elliptical form during the animals contractions. Its uppermost margin is thick and tentacular.

The oral disc measures 12^{mm} from side to side, is round, strongly arcuate, so that it sometimes forms a cone, on whose extremity the oblong oral aperture is seen (Pl. II, fig. 5). The oral labiæ are folded, and the oral angles are smooth and rather broad. From the mouth, 24 folds radiate to the tentacles, and between them there are the same number of furrows (Pl. II, fig. 4; Pl. VIII, fig. 7). The integument of the oral disc is also thick, firm, and opaque.

The tentacles are 24 in number, and retractile; they are placed in one series on the uppermost margin of the body, are short, conically acuminate, and thick at the base. The margin of the body can draw itself over the oral disc and completely conceal it.

The wall of the column is rather thick; its exterior surface has the usual cylinder-epithelium with ciliæ; and between the cells, bottle-shaped, unicellular mucous glands, as well as nematocysts, are found. Inside of the ectoderm, there is a firm fibrillar connective-tissue, in whose middle circular muscle-fibres are observed lying in fasciculi; in transverse sections these present a beautiful reticulated appearance. On the inner surface of the connective-tissue, longitudinal muscles are seen passing immediately over to the septa, and clad with an endothelium that does not present anything remarkable.

The principal septa, which are attached to the œsophagus, consist of 6 pairs; whilst the secondary imperfect

¹ στῆλι'δύον = A little pillar or column.

mange, og paa disse ere Kjonsorganerne fæstede, som ere mere eller mindre udviklede Æggestokke. Disse indtage paa Septum et aflangt Rum imellem Længdemuskelens fri Rand og Mesenterialfilamentet og danne en temmelig fast, halvgjennemsigtig Membran, egentlig Forlængelse af Septums Bindevæv, hvori Æggene sees indleirede, Tab. VIII, Fig. 11. De ere næsten runde, have en noget excentrisk liggende Kimblære, som er omgivet af et temmelig tykt Lag Blommekorn. Men i de fleste Æg er der foregaaet en Differentiering, som er ganske mærkelig, idet Blommen er omgivet af et protoplasmatiske Net, der kun fremtræder tydeligt paa yderst tynde Tversnit, Tab. VIII, Fig. 10. Senere former dette Net sig i stavformige Legemer, der ligge parallelt ved Siden af hverandre, men udbrede sig som en Vifte over Blommen og skjuler den ganske. Disse Protoplasmastave ere smalest der, hvor Ægget hviler i Ovariallamellen, men bliver bredere og tykkere, jo længere de strække sig opover Ægget, Tab. VIII, Fig. 11 a; de farves stærkt af Boraxkarmin, uden at det er muligt at opdage nogensomhelst Cellestruktur. Et lignende Forhold omtales i Brodrene Hertwigs Afhandling over Actinierne¹.

Farven: Kroppen og Fodskiven er perlemorglindsende hvid, spillende svagt i det Rosenrøde. Mundskiven smuk laxerød med lidt mørkere Straaler, der udgaa fra Mundaabningen. Tentaklerne lidt lysere end Mundskiven.

Findested.

Station 255. Et Exemplar.

Slægtskarakter.

Fodskiven bladformet udvidet, omfattende tynde, runde Gjenstande (Grene af *Mopsia borealis*). Kroppen dannende en rund Soile, ribbet paalangs og forsynet med Cinclides. Mundskiven dækkes af Kroppens Rand. Tentaklerne korte, retraktile, faatallige, stillede i 1 eller 2 Rækker. 6 Par fuldstændige Septa. Mesodermale Cirkulermuskler.

Artskarakter.

Fodskiven aflang, 34^{mm} lang, omfattende en Gren af *Mopsia borealis*; dens Rand har 24 temmelig udprægede Folder. Kroppen er cylindrisk, ribbet paalangs med 24 Folder; imellem disse ligesaamange Furer, hvori hist og her Cinclides; dens øverste Rand er tyk, tentakuler og

¹ Oscar und Richard Hertwig. Die Actinien. Jenaische Zeitschrift für Naturwissenschaft 13 B. pag. 551. Jena 1879.

septa are numerous, and on them the reproductive organs are attached, and consist of more or less developed ovaries. These occupy an oblong space on the septum, between the free margin of the longitudinal muscle and the mesenterial filament, and form a rather firm, semitransparent membrane, really a prolongation of the septal connective-tissue, in which the ova are seen to be embedded (Pl. VIII, fig. 11). They are almost round, have a somewhat eccentrically placed germinative-sac surrounded by a pretty thick layer of yoke-granules. But in most of the ova a differentiation has taken place which is quite remarkable, as the yoke is seen to be surrounded by a protoplasmic reticulation, which, however, only appears distinctly in extremely thin transverse sections (Pl. VIII, fig. 10). This reticulation subsequently grows into rod-like bodies that lie adnatly to each other, but distribute themselves in flabelliform over the yoke and completely conceal it. These protoplasmic staves are narrowest at the point where the ovum rests in the ovarian lamella, but become broader and thicker the farther they extend up over the ovum (Pl. VIII, fig. 11 a). They are strongly colourable by Borax-carmine, without it being possible to detect any cellular structure whatsoever. Similar relations are mentioned in the Brothers Hertwig's Memoir on the Actinaria¹.

The colour: The body and the pedal disc have a shining mother-of-pearl white colour, tinged faintly with rose-red. The oral disc has a beautiful salmon-red colour, with somewhat darker rays issuing from the oral aperture. The tentacles are a little lighter in colour than the oral disc.

Habitat.

Station No. 255. One specimen.

Generic characteristics.

The pedal disc membranaceously expanded, enclasps thin, round objects (branches of *Mopsia borealis*). The body forms a round pillar, is longitudinally ribbed, and furnished with cinclides. The oral disc covered by the margin of the body. The tentacles short, retractile, not numerous, placed in 1 or 2 series. 6 pairs of perfect septa. Mesodermal circular muscles.

Specific characteristics.

The pedal disc oblong, 34^{mm} in length, enclasps a branch of *Mopsia borealis*; its margin has 24 rather prominent folds. The body is cylindrical, longitudinally ribbed, has 24 folds; between these a similar number of furrows in which, here and there, cinclides observable; its uppermost

¹ Oscar und Richard Hertwig. Die Actinien. Jenaische Zeitschrift für Naturwissenschaft 13 B. pag. 551. Jena 1879.

kan trækkes over Mundskiven. Denne er stærkt hvælvet og forsynet med 24 Folder, der udgaa straaformigt fra Mundaabningen til Tentakelranden. Tentaklerne 24, retraktile, korte, sidde i en Række paa Kroppens øverste Rand. Farven: Krop og Fod næsten hvid med et blegt Rosen-skjær. Mundskiven smuk laxerød med lidt mørkere Straaler, der udgaa fra Mundaabningen. Tentaklerne lidt lysere end Mundskiven.

Stelidiactis Tubulariæ, n. sp.

Tab. II, Fig. 6, 7; Tab. VIII, Fig. 12.

Fodskiven er aflang, 25^{mm} lang, temmelig tynd med en lappet Rand og siddende paa et uddødt Rør af Tubularia imperialis saaledes, at en stor Del af Fodskivens Underflade sees. Tab. II, Fig. 6, 7; Tab. VIII, Fig. 12. Den omfatter ikke som den foregaaende Art ganske Gjenstanden, hvorpaa den sidder, og den er heller ikke limet til denne ved en afsondret, klæbende Masse, saa at Dyret med temmelig Lethed kan bevæge sig paa Røret, hvilket jo ikke er Tilfældet med Stelidiactis Mopsiæ.

Kroppen er cylindrisk, 20^{mm} høi, glat, glindsende og lidt indsnøret paa Midten, hvorved den nærmer sig noget Timeglasformen, Tab. II, Fig. 6, 7; Tab. VIII, Fig. 12; paa dens nederste Del sees nogle faa, yderst smaa, lidt aflange Fordybninger (Spalter, Cinclides?), der synes at perforere Huden.

Mundskiven er rund, 20^{mm} bred, stærkt hvælvet, forsynet med 48 fine Folder, der udstraale fra Munden, og hvoraf 24 strække sig lige hen til den indre Tentakelrække, imedens de andre 24 naa kun halvt paa Skiven. Munden er næsten rund, stærkt fremspringende med tykke Læber og i hver Mundvig en stor Gonidialknude, Tab. VIII, Fig. 12.

Tentaklerne ere retraktile, sidde i Mundskivens Peripheri og danne 2 afvejlende Rækker, 24 i hver. De ere temmelig korte, og de i den indre Række ere baade lidt tykkere og længere, end de i den ydre Række. Mundskiven med de indtrukne Tentakler kan ganske dækkes af Kroppsranden. Saavel Kroppen som Mundskiven er temmelig gjennemsigtig. Farven: Perlemorglindsende rosenrød. Tentaklerne, især de i den indre Række, ere noget mørkere og omgivne af en hoi rød Ring.

margin is thick, tentacular, and may be drawn over the oral disc. The latter strongly arcuate, and furnished with 24 folds issuing, radially, from the oral aperture to the tentacular margin. 24 tentacles, retractile, short, seated in one series on the uppermost margin of the body. *Colour.* Body and base almost white, with a pale rose tinge. The oral disc a beautiful salmon-red colour, with slightly darker rays issuing from the oral aperture. The tentacles somewhat lighter in colour than the oral disc.

Stelidiactis Tubulariæ, n. sp.

Pl. II, figs. 6, 7; Pl. VIII, fig. 12.

The pedal disc oblong, measures 25^{mm} in length, is rather thin, has a lobate margin, and is seated on a lifeless tube of Tubularia imperialis in such manner that a large part of the under-surface of the pedal disc is visible (Pl. II, figs. 6, 7, Pl. VIII, fig. 12). It does not, like the preceding species, quite enclasp the object upon which it is seated, neither is it glued to it by a deposited glutinous mass, so that the animal can, with considerable ease, move itself upon the tube, which is certainly not the case with Stelidiactis Mopsiæ.

The body is cylindrical, 20^{mm} in height, smooth, shining, and somewhat constricted at the middle, which imparts to it somewhat the form of a sand-glass (Pl. II, figs. 6, 7; Pl. VIII, fig. 12); upon its lowest part, there are seen a few extremely minute, slightly oblong depressions (fissures, cinclides?) which appear to perforate the integument.

The oral disc is round, 20^{mm} in breadth, strongly arcuate, furnished with 48 fine folds that radiate from the mouth, and of which 24 extend themselves right up to the inner tentacular series, whilst the other 24 reach only half way on to the disc. The mouth is almost round, strongly protuberant, with thick labiæ, and in each oral angle there is a large gonidial knot (Pl. VIII, fig. 12).

The tentacles are retractile, are seated on the periphery of the oral disc, and form 2 alternating series, 24 tentacles in each. They are rather short, and those of the innermost series are both somewhat thicker and longer than the tentacles of the outer series. The oral disc with the retracted tentacles, is capable of being quite covered by the margin of the body. Both the body and the oral disc are pretty transparent. *The colour.* Rosy-red, with mother-of-pearl lustre. The tentacles, especially those of the inner series, are somewhat darker in colour and are surrounded by a bright-red annulus.

Findested.

Station 79. Et Exemplar, der ved en Feiltagelse blev saa slet konserveret, at det ved Hjemkomsten befandt i en næsten opløst Tilstand og ubrugeligt til videre Undersøgelse.

Artskarakter.

Fodskiven aflang, 25^{mm} lang, siddende paa et Rør af Tubularia imperialis, som den kun i ringe Grad omfatter med en lappet Rand. Kolumnen 20^{mm} høi, cylindrisk, glat, glindsende og temmelig indsnøret paa Midten, saa at baade Fod- og Mundskive er betydelig bredere end denne. Nederst paa Kolumnen enkelte utydelige Cinclides. Mundskiven er rund, 20^{mm} bred, forsynet med 48 fine Folder, hvoraf de 24 indtage kun Skivens halve Bredde. Munden aflang med en stærk Gonidialknude i hver Mundvig. 2 Rækker korte Tentakler, 24 i hver Række, hvoraf de i indre Række ere tykkeste og længst. Farven: Krop og Fod perlemorglindsende rosenrød. Tentaklerne noget mørkere med høirød Ring omkring Grunden.

Allantactis¹ parasitica, n. g. et sp.

Tab. II, Fig. 3; Tab. IX, Fig. 1—4.

Fodskiven er rund, omtrent 35^{mm} i Tversnit; men da Dyret altid lever paa en Fusus (Neptunia curta Jeffr. (Friele) og omfatter temmelig noie dennes Skal, antager den en aflang Form; paa unge Exemplarer viser det sig bedst, at den er rund. Selve Skiven er tynd og har yderst fine Linier, der straaale vifteformigt ud fra Centrum til Peripherien og antyde Insertionerne af Septa. Randen er overordentlig tyk og stærkt ombøiet indad, hvorved Skiven faar Udseende af at være nedsænket.

Kolumnen, der er cylindrisk, er lige saa bred som høi, henved 30^{mm}, og temmelig stærkt foldet paatvers. Folderne ere brede, naar Dyret er udstrakt og i fuld Vigør, men blive smalere og smalere, alt eftersom det sammentrækker sig, Tab. II, Fig. 3. Overalt paa den udvendige Flade er der mange Cinclides, der dog staa temmelig spredte imellem Folderne. Den øverste Rand danner en tyk, fremstaaende, krenuleret Vold (Parapet), og imellem denne og Tentaklerne er en dyb Fure (Fossa), Tab. II, Fig. 3.

Mundskiven rund, næsten flad med fine Folder, der straaale ud fra Munden henimod Tentaklerne, og som antyde Skilleveggenes Tilheftning. Munden aflang, foldet paalangs.

¹ ἄλλας = en Pølse.

Habitat.

Station No. 79. One specimen, which by an accident was so badly preserved, that on arrival home it was found to be in almost decomposed condition, and useless for any particular examination.

Specific characteristics.

The pedal disc oblong, 25^{mm} in length, seated on a tube of Tubularia imperialis, which it only in slight degree enclasps with a lobate margin. The column 20^{mm} in height, cylindrical, smooth, shining, and considerably constricted at the middle, so that both the pedal and oral disc are considerably broader than the middle part of the column. At the lowest part of the column, a few indistinct cinclides. The oral disc is round, 20^{mm} broad, furnished with 48 fine folds, of which 24 occupy only half the breadth of the disc. The mouth oblong, with a prominent gonidial knot in each oral angle. 2 series of short tentacles, 24 in each series; the tentacles of the inner series being thickest and longest. *Colour.* Body and base rose-red, with mother-of-pearl lustre. The tentacles somewhat darker, with a bright-red annulus round the base.

Allantactis¹ parasitica, n. g. et sp.

Pl. II, fig. 3; Pl. IX, figs. 1—4.

The pedal disc is round, measures nearly 35^{mm} across, but as the animal is always seated upon a Fusus (Neptunia curta Jeffr. (Friele) and embraces its shell rather closely, it acquires, thus, an oblong form. Its round form is best observed in young specimens. The disc itself is thin, and has extremely fine lines which radiate, in flabelliform, from the centre to the periphery, and indicate the insertions of septa. The margin is exceedingly thick, and strongly bent inwards, giving to the disc the appearance of being depressed.

The column, which is cylindrical, is as broad as it is high — about 30^{mm} — and is rather strongly folded transversally. The folds are broad when the animal is extended in full vigour, but become narrower and narrower accordingly as the animal contracts itself (Pl. II, fig. 3). On the exterior surface there are, everywhere, numerous cinclides which are, however, placed rather dispersedly between the folds. The uppermost margin forms a thick protuberant crenate wall, (parapet) and between it and the tentacles there is a deep furrow (fosse) (Pl. II, fig. 3).

The oral disc is round, almost flat, with fine folds that radiate from the mouth towards the tentacles, and indicate the attachments of the divisional walls. The mouth is

¹ ἄλλας = A sausage.

Læberne ere tykke, trelappede. Mundvigene ere halvmaaneformige med en næsten brusket, glat Rand. Svælgruberne ere vide.

Tentaklerne ere forholdsvis korte, fuldstændig retraktile og indtage Skivens Peripheri; de sidde i 2 Rækker, 24 i hver. De i inderste Række ere de længste og tykkeste. Mundskiven kan nedsænkes, og Kroppens Rand hvælver sig ganske over den, naar Dyret er sammentrukket.

Farven: Kroppen er gul, spillende lidt i det Brune; paa dens øverste Rand ligesom paa Mundskiven er den smuk laxerød. Omkring Munden er en næsten purpurrød, aflang Ring, ligesom Folderne paa Skiven ere mørkere farvede, end denne. Tentaklerne bleg violette.

Kroppens ydre Beklædning bestaar som sædvanligt af et Epithel, dannet af lange, cilierende Cylinderceller, hvormellem findes Nematocyster og encellede Slimkjertler, især opimod Mundskiven, Tab. IX, Fig. 2 a. Indenfor Ectodermet er et bredt, fast, fibrillært Bindevævslag, i hvis Midte sees et udbredt Lag af Cirkulærmuskler, Tab. IX, Fig. 2 b, imedens dets indre Flade er beklædt af Endothelet med sine Pidskeceller, Tab. IX, Fig. 2 c.

Der er 6 Par principale, fuldstændige Septa, som altsaa fæste sig paa Svælget, og hvoraf 2 Par ere de saakaldte Retningsseptas (directive Septa), det ene Par svarende til Bugsiden, Tab. IX, Fig. 1 a, og det andet til Rygsiden, Tab. IX, Fig. 1 b. Disse 2 Par Septa af 1ste Orden dele Mavehulheden i 6 Hovedkamre eller 6 interseptale Rum, Tab. IX, Fig. 1. I ethvert af disse er der 3 Par Septa af 2den Orden, Tab. IX, Fig. 4, hvoraf ingen fæste sig paa Svælget; det midterste Par af disse er længst, Tab. IX, Fig. 4 a, de 2 til Siderne ere kortere, Tab. IX, Fig. 4 b. Herved dannes 4 Kamre af 2den Orden, Tab. IX, Fig. 4 c. I ethvert af disse 4 Kamre er der et Par Septa af 3die Orden, hvilke er omtrent halvt saa lange som Septa af 2den Orden, og som dele det interseptale Rum af 2den Orden i 2 Kamre, Tab. IX, Fig. 4 d.

Der er altsaa i det Hele 48 Par Skillevægge. Ethvert saadant er forsynet med særdeles stærke Længdemuskler, Tab. IX, Fig. 2 d, imedens Tvermusklerne ere svagere. Samtlige Septa bære Gastral-filamenter; men imedens de 6 Par fuldstændige Septa ere golde, udvikle Generationsorganerne sig paa de fleste af de øvrige Skillevægge ned imod Gastralhulhedens Bund. Dyret er hermaphroditisk.

Æggstokkene ere oprullede, baandformige Legemer, der ligge indenfor Længdemusklerne paa Septum, noie fæstede til dette, Tab. IX, Fig. 2 e. De indeholde temmelig udviklede Æg og ere forøvrigt væsentlig forskjellig i Bygning fra dem, der af Brødrene Hertwig¹ ere beskrevne

¹ Jenaische Zeitschrift f. Naturwissenschaft 30 B. pag. 548. Jena 1879.

oblong, and longitudinally folded. The labiæ are thick and trilobate. The oral angles are semilunar in form, with an almost cartilaginous smooth margin. The gullet-grooves are wide.

The tentacles are relatively short, completely retractile, and occupy the periphery of the disc. They are placed in 2 series, 24 tentacles in each. Those in the innermost series are the longest and thickest. The oral disc is capable of being depressed, and the margin of the body curves inwards, quite over it, when the animal is contracted.

The colour. The body is yellow, shading a little to brown; on its uppermost margin, as also on the oral disc, it is a beautiful salmon-red colour. Around the mouth there is an almost purple-red oblong annulus, whilst also the folds of the disc are darker coloured than it is. The tentacles pale violet.

The external covering of the body consists, as usual, of an epithelium formed of long ciliating cylinder-cells, amongst which nematocysts and unicellular mucous-glands are found, especially adjoining the oral disc (Pl. IX, fig. 2 a). Inside of the ectoderm, there is a broad, firm, fibrillar, connective-tissue layer, in whose middle a layer of circular muscles is seen to be distributed (Pl. IX, fig. 2 b) whilst its inner surface is clad by the endothelium with its flagelliform cells (Pl. IX, fig. 2 c).

There are 6 pairs of principal, perfect septa, which thus secure themselves to the œsophagus, and of these, 2 pairs are the so-called directive septa, the one pair corresponding to the ventral side (Pl. IX, fig. 1 a), and the other to the dorsal side (Pl. IX, fig. 1 b). These 2 pairs of septa of the 1st order, divide the gastric cavity into 6 principal chambers or 6 interseptal spaces (Pl. IX, fig. 1). In each of these there are 3 pairs of septa of the 2nd order (Pl. IX, fig. 4), none of which secure themselves to the œsophagus. The intermediate one of these pairs is the longest (Pl. IX, fig. 4 a), the 2 pairs to the sides being shorter (Pl. IX, fig. 4 b). In this way 4 chambers of the 2nd order are formed (Pl. IX, fig. 4 c). In each of these 4 chambers, there is a pair of septa of the 3rd order, which are about half the length of the septa of the 2nd order, and divide the interseptal space of the 2nd order into 2 chambers (Pl. IX, fig. 4 d).

There are, thus, 48 pairs of divisional walls altogether. Each of these is furnished with exceedingly powerful longitudinal muscles (Pl. IX, fig. 2 d), whilst the transversal muscles are weaker. All the septa carry gastral-filaments; but whilst the 6 pairs of perfect septa are sterile, the reproductive organs develop themselves on most of the remaining divisional walls, down towards the bottom of the gastral cavity. The animal is hermaphroditic.

The ovaries are coiled, ribbon-shaped bodies, placed on the inside of the longitudinal muscles of the septum, and closely adherent to it (Pl. IX, fig. 2 e). They contain pretty well-developed ova, and are, otherwise, materially different in structure from those described by the Brothers Hertwig¹

¹ Jenaische Zeitschrift f. Naturwissenschaft 30 B. pag. 548. Jena 1879.

hos *Sagartia parasitica*, *Adamsia diaphana*, *Tealia crassicornis* og *Anthea cereus*, hvilke alle havde særskilt Kjønn saaledes, at de undersøgte Exemplarer af *Anthea* og *Adamsia* vare Hunner, imedens de af *Tealia* og *Sagartia* vare Hanner. Testiklerne hos disse sidste ere ifølge de nævnte Forfattere byggede efter samme System som Æggestokkene; men saaledes forholder det sig ikke ganske hos *Allantactis parasitica*, der som ovenfor nævnt er Hermaphrodit.

Imedens Æggestokkene ere i stor Mængde tilstede, ere Testiklerne vistnok meget sjældnere. Kun paa et Septum af 2den Orden fandtes fuldt udviklede Testikler, der udfyldte ganske Kammeret af 2den Orden. De indtog omtrent samme Plads paa Septum som Æggestokkene, men vare ikke som disse saa intimt fæstede til dette. De vare dannede af en stor Mængde større og mindre, slangeformige Rør, der vare leirede i et Mesenterium, som var tykt og temmelig fast ved Tilheftningsstedet paa Septum, men som forøvrigt var yderst tyndt, men bredt. Rørene, der egentlig vare Blindsække, dannede Bundter, Tab. IX, Fig. 3, og havde en hvid Farve; de bestode af en tynd, gjennemsigtig Bindevævsmembran, paa hvis ydre Flade var et Epithel, der dog var saa sonderrevet, at det ikke nærmere lod sig bestemme. Den indre Flade af Sækken var beklædt med et Endothel, der bestod af temmelig store, næsten runde Celler med en rund Kjerne omgivet af finkornet Protoplasma. Endel af disse Blindsække syntes at vare tomme, imedens de fleste vare mere eller mindre udfyldte af yderst smaa, næsten runde, glindsende Organer, der ved let Tryk spredte sig udover hele Synsfeltet. Jeg anser disse Smaalegemer for endnu ikke fuldt udviklede Spermatozoer; nogen Hale var ikke at opdage.

En Stund var jeg i Tvivl om, hvorvidt denne Samling af Blindsække var virkelige Testikler, eller om de ikke muligens kunde være Acontier, hvoraf jeg hidtil ei havde fundet Spor, trods nøiagtig Undersøgelse af 2 vel konserverede Exemplarer; men Tvivlen svandt snart ved Hjælp af Mikroskopet. Acontierne ere jo lange, næsten runde, spiralførmigt oprullede Legemer, uden noget egentligt Indhold, men rigt besatte med Nematocyster og kan betragtes som traadformige Neldebatterier, altsaa ganske anderledes byggede end de ovenfor beskrevne Blindsække, der vare aldeles fri for Neldeceller. Den reiste Tvivl var jo temmelig naturlig, da de hidtil kjendte Testikler hos Actinierne have en Bygning i Overensstemmelse med Æggestokkene, imedens de hos *Allantactis parasitica* optræde under en meget forskjellig Form, som mere nærmer sig den, der er fælles for en hel Del Holothurideslægter. Men ogsaa herfra adskille Testiklerne hos Allant. par. sig blandt andet derved, at de slangeformede Blindsække ikke ere delte eller forgrenede. At jeg kun fandt Testikler paa et Septum, tor have sin Grund deri, at de her havde naaet en vis Udvikling, imedens de paa andre Septa endnu var i sin Vorden; thi jeg saa paa enkelte Septa af 2den Orden en liden, aflang Fortykkelse, som muligens var den begyndende Testikel. Imidlertid er der jo ogsaa en Mulighed

in *Sagartia parasitica*, *Adamsia diaphana*, *Tealia crassicornis* and *Anthea cereus*, all of which had separate sexes; the specimens of *Anthea* and *Adamsia* examined being females, whilst those of *Tealia* and *Sagartia* were males. The testicles in these last are, according to the writers named, constructed on the same system as the ovaries; but this is not quite the case in *Allantactis parasitica*, which, as above stated, is hermaphroditic.

Whilst the ovaries are present in great abundance, the tentacles are, assuredly, less frequent. Only on a septum of the 2nd order were fully developed testicles observed, completely filling the chamber of the 2nd order. They occupied about the same position on the septum as the ovaries, but, unlike these, were not so closely attached to it. They were formed of a great multitude of larger and smaller sinuous tubes, embedded in a mesentery that was thick and rather firm at the point of attachment to the septum, but which otherwise was extremely thin, but broad. The tubes, which really were cæca, formed fasciculi (Pl. IX, fig. 3) and had a white colour; they consisted of a thin, transparent, connective-tissue membrane, on whose exterior surface there was an epithelium which was, however, so torn asunder that it was not possible to clearly determine it; the inner surface of the cæcum was clad with an endothelium that consisted of rather large, almost round cells, containing a round nucleus surrounded by a minutely granular protoplasm. Some of these cæca appeared to be empty, whilst most of them, however, were more or less filled with extremely small, almost round, shining organs, which upon a slight pressure spread themselves out over the entire area of observation. I consider these small bodies to be not yet fully developed spermatozoa; a tail was not observable.

For some time I was in doubt whether this collection of cæca were really testicles, or whether they were not perhaps acontia, of which I had hitherto found no trace in spite of the closest investigation of two well-preserved specimens, but the dubiety soon disappeared on obtaining the aid of the microscope. The acontia are, it is known, long, almost round, spiral-formed, coiled up bodies, without any real contents, but richly beset with nematocysts, and may be considered to be filamentous stinging batteries, consequently quite differently constructed from the above described cæca, which were perfectly devoid of nematocysts. The dubiety which I had was, indeed, quite natural, because the testicles hitherto known, pertaining to the Actinaria, have a structure conforming to that of the ovaries, whilst in *Allantactis parasitica* they appear under a very different form, more resembling that which is common for the entire genus of the Holothuridæ. But also from that, the testicles in Allant. par. distinguish themselves; amongst other things in this, that the sinuous cæca are not divided or ramified. The fact that I found testicles on only one septum may be owing to this, that there they had attained a particular development, whilst in the other septa they were in their gemmation only; because I observed on a few septa of the 2nd order, a small oblong swelling which was

for, at kun et Septum frembringer Testikler, da disse, der bestaa af en Mangfoldighed af Blindsække, nok ere istand til at producere en tilstrækkelig Mængde Spermatozoer til Æggenes Befrugtning. Som bekjendt korrespondere jo alle Kamre med hverandre, saa at der egentlig ingen Hindring er, for at Spermatozoerne kunne vandre rundt om og udføre sit Befrugtningsarbejde.

Paa Kroppens indre Væg, ligesom paa Septa, ere Længdemusklerne langt mere udviklede end Tvermusklerne; kun opimod den øverste Rand tiltage disse sidste betydeligt i Tykkelse og bidrage til at danne den fremstaaende, krenulerede Kropsrand.

Parieto-basilarmuskelen er tyk, strækker sig et temmelig langt Stykke op paa Kropsvæggen, hvor den bliver meget tyndere, ligesom den næsten membranagtig udbreder sig noget paa Fodskiven. Paa dennes indre Flade, der danner Bunden af Gastralhulheden, sees de fuldstændige Septa, saavel som de af 2^{den} Orden, at tage deres Begyndelse fra Centrum med to adskilte Blade, imedens Septa af 3^{die} Orden langtfra naa hen til Centrum af Fodskiven.

Findested.

Station 33. 4 Exemplarer, der alle sad paa levende Exemplarer af *Neptunia curta*. Jeffr. (Friele).

Slægtskarakter.

Fodskiven omfattende store Gjenstande, saasom *Neptunia curta*, Jeffr., med en tyk, ombøiet Rand. Kolumnen cylindrisk, foldet paatvers med en fritstaaende, øverste Rand (Parapet) og spredte Cinclides. Tentaklerne faatalige, korte, retraktile, i faa Rækker. Sex fuldstændige golde Septa. Ingen Acontier, Udprægede mesodermale Cirkulærmuskler. Hermaphroditer.

Jeg har henført denne Slægt til Familien Sagartidæ, ihvorvel den mangler Acontier, som ifølge Rich. Hertwig er en af de to væsentligste Karakterer for Familien. Men da den forresten har saa meget tilfælles med Sagartiderne, og da andre Forfattere, især Dr. Angelo Andres, ikke lægge saa overordentlig Vægt i systematisk Henseende paa Acontiernes Tilstedeværelse, har jeg troet mig berettiget dertil. Skulde det senere vise sig, at Acontierne ere et uundværligt Familiemærke for Sagartiderne, faar man flytte den over i en anden Familie, eller lade den danne en ny.

possibly the rudimentary testicle. There is, however, of course, the possibility that only one septum produces testicles, as these consist of a multitude of cæca, and are certainly capable of producing a sufficient abundance of spermatozoa for the fructification of the ova. As is already known, all the chambers correspond with each other, so that there is really no obstacle to prevent the spermatozoa from circulating round about and completing their work of fructification.

On the inner wall of the body, as also on the septa, the longitudinal muscles are far more developed than the transversal muscles; only up towards the uppermost margin do these last increase considerably in thickness, and contribute to the formation of the crenate, protuberant margin of the body.

The parieto-basilar muscle is thick, and extends itself rather a long way up the wall of the body, where it becomes much thinner, whilst, also, it almost membranaceously distributes itself somewhat on the pedal disc. On the inner surface of the pedal disc, which forms the bottom of the gastral cavity, the perfect septa, as well as also those of the 2nd order, are seen to issue from the centre with two separate lamellæ, whilst the septa of the 3rd order, do not at all approach to the centre of the pedal disc.

Habitat.

Station No. 33. Four specimens, all which were seated on living specimens of *Neptunia curta*, Jeffr. (Friele).

Generic characteristics.

The pedal disc embracing large objects, such as *Neptunia curta* (Jeffr.), with a thick margin bent inwards. The column cylindrical, folded transversally, has a free erect superior margin (Parapet), and scattered cinclides. The tentacles not numerous, short, retractile, in few series. Six perfect, sterile septa. No acontia. Prominent mesodermal circular muscles. Hermaphroditic.

I have assigned this genus to the family Sagartidæ although it is deficient in acontia which, according to Rich. Hertwig, is one of the two most distinctive characteristics of the family. But as it, otherwise, has so much in common with the Sagartidæ, and as other writers, especially Dr. Angelo Andres, do not lay such great systematic stress on the presence of the acontia, I have considered myself warranted in so assigning it. If it should, subsequently, appear that the acontia are an indispensable family characteristic for the Sagartidæ, then it can be transferred to another family, or a new one can be formed for it.

Artakarakter.

Fodskiven rund, 35^{mm} i Tversnit, med tyk, indboiet Rand, omfattende levende Exemplarer af *Neptunia curta*. Jeffr. (Friele), og antager derved en aflang Form. Skiven tynd, med fine, fra Centrum udstraalende Linier. Kroppen cylindrisk, omtrent lige høi som bred og stærkt foldet paa tværs, overalt forsynet med spredte Cinclides imellem Folderne. Dens øverste Rand danner en fritstaaende, krenuleret Vold (Parapet); imellem denne og Tentaklerne en dyb Grube (Fossa). Mundskiven rund, flad, med fine Folder straalende ud fra Munden imod Tentaklerne. Munden aflang, foldet paalangs. Læberne tykke, trelappede. Mundvigene halvmaaneformige med en haard Rand. Tentaklerne korte, retraktile, sidde i 2 Rækker, 24 i hverj; de inderste ere længst og tykkest. Mundskiven kan skjules af Kroppranden. Farven: Kroppen gul, spillende lidt i det Brune; paa dens øverste Rand, ligesom paa Mundskiven, smuk rosenrød. Omkring Munden en purpurrød, aflang Ring. Folderne paa Skiven ere mørkere farvede end denne. Tentaklerne bleg violette.

Anthosactis¹ Jan Mayeni, n. g. et sp.

Tab. II, Fig. 1: Tab. X, Fig. 1.

Fodskiven er rund, noget videre end Kolumnen, omtrent 50^{mm} i Tversnit, med en tyk, lidt undulerende Rand. Den undre Flade er lidt udhulet, især i Centrum, hvorfra udgaa, divergerende mod Randen, en stor Mængde Folder, imellem hvilke der er ligesaa mange Furer, som svare til Skillevæggens Insertioner.

Kroppen er cylindrisk, henved 40^{mm} bred et Stykke ovenfor Fodskiven, men bliver noget bredere op imod Mundskiven; den er omtrent halvt saa høi som Skivens Bredde, naar denne med Tentaklerne er fuldt udslaaet; dens øverste Rand er temmelig tynd, lidt unduleret og dens ydre Flade glat, glindsende, forsynet med svagt fremstaaende, brede Længdefolder, der især ere tydelige opimod Randen, og imellem hvilke sees Cinclides, Tab. II, Fig. 1. Disse Længdefolder forsvinde saagodtsom ganske, naar Dyret er helt udstrakt, og da sees kun fine Længdelinier, som omgive Insertionerne af Skillevæggene. Imellem disse Linier sees temmelig tydelig Længdemusklerne, der ere omtrent 0.5^{mm} brede. Kroppens Hud er tynd, fast, næsten membranøs og halv gjennemsigtig i udspændt Tilstand.

¹ ανθος = en Blomst.**Specific characteristics.**

The pedal disc round, 35^{mm} from side to side, with thick involved margin; embraces living specimens of *Neptunia curta*. Jeffr. (Friele) and acquires, thus, an oblong form. The disc thin, with fine lines radiating from the centre. The body cylindrical, about as high as it is broad, and strongly folded transversally, furnished, everywhere between the folds, with scattered cinclides. Its uppermost margin forms a free, erect, crenate wall (Parapet), and between that and the tentacles there is a deep cavity (fosse). The oral disc, round, flat, with fine folds radiating from the mouth towards the tentacles. The mouth oblong, folded longitudinally. The labiae thick and trilobate. The oral angles semilunate, with a hard margin. The tentacles short, retractile, seated in 2 series, 24 in each; the tentacles of the innermost series are the longest and thickest. The oral disc capable of being concealed by the margin of the body. *Colour*: Body yellow, shading a little to brown; on its uppermost margin, and also on the oral disc, a beautiful rose-red. Around the mouth, a purple-red, oblong annulus. The folds on the disc are darker coloured than the disc itself. The tentacles pale violet.

Anthosactis¹ Jan Mayeni, n. g. et sp.

Pl. II, fig. 1: Pl. X, fig. 1.

The pedal disc is round, somewhat wider than the column, measures about 50^{mm} across, has a thick, somewhat undulating margin. The under surface is a little concave, especially in the centre, from which proceed a great number of folds, diverging towards the margin and having between them the same number of furrows, corresponding to the insertions of the divisional walls.

The body is cylindrical; it is, a little way above the pedal disc, about 40^{mm} in breadth, but increases somewhat in breadth up towards the oral disc; it is about half as high as the breadth of the disc, when that and the tentacles are fully extended. Its uppermost margin is rather thin and somewhat undulated, and the external surface is smooth, shining, and furnished with faintly projecting, broad longitudinal folds which are especially distinct up towards the margin; between the folds cinclides are observed (Pl. II, fig. 1). These longitudinal folds almost quite disappear when the animal is entirely extended, and then only fine longitudinal lines are seen, which indicate the insertions of the divisional walls. Between these lines rather distinct longitudinal muscles are observed, measuring about 0.5^{mm} in breadth. The integument of the body is thin, firm, almost membranous, and semi-transparent when in expanded condition.

¹ ανθος = A flower.

Mundskiven er lidt hvælvet, henved 40^{mm} bred og fint foldet. Folderne ere under lidt Kontraktion noget ophøiede, smalere ved Munden, hvorfra de udgaa, og bredere udad mod den 1^{ste} Tentakelrække, Tab. II, Fig. 1. Munden er aflang, foldet og forsynet med 2 dybe Gonidiefurer, som ere temmelig brede udad, saa de have en næsten triangular Form, og i disse triangulære Mundvige sees 2 aflange, næsten koniske Knuder (Gonidietuberkler), Tab. II, Fig. 1.

Tentaklerne sidde i 3 Rækker indenfor Kroppens Rand. De ere retraktile, temmelig korte, tykke ved Grunden, men udløbe konisk mod den tilspidsede Ende, som er perforeret. I den 1^{ste}, inderste, Række, er der 16; i den 2^{den} er der ligeledes 16, men i den 3^{die}, yderste, Række er der 32, idet nemlig 2 staa imellem hver 2 af 2^{den} Række, Tab. II, Fig. 1. Alle Tentakler ere omtrent lige store. Saavel Tentaklerne som Mundskiven kan fuldkommen dækkes af Kropsranden, og naar Dyret paa denne Maade sammentrækker sig, danner det en Halvkugle.

Kroppens Farve er bleg, rødlig-hvid, men faar paa Grund af det røde Svælg, der skinner igjennem, et rødt Skjær, imedens dog den øverste Rand er hvid. Tentaklerne ere rosenrøde, spillende lidt i det Gule. Mundskiven er mørkere, gulrød, med lysere, gulhvide Straaler, som gaa fra Munden henimod Midten af Skiven. Gonidiefuren er gulhvid, begrændset af en mørkerød Stribe til hver Side; Gonidietuberklerne ere gulhvide. Paa hver Side af Gonidiefuren har Munden 16 stærke Folder, hvoraf 8 ere gulhvide og danne en Straalekrands om Munden; de andre 8 have en mørkerød Farve. Disse Folder paa Mundranden (Læberne) forlænge sig nedover i det mørkerøde, stærkt foldede Svælg. Fodskivens undre Flade havde en mørkerød, lidt i det Brune spillende Farve og var fæstet til Lavabrokker, hvorfra den dog med Lethed løsnedes. Naar Dyret blev sat paa Spiritus, farvedes denne intenst brunviolet, ligesom selve Dyret antog en stærk violet Farve.

Indenfor den ectodermale Beklædning, der som sædvanligt bestaar af lange, cilierende Cylinderceller, hvorimellem sees en Mængde encellede, flaskeformede Slimceller samt Nematocyster, findes et bredt, fibrillært Bindevæv med sine Bindevævslegemer, Tab. X, Fig. 1 a. I Midten af dette iagttages, som et Belte, cirkulære Muskler, der danne større eller mindre Bundter, hvori Muskelfibrillerne ere samlede, og som ligge saaledes indleirede i Bindevævet, at dette omgiver Bundterne som en Skede. Disse Muskelbundter ligge tildels noget fra hverandre og kunne have indtil et halvt Hundrede Fibriller; tildels bestaa de kun af nogle faa Fibriller og kunne ligge tættere sammen, Tab. X, Fig. 1 b; men overalt indtage de Midten af Bindevævsaget, saa at dette til begge Sider danner brede Længde-

The oral disc is slightly arcuate, measures about 40^{mm} in breadth and is finely folded. Under slight contraction the folds are somewhat elevated, and are narrowest at the mouth, from whence they issue, and broadest outwardly, towards the 1st tentacular series (Pl. II, fig. 1). The mouth is oblong, folded, and furnished with 2 deep gonidial grooves which are rather broad outwardly, so that they acquire an almost triangular form, and in these triangular gonidial grooves 2 oblong, almost conical knobs (gonidial tubercles) are observed (Pl. II, fig. 1).

The tentacles are seated in 3 series inside of the margin of the body; they are retractile, rather short, thick at the base, but project conically towards the acuminate extremity, which is perforated. In the innermost, 1st series, there are 16 tentacles; in the 2nd series there are also 16 tentacles; but in the 3rd, outermost series, there are 32 tentacles, as in it 2 tentacles are placed between every two of the 2nd series (Pl. II, fig. 1). All the tentacles are about the same size. The tentacles as well as the oral disc, are capable of being completely covered by the margin of the body, and when the animal, in that manner, contracts itself, it forms a hemisphere.

The colour of the body is pale reddish white, but owing to the red œsophagus which shines through, it acquires a reddish tinge, whilst the uppermost margin is white. The tentacles have a beautiful rose-red colour, shading a little to yellow. The oral disc is a darker yellowish-red, with lighter coloured yellowish-white rays issuing from the mouth towards the middle of the disc. The gonidial groove is yellowish-white, bordered by a dark-red stripe on each side. The gonidial tubercles are yellowish-white. On each side of the gonidial groove the mouth has 16 strong folds, of which 8 are yellowish white and form a radial wreath round the mouth; the remaining 8 folds have a dark-red colour. These folds on the oral margin (labiæ) prolong themselves downwards, into the dark-red strongly folded œsophagus. The inferior surface of the pedal disc has a dark-red, shading to brown, colour, and was adherent to fragments of lava from which it was, however, easily detached. When the animal was placed in alcohol, the fluid became coloured a bright brown-violet, while, also, the animal itself acquired a strong violet colour.

Inside of the ectodermal covering which, as usual, consists of long ciliating cylinder-cells between which a multitude of unicellular, bottle-shaped mucous glands and nematocysts are seen, there is found a broad fibrillar connective-tissue with its connective-tissue corpuscles (Pl. X, fig. 1 a). In the middle of this, circular muscles appearing like a belt are observed, which form larger or smaller fasciculi in which the muscle fibrils are collected, and lie embedded in the connective-tissue in such a manner, that it encloses the fasciculi like a sheath. These muscular fasciculi are separated, somewhat, from each other, and may contain as many as half a hundred fibrils. They consist sometimes of only a few fibrils, and may then lie more compactly together (Pl. X, fig. 1 b) but they,

felter, hvori sees en Mængde Bindevævs-kjerner og Ernæringskanaler, Tab. X, Fig. 1 c.

Der er 6 Par principale Septa, der tillige ere fuldstændige, forsaavidt de fæste sig paa Svælget, og disse Septa ere meget tykke, brede og faste, men golde; de ere forsynede med baade Længde- og Tvermuskler, af hvilke de første danne udprægede, foldede Lameller, Tab. X, Fig. 1 d, e. Der er altsaa 6 principale Kamre; i ethvert af disse er der et Par secundære Septa, der ikke fæste sig paa Svælget, men naa næsten lige hen til dette, ere langt fra saa tykke og brede, som de principale, og bære foruden Mesenterialfilamenter, Kjønorganerne, der ere fuldt udviklede og indeholde Æg i næsten alle Udviklingsstadier. Kjønnen synes at være adskilt; thi kun Æg fandtes overalt; det kan dog hændes, at en eller anden Testikel kan have skjult sig, trods den omhyggeligste Undersøgelse.

Ingen Acontier; begge de fundne Exemplarer ere med Hensyn hertil paa det samvittighedsfuldeste undersøgte; men intet Spor deraf var at opdage. Det er ikke forbunden med synderlige Vanskeligheder at finde Acontierne, hvor de ere tilstede, saa man kan være forvisset om, at Acontier mangler her.

De tertiære Septa ere meget korte, men temmelig tykke og udgjøre 12 Par; der er altsaa i det Hele 24 Par Septa. Parieto-basilarmuskelen er ikke meget tyk og strækker sig membranagtigt et Stykke opover paa Kropsvæggen og nedover paa den indvendige Flade af Fodskiven. Her sees Insertionerne af Septa særdeles godt, og det viser sig, at de primære og secundære Septa naa lige hen til Skivens Centrum, imedens de tertiære Septa ikke naa halvt saa langt.

Findested.

Station 226. 2 Exemplarer.

Slægtskarakter.

Fodskiven rund med tyk Rand. Kolumnen cylindrisk, tyndvægget, glat med Længdefolder og Cinclides. Mundskiven rund. Tentaklerne retraktile, alle af omtrent samme Størrelse, korte, faatallige, i faa Rækker. Mesodermale Cirkulærmuskler. 6 Par fuldstændige, golde Septa. Ingen Acontier.

Artskarakter.

Fodskiven rund med tyk, unduleret Rand og stærkt foldet Underflade. Kroppen cylindrisk, lidt smalere nedad end Fodskiven, udvidende sig noget opad mod den øverste, temmelig tynde, lidt undulerende Rand, med en glat ydre

everywhere, occupy the middle of the connective-tissue layer, so that it forms, on both the sides, broad longitudinal folds in which a multitude of connective-tissue nuclei and nutritory ducts are visible (Pl. X, fig. 1 c).

There are 6 pairs of principal septa, which are perfect as well in so far that they adhere to the œsophagus; these septa are very thick, broad and firm, but sterile; they are furnished with both longitudinal and transversal muscles, of which the first-named form prominent folded lamellæ (Pl. X, fig. 1 d, e). There are, thus, 6 principal chambers, and in each of them there is a pair of secondary septa which do not adhere to the œsophagus but extend almost up to it; they are not nearly so thick or so broad as the principal septa, and they carry, besides mesenterial filaments, the reproductive organs, which are fully developed and contain ova in nearly all stages of development. The sexes appear to be separated, as, everywhere, ova only were observed; it may however be, that one or other testicle has lain' concealed in spite of the closest investigation.

No acontia; both the specimens found have been submitted to the most searching examination in this respect, but no trace of acontia could be detected. There is no very great difficulty in detecting acontia when they are present, so that we may be quite certain that acontia are wanting here.

The tertiary septa are very short but rather thick, and consist of 12 pairs; there are thus 24 pairs of septa altogether. The parieto-basilar muscle is not very thick, and extends itself, membranaceously, a little way up, over the wall of the body and down on the internal surface of the pedal disc. Here the insertions of the septa are particularly well seen, and it is apparent that the primary and secondary septa reach right to the centre of the disc, while the tertiary septa do not reach half so far.

Habitat.

Station No. 226. Two specimens.

Generic characteristics.

Pedal disc round with thick margin, the column cylindrical, wall membranous, smooth, with longitudinal folds and cinclides. The oral disc round. The tentacles retractile, about uniform in size, short, few in number, in few series. Mesodermal circular muscles. 6 pairs of completely sterile septa. No acontia.

Specific characteristics.

The pedal disc round, with thick undulating margin and strongly folded under-surface. The body cylindrical, somewhat narrower, below, than the pedal disc, but expanding somewhat in width, upwards, towards the uppermost, rather

Flade, der er svagt foldet paalangs; imellem Længdefolderne Cinclides. Kroppens Væg tynd, halvt gjennemsigtig i udspændt Tilstand. Mundskiven omtrent 40^{mm} bred, lidt hvælvet og fint foldet. Munden aflang, foldet, forsynet med to dybe, næsten triangulære Gonidiefurer, samt en konisk Gonidieknude i hver Mundvig. Tentaklerne omtrent lige lange, korte, tilspidsede mod Enden, der er perforeret, siddende i 3 Rækker: 16 i første og anden Række, 32 i tredje Række. Tentakler og Mundskive kunne dækkes fuldkommen af Kroppens Rand under Dyrets Sammentrækning. Farven: Kroppen bleg, rødlig-hvid. Tentaklerne rosenrøde, spillende i det Gule. Mundskiven mørkere gulrød med lysere, gulhvide Straaler. Gonidiefuren gulhvid, ligesaa Gonidieknuderne. Paa hver Side af Gonidiefuren (Mundvigen) har Munden 16 stærke Folder, hvoraf de 8 ere gulhvide, de andre 8 have en mørkerød Farve. Fodskivens undre Flade er mørkerød, spillende lidt i det Gule.

Ogsaa denne Slægt har jeg henført til Sagartiderne, uagtet den ingen Acontier har; men da den forresten har Sagartidebygningen, har jeg ikke fundet det nødvendigt, at danne en ny Familie for den.

Sagartia repens, n. sp.

Tab. I, Fig. 6. Tab. X, Fig. 2, 3.

Fodskiven, som ikke er synderlig bredere end Kroppen, er rund med en tyk, lidt unduleret Rand, der med stor Lethed trænges opad og udad; dens Underflade er lidt fordybet mod Centrum, hvorfra udgaa vifteformigt Folder mod Randen, men forresten er den glat.

Kolumnen er cylindrisk, 50^{mm} høi og 40^{mm} bred ved Foden, men smalner noget af op imod den øverste Rand, som er tentakulær. Dens ydre Flade er glat, halvt gjennemsigtig, saa Insertionerne for Skillevæggene kunne tydelig sees som fine Linier, imellem hvilke findes i næsten regelmæssige Længderækker smaa, runde, isolerede Vorter med en Fordybning i Midten (Suckers), hvortil Ler og andre fremmede Legemer, saasom Skiælstumper, ere fæstede. Foruden disse Sugevorter iagttages ogsaa hist og her Cinclides, som især fremtræde tydeligt, naar Dyret er udspændt; derimod er det yderst vanskeligt at opdage dem under dets Sammentrækning, imedens Sugevorterne da blive tydeligere, Tab. I, Fig. 6.

thin, slightly undulating margin, has a smooth external surface, which is faintly folded longitudinally; between the longitudinal folds cinclides visible. The wall of the body thin; in expanded condition semi-transparent. The oral disc about 40^{mm} in breadth, a little arcuate and finely folded. The mouth oblong, folded, furnished with 2 deep, almost triangular gonidial grooves, and also with a conical gonidial knob in each oral angle. The tentacles about equal in length, short, acuminate towards the extremity, which is perforated; seated in 3 series, 16 in the first and second series, and 32 in the third series. The tentacles and oral disc can be completely covered by the margin of the body when the animal contracts itself. *The colour*: the body pale reddish-white; the tentacles rose-red, shading to yellow; the oral disc a darker yellowish-red, with lighter yellowish-white rays; the gonidial groove, and also the gonidial knobs yellowish-white. On each side of the gonidial groove (oral angle) the mouth has 16 strong folds, of which 8 are yellowish-white; the other 8 have a dark-red colour. The under-surface of the pedal disc is dark-red, shading a little to yellow.

This genus I have also assigned to the Sagartidæ although it has no acontia, but as it has, otherwise, the same structure as the Sagartidæ, I have not found it necessary to form a new family for it.

Sagartia repens, n. sp.

Pl. I, fig. 6. Pl. X, figs. 2, 3.

The pedal disc, which is not much broader than the body, is round, and has a thick, slightly undulating margin, that can with perfect ease be careened upwards and outwards; its under-surface is a little depressed towards the centre, from which folds issue in flabelliform towards the margin, but it is smooth otherwise.

The column is cylindrical, measures 50^{mm} in height, and 40^{mm} in breadth at the base, becoming somewhat narrower up towards the uppermost margin, which is tentacular. Its exterior surface is smooth and semitransparent, so that the insertions of the divisional walls may be distinctly seen, appearing as fine lines between which, arranged in almost regular longitudinal series, small round, isolated mammillæ with a small depression (suckers) in the middle are found, to which clay and other foreign bodies, such as fragments of shells, are adherent. Besides these suckers, cinclides are also seen here and there; these become especially prominent when the animal is expanded, while, on the other hand, it is extremely difficult to detect them when the animal is contracted, as the suckers then become more prominent (Pl. I, fig. 6).

Mundskiven, der er noget hvælvet henimod Munden, er lidt videre end Kolumnen og forsynet med Folder, som straaled ud fra den aflange Mund. Dennes Læber ere tykke, foldede og gaa til hver Side over i en temmelig smal Gonidiefure. Stundom skydes Munden op, saa den danner en Konus, og da sees de foldede Læber mere fremspringende.

Tentaklerne ere retraktile, temmelig lange og sidde i 4 Rækker. I den 1^{ste}, inderste, Række, er der 12, som baade ere de længste og tykkeste; i den 2^{den} Række er der ligeledes 12, som afvexle med de i den 1^{ste} Række; den 3^{die} Række har 24, der ere mindre og betydelig tyndere end de 2 foregaaende Rækkers og sidde saaledes, at to tage Plads imellem to af 2^{den} Række; den 4^{de} Række sidder lige i Randen og har ogsaa 24, der ere af samme Størrelse som de i 3^{die} Række.

Farven: Fodskiven er hvid, dens Underflade er svag gulhvid. Kolumnen melkehvid, skinnende yderst svagt i det Violette, og Sugevorterne ere bleg violette. Mundskiven er næsten chamoisfarvet med lidt lysere Straaler. Tentaklerne lidt mørkere end Mundskiven, især ved deres Grund.

Dyret synes ikke at fæste sig, som Actinierne i Almindelighed, til noget andet Legeme, men spadserer paa sin Fod med megen Lethed omkring. Saaledes var det yderst vanskeligt at holde det paa Bunden af Observationskarret, da det stadig gik op over Væggene og det endog temmelig hurtigt. Naar Dyret trækker sig sammen, skjules Mundskiven og Tentaklerne ganske.

Ectodermet er temmelig tyndt og dannet af de hos Actinierne sædvanlige lange, cilierende Cylinderceller, imellem hvilke findes i stor Mængde encellede, kolbeformede Slimkjertler og Nematocyster, Tab. X, Fig. 2, 3 a. Indenfor Ectodermet er et bredt, fibrillært Bindevævslag, i hvis Midte sees et bredt Belte af cirkulære Muskelfibre, der ligge dels i tynde Bundter, dels enkeltvis, Tab. X, Fig. 2, 3 b; til hver Side af dette Muskelbelte er et bredt, fibrillært Bindevævslag, hvori sees Bindevævslegemer og fine Ernæringskanaler, Tab. X, 2, 3 c.

Der er 6 Par principale, fuldstændige Septa (1^{ste} Orden), der ere golde, og som dele Gastralhulheden i 6 Hovedkamre. I ethvert af disse er der 4 Par Septa af 2^{den} Orden, som naa hen til Øsophagus uden at fæste sig paa samme, og som bære foruden Mesenterialfilamenter tildels Kjønorganer. Baade Septa af 1^{ste} og 2^{den} Orden strække sig hen til Fodskivens Centrum. Af Septa, tilhørende 3^{die} Orden, er der 24 Par, som baade ere kortere og tyndere og kun halvt saalange som de af 2^{den} Orden, samt naa omtrent halvt ind paa Fodskiven; de bære alle Kjønorganer og Acontier. Septa af 4^{de} Orden ere meget korte, men temmelig tykke og bære ligeledes Kjønorganer.

The oral disc, which is somewhat arcuate towards the mouth, is a little wider than the column, and is furnished with folds which radiate outwards from the oblong mouth. The oral labiæ are thick, folded, and on each side pass over into a rather narrow gonidial groove. Sometimes the mouth is projected upwards, so as to form a cone, in which case the folded labiæ are seen more prominently.

The tentacles are retractile, rather long, and are seated in 4 series. In the innermost, 1st series, there are 12 tentacles, which are both the longest and the thickest; in the second series there are also 12 tentacles, which alternate with those of the 1st series; the 3rd series has 24 tentacles, which are smaller and much thinner than those of the 2 preceding series, and they are placed in such manner that 2 of them are seated between 2 of the 2nd series; the 4th series of tentacles is seated quite in the margin, and also contains 24, which are of the same size as those in the 3rd series.

The colour: the pedal disc is white; its under-surface is faint yellowish-white. The column is milky-white, with an extremely faint violet-tinge, and the suckers are pale violet. The oral disc is almost light buff colour, with slightly lighter-coloured rays. The tentacles are a little darker than the oral disc, especially at their base.

The animal does not appear to attach itself — as is usual with the Actinaria — to any other object, but perambulates upon its base with much ease. It was consequently extremely difficult to retain it at the bottom of the glass vessel, as it constantly passed up the sides, even with considerable speed. When the animal contracts itself, the oral disc and the tentacles are completely concealed.

The ectoderm is rather thin, and is formed of the long ciliating cylinder-cells usual in the Actinaria, between which a great multitude of unicellular claviform mucous glands and nematocysts are observed (Pl. X, figs. 2, 3 a). Inside of the ectoderm there is a broad fibrillar layer of connective-tissue, in whose middle a broad belt of circular muscle-fibres is seen, which are situated, partly in thin fasciculi, partly singly (Pl. X, figs. 2, 3 b); upon each side of this muscle-belt there is a broad fibrillar layer of connective-tissue, in which connective-tissue corpuscles and slender nutritory ducts are observed (Pl. X, figs. 2, 3 c).

There are 6 pairs of principal, perfect septa (1st order) which are sterile, and divide the gastral cavity into 6 principal chambers. In each of these chambers there are 4 pairs of septa of the 2nd order, which extend to the œsophagus without, however, attaching themselves to it, and that partly carry, besides mesenterial filaments, also reproductive organs. Both the septa of 1st and 2nd order extend to the centre of the pedal disc. There are 24 pairs of septa pertaining to the 3rd order, which are both shorter and thinner and only half the length of those of the 2nd order, and they also extend, only half way on to the pedal disc; they all carry reproductive organs and acontia.

Den Mangfoldighed af interseptale Kamre, der opstaa ved de mange Septapar, ere alle opfyldte af Kjønorganerne, som ere meget udviklede og indeholde Masser af Æg.

Foruden Septalaabningerne (orale Stomata) ved Mundranden er der ogsaa en Aabning paa Septa af 1ste og 2den Orden lige ved deres Befæstning paa den nederste Trediedel af Kropsvæggen (pedale Stomata). Disse Aabninger give Anledning til en rigere Kommunikation imellem Kamrene indbyrdes, hvorved Ernæringsvædsken med Lethed kan overskylle de i Kamrene hvilende Organer.

Parieto-basilarmuskelen er meget tyk og udbreder sig saavel opad som nedad i stor Udstrækning, og Muskulaturen i selve Fodskiven er særdeles stærkt udviklet.

Findested.

Station 275. Et Exemplar.

Artskarakter.

Fodskiven rund med en tyk, undulerende Rand og en stærkt foldet Underflade. Kolumnen cylindrisk, 50^{mm} høj, 40^{mm} bred ved Foden, men smalner af mod den øverste Rand, som er tentakulær. Den ydre Flade glat, halvt gjennemsigtig, naar Kroppen er udspændt, og forsynet med fine Længdelinier, imellem hvilke sees smaa, runde, isolerede Sugevorter (suckers), der især fremtræde paa den øverste Del, hvor de næsten ere stillede i Længderækker. Hist og her Cinclides. Mundskiven fint foldet, hvælvet henimod den foldede Mund, der hyppig danner en Konus og har to Gonidiefurer. Tentaklerne retraktile, lange, siddende i 4 Rækker; i 1ste 12, som ere de længste og tykkeste; i 2den ogsaa 12, noget mindre; i 3die og 4de Række 24 i hver og betydelig mindre end de i 2den. Farven: Fodskiven hvid, dens Underflade svag gulrød. Kroppen melkehvid, skinnende yderst svagt i det Violette. Sugevorterne bleg violette. Mundskiven chamoisfarvet med lidt lysere Straaler. Tentaklerne lidt mørkere end Skiven, især ved deres Grund.

Dyret spadserer frit om med stor Lethed uden Tilbøielighed til at fæste sig.

The septa of the 4th order are very short, but rather thick, and also carry reproductive organs. The multiplicity of interseptal chambers which arise in consequence of the numerous pairs of septa, are all filled with reproductive organs which are well developed and contain masses of ova.

Besides the septal apertures (oral stomata) at the oral margin, there is also an opening on the septa of the 1st and 2nd order, exactly at their attachment on the lowest third-part of the wall of the body (pedal stomata). These apertures permit of greater freedom of communication between the chambers, with each other, so that the nutritory fluids can flow freely over the organs lying in the chambers.

The parieto-basilar muscle is very thick, and distributes itself both upwards and downwards to a great extent, and the musculosity of the pedal disc itself is particularly strongly developed.

Habitat.

Station No. 275. One specimen.

Specific characteristics.

The pedal disc round, with a thick undulating margin, and a strongly folded under-surface. The column cylindrical, 50^{mm} in height, 40^{mm} in breadth at the base, but becomes narrower towards the uppermost margin, which is tentacular. The exterior surface smooth, semi-transparent when the body is expanded, furnished with slender longitudinal lines between which, small, round, isolated suckers are observed, appearing especially on the uppermost part, where they are placed in almost longitudinal series. Cinclides are here and there observable. The oral disc finely folded and arched towards the folded mouth, which frequently forms a cone and has two gonidial grooves. The tentacles retractile, long, seated in 4 series; 12 tentacles in the 1st series, which are the longest and thickest ones; 12 tentacles in the 2nd series, somewhat smaller in size; in the 3rd and 4th series, 24 tentacles in each, but considerably smaller than those of the 2nd series. *Colour.* Pedal disc white, its under-surface faint yellowish-red. The body milky-white, shining with an extremely faint violet tinge. The suckers pale violet. The oral disc light buff colour, with somewhat lighter-coloured rays. The tentacles a little darker than the disc, especially at their base.

The animal perambulates freely, with great ease, without any tendency to attach itself to foreign bodies.

Sagartia abyssicola (Phellia) Kor. et Dan.

Tab. III, Fig. 1, 2. Tab. X, Fig. 4—7.

Syn. *Phellia abyssicola*. Kor. et Dan. — Fauna littoralis Norvegiæ. Heft. 3. 1877, Pag. 78, Pl. IX, Fig. 3, 4.*Sagartia abyssicola*, Verrill. Americ. Journ. Sienc. Vol. XXIII, 1882, Pag. 314.*Sagartia abyssicola*, Verrill. Bulletin of the Mus. of compar. Zoology. Vol. XI. 1883—85, Pag. 45. Pl. VI, Fig. 1, 1 b, 1 c.

Fodskiven snart rund, snart aflang, antagende altid Formen efter den Gjenstand, den har fæstet sig til eller omfattet; hyppigst træffes den paa Conchylier af dels døde, dels levende Fususarter, og den omfatter da saa intimt Skallen, at der er tydeligt Aftryk af denne paa Fodskivens Underflade, Tab. III, Fig. 2. Imellem denne og Skallen eller den Gjenstand, hvortil den ellers er fæstet, findes hyppigt afsat en brun, chitinagtig Membran, som bidrager til at fæste Dyret end stærkere til Gjenstanden. Fodskivens Rand er snart meget tynd og bugtet paa mange Slags Maader, snart tyk og næsten lige, uden Indbugtninger, og dens Flade er ofte papirtynd, saa at Septalinsertionerne skinne igjennem.

Kolumnen er indtil 60^{mm} høi, omkring 50^{mm} bred, rund, tildels søileformig og noget indkneben paa Midten hos mange Exemplarer, imedens andre ere ganske jævnt cylinderformede, og dens nederste 4 Femtedele har en brun, blød, slimet Skede, der væsentlig bestaar af grønbrunt Lerslam, og hvori Dyret trækker sig ind, Tab. III, Fig. 2. Skedens Rand er lidt ujævn og tynd. Den nøgne Del af Kroppen er næsten glat, yderst smal og forsynet med en Mængde Cinclides. Paa yngre Dyr er den omtalte Skede bestandig tilstede, Tab. III, Fig. 1, og de nærme sig saaledes stærkt Slægten *Phellia*; men paa fuldvoxne Dyr mangler enten ganske denne slimede, med Ler inkrusterede, Overhud, Tab. X, Fig. 4, eller findes kun delvis, Tab. III, Fig. 2; ligesom Dyret ved at leve i Observationskarret i nogle Dage skilte sig saagodtsom aldeles ved denne Overhud. Kroppen viser sig da svagt foldet paalangs, halvt gjennemsigtig, saa Insertionerne af Septa sees, og paa Foldernes hele Længde findes en stor Mængde tætstaaende, aflange Cinclides, hvorigjennem paa mange Steder udkastedes lange, spiralformede Acontier, Tab. III, Fig. 2; Tab. X, Fig. 4.

Paa unge Dyr er Overhuden stærkere, og naar de kontrahere sig, faar Kroppens Overflade et stærkt knudet Udseende; det er da yderst vanskeligt at iagttage Cinclides, som forøvrigt ikke synes at være tilstede i saa overordentlig stor Mængde som hos de voxne Dyr, hvor den letteste Irritation, især paa Mundskiven, foranlediger, at Acontier i hundredevis udslynges med Lynets Hurtighed; Inddragningen foregaar ikke med samme Hurtighed, og det synes, som om mange Acontier, efterat være ud-

Sagartia abyssicola (Phellia) Kor. et Dan.

Pl. III, figs. 1, 2. Pl. X, fig. 4—7.

Syn. *Phellia abyssicola*. Kor. et Dan. — Fauna littoralis Norvegiæ. Heft. 3. 1877, Pag. 78. Pl. IX. Fig. 3, 4.*Sagartia abyssicola*, Verrill. Americ. Journ. Sienc. Vol. XXIII, 1882, Pag. 314.*Sagartia abyssicola*, Verrill. Bulletin of the Mus. of compar. Zoology. Vol. XI, 1883—1885, Pag. 45. Pl. VI. Fig. 1, 1 b, 1 c.

The pedal disc is sometimes round, sometimes oblong, always assuming the same form as the object to which it has attached itself or embraced. It is met with most frequently on the shells of inanimate, or animate members of the fusus species, and it then embraces the shell so intimately, that a distinct impression of it appears on the under-surface of the pedal disc (Pl. III, fig. 2). Between that and the shell, or the object otherwise to which it is attached, there is generally found deposited a brown, chitinous membrane, which contributes to attach the animal still firmer to the object. The margin of the pedal disc is sometimes very thin, and is undulated in many ways; sometimes it is thick and almost even, without undulations, and its surface is often as thin as a paper sheet, so that the septal insertions shine through.

The column measures up to 60^{mm} in height, and about 50^{mm} in breadth; it is round, sometimes columnar, and in many specimens is somewhat constricted at the middle, while others are quite uniformly cylindrical, and the lowest four-fifths-part has a soft, brown, slimy sheath, consisting principally of greenish-brown clay-slime, into which the animal retracts itself (Pl. III, fig. 2). The margin of the sheath is slightly uneven, and thin. The exposed portion of the body is almost smooth, extremely narrow, and is furnished with a multitude of cinclides. In young animals the sheath mentioned is invariably present (Pl. III, fig. 1), and they consequently approach much to the genus *Phellia*; but in full-grown animals this slimy, with clay encrusted, external covering, is either entirely absent, or is only partially present (Pl. III, fig. 2), whilst, also, the animal after living a few days in the glass vessel, almost completely divests itself of this external covering. The body then appears faintly folded, longitudinally, and semi-transparent, so that the insertions of septa can be seen, and on the entire length of the folds a great multitude of compactly-placed oblong cinclides are found, through which, in many places, long spiral-formed acontia are projected (Pl. III, fig. 2. Pl. X, fig. 4).

In young animals the external covering is stronger, and when they contract themselves the external surface of the body acquires a strongly nodulous appearance. It then becomes extremely difficult to observe cinclides, which, besides, do not appear to be present in such extraordinary abundance as in the adult animals, where the slightest irritation, especially on the oral disc, causes hundreds of acontia to be projected with lightning-speed. Their retraction does not take place so rapidly, and it seems

slyngede, tabe deres Kontraktionsevne, idet de i udstrakt Tilstand blive hængende langs Kroppens Overflade, Tab. X, Fig. 4. Kroppens øverste Rand er tentakulær.

Mundskiven er lidt hvælvet og rigt foldet; Folderne udstraale vifteformigt fra Munden, ere overalt rigt forsynede med Cinclides, hvorigjennem Acontier udslynges. Disse ere i stor Mængde tilstede paa den Del af Skiven, der nærmest omgiver Mundaabningen. Denne er aflang og har en bred Gonidiegrube med to smaa Gonidieknuder paa hver Side. Mundlæberne ere sexlappede, hvorved Mundaabningen faar Udseende af at være omgivet af en Krands, Tab. III, Fig. 1, 2.

Tentaklerne ere meget lange og staa i 3 Rækker; i den indre er der 12, som ere de længste og meget længere end Mundskivens Bredde; i den mellemste Række er 24, der ere meget kortere, end de indre, og i den ydre Række, som indtager Kroppens øverste Rand, er der ligeledes 24, af omtrent samme Længde og Tykkelse som de i 2den Række. Tentaklerne ere retraktile, og saavel disse som Mundskiven kunne ganske skjules af Kroppens øverste Rand, naar Dyret kontraherer sig, Tab. X, Fig. 4.

Farven. Skeden er brun; Kroppens Hud er rosenrød med blaalige Længdestriber, men dens øverste Rand er næsten kastaniebrun. Mundskiven er smuk rødbrun; Læberne bleg rosenrøde, Gonidiefurerne blegere. De indre Tentakler ere mørk kastaniebrune; de mellemste ere lysere, og de ydre ere laxerøde; forøvrigt varierer Farven ganske betydeligt hos Individier fra forskellige Lokalteter, fra hvide til røde, ja næsten brune over det Hele.

Ved den mikroskopiske Undersøgelse viser paa Tversnit den omtalte Overhud sig at bestaa kun af Ler, fin Sand og Slim; ingen histologisk Bygning findes i den. Er den fjernet, sees det sædvanlige Ectoderm, bestaaende af lange, cilierende Cylinderceller, encellede Slimkjertler og Nematocyster, Tab. X, Fig. 5 a, 6 a. Indenfor Ectodermet er et temmelig smalt, fibrillært Bindevæv, hvori sees foruden Bindevævslegemer og fine Ernæringskanaler, cirkulære Muskler, som indtage omtrent Midtpartiet af Bindevævs-laget, dog nærmere Ectodermet, Tab. X, Fig. 5 b, 6 b, ja paa enkelte Tversnit ser det ud, som om disse Muskler lægge sig lige hen til Ectodermet. De ligge neppe i Bundter; det synes snarere, som hver Fibrille er isoleret. Paa Længdesnit sees imidlertid, at Fibrillerne ligge tæt til og paa hverandre og synes at anastomosere med hinanden, Tab. X, Fig. 5 b.

Der er 6 Par principale, fuldstændige Septa, hvoraf 2 Par ere Retningsseptæ. Disse ere temmelig iøinefaldende derved, at de ere meget vide, det vil sige, at det intrasep-

as if many acontia after being projected, lose their power of contracting, as they remain pendulous, in the extended condition, along the external surface of the body (Pl. X, fig. 4). The uppermost margin of the body is tentacular.

The oral disc is a little arcuate and richly folded. The folds radiate in flabelliform, from the mouth, and are everywhere richly furnished with cinclides through which acontia are projected. These are present in great abundance on the portion of the disc which in closest proximity surrounds the oral aperture. This is oblong, and has a broad gonidial groove with two small gonidial knobs on each side. The oral labiæ are six-lobate, which gives to the oral aperture the appearance of being surrounded by a wreath (Pl. III, fig. 1, 2).

The tentacles are very long, and are placed in 3 series; in the innermost series there are 12 tentacles and these are the longest, being much longer than the breadth of the oral disc; in the intermediate series there are 24 tentacles, which are much shorter than those of the inner series; and in the outer series, which occupies the uppermost margin of the body, there are likewise 24, of about the same length and thickness as those of the 2nd series. The tentacles are retractile, and both these and the oral disc may be completely concealed by the uppermost margin of the body when the animal contracts itself (Pl. X, fig. 4).

The colour. The sheath is brown; the integument of the body is rosy-red, with bluish longitudinal stripes, but its uppermost margin is almost chestnut-brown; the oral disc is beautiful reddish-brown; the labiæ are pale rose-red with the gonidial grooves paler in colour; the innermost tentacles are dark chestnut-brown, the intermediate are lighter in colour, and the outer ones salmon-red. The colour varies however, quite considerably in individuals from different localities, from white to red, even almost to brown over the whole animal.

Upon microscopical examination of transversal sections, the external integument spoken of, shows itself to consist of clay, fine sand and slime only; no histological structure is found in it. When it is removed the usual ectoderm is found, consisting of long, ciliating cylinder-cells, unicellular mucous-glands and nematocysts (Pl. X, fig. 5 a, 6 a). Inside of the ectoderm, there is a rather narrow, fibrillar connective-tissue in which, besides connective-tissue corpuscles and fine nutritory ducts, circular muscles are also found occupying the mesial portion, nearly, of the layer of connective-tissue, but lying closest to the ectoderm (Pl. X, fig. 5 b, 6 b), indeed in some transversal sections it appears as if these muscles lay themselves close in to the ectoderm. They scarcely lie in fasciculi, but appear rather as if each fibril was isolated. In longitudinal sections it is, however, apparent, that the fibrils lie close to and upon each other, and appear, as it were, to anastomose with each other (Pl. X, fig. 5 b).

There are 6 pairs of principal, perfect septa, of which 2 pairs are directive septa. These are rather prominent, owing to there being very wide, that is to say,

tale Rum er meget vidt; de transverselle Muskler ligge som en fint foldet Lamelle paa den indre Flade af Septumet saaledes, at de vende mod hinanden, imedens de longitudinelle Muskler ere fæstede paa den ydre Flade og vende til det interseptale Rum. De 4 øvrige principale Septapar have Musklerne saaledes ordnede, at de longitudinelle vende mod det intraseptale Rum og danne tykke Buske, der henimod Svælgrøret ere saa fremspringende, at de udfylde Rummet: de transverselle Muskler vende mod det interseptale Rum. De 6 Par fuldstændige Septa ere golde.

I det principale Kammer, som opstaar imellem 2 principale Septapar, er der 3 Par Septa af 2^{den} Orden, hvorved hvert Hovedkammer deles i 4 secundære Kamre, og i ethvert saadant Kammer er der 1 Par Septa af 3^{die} Orden. Af de 3 Par secundære Septa er det midterste længst og naar næsten lige hen til Svælgrøret; de 2 øvrige ere meget kortere, bære Generationsorganer, som ere opfyldte af Æg i forskellige Udviklingsstadier, samt en Mængde Acontier og Mesenterialfilamenter. Musklerne ere temmelig udviklede paa disse secundære Septa; saaledes danne de longitudinelle Muskler, der ligge paa den indre Flade imod det intraseptale Rum, tykke Buske, der næsten ganske udfylde Rummet, imedens de transverselle Muskler ligge paa den modsatte Side og vende mod det interseptale Rum. De 4 Par tertiære Septa ere meget korte, knap halvt saa lange som de secundære, have Musklerne placerede som disse, og bære i rigelig Mængde Kjønsorganer, hvori Æg af alle Størrelser, samt tildels Acontier. Disse korte, tertiære Septapar staa temmelig gabende, idet Musklerne ere lidet udviklede. Parieto-basilarmuskelen er tynd og udbreder sig opad paa den nederste Trediedel af Kropsvæggen og nedad et Stykke udover Fodskiven.

Findested.

- Station 323. Flere Exemplarer, hvoraf kun enkelte havde det hudagtige Overtræk i større eller mindre Udstrækning.
— 326. Mange Exemplarer, hvoraf de fleste vare forsynede med Overtrækket.

Artskarakter.

Fodskiven dels rund, dels dannet efter den Gjenstand, hvortil den er fæstet, med en tynd, ujævn Rand. Kroppen cylinderformet, indkneben paa Midten, indtil 60^{mm} høi, omkring 50^{mm} bred; de nederste 4 Femtedele ere omgivne af et rut, hudet Overtræk (coating), sammensat af Ler, Sand og Slim. Den øverste Femtedel nøgen, glat, rig paa

the intraseptal space is very wide; the transversal muscles lie like a finely folded lamella on the inner surface of the septum, in such manner that they face towards each other, while the longitudinal muscles are adherent to the outer surface, and face the interseptal space. The 4 remaining pairs of principal septa have muscles arranged in such manner, that the longitudinal ones face towards the intraseptal space and form thick frutici, which are, in proximity to the œsophagus, so protuberant, that they fill the space; the transversal muscles face towards the interseptal space. The 6 pairs of perfect septa are sterile.

In the principal chamber which arises between 2 pairs of principal septa, there are 3 pairs of septa of the 2nd order, causing each principal chamber to be divided into 4 secondary chambers, and in each of these chambers there is a pair of septa of the 3rd order. Of the 3 pairs of secondary septa, the intermediate pair is the longest one, and extends almost quite to the œsophagus; the two others are much shorter, and carry reproductive organs which are filled with ova in various stages of development, also a multitude of acontia and mesenterial filaments. The muscles are pretty well developed on these secondary septa; the longitudinal muscles, which lie upon the inner surface facing towards the intraseptal space, form, thus, thick frutici which almost completely fill the space, while the transversal muscles lie on the opposite side and face towards the interseptal space. The 4 pairs of tertiary septa are very short, scarcely half the length of the secondary ones, but they have the muscles placed like them, and they carry in rich abundance reproductive organs, in which are ova of all sizes, and also, to some extent, acontia. Those short pairs of tertiary septa stand rather gapingly apart as the muscles are only little developed. The parieto-basilar muscle is thin, and distributes itself upwards on the lowest third-part of the wall of the body and downwards a little way over the pedal disc.

Habitat.

- Station No. 323. Several specimens, of which only a few had the integumental outer covering, in greater or lesser extent.
— „ 326. Many specimens of which most were furnished with the integumental covering.

Specific characteristics.

The pedal disc is partly round, partly formed according to the object to which it is attached, and has a thin, uneven margin. The body cylindrical, constricted at the middle, measures about 60^{mm} in height and about 50^{mm} in breadth. The lowest four-fifths-part is surrounded by a rough integumental coating, composed of clay, sand,

Cinclides. Den hudede Klædning mangler hyppigt paa ældre Dyr. Hele Kroppens Overflade indenfor det hudede Overtræk er foldet; paa Folderne tætstaaende Cinclides, hvorigjennem Acontier overalt fremspringe. Skiven lidt hvælvet, foldet, rig paa Cinclides og Acontier. Tentaklerne meget lange, i 2—5 forskellige Rækker; almindeligst i 3; i 1ste Række 12, der ere de længste; i 2den og 3die Række 24 i hver. Farven: Det hudede Overtræk brunt. Kroppen laxerød med blaalige Længdestriber; dens øverste Rand næsten kastaniebrun. Mundskiven smuk rødbrun. Læberne bleg kjødrøde, Gonidiegruberne blegere. De indre Tentakler mørk-kastaniebrune, de mellemste lysere, de ydre kjødrøde; forresten variere Farverne ganske betydeligt paa de forskellige Individider.

Verrill har med Spørgsmaalstegn opført den af Koren og mig beskrevne *Phellia abyssicola* som Synonym med hans *Sagartia abyssicola*, og heri har han visselig gjort ret. Ved at undersøge Original Exemplarerne paanyt finder jeg, at de ikke kunne henføres til Slægten *Phellia*, men at de aabenbart ere identiske med de paa Nordhavsexpeditionen fundne og ovenfor under Navnet *Sagartia abyssicola* beskrevne Exemplarer og upaatvivlelig falder sammen med Verrill's under samme Navn beskrevne *Actinie*.

Naar jeg nu har opført Verrill's *Sagartia abyssicola* i Synonymrækken, saa er det fordi, vor Beskrivelse er omtrent 5 Aar ældre end hans.

***Sagartia splendens*, n. sp.**

Tab. IV, Fig. 12. Tab. X, Fig. 10—13.

Fodskiven er meget udvidet og har en temmelig tyk, lappet Rand, Tab. IV, Fig. 12; Tab. X, Fig. 10. Dens Underflade er ujævn og har tildels Formen af de Gjenstande, hvortil den er fæstet; saaledes har den paa de Exemplarer, der ere fæstede paa *Stylaster gemmaceus* mange Forhøjninger og Fordybninger, svarende til Grenene, som den omfatter, imedens den paa det Exemplar, der er fæstet paa en Sten, er temmelig jævn og fint foldet fra Centrum mod Peripherien. En brunlig, chitinagtig Masse er afsat paa Underfladen og tjener til yderligere Befæstning. Denne Chitinmasse er saa fast adhæreret til Fodsaalen, at den kun vanskelig kan skilles fra denne.

Kroppen er fra 20—25^{mm} høi, cylindrisk, med en fast, læderagtig Hud og noget indkneben paa Midten, imedens den udvider sig temmelig meget op imod Mundskiven, Tab. IV, Fig. 12; Tab. X, Fig. 10. Den har en glat, perlemorglindsende Overflade, og dens øverste Rand

Den norske Nordhavsexpedition, D. C. Danielssen: Actinida.

and slime. The uppermost fifth part is exposed, smooth, and rich in cinclides. The integumental coating is generally absent in the older animals. The entire surface of the body, inside the integumental coating, is folded; on the folds there are compactly-situated cinclides, through which acontia everywhere project. The disc is slightly arcuate, folded, and rich in cinclides and acontia. The tentacles very long, in several series — 2—5 series — but most commonly 3 series. The 1st series contains 12 tentacles, which are also the longest ones; the 2nd and 3rd series contain 24 tentacles in each. *The colour.* The integumental coating brown. The body salmon-red colour with bluish longitudinal stripes; its uppermost margin almost chestnut brown. The oral disc beautiful reddish-brown. The labiæ pale flesh-colour, the gonidial grooves paler in colour. The inner tentacles dark chestnut brown; the intermediate ones lighter coloured, and the outer ones flesh-coloured. The colour varies however, quite considerably, in the different individuals.

Verrill has, with a mark of interrogation attached, related the *Phellia abyssicola* described by Koren and myself, as synonymous with his *Sagartia abyssicola*, and in this he has certainly acted correctly. On examining the original specimens afresh, I find that they ought not to have been assigned to the genus *Phellia*, and that they are evidently identical with the specimens found on the Norwegian North-Atlantic Expedition, and now described under the designation *Sagartia abyssicola*; they, indubitably, coincide with Verrill's *Actinia* described under the same name.

My reason for now placing Verrill's *Sagartia Abyssicola* in the synonym-series is, because Koren's and my description is about 5 years earlier in date than his.

***Sagartia splendens*, n. sp.**

Pl. IV, fig. 12. Pl. X, fig. 10—13.

The pedal disc is much dilated, and has a rather thick, lobate margin (Pl. IV, fig. 12. Pl. X, fig. 10). Its under-surface is uneven, and has partly the shape of the object to which it is adherent; it has thus, in those specimens which adhere to *Stylaster gemmaceus*, numerous projections and depressions corresponding to the branches which it embraces, while in the specimens adherent to a stone, the under-surface is pretty even and is finely folded from the centre towards the periphery. A brownish chitinous mass is deposited on the under-surface, and serves still further to secure it. This chitinous mass is so firmly adherent to the pedal sole, that it is only with difficulty that it can be separated from it.

The body measures from 20—25^{mm} in height, is cylindrical, and has a firm coriaceous integument; it is somewhat constricted at the middle, whilst it expands itself considerably, upwards in proximity to the oral disc (Pl. IV, fig. 12. Pl. X, fig. 10). It has a smooth,

er afrundet, jævn og kan trækkes over Mundskiven, som den da skjuler.

Mundskiven er rund, lidt hvælvet og forsynet med fine Folder, der straae ud fra Munden mod Peripherien. Munden er aflang med foldede Læber og to Gonidiegruber, Tab. X, Fig. 10. Tentaklerne ere retraktile, sidde i 3 Rækker, ere temmelig korte, men tykke og forsynede med en fin Aabning i Spidsen. Den første — inderste — Række har 18, som ere de tykkeste og længste; den anden — mellemste — Række, der alternerer med den første, har ligeledes 18, som ere lidt tyndere og kortere, end de i inderste; men den tredje — yderste — Række har 18—20, der staa lige ved Kroppens øverste Rand, Tab. IV, Fig. 12; Tab. X, Fig. 10. Som nysnævnt ere Tentaklerne vel retraktile, men Retraktionen sker ualmindeligt langsomt; som oftest bøies de kun ind mod Mundaabningen, idet Kroppranden trækker sig over Mundskiven og skjuler saavel denne som Tentaklerne, Tab. X, Fig. 10 a.

Farven. Kroppen er bleg rosenrød, men stærkt iriserende; dens øverste Rand er noget mørkere rød. Mundskiven er ligeledes rosenrød, spillende lidt i det Gule. Omkring Munden er en hoirod Ring, hvorfra udstraae hoirode Striber til Tentaklerne. Disse ere hoirode, Tab. IV, Fig. 12.

Hele Legemet er udvendigt beklædt med et Ectoderm, der bestaar af lange, cilierende Cylinderceller med Kjerne og Protoplasmahold, Tab. X, Fig. 12 c. Imellem Cylindercellerne findes en Mængde spredte, encellede Slimkjertler, der ere rigest paa Mundskiven, samt Nematocyster. Disse ere i størst Mængde paa Tentaklerne. Indenfor Ectodermet er et meget bredt, fibrillært Bindevæv, forsynet med Bindevævslegemer med og uden Udløbere, samt fine Ernæringskanaler, Tab. X, Fig. 12 a. Omtrent i Midten af dette Bindevæv sees cirkulære Muskelfibre, der danne Bundter og ligge ligesom i 3 Belter med Bindevæv imellem; Forbindelsen imellem disse 3 Belter synes at være yderst sparsom; men fra det inderste Belte udgaa enkelte Fibre henimod Bindevævet indre Flade, der dækkes af Endothelet, Tab. X, Fig. 12 d. Paa et andet Præparat ere disse 3 Belter smeltede sammen til et, Tab. X, Fig. 12 b. De radiære Muskler ere især udviklede paa Mundskiven, hvor de sees i tætte Bundter, temmelig nær Ectodermet. Paa Tentaklerne ere de longitudinelle Muskler fuldstændig ectodermale.

Der er 8 Par fuldstændige Septa, hvoraf de 6 Par ere principale og golde med 2 Par Retningsseptas, Tab. X, Fig. 11, R, R, og to Par secundære, bærende Acontier. Der er kun liden Forskjel paa disse Septa, som samtlige bære Mesenterialfilamenter; men imedens de antagelig principale Septa synes at have en stærkere Muskulatur og ere forresten nøgne, Tab. X, Fig. 11, 1, iagttages paa de to Par sekundære Septa, Tab. X, Fig. 11, 2, mindre

mother-of-pearl lustrous external surface, and its uppermost margin is rounded, even, and capable of being drawn over the oral disc, which is then concealed by it.

The oral disc is round, a little arcuate, and furnished with fine folds which radiate from the mouth towards the periphery. The mouth is oblong with folded labiæ and 2 gonidial grooves (Pl. X, fig. 10). The tentacles are retractile, placed in 3 series, are rather short, but thick, and are furnished with a minute orifice at the point. The innermost (first) series contains 18 tentacles, these are the thickest and longest ones; the intermediate (second) series has also 18 tentacles which alternate with those of the first series, and are a little thinner and shorter than those of the first series; but the outermost (third) series contains 18—20 tentacles, placed exactly at the uppermost margin of the body (Pl. IV, fig. 12. Pl. X, fig. 10). As just stated, the tentacles are indeed retractile, but their retraction proceeds extremely slowly; most frequently they only involve towards the oral aperture, as the margin of the body draws itself over the oral disc and conceals both it and the tentacles (Pl. X, fig. 10 a).

The colour. The body is pale rose-red but strongly iridescent; its uppermost margin is somewhat darker red. The oral disc is likewise rose-red, shading a little to yellow. Round the mouth there is a bright red annulus from which bright red stripes radiate to the tentacles. The latter are bright red. (Pl. IV, fig. 12).

The entire body is covered, exteriorly, with an ectoderm, consisting of long, ciliating cylinder-cells with nucleus and protoplasmic contents (Pl. X, fig. 12 c). Between the cylinder-cells, a multitude of scattered, unicellular mucous glands are found, which are most abundant on the oral disc, also nematocysts. These are found in greatest abundance on the tentacles. Inside of the ectoderm there is a very broad, fibrillar, connective tissue furnished with connective-tissue corpuscles with and without prolongations, also minute nutritory ducts (Pl. X, fig. 12 a). At about the middle of this connective tissue, circular muscle-fibres are seen, forming fasciculi, and lying as if in 3 belts, with connective-tissue between them; any connection between those 3 belts appears to be extremely slight, but from the innermost belt a few fibres issue towards the inner surface of the connective-tissue which is covered by the endothelium (Pl. X, fig. 12 d). In another prepared specimen those 3 belts appear merged into one (Pl. X, fig. 12 b). The radiary muscles on the oral disc are especially well developed, and are seen lying in compact fasciculi rather close to the ectoderm. On the tentacles, the longitudinal muscles are perfectly ectodermal.

There are 8 pairs of perfect septa, of which 6 pairs are principal ones and sterile, and 2 pairs are directive septa (Pl. X, fig. 11 R. R.); there are also two pairs of secondary septa, carrying acontia. There is not much difference between those septa, as all of them carry mesenterial filaments; but whilst the presumably principal septa appear to have a more powerful musculosity, and are, besides, bare (Pl. X, fig. 11, 1), there are seen on

udviklede Længdemuskler, ligesom de ere forsynede med Acontier og, som det forekom mig, paa et enkelt Septum svagt udviklede Kjønorganer. Som sædvanligt ere Tvermusklerne paa Retningssepta fæstede til den indre Flade og vende mod det intraseptale Rum, imedens Længdemusklerne sidde paa den ydre Flade i det interseptale Rum i Form af meget tynde Buske, der opnaa henimod Svælgrøret den største Tykkelse; paa de øvrige fuldstændige Septa ere Længdemusklerne fæstede til den indre Flade og vende mod hverandre i det intraseptale Rum, som de dog paa langt nær ikke udfylde, — især gjælder dette de to sekundære Septapar, hvilket tyder hen paa, at Længdemusklerne paa disse ere meget tyndere. De to sekundære Septapar ere placerede paa hver Side af det ene Par Retningssepta. Tab. X, Fig. 11, 2, som svarer til Svælgrørets Bugside, og som kjendes paa den brede Svælgrube.

Imellem hvert to Par af de principale Septa er der 3 Par ufuldstændige, tertiære Septa, Tab. X, Fig. 11, 3, der rage et langt Stykke ind i Gastralhulheden uden at naa Svælgrøret, Tab. X, Fig. 11, 5. Disse Septa af tredje Orden bære baade Acontier og Generationsorganer, Tab. X, Fig. 11, 3 a, b; de første i stor Mængde, de sidste liggende nedenfor Acontierne og indeholdende Æg i forskellige Udviklingsstadier. Længdemusklerne ere placerede paa den indre Flade af disse Septa, og Tvermusklerne paa den ydre; samtlige ere noget mindre udviklede end de paa Septa af anden Orden.

Imellem de 3 Par lange, ufuldstændige Septa er der 1 Par smaa Septa af fjerde Orden, Tab. X, Fig. 11, 4. Der er altsaa 7 Septapar i hvert af de interseptale Rum, som de 6 Par fuldstændige, principale Septa danne. Derimod synes der kun at være 3 Septapar i hvert af de interseptale Rum, som dannes imellem det ene Par Retningssepta og det fuldstændige, sekundære Septapar, nemlig 1 Par af tredje Orden, bærende Acontier og Kjønorganer, og 2 Par af fjerde Orden. Ogsaa Septa af fjerde Orden ere forsynede med Længde- og Tvermuskler. Ialt er der 54 Septapar. Parieto-basilarmuskelen er stærk og strækker sig et godt Stykke opover Kropsvæggen, ligesom den udbreder sig over en stor Del af Fodskivens indre Flade.

Findested.

Husøen — Sognefjorden — . Nogle Exemplarer, siddende paa Stylaster gemmaceus. Et Exemplar sad fæstet til en Sten.

the two pairs of secondary septa (Pl. X, fig. 11); two less-developed longitudinal muscles, and these are also furnished with acontia; and, as it appeared to me also, upon a solitary septum, with faintly developed reproductive organs. As usual, the transversal muscles on the directive septa are secured to the inner surface, and face towards the intraseptal space, while the longitudinal muscles are seated on the exterior surface in the interseptal space, in the form of very thin frutici which attain their greatest thickness in proximity to the œsophagus; on the remaining perfect septa, the longitudinal muscles are secured to the inner surface, and face towards each other in the intraseptal space, but they do not nearly fill it; this is especially the case with the two secondary pairs of septa, which would appear to indicate that the longitudinal muscles in them are much thinner. The two secondary pairs of septa are seated on each side of the one pair of directive septa (Pl. X, fig. 11, 2) which corresponds to the ventral side of the œsophagus, and is recognised by the broad gullet-groove.

Between each two pairs of the principal septa, there are 3 pairs of imperfect, tertiary septa (Pl. X, fig. 11, 3) that extend a long way into the gastral cavity without reaching to the œsophagus (Pl. X, fig. 11, 5). These septa of the 3rd order carry, both acontia and reproductive organs (Pl. X, fig. 11, 3 a, b); the first in great abundance, and the last-named seated below the acontia and containing ova in various stages of development. The longitudinal muscles are placed on the inner surface of those septa, and the transversal muscles on the outer surface; all of them are less developed than those on the septa of second order.

Between the 3 pairs of long, imperfect, septa, there is 1 pair of small septa of the fourth order (Pl. X, fig. 11, 4). There are thus 7 pairs of septa in each of the interseptal spaces which the 6 pairs of perfect, principal septa form. On the other hand there appear to be only 3 pairs of septa in each of the interseptal spaces which are formed between the one pair of directive septa and the perfect pairs of secondary septa, viz. one pair of the third order, carrying acontia and reproductive organs, and two pairs of the fourth order. The septa of the fourth order are also furnished with longitudinal and transversal muscles. Altogether there are 54 pairs of septa. The parieto-basilar muscle is strong, and extends itself a good way up the wall of the body, while it, at same time, distributes itself over a large part of the inner surface of the pedal disc.

Habitat.

Husøen. — Sognefjord. — A few specimens, seated on Stylaster gemmaceus. One specimen was adherent to a stone.

Artakarakter.

Fodskiven meget udvidet, med en tyk, lappet Rand. Underfladen ujævn, tildels formet efter Gjenstanden, hvorpaa den sidder, og belagt med en chitinagtig Masse. Kolumnen 20—25^{mm} høi, cylindrisk, noget indkneben paa Midten, med en glat, perlemorglindsende Overflade og en afrundet øverste Rand, der kan trækkes over Mundskiven. Denne er rund, lidt hvælvet med fine Folder udstraalende fra Munden, der er aflang med foldede Læber og to Gonidiefurer. 3 Rækker retraktile, temmelig korte Tentakler med en rund Aabning i Spidsen; 18 i inderste og mellemste Række, 18—20 i yderste Række. Farven: Kroppen bleg rosenrød, men stærkt iriserende; den øverste Rand noget mørkere. Mundskiven rosenrød, spillende i det Gule. Omkring Munden en hoirød Ring, hvorfra udstraale hoirøde Striber til Tentaklerne. Disse hoirøde.

Jeg har henført denne Art til Slægten *Sagartia*, uagtet den har 8 Par fuldstændige Septa; men da de 6 Par ere golde og maa ansees for principale, og forresten hele Organisationen er overensstemmende med det Karakteristiske for Slægten *Sagartia*, har jeg ikke fundet det rigtigt eller nødvendigt at drage den bort fra denne.

***Calliactis Krøyeri*, n. sp.**

Tab. II, Fig. 2. Tab. VIII, Fig. 6, 13, 14.

Fodskiven paa ganske unge Exemplarer er rund, men paa voxne Dyr meget irregulær aflang, omfattende næsten ganske Conchylien af *Fusus Krøyeri*, saa at paa flere Exemplarer kun Aabningen og en liden Del af Spiret er ubedækket, Tab. II, Fig. 2, imedens paa andre ogsaa Spiret er omsluttet, og da er kun Aabningen fri, Tab. VIII, Fig. 13, saa at den iboende *Fusus* kan trække sig frit ud og ind og spasere med stor Lethed omkring, dragende paa Actinien. Fodskivens Rand er temmelig tynd og unduleret, og paa dens Underflade, der er overmaade konkav og har antaget Formen af Conchylien, er afsat en brun, chitinagtig Membran, som binder Foden til denne.

Kroppen er næsten dobbelt saa høi som tyk (omkring 100^{mm}), cylinderformet, men ikke lige tyk overalt. Ved Fodskiven er den smalest, udvider sig paa Midten og bliver buget; længere op aftager den noget i Tykkelse for atter at udvide sig mod Mundskiven, Tab. II, Fig. 2. Under Dyrets Kontraktioner antager Kroppen forresten forskellige Former; men er det i fuld Vigør, antager det altid den før omtalte Urneform, hvorunder det er afbildet. Kolumnens Overflade er glat, forsynet med brede, svagt ophøiede Længdefolder, paa hvilke sees, især paa den

Specific characteristics.

The pedal disc much expanded, has a thick, lobate margin. The under-surface uneven, partly formed according to the object upon which it is seated, and coated with a chitinous mass. The column 20—25^{mm} in height, cylindrical, somewhat constricted at the middle; its surface smooth, with a mother-of-pearl lustre, has a rounded uppermost margin which can be drawn over the oral disc. The oral disc round, somewhat arcuate, has fine folds radiating from the mouth; the latter oblong, with folded labiæ and two grooves. Three series of retractile, rather short tentacles, with a round orifice at the point; 18 tentacles in the innermost and intermediate series, 18—20 tentacles in the outermost series. *The colour.* The body pale rose-red, but strongly iridescent. The uppermost margin somewhat darker. The oral disc rose-red, shading to yellow. Round the mouth a bright-red annulus from which bright-red stripes radiate to the tentacles. The tentacles bright-red.

I have assigned this species to the genus *Sagartia* although it has 8 pairs of perfect septa, but as the 6 pairs are sterile and must be considered to be principal ones, and as the entire organisation, otherwise, accords with that characteristic of the genus *Sagartia*, I have not found it right, or necessary, to withdraw it from that genus.

***Calliactis Krøyeri*, n. sp.**

Pl. II, Fig. 2. Pl. VIII, fig. 6, 13, 14.

The pedal disc is, in young specimens, round, but in adult animals very irregularly oblong, and almost completely embraces the shell of *Fusus Krøyeri* so that, in many specimens, only the aperture and a small part of the spire are left exposed (Pl. II, fig. 2), while in others the spire is also enclosed, and then only the aperture is free (Pl. VIII, fig. 13), thus permitting the resident *Fusus* to freely project and retract itself, and to perambulate with great ease, carrying the actinia with it. The margin of the pedal disc is rather thin and undulating, and on its under-surface, which is exceedingly concave and has assumed the form of the shell, there is deposited a brown chitinous membrane which secures the base to the mollusc.

The body is almost twice as high as it is thick (about 100^{mm}), cylindrical, but not uniformly thick in all parts. It is narrowest at the pedal disc, becomes wider at the middle and bulges out; a little farther up it diminishes somewhat in thickness, and again increases in thickness towards the oral disc (Pl. II, fig. 2). During the animals contractions, the body assumes, however, various forms but, when in full vigour, it always assumes the urn-shape previously mentioned, and in which shape it is illustrated. The surface of the column is smooth, furnished with broad, faintly elevated

nederste Halvdel, uregelmæssigt ordnede Cinclides; dens øverste Rand er fri, ikke meget tyk og lidt unduleret (en svag Parapet); ingen Fossa.

Mundskiven er bredere end Kolumnen, lidt hvælvet, temmelig stærkt foldet og forsynet i sin Peripheri med 3 Rækker Tentakler. Munden er meget fremstaaende, aflang, med 2 brede Gonidiegruber, der hver har 2 smaa Gonidieknuder. Læberne danne 4 tykke Folder paa hver Side af Gonidiegruberne, Tab. II, Fig. 2.

Tentaklerne ere retraktile, korte, tynde og perforerede i Enden, i hver Række 48, som staa alternerende. Tentaklerne i den inderste Række ere de længste og tykkeste, dog knap saa lange som Skivens halve Bredde; i den yderste Række staa de strax indenfor Kolumnens Rand og ere noget kortere.

Kroppens Væg er kjødet, og naar Dyret er udspændt, sees de straagule Mesenteriefilamenter meget tydeligt.

Farven. Kroppen er karmosinrød med lyserøde Længdestriber; Mundskiven ligesom Tentaklerne bleg chamoisfarvet; Folderne paa Mundskiven synes at være lidt blegere, forresten er det noget afhængigt af, hvorvidt denne er helt udfoldet eller ikke. I det Hele taget varierer Farven noget paa de forskellige Individuer, fra Lakfarve til Karmin; selv det samme Individ forandrer Farve fra Lak til Karmin, eftersom det er mere eller mindre udstrakt. Gonidiegruberne ere lidt intensere røde end Læberne.

Naar Dyret er kontraheret, er som oftest baade Mundskiver og Tentakler skjulte; det danner da en Halvkugle, hvis ydre Flade er stærkt rynket baade paatvers og paalangs; paa enkelte Exemplarer er Kontraktionen ikke fuldstændig, og da er der en lille Aabning, hvorigennem enkelte Tentakler stikke frem, samt en Del lange Acontier, Tab. VIII, Fig. 13.

Kroppens ydre Flade har sin sædvanlige ectodermale Beklædning, Tab. VIII, Fig. 6 a, 14 a, indenfor hvilken er et bredt, fibrillært Bindevævslag, hvori sees Bindevævslegemer med deres Kjerne, samt Aabninger for Ernæringskanalerne, Tab. VIII, Fig. 6 b, 14 b. I omtrent Midten af dette Bindevævslag, noget nærmere Ectodermet, sees en Samling af cirkulære Muskler, der danne et bredt Belte, og hvis enkelte Fibriller tildels anastomosere med hverandre, Tab. VIII, Fig. 6 c, 14 c. Paa Tversnit ere disse Anastomoser temmelig tydelige, ligesom mange Fibriller ere saa tykke, at de sandsynligvis bestaa af flere finere saadanne, Tab. VIII, Fig. 6 c; thi paa Længdesnit, hvor Musklerne ere afskaarne paatvers, fremkommer et Billede, der end yderligere synes at antyde dette, Tab. VIII, Fig. 14 c. Musklerne ligge her nemlig ligesom i Slyngninger, og hver Slyngning bestaar af mange Fibriller. Paa enkelte Steder ligge disse mesodermale Cirkulærmuskler temmelig nær Ectodermet, og enkelte strække sig endog

longitudinal folds, on which are observed, especially upon its lowest half, irregularly placed cinclides; its uppermost margin is free, not very thick, and slightly undulating (a faint parapet), without fosse.

The oral disc is broader than the column, a little arcuated, rather strongly folded, and furnished on its periphery with 3 series of tentacles. The mouth is very protuberant, oblong, has 2 broad gonidial grooves, each of which has 2 small gonidial nodules. The labiæ form 4 thick folds on each side of the gonidial grooves (Pl. II, fig. 2).

The tentacles are retractile, short and thin, and are perforated at the extremity; there are 48 tentacles in each series, placed alternately. The tentacles in the innermost series are the longest and thickest, but are not quite so long as the half of the breadth of the disc; the outermost series is placed immediately inside of the margin of the column, and in it the tentacles are somewhat shorter.

The wall of the body is fleshy, and when the animal is expanded the straw-yellow coloured mesenterial filaments are very distinctly seen.

The colour. The body carmine-red, with light-red longitudinal stripes. The oral disc, as also the tentacles, pale buff colour. The folds on the oral disc appear to be somewhat paler, but there colour depends, however, somewhat, upon whether the disc is entirely unfolded or not. Altogether, the colour varies somewhat in the different individuals, from scarlet to carmine colour; even the same individual shifts colour from scarlet to carmine, according as it is more or less extended. The gonidial grooves have a little brighter red colour than the labiæ.

When the animal is contracted, both the oral disc and the tentacles are most frequently concealed. It then forms a hemisphere whose outer surface is strongly wrinkled, both transversally and longitudinally; in a few specimens the contraction is incomplete, and then there is a small orifice through which a few tentacles project, and also a number of long acontia (Pl. VIII, fig. 13).

The exterior surface of the body has the usual ectodermal covering (Pl. VIII, fig. 6 a, 14 a), inside of which there is a broad fibrillar layer of connective-tissue, in which connective-tissue corpuscles with their nuclei are observed, as well as, also, orifices for nutritory ducts (Pl. VIII, fig. 6 b, 14 b). At about the middle of this connective-tissue layer, but somewhat closest to the ectoderm, a collection of circular muscles is observed, which form a broad belt and whose individual fibrils partly anastomose with each other (Pl. VIII, fig. 6 c, 14 c). In transverse sections those anastomoses appear pretty distinctly, whilst, also, many fibrils are so thick, that they, presumably, are formed of several together (Pl. VIII, fig. 6 c); because in longitudinal sections, where the muscles are transected transversally, there is presented a picture which appears still more to substantiate that (Pl. VIII, fig. 14 c). The muscles lie here as if in windings, and each such winding consists of many fibrils. In a few places those mesodermal muscles

ligesom ind i samme, saa det ser ud, som de her ere udgaaede fra Ectodermet.

Der er 6 Par principale, fuldstændige Septa, som ere tykkere og fastere end alle de øvrige; de fæste sig meget stærkt paa Svælgrøret (Œsophagus) og ere golde. Af disse principale Septapar er der 2 Par Retningsseptas, hvoraf det ene Par er noget bredere end det andet, det vil sige, Septa staa længere fra hinanden, hvorved det intraseptale Rum bliver bredere. De indre Flader af Retningsseptas ere beklædte med transverselle Muskler, der altsaa vende mod hverandre, medens de ydre Flader have longitudinelle Muskler, som vende fra hverandre. De øvrige 4 Par Septa adskille sig fra Retningsseptas ved en forskjellig Anordning af Musklerne, idet de longitudinelle Muskler beklæde de indre Flader, vende mod hverandre og vise sig som foldede Blade, der ganske udfylde de intraseptale Rum; de transverselle Muskler sidde paa den ydre Flade, ere ikke saa stærkt udviklede og vende mod det interseptale Rum.

De sekundære Septapar ere 18, fæste sig ikke paa Svælgrøret, men naa næsten hen til samme. De ere paa deres indre Flader beklædte med stærke, longitudinelle Muskler, som vende mod hverandre, imedens de ydre Flader ere forsynede med transverselle Muskler. Disse have Udseende af en foldet Lamel, som er temmelig tyk, imedens de longitudinelle Muskler danne Buske, der for en Del udfylde det intraseptale Rum af de sekundære Septa. Disse bære Mesenterialfilamenter og muligens Acontier, men ere forresten golde. De fleste Acontier fandtes paa de Exemplarer, hvor Svælgrøret var noget udkrænget, og udfyldte Mundaabningen; i Kamrene saaes kun enkelte.

De tertiære Septa udgjøre 24 Par; de ere korte, neppe halvt saa lange som de sekundære og bære Generationsorganerne, hvori sees en Mængde forskjelligt udviklede Æg. Paa deres indre Flade sees de transverselle Muskler, som en tynd, foldet Lamel, hvorfor de intraseptale Rum her ere temmelig vide, Tab. VIII, Fig. 6 d; den ydre Flade er beklædt med de longitudinelle Muskler, som ere vel udviklede, Tab. VIII, Fig. 6 e. Kjønne synses at være adskilte; idetmindste har jeg ikke fundet Testikler der, hvor jeg har fundet Ovarier.

Findested.

Station 370. 3 Exemplarer, der alle sad paa Fusus Krøyeri, og hvoraf 1 var særdeles stort.

Station 374 ligeledes 3 Exemplarer, som ogsaa sad paa samme Mollusk's Conchylie, og hvoraf 1 havde samme Størrelse som det største paa Stationen 370. Samtlige Mollusker vare levende og spadserede nok saa hurtigt omkring i Observationskarret, dragende paa Actinien,

lie rather close to the ectoderm, and some even, extend themselves as if into it, so that it almost appears here as if they issued from the ectoderm.

There are 6 pairs of principal, perfect septa, which are thicker and firmer than all the rest; they attach themselves very firmly to the œsophagus and are sterile. Of these pairs of principal septa, 2 pairs are directive septa, of which the one pair is somewhat broader than the other; that is to say, each septum stands farther apart from the other, so that the intraseptal space is broader. The inner surfaces of the directive-septa are clad with transversal muscles, which consequently face towards each other, whilst the outer surfaces have longitudinal muscles and face from each other. The remaining 4 pairs of septa are distinguished from the directive septa by a different arrangement of the muscles; thus the longitudinal muscles clothe the inner surfaces, face towards each other, and appear as folded laminae which quite fill the intraseptal spaces; the transversal muscles are placed on the exterior surface, are not so strongly developed, and face towards the interseptal space.

The secondary pairs of septa are 18 in number, and do not secure themselves to the œsophagus but reach almost to it. On their inner surfaces, they are clad with strong longitudinal muscles which face towards each other, while the outer surfaces are furnished with transversal muscles. These have the appearance of a folded lamella which is rather thick, while the longitudinal muscles form frutici that to a certain extent fill the intraseptal spaces of the secondary septa. These carry mesenterial filaments, and possibly also acontia, but are sterile. Most of the acontia were found on those specimens where the œsophagus was somewhat everted and filled the oral aperture; in the chambers only few were seen.

The tertiary septa consist of 24 pairs; they are short, scarcely half the length of the secondary septa, and carry the reproductive organs, in which a multitude of variously developed ova were observed. On their inner surfaces, the transversal muscles are seen like a thin folded lamella, for which reason the intraseptal spaces are, here, rather wide (Pl. VIII, fig. 6 d). The exterior surface is clad with the longitudinal muscles, which are well developed (Pl. VIII, fig. 6 e). The sexes seem to be separated; at all events, I have not observed testicles where I found ovaries.

Habitat.

Station No. 370. Three specimens; all of which were seated upon Fusus Krøyeri, and one of which was particularly large.

Station No. 374. Also three specimens here; seated on the same mollusk's shell, and one of them was of the same size as the largest one from station No. 370; all the molluscs were alive, and perambulated quite actively about the glass vessel, hauling the actinia along with them;

der ikke lod sig genere, men syntes at befinde sig ret vel ved sine Kjøreture, idet den udfoldede baade Krop og Tentakler i fuld Vigor, saa Afbildningen foregik uden synderlige Hindringer.

Artskarakter.

Fodskiven omfatter Størstedelen af Conchylien af *Fusus Krøyeri*, har en tynd, uregelmæssig og lidt undulerende Rand. Paa Fodskivens Underflade afsondres en chitinagtig Membran, der binder Foden til Conchylien. Kroppen urneformet, næsten dobbelt saa høi som tyk og smalest strax ovenfor Fodskiven; dens Overflade glat med brede, lidt ophoiede Længdefolder, hvor der, især paa den nederste Halvdel, sees Cinclides, uregelmæssigt ordnede. Mundskiven bredere end Kolumnen, lidt hvælvet og foldet. Munden fremstaaende, ottelæbet, aflang, med 2 brede Gonidiegruber, og i hver af dem 2 smaa Gonidieknuder. Tentaklerne retraktile, korte, tynde og perforerede i Spidsen; de staa i 3 alternerende Rækker, 48 i hver Række. Kroppens Væg halv gjennemsigtig, saa Mesenterialfilamenterne sees. Farven: Kroppen karmosinrød med lyserøde Længdestriber. Mundskiven, ligesom Tentaklerne, bleg chamois. Folderne paa Mundskiven kanske lidt blegere. Farven varierer forresten noget paa de forskjellige Individuer fra Lak til Karmin. Gonidiegruberne lidt intensere røde end Mundlæberne.

Familie Bunodidæ, Gosse.

Bunodes abyssorum, n. sp.

Tab. III, Fig. 3. Tab. X, Fig. 8, 9.

Fodskiven rund, noget bredere end Kolumnen, med en temmelig tyk, svagt undulerende Rand. Underfladen er rig paa concentriske, rynkede Ringe, som aftage mod Centrum, hvor der findes en traktformig Fordybning, i hvis Bund er en rund Aabning, der korresponderer med Gastralhulheden.

Kroppen er valseformig, aftagende noget i Tykkelse ned mod Fodskiven. Den er i udstrakt Tilstand omtrent 250^{mm} høi og 200^{mm} i Omkreds; naar den er sammentrukket, er den 150^{mm} høi og 230^{mm} i Omkreds. Kroppens udvendige Flade er forsynet med Længdefolder, paa hvilke iagttages temmelig regelmæssige Rækker Knuder, lige fra Mundskiven til Foden, Tab. III, Fig. 3. Disse Knuder staa tættest og ere stærkest fremtrædende paa den øverste Del af Kroppen, men blive størst paa Midten, imedens de

the latter did not seem at all disturbed, but appeared to perfectly well enjoy the ride, as it unfolded both body and tentacles in full vigour, enabling the illustration to be effected without particular difficulty.

Specific characteristics.

The pedal disc embraces the greater part of the shell of *Fusus Krøyeri*, has a thin, irregular, and slightly undulating margin. On the under-surface of the pedal disc, there is deposited a chitinous membrane which secures the base to the shell. The body is urn-shaped, almost twice as high as it is thick, and it is narrowest immediately above the pedal disc. Its external surface is smooth, with broad, slightly elevated longitudinal folds, upon which, especially on the lowest half, cinclides are observed, arranged irregularly. The oral disc is broader than the column, slightly arcuated and folded. The mouth protuberant, octo-labiate, oblong, with 2 gonidial grooves, having in each of them 2 small gonidial nodules. The tentacles retractile, short, thin, and perforated at the point; they are placed in 3 alternating series, 48 in each series. The wall of the body semi-transparent, so that the mesenterial filaments can be seen. *The colour.* The body carmine-red with light-red longitudinal stripes. The oral disc, as also the tentacles, pale buff colour. The folds on the oral disc are, perhaps, a little fainter in colour. The colour varies, however, somewhat in the different individuals, from scarlet to carmine. The gonidial grooves are a little brighter red than the oral labiæ.

Family Bunodidæ, Gosse.

Bunodes abyssorum, n. sp.

Pl. III, fig. 3. Pl. X, fig. 8, 9.

The pedal disc round, somewhat broader than the column, has a rather thick, faintly undulating margin. The under-surface is rich in concentric, shrunken annuli, which diminish towards the centre, where there is an infundibuliform depression, in whose base a round orifice appears, communicating with the gastric cavity.

The body is cylindrical, diminishing somewhat in thickness down towards the pedal disc. In extended condition, it measures about 250^{mm} in height, and 200^{mm} in circumference; when it is contracted it measures 150^{mm} in height, and 230^{mm} in circumference. The exterior surface of the body is furnished with longitudinal folds upon which rather regular series of nodules are observed, extending right from the oral disc to the base (Pl. III, fig. 3). These nodules are most compactly placed, and

aftage betydeligt mod Fodskiven, paa hvis Rand de dog endnu tildels kunne iagttages. Knuderne ere i sin store Almindelighed ganske glatte med hvælvet Overflade; kun paa enkelte sees en Fordybning, uden dog at være gjen-nemboret. Ved Siden af Knuderne sees hist og her enkelt-staaende Sugevorter, der under Dyrets Kontraktion saagodt-som ganske skjules af de overhvælvende Knuder. Kroppens øverste Rand har et foldet Udseende som Følge af de paa den siddende Knuder og er lidt udkrænget.

Mundskiven er kun lidet hvælvet, foldet, og i dens Centrum sidder den aflange Mund med tykke, foldede Læber og to brede Gonidiegruber. I Mundaabningen er en Del Acontier udkastede. I Mundskivens Peripheri er der 4 Rækker Tentakler, hvoraf den yderste Række har omkring 70, som ere baade kortere og tyndere end de i den inderste Række og staa lige indenfor Kropsranden. Tentaklerne ere i det Hele taget tykke, konisk tilspidsede, ikke meget retraktile, og have paa deres Ende en rund Aabning, omgivet af en Sphincter. Naar Dyret er i fuld Vigør og Tentaklerne udspændte, ser man ofte en fin Vandstraale sprogte ud igjennem Aabningen, og da der er henimod 300 Tentakler, er det et nok saa smukt Vandspring, som derved fremkommer. Irriteres ganske svagt Mundaabningen, sættes Vandspringet let i Spil. I Dyrets døende Tilstand udstødes af Tentakelaabningerne lange, fine Slimtraade.

Farven. Kroppen er hvid, perlemorglindsende, spillede svagt dels i det Røde, dels i det Blaalige. Tentaklerne ere havannabrune. Mundskiven har Kroppens Farve, kanske lidt mørkere, og fra Munden udgaa fine, brune Striber henimod Tentaklerne. Mundlæberne og Svælget ere mørk kastaniebrune.

Indenfor det sædvanlige Ectoderm, Tab. X, Fig. 8 a, 9 a, er paa Kroppen et meget bredt, fibrillært Bindevævs-lag, hvori sees en Mængde yderst smaa Bindevævslegemer og yderst fine Saftkanaler, Tab. X, Fig. 8 b, 9 b. Lige ved den indre Flade sees temmelig stærkt udviklede, endodermale Cirkulærmuskler, imedens hele den øvrige Del af Bindevævet er uden Muskler. Disse cirkulære Muskler, Tab. X, Fig. 9 c, danne temmelig regelmæssige Folder, der fremtræde paa Længdesnit som smukke Guirlander, Tab. X, Fig. 8 c. Paa Tversnit ligge de bølgeformigt i Bindevævet, Tab. X, Fig. 9 c.

Der er 6 principale Par Septa, som ere fuldstændige, forsaavidt de fæste sig paa Svælgrøret. Af disse Septapar er der to Par udprægede Retningsseptas, paa hvis indre Flader — de der vende mod hinanden — sees transverselle Muskler, som danne en meget tynd, foldet Membran, imedens deres ydre Flade er beklædt med buskformede, longitudinelle Muskler; paa de øvrige 4 Par Septa ere

are most protuberant upon the uppermost part of the body, but are largest at the middle, while they diminish considerably towards the pedal disc on whose margin, however, they can still, to some extent, be observed. The nodules are, for the most part, quite smooth with arcuate surface, and only in a few of them is a depression visible, without, however, being perforated. Alongside the nodules there are here and there seen suckers, which, during the contractions of the animal, are almost entirely concealed by the overwhelming mass of nodules. The uppermost margin of the body has a folded appearance owing to the nodules seated on it, and is slightly evolved.

The oral disc is only slightly arcuate, folded, and in its centre the oblong mouth is placed; this has thick folded labiæ and two broad gonidial grooves. In the oral aperture a number of acontia are thrown out. In the periphery of the oral disc there are 4 series of tentacles, of which the outermost series contains about 70, which are both shorter and thinner than those of the innermost series, and are placed just inside of the margin of the body. The tentacles are, upon the whole, thick, and are conically acuminate and not very retractile; they have on their extremities a round orifice surrounded by a sphincter. When the animal is in full vigour and the tentacles extended, a fine water-jet is frequently seen to be squirted out through the orifice, and as there are about 300 tentacles, there is thus produced quite a beautiful fountain. When the oral aperture is gently irritated the fountain is easily set a-going. When the animal is in moribund condition, long fine mucous threads are projected from the tentacular orifices.

The colour. The body is white with a mother-of-pearl lustre, shading faintly, partly to red partly to bluish. The tentacles are Havana-brown. The oral disc has the same colour as the body, perhaps slightly darker; and from the mouth, fine brown stripes issue towards the tentacles. The oral labiæ and the œsophagus are dark chestnut-brown.

Inside of the usual ectoderm (Pl. X, fig. 8 a, 9 a) there is, upon the body, a very broad, fibrillar layer of connective-tissue, in which a multitude of extremely small connective-tissue corpuscles are seen, and extremely slender nutritory ducts. Just at the inner surface, rather strongly developed, endodermal, circular muscles are observed, while the entire remaining part of the connective-tissue is devoid of muscles. These circular muscles (Pl. X, fig. 9 c) form rather regular folds, which appear, in longitudinal sections, as beautiful garlands (Pl. X, fig. 8 c). In transversal sections they appear in wavy form, lying in the connective-tissue (Pl. X, fig. 9 c).

There are 6 principal pairs of septa, which are perfect in so far that they attach themselves to the œsophagus. Of these pairs of septa, there are two pairs of distinguished directive septa upon whose inner surfaces, which face towards each other, transversal muscles are seen forming a very thin folded membrane, whilst the outer surface is clad with fruticous longitudinal muscles; on the remaining

Musklerne placerede ganske omvendt. De principale Septa ere golde og kjendes fra de øvrige derved, at de ere stærkere udprægede ved deres noget tykkere Bindevævs-membran.

De sekundære Septa ere ligeledes 6 Par, fuldstændige og golde; paa deres indre Flade ligge de longitudinelle Muskler, altsaa i de intraseptale Rum, og paa deres ydre Flade de transverselle Muskler, som vende mod de interseptale Rum. Imellem hvert 2 Par fuldstændige Septa er der 3 Par ufuldstændige, hvoraf det midterste (tertiære) er det længste, naar næsten hen til Svælgørret og bærer Mesenterialfilamenter og Acontier. De to andre Par ere meget kortere og bære Generationsorganerne, som ere saa stærkt udfyldte med Æg i forskellige Udviklingsstadier, at de ganske lukke Kamrene. Paa disse kvaternære Septa ere Musklerne ikke meget udviklede, hvilket derimod er Tilfældet paa de terciære, hvor de longitudinelle Muskler ligge som tykke Buske paa den indre Flade, medens de transverselle danne en foldet Membran paa den ydre.

Findested.

Station 2. Et Exemplar.

— 261. To Exemplarer.

Hertwig har henført Slægten *Bunodes* til Sagartidernes Familie, idet han nemlig har beskrevet en Actinie under Navnet: *Bunodes minuta*, funden paa Challenger-Expeditionen;¹ men han sætter rigtignok et Spørgsmaalstegn foran, hvorvidt den virkelig kan henføres dertil; thi ifølge Gosse skal Slægten *Bunodes* ikke have Acontier, omendskjønt han siger, at han engang har fundet saadanne hos *Bunodes coronata*. Hertwig mener, at Acontierne kunne være i sin store Almindelighed overseet hos Slægten *Bunodes*; men skulde den Mening være feilagtig, anser han det nødvendigt at danne en ny Slægt saavel for *Bunodes minuta* som for *Bunodes coronata*.

Den af mig ovenfor beskrevne *Bunodes abyssorum* har ikke alene Acontier, men dens cirkulære Muskler ere endodermale, ligesom den har 12 fuldstændige Septapar; den kan saaledes ifølge Hertwigs Systematik ikke henføres til Sagartiderne, hvorfor det forekommer mig rettest at beholde Familien *Bunodidæ*, Gosse, og lade den indtil Videre tilhøre denne, da den jo i sit Ydre frembyder adskillige Karakterer, der af Gosse ere opstillede som væsentlige baade for Familien og Slægten.

Artskarakter.

Fodskiven rund; paa dens rynkede Underflade en traktformig Fordybning, i hvis Bund en næsten rund Aab-

¹ Voyage of H. M. S. Challenger. Zoologi. Vol. VI. Report on the Actinaria dredged by H. M. S. Challenger, by Professor Richard Hertwig, pag. 84.

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

4 pairs of septa the muscles are placed quite in reverse manner. The principal septa are sterile, and are distinguished from the others by being more prominent, from their somewhat thicker connective-tissue membrane.

The secondary septa consist, likewise, of 6 pairs of perfect septa, and are sterile; on their inner surface lie the longitudinal muscles — consequently in the intraseptal spaces — and on their outer surface lie the transversal muscles facing towards the interseptal spaces. Between each 2 pairs of perfect septa there are 3 pairs of imperfect ones, of which the intermediate pair (tertiary) is the longest, reaches almost to the œsophagus, and carries mesenterial filaments and acontia. The 2 other pairs are much shorter and carry the reproductive organs, which are so perfectly filled with ova in various stages of development that they quite close the chambers. On these quaternary septa the muscles are not much developed, which is the contrary of the case with those of the tertiary septa, where the longitudinal muscles lie like thick frutici on the inner surface, whilst the transversal muscles form a folded membrane on the outer surface.

Habitat.

Station No. 2. One specimen.

— „ 261. Two specimens.

Hertwig has relegated the genus *Bunodidæ* to the family of the *Sagartidæ*, and has, in particular, described an Actinia, under the designation *Bunodes minuta*, found on the „Challenger“-Expedition¹, but he, it is true, prefixes a mark of interrogation as to whether it really can be relegated to it or not, because, according to Gosse, the genus *Bunodides* has no acontia, although he states that on one occasion he found them in *Bunodes coronata*. Hertwig thinks that the acontia may, in the generality of cases, have been overlooked in the genus *Bunodes*, but should that be a mistaken opinion he considers it necessary to form a new genus, both for *Bunodes minuta* as well as for *Bunodes coronata*.

The *Bunodes abyssorum* described by me, above, not only has acontia, but its circular muscles are also endodermal, whilst, also, it has 12 pairs of perfect septa: it can therefore, according to Hertwig's System, not be relegated to the *Sagartidæ*, and it, consequently, appeared to me most correct to retain the family *Bunodidæ*, Gosse, and permit it, for the present, to belong to that family, as in its externals it presents several characteristics which are stated by Gosse to be essential for the family and genus.

Specific characteristics.

The pedal disc round; on its wrinkled under-surface an infundibuliform depression, in whose vortex there is

¹ Voyage of H. M. S. „Challenger“. Zoology. Vol. VI. Report on the Actinaria dredged by H. M. S. „Challenger“. by Professor Richard Hertwig, pag. 84.

ning. Kroppen valseformig, indtil 250^{mm} høi, 200^{mm} i Omkreds; dens ydre Flade forsynet med Længdefolder, paa hvilke regelmæssige Rækker tætstaaende Knuder. Disse ere glatte, stærkt fremtrædende med hvælvet Overflade, hvori tildels sees en liden Fordybning. Ved Siden af Knuderne iagttages hist og her Sugevorter, som skjules under Kontraktionerne. Kroppens øverste Rand har et foldet Udseende. Mundskiven lidt hvælvet og foldet. Munden aflang med tykke, foldede Læber og 2 brede Gonidiegruber. Tentaklerne ikke fuldstændig retraktile, tykke, konisk tilspidsede, med en tydelig Aabning paa Enderne, staa i 4 Rækker, hvoraf den yderste har omkring 70. Farven: Kolumnen hvid, perlemorglindsende, spillende lidt i det Røde, lidt i det Blaalige. Tentaklerne havanna-brune. Mundskiven har Kroppens Farve, og fra Munden til Tentaklerne løbe fine, brune Striber. Mundlæberne og Svælget mørk kastaniebrune.

Actinauge (Verrill) nodosa, Fabr.

Tab. III, Fig. 4.

Actinia nodosa, Otto Fabricius, *Fauna Grønlandica* 1780.

Urticina nodosa, Verrill. *Americ. Journ. Scien.* Vol. VI. 1873—1874. Pag. 413. Pl. VII, Fig. 7. 1883—1885, Pag. 50. Pl. VI. Fig. 6, 7, 8, 8 a.

Actinauge nodosa (Fabr.) Verrill. *Bulletin of the Museum of comparative Zoology, Cambridge*, Vol. XI, Pag. 50.

Denne af O. Fabricius først beskrevne, meget distinkte Art, som forekommende temmelig hyppig ved Grønlands Vestkyst, er ifølge Verrill overordentlig almindelig som Dybvandsform langs de nordamerikanske Kyster lige til Grand Banks. Den varierer adskilligt i Udseende, hvorfor han har opstillet 2 Varieteter, nemlig: Variet. *coronata* og *tuberculosa*. Denne sidste er endog efter Verrill saa meget afvigende fra den typiske Form, at han er tilbøielig til at anse den for en egen Art.

Verrill har dannet en ny Slægt for Fabricius's Art, hvilken han har kaldet *Actinauge*, men som han tidligere havde henført til Slægten *Urticina*. Han karakteriserer Slægten saaledes: „Large actinians, with the tentacles and upper part of the body capable of involution. Integument of body of two kinds; that of the lower part is firm, thick, and more or less coriaceous or parchment-like, with persistent, solid warts or tubercles, usually in vertical rows, and sometimes partially covered with a thin, chitinous epidermal coating; that of the upper part of the body forms a marginal, brighter coloured band, below the tentacles, where it is soft and lubricous, secreting mucous abundantly, and rising into longitudinal ridges, crests, or oblong tubercles, which run to and unite with the bases

an almost round aperture. The body cylindric, measures up to 250^{mm} in height and 200^{mm} in circumference; its exterior surface furnished with longitudinal folds, upon which are regular series of compactly placed nodules. These are smooth, strongly prominent, with arcuate surface in which a small orifice is sometimes observed. At the sides of the nodules suckers are here and there observed, which are concealed during the contractions. The uppermost margin of the body has a folded appearance. The oral disc is slightly arcuate and folded. The mouth oblong, with thick folded labiæ and 2 broad gonidial grooves. The tentacles not perfectly retractile, thick, conically acuminate, have a distinct orifice at the extremities, and are placed in 4 series, of which the outermost contains about 70 tentacles. *The colour.* The column white, with a mother-of-pearl lustre, shading a little to red and a little to bluish. The tentacles chestnut-brown. The oral disc has the same colour as the body, and from the mouth to the tentacles fine brown stripes issue. The oral labiæ and œsophagus dark chestnut-brown.

Actinauge (Verrill) nodosa, Fabr.

Pl. III, fig. 4.

Actinia nodosa, Otto Fabricius, *Fauna Grønlandica* 1780.

Urticina nodosa, Verrill. *Americ. Journ. Scien.* Vol. VI. 1873—1874. Pag. 413. Pl. VII, fig. 7. 1883—1885. Pl. VI, fig. 6, 7, 8, 8 a.

Actinauge nodosa (Fabr.) Verrill. *Bulletin of the Museum of comparative Zoology, Cambridge*. Vol. XI, Pag. 50.

This very distinguished species, first described by O. Fabricius as appearing very abundantly on the west coast of Greenland, is, according to Verrill, exceedingly common as a deep-water form along the North American coast as far as Grand Banks. It varies considerably in appearance, and he has therefore established two varieties viz. Variet. *coronata* and *tuberculosa*. The last-named is even, according to Verrill, so distinguished from the typical form, that he is disposed to consider it as a separate species.

Verrill has formed a new genus for Fabricius's species, which he has designated *Actinauge*, but which, previously, he had related to the genus *Urticina*. He characterizes the genus thus: „Large actinians, with the tentacles and upper part of the body capable of involution. Integument of body of two kinds, that of the lower part is firm, thick and more or less coriaceous, or parchment-like, with persistent, solid warts or tubercles, usually in vertical rows, and sometimes partially covered with a thin, chitinous epidermal coating; that of the upper part of the body forms a marginal brighter-coloured band, below the tentacles, where it is soft and lubricous, secreting mucous abundantly, and rising into longitudinal ridges, crests, or oblong tubercles, which run to and unite with the bases

of all the tentacles. The basal disc may be broad and flat, adherent, or it may be bulbous, clasping mud, or it may ensheathe the branches of *Gorgoniæ* &c. Tentacles long and large, contractile. Legis with large folds and gonidial grooves."

Det tør hælde, at Verrill ikke har havt levende Exemplarer, der har været i fuld Vigør, til sine Undersøgelser; thi den Forskjel, han beskriver imellem den øverste og nederste Del af Kroppen, fremkom først paa de Exemplarer, jeg har undersøgt, naar Dyrene vare begyndte at trække sig sammen, og især efter at de vare opbevarede i Alcohol. Paa hele Kroppens Overflade var der stærk Slimafsondring, og Huden var ikke tykkere og ikke fastere paa den nederste, end paa den øverste Del. Paa et Exemplar vare Vorterne overalt lige store. Nu kunne disse Forhold variere meget efter de Lokaliteter, paa hvilke de leve.

Til de Karaktermærker, Verrill har angivet for Slægten, skal jeg ifølge mine Observationer tilføie Følgende: Imellem de store Knuder sees en stor Mængde Sugevorter, samt hist og her Cinclides, hvorigjennem lange Acontier. 6 Par principale, fuldstændige, gølge Septa. Cirkulære Muskler endodermale.

Idet jeg henviser til Verrill's Beskrivelse over *Actinauge nodosa* og hans to Varieteter, skal jeg supplere den noget.

Fodskiven er bred, udbredt næsten skiveformigt over Stenen, hvortil den er fæstet, med en temmelig tynd og meget unduleret Rand. Kolumnen høj, søileformig, cylindrisk; dens Overflade besat med store, fremragende Knuder, som staa i uregelmæssige Længderækker, og imellem dem sees en stor Mængde smaa Sugevorter, hvortil er hæftet Ler og andre fremmede Legemer, samt hist og her Cinclides, hvorigjennem lange Acontier træde ud; dens øverste Rand er fri, noget afrundet.

Mundskiven, som ikke er synderlig bredere end Kolumnen, er plan, foldet og forsynet med 3 Rækker Tentakler, 24 i hver. Den inderste Række har de tykkeste og længste, den mellemste Rækkes Tentakler ere noget tyndere, de i den yderste Række sidde strax nedenfor Kroppens fri Rand og have samme Størrelse som Mellemrækkens. Munden er aflang, foldet, med 2 temmelig brede Gonidiegruber.

Farven. Kroppen er brungul, spillende i det Violette, men den havde, idet Dyret kom i Skraben sammen med Bundens Ler, et brunt, membranøst Overtræk, hvorigjennem de store, hvide Vorter stak frem. Om dette Overtræk er en virkelig Overhud, eller det blot var en afsondret, seig Slim, blandet med Ler, var vanskeligt at afgjøre; imidlertid antager jeg det sidste for at være det rette Forhold; thi efterat Dyrene havde levet nogle Dage i rent Søvand, skilte de sig ganske med det nævnte Overtræk, og da havde Kroppen den paa Tegningen angivne Farve. Tentaklerne ere i den inderste Række brunrøde, i den mellemste Række ere de blegere og i den yderste Række bleg hvidrøde.

of all the tentacles. The basal disc may be broad and flat, adherent; or it may be bulbous; clasping mud, or it may ensheathe the branches of *Gorgoniæ* &c. Tentacles long and large, contractile. Legis with large folds and gonidial grooves."

It may perhaps have been, that Verrill has not had living specimens that have been in full activity for his investigations, as the difference which he describes as existent between the uppermost and lowermost parts of the body, appeared in the specimens which I have investigated, first after the animal had begun to draw itself together, and especially after preservation in alcohol. On the entire external surface of the body there was a strong mucous deposit, and the integument was neither thicker, nor firmer, on the lowermost part than on the uppermost part. In one specimen the warts were everywhere uniform in size. But those relations may vary much according to the localities in which the animals exist.

To the characteristics Verrill has supplied for the genus, I shall, as the result of my investigations, add the following: Between the large nodules a great multitude of suckers are seen, also cinclides here and there, through which long acontia project; 6 pairs of principal, perfect, sterile septa, and circular muscles endodermal.

Referring to Verrill's description of *Actinauge nodosa* and his two varieties, I shall add a little to it.

The basal disc is broad, distributed almost discoidally over the stone to which it is adherent, and it has a rather thin and somewhat indented margin. The column high, pillar-like, cylindrical; its external surface covered with large protruding nodules, placed in irregular longitudinal series, and between these a great multitude of small suckers are seen, to which clay and other foreign bodies are adherent. Cinclides are also here and there observed, through which long acontia protrude; the uppermost margin is free, and somewhat rounded.

The oral disc, which is not much broader than the column, is plane, folded, and furnished with 3 series of tentacles, 24 in each series. The innermost series contains the thickest and longest tentacles. The tentacles of the intermediate series are somewhat thinner; those in the outermost series are seated immediately inside of the free margin of the body, and are of the same size as those of the intermediate series. The mouth is oblong, folded, and has 2 rather broad gonidial grooves.

The colour. The body is brown-yellow, shading to violet, but it had, as the animal appeared in the dredge together with the clay of the bottom, a brown, membranous coating through which the large white nodules protruded. Whether this coating is a real integument, or only a deposited viscid mucous mixed with clay, was difficult to decide, but I believe, however, that the last named is the true relation, because after the animal had lived for a few days in clean sea-water it completely threw off the coating spoken of, and then the body had the colour indicated in the illustration. The tentacles of the innermost series are brown-red; in the intermediate series they

Omkring Munden er en bleg, gulhvid, smal Ring, hvorfra udgaa blege Straaler til den indre Tentakelrække, Tab. III, Fig. 4.

Hele Legemet er udvendigt beklædt med et Ectoderm, bestaaende af lange, cilierende Cylinderceller, hvorimellem findes en Mængde encellede Slimkjertler og Nematocyster. Indenfor Ectodermet er et tyndt, fibrillært Bindevævslag, paa hvis indre Flade sees cirkulære Muskler, der danne fine Bundter, indesluttede i særskilte Bindevævsrum. Bindevævet er forresten rigt paa Bindevævslegemer med deres Kjerne samt fine Saftkanaler.

Der er 6 Par principale, fuldstændige Septa, hvoraf 2 Par ere Retningsseptas, der følge Gonidiegrubernes Retning og ere forsynede med saavel transverselle som longitudinelle Muskler; de første beklæde som en Lamel de indre Flader, det vil sige dem, der vende mod hinanden, de sidste derimod de ydre Flader, hvor de ligeledes udbrede sig membranagtigt. Paa de øvrige 4 Septapar ere Muskellagene placerede omvendt, saaledes nemlig, at de longitudinelle Muskler beklæde de indre Flader, som vende mod de intraseptale Rum, og de transverselle de ydre. Ihvorvel disse Muskellag ere temmelig tydelige, indtage de dog ikke nogen Tykkelse. Disse 6 Par Septa ere golde, de staa langt fra hverandre, baade hvert Par indbyrdes og det ene Par i Forhold til det andet. Derfor ere ogsaa saavel de intraseptale som interseptale Rum (Kamre) meget vide, især gjælder dette de sidste.

I ethvert af de interseptale Kamre er der 3 Par ufuldstændige Septa, hvoraf det midterste Par er det længste, men selv dette rager kun lidt over en Trediedel ind i Hovedkammeret, imedens de to andre ere endnu kortere. Hovedkamrene, det vil sige de 6 interseptale Rum, som fremkomme ved de 6 Par principale Septa, ere derfor ualmindelig rummelige, ja rummeligere end jeg hidtil har observeret hos nogen anden Actinie. Det midterste Septapar har sine longitudinelle Muskler paa den indre Flade; de vende altsaa mod hverandre, imedens de transverselle Muskler ligge paa de ydre Flader; dette Septapar af 2den Orden er ligeledes golde, men bærer Mesenterialfilamenter og Acontier. De øvrige 2 kortere Par synes at have Muskellaget modsat, idet de longitudinelle Muskelfibre beklæde den ydre og de transverselle den indre Flade, saaledes som Tilfældet er med de to Retningsseptas. Disse 2 korte Septapar bære Generationsorganerne, hvori sees Æg i forskellige Udviklingsstadier. Imellem hvert 2 af samtlige Septapar iagttages 2 yderst rudimentære Septa, der vise sig som smale, listeformige Fremspring, som strække sig fra Fod- til Mundskiven og ere beklædte med Længdemuskler paa den ene og Tvermuskler paa den anden Side. De 6 Par principale, fuldstændige Septa have, hvor de inserere sig paa Fodskiven, en meget stor,

are paler, and in the outermost series pale whitish-red. Round the mouth there is a pale, yellow-white, narrow annulus, from which pale rays issue to the inner tentacular series (Pl. III, fig. 4).

The entire body is, exteriorly, clad with an ectoderm consisting of long, ciliating cylinder-cells, between which a multitude of unicellular mucous glands and nematocysts are observed. Inside of the ectoderm there is a thin, fibrillar layer of connective-tissue on whose inner-surface circular muscles are seen, which form fine fasciculi enclosed in separate connective-tissue spaces. The connective-tissue is, otherwise, rich in connective-tissue corpuscles with their nuclei, and also fine nutritory ducts.

There are 6 pairs of principal, perfect septa, of which 2 pairs are directive septa that follow the direction of the gonidial grooves and are furnished with both transversal and longitudinal muscles. The first-named clothe, as a lamella, the inner surfaces, that is to say, those that face towards each other; the last-named, on the contrary, clothe the outer surfaces, where they likewise distribute themselves membranaceously. On the other 4 pairs of septa, the muscular layers are placed in reverse manner, the longitudinal muscles clothing the inner surfaces, which face towards the intraseptal spaces, while the transversal muscles clothe the outer surfaces. Although these muscular layers are rather distinct, still they do not occupy much of the thickness. These 6 pairs of septa are sterile; they are placed far apart from each other, both each pair as between themselves, as well as the one pair in relation to the other. The intraseptal as well as the interseptal spaces (chambers) are, therefore, very wide, and that is especially the case with the last-named.

In each of the interseptal chambers there are 3 pairs of imperfect septa, of which the intermediate pair is the longest, but even that pair only extends a little more than a third part into the principal chamber, while the two others are even shorter. The principal chambers, that is to say the 6 interseptal spaces produced by the 6 principal septa, are, therefore, unusually roomy, indeed more so than I have hitherto ever observed in any other actinia. The intermediate pair of septa has its longitudinal muscles on the inner surface; they face therefore towards each other, while the transversal muscles are seated on the outer surfaces. This pair of septa of the 2nd order are likewise sterile, but carry mesenterial filaments and acontia. The remaining 2 shorter pairs of septa appear to have the muscular layer reversed, as the longitudinal muscles clothe the outer and the transversal muscles the inner surface, in same manner as with the 2 directive septa. These 2 short pairs of septa carry reproductive organs in which ova are observed in various stages of development. Between each 2 pairs of all the septa 2 extremely rudimentary septa are observed, which present themselves as narrow, fillet-formed prominences, that extend themselves from the pedal to the oral disc, and are clad with longitudinal muscles on the one and

aflang Aabning (Pedal-Stomata), hvorigjennem Kamrene kommunikere med hverandre forneden.

Findested.

Station 290. 3 Exemplarer.

Tealidæ, Hertwig¹.

Tealiopsis polaris, n. g. et sp.

Tab. I, Fig. 7, 8. Tab. VIII, Fig. 2, 3.

Fodskiven er rund, dobbelt saa bred som Kolumnen med en temmelig tyk, uregelmæssigt bugtet Rand; dens Underflade er stærkt foldet, og Folderne udstraale vifteformigt fra Centrum mod Peripherien.

Kroppen er cylindrisk, henved 30^{mm} høi og saavel denne som Fodskiven er ganske inkrusteret af smaa, hvide Skjælstykker samt Sandkorn, Tab. I, Fig. 7, der svare til Bundens Beskaffenhed. Denne viste sig nemlig at bestaa af umaadelige Masser knuste Skjæl, men var forøvrigt yderst fattig paa Dyr. Kun den øverste Fjerdedel af Kroppen er fri for Skjælbeklædningen, som temmelig let kan fjernes, og viser sig da at bestaa af et meget klæbrigt Slim, der tjener som Bindemiddel for Skjælstumperne. Den nøgne, øverste Del af Kroppen er glat, halv gjennemsigtig, saa at Mesenterialfilamenterne og Septa ere synbare, og dens øverste Rand er fri, afrundet, svagt denticuleret. Borttages Skjælbeklædningen, sees Kroppsvæggens ydre Flade at være tæt besat med Sugevorter (Suckers), der staa i regelmæssige, longitudinelle Rækker, mellem hvilke sees fine, glatte Linier, som antyde Insertionerne af Septa, Tab. I, Fig. 8.

Mundskiven er noget hvælvet, fint foldet. Den paa tversgaaende Mund er lidt konisk fremstaaende med afrundet Rand og smale Gonidiegruber, Tab. I, Fig. 7.

Tentaklerne ere retraktile, temmelig tykke, omtrent saa lange som Skivens Bredde og staa i 3 Rækker. De i den inderste Række ere tykkest og længst og udgjøre 24; den mellemste Række afvexler med den inderste Rækkes Tentakler og har samme Antal; i den yderste Række, der staaar strax indenfor Kroppens øverste Rand, er der 28. Saavel Mundskiven som Tentaklerne kunne ganske skjules af Kroppens øverste Rand under Dyrets Sammentrækning.

¹ Jeg har fundet det nødvendigt at beholde Familien Tealidæ, der er opstillet af Hertwig, men senere af ham inddraget.

transversal muscles on the other side. The 6 pairs of principal, perfect septa have, where they insert themselves in the pedal disc, a very large oblong orifice (Pedal-stomata) through which the chambers communicate with each other below.

Habitat.

Station No. 290. Three specimens

Tealidæ, Hertwig¹.

Tealiopsis polaris, n. g. et sp.

Pl. I, fig. 7, 8. Pl. VIII, fig. 2, 3.

The pedal disc is round, twice as broad as the column, and has a rather thick, irregularly indented margin; its under-surface is strongly folded, and the folds radiate in flabelliform from the centre towards the periphery.

The body is cylindrical, and measures about 30^{mm} in height. It, as well as, also, the pedal disc, is quite encrusted with small white fragments of shells and grains of sand (Pl. I, fig. 7), corresponding to the nature of the sea-bottom. That showed itself to consist of immense masses of broken shells but was otherwise extremely destitute of animal life. Only the uppermost fourth-part of the body is destitute of the shell-covering, which can quite easily be removed, and then appears to consist of a very sticky mucous that serves as a cement for the shell-fragments. The uncovered uppermost part of the body is smooth and semi-transparent, so that the mesenterial-filaments and septa are visible, and its uppermost margin is free, rounded and faintly denticulated. If the shell covering is removed the external surface of the body-wall is seen to be closely beset with suckers, placed in regular longitudinal series, and between which slender smooth lines are seen, indicating the insertions of the septa (Pl. I, fig. 8).

The oral disc is somewhat arcuate and finely folded. The transversally placed mouth is slightly conically protuberant, and has a rounded margin and narrow gonidial grooves (Pl. I, fig. 7).

The tentacles are retractile, rather thick, about as long as the breadth of the disc, and situated in three series. Those in the innermost series are thickest and longest, and are 24 in number. The intermediate series alternates with the tentacles of the innermost series and has the same number of tentacles. In the outermost series, which is situated immediately inside the uppermost margin of the body, there are 28 tentacles. Both the oral disc and the tentacles may be quite concealed by the uppermost margin of the body during the animal's contraction.

¹ I have found it necessary to retain the family Tealidæ, established by Hertwig, but subsequently withdrawn by him.

Den førømtalte ydre, skjælformede Membran er dannet af et meget seigt Slim, der sammenbinder Skjælstumperne og Sandkornene og er ikke organisk forbunden til den indenfor liggende Hud. Den omslutter imidlertid Fod og Krop saa intimt, at man vanskelig kan faa den helt fjernet, uden at den sønderrives, og altid bliver der hængende noget igjen ved Huden; kastes Dyret derimod i Alcohol, kan man senere med Lethed løse Membranen i sin Helhed. Det vil heraf erfares, at denne Membran er forskjellig fra den, som er karakteristisk for Phelliderne, og som er stærkere knyttet til Ectodermet.

Er den ydre Skjælmembran borttaget, fremstiller sig Epithellaget, der danner Ectodermet, og som bestaar af lange, meget cilierende Cylinderceller, imellem hvilke iagttages en stor Mængde flaskeformede, encellede Slimkjertler, samt Nematocyster, Tab. VIII, Fig. 2 a, 3 a. Indenfor Ectodermet er et temmelig bredt, fibrillært Bindevævslag, som er overmaade rigt paa Bindevævslegemer, Tab. VIII, Fig. 2 b, 3 b, og i hvis indre Vægflade ligger et Belte af stærkt udviklede, cirkulære Muskelfibre, Tab. VIII, Fig. 2 c, 3 c, der bestaa af enkelte Fibriller, som ligge tæt til hverandre; indenfor dette Belte er Endothelet, der ligeledes bestaar af Cylinderceller, men som ere kortere end de i Ectodermet, og hver forsynede med en lang Cilie, Tab. VIII, Fig. 3 d. Disse endodermale, cirkulære Muskelfibre fremtræde meget skarpt paa Længdesnit, hvor de overskaarne Fibriller ere iøinefaldende som fine Stubber, Tab. VIII, Fig. 3 c.

Der er 18 Par fuldstændige, golde Septa, som ere forsynede med Længde- og Tvermuskler, hvilke ere temmelig udviklede, især gjælder dette de longitudinelle. Imellem hver 2 Par af de fuldstændige Septa er der 3 Par ufuldstændige, af hvilke det midterste Par er længst og naar næsten hen til Svelgrøret; disse lange, ufuldstændige Septa bære Mesenterialfilamenterne, og paa enkelte af dem sees udviklede Generationsorganer; de øvrige 2 Par ere knapt halvt saa lange og ere forsynede med stærke Længde- og Tvermuskler og alle bære Generationsorganer, som udfylde ganske Kamrene med Æg i forskjellige Udviklingsstadier. Der er altsaa i det Hele 72 Par Septa, af hvilke de 18 Par ere fæstede til Svelgrøret. Parieto-basilarmuskelen er temmelig stærk, strækker sig opad langs den nederste Halvdel af Kropsvæggen og udbredt sig henimod Fodskivens Centrum. Farven: Den inkrusterede Del hvidgraa. Hos enkelte Exemplarer er den blottede Del, ligesom Tentaklerne, bleg, skidden hvidgul med en mørkere Mundskive; hos andre Exemplarer er Farven teglstensrød. De rødfarvede Tentakler har en mørkere Ring paa Midten, medens Enderne ere lysere; de hvidgule Tentakler har en hvid Halvring paa Midten af den adoral Flade.

The external shell-encrusted membrane previously mentioned, is formed of a very viscid mucous which binds the shell-pieces and sand-grains together, and is not organically connected with the integument lying inside. It, however, encloses the base and body so intimately, that it is difficult to entirely remove it without tearing it and there always remains some behind adhering to the integument. When, however, the animal is placed in alcohol, it becomes, subsequently, easy to remove the membrane in its integrity. From the foregoing it will be gathered, that this membrane differs from that which is characteristic of the Phellidæ and which is more firmly secured to the ectoderm.

When the external shell-membrane is removed the epithelial layer that forms the ectoderm presents itself, and consists of long, very ciliating cylinder-cells, between which there are observed a great multitude of bottle-shaped unicellular mucous glands, and nematocysts (Pl. VIII, fig. 2 a, 3 a). Inside of the ectoderm there is a rather broad fibrillar connective-tissue layer, extremely rich in connective-tissue corpuscles (Pl. VIII, fig. 2 b, 3 b), and in whose inner mural surface there lies a belt of strongly developed circular muscle-fibres (Pl. VIII, fig. 2 c, 3 c), which consist of a few fibrils lying close in to each other. Inside of this belt is the endothelium, also consisting of cylinder-cells, but which are shorter than those of the ectoderm, and each of them is furnished with a long cilia (Pl. VIII, fig. 3 d). These endodermal circular muscle-fibres appear very prominently in longitudinal sections, where the transsected fibrils become prominent like minute stumps (Pl. VIII, fig. 3 c).

There are 18 pairs of completely sterile septa, furnished with longitudinal and transversal muscles that are pretty well developed; that is especially the case with the longitudinal muscles. Between every 2 pairs of the perfect septa there are 3 pairs of imperfect septa, of which the intermediate pair is the longest, and extends almost to the œsophagus. These long imperfect septa carry the mesenterial filaments, and on some of them developed reproductive organs are seen; the other 2 pairs are scarcely half their length, and are furnished with strong longitudinal and transversal muscles; they all carry reproductive organs, which quite fill the chambers with ova in different stages of development. There are therefore, altogether, 72 pairs of septa, of which 18 pairs are adherent to the œsophagus. The parieto-basilar muscle is pretty strong, and extends itself upwards along the lowest half of the body-wall, and distributes itself towards the centre of the pedal disc. *Colour.* The encrusted portion is whity-grey. The uncovered portion, as well as also the tentacles, is, in a few specimens, a pale dirty whity-yellow, the oral disc being a darker shade; in other specimens it has a brick-red colour. The red coloured tentacles have a darker coloured annulus in the middle, while the extremities are lighter in colour. The whity-yellow tentacles have a white crescent in the middle of their adoral surface.

Findested.

Station 323. 11 Exemplarer af forskjellig Størrelse.

Slægtskarakter.

Fodskiven rund med bugtet Rand. Kroppen cylindrisk, dækket af en seig Hud, inkrusteret af Sand og Skjælstumper; indenfor samme — paa den egentlige Hud — en Mængde udprægede Sugevorter, stillede i Længderækker. Mundskiven foldet; Tentaklerne retraktile i faa Rækker. Fremtrædende endodermale Cirkulærmuskler. Mange fuldstændige Septa.

Artkarakter.

Fodskiven rund, dobbelt saa bred som Kolumnen, med tyk Rand og stærkt foldet Underflade. Kroppen cylindrisk, indtil 30^{mm} høi og saavel som Fodskiven omgivet af en Membran, inkrusteret af Sand og Skjælstumper. Indenfor denne Membran er Kropsvæggen forsynet med Sugevorter i tætte Længderækker. Mundskiven fint foldet. Tentakler i 3 Rækker, omtrent saa lange som Mundskivens Bredde. Farven: Den inkrusterede Del er hvidgraa; den nøgne Del, ligesom Tentaklerne, er paa nogle Exemplarer bleg, skidden hvidgul med en mørkere Mundskive, paa andre tegelstensrød. De rødfarvede Tentakler have paa Midten en mørkere Ring, imedens Enderne ere lysere; de hvidgule have paa Midten af deres adoral Side en hvid Halvring.

Familie Madoniactidæ.

Hexactinier med faa principale Septa, Acontier og et udpræget endodermal-cirkulært Muskelsystem.

Madoniactis¹ *lofotensis*, n. g. et sp.

Tab. I, Fig. 5; Tab. VIII, Fig. 1.

Fodskiven er noget bredere end Kolumnen, rund og dens Rand er tyk og noget unduleret. Dens Underflade er rynket og svagt radieret fra Centrum mod Peripherien.

Kroppen er cylindrisk, omtrent lige høi som bred; dens Overflade er saagodtsom glat og glindsende; kun naar Dyret er lidt sammentrukket, sees med Loupen yderst smaa,

¹ μαδωνία = Vandlilje.

Habitat.

Station No. 323. Eleven specimens of different sizes.

Generic characteristics.

The pedal disc round with indented margin. The body cylindrical, covered with a tough integument encrusted with grains of sand and fragments of shells; inside of this, on the integument-proper, a multitude of distinct suckers placed in longitudinal series. The oral disc folded. The tentacles retractile, placed in few series. Prominent endodermal circular muscles. Numerous perfect septa.

Specific characteristics.

The pedal disc round, twice as broad as the column, has a thick margin and strongly folded under-surface. The body cylindrical, measures up to 30^{mm} in height; it, as well as also the pedal disc, is surrounded by a membrane encrusted with grains of sand and fragments of shells. Inside of this membrane the body-wall is furnished with suckers in compact longitudinal series. The oral disc finely folded. The tentacles placed in 3 series, about as long as the breadth of the oral disc, *Colour*. The encrusted portion whity-grey; the exposed portion, and also the tentacles, are, in a few specimens, pale dirty whity-yellow with a darker oral disc, in others again brick-red. The red coloured tentacles have a darker annulus in the middle, whilst the extremities are lighter; the whity-yellow tentacles have a white crescent in the middle of their adoral surface.

Family Madoniactidæ.

Hexactiniae with few principal septa, acontia, and a prominent endodermal circular muscular system.

Madoniactis¹ *lofotensis*, n. g. et sp.

Pl. I, fig. 5; Pl. VIII, fig. 1.

The pedal disc is somewhat broader than the column, and is round; its margin is thick and somewhat undulating. The under-surface is wrinkled, and faintly radiated from the centre towards the periphery.

The body is cylindrical, about the same in height as in breadth; its external surface is almost smooth, and shining. Only when the animal is a little contracted can

¹ μαδωνία = Waterlily.

vorteformige Fremstaaenheder, der staa uregelmæssigt spredte over hele Kroppsfladen, især dens nederste Del, men synes stundom at have Tendents til at danne Længderækker. Disse Fremstaaenheder ere forsynede med en yderst fin Aabning (Loophole) hvorigjennem lange Acontier udstødes. Kroppens øverste Rand er noget afrundet og fremstaaende, en tydelig Parapet, indenfor hvilken er en Fordybning (Fossa) imellem den fri, afrundede Rand og den yderste Tentakelrække. Kroppens Hud er fast, membranøs, temmelig tynd og halv gjennemskindende, saa at naar Dyret er udspændt og i fuld Vigor, blive Skillevæggen synbare.

Mundskiven er yderst ringe hvælvet, fint foldet; Folderne gaa fra Munden ud mod Peripherien. Munden er aflang, stærkt foldet med tykke Læber og to temmelig brede Gonidiegruber, Tab. I, Fig. 5.

Tentaklerne retraktile, staa i 4 Rækker, ere temmelig tykke, konisk tilspidsede med noget afstumpede Ender, omtrent 2 Trediedele saa lange som Skivens Bredder, noget stive og paa hele deres Overflade overordentligt rigt besatte med Nematocyster, saa de hænge fast ved Fingrene, naar de berøres, uden dog at fremkalde Smerte. I den inderste, 1^{ste} Række, er der 12 Tentakler, disse ere de tykkeste og kanske lidt længere end de øvrige; ogsaa i 2^{den} Række er der 12, hvilke sidde afvekslende med dem i 1^{ste} Række. I den 3^{die} Række er der 18, men i 4^{de} Række er der dobbelt saa mange som i 3^{die} Række, nemlig 36, idet 2 Tentakler af 4^{de} Række sidde mellem hver 2 Tentakler i 3^{die} Række. Saavel Tentaklerne som Mundskiven kan fuldkommen dækkes af Kroppens Rand, naar Dyret kontraherer sig.

Farven. Kroppen med Fodskiven er gulrød med mørkerøde dels Striber, dels Flækker; dens fri, afrundede Rand er lidt mørkere rød. Mundskiven er rosenfarvet med fine, røde Folder, der udgaa fra den røde Ring omkring Munden og strække sig henimod Tentaklerne, hvor de blive bredere, stærkere røde og dele sig saaledes, at de ringformigt omfatte Grunden af Tentaklerne, fra den inderste til den yderste Række. Mundens Læber ere stærkere røde end Skiven, næsten saa røde som Ringen omkring Tentakelgrunden. Gonidiegruberne ere bleg gulrøde, eller de kunne være saa stærkt røde som Mundringen. Svælget, der let udkrænges, er hvidgult. Tentaklerne ere gjennemsigtige, bleg gulrøde med 1 til 2 brede, røde Ringe, foruden den, som findes ved Grunden.

Kroppens udvendige Flade er som sædvanligt beklædt med et Epithel; dette er temmelig tykt og dannet af lange, cilierende Cylinderceller, hvormellem sees encellede, kolbeformede Slimkjertler samt Nematocyster. Indenfor dette Ectoderm er et bredt, svagt fibrillært Bindevævslag, over-

extremely minute mammiform protuberances be seen with the assistance of a magnifier. These are placed, irregularly, over the entire surface of the body, especially on its lowest part, but occasionally they appear to have a tendency to form longitudinal series. These protuberances are furnished with an extremely minute loophole through which long acontia are projected. The uppermost margin of the body is somewhat rounded and projectant, and forms a distinct parapet, inside of which there is a fosse between the free rounded margin and the outermost tentacular series. The integument of the body is firm, membranous, rather thin and semi-transparent, so that when the animal is extended and in full activity the divisional-walls become apparent.

The oral disc is extremely slightly arcuate, and finely folded. The folds issue from the mouth towards the periphery. The mouth is oblong, strongly folded, has thick labiæ and two rather broad gonidial grooves (Pl. I, fig. 5).

The tentacles are retractile and are placed in 4 series. They are rather thick, conically acuminate with somewhat blunted extremities, and they measure in length about two-thirds of the breadth of the disc. They are somewhat stiff, and over their entire surface are richly beset with nematocysts, so that they adhere firmly to the fingers when they are touched, without, however, causing pain. In the innermost series, the first one, there are 12 tentacles; these are the thickest and they are also, perhaps, a little longer than the others. In the second series there are also 12 tentacles, seated alternating with those of the first series. In the third series there are 18 tentacles, but in the fourth series there are twice as many as in the third series, viz. 36, as two tentacles of the fourth series are seated between every two tentacles of the third series. Both the tentacles and the oral disc can be completely covered by the margin of the body when the animal contracts itself.

The colour. The body and pedal disc are yellowish-red with dark-red, partly stripes and partly patches. The free, rounded body-margin is a slightly darker-red. The oral disc is rose-coloured, with fine red folds that issue from the red annulus round the mouth, and extend themselves towards the tentacles, where they become broader and a brighter red, and also divide themselves in such manner that they annularly include the base of the tentacles from the innermost to the outermost series. The oral labiæ are a brighter red than the disc, and are almost as red as the annulus round the base of the tentacles. The gonidial grooves are pale yellowish-red, or they may be as bright a red as the oral annulus. The œsophagus is a little everted, and is whitish-yellow. The tentacles are transparent, pale yellowish-red, and have 1 to 2 broad red annuli besides the one found at the base.

The external surface of the body is, as usual, clad with an epithelium; this is rather thick, and is formed of long ciliating cylinder-cells, between which unicellular claviform mucous glands and also Nematocysts are seen. Inside of this ectoderm there is a broad faintly fibrillar

ordentligt rigt paa Bindevævslegemer med deres Kjerne, Tab. VIII, Fig. 1 *a*. Henimod dette Bindevævs indre Flade sees et Belte af temmelig tykke, cirkulære Muskel-fibre, der tildels anastomosere med hverandre, og som have et udpræget endodermalt Leie, Tab. VIII, Fig. 1 *b*, idet Endothelet støder nærmest til, imedens der i hele det øvrige brede Lag af Bindevævet ikke findes Spor af Muskler.

Der er 6 Par principale, fuldstændige Septa, hvoraf 2 ere Retningsseptas; samtlige ere gølge. I ethvert af de derved fremkomne 6 interseptale Hovedkamre er der 3 Par Septa af 2^{den} Orden, som dele hvert af Hovedkamrene i 4 Kamre af 2^{den} Orden. I ethvert af disse Kamre er der 1 Par Septa af 3^{die} Orden, som er meget kort. Septa-parrene af 2^{den} Orden ere omtrent lige lange og strække sig næsten lige hen til Svælgrøret; paa dem ere Generationsorganerne fæstede, Tab. VIII, Fig. 1 *c*, og paa 1 Exemplar var Æggestokkene saa stærkt udviklede, at Æggene i forskellige Udviklingsstadier opfyldte Kamrene saavel af 1^{ste} og 2^{den} som af 3^{die} Orden, med andre Ord, hele Gastralhulheden var udfyldt med Æg, Tab. VIII, Fig. 1 *d*. Acontierne ere fæstede længere nede mod Bunden af Mavehulheden, ligeledes paa Septa af 2^{den} Orden, og ere i temmelig stor Mængde tilstede, sammenrullede i Spiraler.

Jeg har, som det vil sees, dannet en ny Familie for Slægten *Madoniactis*, omendskjønt denne i sit Ydre ligner Tealiderne, men i væsentlige anatomiske Dele Sagartiderne saa særdeles meget, at det vel kunde forsvares at henføre den til dem. Slægten *Tealia* har saavel Gosse som Dr. Andres hentørt til Familien *Bunodidæ*, imedens Hertwig har dannet en ny Familie, *Tealidæ*, for den, grundet hovedsagelig paa Cirkulærmusklernes endodermale Leie. Han karakteriserer Familien saaledes: „Hexactiniæ with numerous perfect septa, and very contractile, moderately long or short tentacles, which can be completely covered. Circular muscle very strong endodermal, projecting as a thick swelling into the gastric cavity.“

Familien *Sagartidæ* er karakteriseret af Hertwig saaledes: „Hexactiniæ with acontia, a strong mesodermal circular muscle and numerous very contractile tentacles; the principal septa, or septa of the first order, only are perfect and at the same time sterile; all the remaining septa are imperfect.“

Man vil af Beskrivelsen over Slægten *Madoniactis* have erfaret, at den efter dette hverken kan henføres til den ene eller den anden af de to nysnævnte Familier, naar de cirkulære Musklers Leie skal være det afgjørende. Mest nærmer den sig *Sagartiderne*, kun Hensynet til de cirkulære Muskler har gjort, at den ikke er stillet i deres Række. Ihvorvel jeg ikke, ifølge mine hidtil gjorte Undersøgelser, kan tillægge de cirkulære Musklers Leie saa stor Betydning som Hertwig, saa antager jeg dog, at de bør komme i væsentlig Betragtning som et udpræget Karaktermærke, der muligens kan faa den systematiske Overvægt,

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

connective-tissue layer, extremely rich in connective-tissue corpuscles with their nuclei (Pl. VIII, fig. 1 *a*). Towards the inner surface of this connective-tissue there is observed a belt of pretty thick circular muscle-fibres that to some extent anastomose with each other, and which have a distinct endodermal seat (Pl. VIII, fig. 1 *b*), as the endothelium adjoins closest, whilst in the entire remainder of the broad connective-tissue layer no trace of muscles is to be found.

There are 6 pairs of principal, perfect septa, of which 2 are directive septa; all of them are sterile. In each of the 6 interseptal principal chambers thus produced, there are three pairs of septa of the second order, which divide each of the principal chambers into 4 chambers of the second order. In each of these chambers there is 1 pair of septa of the third order which are very short. The pairs of septa of the second order are about equal in length, and extend themselves almost right up to the œsophagus; the organs of reproduction are secured upon them (Pl. VIII, fig. 1 *c*), and in one specimen the ovaries were so strongly developed that the ova, in various stages of development, filled the chambers of the first and second as well as of the third order; in other words the entire gastral cavity was stuffed with ova (Pl. VIII, fig. 1 *d*). The acontia are adherent farther down towards the bottom of the gastral cavity, also upon septa of the second order, and they are present in rather great abundance, coiled up in spirals.

I have, as will be apparent, formed a new family for the genus *Madoniactis*, although it, in externals, resembles the *Tealidæ*, and in important anatomical points the *Sagartidæ* so very greatly, that it might well be justified if it was assigned to them. Gosse, as well as Dr. Andres, has assigned the genus *Tealia* to the family *Bunodidæ*, whilst Hertwig has formed a new family, *Tealidæ*, for it, based principally on the endodermal seat of the circular muscles. He characterizes the family thus: „Hexactiniæ with numerous perfect septa, and very contractile, moderately long or short tentacles, which can be completely covered. Circular muscle very strong endodermal, projecting as a thick swelling into the gastric cavity.“

The family *Sagartidæ* is characterized by Hertwig thus: „Hexactiniæ with acontia, a strong mesodermal circular muscle and numerous very contractile tentacles; the principal septa, or septa of the first order, only are perfect and at the same time sterile; all the remaining septa imperfect.“

From the description of the genus *Madoniactis* it will be seen, that it cannot be assigned to either the one or the other of the two families just mentioned, if the seat of the circular muscles is regarded as the point of determination. It resembles the *Sagartidæ* most, and only regard to the circular muscles has prevented it being placed in that subfamily. Although I cannot, according to my investigations up to date, place such great stress on the seat of the circular muscles as Hertwig does, yet I must assume that it ought to be regarded as of importance as a distinct characteristic trait which, possibly, may have the systematic

som Hertwig allerede har tildelt dem. *Madoniactis* kommer altsaa indtil Videre til at danne et Led imellem Familierne *Bunodidæ*, *Andres*, og *Sagartidæ*, *Gosse*, *Hertwig*.

Findested.

Saltstrømmen, Lofoten. 90 Favne.

Slægtskarakter.

Fodskiven rund, lidt videre end Kroppen. Denne er cylindrisk, omtrent lige høi som bred, glat, forsynet med spredte *Cinclides*. Parapet og Fossa. Tentaklerne i flere Rækker, retraktile, korte. Saavel Tentakler som Mundskive dækkes af Kroppens Rand. De fuldstændige Septa 6 Par, golde. Acontier. De cirkulære Muskler udpræget endodermale.

Artkarakter.

Fodskiven rund, tyk, noget videre end Kroppen med en tyk, noget unduleret Rand. Kroppen cylindrisk, glat, glindsende, omtrent lige høi som bred, forsynet med spredte, yderst smaa, gjennemborede Fremstaaenheder (*Cinclides*), hvorigjennem Acontier udstødes. Kroppens øverste Rand afrundet, fri; Parapet, indenfor hvilket en Fordybning (Fossa). Kroppens Hud fast, membranøs, halvt gjennemsigtig. Mundskiven næsten flad, dækkes tilligemed Tentaklerne ganske af Kroppens Rand under Sammentrækningen. Munden aflang med tykke Læber og to brede Gonidiefurer. Tentaklerne retraktile, tykke, temmelig korte, danne 4 Rækker: 12 i den 1ste — inderste — Række, hvilke ere de tykkeste; 12 i 2den, 18 i 3die og 36 i 4de Række.

Samtlige Tentakler rigt besatte med Nematocyster. *Farven*: Kroppen gulrød med mørkere dels Striber, dels Flækker. Mundskiven Rosa med fine, røde Straaler, der blive bredere og mørkere henimod Tentaklerne og danne Ringe om deres Grunddel. Mundens Læber stærkere røde end Skiven. Gonidiegruberne ere bleg gulrøde. Svælg-røret, der let udkrænges, hvidgult. Tentaklerne bleg gulrøde med 1 til 2 brede, røde Ringe, foruden den Ring, som findes ved Grunden.

predominance that Hertwig has already assigned it. The *Madoniactis* must therefore, for the present, form a link between the families *Bunodidæ*, *Andres*, and *Sagartidæ*, *Gosse*, *Hertwig*.

Habitat.

Saltstrømmen, Lofoten. Depth. 90 fathoms.

Generic characteristics.

The pedal disc round, a little wider than the body. The latter is cylindrical, about the same in height as in breadth, smooth, furnished with dispersed *cinclides*. Parapet and fosse. The tentacles in several series, retractile, short. Both the tentacles and the oral disc covered by the margin of the body. 6 pairs of perfect septa, sterile. Acontia. The circular muscles distinctly endodermal.

Specific characteristics.

The pedal disc round, thick, somewhat wider than the body, with a thick somewhat undulating margin. The body cylindrical, smooth, lustrous, about the same in height as in breadth, furnished with scattered, extremely minute, perforated protuberances (*Cinclides*) through which the acontia are projected. The uppermost margin of the body rounded, free. Parapet, inside of which a depression (Fosse). The integument of the body firm, membranous, semi-transparent. The oral disc almost flat; it as well as the tentacles completely covered by the margin of the body during contraction. The mouth oblong, with thick labiæ and two broad gonidial grooves. The tentacles retractile, thick, rather short, form 4 series; 12 in the innermost series, which are also the thickest ones; 12 in the second series; 18 in the third series, and 36 in the fourth series.

All the tentacles richly beset with nematocysts. *Colour*: The body yellowish-red with, partly stripes partly patches of a darker colour. The oral disc rose colour, with fine red rays which become broader and darker towards the tentacles and form annuli round their bases. The oral labiæ brighter red than the disc. The gonidial grooves are pale yellowish-red. The œsophagus, which is easily everted, whity-yellow. The tentacles pale yellowish-red with 1 to 2 broad, red annuli, besides the annulus found at the base.

Familie Phellidæ, Andres.

Sagartidæ (pars). Gosse. 1858.
 Phellinæ. Verrill. 1868.
 — Klunzinger. 1877.
 Sagartidæ. R. Hertwig. 1882.
 Phellidæ. R. Hertwig. 1888.

Legemet langstrakt. Kolumnen cylindrisk, forsynet med en inkrusteret Skede, fastvoxet til Ectodermet ved en skarpt begrændset Cuticula. Acontier.

Som det vil sees, har jeg optaget Andres's Subfamilie Phellidæ, som jeg finder berettiget, væsentlig paa Grund af den udprægede Skede og den dertil hørende Cuticula, hvormed Phelliderne ere forsynede.

Phellia flexibilis, n. sp.

Tab. III, Fig. 5, 6; Tab. XII, Fig. 1—5.

Fodskiven udvider sig skiveformigt over Gjenstanden, hvorpaa den sidder, med en lidt uregelmæssig, temmelig tynd Rand, Tab. III, Fig. 5, 6; Tab. XII, Fig. 1. Dens Overflade er hvælvet og inkrusteret; Underfladen er næsten plan, glat og straalet fra Centrum mod Peripherien; de fine Straaler antyde Septa-Insertionerne.

Kroppen (Kolumnen) er cylindrisk, omtrent 20^{mm} høi, noget indkneben ved Fodskiven, men udvider sig bægerformigt jopimod Mundskiven, Tab. III, Fig. 5; Tab. XII, Fig. 1. Den nederste Totrediedel er omgivet af en inkrusteret Membran, der danner en Skede, hvis øverste Rand er skarpt begrændset, Tab. III, Fig. 5 a; Tab. XII, Fig. 1 a, 2 a, imedens Kroppens øverste Trediedel er nøgen, glat, glindsende og tæt besat med Nematocyster, Tab. III, Fig. 5 b; Tab. XII, Fig. 1 b, 2 b. Mundskiven er temmelig bred, lidt foldet med en aflang Mund og i Randen 2 Rækker lange, flagrende, retraktile Tentakler, hvoraf dog den ydre Række staar paa Kroppens øverste Rand, Tab. XII, Fig. 1.

Der er 24 Tentakler i hver Række; de i den indre Række ere længst og tykkest, næsten dobbelt saa lange som Mundskivens Bredde; de i den ydre Række ere kortere og smalere. Baade Mundskiven og Tentaklerne ere tæt besatte med Nematocyster, og hele den nøgne Del af Dyret kan trækkes fuldstændig ind i den inkrusterede Skede, Tab. XII, Fig. 3. Naar Dyret er fuldt indtrukket, er det næsten fladt og danner kun en liden, afrundet Forhøining paa Gjenstanden, hvortil det er fæstet, Tab. XII, Fig. 3.

Farven. Den inkrusterede Del af Kroppen og Fodskiven er temmelig udpræget gulbrun; den nøgne Del enten næsten hvid eller bleg rosenrød. Mundskiven stærkt brun med en hvid Ring omkring Munden, hvorfra udgaar hvide Striber hen til Grunden af Tentaklerne, som de omfatte.

Family Phellidæ, Andres.

Sagartidæ (pars). Gosse. 1858.
 Phellinæ. Verrill. 1868.
 — Klunzinger. 1877.
 Sagartidæ. R. Hertwig. 1882.
 Phellidæ. R. Hertwig. 1888.

The body elongate. The column cylindrical, furnished with an encrusted sheath which has grown fast to the ectoderm by means of a distinctly defined cuticulum. Acontia.

As will be observed, I have included Andres' subfamily Phellidæ, as I find that justified, principally on account of the distinguished sheath and the cuticulum pertaining to it, with which the Phellidæ are furnished.

Phellia flexibilis, n. sp.

Pl. III, fig. 5, 6; Pl. XII, fig. 1—5.

The pedal disc expands itself discoidally over the object upon which it is seated, with a slightly irregular, rather thin margin (Pl. III, fig. 5, 6; Pl. XII, fig. 1). Its upper surface is arcuate and encrusted. The inferior surface is almost plane, smooth, and radiated from the centre towards the periphery. The fine rays indicate the insertions of septa.

The body (the column) is cylindrical, about 20^{mm} in height, somewhat constricted at the pedal disc, but expands in crateriform up towards the oral disc (Pl. III, fig. 5; Pl. XII, fig. 1). The lowest two-thirds part is surrounded by an encrusted membrane which forms a sheath whose uppermost margin is sharply defined (Pl. III, fig. 5 a; Pl. XII, fig. 1 a, 2 a), while the body's uppermost third part is exposed, smooth, lustrous, and closely covered with nematocysts (Pl. III, fig. 5 b; Pl. XII, fig. 1 b, 2 b). The oral disc is rather broad, slightly folded, has an oblong mouth and, in the margin, 2 series of long, waving, retractile tentacles, of which, however, the outer series are seated on the uppermost margin of the body (Pl. XII, fig. 1).

There are 24 tentacles in each series; those in the inner series are longest and thickest, almost twice as long as the breadth of the oral disc; those in the outer series are shorter and narrower. Both the oral disc and the tentacles are closely covered with nematocysts, and the entire exposed part of the animal can be completely withdrawn into the encrusted sheath (Pl. XII, fig. 3). When the animal is fully retracted it is almost flat, and then forms only a small rounded prominence on the object to which it is attached (Pl. XII, fig. 3).

The colour. The encrusted part of the body and the pedal disc are a rather distinguished yellowish-brown. The exposed part is either almost white or pale rose-red. The oral disc is strong brown, with a white annulus round the mouth from which white stripes issue to the base of the

Tentaklerne i den ydre Række ere bleg rosenrøde, de i den indre ere brune og ved Grunden mørk kastaniebrune, Tab. III, Fig. 5, 6.

Ved Tversnit viser den inkrusterede Del af Kroppen sig at bestaa af 2 Lag; det ydre, der dannes af en temmelig tyk, seig Slimmembran, hvori er indleiret forskellige haarde, uorganiske Bestanddele, Tab. XII, Fig. 4 a, og en temmelig skarpt afgrændset, fibrøs Cuticula, Tab. XII, Fig. 4 b. Denne Membran er fast adhæreret til den indenfor liggende, egentlige Cutis, hvorfra den dog er skilt ved en skarp Grændse, dannet af cylinderformede Epithelceller, der udgjør det egentlige Ectoderm, Tab. XII, Fig. 4 c. Slimmembranen er et Produkt af Ectodermet, imellem hvis Celler der findes en Mængde encellede Slimkjertler. Indenfor Ectodermet er et bredt, fibrillært Bindevævslag, Tab. XII, Fig. 4 d, i hvis Midte sees cirkulære Muskelfibriller, som samle sig i tynde Bundter, Tab. XII, Fig. 4 e.

Et Tversnit af Kroppens nøgne Del viser et lidt forskjelligt Billede. Ectodermet bestaar her af meget lange, cilierende Cylinderceller, hvormellem iagttages, foruden de ovenfor omtalte Slimceller, en stor Mængde Nematocyster. Disse fremtræde i 3 forskellige Former, nemlig dels som store, næsten cylinderformede Kapsler, hvori en tyk, spiralvunden Traad, dels som meget smaa, lancetformede Kapsler enten uden noget traadformigt Indhold, eller med en lige, spydformet Traad i Kapselen. Paa Tentaklerne, der ogsaa ere rige paa Nematocyster, findes kun de to første Former; indenfor Ectodermet ligger et Lag af stærke, longitudinelle Muskler.

Der er 6 Par principale, fuldstændige Septa, som staa temmelig langt fra hverandre, ligesom hvert Pars Septa ere vel adskilte, saa at baade de intraseptale og de interseptale Rum ere vide, Tab. XII, Fig. 5. Af disse 6 Par fuldstændige Septa ere de to Par Retningsseptas, Tab. XII, Fig. 5, 1, og adskille sig fra de øvrige ved Muskelanordningen. De transverselle Muskler danne en foldet Membran, beklæde den indre Flade af hvert Septum og vende i det intraseptale Rum mod hverandre, Tab. XII, Fig. 5 a, imedens de longitudinelle Muskler ere stærkt udviklede og danne jo længere de komme henimod Svælg-røret en tyk Busk, Tab. XII, Fig. 5 b, ere fæstede til den ydre Flade af hvert Septum og vende altsaa fra de transverselle Muskler, ragende som en Fane ind i det interseptale Rum. De longitudinelle Muskler danne meget smukke Forgreninger, der bedst sees paa Tversnit, Tab. XII, Fig. 5.

Richard Hertwig har beskrevet i sin „Report on the Actinaria dredged by „Challenger“¹ en ny Phellia under

¹ l. c. pag. 83

tentacles which they enclose. The tentacles of the outer series are pale rose-red, those of the inner series are brown, and at their bases dark chestnut-brown (Pl. III, fig. 5, 6).

In transversal sections the encrusted portion of the body presents itself in two layers; the outer one, which is formed of a rather thick, viscid, mucous membrane in which various hard inorganic substances are embedded (Pl. XII, fig. 4 a), and a rather sharply defined, fibrous cuticulum (Pl. XII, fig. 4 b). This membrane is firmly adherent to the true cutis which lies inside, from which it is, however, divided by a clearly defined margin formed of cylindric epithelial cells which compose the real ectoderm (Pl. XII, fig. 4 c). The mucous membrane is a product of the ectoderm, between whose cells a multitude of unicellular mucous glands are found. Inside of the ectoderm there is a broad, fibrillar layer of connective-tissue (Pl. XII, fig. 4 d), in whose middle circular muscle-fibrils which collect themselves into thin fasciculi (Pl. XII, fig. 4 e) are observed.

A transversal section of the exposed part of the body presents a slightly different picture. Here the ectoderm consists of very long, ciliating cylinder-cells, between which there are observed a multitude of nematocysts, besides the mucous glands mentioned above. These present themselves in 3 different forms viz. partly as large, almost cylindrically formed capsules, in which there is a thick spirally coiled filament; partly as very small lanceolate capsules either without any filamentous contents, or with a straight, hastiform filament in the capsule. Upon the tentacles, which are also rich in nematocysts, only the two first-named forms are found. Inside of the ectoderm there lies a layer of powerful longitudinal muscles.

There are 6 pairs of principal, perfect septa, which are placed pretty far apart from each other, while at same time each pair of septa are well separated, so that both the intraseptal and the interseptal spaces are wide (Pl. XII, fig. 5). Of these 6 pairs of perfect septa, 2 pairs are directive septa (Pl. XII, fig. 5, 1), and distinguish themselves from the others by their muscular arrangement. The transversal muscles form a folded membrane and clothe the inner surface of each septum, and face towards each other in the intraseptal space (Pl. XII, fig. 5 a), while the longitudinal muscles, which are powerfully developed and which, the closer they approach to the œsophagus, form a thick frutex (Pl. XII, fig. 5 b), are adherent to the outer surface of each septum and, consequently, face from the transversal muscles and reach like a flag into the interseptal space. The longitudinal muscles form very beautiful ramifications, which are best seen in transversal sections (Pl. XII, fig. 5).

Richard Hertwig has described, in his Report on the Actinaria dredged by „Challenger“¹, a new Phellia under

¹ l. c. pag. 83.

Navn af *Phellia pectinata* og angiver i denne sin Beskrivelse, at i det ene Par Retningssepta (han undersøgte kun det ene Par) fandt der en Sammenvoxning 'Sted imellem begge Septas fri Rand, saaledes, at det ene Septums longitudinelle Muskler gik over i det andet Septums Længdemuskler. Nogen saadan Sammenvoxning findes ikke hos *Phellia flexibilis* og heller ikke hos nogen af de følgende Arter; hvert Septum fæster sig i nogen Afstand fra det andet paa Svælgrøret, som ovenfor antydet, Tab. XII, Fig. 5. Hertwig selv opkaster Tvivl med Hensyn til denne Sammensmeltning af Retningssepta og mener, at han muligens kan have havt med et ungt Exemplar at gøre, idet han gør opmærksom paa, at han hos unge Actinier fandt de nylig dannede Septapar sammenvoxede just saaledes, som han har beskrevet hos *Phellia pectinata* og *Tealia bunodiformis*.

Paa de øvrige 4 Par fuldstændige Septa er Muskelanordningen ganske modsat den paa Retningssepta; de longitudinelle Muskler ere fæstede paa den indre Flade af hvert Septum og rage som en tyk Busk ind i Intraseptalrummet, hvor de ofte møde de fra det andet Septum udgaaende Længdemuskler, Tab. XII, Fig. 5, 2; de transverselle Muskler beklæde næsten ganske som en fint foldet Membran de ydre Flader og vende altsaa mod de interseptale Rum.

Lige ved Insertionen af ethvert fuldstændigt Septum paa Svælgrøret udspringer et Mesenterialfilament, der er proptrækkerformigt oprullet og naar kun lidt nedenfor Svælgrørets nederste Rand, Tab. XII, Fig. 5 c; — der er altsaa 12 Mesenterialfilamenter, men forresten ere samtlige fuldstændige Septa sterile.

Imellem hvert to Par fuldstændige Septa er der i hvert interseptalt Rum 2 Par ufuldstændige, der naa kun halvveis henimod Svælgrøret og ere forsynede med temmelig stærke Længdemuskler og mindre udviklede Tvermuskler, Tab. XII, Fig. 5, 3. Disse sekundære Septa bære Acontier, der ere tilstede i rigelig Mængde, og langt ned imod Gastralhulhedens Bund ere ogsaa Generationsorganerne fæstede til dem.

Imellem hvert 2 Par af disse ufuldstændige, sekundære Septa er der et Par meget korte Septa, der ligeledes ere forsynede med Længde- og Tvermuskler, og som bære Generationsorganer, Tab. XII, Fig. 5, 4; hvorvidt Acontier ere knyttede til disse tertiære Septa, kan ikke afgjøres med Sikkerhed; men det forekom mig, at enkelte Acontier vare fæstede til dem. Undersøgelsesmateriale var saa ringe — kun et Exemplar — at det havde sine Vanskeligheder udførligen at granske Dyrets Anatomi og Histologi.

Findested.

Station 8. Et Exemplar. Paa Station 1 fandtes 1 Exemplar, Tab. III, Fig. 6, der dog varierede noget i Farve og var lidt beskadiget; det er dette Exemplar, der er benyttet til Undersøgelserne.

the designation *Phellia pectinata*, and states in his description of it, that in the one pair of directive septa (he only examined the one pair), there took place a concretion between the free margins of both the septa, in such manner, that the longitudinal muscles of the one septum passed over into the longitudinal muscles of the other septum. A similar concretion is not found in *Phellia flexibilis* or in any of the species to be subsequently mentioned. Each septum secures itself to the œsophagus at some distance apart from the other, as above indicated (Pl. XII, fig. 5). Hertwig, himself, raises a doubt with respect to the concretion of the directive septa, and supposes that he may possibly have had to do with a young specimen, and he draws attention to the fact that in young Actiniae he found the newly formed pairs of septa concreted together quite in the same manner as he has described in *Phellia pectinata* and *Tealia bunodiformis*.

Upon the remaining 4 pairs of perfect septa the muscular arrangement is quite the reverse of that on the directive septa; the longitudinal muscles are adherent to the inner-surface of each septum, and reach, like a thick frutex, into the intraseptal space, where they frequently meet the longitudinal muscles issuing from the other septum (Pl. XII, fig. 5, 2). The transversal muscles almost entirely clothe the outer surfaces like a fine folded membrane and, consequently, face towards the interseptal spaces.

Just at the insertion of each perfect septum upon the œsophagus a mesenterial filament issues; it is coiled like a cork-screw, and extends only slightly below the lowest margin of the œsophagus (Pl. XII, fig. 5 c); there are thus 12 mesenterial filaments but, otherwise, all the perfect septa are completely sterile.

Between each two pairs of perfect septa there are 2 pairs of imperfect septa in each interseptal space, which extend only half way towards the œsophagus, and which are furnished with rather powerful longitudinal muscles and less developed transversal muscles (Pl. XII, fig. 5 3). These secondary septa carry acontia, which are present in rich abundance, and the reproductive organs are also secured to them quite down at the bottom of the gastric cavity.

Between each 2 pairs of these imperfect secondary septa there is a pair of very short septa, which are also furnished with longitudinal and transversal muscles, and carry reproductive organs (Pl. XII, fig. 5, 4). Whether acontia are attached to those tertiary septa can not be stated decisively, but it appeared to me that a few acontia were adherent to them. The investigated material was so small — only a single specimen — that it was most difficult to study fully the animals anatomy and histology.

Habitat.

Station No. 8. One specimen. At station No. 1 a specimen (Pl. III, fig. 6) was found which, however, differed somewhat in colour and was somewhat damaged. It is that specimen which has served for my investigations.

Artskarakter.

Fodskiven udvidet, med en tynd, uregelmæssig Rand; dens Overflade lidt hvælvet; Underfladen næsten plan, glat og straalet. Kroppen cylindrisk, 20^{mm} høi, bægerformigt udvidet mod Mundskiven, og de to nederste Trediedele omgivne af en inkrusteret, membranøs Skede, hvori den øverste Trediedel af Kroppen kan indtrækkes. Denne er nogen, glat, glindsende, tæt besat med Nematocyster. Mundskiven bred, lidt foldet med en aflang Mund og i Randen 2 Rækker lange, flagrende, retraktile Tentakler, — 24 i hver Række, hvoraf de indre ere længst, næsten dobbelt saa lange som Mundskivens Bredde. Mundskiven og Tentaklerne tæt besatte med Nematocyster. Mesodermale, cirkulære Muskler. Farven: Den inkrusterede Del af Kroppen og Fodskiven temmelig udpræget gulbrun; den nøgne Del enten næsten hvid eller bleg rosenrød. Mundskiven stærk brun med en hvid Ring omkring Munden, hvorfra udgaa hvide Striber hen til Tentaklerne. Disse ere i den ydre Række blegrode, i den indre Række brune og ved Grunden mørk kastaniebrune.

Phellia margaritacea, n. sp.

Tab. III, Fig. 7; Tab. XII, Fig. 6—12.

Dyret er udstrakt henved 30^{mm} høit. Fodskiven er bred, skiveformigt udvidet, naar den har fæstet sig paa en Sten, med en snart rund, snart aflang, tynd Rand, — har den derimod fæstet sig paa Ler, er den ikke synderlig bredere end Kolumnen, og Randen er da tyk, ligesom der paa dens iindre Flade er afsat en klæbrig, hornagtig Membran, der er inkrusteret med Biloculinler, og som er saa fast hæftet til Fodsaalen, at den kun med Kniven kan fjernes. Naar Fodskiven har fæstet sig paa en Sten, saa er dens Underflade lidt konkav og foldet straaelformigt fra Centrum mod Peripherien. Fodskivens øvre Flade er lidt hvælvet og fuldkommen inkrusteret, Tab. III, Fig. 7; Tab. XII, Fig. 6.

Kroppen er henved 25^{mm} høi, 18^{mm} bred nede ved Fodskiven og omtrent 10^{mm} bred ved Tentakleranden. De nederste tre Fjerdedele ere omgivne af en temmelig tyk, membranøs Skede, der er inkrusteret af Biloculinler og har foroven en skarp Rand, Tab. III, Fig. 7 a; Tab. XII, Fig. 6, 7 a. Den øverste Fjerdedel er cylindrisk, nogen, glat, perlemorglindsende, fint foldet efter Længden med en krenuleret Rand, Tab. III, Fig. 7 b; Tab. XII, Fig. 6 b.

Mundskiven er næsten flad, bredere end Kolumnen med en aflang Mund, der er foldet, og fra hvis Rand

Specific characteristics.

The pedal disc expanded, has a thin irregular margin; its upper surface is a little arcuate; the under-surface almost plane, smooth and radiate. The body cylindric, 20^{mm} in height, crateriform, expanded towards the oral disc, and the lowest two thirds-part is surrounded by an encrusted membranous sheath into which the uppermost third-part of the body can be withdrawn. That latter part is bare, smooth, lustrous, and closely covered with nematocysts. The oral disc broad, slightly folded; has an oblong mouth, and 2 series of long, waving, retractile tentacles in the margin. 24 tentacles in each series, of which the inner series contains the longest, being almost twice as long as the breadth of the oral disc. The oral disc and the tentacles are closely covered with nematocysts. Mesodermal circular muscles. *The colour.* The encrusted part of the body and the pedal disc a rather distinguished yellowish-brown; the exposed part, either almost white or pale rose-red. The oral disc strong brown, with a white annulus round the mouth, from which white stripes issue to the tentacles. In the outer series these are pale red, in the inner series brown, and at their bases dark chestnut brown.

Phellia margaritacea, n. sp.

Pl. III, fig. 7; Pl. XII, figs. 6—12.

The animal is, when extended, about 30^{mm} in height. The pedal disc is broad and discoidally expanded, when it has secured itself to a stone, with sometimes a round, sometimes an oblong, thin margin. Upon the other hand, when it secures itself to clay it is not much broader than the column, and the margin is then thick, while also, upon its under-surface, there is deposited a glutinous, corneous membrane encrusted with biloculina clay, so firmly adherent to the pedal sole that it can only be removed with the aid of knife. When the pedal disc has secured itself to a stone its under-surface is then a little concave, and radiately folded from the centre towards the periphery. The upper-surface of the pedal disc is a little arcuate, and completely encrusted (Pl. III, fig. 7; Pl. XII, fig. 6).

The body measures about 25^{mm} in height, and 18^{mm} in breadth at the pedal disc, and is about 10^{mm} in breadth at the tentacular margin. The lowest three-fourths part is surrounded by a rather thick, membranous sheath encrusted with biloculina clay, and which has at its top a sharp margin (Pl. III, fig. 7 a, Pl. XII, fig. 6, 7 a). The uppermost fourth part is cylindric, bare, smooth, mother-of-pearl lustrous, finely folded longitudinally, and has a crenulated margin (Pl. III, fig. 7 b; Pl. XII, fig. 6 b).

The oral disc is almost flat, broader than the column, but with an oblong mouth which is folded, and from whose

udgaa radiært fine Folder henimod Tentaklerne, Tab. XII, Fig. 6. Disse sidde i Mundskivens Peripheri i 2 afvexlende Rækker, 24 i hver Række; de ere omtrent saa lange som Mundskivens Bredde, Tab. III, Fig. 7; Tab. XII, Fig. 6. Saavel Tentaklerne som hele den øverste, nøgne Del kunne trækkes ind i den inkrusterede Skede, og naar Indtrækningen er fuldstændig, fremkommer enten en opretstaaende Soile, eller en Halvkugle, hvori den øverste Del af Dyret er ganske skjult.

Farven. Den inkrusterede Del af Kroppen er graa-brun af den indleirede Biloculina; den nøgne Del er bleg rosenrød med stærk Perlemorglands. Mundskiven er blegere med lidt mørkere Striber. Tentaklerne rosenrøde ved Grunden, men deres øverste Halvdel er mørkere og lidt brunlig, Tab. III, Fig. 7.

Et Tversnit af den inkrusterede Kropsdel viser, at der er to Lag udenfor den egentlige Cutis. Det ene Lag, det ydre, bestaar af en meget seig Slimmembran, hvori er indleiret en Mængde fremmede, haarde Legemer, som egentlig danner Krusten, Tab. XII, Fig. 7 *a*, og indenfor denne en skarp afgrændset, fibrilløs Membran, Cuticula, Tab. XII, Fig. 7 *b*, der er fast adhæreret til Ectodermet. Dette dannes af temmelig lange Cylinderceller uden Cilier, Tab. XII, Fig. 7 *c*, imellem hvilke sees mange spredte, encellede Slimkjertler. Indenfor Ectodermet er et bredt, fibrillært Bindevævslag, Tab. XII, Fig. 7 *d*, i hvis Midte sees temmelig fine, undulerende, cirkulære Muskelfibriller, Tab. XII, Fig. 7 *e*, der paa enkelte Steder synes at nærme sig Ectodermet, imedens de paa andre nærme sig Entodermet; tydeligst sees de cirkulære Muskler paa Længdesnit.

Et Tversnit af den nøgne Kropsdel viser, at her ingen Cuticula findes, men Ectodermet bestaar af længere, cilierende Cylinderceller, imellem hvilke baade encellede Slimkjertler og Nematocyster findes; disse sidste dog ikke i nogen stor Mængde. Det fibrillære Bindevæv er meget bredt, og i dets Midte sees cirkulære Muskelfibre, stærkere udviklede end de, som findes i den inkrusterede Dels Bindevæv. Paa Mundskiven samle de cirkulære Muskler sig omkring Munden, hvor de synes at danne en Sphincter. De longitudinelle Muskler paa Tentaklerne ere fuldstændig ectodermale.

Der er 6 Par principale, fuldstændige Septa, som staa temmelig langt fra hverandre, Tab. XII, Fig. 12, og af hvilke der er 2 Par Retningsseptæ, Tab. XII, Fig. 7 *R*, 12 *R*, som adskille sig fra de øvrige 4 Par væsentlig derved, at de transverselle Muskler ere placerede paa den indre Flade af hvert Septum, Tab. XII, Fig. 7 *f*, og vende saaledes i hvert intraseptalt Rum imod hverandre. Disse principale Septa tage deres Begyndelse fra Centrum af Fodskivens indre Flade, hvor de ere vel adskilte og temmelig smale, men tiltage i Bredde, alt eftersom de komme længere op paa Kroppen, imedens de longitudinelle Muskler sidde paa den ydre Flade, Tab. XII, Fig. 7 *g*. Paa de

margin fine folds issue radially towards the tentacles (Pl. XII, fig. 6). These are seated in the periphery of the oral disc in 2 alternating series, 24 in each series; they are about as long as the breadth of the oral disc (Pl. III, fig. 7; Pl. XII, fig. 6). Both the tentacles as well as the entire uppermost bare portion, are capable of being withdrawn into the encrusted sheath, and when the retraction is complete, there is produced either a vertical pillar or a hemisphere, in which the uppermost portion of the animal is quite hidden.

The colour. The encrusted part of the body is grey-brown, from the embedded biloculina clay; the bare portion is pale rose-red, with a strong mother-of-pearl lustre. The oral disc is paler, with somewhat darker stripes. The tentacles rose-red at the base, but the uppermost half is darker and slightly brownish (Pl. III, fig. 7).

A transversal section of the encrusted portion of the body shows, that there are 2 layers outside the true cutis. The one layer, the outer one, consists of a very viscid, mucous membrane, in which there are embedded a multitude of foreign hard bodies, that really forms the crust (Pl. XII, fig. 7 *a*), and inside of it there is a sharply defined fibrillar membrane, cuticulum, (Pl. XII, fig. 7 *b*) which is firmly adherent to the ectoderm. This latter is formed of rather long cylinder-cells devoid of cilia (Pl. XII, fig. 7 *c*), between which a multitude of scattered unicellular mucous glands are observed. Inside of the ectoderm there is a broad layer of fibrillar connective-tissue (Pl. XII, fig. 7 *d*), in whose middle rather fine, undulating, circular muscle-fibres are seen (Pl. XII, fig. 7 *e*) which, in some places, appear to approach to the ectoderm, while in other places they approach to the entoderm. The circular muscles are most distinctly seen in longitudinal sections.

A transversal section of the bare part of the body shows, that no cuticulum is found in it, but the ectoderm consists of longish ciliating cylinder-cells, between which both unicellular mucous glands and nematocysts are found. These last are, however, not present in great abundance. The fibrillar connective-tissue is very broad, and in its middle, circular muscles, more powerfully developed than those in the connective-tissue of the encrusted part, are observed. Upon the oral disc the circular muscles collect themselves round the mouth, where they appear to form a sphincter. The longitudinal muscles on the tentacles are completely ectodermal.

There are 6 pairs of principal, perfect septa, placed rather far apart from each other (Pl. XII, fig. 12), and of these, 2 pairs are directive septa (Pl. XII, fig. 7 *R*, 12 *R*) which are distinguished from the other 4 pairs, principally by the transversal muscles being placed on the inner surface of each septum, (Pl. XII, fig. 7 *f*) and facing thus towards each other in each intraseptal space. These principal septa originate in the centre of the pedal disc's inner surface, where they are well separated and rather narrow, but they increase in breadth, gradually, as they extend farther up the body; while the longitudinal muscles are seated on the outer surface (Pl. XII, fig. 7 *g*). On

andre 4 Par fuldstændige Septa Tab. XII, Fig. 7, 1, Fig. 12, 1 ere de longitudinelle Muskler fæstede til den indre Flade af hvert Septum, Tab. XII, Fig. 7 *h*, og udfylde for en Del Intraseptalrummet, imedens de transverselle Muskler ere adhæerede til den ydre Flade og vende mod det interseptale Rum, Tab. XII, Fig. 7 *i*. De transverselle Muskler danne en finfoldet Membran, men de longitudinelle danne Buske og vise sig i Tversnit som skønne Grene, Tab. XII, Fig. 7 *g, h*, som fremkomme derved, at der fra hvert Septum udgaar en Mængde listeformige Bindevævsforgreninger, paa hvilke Musklerne sidde. De fuldstændige Septa ere golde, men bære Mesenterialfilamenter og Acontier. Disse sidste udmærke sig ved sin overordentlige Rigdom paa Nældeorganer; de ere fæstede ved den fri Rand af Septum, imellem denne og Mesenterialfilamentet, og som sædvanligt dannes Axen, der her synes at være ganske rund, af et fast Bindevæv, som er beklædt med cilierende Epithel (Endothelceller); imellem dette og Bindevævsaxen, hvilende paa denne, sees longitudinelle Muskelfibriller, der ligesom beklæde Axen. Foruden endel spredte, encellede Slimkjertler er Axen forøvrigt tæt besat med Nematocyster, som saagodtsom ganske skjuler Epithellet, Tab. XII, Fig. 8. Disse Nematocyster dannes væsentligst af lange, klare, lysbrydende, næsten cylinderformede Kapsler, der ere tilspidsede i den ene Ende, Tab. XII, Fig. 9, og indeslutte en fin Traad, som er yderst vanskelig at iagttage, selv ved overordentlig stærke Forstørrelser, saa at Kapselen har Udseende af at være uden Indhold. Men en hel Del af disse Nematocyster havde jaget Traaden ud, og den viste sig da som en lang Pidsk, hvis yderst fine Ende næsten blev usynlig, Tab. XII, Fig. 10.

I de ved de fuldstændige Septapar opstaaede 6 Interseptalrum eller Hovedkamre, er der Septa af anden og tredie Orden. Saaledes er der i 4 af disse Kamre et Par Septa af anden Orden, Tab. XII, Fig. 7, 2, Fig. 12, 2, der indtager Midtpartiet, er neppe halvt saa langt som de fuldstændige Septa og har de buskformede Længdemuskler vendte mod hverandre, Tab. XII, Fig. 7, 2. Til den ene Side af dette Septapar er to Par Septa, Tab. XII, Fig. 7, 3, og til den anden Side er et Par af tredie Orden, Tab. XII, Fig. 7, 4; men disse tertiære Septa ere noget uregelmæssige, idet hvert Septum staar temmelig langt fra det andet tilsvarende, saa at det har Udseende af, at de ikke ere stillede parvis, hvilket dog virkelig er Tilfældet. I de øvrige to Hovedkamre er der ligeledes et Par Septa af anden Orden, der som de før omtalte ere stillede i Midten; men til hver af dets Sider er der kun et Septapar af tredie Orden, Tab. XII, Fig. 7, 5. Samtlige Septapar af tredie Orden have omtrent samme Størrelse, rage kun lidet ind i Kamrene og have temmelig udprægede Længdemuskler. Septa saavel af anden som tredie Orden bære Acontier og Generationsorganer. Disse sidste vare kun lidet udviklede paa de undersøgte Exemplarer; hvorvidt Kjønnet er adskilt faar staa derhen. Til et Septum af anden Orden sees fæstet et langt, bugtet, baandformigt Legeme af en blændende hvid Farve, som under Mikro-

the other 4 pairs of perfect septa (Pl. XII, fig. 7, 1—12, 1), the longitudinal muscles are adherent to the inner surface of each septum (Pl. XII, fig. 7 *h*) and partially fill the intraseptal space; while the transversal muscles are adherent to the outer surface towards the interseptal space (Pl. XII, fig. 7 *i*). The transversal muscles form a finely folded membrane, but the longitudinal muscles form frutici, and in transversal sections present themselves as beautiful branches (Pl. XII, fig. 7 *g, h*), produced by a multitude of fillet-formed connective-tissue ramifications, upon which the muscles are seated, issuing from each septum. The perfect septa are sterile but carry mesenterial filaments and acontia. These last are distinguished by an exceeding wealth of nematocysts which are adherent to the free margin of the septum, between it and the mesenterial filament, and, as usual, the axis, which here appears to be quite round, is formed of a firm connective-tissue clad with ciliating epithelium (endothelial cells); between that and the connective-tissue axis, resting upon the latter, longitudinal muscular fibres are seen, which, as it were, clothe the axis. Besides with a number of scattered unicellular mucous glands, the axis is, otherwise, closely covered with nematocysts which almost entirely conceal the epithelium (Pl. XII, Fig. 8). These nematocysts are formed, principally, of long, pellucid, refracting, almost cylindric capsules that are acuminate at the one extremity (Pl. XII, Fig. 9) and enclose a fine filament, which is extremely difficult to observe, even on extremely powerful magnification, so that the capsule has the appearance of being empty. But a great many of these nematocysts had projected the filament, and it then showed itself like a long flagellum whose outermost fine extremity was invisible (Pl. XII, fig. 10).

In the 6 interseptal spaces, or principal chambers produced by the pairs of perfect septa, there are septa of the 2nd and 3rd order. There is thus in 4 of these chambers a pair of septa of the 2nd order (Pl. XII, fig. 7, 2, 12, 2) which occupy the mesial part, are scarcely half the length of the perfect septa, and which have the frutiform longitudinal muscles turned towards each other (Pl. XII, fig. 7, 2). At the one side of this pair of septa there are 2 pairs of septa (Pl. XII, fig. 7, 3) and at the other side one pair of the 3rd order (Pl. XII, fig. 7, 4), but these tertiary septa are somewhat irregular, as each septum stands pretty far apart from the other corresponding one, so that they have the appearance of not being placed in pairs, although that is, however, really the case. In the remaining two principal chambers there is, likewise, a pair of septa of the 2nd order, which like those previously mentioned are placed in the middle; but at each of its sides there is only one pair of septa of the 3rd order (Pl. XII, fig. 7, 5). All the pairs of septa of the 3rd order are about uniform in size, extend only a short way into the chambers, and have rather distinguished longitudinal muscles. The septa of both the 2nd and 3rd orders carry acontia and reproductive organs. These last are only slightly developed in the specimens investigated. Whether the sexes are separated must remain undecided for the present. To

skopet viser sig at være en Æggestok, hvori sees parvis Æg liggende, men ikke meget udviklede, Tab. XII, Fig. 11, 12. Svælgrøret er meget vidt, strækker sig omtrent halvveis ned i Gastralhulheden og er forsynet med to Svælgruber. Parieto-basilarmuskelen er yderst tynd og meget smal.

Findested.

- Station 295. To meget smaa, yderst stærkt kontraherede Exemplarer.
 — 303. To Exemplarer.
 — 353. Flere Exemplarer.

Artskarakter.

Hele Dyret er udstrakt 30^{mm} høit. Fodskiven bred, skiveformigt udvidet med en dels rund, noget tyk, dels aflang, tynd Rand og et Chitinlag paa Underfladen. Kolumnen henved 25^{mm} høi, 18^{mm} bred ved Fodskiven, 10^{mm} bred ved Tentakelranden. Dens nederste tre Fjerdedele samt Fodskivens øvre Flade stærkt inkrusteret; dens øverste Fjerdedel cylindrisk, nøgen, glat, perlemorglindsende, fint foldet efter Længden med en krenuleret Rand. Mundskiven flad; Munden aflang, foldet, udsendende vifteformigt fine Folder mod Tentaklerne. Disse, siddende i Peripherien i 2 afvexlende Rækker, 24 i hver, ere omtrent saa lange som Mundskivens Bredde. Hele den øverste, nøgne Del med Mundskive og Tentakler retraktile. Farven: Den inkrusterede Del graabrun; den nøgne Del bleg rosenrød med stærk Perlemorglands. Mundskiven blegere med lidt mørkere Straaler. Tentaklerne rosenrøde ved Grunden, deres øverste Halvdel mørkere, svagt brunlig.

Phellia arctica, n. sp.

Tab. III, Fig. 8; Tab. XII, Fig. 13, 14; Tab. XIII, Fig. 1—4.

Hele Dyret er i fuld Vigør med udfoldede Tentakler 40^{mm} høit, 12—15^{mm} bredt forneden, men smalner lidt af opover mod Tentakelranden, Tab. III, Fig. 8; Tab. XIII, Fig. 1. Fodskiven er lidt bredere end Kroppens Tykkelse; den har en meget tyk, lidt indbøiet Rand, og dens Underflade er lidt konkav og belagt med en chitinagtig Membran, imedens Overfladen er lidt hvælvet og stærkt inkrusteret.

Kroppens nederste tre Fjerdedele ere omgivne af en inkrusteret Overhud i Form af en Skede, der foroven har

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

a septum of the 2nd order, a long bulging ribbon-like body of a blinding-white colour is seen to be attached, that under the microscope shows itself to be an ovary in which ova are seen lying in pairs but not much developed (Pl. XII, fig. 11, 12). The œsophagus is very wide, extends about half way down the gastric cavity and is furnished with 2 gullet-grooves. The parieto-basilar muscle is extremely thin and very narrow.

Habitat.

- Station No. 295. Two very small, extremely contracted specimens.
 — " 303. Two specimens.
 — " 353. Several specimens.

Specific characteristics.

The entire animal is, when extended, 30^{mm} in height. The pedal disc broad, discoidally expanded, with a partly round, somewhat thick, and partly oblong, thin margin, and it has a chitinous layer on the under-surface. The column about 25^{mm} in height, 18^{mm} in breadth at the pedal disc, 10^{mm} broad at the tentacular margin. Its lowest three-fourths part and the upper-surface of the pedal disc are strongly encrusted. Its uppermost fourth part cylindric, bare, smooth, mother-of-pearl lustrous, finely folded longitudinally, and with a crenulated margin. The oral disc flat; the mouth oblong, folded, sending out fine folds in fiabelliform towards the tentacles. The tentacles, seated in the periphery in 2 alternating series, 24 tentacles in each, are about the same in length as the breadth of the oral disc. The entire upper bare part and the oral disc and tentacles are retractile. *The colour.* The encrusted part greyish-brown; the bare part pale rose-red, with strong mother-of-pearl lustre. The oral disc paler with slightly darker rays. The tentacles rose-red at the base, their uppermost half part darker, faint brownish.

Phellia arctica, n. sp.

Pl. III, fig. 8; Pl. XII, figs. 13, 14; Pl. XIII, figs. 1—4.

When the entire animal is in full vigour, with outstretched tentacles, it measures 40^{mm} in height, and 12—15^{mm} in breadth at the base, but diminishes in thickness a little up towards the tentacular margin (Pl. III, fig. 8; Pl. XIII, fig. 1). The pedal disc is a little broader than the thickness of the body; it has a very thick, slightly involved margin, and its under-surface is slightly concave and coated with a chitinous membrane, while the upper-surface is a little arcuated and strongly encrusted.

The lowest three-fourths part of the body is surrounded by an encrusted outer integument, in the form of

en afrundet, skarpt begrændset Rand, Tab. III, Fig. 8 a; Tab. XIII, Fig. 1 a; den øverste Fjerdedel er nøgen, glat, forsynet med fine Længdestriber, der antyde Septainserterionerne, og er saa gjennemsigtig, at Mesenterialfilamenterne kunne sees, Tab. III, Fig. 8 b; Tab. XIII, Fig. 1 b. Imellem Linierne sees yderst smaa, runde Vorter, som synes at staa i et Par Tverrækker. Disse Vorter, der især blive tydelige under Kontraktionen, men forresten kan sees under Loupen, er paa Midten forsynet med en Grube og maa betragtes som Sugevorter, Tab. XII, Fig. 14.

Mundskiven er næsten plan, strækker sig noget udover Kolumnen og har en Mængde fine Folder, der straae ud fra Munden mod Peripherien. Munden er aflang med tykke, foldede Læber, Tab. XIII, Fig. 1. Tentaklerne ere lange, slanke og staa i 4 Rækker. I den yderste eller 4de Række staa de lige i Kroppens øverste Rand, ere glasklare, traadformige og omtrent 48 i Antal. Den 3die Række har det samme Antal; de ere noget tykkere og sidde afvejlende med de foregaaende; ogsaa i den 2den Række er der 48, som ere baade længere og tykkere end de i 3die Række; men i den 1ste eller inderste Række er der 24; disse ere de længste og tykkeste, Tab. XIII, Fig. 1. Hele den øverste, nøgne Del af Kolumnen med Mundskiven og Tentakler kan fuldstændig drages ind i den inkrusterede Skede og ganske skjules af denne. Halvt indtrukken skjules Tentaklerne, Mundskiven og den nøgne Del af Kolumnen, og der dannes da en Halvkugle med udprægede Folder, Tab. XII, Fig. 13 a. Er den nøgne Del helt indtrukken, sees kun Skeden som en opretstaaende Soile. Fjernes den inkrusterede Skede fra den indenfor værende Hud, hvortil den forøvrigt er meget fast adhæreret, saa frembyder Kroppens Overflade under Loupen et vortet Udseende. Vorterne staa her i temmelig regelmæssige Tverrækker, noget langt fra hverandre, have paa Midten en Grube og ere fuldkomment lig dem, som findes paa den nøgne Del, Tab. XII, Fig. 14.

Farven. Den inkrusterede Skede er graabrun; den nøgne Del af Kroppen er næsten hvid og saa gjennemsigtig, at de temmelig stærkt gulfarvede Mesenterialfilamenter sees. Skiven er fin rosenrød med en smal, gulhvid Ring omkring Munden. Svælget er gulhvidt. Tentaklerne ere i den 1ste, inderste, Række, stærkt laxerøde; i den 2den Række er Farven mindre intens; i den 3die Række er den fin rosenrød, og i den 4de, yderste, Række ere Tentaklerne saagodtsom farveløse, men have en svag, violet Ring omkring deres Grunddel, Tab. III, Fig. 8.

Paa et Tversnit af Kroppens inkrusterede Del sees det ydre Lag at være dannet af en strukturløs, bred Membran, hvori er indleiret fremmede Legemer, saasom Ler,

a sheath, which at its top has a rounded, sharply defined margin (Pl. III, fig. 8 a; Pl. XIII, fig. 1 a). The uppermost fourth part is bare and smooth, and is furnished with fine longitudinal stripes which indicate the insertions of septa, and it is so transparent that the mesenterial filaments can be seen (Pl. III, fig. 8 b; Pl. XIII, fig. 1 b). Between the lines, extremely small, round nodules are observed, which appear to be placed in a couple of transversal series. These nodules become especially distinct during contractions of the animal, but at other times can only be observed with the assistance of a magnifier; they are furnished in their middle with a cavity and must be considered as suckers (Pl. XII, fig. 14).

The oral disc is almost plane and extends itself somewhat out beyond the column, and it has a multitude of fine folds radiating from the mouth towards the periphery. The mouth is oblong, with thick folded labiæ (Pl. XIII, fig. 1). The tentacles are long, attenuated, and placed in 4 series. In the outermost or 4th series they are situated exactly in the uppermost margin of the body, are translucent, filamentous, and about 48 in number. The 3rd series of tentacles has the same number; they are somewhat thicker, and are placed alternating with those of the preceding series. In the 2nd series of tentacles there are also 48, which are both longer and thicker than those of the 3rd series; but in the 1st or innermost series there are 24; these are the longest and thickest (Pl. XIII, fig. 1). The entire uppermost, bare part of the column, with the oral disc and tentacles, can be entirely withdrawn into the encrusted sheath and be completely concealed by it. When only half retracted, the tentacles, oral disc and bare part of the column are hidden, and there is then formed a hemisphere with distinguished folds (Pl. XII, fig. 13 a). When the bare part is entirely retracted the sheath alone is seen, appearing like a vertical pillar. When the encrusted sheath is removed from the integument lying inside of it, to which it is, however, very firmly adherent, the external surface of the body then presents, under the magnifier, a nodulous appearance. The nodules are here placed in rather regular transversal series, somewhat apart from each other, and have a cavity in the middle, and are exactly similar to those which are observed on the bare part (Pl. XII, fig. 14).

The colour. The encrusted sheath is grey-brown; the bare part of the body is almost white, and so transparent that the rather strongly yellow-coloured mesenterial filaments may be seen. The oral disc is fine rose-red with a narrow yellowish-white annulus round the mouth. The oesophagus is yellowish-white. The tentacles are in the 1st, innermost series, strong salmon-red colour; in the 2nd series the colour is less intense, in the 3rd series it is fine rose-red, and in the 4th, outermost series, the tentacles are almost colourless, but have a faint violet-coloured annulus round their base (Pl. III, fig. 8).

In a transversal section of the encrusted part of the body, the outer layer is seen to be formed of a structureless broad membrane in which foreign bodies are embedded,

Skjælstumper, Kiselstykker o. s. v., hvoraf den Harbund væsentlig bestaar, hvorpaa Dyret lever. Indenfor denne Membran er et smalt, vel begrændset, fibrillært Lag, Cuticula, der er fast bundet til det indenfor liggende Ectoderm, hvoraf det er et Produkt. Ectodermet dannes af Cylinderceller med deres Kjerner, men uden Cilier, Tab. XIII, Fig. 2 a, og imellem Cellerne sees aflange, encellede Slimkjertler i temmelig stor Mængde. Nogle af disse ere ganske tomme og ligne Vacuoler, andre ere mere eller mindre fyldte med finkornet Masse, der som oftest skjuler Kjernen. Indenfor Ectodermet er et meget bredt, fibrillært Bindevævslag, forsynet med Bindevævslegemer og fine Saftkanaler, Tab. XIII, Fig. 2, 3 b. Paa den indre Flade af dette Bindevæv, imod Endothelet, iagttages cirkulære Muskler, Tab. XIII, Fig. 2 c, der ligge i Bundter, hvilket især er fremtrædende paa Længdesnit, Tab. XIII, Fig. 3 c. Paa den øverste, nøgne Del af Kroppen er der ingen Cuticula; Ectodermets Cylinderceller ere længere og forsynede med Cilier, og der er rigere Forsyning af encellede Slimkjertler, ligesom Nematocyster optræde i temmelig stor Mængde.

Der er 6 Par principale, fuldstændige, golve Septa, hvoraf de to Par ere Retningsseptas, som adskille sig fra de øvrige ved som sædvanligt at have de transverselle Muskler fæstede paa den indre og de longitudinelle paa den ydre Flade. De øvrige 4 Septapar have deres longitudinelle Muskler fæstede paa den indre Flade og vende mod hverandre i det intraseptale Rum, Tab. XIII, Fig. 4 a, imedens de transverselle Muskler sidde paa den udvendige Flade og vende mod det interseptale Rum, Tab. XIII, Fig. 4 b. De longitudinelle Muskler danne stærke Forgøninger, der ere rigest og længst paa Midtpartiet af Septum, Tab. XIII, Fig. 4, imellem Gastralhulhedens Væg og Svælgrøret, det vil egentlig sige, at fra Septum udgaa dels enkelte, dels forgrenede Bindevævsforlængelser, paa hvilke Længdemusklerne ere fæstede. De transverselle Muskler danne en fint foldet Membran, der beklæder næsten hele Fladen af Septum; kun et smalt Belte langs dettes fri Rand er uden Muskler. Til samtlige fuldstændige Septa ere Mesenterialfilamenter bundne; de tage deres Begyndelse lige ved Skillevæggens Tilheftning til Svælgrøret, strække sig et Stykke nedenfor dette og have en stærk straagul Farve.

Imellem hvert 2 Par af de fuldstændige Septa, altsaa i hvert Hovedkammer, er der 3 Par ufuldstændige Septa, hvoraf det midterste Par er det længste og naar næsten hen til Svælgrøret, Tab. XIII, Fig. 4 c. Længdemusklerne sidde paa den indre Flade mod hverandre i det intraseptale Rum, Tab. XIII, Fig. 4 d, og ere forholdsvis ligesaa stærkt udviklede, som de paa de principale, fuldstændige Septa, hvilket ogsaa er Tilfældet med de transverselle Muskler, der sidde paa den ydre Flade fra hverandre i det interseptale Rum, Tab. XIII, Fig. 4 e. Disse sekundære

such as clay, bits of shell, silicious fragments &c. of which the sea-bottom where the animal exists principally consists. Inside of that membrane there is a narrow, well-defined fibrillar layer — cuticulum — which is firmly secured to the ectoderm lying inside, and of which it is a product. The ectoderm is formed of cylinder cells with their nuclei, but without ciliæ (Pl. XIII, fig. 2 a) and between the cells, oblong, unicellular mucous glands are observed in rather great abundance. Some of these glands are quite empty, and resemble vacuoli, others are more or less filled with a fine granular mass, that most frequently conceals the nucleus. Inside of the ectoderm there is a very broad, fibrillar layer of connective-tissue, furnished with connective-tissue corpuscles and fine nutritory ducts (Pl. XIII, fig. 2, 3 b). On the inner-surface of this connective-tissue, towards the endothelium, circular muscles are observed (Pl. XIII, fig. 2 c), lying in fasciculi, and which are especially prominent in longitudinal sections (Pl. XIII, fig. 3 c). On the uppermost bare part of the body there is no cuticulum; the cylinder-cells of the ectoderm are longer and are furnished with ciliæ, and there is a richer supply of unicellular mucous glands, while, also, nematocysts appear in rather great abundance.

There are 6 pairs of principal, perfect, sterile septa, of which two pairs are directive septa, and distinguish themselves from the others by, as usual, having the transversal muscles adherent to the inner, and the longitudinal muscles to the outer surface. The remaining 4 pairs of septa have their longitudinal muscles secured to the inner surface, and face towards each other in the intraseptal space (Pl. XIII, fig. 4 a), while the transversal muscles are seated on the exterior surface, and face towards the interseptal space (Pl. XIII, fig. 4 b). The longitudinal muscles form strong ramifications, which are richest and longest in the mesial part of the septum (Pl. XIII, fig. 4), between the wall of the gastric cavity and the œsophagus, that is, really, to say, that from the septum there issue, partly single, partly ramified connective-tissue prolongations on which the longitudinal muscles are secured. The transversal muscles form a finely folded membrane which clothes almost the entire surface of the septum; there is only a narrow belt left along its free margin which is devoid of muscles. Mesenterial filaments are secured to all the perfect septa; they originate just at the attachment of the divisional walls to the œsophagus, and extend themselves a piece down it, and have a strong straw-yellow colour.

Between each two pairs of the perfect septa, consequently in each principal chamber, there are 3 pairs of imperfect septa, of which the intermediate pair is the longest, and extends almost to the œsophagus (Pl. XIII, fig. 4 c). The longitudinal muscles are seated on the inner surface, facing each other in the intraseptal space (Pl. XIII, fig. 4 d) and are, relatively, quite as strongly developed as those upon the principal, perfect septa, which is also the case with the transversal muscles, which are seated on the outer surface, facing from each other in the inter-

Septa bære saavel Acontier som Kjønsgorganer, og til hver Side af dem sees det tertiære, ufuldstændige Septapar, Tab. XIII, Fig. 4 *f*, der er meget smalt, rager knapt en Trediedel saa langt frem i det interseptale Rum som de sekundære Septa. De ere ligeledes forsynede med Længde- og Tvermuskler og bære baade Acontier og Kjønsgorganer; disse sidste ere kun lidet udviklede. Svælgrøret er vidt, foldet, forsynet med 2 brede Svælgruber og indtager omtrent to Trediedele af Gastralhulhedens Længde, Tab. XIII, Fig. 4 *g*.

Findested.

Station 290. Et Exemplar.

Artskarakter.

Hele Dyret 40^{mm} høit, 12—15^{mm} bredt lige ved Fodskiven og smalner af mod Tentakelranden. Fodskiven lidt bredere end Kroppen med en tyk, lidt indbøiet Rand og en lidt konkav Underflade. Trefjerdedele af Kolumnen med den hvælvede Fodoverflade ere omgivne af en inkrusteret Skede med en afrundet, skarpt begrændset Rand foroven. Den øverste Fjerdedel er nøgen, glat, forsynet med fine Længdelinier og saa gjennemsigtig, at Mesenterialfilamenterne sees. Imellem Linierne yderst smaa, runde Vorter, forsynede med en Grube (Suckers). Mundskiven plan, fint foldet. Munden aflang med foldede Læber. Tentaklerne lange, slanke, retraktile, i 4 Rækker. 24 i den 1^{ste}, inderste, Række, hvilke ere de længste og tykkeste, 48 i hver af de øvrige 3 Rækker. Hele den øverste, nøgne Del af Kolumnen med Mundskive og Tentakler kan fuldstændig drages ind i den inkrusterede Skede. Fjernes denne, sees regelmæssige Tverrækker af Suckers. Farven: Den inkrusterede Skede graabrun. Kroppens nøgne Del næsten hvid. Mundskiven fint bleg rosenrød med en smal, gulhvid Ring omkring Munden. Svælget gulhvidt. Tentakler i 1^{ste} Række laxerøde, i 2^{den} og 3^{die} Række mindre intens røde og i 4^{de}, yderste, Række næsten farveløse, men have en svag violet Ring omkring Grunddelen. De cirkulære Muskler endodermale.

Phellia crassa, n. sp.

Tab. IV, Fig. 9; Tab. XIII, Fig. 5, 6; Tab. XIV, Fig. 1—5.

Hele Dyret er omkring 45—50^{mm} høit; paa enkelte Exemplarer er det kun 10^{mm} bredt ved Foden, imedens det paa andre er 20^{mm} og derover, Tab. IV, Fig. 9; Tab. XIII, Fig. 5.

septal space (Pl. XIII, fig. 4 *e*). These secondary septa carry both acontia and reproductive organs, and on each side of them the tertiary imperfect pairs of septa are observed (Pl. XIII, fig. 4 *f*); these are very narrow and reach scarcely a third part as far forward into the interseptal space as the secondary septa do. They are, likewise, furnished with longitudinal and transversal muscles, and carry both acontia and reproductive organs; these last are only little developed. The œsophagus is wide, folded, furnished with 2 broad gullet-grooves, and occupies about two-third parts of the length of the gastric-cavity (Pl. XIII, fig. 4 *g*).

Habitat.

Station No. 290. One specimen.

Specific characteristics.

The entire animal measures 40^{mm} in height, 12—15^{mm} in breadth just at the pedal disc, diminishing in thickness upwards towards the tentacular margin. The pedal disc a little broader than the body, has a thick, slightly involved margin, and a slightly concave under-surface. Three-fourth parts of the column with the surface of the arcuate base, is surrounded by an encrusted sheath having a rounded sharply defined margin at its top. The uppermost fourth part is bare, smooth, furnished with fine longitudinal lines, and is so transparent that the mesenterial filaments can be seen. Between the lines there are extremely small, round nodules furnished with a cavity in the middle (suckers). The oral disc plane, finely folded. The mouth oblong, with folded labiæ. The tentacles long, attenuated, retractile, in 4 series. 24 tentacles in the 1st, innermost series, and these the longest and thickest; 48 tentacles in each of the other 3 series. The entire uppermost, bare part of the column with the oral disc and tentacles, can be completely withdrawn into the encrusted sheath. When that is removed, regular transversal series of suckers are seen. *The colour.* The encrusted sheath grey-brown; the bare part of the body almost white; the oral disc fine pale rose-red with a narrow yellowish-white annulus round the mouth. The œsophagus yellowish-white. The tentacles in the 1st series salmon-red colour; in the 2nd and 3rd series not quite so intense red, and in the 4th, outermost series almost colourless, but with a faint violet annulus around the base. The circular muscles endodermal.

Phellia crassa, n. sp.

Pl. IV, fig. 9; Pl. XIII, fig. 5, 6; Pl. XIV, fig. 1—5.

The entire animal measures about 40—50^{mm} in height, and in some specimens it measures only 10^{mm} in breadth at the base, whilst in others the breadth is 20^{mm} and upwards (Pl. IV, fig. 9; Pl. XIII, fig. 5).

Fodskiven er bred, næsten skiveformigt udvidet med en tynd, uregelmæssig Rand og en temmelig jævn Underflade. beklædt med en tynd, chitinagtig Membran, der fæster den til den Gjenstand, hvorpaa den sidder, hvilken i Almindelighed er døde Skaller af Astarte; kun et Exemplar syntes at være løsrevet fra den almindelige Befæstningsgjenstand, og hos det var Fodskivens Rand indbøiet over en Lerklump, der i dette Tilfælde dannede Befæstningsgjenstanden, Tab. IV, Fig. 9.

Saa vel Fodskivens Overflade som de nederste to Trediedele af Kolumnen ere beklædte med en grovt inkrusteret, membranøs Skede, der foroven har en rund, jævn, men stærkt udpræget Rand, Tab. IV, Fig. 9 a; Tab. XIII, Fig. 5 a. Denne inkrusterede Del af Kroppen aftager successivt i Tykkelse, saa at den øverste Rand er knapt halvt saa bred som det nederste Parti ved Fodskiven, Tab. IV, Fig. 9. Den øverste Trediedel er cylindrisk, nøgen, glat, lidt smalere end Skedens Rand og forsynet med Længdefolder, imellem hvilke findes fine Furer, Tab. IV, Fig. 9 b; Tab. XIII, Fig. 5 b. Paa Folderne iagttages dels smaa runde Vorter med en Grube i Midten (Suckers), dels Cinclides. De første have en Tendents til at danne Tverrækker, der dog ere meget uregelmæssige; de sidste ere aflange Spalter, der kun ere sparsomme, og igjennem enkelte af dem stikker en Acontie frem.

Mundskiven er næsten plan. Munden er aflang med tykke Læber, der danne 5 Folder paa hver Side af Mundvigene (Gonidialgruberne), Tab. XIII, Fig. 5. Tentaklerne staa i 2 Rækker, 12 i hver; de ere retraktile, ikke meget lange, omtrent som Skivens Bredde. I den yderste Række sidde Tentaklerne lige i Kroppranden og synes at være lidt tykkere end de i den inderste Række, der sidde afvejlende med de første, Tab. XIII, Fig. 5. Hele den nøgne, øverste Del af Kroppen med Mundskive og Tentakler kunne med Lethed trækkes ind i den inkrusterede Skede og derved ganske skjules af denne, der da antager snart Formen af en afstumpet Kegle, snart af en fladtrykt Halvkugle, Tab. XIII, Fig. 6. Borttager man den inkrusterede Skede, saa frembyder Kroppens Overflade et yderst fintkornet Udseende, der under Loupen viser sig at være tætstaaende, smaa Vorter, fuldkommen lig dem paa den nøgne Del, Tab. XIII, Fig. 6 a.

Farven. Den inkrusterede Skede, der bestaar væsentligst af grove Sandkorn, er graabrun; den nøgne Del af Kroppen er næsten hvid. Tentaklerne i yderste Række ere violetrøde, intensere ved Grunden; de i den inderste Række ere mere rosenrøde. Mundskiven er violetrød, straalet med violette Striber. De foldede Mundlæber ere intensere violetrøde. Kropshuden indenfor Skeden er ganske hvid. Vorterne skinne lidt i det Gule.

The pedal disc is broad, almost discoidally expanded, has a thin irregular margin and a rather even under-surface clad with a thin, chitinous membrane that secures it to the object upon which it is seated, usually shells of dead Astarte; only one specimen appears to be torn from the usual object of adhesion and, in it, the margin of the pedal disc was curved over a lump of clay, which in this case formed the object of adhesion (Pl. IV, fig. 9).

Both the upper-surface of the pedal disc as well as the lowest two-third parts of the column are clad with a coarse encrusted membranous sheath, which at the top has a round, even, but strongly prominent margin (Pl. IV, fig. 9 a; Pl. XIII, fig. 5 a). This encrusted part of the body diminishes, gradually, in thickness, so that the uppermost margin is scarcely half the breadth of the lowest part at the pedal disc (Pl. IV, fig. 9). The uppermost third part is cylindric, bare, smooth, slightly narrower than the margin of the sheath, and is furnished with longitudinal folds between which fine furrows are observed (Pl. IV, fig. 9 b; Pl. XIII, fig. 5 b). On the folds there may be observed, partly small round nodules with a cavity in the middle (suckers), partly cinclides. The first-named have a tendency to form transversal series, which are, however, very irregular; the last-named are oblong fissures which are only sparingly present, and through some of them an acontia is protruded.

The oral disc is almost plane. The mouth is oblong, with thick labiæ which form 5 folds on each side of the oral angles (gonidial grooves) (Pl. XIII, fig. 5). The tentacles are placed in 2 series, 12 in each; they are retractile, not very long, about the breadth of the disc. In the outermost series the tentacles are seated quite at the margin of the body, and appear to be a little thicker than those of the innermost series, which are placed so as to alternate with those of the first series (Pl. XIII, fig. 5). The entire, bare, uppermost part of the body with the oral disc and tentacles, can be withdrawn with ease into the encrusted sheath, and is thus quite concealed by it, and the sheath then assumes, sometimes the form of a shortened blunted cone, sometimes of a flattened hemisphere (Pl. XIII, fig. 6). When the encrusted sheath is removed, the external surface of the body then presents an extremely fine granulated appearance, which, under the magnifier, shows itself to arise from compactly placed, small nodules, quite similar to those on the bare part (Pl. XIII, fig. 6 a).

The colour. The encrusted sheath, which consists principally of coarse grains of sand, is grey-brown; the bare part of the body is almost white. The tentacles of the outermost series are violet-red with a more intense colour at the base; those of the innermost series are more rosy-red. The oral disc is violet-red radiated with violet stripes. The folded oral labiæ are a more intense violet-red. The integument of the body, inside the sheath, is quite white. The nodules (suckers) a lustrous yellowish-colour.

Den inkrusterede Del af Kroppen viser paa Tværsnit to Hovedlag, nemlig Skeden, der bestaar af en Slimmembran, hvori de fremmede, haarde Legemer ere indleirede i stor Mængde, og Cuticula, der er fast adhæreret til det indenfor værende Ectoderm. Dette er dannet af Cylinder-celler, som ikke ere meget lange og uden Cilier, men imellem Cellerne sees mange encellede Slimkjertler, ligesom Sugevorterne vise sig at være lukkede indad, saa at de ikke perforere Huden. Indenfor Ectodermet er et ikke meget bredt, fibrillært Bindevæv, i hvis Midte sees et temmeligt bredt Belte af cirkulære Muskelfibre, der danne Bundter og strække sig henimod den indre Flade, som er beklædt med Endothelceller, forsynede med lange Cilier. Paa den nøgne Del af Kroppen er Ectodermcellerne længere og forsynede med Cilier, Tab. XIV, Fig. 3 a; de encellede Slimkjertler synes at være i større Mængde tilstede, ligesom her optræde Nematocyster i saa stor Rigdom, at de saagodtsom ganske dække Ectodermet, Tab. XIV, Fig. 3 b. Indenfor dette er Bindevævet, Tab. XIV, Fig. 3 c med sine cirkulære Muskelfibre, Tab. XIV, Fig. 3 d, som her ere stærkere udviklede end paa den inkrusterede Del. Muskelfibrillerne, der danne Bundter, sees tydeligst paa Længdesnit, Tab. XIV, Fig. 4 a. Paa Mundskiven er en lignende Mængde Nematocyster som paa den nøgne Del af Kroppen, og de cirkulære Muskelfibre samle sig omkring Munden til en temmelig kraftig Sphincter.

Tentaklerne have et temmelig bredt Ectoderm, bestaaende af lange, cilierende Cylinder-celler, Tab. XIV, Fig. 1 a, imellem hvilke sees hist og her encellede Slimkjertler samt Nematocyster, der paa større Strækninger ganske dække Ectodermcellerne, Tab. XIV, Fig. 1 b. Indenfor disse sees paa Bindevævsfladen, Tab. XIV, Fig. 1 c, og ligesom indleiret i denne, stærkt udviklede, longitudinelle Muskelfibre, som danne Bundter og ere fuldkommen ectodermale, Tab. XIV, Fig. 1 d. Selve Bindevævslaget er ikke meget bredt, det er fibrillært, forsynet med Bindevævslegemer og fine Ernæringskanaler, og paa dets indre Flade sees fine, cirkulære Muskelfibre, beklædte af Endothelet, Tab. XIV, Fig. 1 e, f. Svælgrøret er cylindrisk, strækker sig til lidt over Halvdelen af Gastralhulheden og har paa dets indre Flade to udprægede Svælggruber, der ere Fortsættelser af Mundvigene, Tab. XIV, Fig. 2 a, og 5 Længdefolder paa hver Side af Gruberne, hvilke især ved Svælgrørets Sammentrækninger bleve tydelige, Tab. XIV, Fig. 2 b. Svælgrørets ydre Flade er beklædt med lange, cilierende Cylinder-celler, Tab. XIV, Fig. 5 a, som ligeledes beklæde Kamrene, og indenfor dette Endothel er Bindevævet, Tab. XIV, Fig. 5 b, hvorfra udgaa listeformige Forlængelser, Tab. XIV, Fig. 5 c, der bidrage til at danne Folderne i Svælget. Imellem Bindevævs ydre Flade og Endothelet er et Belte med cirkulære Muskelfibre, Tab. XIV, Fig. 5 d, der ved Kontraktioner danne ligesom en Konus, Tab. XIV, Fig. 5 d, ind i Folderne, og paa dets indre Flade sees longitudinelle Muskel-

The encrusted part of the body shows, in transversal sections, two principal layers, viz. the sheath, consisting of a mucous membrane in which the hard foreign bodies are embedded in great abundance, and a cuticulum that is firmly adherent to the ectoderm lying inside. The latter is formed of cylinder-cells, which are not very long and are devoid of cilia, but between the cells numerous unicellular mucous glands are seen, whilst, also, the suckers show themselves to be shut inwards, so that they do not perforate the integument. Inside of the ectoderm there is a not very broad, fibrillar connective-tissue, in whose middle a rather broad belt of circular muscle-fibres is seen, that form fasciculi and stretch themselves towards the inner surface, which is clad with endothelial cells furnished with long cilia. On the bare part of the body the ectodermal cells are longer, and are furnished with cilia (Pl. XIV, fig. 3 a). The unicellular mucous glands appear to be present in great abundance, whilst, also, nematocysts appear here in such great abundance that they almost entirely conceal the ectoderm (Pl. XIV, fig. 3 b). Inside of that is the connective-tissue (Pl. XIV, fig. 3 c) with its circular muscle-fibres (Pl. XIV, fig. 3 d), which are, here, more powerfully developed than on the encrusted part. The muscular fibrils, which form fasciculi, are most distinctly observed in longitudinal sections (Pl. XIV, fig. 4 a). Upon the oral disc there is a similar abundance of nematocysts as on the bare part of the body, and the circular muscle-fibres collect themselves round the mouth into a rather powerful sphincter.

The tentacles have a rather broad ectoderm consisting of long ciliating cylinder-cells (Pl. XIV, fig. 1 a), between which there are here and there seen unicellular mucous glands, also nematocysts, which for considerable distances quite cover the ectodermal cells (Pl. XIV, fig. 1 b). Inside of these there are observed, on the surface of the connective-tissue (Pl. XIV, fig. 1 c), and, as it were, embedded in it, strongly developed longitudinal muscle-fibres, which form fasciculi and are completely ectodermal (Pl. XIV, fig. 1 d). The layer of connective-tissue itself is not very broad; it is fibrillar and is furnished with connective-tissue corpuscles and fine nutritory ducts; and on its inner-surface fine circular muscles clad with endothelium are seen, (Pl. XIV, fig. 1 e, f). The œsophagus is cylindric and extends itself over a little more than the half of the gastric cavity, and upon its inner-surface it has two distinguished gullet-grooves, that are continuations of the oral angles (Pl. XIV, fig. 2 a), and 5 longitudinal folds upon each side of the grooves which become especially distinct on the contraction of the œsophagus (Pl. XIV, fig. 2 b). The outer surface of the œsophagus is clad with long, ciliating cylinder-cells (Pl. XIV, fig. 5 a), which also clothe the chambers, and inside of this endothelium lies the connective-tissue (Pl. XIV, fig. 5 b), from which fillet-formed prolongations proceed, contributing to the formation of the folds in the œsophagus. Between the outer surface of the connective-tissue and the endothelium, there is a belt with circular muscle-fibres (Pl. XIV, fig. 5 d), which on contraction

fibre, Tab. XIV, Fig. 5 e, der støde lige til Epithelet, som beklæder Svælgrørets indre Flade. Dette Epithel bestaar af temmelig lange, cilierende Cylinderceller, Tab. XIV, Fig. 5 f, lig dem, som danne Ectodermet paa den nøgne Kropsdel, og imellem disse Celler sees temmelig tæt placeret encellede Slimkjertler, Tab. XIV, Fig. 5 g, h.

Der er 6 Par principale, fuldstændige, golde Septa, Tab. XIV, Fig. 2, hvoraf 2 Par ere Retningsseptata, Tab. XIV, Fig. 2 c, der svare til Svælgrørsgruberne. De to Septa i hvert af disse Par ere stillede temmelig langt fra hinanden, saa at det intraseptale Rum bliver vidt, Tab. XIV, Fig. 2 c, og paa hvert Septums ydre Flade ere de longitudinelle Muskler placerede i Form af Buske, som ere tykke i nogle Millimeters Afstand fra Svælgrøret, Tab. XIV, Fig. 2 d, imedens de transverselle Muskler beklæde Størstedelen af den indre Flade som en Lamel, Tab. XIV, Fig. 2 e. De øvrige 4 Septapar, nemlig 2 Par paa hver Side af Retningsseptata, have Musklernerne placerede ganske modsat disses; saaledes ere de longitudinelle Muskler fæstede til den indre Flade, rage ind i det intraseptale Rum, hvor de vende mod hverandre og tildels mødes, Tab. XIV, Fig. 2 f, medens de transverselle Muskler ligge paa den ydre Flade, vende fra hverandre i det interseptale Rum, Tab. XIV, Fig. 2 g. De fuldstændige Septa bære Mesenterialfilamenter, der som sædvanligt tage sin Begyndelse lige ved Septainsertionerne paa Svælgrøret og ligge sammenrullede et lidet Stykke nedover Septums fri Rand.

Imellem hvert 2 Par fuldstændige Septa (i de principale Kamre) er der et Par sekundære, ufuldstændige Septa, der ere temmelig brede, rage lidt over Halvdelen ind i Kamret og ere forsynede saavel med Længde- som Tvermuskler, hvoraf de første ere temmelig udviklede, Tab. XIV, Fig. 2 h. Disse Septa bære baade Acontier og Generationsorganer, af hvilke de sidste ere meget udviklede og bestaa af Æggestokke i Form af sammenrullede Baand, der udfylde ganske Kammeret og indeholde baade Æg og Unger, Tab. XIV, Fig. 2 i. Der er altsaa i det Hele kun 12 Par Septa, hvoraf de 6 Par ere fuldstændige. Parietobasilarmuskelen er yderst lidet udviklet; dette er Tilfældet hos alle de Phellia-arter, jeg har undersøgt. Grunden tør være den, at disse Dyr bevæge sig kun lidet, deres Fodskive er som oftest limet fast ved en chitinagtig Masse til den Gjenstand, hvorpaa de sidde.

Findested.

Station 290. 4 Exemplarer.

Artskarakter.

Hele Dyret 45—50^{mm} høit, paa enkelte Exemplarer 10^{mm} bredt ved Foden, paa andre 20^{mm} og derover. Fod-

forms, as it were, a cone (Pl. XIV. fig. 5 d) within the fold; and upon its inner surface longitudinal muscle-fibres (Pl. XIV., fig. 5 e) are seen, which quite meet the epithelium that clothes the inner surface of the œsophagus. This epithelium consists of rather long, ciliating cylinder-cells (Pl. XIV, fig. 5 f) like those which form the ectoderm of the bare portion of the body, and between these cells rather closely placed unicellular mucous glands are seen (Pl. XIV, fig. 5 g, h).

There are 6 pairs of principal, perfect, sterile septa (Pl. XIV, fig. 2) of which 2 pairs are directive septa (Pl. XIV, fig. 2 c) which correspond with the gonidial grooves. The two septa in each of these pairs are placed pretty far apart from each other, so that the intraseptal space becomes wide (Pl. XIV, fig. 2 c), and on the outer surface of each septum the longitudinal muscles are seated in the form of frutici, which are thickest at a few millimetres distance from the œsophagus (Pl. XIV, fig. 2 d) whilst the transversal muscles cloth the greater part of the inner surface like a lamella (Pl. XIV, fig. 2 e). The other 4 pairs of septa, viz. 2 pairs on each side of the directive septa, have the muscles placed quite the opposite of those; thus, the longitudinal muscles are secured to the inner surface, extend into the intraseptal space where they face towards each other and partly meet (Pl. XIV, fig. 2 f); but the transversal muscles lie on the outer surface and face from each other in the interseptal space (Pl. XIV, fig. 2 g). The perfect septa carry mesenterial filaments which, as usual, originate just at the insertions of the septa on the œsophagus and lie coiled together a little way down the free margin of the septum.

Between each 2 pairs of perfect septa (in the principal chambers), there is a pair of secondary, imperfect septa, which are rather broad, extend a little more than half way into the chamber, and are furnished with both longitudinal and transversal muscles, of which the first are pretty well developed (Pl. XIV, fig. 2 h). These septa carry both acontia and reproductive organs, of which the last-named are very fully developed, and consist of ovaries in the form of coiled ribbons that quite fill the chamber, and contain both ova and embryos (Pl. XIV, fig. 2 i). There are thus, altogether, only 12 pairs of septa, of which 6 pairs are perfect. The parieto-basilar muscle is extremely little developed; this is the case with all the Phellia species that I have examined. The reason may be, perhaps, that those animals move themselves only little; their pedal disc is most frequently glued by a chitinous substance to the object upon which it is seated.

Habitat.

Station No. 290. Four specimens.

Specific characteristics.

The entire animal, 45—50^{mm} in height, in some specimens 10^{mm} in breadth at the base, in others 20^{mm} and

skiven bred, skiveformigt udvidet med en tynd, uregelmæssig Rand. Fodskivens Overflade og to Trediedele af Kolumnen beklædt med en grovt inkrusteret, membranøs Skede. Den inkrusterede Del aftager i Tykkelse opad mod Skedens skarpe Rand. Den øverste Trediedel cylindrisk, nøgen, glat, lidt smalere end Skedens Rand, forsynet med Længdefolder og Furer. Paa Folderne smaa, runde, tætstaaende Sugevorter, imellem disse enkelte Cinclides. Mundskiven plan. Munden aflang med tykke, foldede Læber. Tentaklerne omtrent saa lange som Mundskivens Bredde, staa i 2 afvejlende Rækker, 12 i hver, retraktile; den yderste Række staa lige i Kroppens Rand. Hele den øverste, nøgne Del trækkes ganske ind i Skeden. Skræbes Skeden væk, sees Kroppens flade tæt besat med Sugevorter. Farven: Den inkrusterede Del graabrun; den nøgne Del af Kroppen næsten hvid. Tentaklerne i den yderste Række violet-røde, intensere ved Grunden; de i den inderste Række ere mere rosenrøde. Mundskiven violetrød, straalet, med violetrøde Striber. De foldede Mundlæber intens violetrøde. Kroppens hud indenfor Skeden ganske hvid. Vorterne skinne lidt i det Gule. Cirkulærmusklerne mesodermale. 12 Septapar, hvoraf 6 fuldstændige.

Phellia bathybia, n. sp.

Tab. IV, Fig. 1—4; Tab. XIII, Fig. 7—9.

Dyrets hele Høide er omkring 45^{mm}. Fodskiven rund, tyk, lidt bredere end Kolumnens nederste Del, men smalere end dennes øverste Rand. Tab. IV, Fig. 1, 2. Den undre Flade er lidt konkav og foldet fra Centrum mod Peripherien; den øvre Flade er hvælvet og inkrusteret.

Kolumnen er cylindrisk, dens nederste tre Fjerdedele har en membranøs Skede, hvori er indleiret plastisk Biloculinler, og hvis øverste Rand er skarpt afgrændset, Tab. IV, Fig. 4; Tab. XIII, Fig. 7 a. Kroppens øverste Fjerdedel er nøgen og udvider sig fra Skedens Rand urnformigt op imod Mundskiven; den har mange Længdefolder, Tab. IV, Fig. 4, imellem hvilke sees fine Furer, der antyde Septainsertionerne; paa hver Fold sees en Længderække af temmelig store, tætstaaende Sugevorter, Tab. XIII, Fig. 7 b.

Mundskiven er bred med en aflang Mund, hvorfra udgaa mange Folder mod Peripherien, Tab. XIII, Fig. 7. Tentaklerne sidde afvejlende i 2 Rækker, 18 i hver, ere retraktile og indtage Kroppens øverste Rand. I den inderste Række ere de meget korte og afstumpede, imedens de i den ydre Række ere overordentlig lange, ja næsten

opwards. The pedal disc broad, discoidally expanded, has a thin irregular margin. The external surface of the pedal disc and two-third parts of the column, clad with a coarse, encrusted membranous sheath. The encrusted portion diminishes in thickness upwards towards the sharp margin of the sheath. The uppermost third part cylindrical, bare, smooth, slightly narrower than the margin of the sheath, furnished with longitudinal folds and furrows. Upon the folds, small, round, compactly placed suckers; between these a few cinclides. The oral disc plane. The mouth oblong, with thick folded labiæ. The tentacles about the same length as the breadth of the oral disc, placed in 2 alternating series, 12 in each, retractile; the outermost series placed just at the margin of the body. The entire uppermost, bare part, can be quite withdrawn into the sheath. When the sheath is scraped away the surface of the body is seen to be closely covered with suckers. *The colour.* The encrusted portion grey-brown; the bare part of the body almost white. The tentacles in the outermost series violet-red, and more intense in colour at the base; the tentacles in the innermost series are more rose-red in colour. The oral disc violet-red, radiated with violet-red stripes. The folded oral labiæ, intense violet-red. The integument of the body, inside the sheath, quite white. The suckers have a slight yellow lustre. The circular muscles are mesodermal. 12 pairs of septa, of which 6 pairs perfect.

Phellia bathybia, n. sp.

Pl. IV, fig. 1—4; Pl. XIII, fig. 7—9.

The entire height of the animal is about 45^{mm}. The pedal disc is round, thick, slightly broader than the lowest part of the column, but narrower than its uppermost margin (Pl. IV, fig. 1, 2). The inferior surface is slightly concave, and folded from the centre towards the periphery; the upper surface is arcuate and encrusted.

The column is cylindrical; its lowest three-fourths part has a membranous sheath in which plastic biloculina-clay sits embedded, and whose uppermost margin is sharply defined (Pl. IV, fig. 4; Pl. XIII, fig. 7 a). The uppermost fourth part of the body is bare, and expands from the margin of the sheath in urn-shape, up towards the oral disc; it has numerous longitudinal folds (Pl. IV, fig. 4) between which fine furrows that indicate the insertions of septa are seen, and upon each fold there is a longitudinal series of pretty large, highly protuberant suckers (Pl. XIII, fig. 7 b).

The oral disc is broad, with an oblong mouth from which numerous folds issue towards the periphery (Pl. XIII, fig. 7). The tentacles are seated alternately in 2 series, 18 in each; they are retractile and occupy the uppermost margin of the body. In the innermost series they are very short and blunted, whilst in the outer series they

lige saa lange som Kroppens hele Længde og ende traadformigt, saa at de under Bevægelsen viste sig meget flagrende, Tab. IV, Fig. 1; Tab. XIII, Fig. 7. Hele den øverste, nøgne Del af Kroppen med Tentakler og Mundskive kan fuldkommen trækkes ind i Skeden, der lukkes ganske og antager Formen af en opretstaaende Kølle, Tab. IV, Fig. 2. Naar den inkrusterede Skede fjernes, viser den indenfor værende Hud sig at være foldet, ligesom den øverste, nøgne Del af Kroppen, og som denne besat med Længderækker af Sugevorter, Tab. XIII, Fig. 7 c.

Farven. Skeden er graahvid; indenfor den er Kroppshuden laxerød, hvilket ogsaa er Tilfældet med den nøgne Del. Mundskiven og den indre Række af Tentaklerne ere mørkere, medens de ydre Tentakler ved Grunden og paa den aborale Flade have Kroppens Farve, men ere næsten ganske hvide forresten, Tab. IV, Fig. 1—4.

Den inkrusterede Del af Kroppen viser paa Tversnit, at den inkrusterede Skede bestaar af to Lag; det ydre, som er dannet af en tyk, seig, slimet Membran, hvori er indleiret Lerklumper og Biloculiner, og et indre, der danner en fast, tynd, fibrillær Membran (Cuticula), som er stærkt adhæreret til det indenfor værende Ectoderm. Dette bestaar af temmelig korte, lidt forkrøblede Cylinderceller med Kjerne, men uden Cilier, og imellem Cellerne spredte, encellede Slimkjertler. Indenfor Ectodermet, Tab. XIII, Fig. 8 a, er et fibrillært Bindevæv, der ikke er meget bredt, Tab. XIII Fig. 8 b, og i hvis Midte sees stærkt udviklede, cirkulære Muskler, som danne Bundter, der især ere fremtrædende baade paa Længde- og Skraasnit, Tab. XIII, Fig. 8 c. Til begge Sider af de cirkulære Muskler er et Belte, hvori sees Bindevævslegemer og fine Ernæringskanaler, Tab. XIII, Fig. 8 b. Paa den indre Flade af dette Bindevæv sees Længdemuskler, beklædte med lange Cylinderceller, som ere forsynede med Cilier.

Paa den nøgne Del af Kroppen er Ectodermet temmelig bredt og bestaar af lange cilierende Cylinderceller, imellem hvilke sees encellede Slimkjertler og en rigelig Mængde Nematocyster. Ectodermet paa Mundskiven er mindre rigt paa Nematocyster; derimod synes her Cilierne at være længere end paa Kroppen, og i Bindevævet samle de cirkulære Muskler sig omkring Mundaabningen og danne Slutmuskelen (Sphincter).

Tentaklernes Ectoderm er overordentligt rigt paa Nematocyster, især paa den aborale Flade, og indenfor det ere stærke Længdemuskler leirede saaledes, at de rage noget ind i Bindevævet. Paa dettes indre Flade findes et yderst tyndt Lag Tvermuskler, der beklædes af Endothelceller, hvorimellem iagttages enkelte encellede Slimkjertler.

are exceedingly long, indeed almost as long as the entire length of the body, and terminate filamentously, so that during movement they show themselves very wavelingly (Pl. IV, fig. 1; Pl. XIII, fig. 7). The entire uppermost, bare part of the body with the tentacles and oral disc, can be completely withdrawn into the sheath, which then becomes quite closed and assumes the form of a vertical club (Pl. IV, fig. 2). When the encrusted sheath is removed the integument that lies inside of it shows itself to be folded in similar manner to the uppermost bare portion of the body, and, like it, it is also covered with longitudinal series of suckers (Pl. XIII, fig. 7 c).

The colour. The sheath is greyish-white; inside of it the integument of the body is salmon-red colour, which is also the case with the bare portion. The oral disc and the inner series of the tentacles are darker in colour, whilst the outer series of tentacles have, at the base and on the aboral surface, the colour of the body, but are otherwise almost quite white (Pl. IV, fig. 1—4).

The encrusted portion of the body shows in transversal sections, that the encrusted sheath consists of two layers viz. the outer one formed of a thick, viscid, mucous membrane in which pieces of clay and biloculina are embedded; and an inner one that forms a firm, thin, fibrillar membrane (cuticulum) and is strongly adherent to the ectoderm lying inside of it. The latter consists of rather short, slightly deformed cylinder-cells with nuclei but without cilia, and between the cells unicellular mucous glands are dispersed. Inside of the ectoderm (Pl. XIII, fig. 8 a) there is a fibrillar connective-tissue which is not very broad (Pl. XIII, fig. 8 b), and in whose middle strongly developed circular muscles are seen forming fasciculi, which are especially prominent in both longitudinal and diagonal sections (Pl. XIII, fig. 8 c). On both sides of the circular muscles there is a belt in which connective-tissue corpuscles and fine nutritory ducts are observed (Pl. XIII, fig. 8 b). On the inner-surface of this connective-tissue longitudinal muscles are seen, clad with cylinder-cells furnished with cilia.

On the bare portion of the body the ectoderm is rather broad, and consists of long, ciliating cylinder-cells, between which unicellular mucous glands and a rich abundance of nematocysts are observed. The ectoderm on the oral disc is less rich in nematocysts, but on the other hand the cilia appear here to be longer than on the body, and in the connective-tissue the circular muscles collect themselves around the oral aperture and form a sphincter.

The ectoderm of the tentacles is exceedingly rich in nematocysts, especially upon the aboral surface, and inside of it powerful longitudinal muscles are embedded, in such manner that they extend somewhat into the connective-tissue. On the inner surface of the connective-tissue an extremely thin layer of transversal muscles is found, clothed with endothelial cells between which a few unicellular mucous glands are observed.

Svælgrøret er vidt, foldet efter Længden, Tab. XIII, Fig. 9 a, og har 2 temmelig vide Svælggruber, Tab. XIII, Fig. 9 b; det er ligesom hos den foregaaende Art forsynet med Tver- og Længdemuskler.

Der er 12 Par fuldstændige Septa, hvoraf 6 Par maa ansees som de principale, der adskille sig fra de øvrige derved, at de ere bredere, ligesom stærkere bygget og golde. Af de 6 Par fuldstændige, principale Septa er der 2 Par, som danne Retningsseptum, Tab. XIII, Fig. 9 R, der svare til de to Svælggruber, Tab. XIII, Fig. 9 b; hvert Pars Septa staa langt fra hinanden, fordi Svælggruberne ere meget vide, saa at det intraseptale Rum er meget vidt, Tab. XIII, Fig. 9. De longitudinelle Muskler ere fæstede paa den ydre Flade af hvert Septum, Tab. XIII, Fig. 9 c; de ere temmelig udviklede, næsten i Form af Buske, imedens de transverselle Muskler sidde paa den indre Flade, vende mod hverandre og danne en tynd, foldet Membran i det intraseptale Rum. De øvrige 4 Par af de principale, fuldstændige Septa, Tab. XIII, Fig. 9, 1, have de longitudinelle Muskler insererede paa den indre Flade af hvert Septum, hvor de henimod Svælgrøret ere stærkt udviklede og danne her en tyk Busk, der sammen med de tilsvarende fra det andet Septum næsten ganske udfylder paa dette Sted det intraseptale Rum. De transverselle Muskler danne en foldet, temmelig tynd Membran, der indtager Størstedelen af den ydre Flade af Septumet, dog saaledes, at der er et frit Belte langs den fri Rand, hvori Mesenterialfilamentet ligger.

De 6 Par fuldstændige, sekundære Septa ere stillede saaledes, at et Par staa imellem to Par af de principale Septa, Tab. XIII, Fig. 9, 2. Disse sekundære Septa ere ikke fuldt saa brede som de primære; deres longitudinelle Muskler ere fæstede paa hvert Septums indre Flade, vende mod hverandre i det intraseptale Rum og synes at være mindre udviklede, idet de danne en tyndere Busk; de transverselle Muskler danne en tynd, yderst fint foldet Membran, der indtager saagodtsom hele Fladen, naar undtages et smalt Felt langs den fri Rand. Paa dette Felt sees, foruden Mesenterialfilamentet, Acontier at være fæstede — ikke i nogen stor Mængde og temmelig spredte — og nedenfor Acontierne imod Gastralhulhedens Bund Kjønnsorganerne, der indeholde Æg i forskellige Udviklingsstadier. Samtlige Septa, som alle ere fuldstændige, forsaavidt de fæste sig paa Svælgrøret, bære Mesenterialfilamenter, der tage deres Begyndelse ved den nederste Ende af Svælgrøret, ved Septainsertionerne, og strække sig i en sammenrullet Tilstand et lidet Stykke nedover Septum. Der er altsaa i det Hele 12 Par Septa, hvoraf ingen ere ufuldstændige.

Parieto-basilarmuskelen er yderst tynd og strækker sig kun lidt opover Væggen, imedens den udbreder sig noget videre nedover Fodskivens indre Flade.

The œsophagus is wide, longitudinally folded (Pl. XIII, fig. 9 a), and has 2 rather wide gonidial grooves (Pl. XIII, fig. 9 b). It is furnished with transversal and longitudinal muscles like the preceding species.

There are 12 pairs of perfect septa, of which 6 pairs must be considered as the principal ones, and are distinguished from the rest by being broader and, as it were, stronger built and sterile. Of the 6 pairs of perfect principal septa, there are 2 pairs which form directive septa (Pl. XIII, fig. 9 R), corresponding to the two gullet-grooves (Pl. XIII, fig. 9 b). The septa of each pair stand far apart from each other, because the gullet-grooves are very wide, so that the intraseptal space is very wide (Pl. XIII, fig. 9). The longitudinal muscles are secured to the outer surface of each septum (Pl. XIII, fig. 9 c), and are pretty well developed, almost in the form of frutici; whilst the transversal muscles are seated on the inner surface, face towards each other, and form a thin folded membrane in the intraseptal space. The other 4 pairs of the principal perfect septa (Pl. XIII, fig. 9, 1) have the longitudinal muscles inserted on the inner surface of each septum where they, in proximity to the œsophagus, are strongly developed and form here a thick frutex, which, together with the corresponding one from the other septum, almost quite fills, at this place, the intraseptal space. The transversal muscles form a folded, rather thin membrane that occupies the greater part of the outer surface of the septum, in such manner, however, that there is a free belt along the free margin in which the mesenterial filament lies.

The 6 pairs of perfect, secondary septa are placed in such manner, that one pair stands between two pairs of the principal septa (Pl. XIII, fig. 9, 2). These secondary septa are not quite so broad as the primary ones; their longitudinal muscles are secured to the inner surface of each septum, face towards each other in the intraseptal space and appear to be less developed, inasmuch as they form a thinner frutex; the transversal muscles form a thin, extremely fine, folded membrane that almost covers the entire surface with the exception of a narrow area along the free margin. In this area, besides the mesenterial filament, acontia are seen to be secured, not in any great abundance and pretty much dispersed; and below the acontia, towards the bottom of the gastric cavity, the reproductive organs are seen. These contain ova in various stages of development. The whole of the septa, all of which are perfect in so far that they secure themselves to the œsophagus, carry mesenterial filaments which originate in the lowest extremity of the œsophagus, at the insertions of the septa, and stretch themselves in a coiled up condition a little way down the septum. There are, thus, altogether, 12 pairs of septa, of which none are imperfect.

The parieto-basilar muscle is extremely thin and extends itself only a little way up the wall, whilst it distributes itself somewhat farther down the inner surface of the pedal disc.

Hele Gastralhulheden med alle de deri værende Organer har en Endothelbeklædning, bestaaende af temmelig lange, cilierende Cylinderceller. Om hver Celle kun har en Cilie eller flere, har ikke været muligt at bestemme. Paa enkelte Steder af Væggen synes der at være kun en; Cellerne paa Svælgrøret har blot en lang Cilie.

Findested.

Station 51. Mange Exemplarer, hvoraf dog de fleste vare stærkt kontraherede, idet de kom op af Skraben, og strakte sig ikke mere ud, imedens nogle faa levede flere Dage i Observationskarret.

Artskarakter.

Dyrets Høide er omkring 45^{mm}. Fodskiven tyk, rund, bredere end Kolumnens nedre Del. Fodsaalen konkav, foldet. Kolumnen er cylindrisk; de nederste tre Fjerdedele have en membranøs Skede, inkrusteret af plastisk Ler og Biloculiner. Den øverste Fjerdedel nøgen, urneformigt udvidet opad og forsynet med Længdefolder, der hver har en Længderække af temmelig tætstaaende Sugevorter. Mundskiven bred, fint foldet, med aflang Mund. Tentaklerne retraktile, afvejlende i 2 Rækker, 18 i hver, paa Kroppens øverste Rand. De i den indre Række ere korte, afstumpede; i den ydre Række ere de overordentlig lange og flagrende. Hele den nøgne Del fuldstændig retraktil og skjules under Kontraktionen ganske af Skeden, som da danner en opretstaaende Kølle. Indenfor Skeden har Huden Længdefolder med Sugevorter ligesom paa den nøgne Del. Farven: Skeden er graahvid; indenfor den er Kropshuden laxerød, ligesom paa den nøgne Del. Mundskiven og de indre Tentakler mørkere; de ydre Tentakler ved Grunden og paa den aborale Side laxerøde, ellers hvide. 12 Septapar, alle fuldstændige, men hvoraf 6 Par ere primære og golde. Cirkulærmusklerne mesodermale.

Phellia norvegica, n. sp.

Tab. IV, Fig. 5, 6; Tab. XIV, Fig. 6—8.

De to Exemplarer, der af denne Art bleve fundne, sidde paa Skjæl af *Astarte crebricostata*.

Fodskiven er rund, membranagtig udbredt, omtrent 8^{mm} bred med en tynd Rand, Tab. IV, Fig. 5, 6. Underfladen er næsten plan og straalet fra Centrum mod Peripherien. Overfladen, der er lidt hvælvet, danner, naar Dyret ikke er fuldt udstrakt, en Halvkugle, Tab. IV, Fig. 6, og er inkrusteret af fin Sand.

The entire gastral-cavity, with all the organs lying within it, has an endothelial covering consisting of rather long, ciliating cylinder-cells. Whether each cell has only one cilia or several, it has not been possible to determine. In some parts of the wall there appears to be only one; the cells on the œsophagus have only one long cilia.

Habitat.

Station No. 51. Many specimens, of which, however, most were strongly contracted, as when they came up in the dredge they did not again extend themselves, whilst a few lived several days in the glass vessel.

Specific characteristics.

The entire height of the animal is about 45^{mm}. The pedal disc thick, round, broader than the lower part of the column. The pedal sole concave, folded. The column cylindrical; the lowest three-fourths part has a membranous sheath encrusted with plastic clay and biloculina. The uppermost fourth part bare, expanded in urn-shape above, and furnished with longitudinal folds, each of which has a longitudinal series of pretty closely placed suckers. The oral disc broad, finely folded, with oblong mouth. The tentacles retractile, alternating in 2 series, 18 in each, on the uppermost margin of the body. The tentacles in the inner series are short, blunted; in the outer series they are exceedingly long and waving. The entire bare portion completely retractile, and quite hidden by the sheath during contraction; the sheath then forms a vertical club. Inside of the sheath the integument has longitudinal folds with suckers similar to the bare part. *The colour*: The sheath in greyish-white; inside it the integument of the body is salmon-red colour, similar to the bare part. The oral disc and the inner tentacles darker in colour; the outer tentacles at the base and on the aboral side salmon-red colour, otherwise white. 12 pairs of septa, all perfect but of which 6 pairs are primary and sterile. Mesodermal circular muscles.

Phellia norvegica, n. sp.

Pl. IV, fig. 5, 6; Pl. XIV, fig. 6—8.

The two specimens of this species which were found are seated on shells of *Astarte crebricostata*.

The pedal disc is round, membranaceously expanded, about 8^{mm} broad, with a thin margin (Pl. IV, fig. 5, 6). The under surface is almost plane and radiated from the centre towards the periphery. The upper surface, which is slightly arcuate, forms, when the animal is not fully extended, a hemisphere (Pl. IV, fig. 6), and is encrusted with fine sand.

Kroppen er omtrent 10^{mm} høi, cylindrisk og omtrent de 6 nederste Millimeter forsynede med en tynd, inkrusteret Skede, der foroven har en fri, afrundet Rand. De øverste 4 Millimeter af Kroppen er nøgen og har Længdefolder, paa hvilke sees temmelig store Sugevorter, som staa temmelig langt fra hverandre i Længderækker, Tab. XIV, Fig. 6 a. Enkelte af disse Sugevorter rage lidt over Hudens Niveau; men de fleste ere ligesom ned-sænkede i en Grube. Borttages den inkrusterede Skede, saa viser ogsaa den Del af Kroppen Længdefolder, hvorpaa findes lignende Sugevorter som paa den nøgne Del, kun med den Forskjel, at her ligge de overalt i Gruber, og til hvilke fremmede Legemer, saasom Sandkorn ere fæstede, Tab. XIV, Fig. 6 b.

Mundskiven er kun lidet hvælvet og fint foldet; Munden er aflang med tykke, foldede Læber og 2 temmelig vide Gonidiefurer, Tab. XIV, Fig. 6. Tentaklerne sidde i 3 Rækker, ere retraktile, koniske, ikke meget lange, men temmelig tykke, Tab. IV, Fig. 5; Tab. XIV, Fig. 6. I den 1ste — inderste — Række er der 12 Tentakler, som ere baade de længste og tykkeste. Den 2den Række afvexler med den 1ste, og i den er 12, som ere tyndere og lidt kortere; men i den 3die Række er der 24, nemlig 2 imellem hver 2 af 2den Række; de ere de mindste. Hele den øvre, nøgne Del af Kroppen med Mundskive og Tentakler kan trækkes ind i Skeden, saa den ganske skjuler de indtrukne Dele, Tab. IV, Fig. 6.

Farven: Skeden er graabrun; den nøgne Del af Kroppen er rosenrød; Mundskiven er brunrød med lysere Striber, der gaa fra Munden mod Tentaklerne. Disse ere intens brunrøde, især langs den aborale Side; de i 2den og 3die Række ere noget lysere.

Et Tversnit af den Del af Kroppen, der er beklædt af Skeden, viser, at denne, som tidligere angivet hos andre Arter, bestaar af et ydre Lag, der er dannet af en seig Membran, hvori fremmede Legemer ere inkrusterede, og et indre Lag, der udgjør en skarpt begrænset, fibrillær Cuticula, som nøie er fæstet til det indenfor værende Ectoderm. Dette dannes af forkrøblede Cylinderceller med en aflang Kjerne, men uden Cilier, Tab. XIV, Fig. 7 a, og imellem Cellerne iagttages encellede Slimkjertler. Indenfor Ectodermet er et smalt, fibrillært Bindevævslag, Tab. XIV, Fig. 7 b, i hvis Midte sees cirkulære Muskelfibre, der ikke synes at være meget udviklede, Tab. XIV, Fig. 7 c, og paa hvis indre Flade Endothelet er fæstet, Tab. XIV, Fig. 7 d.

Paa den nøgne Kropsdel bestaar Ectodermet af lange, cilierende Cylinderceller med Kjerne og rigt Protoplasma-indhold, og imellem Cellerne findes encellede Slimkjertler og Nematocyster, begge i rigelig Mængde. Indenfor Ectodermet er Bindevævslaget noget bredere, og de cirkulære Muskelfibriller noget mere udviklede, end paa den af Skeden

The body measures about 10^{mm} in height, is cylindric, and about the lowest 6 millimetres of its height is furnished with a thin, encrusted sheath, which has at the top a free rounded margin. The uppermost 4 millimetres of the height of the body is bare, and has longitudinal folds upon which rather large suckers are seen, standing pretty far apart from each other in longitudinal series (Pl. XIV, fig. 6 a). A few of these suckers protrude a little beyond the surface of the integument, but the bulk of them are, as it were, depressed in a cavity. When the encrusted sheath is removed, that part of the body also shows longitudinal folds, upon which similar suckers are found as on the bare part, with this difference only, that they here lie everywhere in cavities and have foreign bodies, such as grains of sand, adherent to them (Pl. XIV, fig. 6 b).

The oral disc is only slightly arcuate, and is finely folded; the mouth is oblong with thick, folded labiæ and two rather wide gonidial grooves (Pl. XIV, fig. 6). The tentacles are seated in 3 series, are retractile, conical, not very long, but rather thick (Pl. IV, fig. 5; Pl. XIV, fig. 6). In the innermost series there are 12 tentacles which are both the longest and thickest. The second series alternates with the first (innermost), and in it there are also 12 tentacles which are thinner and slightly shorter, but in the third series there are 24 tentacles viz. two tentacles between each 2 of the second series; these are the smallest. The entire upper, bare part of the body with the oral disc and tentacles can be withdrawn into the sheath, which then completely conceals the retracted parts (Pl. IV, fig. 6).

The colour. The sheath is grey-brown; the bare part of the body is rose-red; the oral disc is brown-red, with lighter-coloured stripes which issue from the mouth towards the tentacles. These latter are intense brown-red in colour, especially along the aboral side. Those of the second and third series are somewhat lighter in colour.

A transversal section of that part of the body which is clothed by the sheath shows, that it, as previously indicated in other species, is composed of an outer layer formed of a viscid membrane in which foreign bodies are encrusted, and an inner layer that forms a sharply defined fibrillar cuticulum, closely adherent to the ectoderm lying inside. The ectoderm is composed of deformed cylinder-cells with an oblong nucleus but without ciliæ (Pl. XIV, fig. 7 a), and between the cells unicellular mucous glands are observed. Inside of the ectoderm there is a narrow, fibrillar layer of connective-tissue (Pl. XIV, fig. 7 b) in whose middle circular muscle-fibres are seen, which do not appear to be very much developed (Pl. XIV, fig. 7 c) and upon whose inner surface the endothelium is secured (Pl. XIV, fig. 7 d).

On the bare portion of the body the ectoderm consists of long, ciliating cylinder-cells with nuclei and rich protoplasmic contents, and between the cells unicellular mucous glands and nematocysts are found, both in great abundance. Inside of the ectoderm the layer of connective-tissue is somewhat broader, and the circular muscle-fibrils are some-

beklædte Kropsdel. I Mundskiven samler de cirkulære Muskelfibriller sig i større Bundter og nærme sig stærkt Ectodermbeklædningen, imedens de danne en Slutmuskel omkring Munden.

Tentaklerne ere udvendigt beklædte med et bredt Ectoderm, bestaaende af lange, cilierende Cylinderceller, imellem hvilke sees encellede Slimkjertler og en stor Mængde Nematocyster. Indenfor Ectodermet er et stærkt Lag longitudinelle Muskler, der rage lidt ind i det fibrillære Bindevæv, som er forsynet med Bindevævslegemer med dels en, dels flere Udløbere, samt fine Ernæringskanaler. Paa dette Bindevævs indre Flade ligge transverselle Muskelfibriller, der ikke ere meget udviklede, og som ere beklædte af det cilierende Endothel.

Der er 6 Par principale, fuldstændige Septa, som indbyrdes staa langt fra hinanden, saa at de intraseptale Rum blive meget vide, Tab. XIV, Fig. 8. De to Par Retningsseptata ere fæstede paa hver Side af Svælgrøret og svare ganske til Svælgruberne, Tab. XIV, Fig. 8 a. De adskille sig fra de øvrige væsentlig derved, at deres Længdemuskler ere fæstede paa den ydre Flade af Septumet og vende fra hverandre i det interseptale Rum, imedens de transverselle Muskler beklæde for en stor Del den indre Flade og vende mod hverandre i det intraseptale Rum. Paa de øvrige 4 Par fuldstændige Septa, Tab. XIV, Fig. 8 b, ere Længdemusklerne fæstede paa den indre Flade; de vende altsaa mod hverandre i det intraseptale Rum, imedens Tvermusklerne findes paa den ydre Flade og vende mod det interseptale Rum. Længdemusklerne paa samtlige disse Septa ere omtrent lige meget udviklede; de tiltage i Tykkelse henimod Svælgrøret, hvor de danne en liden Busk for igjen at blive smalere, idet de gaa over paa dette. Tvermusklerne forme sig i en fint foldet Membran; hverken disse eller Længdemusklerne beklæde hele Fladen af Septum; thi henimod den fri Rand ophøre de, hvorved der dannes et smalt Belte imellem denne og Muskelen, og i dette Belte paa den ydre Flade er Mesenterialfilamentet fæstet, Tab. XIV, Fig. 8 c. Hvert Septum bærer et saadant, som udspringer tæt ved Svælgrørets nederste Ende og følger spiralformigt sammenrullet et Stykke nedover den ydre Flade af Septum, langs det smale Belte, Tab. XIV, Fig. 8 c.

Imellem hvert 2 Par af de fuldstændige, principale Septa i de 6 Hovedkamre, er der et Par ufuldstændige, sekundære Septa, som ere temmelig lange, men ophøre 2—3 Millimeter fra Svælgrøret, Tab. XIV, Fig. 8 d. De ere forsynede med baade Længde- og Tvermuskler; de første ere fæstede paa den ydre Flade af Septumet og ligesom paa de fuldstændige Septa stærkest fremtrædende henimod Svælgrøret, de sidste paa den indre og ikke meget udviklede. De ufuldstændige Septa bære Acontier, som ikke ere i nogen stor Mængde tilstede; enkelte Septa bære 2—3 Acontier, andre kun en, Tab. XIV, Fig. 8 e, og

what more developed than on the part of the body covered by the sheath. On the oral disc the circular muscle-fibrils collect themselves into largish fasciculi, and approach close to the ectodermal covering, whilst they form a sphincter round the mouth.

The tentacles are exteriorly clad with a broad ectoderm consisting of long, ciliating cylinder-cells, between which unicellular mucous glands and a great number of nematocysts are seen. Inside of the ectoderm there is a strong layer of longitudinal muscles, that reach a little way into the fibrillar connective-tissue, which is furnished with connective-tissue corpuscles having sometimes one, sometimes several prolongations and also fine nutritory ducts. On the inner-surface of this connective-tissue lie the transversal muscle-fibrils; these are not much developed and are clad with the ciliating endothelium.

There are 6 pairs of principal perfect septa, which between themselves stand far apart from each other, so that the intraseptal spaces are very wide (Pl. XIV, fig. 8). The 2 pairs of directive septata are secured upon each side of the œsophagus, and quite correspond with the gonidial-grooves (Pl. XIV, fig. 8 a). They are distinguished from the others principally by their longitudinal muscles being secured to the outer surface of the septum and facing from each other in the interseptal space, whilst the transversal muscles, for a great part, clothe the inner-surface and face towards each other in the intraseptal space. In the other 4 pairs of perfect septata (Pl. XIV, fig. 8 b), the longitudinal muscles are secured upon the inner surface; they face consequently towards each other in the intraseptal space, while the transversal muscles are found on the outer surface, and face towards the interseptal space. The longitudinal muscles upon all of these septata are about equal in development; they increase in thickness towards the œsophagus, where they form a small frutex, becoming again narrower as they pass over upon it. The transversal muscles form themselves into a finely folded membrane; neither they nor the longitudinal muscles clothe the entire surface of the septum, as they terminate in proximity to the free margin, causing a narrow belt to be formed between that and the muscle, and on the outer surface of this belt the mesenterial filament is secured (Pl. XIV, fig. 8 c). Each septum carries one of these, which originates close to the lowest extremity of the œsophagus, and passes, coiled up in spiral form, for a little way down the outer surface of the septum along the narrow belt (Pl. XIV, fig. 8 c).

Between each 2 pairs of the perfect, principal septata, in the 6 principal chambers, there is a pair of imperfect, secondary septata which are rather long, but terminate 2—3 millimetres from the œsophagus (Pl. XIV, fig. 8 d). They are furnished with both longitudinal and transversal muscles; the first-named are secured upon the outer surface of the septum and are, in same manner as upon the perfect septata, most strongly prominent in proximity to the œsophagus; the last-named are secured upon the inner-surface and are not much developed. The imperfect septata carry acontia but they are not present in any great

under Acontierne nede imod Gastralhulhedens Bund sidde Generationsorganerne, der ikke ere meget udviklede, Tab. XIV, Fig. 8 *f*. Æg i deres tidlige Udvikling udfylde enkelte Æggestokke, imedens andre synes at være tomme. Svælg-røret er cylindrisk, Tab. XIV, Fig. 8 *g*, temmelig langt, har paa hver Side af Svælggruberne flere Længdefolder og er forsynet med baade Tver- og Længdemuskler. Parieto-basilarmuskelen er tynd men bred og strækker sig et godt Stykke baade opad og nedad.

Findested.

Station 260—261. To Exemplarer.

Artskarakter.

Fodskiven rund, membranagtig udbredt, omtrent 8^{mm} i Tversnit, med en tynd Rand. Underfladen plan, fint foldet. Kolumnen omtrent 10^{mm} høi, cylindrisk; dens to nederste Trediedele forsynede med en tynd, inkrusteret Skede, der har en fri, afrundet Rand foroven; den øverste Trediedel nøgen med Længdefolder, hvorpaa store Sugevorter, staaende i Længderækker. Indenfor Skeden lignende Længdefolder med Sugevorter. Mundskiven lidt hvælvet, fint foldet. Munden aflang med tykke, foldede Læber og vide Mundvige. Tentaklerne retraktile, koniske, korte og tykke, i 3 Rækker. I den 1^{ste} og 2^{den} Række 12 i hver; i den 3^{die} (yderste) 24; disse ere de mindste. Hele den øvre, nøgne Del med Mundskiven og Tentaklerne kan indtrækkes i Skeden, der lukker sig. Farven: Skeden graabrun; den nøgne Del af Kolumnen rosenrød. Mundskiven brunrød med lysere Striber. De indre Tentakler intens brunrøde, især langs den aborale Side; de i 2^{den} og 3^{die} Række noget lysere.

Phellia violacea, n. sp.

Tab. IV, Fig. 7; Tab. XIII, Fig. 10; Tab. XIV, Fig. 9, 10.

Phellia violacea er omtrent 25^{mm} høi, medens Mund- og Fodskive ere mindst 10^{mm} bredere. Fodskiven er 35^{mm} bred og rund med en tyk, jævn, ringformig Rand, der danner ligesom en Vold omkring den nederste Del af Kolumnen, Tab. IV, Fig. 7 *a*. Fodskivens Underflade er konkav, straaformigt foldet fra Centrum mod Peripherien.

Kroppen er cylindrisk, smalere nedad mod Fodskiven, bredere foroven, Tab. IV, Fig. 7. Dens nederste tre Fjerdedele, ligesom Fodskivens Rand, er beklædt med en membranøs

abundance. A few septa carry 2—3 acontia, others only one (Pl. 8 *e*), and below the acontia, down towards the bottom of the gastral cavity, lie the reproductive organs, which are not much developed (Pl. XIV, fig. 8 *f*). Ova in their earliest development occupy some ovaries whilst others appear to be empty. The œsophagus is cylindrical (Pl. XIV, fig. 8 *g*) rather long, and has several longitudinal folds on each side of the gonidial-grooves. It is furnished with both transversal and longitudinal muscles. The parieto-basilar muscle is thin but broad, and extends itself a considerable way both upwards and downwards.

Habitat.

Station No. 260—261. Two specimens.

Specific characteristics.

The pedal disc round, membranaceously expanded, measures about 8^{mm} in breadth, has a free margin. The under surface plane, finely folded. The column about 10^{mm} in height, cylindrical, its lowest two thirds part furnished with a thin encrusted sheath having a free, rounded margin at the top. The uppermost third part bare, with longitudinal folds upon which are large suckers placed in longitudinal series. Inside of the sheath similar longitudinal folds with suckers. The oral disc slightly arcuate, finely folded. The mouth oblong, with thick, folded labiæ and wide oral angles. The tentacles retractile, conical, short and thick, placed in 3 series. In the first and second series 12 tentacles in each; in the third series (outermost) 24 tentacles, and these last are the smallest in size. The entire upper bare part with the oral disc and the tentacles, can be withdrawn into the sheath, which then closes itself. *The colour.* The sheath grey-brown; the bare part of the column rose-red. The oral disc brown-red with lighter coloured stripes. The inner tentacles intense brown-red, especially along the aboral side; those in the second and third series somewhat lighter in colour.

Phellia violacea, n. sp.

Pl. IV, fig. 7; Pl. XIII, fig. 10; Pl. XIV, figs. 9, 10.

Phellia violacea is about 25^{mm} in height, whilst the oral and pedal discs are at least 10^{mm} broader. The pedal disc is 35^{mm} broad, and round, with a thick, even, annular margin which forms, as it were, a ridge round the lowest part of the column (Pl. IV, fig. 7 *a*). The under surface of the pedal disc is concave, and folded radiately from the column towards the periphery.

The body is cylindrical, narrowest downwards towards the pedal disc, and broadest at the top (Pl. IV, fig. 7). Its lowest three-fourths part, as also the margin of the

Skede, der er stærkt inkrusteret og har foroven en skarpt afgrændset, glat Rand. Den øverste Fjerdedel af Kroppen er nøgen, cylindrisk, glat og har foroven en tyk Rand, som er krenuleret af temmelig fremstaaende Ribber, der danne ligesom en spansk Krave omkring Mundskiven, Tab. IV, Fig. 7 b. Der er 24 saadanne Ribber eller Folder, som strække sig omtrent et Par Millimeter nedover Kroppens udvendige, nøgne Flade. Det er, om man saa vil, en Parapet, men nogen indenfor værende Fossa eksisterer ikke. Saavel paa den nøgne Dels Overflade som paa den, der bedækkes af Skeden, sees uregelmæssigt stillede Suckers, som ligge indsinkne i Huden.

Mundskiven er næsten flad, har 12 brede Folder, der udgaa fra Mundaabningen og strække sig henimod den indre Række Tentakler, hvor de dele sig i to, der hver for sig synes at korrespondere med de ovenfor omtalte Ribber paa Kroppens øvre Rand. Munden er aflang, har to Mundvige, der føre ned til Svælgruberne, og som paa hver Side har 12 temmelig tykke Folder, der danne Læberne.

Tentaklerne staa i 2 afvejlende Rækker, 12 i hver, og ere retraktile. De i den inderste Række ere længst, men tyndere end de i den ydre Række, der ere tykke og korte, Tab. IV, Fig. 7. Naar Dyret i fuld Vigør har udslaaet sine Tentakler, ser det ud, som om der kun er en Række; men ved nærmere Undersøgelse viser det sig, at de tyndere, som afvejl med de tykkere, staa lidt indenfor disse. Den nøgne, cylindriske Del af Kroppen tilligemed Tentaklerne kan trækkes ganske ind i Skeden; men Midtpartiet af Mundskiven synes ikke at kunne inddrages eller dækkes af Kroppens øverste Rand, da Mundaabningen med de nærmest omgivende Dele altid ligger blottet.

Farven. Skeden er inkrusteret af lysegraat Ler, spillende lidt i det Brune (plastisk Biloculinler), som paa dens nederste Del, der omgiver Fodskivens Rand, er grovere. Kroppens nøgne Del er lysviolet, imedens dens øverste, ribbede Rand er skidden gulhvid. De indre Tentakler ere næsten brun violette; de i ydre Rækken lys violétté med en hvid Ring omkring Grunddelen og lysere Spids. Mundskiven bleg violet med skidden gulhvite Folder. Dyret sidder paa smaa, flade, kompakte Lerklumper.

Den Del af Kroppen, som er bedækket af Skeden, er i histiologisk Henseende noget forskjellig fra den nøgne Del. Skeden bestaar af to Lag; et ydre, der danner en seig Slimmembran, hvori er indleiret fint Ler, Sand og Skaller af Foraminiferer, alt fremmede Gjenstande, som tilhøre Bunden, paa hvilket Dyret lever, og et indre Lag, der bestaar af en skarpt begrændset, fibrillær Membran (Cuticula), som skilles temmelig fra den ydre Slimmembran, men er fast bunden til det indenfor værende Ectoderm. Naar Dyret berøves en større eller mindre Del af det ydre Lag, reproduceres det paa den Maade, at der fra

pedal disc, is clad with a membranous sheath strongly encrusted, and having at its top a sharply defined, smooth margin. The uppermost fourth part of the body is bare, cylindric, smooth, and at the top has a thick margin which is crenulated by rather projectant ribs, which form, as it were, a frilled collar round the oral disc (Pl. IV, fig. 7 b). There are 24 of these ribs or folds, which extend themselves about a couple of millimetres down the exterior, bare surface of the body. It is, as we may say, a parapet but without any fosse inside it. Both upon the exterior surface of the bare part of the body as well as upon the part clothed with the sheath, irregularly placed suckers are seen lying embedded in the integument.

The oral disc is almost flat, has 12 broad folds which issue from the oral aperture and extend themselves towards the inner series of tentacles, where they split themselves into two parts, each of which appears to correspond with the ribs on the upper margin of the body above mentioned. The mouth is oblong, has two oral angles leading down to the gonidial-grooves, and which have on each side 12 rather thick folds that form the labiæ.

The tentacles are situated in 2 alternating series, 12 in each, and are retractile. Those in the innermost series are longest, but thinner than those in the outer series, which are thick and short (Pl. IV, fig. 7). When the animal is in full vigour and has outstretched its tentacles, it appears as if there was only one series, but upon closer investigation it is seen that the thinner ones, which alternate with the thicker ones, are situated a little to the inside of the latter. The bare cylindric part of the body as well as also the tentacles, can be quite withdrawn into the sheath; but the mesial part of the oral disc appears not to be capable of being retracted or being covered by the uppermost margin of the body, as the oral aperture with the adjacent surrounding parts always remains exposed.

The colour. The sheath is encrusted with light grey clay, shading a little to brown (plastic biloculina-clay) which is coarsest upon the lowest part surrounding the margin of the pedal disc. The bare part of the body is light-violet, whilst its uppermost ribbed margin is dirty yellowish-white. The inner tentacles are almost brown-violet; those in the outer series, light-violet with a white annulus round the base and lighter coloured points. The oral disc pale violet, with dirty yellowish-white folds. The animal is seated on small, flat, compact lumps of clay.

That part of the body which is clothed by the sheath is, in histological respects, somewhat different from the bare portion. The sheath consists of two layers, an outer one that forms a viscid mucous membrane in which fine clay, sand, and shells of foraminifera lie embedded, all of them foreign bodies which belong to the sea-bottom upon which the animal exists; and an inner layer that consists of a sharply defined, fibrillar membrane (cuticulum) which is well separated from the outer mucous membrane, but firmly adherent to the ectoderm lying inside. When the animal is deprived of a greater or smaller portion of the outer

Ectodermet afsøndres Slim, og saa vælter Dyret sig paa Bunden, eller det sætter Overfladen af denne i Bevægelse med Tentaklerne, hvorved de fremmede Legemer fæste sig i Slimet. Ectodermet er dannet af temmelig forkrøblede Cylinderceller med Kjerne, men uden Cilier og fattige paa Protoplasma, Tab. XIV, Fig. 9 a. Imellem Ectodermcellerne sees hist og her encellede, kolbeformige Slimkjertler, hvoraf flere ere tomme og sammenskrumpede. Indenfor Ectodermet er et temmelig bredt Lag fibrillært Bindevæv, forsynet med Bindevævslegemer, der have dels en, dels flere Udløbere, samt fine Saftkanaler med deres Epithel, Tab. XIV, Fig. 9 b, som bestaar af smaa, aflange Celler, der ganske udfylde Lumenet, saaledes som jeg oftere har paa-vist at være Tilfælde hos Coelenteraterne. Omtrent i Midten af dette Bindevæv sees temmelig stærkt udviklede, cirkulære Muskler, der danne fine Bundter, som synes paa enkelte Steder at anastomosere med hverandre, Tab. XIV, Fig. 9 c, og paa dets indre Flade er et Epithelialovertræk, bestaaende af lange, cilierende Cylinderceller, Tab. XIV, Fig. 9 d, der forresten beklæder hele Gastralhulheden med deri værende Organer. ▲

Et Tversnit af den nøgne Kropsdel viser et bredt Ectodermilag, dannet af lange, cilierende Cylinderceller med en aflang Kjerne og et rigt Protoplasmaindhold. Imellem Cellerne er leiret en rigelig Mængde encellede, langstrakte Slimkjertler, samt Nematocyster. Bindevævet er her som paa den af Skeden indesluttede Kropsdel og ligesaa Endothelet, imedens de mesodermale Cirkulærmuskler ere kanske noget mere udviklede.

Tentaklerne have paa deres ydre Flade en stærk Beklædning af Ectodermet, bestaaende af Cylinderceller, ganske lig dem paa den nøgne Kropsdel, imellem hvilke ere encellede Slimkjertler og en overordentlig stor Mængde Nematocyster, der aldeles skjule Ectodermcellerne; indenfor disse er et Lag meget udviklede Længdemuskler, som ere fæstede til Bindevævet, paa hvis indre Flade de transverselle Muskler ere leirede, beklædte af Endothelet.

Der er 12 Par fuldstændige Septa, Tab. XIV, Fig. 10; af disse synes 6 Par at være de principale, da de ere stærkere byggede, have en kraftigere Muskulatur og ere golde; desforuden er der 4 Par ufuldstændige Septa. Af de 6 Par principale, fuldstændige Septa, er der 2 Par Retningsseptas, som svare til Svælggruberne og ere meget brede; hvert Pars Septa staa langt fra hinanden, saa at Intra-septalrummet bliver meget bredt, Tab. XIV, Fig. 10 R. Længdemusklerne ere fæstede paa den udvendige Flade af hvert Septum, vende mod Interseptalrummet, ere meget stærkt udviklede og danne henimod Svælggrøret, hvor de opnaa den største Tykkelse, store Buske, der rage langt ind i Interseptalrummet, Tab. XIV, Fig. 10 a. De transverselle Muskler ligge paa den indre Flade af Septumet

layer it becomes reproduced in this way viz. mucous is deposited from the ectoderm, and the animal rolls itself on the sea-bottom or stirs the surface of the bottom up with its tentacles, causing the foreign bodies to attach themselves to the mucous. The ectoderm is formed of rather deformed cylinder-cells with nuclei but without cilia and poor in protoplasm (Pl. XIV, fig. 9 a). Between the ectoderm cells there are here and there seen unicellular claviform mucous glands, several of which are empty and shrunk together. Inside of the ectoderm there is a rather broad layer of fibrillar connective-tissue furnished with connective-tissue corpuscles that have, partly one, partly several prolongations, also fine nutritory ducts with their epithelium (Pl. XIV, fig. 9 b); the latter consists of small oblong cells that quite fill the channel in the same way as I have frequently shown to be the case with coelenterata. At about the middle of this connective-tissue rather strongly developed circular muscles are seen, forming fine fasciculi that appear in some places to anastomose with each other (Pl. XIV, fig. 9 c), and upon its inner-surface there is an epithelial covering consisting of long ciliating cylinder-cells (Pl. XIV, fig. 9 d), which further clothes the entire gastral cavity and the organs lying within it.

A transversal section of the bare part of the body shows a broad layer of ectoderm, formed of long ciliating cylinder-cells with an oblong nucleus and a rich protoplasmic contents. Between the cells there are embedded a rich abundance of unicellular, elongate mucous glands, also nematocysts. The connective-tissue is here similar to that of the part of the body enclosed in the sheath, and so also is the endothelium, whilst the mesodermal circular muscles are, perhaps, a little more developed.

The tentacles have, upon their outer surface, a strong covering of the ectoderm, consisting of cylinder-cells, quite like those on the bare part of the body, between which there are unicellular mucous glands and an exceeding great abundance of nematocysts that quite conceal the ectoderm-cells; inside of these there is a layer of well developed longitudinal muscles secured to the connective-tissue, upon whose inner-surface the transversal muscles, clothed with the endothelium, are situated.

There are 12 pairs of perfect septa (Pl. XIV, fig. 10); of these 6 pairs appear to be the principal ones, as they are stronger built, have a more powerful musculosity, and are sterile; besides those there are 4 pairs of imperfect septa. Of the 6 pairs of principal, perfect septa, there are 2 pairs of directive septa that correspond to the gonidial-grooves and are very broad. The septa of each pair stand far apart from each other, so that the intraseptal space becomes very broad (Pl. XIV, fig. 10 R). The longitudinal muscles are secured on the outer surface of each septum, face towards the interseptal space, are very fully developed, and in proximity to the œsophagus, where they attain the greatest thickness, form large frutici which extend far into the interseptal space (Pl. XIV, fig. 10 a). The transversal

danne en tyk, foldet Membran og vende mod de transverselle Muskler paa det tilsvarende modsatte Septum i det intraseptale Rum, Tab. XIV, Fig. 10 *b*. De øvrige 4 principale Septapar, Tab. XIV, Fig. 10 *c*, have deres Muskler placerede ganske modsat, saaledes at de longitudinelle Muskler altid ere fæstede paa den indre Flade og vende mod hverandre i det intraseptale Rum, Tab. XIV, Fig. 10 *d*, som de paa Grund af deres stærke Udvikling synes ganske at udfylde i en Strækning af flere Millimeter, imedens de transverselle Muskler fæste sig paa den ydre Flade mod det interseptale Rum. Hverken de longitudinelle eller transverselle Muskler udfylde ganske hele Fladen af Septumet; de ophøre altid henimod Randen, hvorved der bliver et Længdebelte, som er nøgent, og hvori Mesenterialfilamentet hviler.

De 6 Par sekundære, fuldstændige Septa ere alle noget spinklere i Bygning, Tab. XIV, Fig. 10 *e*, og paa dem ere de longitudinelle Muskler placerede paa den indre Flade, saa at de vende mod hverandre i det intraseptale Rum, Tab. XIV, Fig. 10 *f*. De ere kanske ikke saa stærkt udviklede som de paa de principale Septa, men stor Forskjel er der dog ikke; de transverselle Muskler ere fæstede paa den ydre Flade, vende mod det interseptale Rum og danne en temmelig tyk, foldet Membran, ligesom paa de principale Septa. Paa et af disse sekundære Septa fandt jeg en kun lidet udviklet Æggestok, men paa de øvrige var der ikke noget, der kunde tyde hen paa Generationsorganer.

De 4 Par ufuldstændige, tertiære Septa ere kortere, naa ikke til Svælgrøret og ere saaledes stillede, at 1 Par findes paa den ydre Side af hvert Retningsseptum, altsaa imellem dette og det 1ste Par sekundære, fuldstændige Septa, eller, om man vil, i det 1ste Interseptalum, Tab. XIV, Fig. 10 *g*. Paa disse ufuldstændige Septa ere de longitudinelle Muskler placerede paa den indre Flade, de vende mod hverandre i det intraseptale Rum, som de omtrent paa Midten næsten ganske udfylde. Ligesom de longitudinelle Muskler ere temmelig stærke og danne tykke Bundter, saaledes ere ogsaa de transverselle Muskler godt udviklede og danne en tynd, foldet Membran paa den ydre Flade. Disse ufuldstændige Septa bære Generationsorganerne; paa et Par af dem sees Æggestokke, der indeholde kun lidet udviklede Æg. Acontier har ikke været til at opdage; men jeg maa bemærke, at jeg har havt kun et eneste Exemplar, saa Materialet har været meget sparsomt. Acontier ere forøvrigt ikke vanskelige at iagttage, hvor de ere tilstede, saa jeg er tilbøielig til at antage, at denne Art ingen Acontier har. Parieto-basilar-muskelen er bred, men ikke meget tyk.

Svælgrøret er forsynet med to meget vide Svælgruber, Tab. XIV, Fig. 10 *h*, der have et gult Pigmentovertræk, og paa hver Side af dem er der 12 Længdefolder, Tab. XIV, Fig. 10 *i*, som rage temmelig langt ind i Svælget og have et kastaniebrunt Pigmentovertræk.

muscles are seated on the inner surface of the septum, form a thick, folded membrane and face towards the transversal muscles on the corresponding opposite septum in the intraseptal space (Pl. XIV, fig. 10 *b*). The other 4 pairs of principal septa (Pl. XIV, fig. 10 *c*) have their muscles placed in quite reverse manner; thus, the longitudinal muscles are always secured upon the inner surface and face towards each other in the intraseptal space (Pl. XIV, fig. 10 *d*), which they, by reason of their great development, appear to completely fill for an extent of several millimetres, whilst the transversal muscles secure themselves upon the outer surface opposite the interseptal space. Neither the longitudinal nor the transversal muscles quite occupy the entire surface of the septum; they always terminate near the margin, so that there is always left a bare longitudinal belt in which the mesenterial filament lies.

The 6 pairs of secondary, perfect septa are all somewhat more delicate in their structure (Pl. XIV, fig. 10 *e*), and upon them the longitudinal muscles are placed on the inner surface, so that they face towards each other in the intraseptal space (Pl. XIV, fig. 10 *f*). They are perhaps not so fully developed as those on the principal septa, but yet there is no great difference; the transversal muscles are secured upon the outer surface, face towards the interseptal space, and form a rather thick, folded membrane, similar to what is the case with the principal septa. On one of these secondary septa I found a but slightly developed ovary, whilst on the others there was nothing that showed any indication of reproductive organs.

The 4 pairs of imperfect, tertiary septa are shorter, do not reach to the œsophagus, and are so placed, that one pair is found upon the outer side of each directive septum, consequently, between it and the 1st pair of secondary, perfect septa or, as it may be said, in the 1st interseptal space (Pl. XIV, fig. 10 *g*). Upon these imperfect septa the longitudinal muscles are placed on the inner surface, and face towards each other in the intraseptal space, which they, at about the middle, completely fill. Just as the longitudinal muscles are pretty strong and form thick fasciculi, so also are the transversal muscles well developed and form a thin, folded membrane on the outer surface. These imperfect septa carry the reproductive organs; upon a couple of them ovaries are observed, containing only slightly developed ova. It has not been possible to discover acontia, but I must remark that I have only had a single specimen, so that my material has been very scanty. Acontia are usually not difficult to discover when they are present, so I am disposed to assume that this species has no acontia. The parieto-basilar muscle is broad but not very thick.

The œsophagus is furnished with two very wide gonidial-grooves (Pl. XIV, fig. 10 *h*) that have a yellow pigmental covering, and upon each side of them there are 12 longitudinal folds (Pl. XIV, fig. 10 *i*) that extend considerably into the œsophagus, and have a chestnut brown pigmental covering.

Findested.

Station 205. Et Exemplar. I min Notisebog er angivet ogsaa et Exemplar, fundet paa Station 240; men dette maa paa en eller anden Maade være bortkommet; thi det har ikke været mig muligt at finde det blandt det opbevarede Materiale.

Artskarakter.

Hele Dyrets Høide er 25^{mm}. Fodskiven 35^{mm} bred, rund, med en tyk, ringformig Rand, dannende en Vold om Kolumnens nederste Del. Fodskivens Underflade konkav, foldet fra Centrum mod Peripherien. Kroppen cylindrisk, smalere nedad mod Fodskiven; dens nederste tre Fjerdedele, ligesom Fodskivens Rand, forsynet med en stærkt inkrusteret Skede, hvis øverste Rand er glat. Den øverste Fjerdedel nøgen, cylindrisk, glat, har foroven en tyk, stærkt krenuleret Rand, dannende en Krave med 24 Folder omkring Mundskiven. Paa Kroppens Overflade spredte, uregelmæssigt stillede Sugvorter. Mundskiven næsten flad med 12 brede Folder, udgaaende fra Munden og strækkende sig henimod Tentaklerne, hvor de dele sig i to. Munden aflang med 12 Folder paa hver Side af Mundvigene. Tentaklerne retraktile, staa i 2 afvexlende Rækker, 12 i hver, hvoraf de inderste ere længst. Den nøgne Kropsdel med Tentakler lader sig trække ind i Skeden, men Mundskiven kan ikke ganske skjules. Farven: Skeden er inkrusteret af lysegraat, lidt i det Grønlige spillende, Ler. Kroppens nøgne Del lysviolet; dens øverste, krenulerede Rand gulhvid. De indre Tentakler brunviolette; de ydre lysere med en hvid Ring omkring Grunddelen og en lysere Spids. Mundskiven blev violet med gulhvide Folder.

Phellia spitsbergensis, n. sp.

Tab. IV, Fig. 8; Tab. XV, Fig. 1—3.

Fodskiven, som ikke er synderlig bredere end Kolumnen, er rund med en jævn, temmelig tynd Rand og en næsten flad Underflade, der har mange fine Linier, som straalet ud fra Centrum mod Peripherien og angive Septalinsertionerne. Kolumnen er 15^{mm} høj, cylindrisk, beklædt indtil et Par Millimeter fra den øverste Rand med en inkrusteret, slimet Skede, der har en fri Rand foroven, og som forinden ganske omslutter Fodskivens Rand, Tab. IV, Fig. 8. Skeden er paa Overfladen lidt ru som Følge af den inkrusterede, grove Sand og har fine Længdefurer, der hverken ere meget dybe eller brede, Tab. IV, Fig. 8; Tab. XV, Fig. 1. Den nøgne Del af Kolumnen er glat, glindsende, har ligeledes fine Længdefurer og er forsynet

Habitat.

Station No. 205. One specimen. In my Journal another specimen, found at station No. 240, is also mentioned, but that one must in some way or other have been lost, as it has not, subsequently, been found possible to discover it amongst the material preserved.

Specific characteristics.

The height of the entire animal is 25^{mm}. The pedal disc 35^{mm} in breadth, round, with a thick annular margin, forming a ridge round the lowest part of the column. The under surface of the pedal disc concave, folded from the centre towards the periphery. The body cylindric, narrowest downwards towards the pedal disc. Its lowest three-fourths part, as also the margin of the pedal disc, furnished with a strongly encrusted sheath, whose uppermost margin is smooth. The uppermost fourth part bare, cylindric, smooth, has at the top a thick, strongly-crenulated margin, forming a collar, with 24 folds, round the oral disc. On the exterior surface of the body, scattered, irregularly-placed suckers. The oral disc almost flat, with 12 broad folds issuing from the mouth and extending themselves towards the tentacles, where they become split into two. The mouth oblong with 12 folds upon each side of the oral angles. The tentacles retractile, placed in 2 alternating series, 12 in each, of which the innermost are the longest. The bare portion of the body with the tentacles can be withdrawn into the sheath, but the oral disc cannot be quite hidden. *The colour.* The sheath is encrusted with a light-grey clay having a slightly greenish play of colour. The bare part of the body light-violet; the uppermost, crenulated margin yellowish white. The inner tentacles brown-violet, the outer tentacles lighter in colour with a white annulus round the base and lighter coloured point. •The oral disc pale violet with yellowish-white folds.

Phellia spitsbergensis, n. sp.

Pl. IV, fig. 8; Pl. XV, fig. 1—3.

The pedal disc, which is not much broader than the column, is round, has an even, rather thin margin, and an almost flat under-surface with numerous fine lines, radiating from the centre towards the periphery, indicating the insertions of septa. The column is 15^{mm} in height, cylindric, clad up to within a couple of millimetres from the uppermost margin, with an encrusted, mucous sheath having a free margin at the top, and which at the foot quite encloses the margin of the pedal disc (Pl. IV, fig. 8). The exterior surface of the sheath is somewhat rough in consequence of the encrusted coarse sand, and has fine longitudinal folds which are neither very broad nor deep (Pl. IV, fig. 8; Pl. XV, fig. 1). The bare part of the column

med spredte Cinclides, hvorigjennem paa et Par af dem Acontier træde frem.

Mundskiven er næsten plan med en aflang, lidt frem-springende Mund, hvis Læber ere tykke og have 5 Folder paa hver Side af de temmelig brede Mundvige (Gonidie-gruber), Tab. XV, Fig. 1. Tentaklerne staa i 3 afvejlende Rækker, 24 i hver, og ere omtrent saa lange som Mundskivens Bredde, dog ere de i den inderste Række noget længere. Den yderste Række staa paa Kolumnens øverste Rand.

Farven. Den nøgne Del af Kolumnen er blaaviolet, men dens tentakulære Rand er noget blegere, saa det ser ud, som om den havde en Ring om sig. Mundskiven er ligeledes blaaviolet med lysere Straaler og en lysere Ring om Munden. Tentaklerne ere intens blaaviolette med rød-lige Ender. Skeden har et grønligt Skjær, imedens Længdefolderne spille noget i det Violette.

Phellia spitsbergensis sad paa *Buccinum hydrophanum*, og naar den strakte sig noget ud, dannede den en Kegel eller Søile med hvælvet Top, men trak den sig ganske ind i Skeden, fremkom en Halvkugle med en fin Aabning paa Midten, Tab. IV, Fig. 8; Tab. XV, Fig. 1.

Et Tversnit af Kroppens skedebeklædte Del viser, at Skeden danner et ydre Lag, bestaaende af en seig Slim-membran, hvori er inkrusteret Sand og Skjælstumper, Tab. XV, Fig. 2 *a*, og et indre Lag, dannet af en fast, fibrillær Membran (Cuticula), Tab. XV, Fig. 2 *b*. Denne er fast adhæreret til det indenfor liggende Ectoderm, der bestaar af temmelig korte Cylinderceller, som ere fattige paa Protoplasmaindhold og uden Cilier, Tab. XV, Fig. 2 *c*, og imellem hvilke iagttages kolbeformede, encellede Slimkjertler. Indenfor Ectodermet er et bredt, fibrillært Bindevævslag, forsynet med Bindevævslegemer og fine Ernæringskanaler, Tab. XV, Fig. 2 *d*, og omtrent i Midten af dette Bindevævslag ere cirkulære Muskler indleirede, der danne tynde Bundter, Tab. XV, Fig. 2 *e*. Paa den indre Flade af Bindevævet er som sædvanligt Endothelet med sine lange Cilier fæstet, Tab. XV, Fig. 2 *f*. Den nøgne Del af Kroppen frem-byder paa Tversnit et noget andet Billede. Ectodermet bestaar her af lange Cylinderceller med store, aflange Kjerner, omgivne af Protoplasma og forsynede med lange Cilier. Imellem Cylindercellerne sees i stor Mængde baade encellede Slimkjertler og Nematocyster. Bindevævslaget indenfor Ectodermet er noget bredere end paa den inkru-sterede Del, ligesom de cirkulære Muskler synes at være stærkere udviklede, end paa denne.

Der er 12 Par fuldstændige Septa. Af disse er der 6 Par, der maa betragtes som de principale, Tab. XV, Fig. 3 *a*; de ere meget stærkere i Bygning, ere golde, og til dem høre de 2 Par Retningsseptas, Tab. XV, Fig. 3 *R*, der ere stærkt iøinefaldende derved, at deres intraseptale Rum er meget vidt, ligesom de longitudinelle Muskler ere

is smooth, lustrous, and has likewise fine longitudinal furrows, and is also furnished with scattered cinclides through a couple of which acontia protrude.

The oral disc is almost plane, with an oblong, somewhat projecting mouth whose labiæ are thick and have 5 folds on each side of the rather broad oral angles (gonidial-grooves) (Pl. XV, fig. 1). The tentacles are placed in 3 alternating series, 24 in each, and are about the same length as the oral disc is broad, but they are, however, somewhat longer in the innermost series. The outermost series stands upon the uppermost margin of the column.

The colour. The bare part of the column is blue-violet, but its tentacular margin is somewhat paler, so that it appears as if it had an annulus round it. The oral disc is also blue-violet with lighter coloured rays and a lighter coloured annulus round the mouth. The tentacles are intense blue-violet with reddish extremities. The sheath has a greenish tinge, whilst the longitudinal folds shade a little to violet.

Phellia spitsbergensis was seated on *Buccinum hydroplanum*, and when it stretched itself somewhat out, it formed a cone or pillar with an arcuate top, but when it quite withdrew itself into the sheath a hemisphere, with a minute aperture in the middle, was produced (Pl. IV, fig. 8; Pl. XV, fig. 1).

A transversal section of the portion of the body clad with the sheath shows, that the sheath forms an outer layer, consisting of a viscid, mucous membrane in which sand and fragments of shells are encrusted (Pl. XV, fig. 2 *a*); and an inner layer, formed of a firm fibrillar membrane (cuticulum) (Pl. XV, fig. 2 *b*). This is firmly adherent to the ectoderm lying inside of it, which consists of rather short cylinder-cells poor in protoplasmic contents and without ciliæ (Pl. XV, fig. 2 *c*), and between which claviform unicellular mucous glands are observed. Inside of the ectoderm there is a broad fibrillar layer of connective-tissue, furnished with connective-tissue corpuscles and fine nutritory ducts (Pl. XV, fig. 2 *d*), and at about the middle of this layer of connective-tissue the circular muscles are embedded, forming thin fasciculi (Pl. XV, fig. 2 *e*). On the inner surface of the connective-tissue, the endothelium, with its long ciliæ, is secured as usual (Pl. XV, fig. 2 *f*). The bare part of the body presents, in transversal sections, a somewhat different picture. The ectoderm, here, consists of long cylinder-cells containing large oblong nuclei surrounded by protoplasm, and furnished with long ciliæ. Between the cylinder-cells a great abundance of both unicellular mucous glands and nematocysts are observed. The layer of connective-tissue inside of the ectoderm, is somewhat broader than on the encrusted portion, whilst its circular muscles appear also to be more powerfully developed than upon the latter.

There are 12 pairs of perfect septa. Of these there are 6 pairs which must be considered as the principal septa (Pl. XV, fig. 3 *a*); they are somewhat stronger in structure, are sterile, and to them belong the 2 pairs of directive septa (Pl. XV, fig. 3 *R*), which are strongly prominent, owing to their intraseptal space being very wide,

placerede paa den ydre Flade af hvert Septum og vende mod det interseptale Rum, imedens de transverselle Muskler dække næsten ganske den indre Flade og vende altsaa mod det vide, intraseptale Rum. De øvrige 4 Par principale Septa, nemlig 2 paa hver Side af Retningsseptum, have Muskulaturen placeret ganske modsat, saaledes at de longitudinelle Muskler ere paa den indre, og de transverselle paa den ydre Flade, Tab. XV, Fig. 3 a. De longitudinelle Muskler ere henimod Svælget stærkest udviklede, hvor de forme sig i Buske, idet der fra Skilleveggen (Septum) udgaa listeformige Bindevævsforlængelser, hvorpaa Musklerne fæste sig. De andre 6 Par fuldstændige Septa maa vel ansees som sekundære, Tab. XV, Fig. 3 b; de ere stillede saaledes, at imellem hvert 2 Par principale Septa, altsaa i det principale Kammer, er 1 Par af de fuldstændige, sekundære Septa. Paa disse ere Længdemusklerne fæstede paa den indre Flade, vende mod hverandre i det intraseptale Rum, imedens Tvermusklerne dække Størstedelen af den ydre Flade i det interseptale Rum. Alle de fuldstændige Septa bære Mesenterialfilamenter; men imedens de 6 Par principale Septa ere golde, sees paa enkelte af de sekundære Septa Acontier.

Imellem hver 2 Par af samtlige fuldstændige Septa er der 1 Par ufuldstændige, der indtager knapt den halve Længde af det interseptale Rum, saa at dettes anden Halvdel, som vender mod Svælgrøret, er frit, Tab. XV, Fig. 3 c. Disse ufuldstændige, tertiære Septa ere ligesom de fuldstændige forsynede med Længde- og Tvermuskler; de bære baade Acontier og Generationsorganer, og det i saa stor Mængde, at disse Organer udfylde en stor Del af det interseptale Rum, hvori de findes. Acontierne sidde øverst, Tab. XV, Fig. 3 d, og afvige ikke i Organisation fra de tidligere omtalte Acontier, men synes at være i større Mængde tilstede, end hos nogen af de forhen omtalte Phellia-arter. Nedenfor Acontierne, imod Gastralhulhedens Bund, sidde Kjønsorganerne, der danne lange, baandformige, sammenrullede Ovarier, Tab. XV, Fig. 3 e, hvori sees Æg i forskellige Udviklingsstadier. Svælgrøret er temmeligt langt, og paa dets indre Flade forsynet med to temmeligt brede Svælgruber, hvis Epithel bestaar af lange Cylinder-celler, der bære lange Cilier; den øvrige Del af Svælgladen har stærke Længdefolder, beklædte med Cylinder-celler, men hvis Cilier ere meget kortere. Imellem Cylinder-cellerne sees mange encellede Slimkjertler; men i Svælgruberne findes ingen saadanne paa det undersøgte Exemplar.

De 6 Par fuldstændige, principale Septa tage deres Begyndelse fra Centrum af Fodskivens indvendige Flade; de andre 6 Par fuldstændige Septa udspringe lidt udenfor Centrum og de 12 Par ufuldstændige Septa omtrent midt imellem Centrum og Peripherien.

whilst, also, the longitudinal muscles are placed on the outer surface of each septum and face towards the interseptal space, whilst the transversal muscles almost entirely cover the inner surface and consequently face towards the wide intraseptal space. The other 4 pairs of principal septa, viz. 2 upon each side of the directive septa, have their musculosity placed in quite a reverse manner; thus, the longitudinal muscles are upon the inner, and the transversal muscles upon the outer surface (Pl. XV, fig. 3 a). The longitudinal muscles are most developed in the neighbourhood of the gullet, where they form themselves into frutici, owing to fillet-formed connective-tissue prolongations upon which the muscles attach themselves issuing from the divisional wall (septum). The other 6 pairs of perfect septa must, I suppose, be considered as secondary septa (Pl. XV, fig. 3 b); they are placed in such manner that between each 2 pairs of principal septa, consequently in the principal chamber, there is 1 pair of perfect, secondary septa. Upon these the longitudinal muscles are secured on the inner surface, face towards each other in the intraseptal space, whilst the transversal muscles cover the greater part of the outer surface in the interseptal space. All the perfect septa carry mesenterial filaments; but whilst the 6 pairs of principal septa are sterile, acontia are observed upon some of the secondary septa.

Between every two pairs of all the perfect septa, there is 1 pair of imperfect septa, which occupy barely half the length of the interseptal space, so that its remaining half, which faces towards the œsophagus, is free (Pl. XV, fig. 3 c). These imperfect, tertiary septa are, like the perfect septa, furnished with longitudinal and transversal muscles; they carry both acontia and reproductive organs, and in such great abundance that these organs fill up a great part of the interseptal space in which they are found. The acontia are placed uppermost (Pl. XV, fig. 3 d), and do not differ in organisation from the acontia previously spoken of, but appear to be present in greater abundance than in any of the species of Phellia previously mentioned. Below the acontia, towards the bottom of the gastral cavity, the reproductive organs are situated, forming long ribbon-like coiled ovaries (Pl. XV, fig. 3 e), in which ova in various stages of development are observed. The œsophagus is rather long and is, upon its inner surface, furnished with two rather broad gullet-grooves whose epithelium consists of long cylinder-cells carrying long ciliæ. The remaining part of the gullet surface has strong longitudinal folds clad with cylinder-cells, but whose ciliæ are much shorter. Between the cylinder-cells numerous unicellular mucous glands are seen, but in the gullet-grooves no such glands were found in the specimen examined.

The 6 pairs of perfect, principal septa originate in the centre of the inner surface of the pedal disc; the other 6 pairs of perfect septa originate a little beyond the centre, and the 12 pairs of imperfect septa originate about half way between the centre and the periphery.

Findested.

Station 363. To Exemplarer, siddende paa Buccinum hydrophanum.

Artskarakter.

Phellia spitsbergensis er 15^{mm} høi. Fodskiven rund, ikke synderlig bredere end Kolumnen med en tynd, jævn Rand. Kolumnen cylindrisk, beklædt indtil et Par Millimeter fra Mundskiven med en inkrusteret Skede, hvis øverste Rand er fri og forsynet med Længdefolder og Furer. Kolumnens nøgne Del glat, furet paalangs, med spredte Cinclides. Mundskiven plan med en aflang, lidt fremspringende Mund; femfoldede Læber til hver Side af Mundvigene. 3 Rækker Tentakler, 24 i hver, omtrent saa lange som Mundskivens Bredde; de indre dog længst; den ydre Række paa Kolumnens øverste Rand. Farven: Kroppens nøgne Del blaaviolet, men den tentakulære Kropprand lysere. Mundskiven blaaviolet med lysere Straaler og en lysere Ring om Munden. Tentaklerne intens blaaviolette med rødlig Ender. Skeden grønlig med et svagt violet Underlag.

Kodioides¹ pedunculata.

Tab. VI, Fig. 3, 4; Tab. XXII, Fig. 8—11; Tab. XXIII, Fig. 1—4.

Legemet er pæreformet med en lang Stilk. Den øverste Del eller Kroppen er henved 20^{mm} høi og omkring 12^{mm} bred paa Midten, men smalner betydeligt af nedad, saa at den ved Overgangen i Stilken kun er 4^{mm} bred. Opad bliver den ogsaa noget smalere, idet den gaar over til Mundskiven, hvor den bliver omtrent 8^{mm} bred. Stilken er mindst 30^{mm} lang og ender i en lidt aflang Fodskive, Tab. VI, Fig. 3, 4.

Kroppen er tæt bedækket med grov Sand og Biloculiner, saa det ikke er muligt at se den indenfor værende Hud, Tab. VI, Fig. 3, 4; men efterat Dyret er kommet i Alcohol, kan Krusten med nogenlunde Lethed borttages, og da viser det sig, at Kroppens Overflade er tæt besat med Sugevorter, der kunne inddrages og udskydes efter Omstændighederne, Tab. XXII, Fig. 8, og hvortil de fremmede Legemer ere fæstede. Paa mange Steder staa Sugevorterne saa tæt sammen, at de ved at trækkes ind danner en større eller mindre Grube, der er fyldt med Sandkorn, og i hvis Bund iagttages 2—4 Sugevorter,

¹ Κώδιαι = Et Valmuehoved.

Habitat.

Station No. 363. Two specimens seated on Buccinum hydrophanum.

Specific characteristics.

Phellia spitsbergensis is 15^{mm} in height. The pedal disc round, not much broader than the column, has a thin, even margin. The column cylindric, clad, up to within a couple of millimetres from the oral disc, with an encrusted sheath, whose uppermost margin is free and furnished with longitudinal folds and furrows. The bare part of the column smooth, longitudinally furrowed, with scattered cinclides. The oral disc plane, with an oblong, slightly projectant mouth and finely folded labiæ upon each side of the oral angles. 3 series of tentacles, 24 in each, about as long as the oral disc is broad, the innermost series being, however, longest. The outermost series situated on the uppermost margin of the column. *The colour.* The bare part of the body blue-violet, but its tentacular margin is lighter-coloured. The oral disc blue-violet with lighter-coloured rays and a lighter-coloured annulus round the mouth. The tentacles intense blue-violet with reddish extremities. The sheath greenish with a faint violet-coloured substratum.

Kodioides¹ pedunculata.

Pl. VI, fig. 3, 4; Pl. XXII, fig. 8—11; Pl. XXIII, fig. 1—4.

The animal is piriform with a long stem. The superior portion, or the body, is about 20^{mm} in height, and about 12^{mm} in breadth at the middle, but diminishes considerably in breadth downwards, so that at the point where it passes over into the stem it is only 4^{mm} in breadth. Towards the top it is also a little narrower at the point where it passes over into the oral disc, in which situation it is about 8^{mm} in breadth. The stem is at least 30^{mm} in length, and terminates in a slightly oblong pedal disc (Pl. VI, fig. 3, 4).

The body is closely covered with coarse sand and biloculina, so much so that it is impossible to observe the integument lying underneath (Pl. VI, fig. 3, 4); but after the animal has been placed in alcohol the crust may be removed without much difficulty, and it then appears that the surface of the body is closely covered with suckers which may be retracted and projected, according to circumstances (Pl. XXII, fig. 8), and to which the foreign bodies are adherent. In many places the suckers are placed so close that, upon being retracted, they form a larger or smaller hollow filled with grains of sand, in whose

¹ Κώδιαι = A poppy head.

Tab. XXII, Fig. 8^a, der ere mere eller mindre indtrukne.

Mundskiven, som er nøgen og blottet for Grusbedækning, er lidt hvælvet og forsynet med Folder, der udstraale fra den lidt aflange Mund og blive bredere mod Peripherien, Tab. XXII, Fig. 8, hvor der er 2 Rækker meget korte, koniske og retraktile Tentakler — 12 i hver Række. Tentaklerne i den indre Række ere tykkere og lidt kortere end i den ydre. Munden er næsten rund med foldet Rand og uden Gonidiegrube.

Stilken er nøgen, rund, glat og glindsende, lader sig let sammentrykke og bliver noget bredere (tykkere) ned imod Fodskiven, Tab. VI, Fig. 3, 4; Tab. XXII, Fig. 8. Denne er lidt aflang, glat, noget hvælvet paa den øvre Flade, imedens den undre er lidt konkav og forsynet med fine Folder, der gaa vifteformigt fra Centrum mod Peripherien; den er fæstet til et lidet Stykke af Stilken af Bathycrinus Carpenteri.

Farven. Den inkrusterede Del af Kroppen er graagrøn, spillende lidt i det Violette; men borttages Krusten, viser Huden sig at være hvid. Mundskiven med Tentakler er bleg rosenrød. Stilken er næsten farveløs, imedens Fodskiven har et fint røddigt Skjær, Tab. VI, Fig. 3, 4.

Af dette ret mærkelige Dyr har Expeditionen kun 1 Exemplar fra en Dybde af 1050 Favne i den kolde Area. Det var i meget stormfulde Dage, saa Skibet var i stadig rullende Bevægelse, der i høi Grad vanskeliggjorde Undersøgelserne. Det lykkedes mig dog at faa Dyret tegnet levende og at faa gjort nogle Notiser med Hensyn til dets Ydre; men da det stødse holdt sig temmelig sammentrukket, uagtet jeg havde det i flere Dage i Observationskarret, kunde jeg intet bestemme angaaende Tentaklerne, — kun saameget iagttog jeg, at Stilken til enkelte Tider holdt sig ganske opret, til andre bøiede sig, imedens Kroppen udvidede og sammentrak sig — Bevægelser, som fulgtes af Stilken, saaledes nemlig, at naar Kroppen trak sig sammen, blev Stilken smalere, og naar den udvidede sig, svulmede Stilken op. I min Notisebog var Dyret opført blandt Zoantherne, med hvilke det havde adskillig Lighed, og det er derfor, at det paa Plancherne har faaet Plads iblandt disse. Da jeg kun havde et Exemplar at raade over, opstod Spørgsmaalet, om jeg skulde ofre dette i Videnskabens Tjeneste for muligens ved en anatomisk-histologisk Undersøgelse at kunne faa bestemme dets systematiske Plads, eller lade det blive staaende i Samlingen som en ubestemmelig Gjenstand. Jeg valgte det første, og nu er kun tilbage den øverste Del af Kroppen, samt Tversnit af Kropsvæggen og hele Stilken med Fodskiven.

Den anatomisk-histologiske Undersøgelse. Ved at aabne Dyret efter Længden fra Mundaabningen til Stilkens Begyn-

bottom 2—4 suckers are observed (Pl. XXII, fig. 8^a), more or less retracted.

The oral disc, which is bare and free of any sandy covering, is a little arcuate, and is furnished with folds, which radiate from the slightly oblong mouth and become broader towards the periphery (Pl. XXII, Fig. 8); at which point there are 2 series of very short conical retractile tentacles — 12 in each series. The tentacles in the inner series are a little thicker and shorter than those of the outer series. The oral aperture is almost circular, has a folded margin and no gonidial recesses.

The stem is bare, round, smooth and shining, and may be easily compressed. It becomes somewhat broader (thicker) downwards towards the pedal disc (Pl. VI, fig. 3, 4; Pl. XXII, fig. 8). The latter is slightly oblong, smooth, somewhat arcuate on the upper surface, whilst its under surface is slightly concave, and is furnished with fine folds issuing, in fan-shape, from the centre to the periphery; it is secured to a small piece of the stem of Bathycrinus Carpenteri.

The colour. The encrusted portion of the body is greyish green with a violet play of colour, but if the crust is removed the integument appears to be white. The oral disc and the tentacles are pale rose-red. The stem is almost colourless, whilst the pedal disc has a fine reddish tinge (Pl. VI, fig. 3, 4).

The expedition obtained only one specimen of this very remarkable animal, at a depth of 1050 fathoms in the cold area. The weather was very stormy at the time, and the vessel had a constant heaving and rolling movement, which in a great degree obstructed the investigations. I was, however, fortunate enough to obtain the animal drawn in the live state, and to jot down some observations in regard to its exterior; but as it constantly kept itself pretty much shrunk together, although I had it for several days in the glass vessel for observation, I could determine nothing in respect of the tentacles, only so much did I observe viz. that the stem at some times kept itself quite erect and at other times became bent, whilst the body expanded and contracted — movements which were participated in by the stem in such manner, that when the body contracted the stem became attenuated and when the body expanded the stem became tumified. In my memorandum-book the animal was placed among the Zoanthidæ, to which it had considerable resemblance, and it is owing to this that it has been placed among them in the illustrative plates. As I only had one specimen at my disposal, the question arose whether I should sacrifice it in the service of science, in order, possibly, by an anatomo-histological investigation to be in a position to determine its systematic position, or whether I should let it remain uninjured in the collection as an object incapable of determination. I chose the first-named course, and, now, there only remains the uppermost part of the body, also a section of the body-wall, and the entire stem with the pedal disc.

The anatomo-histological examination. Upon dissecting the animal longitudinally, from the oral aperture to the

delse og ved at udvide Kropsvæg og Svælgrør til Siderne, Tab. XXII, Fig. 9, viste det sig, at de indre Dele vare mindre godt konserverede, idet en Del af Septa med deres Mesenterialfilamenter og Generationsorganer befandtes i en opløst Tilstand. Kun Septaernes Tilheftninger til den indre Kropsvæg og Svælgrøret vare saavidt bevarede, at de kunde tjene til Undersøgelse. Af denne fremgaar det, at der er 12 Par Septa, hvoraf 6 Par ere fuldstændige, det vil sige, inserere sig paa Svælgrøret, Tab. XXII, Fig. 9 *a*, imedens de øvrige 6 Par ere ufuldstændige og strække sig henimod Svælgrøret uden at naa dette, Tab. XXII, Fig. 9 *b*. Af de 6 Par fuldstændige Septa er der sandsynligvis 2 Par, som kunne ansees for Retningsseptas, omendskjønt jeg ikke med Bestemthed kan paavise dem; men der er 2 Par, som ere stillede saaledes, at de fæste sig paa Svælgrørets ydre, modsatte Sider og ere meget stærkere i Bygning end de øvrige, Tab. XXII, Fig. 9 *c*. Musklerne ere ødelagte saagodtsom paa alle Septa i den øvre Del af Gastrovascularhulheden, saa der ingen Veiledning er at erholde ved dem, derimod skulle vi senere se, at Septaerne ere bedre konserverede i Stilken.

De ufuldstændige Septa ere noget smalere, staa indbyrdes tættere sammen, saa det intraseptale Rum er meget smalt, og strække sig paa nogle Millimeter nær hentil Svælgrøret. Samtlige Septa bære Mesenterialfilamenter, hvoraf der kun findes Rester. De ufuldstændige Septa bære Generationsorganer.

Til et fuldstændigt Septum lige ved Svælgrøret er fæstet en Acontie, der er overmaade rig paa Nematocyster, forresten bygget som sædvanligt; kun denne ene lykkedes det mig at finde, Tab. XXII, Fig. 10.

Svælgrørets indre Flade har stærkt udprægede Længdefolder og er beklædt med et bredt Epithel, Tab. XXII, Fig. 9 *d*; nogen Svælgrube var ikke at opdage. Ved at løfte det spaltede Svælgrør op sees de to Rækker af de indtrukne Tentakler, hvoraf de i den ydre Række ere temmelig medtagne.

Paa Tversnit af den inkrusterede Kropshud sees, at det ydre, tykke Dække dannes af en temmelig tyk, seig Slimmembran, hvori de fremmede Legemer ere indleirede, Tab. XXII, Fig. 11 *a*. Indenfor denne er et Epithel (Ectoderm), bestaaende af høie Cylinderceller, forsynede med Kjerne og Kjernelegeme, Tab. XXII, Fig. 11 *b*; Tab. XXIII, Fig. 2 *a*. Imellem disse Celler ligger en stor Mængde noget spredte, encellede Slinkjertler, der ere kolbeformede og fyldte med en kornet Masse, som for Størstedelen skjuler Kjernen, Tab. XXIII, Fig. 2 *b*, samt enkelte Nematocyster. I Ectodermets sees de før omtalte Sugvorter; de ere cylindriske, have paa den næsten tværs afskaarne Ende en Sugeskive og ere udvendig beklædte med et Epithel, hvis Celler ere noget mindre (lavere) end Ectodermets, Tab. XXIII, Fig. 2 *d*. Deres indvendige Væg er beklædt med næsten runde Celler, der have en

commencement of the stem, and upon widening the body-wall and the gullet-tube laterally (Pl. XXII, fig. 9), it appeared that the internal portions were indifferently well preserved, as a portion of the septa, with their mesenterial filaments and reproductive organs, were found to be in a putrid state. Only the septal attachments to the inner body-wall and the gullet-tube were sufficiently well preserved that they could serve for purposes of investigation. From this investigation it appears, that there are 12 pairs of septa, of which 6 pairs are perfect, that is to say, they insert themselves on the gullet-tube (Pl. XXII, fig. 9 *a*), whilst the other 6 pairs are imperfect and extend towards the gullet-tube without, however, reaching it (Pl. XXII, fig. 9 *b*). Of the 6 pairs of perfect septa, there are probably 2 pairs that may be considered to be directive septa, although I am unable, with precision, to point them out; but there are 2 pairs placed in such a manner, that they secure themselves to the exterior opposite sides of the gullet-tube, and are much stronger in structure than the others (Pl. XXII, fig. 9 *c*). The muscles are destroyed upon nearly all the septa in the superior part of the gastro-vascular cavity, so that no assistance is to be had from them, but, on the other hand, we shall subsequently see that the septa are better preserved in the stem.

The imperfect septa are somewhat narrower, and are placed closer together and to each other, so that the intraseptal spaces are very narrow, and extend to within a few millimetres of the gullet-tube. All the septa carry mesenterial filaments, of which remains only are found. The imperfect septa carry reproductive organs.

An acontia is adherent to a perfect septum close to the gullet-tube, which is extremely rich in nematocysts, and otherwise constructed as usual. Only this single one have I been fortunate enough to find (Pl. XXII, fig. 10).

The inner surface of the gullet-tube has strongly distinguished longitudinal folds, and is covered with a broad epithelium (Pl. XXII, fig. 9 *d*). It was not possible to discover any gullet-groove. Upon raising the fissured œsophagus the 2 series of retracted tentacles are observed, of which those in the outer series are considerably damaged.

Upon transection of the encrusted integument of the body it is seen, that the external thick covering is formed by a rather thick, viscid, mucous membrane, in which the foreign bodies are entrenched (Pl. XXII, fig. 11 *a*). Inside this there is an epithelium (ectoderm) consisting of high cylinder-cells furnished with a nucleus and nucleus corpuscle (Pl. XXII, fig. 11 *b*; Pl. XXIII, fig. 2 *a*). Between those cells there lie a great multitude of somewhat scattered unicellular mucous glands, claviform in shape, and filled with a granular substance, which for the greater part conceals the nucleus (Pl. XXIII, fig. 2 *b*), and also a few nematocysts. In the ectoderm are seen the previously mentioned suckers; they are cylindrical, and on the almost truncate extremity have a sucker disc; externally they are clad with an epithelium whose cells are somewhat less (lower) than those of the ectoderm (Pl. XXIII, fig. 2 *d*)

forholdsvis stor, rund Kjerne, samt Kjernelegeme. Tab. XXIII, Fig. 2 *d*. Indenfor Sugevorternes ydre Epithel, imellem dette og deres Bindevævslag, sees longitudinelle Muskelfibre at strække sig et godt Stykke op paa Sugevorten, Tab. XXIII, Fig. 2 *i*; disse Sugevorter ligge i en afgrændset Hule i Hudens Bindevæv, Tab. XXIII, Fig. 2 *e*, og ere, eftersom de ere mere eller mindre indtrukne, optagne af de fremmede Legemer, Tab. XXII, Fig. 11 *c*.

Indenfor Ectodermet er et bredt, hyalint Bindevævslag, Tab. XXII, Fig. 11 *d*; Tab. XXIII, Fig. 2 *f*, hvori sees mange fine Saftkanaler med deres Epithel, og i Midten af dette Bindevæv findes et temmelig bredt Belte af cirkulære Muskelfibre, der synes at danne Bundter, Tab. XXII, Fig. 11 *e*; Tab. XXIII, Fig. 2 *g*. Paa Bindevævet indre Væg er et Muskellag, dannet af Tver- og Længdemuskler, hvoraf de sidste ere meget tydelige og stærkt udviklede, Tab. XXII, Fig. 11 *f*, og dette Muskellag beklædes af et Endothel, bestaaende af cilierende Cylinderceller, der dog ikke ere saa høje som Ectodermets, men forsynede med lidt aflange Kjerner med Kjernelegemer, Tab. XXII, Fig. 11 *g*.

Paa Tværsnit af Stilkens øverste Del sees Ectodermet at bestaa af meget høje, smale, cilierende Cylinderceller med store, aflange Kjerner, der indeslutte et næsten rundt Kjernelegeme og ere omgivne af en tynd, kornet Protoplasmamasse, Tab. XXIII, Fig. 3 *a*. Hverken Slimkjertler eller Nematocyster findes i Stilkens Ectoderm; men indenfor dette er et temmelig bredt Bindevævslag, rigt paa Bindevævslegemer og Ernæringskanaler, Tab. XXIII, Fig. 3 *b*, og i Midten af dette Bindevæv iagttages øverst paa Stilken svage, cirkulære Muskelfibre, der blive stærkere, rigere og danne Bundter, alt eftersom de komme længere ned, saa at de ved Overgangen til Foden ere meget udviklede, Tab. XXIII, Fig. 3 *c*. Fodskiven, der har samme Struktur som Stilken, er dog rigere paa Muskelfibre end denne.

Samtlige Septa udgaa fra Bunden af Gastrovascularhulheden, nemlig fra den indre Flade af Fodskiven, Tab. XXIII, Fig. 1 *a*, omtrent paa Midten af denne som parrede, smale, listeformige Fremspring; de strække sig langs Stilkens indre Flade, bundet til dennes Bindevæv, hvoraf de egentlig ere Forlængelser og ere lige brede i hele Stilkens Gastrovascularhulhed, Tab. XXIII, Fig. 4 *b*, som de kun udfylde halvt, Tab. XXIII, Fig. 4 *a*. Idet de forlade Stilkens Hulhed, blive de bredere langs Kroppsvæggen, og her indtage de fuldstændige Septa en større og større Bredde, alt eftersom de komme op imod Underfladen af Mundskiven og Svælgrøret, imedens de ufuldstændige Septa synes ikke at indtage større Bredde, end de have i Stilkens øverste Del.

Their inside wall is clad with almost round cells containing a relatively large round nucleus, also a nucleus-corpuscle (Pl. XXIII, fig. 2 *d*). Inside the external epithelium of the suckers, between it and their connective-tissue layer, longitudinal muscle-fibres are seen to extend themselves a considerable distance up the suckers (Pl. XXIII, fig. 2 *i*); those suckers lie in a well defined cavity in the integumental connective-tissue (Pl. XXIII, fig. 2 *e*), and are, according as they are more or less retracted, occupied by the foreign bodies (Pl. XXII, fig. *c*).

Inside the ectoderm there is a broad hyaline connective-tissue layer (Pl. XXII, fig. 11 *d*; Pl. XXIII, fig. 2 *f*), in which are seen many slender nutritory ducts with their epithelium, and in the middle of this connective-tissue there is found a pretty broad belt of circular muscle-fibres, which appear to form bundles (Pl. XXII, fig. 11 *e*; Pl. XXIII, fig. 2 *g*). On the inner wall of the connective-tissue there is a muscular layer, formed of transversal and longitudinal muscles, of which the last-named are very prominent and strongly developed (Pl. XXII, fig. 11 *f*), and this muscular layer is clad with an endothelium consisting of ciliating cylinder-cells, which are, however, not so high as those of the ectoderm, and are furnished with slightly oblong nuclei and nucleus-corpuscles (Pl. XXII, fig. 11 *g*).

Upon transection of the uppermost portion of the stem, the ectoderm is seen to consist of very high, narrow, ciliating cylinder-cells containing large oblong nuclei with an almost round nucleus-corpuscle surrounded by a thin granular protoplasmic substance (Pl. XXIII, fig. 3 *a*). Neither mucous glands nor nematocysts are found in the ectoderm of the stem, but inside it there is a pretty broad connective-tissue layer, rich in connective-tissue corpuscles and nutritory ducts (Pl. XXIII, fig. 3 *b*), and in the middle of this connective-tissue there are observed, in the uppermost part of the stem, delicate circular muscle-fibres, which become stronger and richer and form bundles according as they proceed downwards, so that at the transition to the pedestal they are well developed (Pl. XXIII, fig. 3 *c*). The pedal disc, which has the same structure as the stem, is, however, richer in muscle-fibres than it.

All the septa issue from the bottom of the gastrovascular cavity, viz. from the inner surface of the pedal disc (Pl. XXIII, fig. 1 *a*), about the middle of it, as paired, narrow, fillet-formed protuberances; they extend themselves along the inner surface of the stem, adherent to its connective-tissue of which they are really prolongations, and are uniform in breadth through the whole of the gastrovascular cavity of the stem (Pl. XXIII, fig. 4 *b*), which they only half occupy (Pl. XXIII, fig. 4 *a*). As they pass from the cavity of the stem they become broader along the body-wall, and here the perfect septa occupy a greater and greater breadth according as they pass up towards the under surface of the oral disc and the oesophagus, whilst the imperfect septa do not appear to occupy a greater breadth than they have in the uppermost part of the stem.

Der er i Stilken to Par Septa, som udmærke sig fremfor de øvrige baade ved deres Stilling og ved deres Muskelanordning, og som maa betragtes som Retningssepta, Tab. XXIII, Fig. 4 c; de staa lige overfor hinanden og have deres Længdemuskler placerede paa den udvendige Side af hvert Septum, saaledes nemlig, at de vende fra hverandre i det interseptale Rum, Tab. XXIII, Fig. 4 d, imedens de transverselle Muskler ere fæstede til den indre Side og vende mod hverandre i det intraseptale Rum, Tab. XXIII, Fig. 4 e. Paa de øvrige 10 Septapar ere Længdemusklerne fæstede til den indre Side af ethvert Septum, saa at de vende mod hverandre i det intraseptale Rum, Tab. XXIII, Fig. 4 f, imedens de transverselle ere bundne til den ydre Side og vende til det interseptale Rum. Hvert Septum har i Midten en Bindevævslamelle, der er en Forlængelse af Hudens Bindevæv, Tab. XXII, Fig. 11 i; Tab. XXIII, Fig. 2 h, 3 d, og som tilligemed sine Muskellag er beklædt med et Endothel, der giver hele Gastrovascularhulheden sit Overtræk og bestaar af cilierende Cylinder-celler, Tab. XXII, Fig. 11 k.

Generationsorganerne ere fæstede til Randen af de ufuldstændige Septa ved et løst Bindevæv og ere kun lidet udviklede. Hos det eneste Individ, jeg havde, fandtes kun Æggestokke, der dannede Rør, hvori de lidet udviklede Æg laa parvis, Tab. XXII, Fig. 11 l. Det tør hælde, at Kønnet er særskilt.

Tentaklerne ere udvendigt beklædte med et Ectoderm, bestaaende af cilierende Cylinder-celler, imellem hvilke sees en stor Mængde Nematocyster.

Findested.

Station 35. Kun et Exemplar.

Jeg har henført *Kodiodes pedunculata* til Familien Phellidæ, omendskjønt jeg maa erkjende, at der ikke findes en saa udpræget Cuticula, som egentlig adskiller Familierne Phellidæ og Sagartidæ fra hinanden. Naar jeg ei vil danne en ny Familie, som jeg i dette Tilfælde ikke finder paakrævet, forekommer det mig, at den nærmest maa henføres til Phelliderne.

Slægtskarakter.

Legemet inkrusteret, pæreformet, med en lang, nogen Stilk, endende i en Fodskive. To Rækker faa, retraktile Tentakler. 12 Par Septa, hvoraf 6 Par fuldstændige. Sugevorter paa Kroppens inkrusterede Del. Ingen Svælgruber. Mesodermale Ringmuskler. Acontier.

Artskarakter.

Legemets øverste Del (Kroppen) henved 20^{mm} høj, 12^{mm} bred paa Midten; nedad mod Stilken kun 4^{mm} bred; opad mod Mundskiven 8^{mm} bred og stærkt inkrusteret med grov Sand og Foraminiferer. Indenfor Krusten en Mængde Sugevorter over hele Overfladen. Stilken er nogen, 30^{mm} lang.

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

There are two pairs of septa in the stem, which distinguish themselves from the others both by their position and by their muscular arrangement, and these must be considered to be directive septa (Pl. XXIII, fig. 4 c); they are placed exactly opposite each other, with their longitudinal muscles placed on the outer side of each septum in such a manner, that they face from each other in the interseptal space (Pl. XXIII, fig. 4 d); whilst the transversal muscles are secured to the inner surface, and face towards each other in the interseptal space (Pl. XXIII, fig. 4 e). In the other 10 pairs of septa the longitudinal muscles are secured to the inner side of each septum, so that they face towards each other in the intraseptal space (Pl. XXIII, fig. 4 f), whilst the transversal muscles are attached to the outer side and face towards the interseptal space. Each septum has in the middle a connective-tissue lamella, which is a prolongation of the integumental connective-tissue (Pl. XXII, fig. 11 i; Pl. XXIII, fig. 2 h, 3 d) and which, as well as its muscous layer, is clad with an endothelium that forms the covering of the entire gastro-vascular cavity, and consists of ciliating cylinder-cells (Pl. XXII, fig. 11 k).

The reproductive organs are attached to the margin of the imperfect septa by a loose connective-tissue, and are only little developed. In the single specimen I had, there were only ovaries to be found, which formed tubes in which the but slightly developed ova lay in pairs (Pl. XXII, fig. 11 l). It may perhaps be the case that the sexes are separated.

The tentacles are externally clad with an ectoderm consisting of ciliating cylinder-cells, between which a great multitude of nematocysts are observed.

Habitat.

Station No. 35. Only one specimen.

I have assigned *Kodiodes pedunculata* to the family Phellidæ, although I must acknowledge, that there is not found such a distinguished cuticulum as really divides the families Phellidæ and Sagartidæ from each other. When, therefore, I do not establish a new family, which I do not consider necessary in the present case, it appears to me that it will be most appropriate to assign it to the Phellidæ.

Generic characteristics.

The body encrusted, piriform, with a long bare stem terminating in a pedal disc. Two series, containing a few retractile tentacles. 12 pairs of septa, of which 6 pairs perfect. Suckers on the encrusted portion of the body. No gullet-groove. Mesodermal, annular muscles. Acontia.

Specific characteristics.

The uppermost part of the animal (body) about 20^{mm} in height, 12^{mm} in breadth at the middle, and downwards towards the stem only 4^{mm} broad; upwards towards the oral disc 8^{mm} broad; strongly encrusted with coarse sand and foraminifera. Inside the crust a multitude of suckers over the

endende i en lidt aflang Fodskive. Mundskiven lidt hvælvet, forsynet med fine Folder, udstraalende fra den runde Mund. Tentaklerne korte, i to Rækker, 12 i hver Række. Farven: Den inkrusterede Del graagrøn, spillende lidt i det Violette. Huden indenfor Krusten hvid; Mundskiven med Tentakler bleg rosenrød; Stilken næsten farveløs; Fodskiven har et fint, rødligt Skjær.

*Cactosoma*¹ *abyssorum*.

Tab. VI, Fig. 5; Tab. XXIII, Fig. 5—8.

Legemet kølleformet, cylindrisk, bredere i den øverste Ende, meget smal i den nederste. Udstrakt er Dyret indtil 40^{mm} langt, 10^{mm} bredt i den øverste Ende, men kun 5^{mm} i den nederste. Sammentrukken har det Pæreformen, og da er den øverste Ende mindst 16^{mm} bred.

Størstedelen af Kolumnen har et tykt Overtræk af inkrusteret, grov Sand, Tab. VI, Fig. 5 *a*, kun den øverste Del er nøgen i omtrent 4^{mm} Høide til Mundskiven, Tab. VI, Fig. 5 *b*; Tab. XXIII, Fig. 5 *a*. Men opimod denne nøgne Del har Kolumnen 6 temmelig brede, omtrent 6^{mm} lange, inkrusterede Ribber, Tab. VI, Fig. 5 *c*, imellem hvilke findes 6 ligesaa lange og brede Mellemrum, der ere nøgne, Tab. VI, Fig. 5 *d*.

Mundskiven er stærkt hvælvet, forsynet med 12 fra Munden udstraalende Folder, Tab. XXIII, Fig. 5, og i Midten sees den aflange Mund med foldede, næsten lappede Læber og to smale Mundvige (Gonidiefurer). Tentaklerne staa i to alternerende Rækker, 12 i hver Række, ere retraktile, lancetformede, brede ved Basis og med meget tilspidsede Ender; de ere omtrent 2^{mm} lange og 1,3^{mm} brede ved Grunden, Tab. VI, Fig. 5; Tab. XXIII, Fig. 5.

Fodskiven er lidt hvælvet og stærkt inkrusteret paa Overfladen med en rund, undulerende Rand, Tab. VI, Fig. 5; Tab. XXIII, Fig. 5, imedens Underfladen er lidt konkav, nøgen, fint foldet fra Centrum mod Peripherien og fæstet til en liden Sten.

Borttages den inkrusterede Overhud, hvilket kan ske med stor Lethed, saa fremtræder den egentlige Hud, der er næsten hvid, temmelig gjennemsigtig og forsynet med 12 fine Længdelinier, som antyde Insertionerne for Septa. Imellem disse Linier sees overalt paa Legemets Overflade en Mængde uregelmæssigt spredte Sugevorter, Tab. XXIII, Fig. 5 *b*, der tildels staa saa tæt sammen, at de ved at trække sig ind danne en større Grube, i hvis Bund iagttages 3—4 hvidagtige Punkter, der angive Sugevorternes Antal, Tab. XXIII, Fig. 5 *c*. Til disse Sugevorter ere mange af de grove Sandkorn fæstede.

¹ κάκτος = en pigget Plante σῶμα = Legeme.

whole surface. The stem is bare, 30^{mm} in length, and terminates in a slightly oblong pedal disc. The oral disc slightly arcuate, furnished with fine folds radiating from the circular mouth. The tentacles short, placed in two series; 12 in each series. *The colour.* The encrusted portion greyish-green with a violet play of colour. The integument below the crust white. The oral disc with tentacles pale rose-red. The stem almost colourless. The pedal disc has a fine reddish tinge.

*Cactosoma*¹ *abyssorum*.

Pl. VI, fig. 5; Pl. XXIII, fig. 5—8.

The body claviform, cylindrical, broadest in the uppermost extremity, very narrow in the lowest. When extended the animal measures up to 40^{mm} in length, 10^{mm} in breadth at the uppermost extremity but only 5^{mm} at the lowest. When contracted it has a piriform shape, and then its uppermost extremity is at least 16^{mm} in breadth.

The greater part of the column has a thick covering of encrusted coarse sand (Pl. VI, fig. 5 *a*); only the uppermost part is bare for about 4^{mm} in height next the oral disc (Pl. VI, fig. 5 *b*; Pl. XXIII, fig. 5 *a*). But up towards this bare part, the column has 6 rather broad — about 6^{mm} long — encrusted ribs (Pl. VI, fig. 5 *c*), between which there are 6 intervening spaces of similar length and breadth, which are bare (Pl. VI, fig. 5 *d*).

The oral disc is strongly arcuate, and is furnished with 12 folds radiating from the mouth (Pl. XXIII, fig. 5); in the middle the oblong mouth is seen, with folded, almost lobate labiæ and two narrow gonidial recesses (gonidial-grooves). The tentacles are placed in two alternating series, 12 in each series; they are retractile, lanciform, broad at the base, and have very acuminate extremities; they are about 2^{mm} in length, and 1,3^{mm} in breadth at the base (Pl. VI, fig. 5; Pl. XXIII, fig. 5).

The pedal disc is a little arcuate, strongly encrusted on the surface, and has a round undulating margin (Pl. VI, fig. 5; Pl. XXIII, fig. 5); whilst its under surface is a little concave, bare, finely folded from the centre towards the periphery, and is adherent to a small stone.

If the encrusted covering is removed, which can be done with great ease, then the integument-proper appears; this is almost white, rather transparent, and furnished with 12 fine longitudinal lines indicating the insertions of septa. Between those lines there is everywhere visible, on the surface of the body, a multitude of irregularly spread suckers (Pl. XXIII, fig. 5 *b*), partly placed so closely together that, on retracting themselves they form, in doing so, a considerable cavity, in whose bottom 3—4 whitish points are observed; these indicate the number of suckers (Pl. XXIII, fig. 5 *c*). Many of the coarse grains of sand are adherent to those suckers.

¹ κάκτος = a spiny plant = (The Cactus); and σῶμα = body.

Den nøgne Del af Kolumnen tilligemed Mundskiven og Tentaklerne kan indtrækkes i Legemet, og naar saa den øverste Del af Kroppen lukker sig, danne de 6 Ribber med deres nøgne Mellemrum en Glorie med en fin Aabning i Midten, og Dyret faar derved saa megen ydre Lighed med en Zoanthide, at jeg ved den første, overfladiske Betragtning antog det derfor. Farven: Det inkrusterede Overtræk med Ribberne er brunt med mørke, næsten sorte Punkter. Indenfor Overtrækket er Huden hvid, spillende lidt i det Rosenrøde. Længdelinierne ere blegrøde. Den nøgne Del med Ribbernes Mellemrum er bleg rosenrød. Mundskiven er næsten hvid; omkring Munden er en rød Ring, hvorfra udgaa 12 fine, rosenrøde Striber henimod Skivens Rand. Tentaklerne ere intens laxerøde, Tab. VI, Fig. 5.

Ogsaa af dette interessante Dyr fandt jeg destoværre kun 1 Exemplar paa 457 Favnes Dyb — i den kolde Area — hvilket blev observeret og tegnet levende. Men ogsaa dette Unicum har jeg fundet nødvendigt at ofre paa Videnskabens Alter for at faa Kundskab om dets indre Bygning og derefter at bestemme dets systematiske Plads. Jeg har skaaret det tversover Midten af Kroppens nøgne Del og opbevaret Størstedelen heraf med Mundskive og Tentakler i Alkohol; af hele den øvrige Kroppsdel har jeg gjort Snitpræparater, som ogsaa opbevares.

Anatomisk-histologisk Undersøgelse. Paa Tversnitene af Kroppen sees det ydre, inkrusterede Overtræk at bestaa af en tyk Slimmembran, hvori de grove Sandkorn (fornemmelig Kvarts) ere indleirede, Tab. XXIII, Fig. 6 a. Slimmembranen er ganske løst fæstet til den indenfor værende Hud, uden nogen organisk Forbindelse. Indenfor det skedeformede Overtræk er et bredt Epithellag (Ectoderm), der dannes af meget høie, smale Cylinder-celler med deres Kjerne og Kjernelegeme, Tab. XXIII, Fig. 6 b, og imellem hvilke iagttages en stor Mængde Nematocyster og Slimkjertler. Nematocysterne, der ere de almindelige med Spiraltraad, rage tildels ind i Slimmembranen, saa at, naar denne fjernes, følge mange med den, Tab. XXIII, Fig. 6 c. Slimkjertlerne ere kolbeformede, encellede, ligge tildels i Grupper og ere snart fyldte med en kornet Masse, saa at Kjernen skjules, snart ere de tomme og se ud som Vacuoler, Tab. XXIII, Fig. 6 d.

Indenfor Ectodermet er et bredt, fibrillært Bindevævslag, forsynet med Bindevævslegemer med flere Udløbere samt Ernæringskanaler, fyldte med Epithel, Tab. XXIII, Fig. 6 e, og omtrent i Midten af dette Bindevæv er et temmelig bredt Belte af stærke Cirkulærmuskler, der synes at ligge i Bundter, Tab. XXIII, Fig. 6 f. Paa den indre Flade af Bindevævslaget er et Muskellag, bestaaende af Tver- og Længdemuskler, hvoraf de sidste ere især fremtrædende, Tab. XXIII, Fig. 6 g, og som er beklædt med et temmelig bredt Endothel.

The bare part of the column, as well as the oral disc and tentacles, may be withdrawn into the body; and when the uppermost part of the body then closes itself, the 6 ribs with their bare intermediate spaces, form a halo having a minute aperture in the middle; in this way the animal acquires so much the external appearance of a Zoanthid, that on the preliminary, summary investigation I took it to be one. *The colour.* The encrusted covering and the ribs are brown, with dark, almost black points. Inside the covering the integument is white with a slight rose-red play of colour. The longitudinal lines are paler. The bare part and the spaces between the ribs are pale rose-red. The oral disc is almost white; round the mouth there is a red annulus from which 12 fine rose-red stripes issue towards the margin of the disc. The tentacles are bright salmon-red (Pl. VI, fig. 5).

Also of this interesting animal I found, unfortunately, only one specimen, at a depth of 457 fathoms — in the cold area — which was observed and drawn in the live state. But this *unicum*, also, I have found it necessary to offer as a sacrifice on the altar of science, in order to obtain a knowledge of its internal structure and determine its systematic position. I have transsected it at the middle of the bare part of the body, and preserved the greater part of this with the oral disc and tentacles in alcohol; of the entire remaining part of the body I have made sectional preparations, which have also been preserved.

Anatomo-histological examination. In the transversal sections of the body, the outer encrusted covering is seen to consist of a thick mucous membrane in which the coarse grains of sand (quartz principally) are entrenched (Pl. XXIII, fig. 6 a). The mucous membrane is quite loosely adherent to the integument lying inside, and has no organic connection with it. Inside the vaginate covering there is a broad layer of epithelium (ectoderm), formed of very high, narrow cylinder-cells with their nuclei and nucleus-corpuscles (Pl. XXIII, fig. 6 b), and between these a great multitude of nematocysts and mucous glands are observed. The nematocysts — which are the usual ones with spiral filaments — extend partially into the mucous membrane, so that, when it is removed, many of them follow along with it (Pl. XXIII, fig. 6 c). The mucous glands are claviform, unicellular, situated partly in groups, and are often filled with a granular substance, so that the nucleus is concealed; often they are empty and appear like vacuoli (Pl. XXIII, fig. 6 d).

Inside the ectoderm there is a broad, fibrillar connective-tissue layer, furnished with connective-tissue corpuscles having several prolongations, also nutritory ducts filled with epithelium (Pl. XXIII, fig. 6 e), and at about the middle of this connective-tissue there is a pretty broad belt of strong circular muscles, which appear to lie in bundles (Pl. XXIII, fig. 6 f). On the inner surface of the layer of connective-tissue there is a muscular layer, consisting of transversal and longitudinal muscles, the last-named being especially prominent (Pl. XXIII, fig. 6 g), and which is clad with a pretty broad endothelium.

Der er 12 Par Septa, hvoraf 6 Par ere fuldstændige, primære, det vil sige, de fæste sig paa Svælgrøret; de øvrige 6 Par ere ufuldstændige. Af de 6 Par fuldstændige Septa ere de 2 Par Retningssepta. Samtlige Septa tage deres Begyndelse fra Bunden af Gastrovascularhulheden (den indre Flade af Fodskiven) og ere Fortsættelser af Hudens Bindevæv. De udbrede sig som sædvanligt langs Kropsvæggen, og imedens de fuldstændige Septa naa til Mundskiven og Svælgrøret, hvor de fæste sig, naa de ufuldstændige Septa neppe op til Gastralhulhedens øverste Halvdel, Tab. XXIII, Fig. 7. De to Par Retningssepta fæste sig paa Svælgrørets ydre Side saaledes, at de staa modsat hverandre og svare til de omtalte Gonidiefurer, Tab. XXIII, Fig. 7 a, 8 a; de synes at være stærkere bygget end de øvrige og skille sig fra disse ved Muskelanordningen. Paa begge Sider af Bindevævslamellen, som danner Septumets Midtparti, Tab. XXIII, Fig. 7 a, 8 b, er der udviklede Længdemuskler, som skjule Tvermusklerne. Disse Længdemuskler ere paa den nederste Trediedel temmelig udprægede, Tab. XXIII, Fig. 7 b, 8 c, ligesom Bindevævslamellen her er temmelig bred; men saa bliver Septumet meget smalt et langt Stykke opover, og i denne Længde ere Musklerne kun lidet udviklede, Tab. XXIII, Fig. 7 c, 8 d. Naar det saa nærmer sig op imod Mundskiven for at gaa over paa Svælgrøret, bliver det bredere, og Længdemusklerne antage da paa den ydre Flade ganske betydelige Dimensioner, saa at de her danne smukke Forgreninger i Form af en Fane, Tab. XXIII, Fig. 7 d, 8 e. Disse udviklede Længdemuskler paa Retningssepta vende fra hverandre i det interseptale Rum; paa de øvrige 4 Par fuldstændige Septa vende de mod hverandre i det intra-septale Rum, Tab. XXIII, Fig. 7 e.

Fra den brede Del af de fuldstændige Septa, ikke langt fra Svælgrørets nederste Ende, udgaar en Bindevævsstræng, der membranagtig udvider sig og følger Septumet et langt Stykke nedover Gastrovascularhulhedens nederste Trediedel, Tab. XXIII, Fig. 8 f, og i denne Bindevævsmembran ligge Mesenterialfilamenterne og Generationsorganerne, Tab. XXIII, Fig. 8 g. Det synes, som om samtlige fuldstændige Septa bære disse Organer, der ligge ved Siden af hinanden og adskille sig i Bygning ikke fra Actiniernes i Almindelighed. Kun Æggestokke med lidet udviklede Æg findes hos det undersøgte Individ, Tab. XXIII, Fig. 8 h.

De ufuldstændige Septa ere stillede saaledes, at et Par staa imellem to Par fuldstændige, Tab. XXIII, Fig. 7 f, 8 i. De udvide sig noget, ligesom deres Midtparti (Bindevævslamellen) bliver bredere, alt eftersom de naa op paa Kropsvæggen, og deres fri Rand, der vender indad i de primære Kamre, synes at være afrundet, Tab. XXIII, Fig. 7, 8. Ligesom paa de fuldstændige Septa, saaledes

There are 12 pairs of septa, of which 6 pairs are perfect and primary, that is to say they attach themselves to the œsophagus; the remaining 6 pairs are imperfect. Of the 6 pairs of perfect septa, there are 2 pairs of directive septa. All the septa have their origin in the bottom of the gastro-vascular cavity (the inner surface of the pedal disc), and are prolongations of the integumental connective-tissue. They distribute themselves, as usual, along the body-wall, and whilst the perfect septa reach to the oral disc and the œsophagus, where they attach themselves, the imperfect septa scarcely reach up to the gastral cavity's uppermost half (Pl. XXIII, fig. 7). The two pairs of directive septa attach themselves to the outer side of the œsophagus in such manner, that they stand opposite each other and correspond to the gonidial grooves previously spoken of (Pl. XXIII, figs. 7 a, 8 a). They appear to have a stronger structure than the others, and they distinguish themselves from them by their muscular arrangement. Upon both sides of the connective-tissue lamella, which forms the medial portion of the septa (Pl. XXIII, figs. 7 a, 8 b), there are well developed longitudinal muscles, which conceal the transversal muscles. These longitudinal muscles are pretty prominent on the lowest third-part (Pl. XXIII, figs. 7 b, 8 c), whilst, also, the connective-tissue lamella is here pretty broad; but then the septum becomes very narrow for a long way upwards, and in that portion the muscles are only little developed (Pl. XXIII, fig. 7 c, 8 d). When it then approaches towards the oral disc, in order to pass over to the œsophagus, it becomes broader, and the longitudinal muscles assume, then, on the outer surface, quite considerable dimensions, so that they form, here, beautiful ramifications in the form of a flag (Pl. XXIII, figs. 7 d, 8 e). Those developed longitudinal muscles on the directive septa, face from each other in the interseptal space; on the other 4 pairs of perfect septa they face towards each other in the intra-septal space (Pl. XXIII, fig. 7 e).

From the broad part of the perfect septa, not far from the lowest extremity of the œsophagus, there issues a connective-tissue cord, which dilates itself membranously and follows the septum a long way down the lowest third part of the gastro-vascular cavity (Pl. XXIII, fig. 8 f); and in this connective-tissue membrane the mesenterial filaments and the reproductive organs lie (Pl. XXIII, fig. 8 g). It appears as if all the perfect septa carry such organs; they lie alongside each other, and do not distinguish themselves in structure from those of the Actinidæ in general. Ovaries only, containing little developed ova, are to be found in the specimen examined (Pl. XXIII, fig. 8 h).

The imperfect septa are placed in such manner, that one pair is situated between two pairs of perfect septa (Pl. XXIII, figs. 7 f, 8 i). They expand themselves somewhat, whilst at same time their medial part (the connective-tissue lamella) becomes broader, according as they extend up the wall of the body, and their free margin, which faces inwards in the primary chambers, appears to be

ere ogsaa Musklerne paa de ufuldstændige ordnede. Længdemusklerne ere stærkt udviklede og beklæde ikke alene Septumets begge Sider, men ogsaa dettes fri Rand, hvorved et Tversnit af et saadant Septum faar Udseende af at være omgivet af en Glorie, Tab. XXIII, Fig. 8 *k*. Disse ufuldstændige Septa ere golde, hvad der er ganske ualmindeligt for Actinierne, imedens det synes at høre hjemme hos Zoanthiderne. Saavel Septa som hele Gastrovascularhulheden er beklædt med et Endothel, der især paa Kropsvæggen er meget bredt og bestaar af høie, cilierende Cylinderceller, Tab. XXIII, Fig. 7 *g*, 8 *l*, med deres Kjerne og Kjernelegeme.

Svælgrøret er kort, cylindrisk og har paa dets indre Flade fine Længdefolder, samt to tydelig udprægede Svælgruber, hvoraf den ene, sandsynligvis Bugfuren, er lidt bredere end den anden. Til disse Svælgruber svare de to Par Retningsseptasaaledes, at hvert af disse fæster sig udvendig paa Svælgrørets nederste Ende paa et Punkt, der er netop modsat Randen af Svælgruben. Tentaklerne, ligesom Mundskiven, har et Ectoderm, imellem hvis Cylinderceller der er en stor Mængde Nematocyster, som især paa Tentaklerne ere i stor Mængde tilstede.

Findested.

Station 164. Et Exemplar.

Ogsaa med dette Dyr var jeg i stor Tvivl om, hvortil jeg skulde henvise det. Liggende sammentrukket i Observationskarret lignede det i høi Grad en Zoanthide, en Lighed, der forsvandt noget ved dets fulde Udstrækning, men som dog ikke ved den udvendige Undersøgelse ganske kunde opgives. Ved en nøiere anatomisk Granskning viste det sig, at *Cactosoma* fjernede sig langt fra Zoanthidernes Familie, imedens den nærmede sig stærkt til Phellidernes; men heller ikke i denne Familie kunde den uden videre Bemærkning indlemmes; thi foruden at det inkrusterede Overtræk ikke egentlig er en organiseret Cuticula, saa er jo den Omstændighed, at det er de fuldstændige Septa, der ere fertile, noget der er fremmed for Familien. Heller ikke har den Acontier, hvilke jo skulde tilhøre Phelliderne. *Cactosoma* er, saa forekommer det mig, en Overgangsform, der stræber hen mod Zoanthiderne. Jeg har imidlertid for det Første henvist den til Familien Phellidæ, Andres, senere kan den muligens komme til at danne en egen Familie.

Slægtskarakter.

Legemet kølleformet med inkrusteret Overtræk; den øverste Del nøgen. Udpræget Fodskive. Kroppens Overflade forsynet med Sugvorter. 2 Rækker retraktile Tentakler. 6 Par fuldstændige Septa, hvoraf 2 Par Retnings-

rounded (Pl. XXIII, figs. 7, 8). In the same manner as on the perfect septa, the muscles are also arranged on the imperfect ones. The longitudinal muscles are strongly developed, and clothe not only both sides of the septum but also its free margin, so that the section of such a septum acquires the appearance of being surrounded by a halo (Pl. XXIII, fig. 8 *k*). These imperfect septa are sterile, a feature quite uncommon in the Actidinæ, although it appears to be a feature of the Zoanthidæ. Both septa and the entire gastral cavity are clad with an endothelium which, especially on the wall of the body, is very broad, and consists of high ciliating cylinder-cells (Pl. XXIII, figs. 7 *g*, 8 *l*) with their nuclei and nucleus-corpuscles.

The œsophagus is short and cylindrical, and upon its inner surface has fine longitudinal folds, also two distinctly marked gullet-grooves, of which the one, probably the ventral furrow, is a little broader than the other. The two pairs of directive septa correspond to these gullet-grooves in such manner, that each of them attaches itself, externally, to the lowest extremity of the œsophagus, at a point which is exactly opposite the margin of the gullet-groove. The tentacles, as well as the oral disc, have an ectoderm between whose cylinder-cells there is a large multitude of nematocysts which are, especially on the tentacles, present in great numbers.

Habitat.

Station No. 164. One specimen.

Also in regard to this animal I was in great dubiety as to how it should be assigned. Lying contracted in the glass jar, it greatly resembled a Zoanthid, a resemblance that disappeared, somewhat, upon its complete extension, but could, however, not be quite abandoned on the external investigation. Upon a more perfect anatomical study it appeared, that *Cactosoma* was far removed from the family of Zoanthidæ, whilst it approached, considerably, to that of the Phellidæ, but not even in that family could it be included without further remark, because, besides the feature that its encrusted covering is not really an organic cuticulum, there is added, further, the circumstance, that it is the perfect septa which are fertile, a feature foreign to the family. Neither has it acontia, which is supposed to be a feature of Phellidæ. *Cactosoma* is, it appears to me, a transition-form striving towards the Zoanthidæ. I have, in the meantime, preliminarily assigned it to the family Phellidæ, Andres; perhaps by and by it may come to form a family by itself.

Generic characteristics.

The body claviform, with an encrusted covering, the uppermost part bare. Distinguished pedal disc. The surface of the body furnished with suckers. 2 series of retractile tentacles. 6 pairs of perfect septa, of which

septa, alle bærende Mesenterialfilamenter og Generationsorganer. 6 Par ufuldstændige, gølle Septa. 2 Svælggruber. Mesodermale Cirkulærmuskler.

Artskarakter.

Legemet cylindrisk, indtil 40^{mm} langt, 10^{mm} bredt i den øverste Ende, 5^{mm} i den nederste; pæreformet i kontraheret Tilstand. Størstedelen af Kolumnen har et tykt, inkrusteret Overtræk (Skede); dens øverste Del nøgen. Mod Skedens øverste Rand 6 inkrusterede Ribber, imellem hvilke nøgne Mellemrum. Mundskiven hvælvet med en aflang Mund med foldede Læber og to Gonidiefurer. Tentaklerne korte i to Rækker, 12 i hver. Fodskiven hvælvet, med en rund og undulerende Rand. Kroppens Overflade besat med Sugevorter og forsynet med 12 Længdelinier. Farven: Den inkrusterede Skede med Ribberne brune med mørke, næsten sorte Punkter. Indenfor Skeden er Huden hvid, spillende lidt i det Rosenrøde. Længdelinierne blegrøde. Den nøgne Del bleg rosenrød. Mundskiven næsten hvid, omkring Munden en rød Ring, hvorfra udgaa 12 rosenrøde Striber mod Mundskivens Rand. Tentaklerne intens laxerøde.

Familie Andvakiadæ.

Hexactiniae, langstrakte, siddende løse i Sandet, uden egentlig Fodskive, med Størstedelen af Kroppen inkrusteret; dennes øverste, nøgne Del, Mundskiven og Tentaklerne fuldstændig retraktile; faa Septa.

Andvakia¹ mirabilis, n. sp.

Tab. IV, Fig. 10, 11; Tab. XI.

Dyret har i udstrakt Tilstand nogen Lighed med et Overflødhorn; sammentrukket ligner det en krum Kølle, Tab. IV, Fig. 10; Tab. XI, Fig. 1, 2.

Legemet er 60—70^{mm} langt, 15^{mm} bredt i den øverste Del og 4—5^{mm} i den nederste, hvor det ender i en særegen Skive. For at lette Beskrivelsen vil jeg, ligesom Gosse har gjort for Edwardsiernes Vedkommende, inddele hele Dyret i 3 Dele, nemlig den øverste Del, Capitulum, den mellemste, Scapus, og den nederste, Physa.

Capitulum er nøgent, cylindrisk, Tab. IV, Fig. 10 a; Tab. XI, Fig. 1 a, retraktile, omtrent 8^{mm} langt og 12^{mm} bredt, halvt gennemsigtigt og forsynet med Længdestriber, som angive Insertionerne for Skillevæggene (Septa),

¹ Andvaka = Nomen tubæ Sverreris regis.

2 pairs are directive septa, all of them carrying mesenterial filaments and reproductive organs. 6 pairs of imperfect, sterile septa. 2 gullet-cavities. Mesodermal circular muscles.

Specific characteristics.

The body cylindrical, measures up to 40^{mm} in length, 10^{mm} in breadth at the uppermost extremity, 5^{mm} in breadth at the lowest; in contracted condition piriform in shape. The greater part of the column has a thick encrusted covering (sheath); its uppermost part bare. Towards the uppermost margin of the sheath 6 encrusted ribs, between which bare intermediate spaces. The oral disc arcuate, with an oblong mouth having folded labiæ and two gonidial grooves. The tentacles short, in two series, 12 in each. The pedal disc arcuate, with a round and undulating margin. The surface of the body covered with suckers, and furnished with 12 longitudinal lines. *The colour.* The encrusted sheath and the ribs brown, with dark, almost black points. Inside the sheath the integument is white with a slight play of rose-red colour. The longitudinal lines pale-red. The bare part pale rose-red. The oral disc almost white; round the mouth a red annulus from which 12 rose-red stripes issue towards the margin of the oral disc. The tentacles bright salmon-red.

Family Andvakiadæ.

Hexactiniae, elongated, seated loose in the sand, without any real pedal disc, the greater part of the body encrusted; the uppermost bare part of the body, the oral disc and the tentacles, completely retractile; few septa.

Andvakia¹ mirabilis, n. sp.

Pl. IV, fig. 10, 11; Pl. XI.

In outstretched condition the animal has somewhat the resemblance of a cornucopia; contracted, it resembles a bent club (Pl. IV, fig. 10; Pl. XI, figs. 1, 2).

The body is 60—70^{mm} in length, 15^{mm} in breadth at the uppermost part, and 4—5^{mm} in breadth at the lowest part, where it terminates in a peculiar disc. To facilitate the description, I will, as Gosse has done in respect of the Edwardsia, divide the complete animal into three parts, viz. the uppermost part, capitulum; the intermediate part, scapus; and the lowest part, physa.

The capitulum is bare, cylindric (Pl. IV, fig. 10 a; Pl. XI, fig. 1 a) retractile, about 8^{mm} in length and 12^{mm} in breadth, semi-transparent, and furnished with longitudinal stripes, which indicate the insertions of the

¹ Andvaka = Nomen tubæ Sverreris regis.

og imellem disse Længdestriber sees hist og her næsten runde Cinclides; opad gaar Capitulum over i Skiven, der er rund, fra 12—14^{mm} bred, kun svagt hvælvet. I Midten er den aflange Mund med 2 Gonidiegruber og foldede Læber med 6 lancetformede Folder paa hver Side af Mundvigene; hver Fold eller Flig har paa den aborale Side en temmelig dyb Fure, Tab. XI, Fig. 12 a. I hver Mundvig (Gonidiegrube) sees en liden Gonidialknude, Tab. XI, Fig. 12 b. Fra Munden udstraale temmelig tætstaaende, fine Linier hen til Peripherien, hvilke ligeledes antyde Skillevæggenes Insertioner paa Skiven. Dennes ydre Rand er jævn og forsynet med 2 Rækker korte, alternerende, retraktile Tentakler, 12 i hver Række. Tentaklerne i den inderste Række ere meget tykkere og kanske lidt længere, end de i den ydre Række, Tab. IV, Fig. 10. Nedad gaar Capitulum over i Scapus; denne er krumbøiet, omkring 50^{mm} lang, 10—12^{mm} bred foroven, men smalner hetydelt af, saa at den nederste Del, hvor den gaar over i Physa, kun er 5—6^{mm} bred, Tab. IV, Fig. 10 b; Tab. XI, Fig. 1, 2 b. Den er stærkt inkrusteret med Sand, Foraminiferer, Stumper af Skjæl samt smaa, sorte, haarde Legemer og ikke retraktil, men vel kontraktil; naar saa den øverste Del, Capitulum, med Skive og Tentakler trækker sig ind, lukker Scapus sig ganske, saa at der kun sees en yderst fin Indsænkning i Centrum, hvori man med Loupen kan opdage en haarfin Aabning, Tab. XI, Fig. 2. Scapus kan forøvrigt forlænge og forkorte sig efter Dyrets Forholdsbefindende.

Physa udvider sig halvkugleformigt, er omtrent 15^{mm} bred og ligesom Scapus overalt inkrusteret paa lignende Maade som denne, Tab. IV, Fig. 10 c, 11 a. Den øverste Flade er stærkt hvælvet, imedens den underste kun er lidet konvex; men forresten forandres Formen, eftersom den kontraheres mere eller mindre. Stundom antager den næsten Kugleformen, Tab. XI, Fig. 1 c, 2 c, til andre Tider bliver den temmelig flad, næsten skiveformig og ligner da Fodskiven paa en Phellia, Tab. IV, Fig. 10 c. Denne Del af Dyret er overmaade irriteret, saa at den mindste Berørelse fremkalder ikke alene Kontraktioner i selve Physa, men gjør, at Capitulum med Skive og Tentakler hurtigt trækker sig ind. Det var ganske interessant at se, hvorledes Physa skiftede Form, naar Dyret enten vilde fæste sig i Sandet, eller vilde forandre Sted. I første Tilfælde dannede den en Konus og borede sig paa den Maade et Stykke ned i Sandet, hvorefter den antog den udvidede Kugle- eller Skiveform og blev da ganske skjult af det overliggende Sand. Dyret stod da temmelig fast, udfoldede sig frodigt i Observationskarret og syntes i det Hele taget at befinde sig meget vel. Efter nogle Dages Forløb blev det uroligt; Physa forandrede atter Form, frigjorde sig fra Sandet, paa hvis Overflade hele Dyret nu laa og forsøgte ved Kontraktioner og ormformige Bevægelser af hele Kroppen at forandre Plads, hvilket ogsaa lykkedes. Nu

divisional walls (septa), and between these longitudinal stripes, almost round cinclides are here and there seen. At the top the capitulum passes over into the disc, which is round and from 12—14^{mm} in breadth, and only slightly arcuate. In the middle is the oblong mouth with 2 gonidial grooves and folded labiæ; there are 6 lanceolate folds upon each side of the oral angles, and each fold or flap has a rather deep furrow on its aboral side (Pl. XI, fig. 12 a). In each oral angle (gonidial groove) a small gonidial nodule is seen (Pl. XI, fig. 12 b). Rather closely placed, fine lines radiate from the mouth to the periphery, and these also indicate the insertions of the divisional walls on the disc. The outer margin of the disc is even, and is furnished with 2 series of short, alternating, retraktile tentacles, 12 in each series. The tentacles in the innermost series are somewhat thicker and, perhaps, a little longer than those in the outer series (Pl. IV, fig. 10). Lower down the capitulum passes over into the scapus. The scapus is bent, measures about 50^{mm} in length, 10—12^{mm} in breadth at the top, but narrows considerably lower down, so that at the lowest part, where it passes over into the physa, it is only 5—6^{mm} in breadth (Pl. IV, fig. 10 b; Pl. XI, fig. 1, 2 b). It is strongly encrusted with sand, foraminifera, fragments of shells, and small, black, hard bodies, and is not retraktile but, presumably, is contractile. When the uppermost part, capitulum with disc and tentacles, retracts, the scapus completely closes itself, so that only an exceedingly minute cavity is observed in the centre, in which, with the assistance of the magnifier, a capillary orifice may be seen (Pl. XI, fig. 2). The scapus can, besides, be lengthened and shortened at the will of the animal.

The physa expands itself hemispherically, and measures about 15^{mm} in breadth, and it is, like the scapus, everywhere covered with an encrustation in the same manner as that is (Pl. IV, fig. 10 c, 11 a). The uppermost surface is strongly arcuate, whilst the lowest one is only a little convex, but the form changes, however, according as it more or less contracts. Sometimes it assumes almost the spheriform (Pl. XI, fig. 1 c, 2 c), but at other times it becomes rather flat, almost discoidal, and then resembles the pedal disc of a Phellia (Pl. IV, fig. 10 c). This part of the animal is particularly sensitive, so that the slightest touch produces not only contractions in the physa itself, but also causes the capitulum, with disc and tentacles, to be quickly withdrawn. It was quite interesting to see how the physa changed shape when the animal was either about to secure itself in the sand or to change its situation. In the first-named case it formed a cone, and in that way bored itself a little way into the sand, after which operation it assumed the expanded spheriform or discoid form and was then quite hidden by the superincumbent sand. The animal then stood pretty firmly, and unfolded itself luxuriantly in the glass-jar, and appeared altogether to quite enjoy itself. After the expiry of a few days it became uneasy, the physa again changed its form, loosened itself from the sand upon whose surface

begyndte atter Befæstningsarbeidet paa den tidligere omtalte Maade.

Paa den øverste, nøgne Del (Capitulum) iagttages hos flere Exemplarer en snyltende Bryozoa, der sandsynligvis er ny, og som senere vil blive beskrevet af Professor G. Ossian Sars, der har Nordhavsexpeditionens Bryozoaer til Bearbejdelse. Hele den nøgne, cylindriske Del var paa enkelte Exemplarer tæt besat med Snylteren, Tab. XI, Fig. 1 *d*, der maatte finde sig i at drages ind i Scapus, saa ofte Capitulum trak sig sammen; og da Andvakia kunde holde sig sammentrukket i flere Dage under sit Fangenskab, var Bryozoen i den Tid fuldstændig arresteret.

Farven. Den inkrusterede Del er brunsort med isprængte dels hvide, dels grønne og rødlige Punkter. Den øverste, nøgne, cylindriske Del er svag laxerød, stundom ganske hvid med et fint Rosenskjær. Mundskiven sinnoberød med fine, mørkere Linier. Tentaklerne samme Farve som Mundskiven, men lidt mørkere ved Roden og lysere i Spidsen. Tages Krusten bort, er den underliggende Hud hvid, og da sees med Lethed Insertionerne af Septa, hvilket især er fremtrædende i Physa, naar denne er udspændt, Tab. XI, Fig. 1 *c*, 2 *c*.

Hudens Bygning afviger ikke særdeles meget fra Actiniernes i Almindelighed, især gjælder dette Slægten Phellia. Et Tversnit af den inkrusterede Del (Scapus) viser, at udenpaa det egentlige Ectoderm er der et Lag meget seigt Slim, hvori de mineralske Bestanddele ere tæt indleirede, Tab. XI, Fig. 5, 6 *a*. Dette Krustelag er flere Millimeter bredt og temmelig fast adhæreret til Epithelet, saa at det vanskeligt lader sig fjerne uden ved Skrabning, men Dyret kan delvis skille sig ved det, dog reproduceres det snart. Epithelet er paa enkelte Steder ligesom forkrøblet; men i det Hele taget bestaar det af lange Cylinderceller med en forholdsvis liden, aflang Kjerne og et temmelig fattigt Protoplasmahold, Tab. XI, Fig. 5 *b*, 6 *b*. Imellem Epithelcellerne iagttages en Mængde encellede, flaskeformede Slimkjertler, der udmunde paa Overfladen, og som afgive den seige Slim, hvori de fremmede Legemer ere inkrusterede. Mange af disse Slimkjertler ere fuldproppede af en mørkladen, finkornet Masse, der ganske skjuler Kjernen; andre have et meget tyndere Indhold, ere klarere, saa at Kjernen tydelig kan sees, og atter andre ere ganske tomme og ligne Vacuoler. Paa den øverste, nøgne Del (Capitulum) ere Epithelcellerne længere, forsynede med lange Cilier, og her iagttages foruden Slimkjertlerne tillige talrige Nematocyster.

Indenfor Ectodermet er overalt et bredt, fibrillært Bindevævslag, Tab. XI, Fig. 5 *c*, 6 *c*, som henimod dets indre Flade er forsynet med stærke, cirkulære Muskelfibre, Tab. XI, Fig. 5 *d*, 6 *d*, der beklædes tildels af Endothelet,

the complete animal now lay, and attempted, by contractions and vermicular movements of the whole body, to change situation, which was also successful. Now began again the work of securing itself, in the same manner as previously mentioned.

Upon the uppermost bare part (capitulum) there was observed, in several specimens, a parasitic Bryozoa, which probably is new, and will subsequently be described by Professor G. Ossian Sars, who has the Bryozoa of the North-Atlantic Expedition under investigation. The entire, bare, cylindrical part was, in some specimens, closely covered with the parasite (Pl. XI, fig. 1 *d*), which were obliged to submit to being drawn into the scapus every time the capitulum contracted itself, and as the Andvakia in its confinement, may remain contracted for several days, the Bryozoa were during that time completely shut in.

The Colour. The encrusted portion is brown-black with partly white, partly green and reddish dots. The uppermost, bare, cylindrical portion is faint salmon-red colour, occasionally quite white with a fine rose tinge. The oral disc is cinnabar-red with fine darker coloured lines. The tentacles have the same colour as the oral disc, but are a little darker at the root and lighter coloured at the point. When the crust is removed the integument underneath is white, and the insertions of the septa are easily observed, and are especially prominent in the physa when it is expanded (Pl. XI, fig. 1 *c*, 2 *c*).

The structure of the integument does not differ very much from that of the Actinaria in general, and especially from that of the Phellia genus. A transversal section of the encrusted portion (scapus) shows, that outside the real ectoderm there is a layer of very viscid mucous, in which the mineral substances are closely embedded (Pl. XI, fig. 5, 6 *a*). This crust-layer is several millimetres broad, and rather firmly adherent to the epithelium, so that it is with difficulty removeable except by scraping it off; the animal can, however, to some extent cast it, but it is soon reproduced. The epithelium appears in some places as if it were deformed, but, taken generally, it consists of long cylinder-cells with a relatively small, oblong nucleus, and a rather poor protoplasmic contents (Pl. XI, figs. 5 *b*, 6 *b*). Between the epithelial cells a multitude of unicellular, bottle-shaped mucous glands are observed, which open on to the outer surface and supply the viscid mucous in which the foreign bodies are encrusted. Many of these mucous glands are quite stuffed with a darkly coloured, fine granular mass that quite conceals the nucleus; others, again, have a much thinner contents, are more pellucid, so that the nucleus can be distinctly seen, and, again, others are quite empty and resemble vacuoli. Upon the uppermost bare part (capitulum) the epithelial cells are longer and are furnished with long ciliae, and here numerous nematocysts, besides the mucous glands, are also observed.

Inside of the ectoderm, there is, every where, a broad fibrillar layer of connective-tissue (Pl. XI, figs. 5 *c*, 6 *c*) which, towards its inner surface, is furnished with strong circular muscle-fibres (Pl. XI, fig. 5 *d*, 6 *d*), clothed, to

som danner lange Cylinderceller, der paa deres fri Ende har en temmelig lang Pidsk (Geissel). Ved Længdesnit, Tab. XI, Fig. 5 *d*, vise de endodermale Cirkulærmuskler sig at ligge i tykke Bundter.

Paa Tentaklerne er det egentlige Ectoderm noget bredere end paa Kroppen. Foruden de almindelige, lange, cylinderformede Epithelceller findes der imellem disse mange encellede, kolbeformede Slimkjertler, Tab. XI, Fig. 4 *a*, samt en Mængde Nematocyster, Tab. XI, Fig. 4 *b*. Indenfor Ectodermet, lige i Randen af det fibrillære Bindevævs-lag, er der et Lag stærke, longitudinelle Muskler, som bundtevis ligge ligesom indkapslede i Bindevævet, Tab. XI, Fig. 4 *c*. Fra dettes indre Flade udgaa Forlængelser i næsten alle Retninger, hvilke anastomosere med hverandre og danne derved et tæt Kanalsystem, hvis Vægge ere beklædte med Epithel, Tab. XI, Fig. 4 *d*. Paa et Tversnit faar denne Mængde Kanaler Udseende af et Netværk med store Masker, Tab. XI, Fig. 4 *d*. Det forekom mig, at der paa Bindevævs-lagets indre Flade, hvorfra de beskrevne Forlængelser udgaa, laa et yderst smalt Lag af transverselle Muskler, Tab. XI, Fig. 4 *e*; men det tør hælde, at det var Bindevævsfibriller, som let kan forvexles med Muskelfibriller.

Paa Kroppens nederste, inkrusterede og udvidede Ende (Physa) viser et Tversnit, at indenfor Ectodermet, Tab. XI, Fig. 9 *a*, eller rettere, just der, hvor dette støder til Bindevævet, Tab. XI, Fig. 9 *b*, ligger et ganske særegent Lag, bestaaende af Grupper af store Celler med en meget stor Kjerne, omgivet af et rigt Protoplasma, Tab. XI, Fig. 9 *c*. Disse Celler ere lidt aflange og fra den Ende, der vender mod Ectodermet, udgaaer jævnlig 1, sjelden 2 Udløbere, som tabe sig i eller imellem Ectodermcellerne. Foruden disse Celler, som antagelig ere Ganglieceller, findes der under eller bag dem et Belte af meget mindre, runde, temmelig klare Celler med deres Kjerne, hvilke ligesom hvile paa et smalt Stratum af yderst fine Fibriller, Tab. XI, Fig. 9 *d*. Jeg kan ikke henføre de her beskrevne Elementer til noget andet histologisk Væv end et Nerveapparats. Det lykkes mig ikke at finde noget lignende paa Mundskiven eller omkring den øverste Svælgrørsaabning, ihvorvel det er sandsynligt, at noget saadant findes der; imidlertid er det at lægge Mærke til, at denne nederste Del af Dyret er i høieste Grad ømfindtlig, saa at den letteste Berørelse her fremkalder stærke Kontraktioner og ormformige Bevægelser.

Der er 6 Par fuldstændige Septa, Tab. XI, Fig. 3, 8, 11, som tage sin Begyndelse i Bundens Centrum af Physa; hvert Pars Skillevægge ligge her saagodtsom i Berørelse med hinanden; efterhvert som de straaelformigt forlænge sig opover Scapus, vige de mere fra hinanden Tab. XI, Fig. 8, og blive bredere, saa at de, naar de have naaet op til Svælgrøret, hvorpaa de fæste sig, danne 2 lige brede Blade, der staa nogle Millimeter fra hinanden, Tab. XI, Fig. 3, 11 *a*. Af de 6 Par fuldstændige Septa er der

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

some extent, by the endothelium, which forms long cylinder-cells, which upon their free extremity have a rather long flagellum (Geissel). In longitudinal sections (Pl. XI, fig. 5 *d*), the endodermal circular muscles show themselves lying in thick fasciculi.

Upon the tentacles the real ectoderm is somewhat broader than on the body. Besides the usual, long cylindrical cells, there are found, amongst them, numerous unicellular, claviform mucous glands (Pl. XI, fig. 4 *a*), also a multitude of nematocysts (Pl. XI, fig. 4 *b*). Inside of the ectoderm, quite in the margin of the fibrillar layer of connective-tissue there is a layer of strong longitudinal muscles, which lie in fasciculi, encapsuled, as it were, in the connective-tissue (Pl. XI, fig. 4 *c*). From the inner surface of the connective-tissue, prolongations issue in almost all directions; these anastomose with each other, and thus form a compact ductiferous system whose walls are clad with epithelium (Pl. XI, fig. 4 *d*). In a transversal section this mass of ducts acquires the appearance of a reticulation with large meshes (Pl. XI, fig. 4 *d*). It appeared to me that, upon the inner surface of the layer of connective-tissue from which the prolongations issue, there lay an extremely narrow layer of transversal muscles (Pl. XI, fig. 4 *e*), but it may be that these were connective-tissue fibrils, which can easily be mistaken for muscle fibrils.

In the lowest, encrusted and expanded extremity of the body (physa) a transversal section shows, that inside of the ectoderm (Pl. XI, fig. 9 *a*), or more correctly, just at the point where it meets the connective-tissue (Pl. XI, fig. 9 *b*) there lies a quite peculiar layer, consisting of groups of large cells with a very large nucleus surrounded by a rich protoplasm (Pl. XI, fig. 9 *c*). These cells are slightly oblong, and from the extremity that faces the ectoderm there issues, generally 1, seldom 2 prolongations, which loose themselves in, or between, the ectoderm cells. Besides those cells, which are probably ganglial cells, there is found below or behind them, a belt of much smaller, round, rather pellucid cells with their nuclej, which, as it were, rest upon a narrow stratum of extremely fine fibrils (Pl. XI, fig. 9 *d*). I can not relegate the elements here described to any other histological tissue than that of a nervous system. I did not succeed in finding any thing similar on the oral disc or round the uppermost œsophageal orifice, although it is probable that something of the kind is found there. It is, in the meantime, to be remarked, that this lowest part of the animal is sensitive in the highest degree, so that the least touch produces, here, strong contractions and vermicular movements.

There are 6 pairs of perfect septa (Pl. XI, figs. 3, 8, 11) which originate in the centre of the base of the physa; the divisional walls of each pair of septa lie here almost in contact with each other; as they prolong themselves gradually, radially, upwards over the scapus, they open out more apart from each other (Pl. XI, fig. 8) and become broader, so that when they have reached up to the œsophagus, upon which they secure themselves, they form 2 equally broad laminae, which stand a few millimetres

2 Par, som adskille sig noget fra de øvrige, nemlig Retningssepta, der svare til Mundvigene eller Gonidierne. Septa staa her længere fra hinanden, hvorved Intraseptalrummet bliver større, Tab. XI, Fig. 3, 11 *a*, og Muskelanordningen er forskjellig, idet de transverselle Muskler ere placerede paa den indre Flade, saa at de vende mod hinanden og udfylde for en liden Del Intraseptalrummet, Tab. XI, Fig. 3 *a*, imedens de longitudinelle Muskler sidde paa Skillevæggens ydre Flade og altsaa vende mod det tilgrændsende Interseptalum, Tab. XI, Fig. 3 *b*. Paa de øvrige 4 Par Septa, Tab. XI, Fig. 3, 2, er Muskelanordningen ganske modsat. De longitudinelle Muskler sidde paa Skillevæggens indre Flade, vende mod hverandre i det intraseptale Rum, Tab. XI, Fig. 3 *c*, imedens de transverselle Muskler indtage den ydre Flade, Tab. XI, Fig. 3 *d*. Ved Skillevæggenes Udspring i Physa ere hverken de longitudinelle eller transverselle Muskler stærkt udviklede, men de blive stærkere, alt eftersom de komme længere op.

De transverselle Muskler danne en Membran, der er yderst tynd forneden, men opad imod Svælgrøret bliver den tykkere og foldet, og udfylder for de 4 Septapars Vedkommende omtrent det halve Interseptalum. De longitudinelle Muskler ere langt stærkere end de transverselle; opimod Svælgrøret tiltage de stærkt i Tykkelse og danne en tyk Busk (Fane), der ganske udfylder Intraseptalrummene, Tab. XI, Fig. 3 *c*, 11 *b*. Naar man gjør et Tvernsnit af Dyrets øverste Del, ser det ud, som om Svælgrøret er omsluttet af tykke, hvidgule Søiler, der ere Længdemuskler i noget kontraheret Tilstand, Tab. XI, Fig. 10 *b*, 11 *b*. Samtlige fuldstændige Septa bære Mesenterialfilamenter, som ere temmelig korte, proprækkerformigt optrukne og strække sig kun et lidet Stykke nedenfor Svælgrørets nederste Del, i hvis Nærhed de udspringe, lige ved Randen af de longitudinelle Musklers Fane, Tab. XI, Fig. 10 *a*, 11 *c*.

Imellem hvert 2 Par af de fuldstændige Septa i Interseptalrummet er et Par sekundære, ufuldstændige Septa, der ogsaa tage deres Udspring i Bunden af Physa, Tab. XI, Fig. 8 *a*, 10 *c*, og ere her knapt en halv Millimeter brede, men blive snart smalere, idet de fortsætte sig opad, hvor de sees som smale, listeformige Fremspring, der gaa lige op paa Mundskiven, Tab. XI, Fig. 8 *a*, 10 *c*, 11 *d*. Disse sekundære Septa ere forsynede med baade Længde- og Tvermuskler, Tab. XI, Fig. 3 *e*, af hvilke dog de sidste ere yderst lidet udviklede og vanskelige at iagttage, da de bestaa af kun enkelte Fibre. De longitudinelle derimod ere stærkere og have et Leie, der er modsat det paa de fuldstændige Septa; de ere nemlig placerede paa Skillevæggens udvendige Flade og vende mod de interseptale Rum. Paa disse listeformede, ufuldstændige Septa er langs hele Kroppens indre Flade fæstet Acontier i større og mindre Afstand, Tab. XI, Fig. 10 *d*, og længst ned

apart from each other (Pl. XI, fig. 3, 11 *a*). Of the 6 pairs of perfect septa, there are 2 pairs that distinguish themselves somewhat from the others viz. directive septa, which correspond to the oral angles or gonidia. The septa stand, here, farther apart from each other, causing the intraseptal space to be larger, (Pl. XI, fig. 3, 11 *a*) and the muscular arrangement is different, as the transversal muscles are placed on the inner surface, so that they face towards each other and to a small extent fill the intraseptal space (Pl. XI, fig. 3 *a*); whilst the longitudinal muscles are seated upon the outer surface of the divisional wall and, consequently, face towards the adjacent interseptal space (Pl. XI, fig. 3 *b*). Upon the remaining 4 pairs of septa (Pl. XI, fig. 3, 2) the muscular arrangement is quite the reverse. The longitudinal muscles are seated on the inner surface of the divisional wall, and face towards each other in the intraseptal space (Pl. XI, fig. 3 *c*), whilst the transversal muscles occupy the outer surface (Pl. XI, fig. 3 *d*). At the origin of the divisional walls in the physa neither the longitudinal nor the transversal muscles are strongly developed, but they become stronger, progressively, as they extend farther up.

The transversal muscles form a membrane, which is extremely thin below, but at the top, towards the œsophagus, becomes thicker and folded and, as far as regards the 4 pairs of septa, fills about one half of the interseptal space. The longitudinal muscles are far stronger than the transversal ones; up in the proximity of the œsophagus, they increase greatly in thickness and form a thick frutex (flag) which quite fills the intraseptal spaces (Pl. XI, fig. 3 *c*, 11 *b*). When one makes a transversal section of the uppermost part of the animal, it appears as if the œsophagus is enclosed by thick, whity-yellow pillars; these are longitudinal muscles in somewhat contracted condition (Pl. XI, fig. 10 *b*, 11 *b*). All the perfect septa carry mesenterial filaments, which are rather short, corkscrew shaped when retracted, and stretch themselves only a little way down the lowest part of the œsophagus, in the neighbourhood of which they originate, just at the margin of the longitudinal, muscular frutex (Pl. XI, fig. 10 *a*, 11 *c*).

Between each 2 pairs of the perfect septa in the interseptal space, there is a pair of secondary, imperfect septa that also originate in the bottom of the physa (Pl. XI, fig. 8 *a*, 10 *c*) and which are, here, scarcely half a millimetre in breadth, but quickly become narrower as they proceed upwards, where they appear as small, fillet-formed prominences that pass quite up and on to the oral disc (Pl. XI, fig. 8 *a*, 10 *c*, 11 *d*). These secondary septa are furnished with both longitudinal and transversal muscles (Pl. XI, fig. 3 *e*), of which the last-named are, however, extremely little developed and difficult to be observed, as they consist of only a few fibres. The longitudinal muscles are, upon the other hand, stronger, and are seated in a reverse manner to those on the perfect septa; thus, they are placed on the outer surface of the divisional wall, and face towards the interseptal space. Upon these fillet-formed, imperfect septa, along the inner surface of the

mod Gastralhulhedens Bund udspringe Generationsorganerne. Kun hos et Dyr lykkedes det at iagttage Æggestokke, der vare yderst lidet udviklede.

De cirkulære Muskler, som ere endodermale, ligge paa Gastralhulhedens Væg i regelmæssige, baandformige Bundter, adskilte ved et meget smalt Mellemrum, hvori sees dels runde, dels aflange Aabninger (Cinclides). I disse sees paa et Par Steder Acontier at være indtrængte. Om disse Aabninger perforere Huden eller kun trænge et Stykke ind i Bindevævet, kan jeg ikke afgjøre. Vel findes der lignende Aabninger paa Kroppens ydre Flade, men hvorvidt disse korrespondere med de indre Aabninger, har jeg ikke kunnet overbevise mig om; thi ved Tversnit er det ikke lykkedes at paavise en saadan Kommunikation; sandsynligt er det imidlertid, da jeg har fundet Acontier siddende saavel i indre som i ydre Aabninger. Svælgrøret er cylindrisk, omtrent en Trediedel saa langt som hele Dyrets Længde; det er foldet paa langs og forsynet med 2 Gonidiegruber, der udgaa fra Mundvigene og strække sig lige ned til Svælgets nederste, fri Ende.

Den ovenfor leverede Beskrivelse vil formentlig godtgjøre, at Andvakia, ikke uden at gøre Vold paa Systemet, vil kunne henføres til nogen af de hidtil opstillede Familier og endnu mindre til nogen kjendt Slægt, imedens den vistnok maa henføres til den store Tribus, Hexactinia, Hertwig. Andvakia maa i flere Henseender tiltrække sig Opmærksomheden og ikke mindst derved, at den tyder hen paa at være en Overgangsform. I sin indre Bygning har den adskilligt tilfælles med Sagartiderne og Phelliderne, imedens den i det Ydre afviger væsentlig. Men selv den indre Bygning er ved sine faa og næsten rudimentære, listeformige, ufuldstændige Septa og ved sine stærkt udprægede, endodermale Cirkulærmuskler saa yderst forskjellig fra Sagartidernes Familie, at den ikke kan indregistreres i denne.

Ligesaa meget som den i sit Ydre afveg fra Sagartiderne, ligesaa meget synes den netop ved sit Ydre at nærme sig Gruppen Edwardsia; dens Legeme kan jo med Lethed inddeles i den af Gosse for Slægten Edwardsia benyttede Tredeling, hvilken jeg ogsaa har gjort Brug af; men det er dog kun ved en overfladisk Betragtning, at Sammenligningen med Edwardsia kan holdes oppe. Hele den indre Bygning er jo grundforskjellig. Edwardsierne have nemlig 8 Septa, hvoraf 2 Par ere Retningsseptas, imedens de øvrige 4 Septa ere enkle og optræde ikke parvis. Alle Septa ere forsynede med Generationsorganer; Tentaklerne ere simple og i Almindelighed flere i Antal, end der er Septa. Men helt anderledes forholder det sig med Andvakia, hvilket tydeligt nok fremgaar af Beskrivelsen, og som det derfor her er unødigt at gjentage.

entire body, acontia are seated at longer or shorter intervals (Pl. XI, fig. 10 *d*), and quite at the bottom of the gastral cavity the reproductive organs appear. Only in a single animal was I fortunate enough to observe ovaries, which were, however, extremely little developed.

The circular muscles, which are endodermal, lie upon the wall of the gastral cavity in regular, ribbon-like fasciculi, separated by a very narrow interval in which partly round, partly oblong apertures are seen (cinclides). In these apertures acontia are observed, at a couple of places, to have forced themselves in. Whether those apertures perforate the integument or only penetrate partially into the connective-tissue, I cannot determine. It is true that similar apertures are found upon the outer surface of the body, but how far these correspond with the internal apertures, I have been unable to satisfy myself, as, upon transversal section, it has not been possible to demonstrate a correspondence in communication: such is however probable, as I have found acontia seated in both the inner and outer apertures. The œsophagus is cylindrical and about one third part of the length of the entire animal; it is longitudinally folded and furnished with 2 gonidial grooves that issue from the oral angles and stretch themselves right down to the lowest, free extremity of the gullet.

The description given above will, it is hoped, demonstrate, that Andvakia cannot, without doing violence to the system, be relegated to any of the hitherto established families, and still less to any known genus, whilst it must certainly be relegated to the great tribe, Hexactinia, Hertwig. Andvakia must, in several respects, attract attention, none the less from its indication of being a transition-form. In its internal structure it has several things in common with the Sagartidæ and Phellidæ, whilst in its externals it differs materially. But even the inner structure is, owing to its few and almost rudimentary, fillet-formed, imperfect septa and its strongly distinguished endodermal circular muscles, so extremely different from the family of Sagartidæ that it cannot be registered as one of its members.

Just as much as it, in its externals, differs from Sagartidæ, does it appear, and just in its externals too, to approach the group Edwardsia. Its body, for instance, can with ease be divided into the triple division made use of by Gosse for the genus Edwardsia, and which I have also availed myself of, but it is only upon a cursory examination that the comparison with Edwardsia can be maintained. The entire inner structure is, indeed, radically different. The Edwardsia have, for instance, 8 septa, of which 2 pairs are directive septa, whilst the other 4 septa are single, and do not appear in pairs. All the septa are furnished with reproductive organs. The tentacles are plain and, in general, more numerous than the septa. But the case is perfectly different in Andvakia, which is distinctly enough shown by the description, and is, therefore, needless to repeat here.

Endelig er Ligheden størst med den i Zoanthidernes Gruppe indlemmede Familie, Sphenopidæ, Hertwig, hvis Slægt Sphenopus, Steenstrup, er en ganske mærkelig, solitær Zoanthide. Det er først ved Hertwigs Undersøgelser, at man er kommen til Vished om dens systematiske Stilling; men det er ogsaa kun i det Ydre, at der findes nogen Lighed; thi den indre Bygning er jo helt forskjellig. Hertwig karakteriserer Zoanthiderne saaledes: Actiniaria with numerous septa of two different kinds, smaller, imperfect, sterile micro-septa, and larger perfect macro-septa furnished with reproductive organs and mesenteric filaments; the two kinds usually placed alternately, so that each pair is composed of a larger and a smaller septum; two pairs of directive septa at the ends of the saggital axis, one pair containing only macro-septa, the other only micro-septa; only one œsophageal groove, corresponding to the larger directive septa; animals usually forming colonies; wall usually traversed by ectodermal canals, and having the outside encrusted with foreign bodies. Sammenlignes nu denne Karakteristik med den, jeg har leveret af Andvakia, springer den store Forskjel strax i Øinene, og det paa en saadan Maade, at der ikke kan blive Tale om at indlemme den i Gruppen Zoanthidæ, Hertwig.

Findested.

Husøen, Sognefjord. 100—150 Favne. Sandbund. Mange Exemplarer.

Slægtskarakter.

Andvakiadæ med 6 Par fuldstændige, golde Septa; 6 Par ufuldstændige, næsten rudimentære Septa, bærende Acontier og Generationsorganer; stærkt udviklede, endodermale Cirkulærmuskler. Cinclides.

Artkarakter.

Legemet lig et Overflødigedshorn, 60—70^{mm} langt, 15^{mm} bredt i den øverste Ende, 4—5 i den nederste. Capitulum nøgent, cylindrisk, rekraktilt, 8^{mm} langt, 12^{mm} bredt, halvt gjennemsigtigt, forsynet med Længdestriber, imellem hvilke hist og her Cinclides. Mundskiven rund, 12—14^{mm} bred, i Midten en aflang Mund med 2 Mundvige og 6 lancetformede Læbefolder paa hver Side af disse. I hver Mundvig en liden Gonidieknode. To Rækker korte, alternerende, rekraktiler Tentakler, 12 i hver Række. Scapus krumbøiet, omkring 50^{mm} lang, 10—12^{mm} bred foroven, 5—6^{mm} forneden, stærkt inkrusteret, ikke rekraktil, men vel kontraktil; naar Capitulum er indtrukket, lukker Scapus sig foroven. Physa udvider sig halvkugleformigt, er omtrent 15^{mm} bred og overalt inkrusteret, meget irritabel og forandrer let Form. Farven: Den inkrusterede Del brunsort med isprængte, dels hvide, dels grønne og rødlig

Finally, resemblance is greatest with the family Sphenopidæ, Hertwig, included in the Zoanthidæ group, whose genus Sphenopus, Steenstrup, is a quite peculiar, isolated Zoanthid. It is only in consequence of Hertwig's investigations we have attained certainty as to its systematic position; but it is only in the externals that a resemblance is found, as the inner structure is indeed quite different. Hertwig characterises the Zoanthidæ thus: „Actiniaria with numerous septa of two different kinds, smaller, imperfect, sterile micro-septa, and larger perfect macro-septa furnished with reproductive organs and mesenteric filaments; the two kinds usually placed alternately, so that each pair is composed of a larger and a smaller septum; two pairs of directive septa at the ends of the saggital axis, one pair containing only macro-septa, the other only micro-septa; only one œsophageal groove corresponding to the larger directive septa; animals usually forming colonies; wall usually traversed by ectodermal canals and having the outside encrusted with foreign bodies.“ If that characteristic description is compared with the one I have given of Andvakia, the great difference is immediately apparent, and, in such a manner, that there can be no thought of including Andvakia in the group Zoanthidæ, Hertwig.

Habitat.

Husøen, Sognefjord. Depth 100--150 fathoms. Sandy bottom. Numerous specimens.

Generic characteristics.

Andvakiadæ with 6 pairs of perfect, sterile septa; 6 pairs of imperfect almost rudimentary septa, carrying acontia and reproductive organs; strongly developed, endodermal circular muscles. Cinclides.

Specific characteristics.

The body resembles a cornucopia. 60—70^{mm} in length, 15^{mm} in breadth at the uppermost end, and 4—5^{mm} at the lowest end. The capitulum bare, cylindric, retractile, 8^{mm} long, 12^{mm} broad, semi-transparent, furnished with longitudinal stripes; between which cinclides here and there visible. The oral disc round, 12—14^{mm} broad; in its middle an oblong mouth with 2 oral angles, and 6 lanceolate labial folds on each side of these. In each oral angle a small gonidial nodule. Two series of short, alternating, retractile tentacles, 12 in each series. Scapus bent, about 50^{mm} in length, 10—12^{mm} broad at the top, 5—6^{mm} broad at the foot, strongly encrusted, non-retractile, but, presumably, contractile. When the capitulum is retracted the scapus closes itself at the top. The physa expands itself hemispherically, is about 15^{mm} in breadth, and is encrusted all over, very sensitive, and readily changes form.

Punkter. Capitulum svagt laxerødt, stundom ganske hvidt. Mundskiven sinnoberrød med fine, mørkere Linier. Tentaklerne samme Farve, dog noget mørkere ved Grunden, lysere i Spidsen.

Subfamilie Halcampidæ, Andres.

Halcampoides abyssorum.

Tab. V, Fig. 1; Tab. XV, Fig. 4—11; Tab. XVI, Fig. 1—3.

Legemet, der er langstrakt, cylindrisk, omkring 70^{mm} langt og 12^{mm} bredt i den forreste Del, ender temmelig spids, tapformigt, Tab. V, Fig. 1. Den midterste Del af Kroppen (Scapus) er tykkest, indtil 15^{mm}. Hele Kolumnen omgivet af en membranagtig Skede, der udvendig er infiltreret med Ler og Skaller af Foraminiferer, men indvendig glattere og mere eller mindre fast adhæreret til Kroppens Overflade. Denne Skede er dog ikke fastere heftet til Kroppen, end at den ved stærk Skylning med Sovand løsriveres, saa at kun enkelte Flækker blive tilbage, Tab. V, Fig. 1 a.

Naar Dyret er udstrakt, og Tentaklerne udfoldede, viser Kolumnens øverste Del sig at være nøgen og rager 5—6^{mm} over Skedens Rand, Tab. V, Fig. 1 b. Denne forreste, nøgne Del (Capitulum) er glindsende og forsynet med 12 Længdefurer, som opimod Mundskiven blive dybere og bredere, Tab. XV, Fig. 5 a, og imellem disse Furer sees Længdefelter, hvori findes uregelmæssigt spredte Sugevorter, der ligge nedsænkede i Huden og ere saa smaa, at de kun iagttages under stærk Loupe, Tab. XV, Fig. 5 b. Borttages Skeden, saa viser det sig, at de nævnte Furer strække sig lige til Kolumnens bagerste Ende, ligesom Kroppens Overflade overalt er forsynet med de samme Længdefelter og Sugevorter, som paa den nøgne Del.

Den bagerste Ende (Physa) er konisk tilspidset, temmelig kontraktile, forandrer let Form, idet den udvides og sammentrækkes, uden nogensinde at kunne indtrækkes, og er paa sin yderste Spidse forsynet med en rund Aabning, som ligeledes udvider og sammentrækker sig. Denne Sammentrækning og Udvidning er temmelig uregelmæssig, og ved Kontraktionen sees en fin Vandstraale at jages ud af Aabningen, Tab. V, Fig. 1; Tab. XV, Fig. 4.

Mundskiven er lidt hvælvet og har 12 Folder, der udgaa fra den noget aflange Mund, hvor de ere temmelig smale, men blive bredere henimod Kroppens Rand, Tab. XV, Fig. 6, som er afrundet og jævn.

Tentaklerne sidde i en Række omkring Skivens Rand; de ere lange, tilspidsede, 12 i Antal og kunne trækkes fuldkommen ind i Kroppen, Tab. V, Fig. 1.

The Colour. The encrusted portion brown-black, dotted with partly white, partly green and reddish points. The oral disc cinnabar-red with fine, darker lines. The tentacles the same colour, but somewhat darker at the base, lighter at the point.

Subfamily Halcampidæ, Andres.

Halcampoides abyssorum.

Pl. V, fig. 1; Pl. XV, figs. 4—11; Pl. XVI, figs. 1—3.

The body is elongate and cylindrical; measures about 70^{mm} in length, and 12^{mm} in breadth at the anterior part, and terminates rather pointedly in coniform (Pl. V, fig. 1). The medial part of the body (scapus) is the thickest, measuring about 15^{mm} in thickness. The entire column is surrounded by a membranous sheath infiltrated, exteriorly, with clay and shells of foraminifera, but whose interior surface is smooth and more or less firmly adherent to the outer surface of the body. This sheath is, however, not more firmly adherent to the body, than that it may be removed by a strong deluging with seawater, so that only a few patches are then left behind (Pl. V, fig. 1 a).

When the animal is extended and the tentacles unfolded, the upper part of the column appears bare, and reaches 5—6^{mm} beyond the margin of the sheath (Pl. V, fig. 1 b). This anterior, bare part (capitulum), is shiny, and furnished with 12 longitudinal furrows, which up towards the oral disc become deeper and broader (Pl. XV, fig. 5 a); and between those furrows longitudinal folds are observed, in which irregularly scattered suckers are found lying embedded in the integument, and so small that they can only be observed with the aid of a powerful magnifying glass (Pl. XV, fig. 5 b). If the sheath is removed it then appears, that the furrows mentioned extend themselves quite to the posterior extremity of the column, whilst, also, the external surface of the body is everywhere furnished with similar longitudinal folds and suckers as on the bare portion.

The posterior extremity (physa) is conically acuminate, rather contractile, changes its form whilst expanding and contracting, without at anytime being capable of retraction. At its extreme point it is furnished with a round aperture, which also expands and contracts itself. This contraction and expansion is rather irregular, and during contraction a fine jet of water is seen to be ejected from the aperture (Pl. V, fig. 1; Pl. XV, fig. 4).

The oral disc is slightly arcuate and has 12 folds, which issue from the somewhat oblong mouth, where they are rather narrow, but become broader towards the margin of the body (Pl. XV, fig. 6), which is rounded and even.

The tentacles are situated in a series round the margin of the disc; they are long, acuminate, 12 in number, and may be completely retracted into the body (Pl. V, fig. 1).

Farven. Skeden er graagrøn, dels lysere, dels mørkere efter Lerets Beskaffenhed, hvormed den er infiltreret. Kolumnen er bleg rosenrød, naar den er udstrakt, men sammentrukket er den mørkere rosenrød; i den bagerste Ende spiller den lidt i det Violette. Længdefurerne ere lidt mørkere rød end Mellempartierne. Mundskiven har Kroppens Farve. Tentaklerne ere næsten mørkerøde, spillende noget i det Karmosinrøde, Tab. V, Fig. 1.

Ved Tværsnit viser Skeden sig at være dannet af en Slimmembran, hvori Ler og andre fremmede Legemer ere indleirede. Denne Slimmembran er meget tynd, seig og fastklæbet til Kropshuden uden egentlig at være organisk bunden til denne, saaledes som Tilfældet er hos Slægten Phellia. Det synes mere som om Sugevorterne holde den fast; thi netop hvor disse findes, sees altid Rester af Membranen, naar den forresten er bortskyllet, Tab. V, Fig. 1.

Kropshudens ydre Flade har et temmelig bredt Ectoderm, der bestaar af lange Cylinderceller, Tab. XV, Fig. 7 a, som paa den nøgne, øverste Del have temmelig lange Cilier, ligesom der her er en stor Mængde Nematocyster og encellede Slimkjertler. Paa den Del af Kroppen, som er bedækket af den inkrusterede Slimmembran, ere Nematocysterne yderst sjeldne, imedens Slimkjertlerne ere her ligesaa hyppige som paa den nøgne Del. Indenfor Ectodermet er et bredt, fibrillært Bindevævslag med mange Bindevævslegemer og fine Ernæringskanaler, Tab. XV, Fig. 7 b; henimod den indre Flade af dette Bindevæv iagttages et forholdsvis bredt Belte, bestaaende af cirkulære Muskler, Tab. XV, Fig. 7 c. Hvorvidt Muskelfibrillerne samle sig i Bundter eller ere leirede lige ved Siden af hverandre, er vanskeligt at afgjøre; paa Længdesnittet synes det første at være Tilfældet, Tab. XV, Fig. 8 a. Endothelet, som beklæder Gastralhulhedens Flade, bestaar af lange Cylinderceller, der bære lange Cilier.

Der er 6 Par fuldstændige Septa, som tage deres Begyndelse i den bagerste Ende, omkring Sluttemuskelen for Caudalaabningen, Tab. XV, Fig. 9 a, hvor de ere meget smale, men blive alt bredere og bredere, jo længer de komme op, saa at de omtrent paa Midten af Gastralhulhedens Flade ere 3^{mm} brede, Tab. XV, Fig. 9 b, men af-tage nu noget i Bredden, idet de fæste sig paa Svælgrøret, Tab. XV, Fig. 9 c, d, og blive atter meget smale ved Insertionen paa Mundskiven, Fig. 9 e. Af disse Septa er der 2 Par, der udpræge sig som Retningsseptas og ere fæstede til Svælgrørets Bug- og Rygside, Tab. XV, Fig. 10 a; de øvrige 4 Par ere fæstede 2 paa hver Side af Svælgrøret, Tab. XV, Fig. 10 b. Samtlige Septa ere som sædvanligt forsynede med Længde- og Tvermuskler.

Paa Retningsseptas ere Længdemusklerne placerede paa den ydre Flade og vende fra hverandre i det inter-

The colour. The sheath is greyish-green, lighter or darker in colour according to the nature of the clay with which it is infiltrated. The column is pale rosy-red when it is extended, but dark rosy-red when contracted; in the posterior extremity it has a slightly violet play of colour. The longitudinal furrows are a little darker in colour than the intermediate parts. The oral disc has the same colour as the body. The tentacles are almost dark red with a slight crimson-red play of colour (Pl. V, fig. 1).

In transversal sections the sheath appears to be formed of a mucous membrane, in which clay and other foreign bodies are entrenched. This mucous membrane is very thin and viscid, and is firmly glued to the integument of the body without, however, being really organically attached to it, like what is the case in the genus Phellia. It looks more as if the suckers held it fast, as, just at the points where they are met with, remains of the membrane are always observed when in all other parts it is washed off (Pl. V, fig. 1).

The external surface of the integument of the body has a rather broad ectoderm, consisting of long cylinder-cells (Pl. XV, fig. 7 a), which, upon the bare, uppermost part have pretty long ciliae, whilst, here, also, there is a great abundance of nematocysts and unicellular mucous glands. On the part of the body covered by the encrusted mucous membrane, the nematocysts are extremely rare, whilst the mucous glands are, here, as frequent as upon the bare part. Inside of the ectoderm there is a broad, fibrillous, connective-tissue layer with numerous connective-tissue corpuscles and fine nutritory ducts (Pl. XV, fig. 7 b); and towards the inner surface of this connective-tissue there is observed, a relatively broad belt, consisting of circular-muscular fibres (Pl. XV, fig. 7 c). It is difficult to determine whether the muscle fibrils collect themselves into bundles or are seated alongside each other. In longitudinal sections the first-named arrangement seems to be the case (Pl. XV, fig. 8 a). The endothelium that clothes the surface of the gastral cavity, consists of long cylinder-cells carrying long ciliae.

There are 6 pairs of perfect septa, which have their origin in the posterior extremity, round the sphincter of the caudal aperture (Pl. XV, fig. 9 a); they are, here, very narrow, but become broader and broader the farther they extend upwards, so that, at about the middle of the surface of the gastral cavity they are 3^{mm} in breadth (Pl. XV, fig. 9 b), but then diminish somewhat in breadth as they secure themselves upon the gullet-tube (Pl. XV, fig. 9 c, d) becoming, again, very narrow at the insertion on the oral disc (Pl. XV, fig. 9 e). Of these septa there are 2 pairs that distinguish themselves as directive septa, and which are secured to the ventral and dorsal side of the gullet-tube (Pl. XV, fig. 10 a); the other 4 pairs of septa are secured, 2 upon each side of the gullet-tube (Pl. XV, fig. 10 b). All the septa are furnished, as usual, with longitudinal and transversal muscles.

On the directive septa, the longitudinal muscles are seated on the outer surface, and face from each other in

septale Rum, Tab. XV, Fig. 10 *c*, imedens Tvermusklerne sidde paa den indre Flade og vende mod hverandre i det intraseptale Rum, Tab. XV, Fig. 10 *d*. Paa de øvrige Septa ere Musklerne stillede netop modsat; saaledes ere Længdemusklerne fæstede til den indre Flade og vende mod hverandre i det intraseptale Rum, og Tvermusklerne paa den ydre Flade, vendende fra hverandre i det interseptale Rum.

Længdemusklerne ere i en overordentlig Grad udviklede; de ere indtil 2^{mm} brede, hvor de naa Svælgrøret, Tab. XV, Fig. 9 *f*, 10 *c*. men aftage i Bredde op imod Mundskiven, paa hvis indre Flade de fæste sig. De indtage mindst to Trediedele af Septumets Flade, imedens dennes ene Trediedel henimod den fri (indre) Rand er blottet for Muskler og danner et Længdefelt, hvori Mesenterialfilamenterne og Kjønorganerne ere situerede. Men imedens Længdemusklerne ikke ganske naa Septumets indre, fri Rand, saa strække de sig udover den ydre Insertionsrand hen paa Gastralvæggens indre Flade, Tab. XV, Fig. 10 *f*, hvortil de synes at være klæbede ved løse Bindevævstraade og bidrage til at danne de fremtrædende Længdefelter imellem Furerne, der antyde Insertionerne for Septa. Længdemusklerne ere dannede af en stor Mængde Muskel-fibre, som ere fæstede til forgrenede Bindevævsforlængelser, udgaaende fra Septum, Tab. XV, Fig. 10 *e*, *f*; de transverselle Muskler ere forholdsvis kun lidet udviklede. indtage saagodtsom hele Fladen af Septum og dække denne i Form af en tynd, fint foldet Membran.

Samtlige Septa bære Mesenterialfilamenter og Kjønorganer. Mesenterialfilamenterne udspringe fra den nederste Del af Svælgrøret, Tab. XV, Fig. 9 *i*, og følge som en slangeformig Stræng den fri Rand af Septum ligetil sammes bagerste Ende, Tab. XV, Fig. 9 *g*. Kjønorganerne bestaa af i Proptrækkerform sammenrullede Baand og ere placerede indenfor Mesenterialfilamenterne, mellem disse og Længdemusklerne, i den bagerste Trediedel af Gastralhulheden, Tab. XV, Fig. 9 *h*. De undersøgte to Exemplarer havde Æggestokke, hvori Æggene i forskellige Udviklingsstadier laa i Rækker, to og to ved Siden af hinanden. Det er sandsynligt, at Kjønnen er adskilt; thi Testikler vare ikke at opdage.

Svælgrøret er ganske særegent; det har temmelig tykke, muskuløse Vægge, er lidt fladtrykt, stærkt foldet, og paa dets ydre Flade, der beklædes af Endothelet, ligesom delt i tolv Felter, som Følge af Septainsertionerne, Tab. XV, Fig. 9, imedens den dorsale og ventrale Side er temmelig udvidet, hvorved hele Svælgrøret faar en næsten firkantet Form, Tab. XV, Fig. 10 *g*; især gjælder denne Udvidning den ventrale Del, der allerede paa Svælgrørets ydre Flade viser sig som et bredere Længdefelt med en Fure paa hver Side. Men paa Svælgrørets indre Flade fremtræder Særegenheden tydeligere. Her viser det sig, at Svælgrøret ikke som sædvanligt danner en eneste Hulhed,

the interseptal space (Pl. XV, fig. 10 *c*); whilst the transversal muscles are seated on the inner surface and face towards each other in the intraseptal space (Pl. XV, fig. 10 *d*). Upon the remaining septa the muscles are placed in exactly the reverse manner; thus, the longitudinal muscles are secured to the inner surface and face towards each other in the intraseptal space, and the transversal muscles on the outer surface, facing from each other in the interseptal space.

The longitudinal muscles are developed in a very high degree; they measure up to 2^{mm} in breadth at the point where they reach the gullet-tube (Pl. XV, fig. 9 *f*, 10 *c*), but diminish in breadth up towards the oral disc, upon the inner surface of which they secure themselves. They occupy at least two-thirds part of the surface of the septum, whilst the remaining third part, towards the free (inner) margin, is devoid of muscles and forms a longitudinal area in which the mesenterial filaments and reproductive organs are situated. But whilst the longitudinal muscles do not quite reach to the inner, free margin of the septum, they, yet, stretch themselves beyond the outer insertional margin to the inner surface of the gastral wall (Pl. XV, fig. 10 *f*), to which they appear to be glued by loose connective-tissue filaments, and aid in forming the prominent longitudinal areas between the furrows that indicate the insertions of the septa. The longitudinal muscles are formed of a great multitude of muscle fibres secured to the ramified connective-tissue prolongations proceeding from the septum (Pl. XV, fig. 10 *e*, *f*). The transversal muscles are, relatively, only little developed, and occupy almost the entire surface of the septum, covering it in the form of a thin fine folded membrane.

All the septa carry mesenterial filaments and reproductive organs. The mesenterial filaments issue from the lowest part of the gullet-tube (Pl. XV, fig. 9 *i*), and follow, like a sinuous cord, the free margin of the septum quite to its posterior extremity (Pl. XV, fig. 9 *g*). The reproductive organs consist of cork-screw shaped, coiled ribbons, and are situated inside of the mesenterial filaments, between these and the longitudinal muscles, in the posterior third part of the gastral cavity (Pl. XV, fig. 9 *h*). The two specimens examined had ovaries, in which the ova, in various stages of development, lay in series, two and two alongside each other. It is probable that the sexes are separated, as testicles could not be detected.

The gullet-tube is quite peculiar; it has rather thick muscular walls, is somewhat adpressed, strongly folded, and on its external surface, which is clad with endothelium, divided, as it were, into 12 areas, in consequence of the septal insertions (Pl. XV, fig. 9), whilst the dorsal and ventral side is pretty much dilated, giving to the entire gullet-tube an almost quadrangular form (Pl. XV, fig. 10 *g*); this dilation is specially prominent on the ventral part, which, already on the outer surface of the gullet-tube, shows itself as a broadish longitudinal area with a furrow on each side. But on the inner surface of the gullet-tube the peculiarity appears still more prominently. Here, it

men at denne er ved et temmelig bredt Bindevæv delt efter Længden i to, Tab. XV, Fig. 10 *h*, 11 *b*, saaledes, at den ene Hulhed, der følger Bugsiden, er betydeligt trangere end den anden, som er mere end tredobbelt saa vid. Denne smalere Hulhed dannes af et Rør, der er næsten halv-cirkelformet, hvorved den afrundede Del, Tab. XV, Fig. 11 *a*, kommer til at vende ud i Gastralhulheden, imedens den mere tværsafskaarne, Tab. XV, Fig. 10 *h*, 11 *b*, støder til den øvrige Del af Svælgrøret, Tab. XV, Fig. 10 *i*, 11 *d*. Dette trangere Rør, der maa ansees som en Rectum, ender foroven lidt under Mundaabningen og forneden lidt ovenfor Svælgrørets nederste, fri Rand, og er paa hele sin indre Flade beklædt med lange Cylinderceller, som hver bærer en lang Pidske, Tab. XV, Fig. 11 *e*. Hulheden i Rectum er opfyldt dels af Slim, Tab. XV, Fig. 11 *f*, dels af Ler, blandet med Skaller af Foraminiferer, Tab. XV, Fig. 11 *g*. Den bredere Del, det egentlige Svælgrør, udfylder Størstedelen af den forreste Trediedel af Gastralhulheden, er stærkt foldet, Tab. XV, Fig. 10 *i*, og udvider sig temmelig betydeligt langs Rygsiden, saa at den her danner en Slags Svælgrube, Tab. XV, Fig. 10 *k*, hvortil svarer paa den ydre Side det dorsale Par Retningssepta, Tab. XV, Fig. 10 D. D., imedens de ventrale Retningssepta ere fæstede til Rectum, Tab. XV, Fig. 10 V. Den indre Flade af Svælgrøret er beklædt med et Epithel, der er temmeligt forskjelligt fra det, der tapetserer Rectum; Cylindercellerne, Tab. XV, Fig. 11 *h*, ere meget kortere, forsynede med temmelig korte Cilier, og imellem disse Celler iagttages mange encellede Slimkjertler, men Svælgruben gjør dog nogen Undtagelse herfra, idet Cylindercellerne her nærme sig noget de i Rectum.

Ved et Tværsnit gennem Dyrets bagerste Ende viser Aabningen sig at være omgivet af stærke Muskelfibre, der danne en Sphincter, Tab. XVI, Fig. 1 *a*; hvorvidt disse Muskelfibre ere Udløbere fra Længde- eller Tvermusklerne, kan jeg ikke med Bestemthed afgjøre; men det synes som om Længdemusklernes sene Fibre derhen, imedens jeg ikke har kunnet iagttage saadanne fra Tvermusklerne.

Tentaklerne have et temmelig bredt Ectoderm, der dannes af lange Cylinderceller forsynede med Cilier, Tab. XVI, Fig. 2 *a*, og imellem hvilke sees en Mængde encellede, flaskeformede Slimkjertler, dels tomme som Vacuoler, dels med Kjerne og kornet Indhold, Tab. XVI, Fig. 2 *b*, samt Nematocyster med deres Spiraltraade, Tab. XVI, Fig. 2 *c*. Indenfor Ectodermet er et Lag stærke Længdemuskler, Tab. XVI, Fig. 2 *d*; men imellem Muskellaget og Ectodermet sees et yderst smalt, fintkornet Lag, der er overskaarne Nervefibriller, Tab. XVI, Fig. 2 *e*. Længdemusklernes hviler paa Bindevævet, som danner et temmelig bredt Lag, Tab. XVI, Fig. 2 *f*, paa hvis indre Flade er leiret et Belte af transverselle Muskler, Tab. XVI, Fig. 2 *g*,

appears that the gullet-tube does not form, as usual, a single cavity, but is divided longitudinally, by a rather broad connective-tissue, into two (Pl. XV, figs. 10 *h*, 11 *b*), so that the one cavity, which follows along the ventral side, is considerably narrower than the other, which is more than three times as wide. This narrower cavity is formed by a tube which is almost semi-circular in form, causing the rounded portion (Pl. XV, fig. 11 *a*) to face outwards in the gastral cavity, whilst the more truncated part (Pl. XV, figs. 10 *h*, 11 *b*) unites to the remaining part of the gullet-tube (Pl. XV, figs. 10 *i*, 11 *d*). This narrowish tube, which must be regarded as a rectum, terminates, at the top, a little below the oral aperture, and, at the bottom, a little above the lowest free margin of the gullet-tube, and is, upon its entire inner surface, clad with long cylinder-cells, each of which carries a long flagellum (Pl. XV, fig. 11 *e*). The cavity in the rectum is partly filled with mucous (Pl. XV, fig. 11 *f*), and partly with clay mixed with shells of foraminifera (Pl. XV, fig. 11 *g*). The broader part — the real gullet-tube — occupies the greater part of the anterior third-part of the gastral cavity and is strongly folded (Pl. XV, fig. 10 *i*); it dilates itself, rather considerably, along the dorsal side, so that it, there, forms a kind of gullet-groove (Pl. XV, fig. 10 *k*) to which the dorsal pair of directive septa on the outer side correspond (Pl. XV, figs. 10 D. D.), whilst the ventral directive septa are secured to the rectum (Pl. XV, fig. 10 V.). The inner surface of the gullet-tube is clad with an epithelium, considerably different from that coating the rectum; the cylinder-cells (Pl. XV, fig. 11 *h*) are much shorter, are furnished with rather short ciliae, and between those cells many unicellular mucous glands are observed, but the gullet-groove forms somewhat an exception, as here the cylinder-cells approach somewhat to those of the rectum.

In a transversal section through the posterior extremity of the animal, the aperture appears to be surrounded by strong muscle-fibres that form a sphincter (Pl. XVI, fig. 1 *a*); whether those muscle-fibres are prolongations of the longitudinal or transversal muscles, I have been unable to determine with certainty, but it appears as if the longitudinal muscles sent fibres in that direction, whilst I have not been able to detect a similar relation in the transversal muscles.

The tentacles have a pretty broad ectoderm, formed of long cylinder-cells furnished with ciliae (Pl. XVI, fig. 2 *a*), and between which a multitude of unicellular bottle-shaped mucous-glands, partly empty, like vacuoli, partly containing nucleus and granular contents (Pl. XVI, fig. 2 *b*) are seen, and also nematocysts with their spiral filaments (Pl. XVI, fig. 2 *c*). Inside of the ectoderm there is a layer of strong longitudinal muscles (Pl. XVI, fig. 2 *d*), but between the muscular layer and the ectoderm there is seen an extremely narrow, finely granular layer composed of transected nerve fibrils (Pl. XVI, fig. 2 *e*). The longitudinal muscles rest on the connective-tissue, which forms a rather broad layer (Pl. XVI, fig. 2 *f*), upon whose inner surface there

der beklædes af meget lange, cilierende Cylinderceller, Tab. XVI, Fig. 2 *h*, som rage langt ind i Tentakelens Lumen.

Nervesystemet har meget tilfælles med det, som Brødrene Hertwig have paavist at tilhøre Actinierne¹. Det bestaar, om man saa vil, af to Lag, der dog ere knyttede noie til hinanden. Det har sine store Vanskeligheder at fremstille Nervesystemet hos Cœlenterater, som i længere Tid have været opbevarede i Spiritus, naar man ikke fra første Stund har præpareret Gjenstandene for saadanne Undersøgelser, og i de fleste Tilfælde lykkes det aldeles ikke. Men hos et ganske ungt Exemplar af *Halcampoides abyssorum* var jeg saa heldig ved Hjælp af Osmiumsyre og Hæmatoxylin at faa en Del af Nervesystemet fremstillet. Paa Tversnit af Mundskiven, lige ved Grunden af Tentaklerne eller maaske rettere imellem disse, sees umiddelbart under Ectodermet flere Grupper af større og mindre Ganglieceller, hvilke korrespondere med hverandre og synes at danne et Net af Nervefibriller, der udsende Grene i alle Retninger. De store Ganglier have en oval Form, ere forsynede med en stor, næsten rund Kjerne med Kjernelegeme og omgivne af et tæt kornet Protoplasma, Tab. XVI, Fig. 3 *a*; fra den brede Ende af disse Ganglier udløbe to Grene, der ere fyldte med Protoplasma, og som, idet de forlænge sig til Siderne, dele sig i flere Smaagrener, hvoraf flere udbrede sig dels i Ectodermet, dels i Muskellaget, Tab. XVI, Fig. 3 *b*. Fra den smalere Ende udløber kun en Gren, Tab. XVI, Fig. 3 *c*, der er tyk, og som et Stykke fra dens Udspring udsender flere meget fine Grene, der dels forene sig med hinanden indbyrdes, dels korrespondere med lignende Grene fra tilgrændsende Ganglier, hvorved et Nervenet dannes, som sender Grene opover til Tentaklerne og nedover Kroppen, Tab. XVI, Fig. 3 *d*, imedens den tykke, enkle Gren løber nedover paa Svælgrøret og synes at tabe sig dels i dette, dels i Musklerne paa Septa. De mindre Ganglier ere knapt halvt saa store, men have omtrent samme Form som de store; de danne ligeledes Grupper, der synes dels at alternere med de store med Hensyn til Stedet, hvor de ligge, saaledes nemlig, at en Gruppe store Ganglier afvexle med en Gruppe smaa, Tab. XVI, Fig. 3 *e*, og dels støde direkte til de store, Tab. XVI, Fig. 3 *a*, hvoraf der synes at være 6 Grupper. Disse smaa Ganglier have lignende Udløbere som de store, ere forsynede med en stor Kjerne med sit Kjernelegeme og fyldte med Protoplasmakorn, Tab. XVI, Fig. 3 *f*; de bidrage i væsentlig Mon til at danne det ovenfor omtalte Nervenet, der vistnok udbreder sig over Dyrets hele Legeme; thi paa alle de Tversnit, jeg tog fra de forskjellige Legemsdele, viste der sig altid imellem Ectodermet og det dertil stødende Bindevæv et smalt, fintkornet Belte, som neppe kunde være noget andet end overskaarne Nervefibriller; derimod

is embedded a belt of transversal muscles (Pl. XVI, fig. 2 *g*) clad with very long ciliating cylinder-cells (Pl. XVI, fig. 2 *h*) that extend far into the channel of the tentacles.

The nervous system has much in common with that which the Brothers Hertwig have shown to belong to Actinidæ¹. It consists, if we may say so, of two layers, which are, however, closely united to each other. It is attended with great difficulty to present the nervous system in Cœlenterata that have been for some time preserved in alcohol, if we have not, from the first, prepared the subjects specially for such investigation, and in most cases it proves impossible. But in quite a young specimen of *Halcampoides abyssorum* I was fortunate enough, with the assistance of osmic acid and hæmatoxylin, to obtain a portion of the nervous system presented. In a transversal section of the oral disc, just at the base of the tentacles, or, perhaps, more correctly speaking, between them, there are observed; immediately underneath the ectoderm, several groups of larger and smaller ganglial cells, which correspond with each other and appear to form a reticulation of nerve-fibrils that send out branches in all directions. The large ganglia have an oval form, are furnished with a large, almost round, nucleus with nucleus-corpuscle, and are surrounded by a compact granular protoplasm (Pl. XVI, fig. 3 *a*); from the broad extremity of those ganglia two branches issue, which are filled with protoplasm, and which, while prolonging themselves to the sides, divide into several small branches, of which several distribute themselves, partly in the ectoderm and partly in the muscular layer (Pl. XVI, fig. 3 *b*). From the narrow extremity only one branch issues (Pl. XVI, fig. 3 *c*); this is thick, and a little way from its origin sends out several fine branches that partly unite reciprocally to each other, or partly correspond with similar branches from neighbouring ganglia, causing a nervous reticulation to be formed, which sends branches upwards to the tentacles and down along the body (Pl. XVI, fig. 3 *d*), whilst the thick solitary branch passes down the gullet-tube and appears to lose itself partly in it, and partly in the muscles of the septa. The smaller ganglia are scarcely half the size, but have about the same form as the large; they also form groups, which appear to partly alternate with the large ganglia with regard to locality, and are seated in such manner, that a group of large ganglia alternates with a group of small (Pl. XVI, fig. 3 *e*), or partly unites directly to the large ones (Pl. XVI, fig. 3 *a*), of which there appear to be 6 groups. These small ganglia have similar prolongations to the large ones, and are furnished with a large nucleus and its corpuscle, and are filled with protoplasmic granules (Pl. XVI, fig. 3 *f*); they contribute, in a special degree, to form the nervous reticula-

¹ Die Actinien, anatomisch und histologisch mit besonderer Berücksichtigung des Nervenmuskelsystems untersucht von Oscar Hertwig und Richard Hertwig. Jenaische Zeitschrift für Naturwissenschaft, 13 B. Pag. 481. Jena 1879.

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

¹ Die Actinien, anatomisch und histologisch mit besonderer Berücksichtigung des Nervenmuskelsystems untersucht von Oscar Hertwig und Richard Hertwig. Jenaische Zeitschrift für Naturwissenschaft, 13 B. Pag. 481. Jena 1879.

fundt jeg ikke uden paa Mundskiven Ganglier. Paa Mundskiven er der antagelig 12 Gangliegrupper, 6 store og 6 smaa, som synes at være forbundne med hverandre med Udløbere, eller rettere med Nervefletninger, udgaaende fra den ene Gruppe til den anden, og fra disse Grupper have da hele den øvrige Nerveudbredning sit Udspring. Naar jeg har benyttet Ordet „antagelig“ eller „synes“, er det, fordi jeg paa Grund af manglende Material ikke vovede at udtrykke mig med større Bestemthed.

Findested.

Station 164. Et Exemplar.
— 200. Et voxent og 3 smaa Exemplarer.

Slægtskarakter.

Legemet langstrakt, cylindrisk, endende tapformigt med en rund Caudalaabning og forsynet med en tynd, inkrusteret Skede. En Tentakelrække. 6 Par fuldstændige Septa, bærende Mesenterialfilamenter og Generationsorganer. Udprægede endodermale Cirkulærmuskler. Svælgerøret delt efter Længden.

Artskarakter.

Legemet langstrakt, cylindrisk, 70^{mm} langt, 12^{mm} bredt; den forreste Del ender tapformigt med en rund Aabning. Størstedelen af Kolumnen omgivet af en tynd, inkrusteret Skede, kun dens øverste Del er nøgen og forsynet med 12 Længdefurer, imellem hvilke brede Længdefelter med spredte Sugevorter. Mundskiven hvælvet og har 12 Folder, straalende ud fra den aflange Mund mod Peripherien. 12 lange, retraktile Tentakler i en Række. Kroppens øverste, nøgne Del med Mundskive og Tentakler kan indtrækkes i Skeden. Farven: Skeden graagrøn. Kolumnen bleg rosenrød, i dens bagerste Ende spillende lidt i det Violette. Længdefurerne lidt mørkere end Mellemparterne. Mundskiven har Kroppens Farve. Tentaklerne næsten mørkerøde, spillende i det Karmosinrøde.

Jeg har fundet det nødvendigt at danne en ny Slægt for det ovenfor beskrevne Dyr, omendskjønt det har adskiligt tilfælles med den af Gosse opstillede Slægt „Halcompa“,

tion before mentioned, which it is certain distributes itself over the entire body of the animal, as, in all the transversal sections I took from the different parts of the body, there always appeared, between the ectoderm and the connective-tissue uniting with it, a narrow, finely granulated belt, which could scarcely be anything else than transected nerve-fibrils; on the other hand I found no ganglia except on the oral disc. On the oral disc there are, presumably, 12 ganglial groups, 6 large and 6 small ones, which appear to be connected with each other by prolongations, or, more correctly, by nervous pleats issuing from the one group to the other, and in those groups the whole of the remaining nervous distribution takes its origin. That I make use of the words „presumably“ and „appears“, is caused by the fact, that I dared not, in the absence of sufficient material, express myself more decisively.

Habitat.

Station No. 164. One specimen.
— „ 200. One adult and three small specimens.

Generic characteristics.

The body elongate, cylindrical, terminating conically in a round caudal aperture, and furnished with a thin encrusted sheath. One tentacular series. Six pairs of perfect septa, carrying mesenterial filaments and reproductive organs. Distinct endodermal circular muscles. The gullet-tube divided longitudinally.

Specific characteristics.

The body elongate, cylindrical, measures 70^{mm} in length, and 12^{mm} in breadth in the anterior part, terminates conically with a round aperture. The greater part of the column surrounded by a thin encrusted sheath, only its uppermost part is bare and furnished with 12 longitudinal furrows, between which there are broad longitudinal areas with scattered suckers. The oral disc arcuated, has 12 folds radiating from the oblong mouth towards the periphery. Twelve long, retractile tentacles in one series. The superior, bare portion of the body with oral disc and tentacles may be retracted into the sheath. *The colour.* The sheath grey-greenish. The column pale rosy-red at the posterior extremity, with a violet play of colour. The longitudinal furrows a little darker than the intermediate areas. The oral disc has the same colour as the body. The tentacles are almost dark-red with a crimson red play of colour.

I have found it necessary to form a new genus for the above-described animal, although it has several features in common with the genus „Halcompa“, established by

der karakteriseres saaledes: „Column long, slender, cylindrical, or swollen at the inferior extremity, which appears to be imperforate; no distinct margin. Surface without loopholes, but studded with minute suckers. Disk flat. Radii distinct. Tentacles of one kind, few (less than twenty), marginal or submarginal, cylindrical, obtuse, perfectly retractile. Mouth simple. No obvious gonidial development“¹. Nogen anatomisk Undersøgelse har Gosse ikke anstillet, saavidt det kan erfares; men han henfører Slægten til Familien Ilyanthidæ, hvilket ogsaa Richard Hertwig gjør, der paa det Exemplar, han beskriver under Navn af *Halcampa clavus*,² har foretaget baade anatomiske og histologiske Undersøgelser. Han har paavist, at *Halcampa* hører til Hexactiniernes store Gruppe, idet den har 6 Par fuldstændige Septa og saaledes væsentlig adskiller sig fra Edwardsierne, der af tidligere Forfattere have været henførte til Familien Ilyanthidæ.

Men det tør vel være et Spørgsmaal, hvorvidt Hertwig's *Halcampa* virkelig kan henføres til Gosse's; thi allerede i det Ydre frembyder *Halcampa clavus* mærkelige Afvigelser fra den typiske Slægt; saaledes den Kreds af Huller, der findes paa den bagerste Del, samt Mangel paa et cuticulært Overtræk, og det kan hælde, at ved en anatomisk Undersøgelse af Gosse's Slægt endnu flere og væsentligere Afvigelser ville kunne findes. Hertwig gjør opmærksom paa en Særegenhed, han fandt hos *Halcampa clavus*, den nemlig, at af de 12 Septa var 4 mindre end de 8, noget han mener har Betydning i morfologisk Henseende, da det tyder hen paa, at *Halcampa* nærmer sig stærkt Slægten *Edwardsia* og danner muligens et Led imellem denne og Hexactinierne. Denne Særegenhed ved Septa omtaler ogsaa Strethill Wright i sin Beskrivelse over en parasitær *Halcampa*, der lever paa Meduser og er kaldet *Halcampa Fultoni*³. Han kalder de 4 mindre Septa intermediære Septa; men her kan atter reises det Spørgsmaal, om Wright's Form virkelig er en *Halcampa*; thi den er unegtelig i flere Henseender forskjellig baade fra Gosse's og Hertwig's. *Halcampa Fultoni* mangler cuticulært Overtræk, har en tydelig Aabning i den bagerste Ende, er forsynet med Acontier (Thread-cells of the septal bands) og har endelig en ganske særegen Øsophagus.

Det forekommer mig, at *Halcampa Fultoni* nærmer sig meget mere den af mig beskrevne *Halcampoides abyssorum*, og det tør hælde, at den ved nærmere Undersøgelser bliver at henføre til denne ny opstillede Slægt. Som det fremgaar af min Beskrivelse, har *Halcampoides abyssorum* ikke Wright's intermediære Septa eller Hertwig's 4 mindre Septa; dens 6 Par Septa have samme Størrelse, og kun Retningsseptata adskille sig fra de øvrige væsentlig ved Muskelanordningen. *Halcampoides abyssorum* har ligesom *Halcampa Fultoni* en tydelig Aabning i den bagerste

Gosse, which is thus characterized „Column long, slender, cylindrical, or swollen at the inferior extremity, which appears to be imperforate; no distinct margin. Surface without loopholes, but studded with minute suckers. Disk flat. Radii distinct. Tentacles of one kind, few (less than twenty), marginal or submarginal, cylindrical, obtuse, perfectly retractile. Mouth simple. No obvious gonidial development“¹. Gosse does not appear to have made any anatomical investigation, but he relegates the genus to the family Ilyanthidæ, which Richard Hertwig also does, who, with the specimen he describes under the name of *Halcampa clavus*², has made both an anatomical and histological investigation. He has shown that *Halcampa* belongs to the large group of Hexactinidæ, as it has 6 pairs of perfect septa, and thus materially distinguishes itself from the Edwardsiæ, which have, by previous writers, been assigned to the family Ilyanthidæ.

But there may, perhaps, be a question whether Hertwig's *Halcampa* can really be assigned to Gosse's, as, already in its exterior, *Halcampa clavus* presents remarkable divergencies from the generic type; for instance, the group of loopholes that are observed on its posterior part, and the absence of cuticular covering; and, it may be, that upon anatomical investigation of Gosse's genus, still further and more material divergencies will be found. Hertwig draws attention to a peculiarity he found in *Halcampa clavus*, viz. that of the 12 septa four were smaller than the other eight, a feature that he thinks to be of importance in morphological respects, as it indicates that *Halcampa* approaches greatly to the genus *Edwardsia*, and possibly forms a link between it and Hexactinidæ. This peculiarity in the septa is also mentioned by Strethill Wright, in his description of a parasitic *Halcampa* that exists upon Medusæ, designated *Halcampa Fultoni*³. He calls the 4 small septa intermediary septa, but here, again, the question may be raised, whether Wright's form is really a *Halcampa*, as it differs, undeniably, in several respects, both from Gosse's and Hertwig's. *Halcampa Fultoni* has no cuticular covering, has a distinct aperture in the posterior extremity, is furnished with acontia (thread-cells of the septal bands), and, finally, has quite a peculiar œsophagus.

It appears to me that *Halcampa Fultoni* approaches somewhat nearer to *Halcampoides abyssorum*, described by me, and it may happen that, on closer investigation, it will have to be assigned to that newly established genus. As appears from my description, *Halcampa abyssorum* has not Wright's intermediary septa, nor Hertwig's 4 small septa; its 6 pairs of septa are uniform in size, and the directive septa alone distinguish themselves materially from the others, principally in their muscular arrangement. *Halcampoides abyssorum* has, like *Halcampa Fultoni*, a distinct

¹ The British Sea-Anemones and Corals. Ph. H. Gosse. London 1866, pag. 246.

² l. c. Pag. 92.

³ Ann. & Magazine of Nat. History Vol. VIII. Third Ser. 1861, pag. 133. *Halcampa Fultoni* by Dr. Strethill Wright.

¹ The British Sea-Anemones and Corals. Ph. H. Gosse, London, 1866. Pag. 246.

² l. c. Pag. 92.

³ Ann. & Magazine of Nat. History. Vol. VIII. Third Ser. 1861, pag. 133. *Halcampa Fultoni* by Dr. Strethill Wright.

Ende, og jeg er tilbøielig til at antage, at Svælgrøret hos den sidste er ligesom hos *Halcampoides abyssorum* i sit Indre delt i to Længdekanaler, eller med andre Ord, at det har differentieret sig i *Ōsophagus* og *Rectum*. Skulde dette vise sig at være Tilfældet, saa mener jeg, at Tilnærmelsen er saa stor, at de Betæneligheder, som endnu maatte være tilstede ved at overføre *Halcampa Fultoni* til Slægten *Halcampoides* med Lethed maa kunne overvindes.

Dr. Angelo Andres¹ har i en Afhandling over *Halcampa Claparedii*, Panc. paa det klareste godtgjort, at denne *Panceris* Form ingen *Halcampa* er, men en *Edwardsia*, idet han konstaterer den af Allmann² gjorte Iagttagelse, at *Edwardsia* har 8 Septa og saaledes maa danne en egen Type, forskjellig fra *Hexactiniæ*. Dr. Andres henfører Slægten *Halcampa* ikke til Familien *Ilyanthidæ*, Gosse; men danner en ny Underfamilie for den, nemlig *Halcampidæ*, under den store Gruppe *Actinidæ*, og som forekommer mig at være ret vel begrundet, ligesom den passer bedre for min Slægt, hvorfor jeg for denne har optaget Andres Underfamilie „*Halcampidæ*“.

Tribus II. Edwardsiæ, Hertwig.

Familie *Edwardsiæ*, Andres.

Subfamilie *Edwardsiæ*, Andres.

Slægt *Edwardsioides*, mihi.

Edwardsioides vitrea.

Tab. V, Fig. 3; Tab. XVI, Fig. 4—10.

Legemet er langtstrakt, cylindrisk, 45—50^{mm} langt, 8^{mm} bredt. Scapus er noget opsvulmet paa Midten og har et yderst tyndt, grønligt, membranøst Slimovertræk, der danner en Slags Skede, Tab. V, Fig. 3 a; Tab. XVI, Fig. 4 a, men er forresten meget løst bundet til den underliggende Hud. Denne er forsynet med 8 fine Længdefurer, Tab. V, Fig. 3; Tab. XVI, Fig. 4 b, imellem hvilke sees noget ophøiede Længdefelter, paa hvilke iagttages en stor Mængde yderst smaa Sugevorter, der staa i temmelig regelmæssige Tverrækker, Tab. XVI, Fig. 4 c. Disse Sugevorter ere saa smaa, at de først ved stærk Loupe blive ret synbare; de kunne udstrække sig i mindst 1 Millimeters Længde, og naar de trækkes ind, sees de som et lidet, hvidt Punkt i Midten af en lidt aflang Fordybning, Tab.

¹ Mittheilungen aus der zoologischen Station, Neapel 1881. 2 B., pag. 123. Intorno all *Edwardsia Claparedii*, Mem. dell. dott. Angelo Andres.

² Allmann. On the structure of *Edwardsia*. Quarterly Journal of microscopical Science, Vol. XII. N. Series. pag. 394. London 1872.

aperture in the posterior extremity, and I am disposed to assume that the gullet-tube in the last-named is, as in *Halcampoides abyssorum*, divided, in its interior, into longitudinal canals, or in other words, that it has differentiated into an *ŏsophagus* and a *rectum*. Should this prove to be the case, then I think that the approximation is so close, that the difficulties which still remain in assigning *Halcampa Fultoni* to the genus *Halcampoides* may easily be surmounted.

Dr. Angelo Andres has, in his Memoir¹ on *Halcampa Claparedii*, Panc, in the clearest manner proved, that that form of *Panceris* is no *Halcampa*, but an *Edwardsia*, as he confirms the observations made by Allmann², that *Edwardsia* has 8 septa and must thus form a separate type, differing from the *Hexactinidæ*. Dr. Andres does not assign the genus *Halcampa* to the family *Ilyanthidæ*, Gosse, but forms a new sub-family for it, viz. *Halcampidæ*, under the great group *Actinidæ*, and it appears to me that this is well warranted, whilst, at same time, it suits better for my genus, wherefore I have, for it, accepted Andres's sub-family „*Halcampidæ*“.

Tribus II. Edwardsiæ, Hertwig.

Family *Edwardsiæ*, Andres.

Subfamily *Edwardsiæ* Andres.

Genus *Edwardsioides*, mihi.

Edwardsioides vitrea.

Pl. V, fig. 3; Pl. XVI, fig. 4—10.

The body elongate, cylindrical, 45—50^{mm} in length, and 8^{mm} in breadth. The scapus is somewhat swollen at the middle, and has an extremely thin, greenish, membranous mucous covering that forms a kind of sheath (Pl. V, fig. 3 a; Pl. XVI, fig. 4) but, otherwise, is very loosely connected to the subjacent integument. It is furnished with 8 fine longitudinal furrows (Pl. V, fig. 3; Pl. XVI, fig. 4 b), between which, somewhat elevated, longitudinal areas are observed, upon which a great multitude of extremely small suckers are situated in rather regular transversal series (Pl. XVI, fig. 4 c). These suckers are so small, that they first become visible on application of a powerful magnifying glass; they are capable of extending themselves at least 1 millimetre, and when they are retrac-

¹ Mittheilungen aus der zoologischen Station. Neapel 1881. 2 B., pag. 123. Intorno all *Edwardsia Claparedii*, Mem. dell. dott. Angelo Andres.

² Allmann. On the Structure of *Edwardsia*. Quarterly Journal of microscopical Science, Vol. XII. N. Series. pag. 394. London 1872.

XVI. Fig. 5 a. Det omtalte, membranøse Overtræk er slimet, svagt inkrusteret med Ler og har opad en skarpt begrændset Rand, Tab. V, Fig. 3 b; Tab. XVI, Fig. 4 d, imedens det nedad ikke har nogen saadan Begrændsning, men er forøvrigt saa tyndt, at naar Dyret er fuldt udstrakt, forsvinder det næsten ganske for Øiet.

Physa er afrundet, blæreformigt opsvulmet og for Størstedelen blottet for Overtræk; men ogsaa den har 8 fine Furer, der svare til Længdefurerne paa Scapus og ligesom samle sig omkring en navleformet Fordybning, som ikke er perforeret, Tab. XVI, Fig. 4 e. Physa er vel kontrakt, forsaa vidt den udvider og sammentrækker sig, men den kan ikke indtrækkes eller skjules af Skeden, og der findes paa dens Overflade imellem Furerne lignende Sugevorter som paa Scapus, men de ere her meget sparsomme.

Capitulum er cylindrisk, 8^{mm} langt, aldeles blottet for Overtræk, yderst gjennemsigtigt, glasklart og forsynet med 8 fine Længdefurer, Fortsættelse af de paa Scapus, og imellem hvilke findes ligesaa mange, lidt ophøjede Længdefelter, hvori sees spredte Sugevorter, Tab. V, Fig. 3; Tab. XVI, Fig. 4 f. Længdefurerne dele sig i to opimod Capitulum's øverste, afrundede Rand, der bærer Tentaklerne.

Mundskiven er hvælvet og har 8 fine Furer, imellem hvilke findes ophøjede Folder, der gaa fra Munden og straae ud mod Skedens Peripheri, hvor Furerne dele sig i to og korrespondere med de todelte Furer fra Capitulum, Tab. XVI, Fig. 4. Munden danner en Tverspalte og er lidt fremspringende. Tentaklerne ere omtrent 8^{mm} lange, temmelig spidse og staa ved Grunden tæt i hinanden. De danne en Række, 16 i Antal, og ere meget retraktile.

Farven. Scapus har et fint, grønligt, gjennemsigtigt Overtræk. Huden indenfor er næsten glasklar, spillende svagt i det Røde med blege, lyserøde Længdefurer. Naar Dyret er fuldt udstrakt, har Capitulum et svagt rosenrødt Skjær, hvilket ogsaa er Tilfældet med Physa. Mundskiven er rosenrød med 8 blege Furer. Tentaklerne ere smukt hoirode, Tab. V, Fig. 3.

Dyret ligger løs i det sandholdige Ler og ser udstrakt ormagtigt ud; men naar Tentaklerne ere indtrukne, og Legemet er udspændt af Vand, som Tilfældet var, da det kom op af Skraben, er det omtrent 24^{mm} langt og 12^{mm} bredt og saa fuldstændigt glasklart, at de røde Tentakler og Mesenterialfilamenterne kunde sees, og det lignede da overordentlig meget en Myriotrochus brevis, som jeg ved første Øiekast ogsaa antog det for.

Ved Tversnit viser det sig, at den inkrusterede Overhud er dannet af en seig, slimagtig Masse, hvori er indleiret fin Sand og Ler, uden at der kunde opdages nogen organiske

ted they appear as a small white point in the middle of a small oblong depression (Pl. XVI, fig. 5 a). The membranous covering mentioned is mucous, slightly encrusted with clay, and has at the top a sharply defined margin (Pl. V, fig. 3 b; Pl. XVI, fig. 4 d), whilst in the inferior part it has no such margin, but, otherwise, is very thin, and when the animal is fully extended almost entirely disappears to the eye.

The physa is rounded, sac-formed, swollen, and for the greater part is without any covering; but it, also, has 8 fine furrows, which correspond to the longitudinal furrows on the scapus and, as it were, collect round an imperforate navel-shaped depression (Pl. XVI, fig. 4 e). The physa is indeed contractile, in as much that it expands and contracts itself, but it can not be retracted or be concealed by the sheath, and on its outer surface, between the furrows, similar suckers to those of the scapus are found, but are, here, much more rare.

The capitulum is cylindrical, 8^{mm} in length, perfectly devoid of covering, extremely transparent, clear as glass, and is furnished with 8 fine longitudinal furrows, continuations of the furrows of the scapus, between which occur the same number of slightly elevated longitudinal areas, in which scattered suckers are observed (Pl. V, fig. 3; Pl. XVI, fig. 4 f). The longitudinal furrows divide themselves into two up towards the capitulum's superior, rounded margin, which carries the tentacles.

The oral disc is arcuate and has 8 fine furrows, between which elevated folds are found, issuing from the mouth and radiating to the periphery of the disc, where the furrows divide into two and correspond with the two divided furrows of the capitulum (Pl. XVI, fig. 4). The mouth forms a transversal fissure and is slightly protuberant. The tentacles are about 8^{mm} in length, rather pointed, and are, at the base, situated close to each other. They form a series, 16 in number, and are very retractile.

The colour. The scapus has a fine, greenish, transparent covering. The integument inside is almost as clear as glass, with a faint play of reddish colour, and has pale light-red longitudinal furrows. When the animal is fully extended, the capitulum has a faint rosy-red tinge, which is also the case with the physa. The oral disc is rosy-red, and has 8 pale furrows. The tentacles are a beautiful bright-red colour (Pl. V, fig. 3).

The animal lies loose in the sandy clay and, when extended, appears vermiform; but when the tentacles are retracted and the body dilated with water, as was the case when the specimen came up in the dredge, it is about 24^{mm} in length and 12^{mm} in breadth, and so perfectly transparent, like glass, that the red tentacles and the mesenterial filaments may be observed; it then appeared extremely like a Myriotrochus brevis, which I, also, at the first glance assumed it to be.

In transversal sections it is seen, that the encrusted outer covering is formed of a viscid, mucous mass, in which fine sand and clay are embedded, but without any

Elementer i samme; heller ikke var det muligt at finde nogen organisk Forbindelse imellem dette Overtræk og den indenfor liggende Hud, hvortil det syntes at være fæstet dels ved sin Klæbrighed og dels ved de paa Kroppens Overflade værende Sugedyrter. Men at dette Overtræk bestaar af en sammenhængende Slimmembran, sees bedst derved, at saasnart Dyret var kommet i Alkohol, stødtes denne Overhud af overalt, og ved da at undersøge den, viste den sig som en grøn, tynd, gjennemsigtig Membran, hvori var leiret de omtalte fremmede Legemer, samt en Mængde Nematocyster og en Del Cylinderceller, der vare løsrevne fra Ectodermet og fulgte med det membranøse Overtræk, Tab. XVI, Fig. 10. Nematocysterne slynge sine Spiraltraade aabenbart ud igjennem den tynde Membran, som desuden paa enkelte Steder synes at have runde Aabninger, hvorigjennem Sugedyrterne kunne strække sig ud.

Hudens ydre Flade er dækket af et Ectoderm, bestaaende af Cylinderceller med deres Kjerne og Kjernelegeme og forsynede med Cilier. Saavidt jeg kunde iagttage, var dette Tilfældet overalt, baade der hvor Overtrækket fandtes, og hvor Huden var uden saadant, Tab. XVI, Fig. 6 *a*. Imellem Cylindercellerne findes encellede Slimkjertler, som dog ikke synes at være i nogen særdeles stor Mængde tilstede, især gjælder dette Capitulum og Physa, samt Nematocyster, der optræde i stor Mængde paa Tentaklerne.

Indenfor Ectodermet er et temmelig bredt, fibrillært Bindevævslag, som er rigt paa Bindevævslegemer, dels med enkelte, dels med flere Udløbere, samt fine Ernæringskanaler, med hvilke de nys nævnte Udløbere korrespondere, Tab. XVI, Fig. 6 *b*. Disse fine Saftkanaler ere altid forsynede med et Epithel, hvis aflange Celler saagodt som ganske udfylde Lumenet. Henimod den indre Flade af Bindevævslaget iagttages et bredt Belte af Cirkulermuskler, Tab. XVI, Fig. 6 *c*, der danne temmelig stærke Bundter, som paa enkelte Steder synes at rage ind paa den indre Flade, der er beklædt med Endothelet. Dette bestaar af temmelig lange Cylinderceller, forsynede med Kjerne, Kjernelegeme og Cilier, samt et Endothel, som beklæder hele Gastrovascularhulheden og de i denne liggende Organer.

Fra den indre Væg af det omtalte Bindevæv udspringe 8 Septa, der i Bunden af Gastralhulheden ere temmelig smale, men blive jo længere de komme op paa Kroppen bredere og bredere, indtil de fæste sig paa Svælgrøret. Disse 8 Septa staa saa langt fra hverandre, at de nok kunne betragtes som isolerede og ikke parrede. Imidlertid ere de 4 af dem stillede saaledes, at de muligens kunne ansees for 2 Par, som baade ifølge deres Stilling og Muskelanordning maa blive Retningsseptata, Tab. XVI, Fig. 7 *a*. De ere fæstede til den Del af Svælgrøret, der svarer til Mundvigene, og de to Svælgruber, som jeg har Grund til at antage ere tilstede. Da jeg ikke havde mere end 1 Exemplar til Undersøgelse, har jeg, for ikke ganske at odelægge dette, gjort Tversnit kun igjennem den halve Del

organic elements being seen in these; neither was it possible to detect any organic connection between this covering and the integument situated within, to which it appeared to be attached, partly by its stickiness, and partly by means of the suckers on the outer surface of the body. But that this covering consists of a continuous mucous membrane is best observed from this fact, that as soon as the animal was placed in alcohol the covering was everywhere thrown off, and, upon examination then, appeared to be a green, thin, transparent membrane, in which the foreign bodies mentioned were embedded, also a multitude of nematocysts and some cylinder-cells which were torn away from the ectoderm and accompanied the membranous covering (Pl. XVI, fig. 10). The nematocysts evidently twine their spiral threads out through the thin membrane, which appears in a few places, also, to have round apertures through which the suckers may stretch themselves out.

The outer surface of the integument is covered by an ectoderm, consisting of cylinder-cells with their nucleus and nucleus-corpuscle and furnished with cilia. So far as I could observe this was everywhere the case, both where the covering was present and also where it was absent (Pl. XVI, fig. 6 *a*). Between the cylinder-cells unicellular mucous glands were found, which did not, however, appear to be present in any particularly great abundance, especially on the capitulum and physa, also nematocysts, which appear in great abundance on the tentacles.

Inside of the ectoderm there is a rather broad, fibrillous layer of connective-tissue, partly with a few, partly with many prolongations, also fine nutritory ducts with which the prolongations just mentioned correspond (Pl. XVI, fig. 6 *b*). These fine nutritory ducts are always supplied with an epithelium whose oblong cells almost quite fill the channel. Towards the inner surface of the layer of connective-tissue, a broad belt of circular muscles is observed (Pl. XVI, fig. 6 *c*), which form pretty strong bundles that in some places appear to reach inwards to the inner surface, which is clad with the endothelium. This consists of rather long cylinder-cells, furnished with nucleus, nucleus-corpuscle and cilia, also an endothelium that clothes the entire gastro-vascular cavity and the organs situated in it.

From the inner wall of the connective-tissue spoken of, 8 septa issue, which, in the bottom of the gastral cavity, are rather narrow, but become broader and broader the farther up the body they extend, until they attach themselves to the gullet-tube. These 8 septa stand so far apart, that they may almost be regarded as isolated and not in pairs. However, 4 of them are placed in such a manner, that they may possibly be regarded as 2 pairs, which, both from their position and muscular arrangement, must be directive septata (Pl. XVI, fig. 7 *a*). They are secured to the part of the gullet-tube that corresponds to the oral angles and the two gullet-grooves which I have reason to believe are present. As I had not more than a single specimen for my investigations, I have, in order

af Kroppen, og paa denne kan iagttages en Svælggrube, Tab. XVI, Fig. 7 *b*, saa det er meget sandsynligt, at den anden findes paa den ikke gjennemskaaede Del.

De to Par Retningssepta ere meget stærkere udviklede, end de øvrige. De longitudinelle Muskler ere fæstede paa den ydre Flade, vende fra hinanden i det interseptale Rum og ere meget brede, især henimod Svælgørret, Tab. XVI, Fig. 7 *c*, men de indtage dog ikke ganske hele Septumets Flade; thi henimod dennes indre Rand er der et Længdebelte, som er frit for Muskler, og hvori Mesenterialfilamenterne og Generationsorganerne ligge. Længdemusklerne ere egentlig fæstede paa en Mængde listeformige Bindevævsudløbere, hvorfor de ogsaa i Tversnit vise sig som smukke Buske, Tab. XVI, Fig. 7 *c*. De transverselle Muskler synes at være lidet udviklede; de ligge som en tynd, fint foldet Membran paa Septumets indre Flade, der vender mod det intraseptale Rum, Tab. XVI, Fig. 7 *d*. De øvrige 4, mere isolerede Septa, der altsaa ikke blive at betragte som parrede, fæste sig paa Svælgørrets Sider; deres Længdemuskler ere fæstede paa den indre Flade og vende mod det intraseptale Rum, netop modsat de paa Retningssepta og ere forøvrigt lidet forskellige fra dem, imedens Tvermusklerne findes paa den ydre Flade og vende mod det interseptale Rum. Samtlige Septa bære Mesenterialfilamenter og Generationsorganer.

Mesenterialfilamenterne strække sig fra den nederste Ende af Svælgørret og lige ned til Bunden af Gastralhulheden langs Septums fri Rand i proptrækkerformede Slingninger, beklædte af Cylinderepithel med lange Cilier. Imellem Mesenterialfilamenterne og Længdemusklerne, Tab. XVI, Fig. 8 *a*, i det fri Længdefelt, ligge Kjønnsorganerne, Tab. XVI, Fig. 8 *b*, *c*.

Testiklerne ere fæstede øverst, lige ved Svælgørret, og strække sig 12—15^{mm} nedover (bagover), og have under stærk Loupeforstørrelse et tverstribet, fint punkteret, mørkt Udseende, Tab. XVI, Fig. 7 *e*, 8 *b*. Ved stærk Forstørrelse (Zeisse: Apochrom. — Obj. 4,0^{mm}. Comp. Ocul. XII) sees disse mørke Striber at bestaa af lange Rør, hvis Membran er yderst tynd, og hvis indre Flade er beklædt med et Epithel, bestaaende af runde Celler med en rund Kjerne og Kjernelegeme, Tab. XVI, Fig. 9 *a*. I en stor Del af disse Celler sees en, sjelden to Spermatozoer, der have et næsten cirkelrundt, temmelig mørkt Hoved og en Hale, som er 4—5 Gange saa lang som Hovedet er bredt, Tab. XVI, Fig. 9 *b*. Men desforuden iagttages tætte Grupper af Spermatozoer, der have forladt Cellerne, ligge ganske fri og flyde tildels enkeltvis omkring i Synsfeltet, Tab. XVI, Fig. 9 *c*. Mange af Cellerne ere overmaade klare, saa den indeni liggende Spermatozo er let at se; men andre Celler ere meget mørkere, have et rigere Protoplasmahold, og disse synes ikke at indeholde nogen

not to entirely destroy it, only made the transversal section through the half part of the body, and in this a gullet-groove may be observed (Pl. XVI, fig. 7 *b*); it is very probable, therefore, that the other groove is found on the portion not transected.

The two pairs of directive septa are somewhat more strongly developed than the others. The longitudinal muscles are attached to the outer surface, and face from each other in the interseptal space; they are very broad, especially towards the gullet-tube (Pl. XVI, fig. 7 *c*), but do not quite occupy the entire surface of the septum, as, towards its inner margin, there is a longitudinal belt devoid of muscles, and in which mesenterial filaments and reproductive organs are situated. The longitudinal muscles are really secured to a multitude of fillet-formed connective-tissue prolongations, for which reason they, in transversal sections, appear as beautiful tufts (Pl. XVI, fig. 7 *c*). The transversal muscles appear to be little developed; they lie as a thin, finely folded membrane on the inner surface of the septum, which faces towards the intraseptal space (Pl. XVI, fig. 7 *d*). The remaining 4, more isolated septa, which consequently are not to be regarded as pairs, secure themselves to the sides of the gullet-tube; their longitudinal muscles are secured to the inner surface and face towards the intraseptal space, exactly the reverse of those on the directive septa, and are otherwise little divergent from them, whilst the transversal muscles are found on the outer surface and face towards the interseptal space. All the septa carry mesenterial filaments and reproductive organs.

The mesenterial filaments extend from the lowest extremity of the gullet-tube, and right down to the bottom of the gastral cavity along the free margin of the septum, in cork-screw formed spirals, clad with cylinder-epithelium having long cilia. Between the mesenterial filaments and the longitudinal muscles (Pl. XVI, fig. 8 *a*), in the free longitudinal area, lie the reproductive organs (Pl. XVI, fig. 8 *b*, *c*).

The testicles are attached at the top, exactly at the gullet-tube, and stretch themselves 12—15^{mm} downwards (posteriorly) and have, under a powerful magnifying glass, a transversally striped, finely dotted, dark appearance (Pl. XVI, figs. 7 *e*, 8 *b*). On powerful magnification (Zeisse: Apochrom. — Obj. 4,0^{mm} Comp. Ocul. XII) those dark stripes are seen to consist of long tubes, whose membrane is extremely thin, and whose inner surface is clad with an epithelium consisting of round cells with a round nucleus and nucleus-corpuscle (Pl. XVI, fig. 9 *a*). In a great many of those cells there is seen one, rarely two, spermatozoa, with an almost circular-round, pretty dark head, and a tail which is 4—5 times as long as the head is broad (Pl. XVI, fig. 9 *b*). But, besides these, compact groups of spermatozoa, which have abandoned the cells, lie quite free and float around, partly isolated, in the area of vision (Pl. XVI, fig. 9 *c*). Many of the cells are extremely transparent, so that the spermatozoa lying within are easily observed, but other cells, again, are much

Spermatozo, idetmindste var den ikke til at opdage. Endelig findes der ikke saa faa Celler, hvori kun Spermatozoens Hoved er at iagttage, og dette er endog meget mindre end paa de fuldt udviklede Spermatozoer og synes at været udgaaet fra Cellekjernen, der da har afsnøret sig. hvilket sidste dog kun er en Formodning.

Nedenfor Testiklerne sees i det for omtalte, fri Længdebelte Æggstokkene, der i Bygning ikke ere væsentlig forskellige fra Actinidernes i Almindelighed; de danne lange, baandformige, noget sammenrullede Rør, hvori Æggene ligge i forskellige Udviklingsstadier, i Regelen to og to sammen, Tab. XVI, Fig. 8 c, og i enkelte Æg er Furingen allerede gennemgaaet og Embryonaldannelsen begyndt.

Svælgrøret er cylindrisk, temmelig foldet paalangs og sandsynligvis forsynet med to Svælgruber. Som tidligere antydet er der kun foretaget Tversnit igennem den halve Krop med Svælgrør, og paa dette Tversnit sees en tydelig udpræget Svælgrube, tapetseret med lange Cylinder-celler, der bære lange Pidske-Cilier (Geissel) Tab. XVI, Fig. 7 b, imedens Siderne af Svælgrøret have kortere Cylinder-celler med finere Cilier. Den udvendige Flade af Svælgrøret er som sædvanligt beklædt med Endothel, lig det, der beklæder hele Gastralhulheden. Imellem Endothelcellerne, der beklæde Septa, Mesenterialfilamenterne og Generationsorganerne findes spredte Nematocyster, ligesom der paa Svælgrørets indre Side, imellem Epithelcellerne, findes encellede Slimkjertler.

Saa vel i Svælgrøret som i Gastralhulheden fandtes en hel Del Foraminiferer, ligesom der besynderligt nok fandtes en Bladknop af en Sphagnum, der var berøvet alt Protoplasma, saa at kun det smukt netformige, farveløse Væv, der danner Cellevæggene, var tilbage. Denne Moseknop maa vel være sunket ned paa dette store Dyb (2742 Fod) fra en eller anden Strandbred, og er da omsider tørnet ind i Dyrets Ernæringskreds, hvor den sammen med Foraminifererne er slugt ned i Fordøielsestrakten. Her er den sandsynligvis under Fordøielsesprocessen bleven berøvet Protoplasmaet, der er gaaet over i Ernæringsvædsken, imedens det ufordøielige Cellulosevæv er blevet tilbage. Det er høist rimeligt, at Bladknoppen er kommen ned i Gastrovascularhulheden i temmelig frisk og uskadt Tilstand; thi naar undtages, at et Blad var veget noget ud fra de øvrige, befandtes den med Hensyn til Formen i uforandret Tilstand.

Findested.

Station 164. Et Exemplar.

Slægtskarakter.

Legemet cylindrisk, ormformigt, forsynet med 8 Længdefurer og Mellenrummene tæt besatte med Sugervorter.

darker, have a richer protoplasmic contents, and these do not appear to contain any spermatozoa, at all events none could be detected. Finally, not a few cells are found in which only the head of the spermatozoon can be observed, and this is even much less than in the fully developed spermatozoa, and appears to have proceeded from the cellular nucleus, which has thus constricted itself, but that is only a supposition.

Below the testicles the ovaries are seen situated in the longitudinal belt previously mentioned, and in structure they are not essentially different from that of Actinidæ in general; they form long, ribbon-shaped, somewhat coiled tubes, in which the ova lie in various stages of development, generally two and two together (Pl. XVI, fig 8 c); in a few ova the segmentation had already taken place and the embryonal formation begun.

The gullet-tube is cylindrical, somewhat folded longitudinally, and is probably furnished with two gullet-grooves. As previously stated, transversal section has only been made through one half of the body and the gullet-tube, and in this section a distinctly marked gullet-groove is observed, coated with long cylinder-cells carrying long flagellate ciliae (Geissel) (Pl. XVI, fig. 7 b), whilst the sides of the gullet-tube have shorter cylinder-cells with finer ciliae. The exterior surface of the gullet-tube is, as usual, clad with endothelium similar to that which clothes the entire gastral cavity. Between the endothelial cells that clothe the septa, the mesenterial filaments and the reproductive organs, scattered nematocysts are found, whilst, also, upon the inner side of the gullet-tube, between the epithelial cells, unicellular mucous glands are found.

In the gullet-tube also, as well as in the gastral cavity, a large number of foraminifera were found, whilst also, strangely enough, there was found a leaf-bud of a sphagnum, deprived of all protoplasm, so that only the beautiful, reticulated, colourless tissue that forms the walls of the cells was left. That moss-bud must certainly have sunk to this great depth (457 fath.), and have proceeded from some shore or other, and then been drawn within the region of the animal's feeding ground, where, together with the foraminifera, it has been drawn into the digestive funnel. Here, it has probably during the process of digestion been deprived of its protoplasm, which has passed into the nutritory fluid, whilst the indigestible cellular tissue has been left. It is extremely probable that the leaf-bud has arrived in the gastro-vascular cavity in a pretty fresh and undamaged condition, because, with the exception that a leaf had separated a little from the rest, it was found to be unchanged in form.

Habitat.

Station No. 164. One specimen.

Generic characteristics.

The body cylindrical, vermiform, furnished with 8 longitudinal furrows and the intervals closely occupied by

Scapus har et tyndt, gjennemsigtigt Overtræk. Capitulum nøgen med en Række marginale, retraktile Tentakler. Physa liden og ikke retraktil. 8 Septa. Cirkulærmuskelnerne endodermale. Hermaphrodit.

Artskarakter.

Legemet 40—50^{mm} langt, 8^{mm} bredt, cylindrisk. Scapus lidt opsvulmet paa Midten, forsynet med et tyndt, gjennemsigtigt, membranøst Overtræk, samt 8 Længdefurer, imellem hvilke 8 Længdefelter, tæt besatte med Sugevorter, der næsten danne Tverrækker. Physa afrundet, blæreformigt opsvulmet, for Størstedelen nøgen og ikke retraktil. Capitulum retraktilt, cylindrisk, 8^{mm} langt, nøgent, glasklart med lignende Furer og Sugevorter som paa Scapus. Mundskiven hvælvet med 8 fine Furer, imellem hvilke 8 ophøiede Folder, straalende ud fra den aflange Mund mod Peripherien, hvor Furerne dele sig i to. Tentaklerne 16 i en Række, marginale, meget retraktile, omtrent 8^{mm} lange. Farven: Scapus har et fint, grønt, gjennemsigtigt Overtræk. Huden indenfor næsten glasklar, spillende svagt i det Røde med blege, lyserøde Længdefurer. Naar Dyret er fuldt udstrakt, har Capitulum og Physa et svagt rosenrødt Skjær. Mundskiven rosenrød med 8 blege Furer. Tentaklerne smukt rosenrøde.

Ved den første Undersøgelse af det ovenbeskrevne Dyr — det vil sige, da jeg paa Expeditionen havde faaet det op af Skraben og ned i Observationskarret, og det der havde udfoldet sig, antog jeg det for en Halcampa, som det jo i sit Ydre lignede meget. Men ved nøiere Granskning, og især ved den anatomiske Undersøgelse, maatte jeg opgive dette; thi det viste sig da, at Dyret ei alene ikke kunde henføres til den nævnte Slægt, men at det endog maatte ud af Ilyanthidernes Familie. De 8 Septa maa nødvendigvis her gjøre Udslaget, og jeg har derfor nu indlemmet det i Familien Edwardsinæ, Andres, som kun har to Slægter, Edwardsia, Qvartref. og Edwardsiella, Andres. Men hvormeget det end nærmer sig den første, kan jeg dog ikke henføre det dertil; thi baade det tynde, gjennemsigtige Overtræk og Sugevorterne, i Forening med den Omstændighed, at Physa er forholdsvis lidet blottet og ikke kontraktil, forekommer mig at være Karakterer, der ei tilhører Slægten Edwardsia, men meget mere er fælles for Slægten Halcampa, hvortil den dog af tidligere anførte Grunde ikke kunde henføres. Jeg har derfor dannet en ny Slægt, nemlig Edwardsioides, der forekommer mig at kunne danne et Led mellem Slægterne Halcampa og Edwardsia.

suckers. The scapus has a thin transparent covering. The capitulum bare, with a series of marginal retractile tentacles. The physa small and non-retractile. 8 septa. The circular muscles endodermal. Hermaphrodite.

Specific characteristics.

The body 40—50^{mm} in length, 8^{mm} in breadth, cylindrical. The scapus somewhat swollen at the middle, furnished with a thin, transparent, membranous covering, also 8 longitudinal furrows, between which 8 longitudinal areas closely occupied by suckers, which form nearly transverse series. The physa rounded, swollen in sac-form, for the greater part exposed and non-retractile. The capitulum retractile, cylindrical, 8^{mm} in length, bare, clear as glass, with furrows and suckers like those on the scapus. The oral disc arcuate, with 8 fine furrows, between which 8 elevated folds, radiating from the oblong mouth towards the periphery, where the furrows divide into two. The tentacles 16 in number, situated in a single series, marginal, very retractile, about 8^{mm} in length. *The colour.* The scapus has a fine, green, transparent covering. The internal integument clear as glass, with a faint play of red colour, and with pale light-red longitudinal grooves. When the animal is fully extended the capitulum and physa have a faint rosy-red lustre. The oral disc rosy-red with 8 pale grooves. The tentacles beautiful rosy-red.

Upon the preliminary examination of the above-described animal; that is as soon as I had, when on the North Atlantic Expedition, obtained it from the dredge and deposited it in the glass vessel for observation, and it had there unfolded itself; I took it to be a Halcampa, which it, indeed, in external appearance much resembled. But upon closer examination, and especially upon anatomical investigation, I found myself forced to abandon that view, as it then appeared, that not only was it impossible to assign the animal to that genus, but that it, also, could not belong to the family of the Ilyanthidæ. The 8 septa must necessarily determine the point here, and I have therefore included it in the family of the Edwardsinæ, Andres, which has only two genera, Edwardsia Qvartref. and Edwardsiella, Andres. But however much it approaches to the first-named, I can yet not assign it to it, as both the thin transparent covering and the suckers, in combination with the circumstance that the physa is relatively little exposed and non-retractile, appear to me to be characteristics that do not pertain to the genus Edwardsia, but are much more common to the genus Halcampa, to which, however, for reasons previously stated, it could not be relegated. I have, therefore, formed a new genus viz. Edwardsioides, which appears, to me, to serve as a link between the genera Halcampa and Edwardsia.

Edwardsia Andresi,¹ n. sp.

Tab. V, Fig. 5; Tab. XX.

Legemet er i udstrakt Tilstand med Tentaklerne 90^{mm} langt.

Scapus er cylindrisk, 50^{mm} lang, 8—10^{mm} bred paa den midterste Del og forsynet med 8 Længderibber. Det har et tyndt men fast membranøst Overtræk, som danner en tæt sluttende Skede, Tab. V, Fig. 5; Tab. XX, Fig. 1, hvori Dyrets begge Ender kunne indtrækkes. Paa Ribberne, der ikke ere synderlig fremspringende, naar Dyret er helt udstrakt og i fuld Vigør, sees en Række koniske Papiller, som især blive tydelige under Kontraktionerne, hvorved de ligesom fremskydes. De staa dels enkeltvis efter hverandre, dels sees to ved Siden af hinanden, og da blive Længderækkerne paa de Steder noget undulerende, Tab. XX, Fig. 1 a. Hvorvidt disse Papiller kunne indtages, kan jeg ikke afgjøre, da jeg ei har iagttaget en saadan Bevægelse; men at de under Kroppens Kontraktioner skydes stærkt frem, er sikkert; de blive da mere koniske, og paa deres Spids sees ved Hjælp af Loupen en yderst fin Aabning.

Physa danner en ægformig, aldeles vandklar Blære, med 8 lidet fremtrædende Linier, der ere Fortsættelser af Ribberne paa Scapus, og paa hvilke lignende Papiller sees, men som staa meget mere spredte end paa Scapus, Tab. XX, Fig. 1 b. Den er udstrakt 10^{mm} lang, 8^{mm} bred, og kan fuldstændig inddrages i Scapus.

Capitulum er 14^{mm} langt, 6^{mm} bredt, lidt smalere op imod Mundskiven. Det er cylindrisk, fuldkomment vandklart og saa gjennemsigtigt, at Svælgrøret godt kan sees. Det har ligesom Physa 8 fine Længdelinier, der opad ere Fortsættelser af Ribberne paa Scapus, og som ligeledes ere forsynede med spredte Papiller, Tab. XX, Fig. 1 c. Disse Linier, som strække sig opad til Mundskiven, dele sig der og omfatte Tentaklernes Grund. Mundskiven noget hvelvet, og paa dens Midte iagttages en lidt aflang Mundaabning, som under Kontraktionerne bliver rund og danner da paa Grund af de foldede Læber en Roset. Tentaklerne, hvoraf der er 12, staa i en Række, ere retraktile, 16—20^{mm} lange, tynde, meget tilspidsede, yderst let bevægelige og trække sig meget hurtigt ind ved den letteste Berørelse. Ved en pludselig Overraskelse bøies Tentaklerne hurtigt ned i Svælgrøret, som da med Capitulum inddrages i Scapus.

Farven: Scapus er grøn med enkelte brungule Partier. Det er egentlig det skedeformige Overtræk, som har denne Farve; thi den egentlige Cutis er aldeles farveløs. Capitulum er vandklart, fuldstændigt gjennemsigtigt, saa at

¹ Dr. Angelo Andres.**Edwardsia Andresi**,¹ n. sp.

Pl. V, fig. 5; Pl. XX.

When in extended condition the body, including the tentacles, measures 90^{mm} in length.

The scapus is cylindrical, 50^{mm} in length, 8—10^{mm} in breadth at the medial portion, and is furnished with 8 longitudinal ribs. It has a thin, but firm, membranous covering, which forms a closely-fitting sheath (Pl. V, fig. 5; Pl. XX, fig. 1) into which both the extremities of the animal may be withdrawn. Upon the ribs, which are not particularly prominent when the animal is fully extended and in full vigour, a series of conical papillæ is visible, which become especially distinct during the contractions, which, cause them, as it were, to be projected. They are placed, partly singly, one after the other, partly two alongside each other, and in that case the longitudinal series become somewhat undulating (Pl. XX, fig. 1 a). Whether these papillæ are capable of retraction or not I have been unable to determine, as I have not observed such a movement, but it is certainly the case that during the contractions of the body they are strongly projected; they become, then, more conical, and at their point an extremely minute aperture may be seen with the aid of a magnifying glass.

The physa forms an ovate, almost translucent vesicle with 8 little-prominent lines, which are prolongations of the ribs of the scapus, and upon which similar papillæ as on it are visible, but here they are placed much more spread than on the scapus (Pl. XX, fig. 1 b). When extended it measures 10^{mm} in length and 8^{mm} in breadth, and it may be completely withdrawn into the scapus.

The capitulum measures 14^{mm} in length and 6^{mm} in breadth, but is a little narrower up towards the oral disc. It is cylindrical, perfectly translucent, and so transparent that the gullet-tube may easily be seen. It has, like the physa, 8 fine longitudinal lines that, at the top, are prolongations of the ribs of the scapus, and which are also furnished with scattered papillæ (Pl. XX, fig. 1 c). These lines, which extend themselves upward to the oral disc, divide here and enclose the base of the tentacles. The oral disc is somewhat arcuate, and in its middle is observed a slightly oblong oral aperture, which during the contractions becomes round, and forms then, owing to the folded labiæ, a rosette. The tentacles, of which there are 12, are placed in one series; they are retractile, 16—20^{mm} in length, thin, very acuminate, and extremely mobile; and they withdraw themselves with great rapidity at the slightest touch. On a sudden surprise the tentacles are bent quickly down into the œsophagus, which, with the capitulum, is then withdrawn into the scapus.

The colour. The scapus is green with a few brownish yellow patches. Properly speaking it is the vaginate covering that has this colour, as the cutis-proper is perfectly colourless. The capitulum is pellucid, and perfectly

¹ Dr. Angelo Andres.

det brune Svælgrør skinner igjennem. Mundskiven er brun, noget lysere end Øsophagus. Tentaklerne ere ligeledes vandklare, men have paa Enderne en svag violet Farve, der som en fin Linie strækker sig noget nedover den adorale Side, ligesom de ved Grunden have en brun Ring. Hele Capitulum med Tentaklerne er forresten ganske uden Farve og antager mod Lyset et blaaligt Skjær. Ved den øverste Rand af Capitulum er en Kreds af temmelig intens brune Punkter, som sidde to og to sammen paa en melkehvid Bund, hvorved det faar Udseende af to Ringe, — en brun og en hvid, nedenfor den brune.

Det skedeformige Overtræk paa Scapus er ikke organisk forbundet med Dyrets Hud, men er klæbet fast til denne ved en meget seig Slim, hvori der inkrusteres en Mængde fremmede Legemer, alt efter Bundens Beskaffenhed, Tab. XX, Fig. 3, 5 a. Men denne Slim kan fortættes til en fast Membran, saaledes som Tilfældet er hos flere Phellia-arter.

Ved Tversnit af Kroppens Hud viser sig den histologiske Bygning, paa faa Undtagelser nær, at være ens overalt. Ectodermet bestaar af temmelig høie Cylinder-celler, der paa Capitulum og Physa ere forsynede med Cilier, imedens de paa Scapus synes at være uden saadanne, Tab. XX, Fig. 3 b, 5 b. Imellem disse Ectoderm-celler sees ægformede, encellede Slimkjertler, dels fyldte med en kornet Masse, der ganske skjuler Kjernen, dels tomme.

Indenfor Ectodermet er et bredt Lag fibrillært Bindevæv, hvori iagttages Bindevævslegemer med Udløbere, samt fine Ernæringskanaler med Epithel, Tab. XX, Fig. 3 c, 5 c, og henimod den indre Flade af dette Bindevæv er et smalt Belte af cirkulære Muskler, Tab. XX, Fig. 3 d. Paa selve den indre Flade er et Muskellag fæstet, bestaaende af Tver- og Længdemuskler. Tvermusklerne ere temmelig udviklede, samlede i Bundter, Tab. XX, Fig. 4 a, som afskjæres af de 8 stærkt fremtrædende Længdemuskler, Tab. XX, Fig. 4 b. Dette Muskellag er beklædt med et Endothel, dannet af høie Cylinder-celler, forsynede med Cilier, Tab. XX, Fig. 3 e, 5 e. Paa Physa og Capitulum er Bindevævslaget noget smalere end paa Scapus.

Men foruden de her nævnte Elementer findes der indleiret i Huden de tidligere omtalte Papiller. De have en ganske særegen Organisation; i selve Bindevævet danne de en fast Kapsel, der er ægformig, afsluttet indad, men forlænge sig udad, hvor de udmunder paa Kroppens Overflade, Tab. XX, Fig. 3 f, 5 f. Fra Kapselens indre Væg udgaa Bindevævsforlængelser i alle Retninger, og i disse sees stærkt udviklede, stjerneformige Bindevævslegemer med Kjerne og Kernelegeme. Fra disse Bindevævslegemer udsendes fine Udløbere, der anastomosere med Udløbere fra tilgrænsende Bindevævslegemer, hvorved der dannes et

transparent, so that the brown gullet-tube becomes visible through. The oral disc is brown, somewhat lighter in colour than the œsophagus. The tentacles are also pellucid, but have at the extremities a faint violet colour, which, like a fine line, extends a short way down the adoral side, whilst, also, they have a brown annulus at the base. The entire capitulum and tentacles are, otherwise, quite colourless, and acquire when turned to the light a bluish tinge. At the uppermost margin of the capitulum there is a ring of rather intense-brown dots, placed two and two together on a milk-white ground, imparting the appearance of a double ring — a brown one, and a white one below the brown one.

The vaginate covering of the scapus is not organically united with the integument of the animal; it is firmly glued to it by a very viscid mucous, in which there are a multitude of foreign bodies, according to the nature of the sea-bottom, encrusted (Pl. XX, fig. 3, 5 a). But this mucous is capable of being condensed into a firm membrane, in the same manner as happens in several of the Phellia species.

A section of the integument of the body shows, that the histological structure, with only slight exceptions, is everywhere the same. The ectoderm consists of rather high cylinder-cells which, on the capitulum and physa, are furnished with cilia, whilst on the scapus they appear to have none (Pl. XX, fig. 3 b, 5 b). Between those ectoderm cells, oviform unicellular mucous glands are observed, partly filled with a granular substance that quite conceals the nucleus, or partly empty.

On the inside of the ectoderm there is a broad layer of fibrillous connective-tissue, in which connective-tissue corpuscles with prolongations are observed, also slender nutritory ducts with epithelium (Pl. XX, fig. 3 c, 5 c), and towards the inner surface of this connective-tissue there is a narrow belt of circular muscles (Pl. XX, fig. 3 d). On the inner surface, itself, there is a muscular layer adherent, consisting of transversal and longitudinal muscles. The transversal muscles are pretty well developed, and are collected into bundles (Pl. XX, fig. 4 a) which are cut across by the 8 strongly-prominent longitudinal muscles (Pl. XX, fig. 4 b). This muscular layer is clad with an endothelium formed of high cylinder-cells furnished with cilia (Pl. XX, figs. 3 e, 5 e). On the physa and capitulum the layer of connective-tissue is somewhat narrower than on the scapus.

But, in addition to the elements just named, there are also found entrenched in the integument the papillæ previously spoken of. The papillæ have quite a peculiar organisation. In the connective-tissue itself they form a firm capsule, ovate in shape, terminated inwards, but prolonged outwards, where they debouch on the surface of the body (Pl. XX, figs. 3 f, 5 f). From the inner wall of the capsule connective-tissue prolongations issue in all directions, and in these, strongly developed, stelliform connective-tissue corpuscles with nuclei and nucleus corpuscles are seen. From these connective-tissue corpuscles slender

Net, som udfylder Størstedelen af Kapselen, Tab. XX, Fig. 3 *g*, 5 *g*. Saavel Kapselens indvendige Side som hele Netværket er beklædt med et Epithel, bestaaende af smaa runde Celler, der har en rund, næsten central Kjerne, Tab. XX, Fig. 3 *h*, 5 *h*. I Maskerne af dette Net sees kortere eller længere, stavformede Legemer, Nematocyster, som i sit Indre har en fin Traad, der ikke er spiralvunden, Tab. XX, Fig. 5 *i*, 6. Disse Nematocyster samle sig efterhaanden imod Kapselens ydre Ende, hvor Nettet er sparsommere og Maskerne langt større, og hvor de ligge tildels pyramideformigt, med den spidse Del af Pyramiden vendt mod Aabningen, Tab. XX, Fig. 5 *i*. Kun paa et Par Papiller saa jeg Nematocyster ligge dels i Aabningen, dels udenfor denne.

Det synes, som om Nematocysterne dannes og udvikles inden disse Kapsler af Epithelialbeklædningens Celler. I Maskerne sees nemlig Nematocyster i forskellige Størrelser, og fra den runde Epithelcelle kan iagttages Overgange til forlængede Celler, der efterhaanden antage Stavform, hvori den fine Traad bliver synbar, Tab. XX, Fig. 5 *k*. Disse mærkelige Organer, som tør være ganske eendommelige for Slægten *Edwardsia*, ihvorvel noget tilnærmelsesvis nok kan findes hos enkelte Actinider, ere visselig bleve overseede af Størstedelen af de Forfattere, der have beskæftiget sig med denne Dyreslægt; kun Dr. Andres¹ har skjænket dem sin fulde Opmærksomhed. Han beskriver dem som Nematocystbatterier uden dog at angive deres indre Bygning. Naar ikke andre Forfattere have antydnet disse Organer, saa mener Andres, at det kan have sin Grund i, at ikke alle Arter af Slægten *Edwardsia* ere forsynede med dem; men jeg betvivler, at dette er Grunden; thi hos alle de Arter, jeg har havt Anledning til at observere, findes disse Papiller, dog mere eller mindre fremtrædende.

Fra den indre Kropsvæg udgaa 8 Septa, der ere Forlængelser af Kropshudens Bindevæv (Stützmembran, Lamelle de soutien), og løbe fra den bagerste Ende op til Mundskivens Underflade og derfra over paa Svælgrøret, paa hvilke sidste to Steder de fæste sig, Tab. XX, Fig. 2 *a*. De ere meget smale i den bagre Ende, men blive alt bredere og bredere, indtil de fæste sig paa Øsophagus, Tab. XX, Fig. 7 *a*, hvorved de dele den forreste Del af Gastrovascularhulheden i 8 Kamre, Tab. XX, Fig. 7 *b*. Disse Septa, der alle ere fuldstændige, forsaavidt de fæste sig paa Svælgrøret, ere ikke gjennemborede, som saa hyppigt ere Tilfældet hos Actiniderne, saa at Kamrene ei kommunikere indbyrdes med hinanden; de ere enkle, ikke

prolongations are sent forth, which anastomose with prolongations from adjacent connective-tissue prolongations, producing a reticulation, which fills the capsule for the greater part (Pl. XX, fig. 3 *g*, 5 *g*). Both the internal side of the capsule as well as the entire reticulation, are clad with an epithelium consisting of small round cells, containing a round, almost central nucleus (Pl. XX, figs. 3 *h*, 5 *h*). In the meshes of this reticulation are seen, shorter or longer rod-like corpuscles, nematocysts that internally have a fine filament, but which is not spirally coiled (Pl. XX, figs. 5 *i*, 6). These nematocysts gradually collect towards the outer extremity of the capsule, where the reticulation is coarser and the meshes far larger, and there they lie, partly pyramidiform, with the pointed part of the pyramid turned towards the aperture (Pl. XX, fig. 5 *i*). Only in the case of a couple of papillæ did I observe nematocysts situated partly in the aperture, partly outside it.

It appears as if the nematocysts are formed and developed inside those capsules, from the cells of the epithelial covering. In the meshes we find, thus, nematocysts of various sizes, and from the round epithelial cells, transitions to prolonged cells may be observed, which gradually assume the rod-shape in which the fine filament becomes visible (Pl. XX, fig. 5 *k*). Those remarkable organs, which are probably quite peculiar to the genus *Edwardsia*, although a considerable resemblance to them may perhaps be found in a few Actinidæ, have certainly been overlooked by the greater number of writers who have occupied themselves with the study of this animal genus; Dr. Andres¹ alone has devoted his full attention to them. He describes them as nematocyst-batteries without, however, indicating their internal structure. The fact that other writers have omitted to indicate those organs may be owing, Dr. Andres thinks, to this, that not all the species of the genus *Edwardsia* are supplied with them, but I question whether that is the reason, as in all the species that I have had an opportunity of observing, those papillæ have been found, although more or less prominent.

From the inner wall of the body 8 septa issue; these are prolongations of the connective-tissue of the integument of the body (stützmembran; Lamelle de soutien) and pass from the posterior extremity up to the inferior surface of the oral disc and thence over to the gullet-tube, upon which two last-named places they secure themselves (Pl. XX, fig. 2 *a*). They are very narrow at the posterior extremity, but become broader and broader until they secure themselves to the œsophagus (Pl. XX, fig. 7 *a*), dividing, thus, the anterior portion of the gastro-vascular cavity into 8 chambers (Pl. XX, fig. 7 *b*). These septa, which are all perfect ones, in so far that they attach themselves to the gullet-tube, are not perforated, as so often

¹ Interno all' *Edwardsia Claparedii* (*Halcampa Claparedii*, Panc.). Memoria dell. dott. Angelo Andresi. Mitheilungen aus der zoolog. Station zu Neapel. 2 Band, pag. 123. Leipzig 1881.

¹ Interno all' *Edwardsia Claparedii* (*Halcampa Claparedii*, Panc.). Memoria dell. dott. Angelo Andresi. Mitheilungen aus der zoolog. Station zu Neapel. 2 Band, pag. 123. Leipzig 1881.

parrede, staa lige langt fra hinanden og ere forsynede med Længde- og Tvermuskler.

Længdemusklerne ere fæstede til Bindevævslister, der udgaa fra Septumets ene Flade, men stundom ser det ud paa Tversnit, som de udgaa fra begge; de danne Buske, der især ere stærke ved Udspringet paa den indre Kropsvæg, Tab. XX, Fig. 7 *c*, og ved Septumets Tilhæftning til Svælg-røret, Tab. XX, Fig. 7 *d*, imedens de ere meget tynde og ikke danne Buske paa Septumets hele Midtparti, Tab. XX, Fig. 7 *e*, men ligesom dele sig ved deres Udspring, saaledes nemlig, at et temmelig tykt Parti følger Septumet og danner derved de 8 Længdemuskler paa den indre Kropsvæg, imedens det andet Parti danner Længdemusklerne paa Septum. Tvermusklerne ere fæstede til Septum paa den modsatte Side af Længdemusklerne i Form af en meget tynd, fintfoldet Membran, som tildels er dækket af Længdemusklerne.

Jeg har ikke med min bedste Villie været istand til at finde, at nogen af disse Septa optræder som Retnings-septa; thi paa de Exemplarer, jeg har undersøgt, synes alle Septa at være lige, idet baade Størrelsen og Muskel-anordningen er ens for dem alle, Tab. XX, Fig. 7, 8, 9. Der er ingen Vexlen, saaledes som i Almindelighed er Tilfældet hos Actinierne, nemlig at Længdemusklerne sidde snart paa højre, snart paa venstre Side af Septa, alt i Overensstemmelse med de udprægede Retnings-septa. Dr. Andres fremstiller Forholdet af Musklerne paa Septa hos *Edwardsia Claparedii* helt anderledes, end jeg har fundet, og mere i Overensstemmelse med Septaanordningen hos Actinierne. Han udtrykker sig saaledes: „Tratto caratteristico è l'incongruenza rapporto al setto; nella porzione gastrica è sviluppato egualmente dall' un lato è dall' altro, al disotto si riduce tutto su una faccia er per vero secondo una legge costante: cioè che tre setti di seguito portano il fascio muscolare a destra, il susseguente lo porta a sinistra, il quinto ancora a destra e gli ultimi tre di nuovo a sinistra; cosicchè due paia di setti sono congruenti fra loro e due paia sono solo simmetrici.“

Samtlige Septa bære Mesenterialfilamenter, Tab. XX, Fig. 2 *b*, der tage deres Udspring fra den nederste, fri Ende af Øsophagus og slynge sig bagover langs den fri Rand til henimod Physa. I Bygning ere de fuldstændig overensstemmende med Actiniernes Mesenterialfilamenter og adskille sig ikke fra dem.

Ved Siden af Mesenterialfilamenterne sees hist og her, især mod deres bagre Ender, Acontier, der ligeledes ere fæstede til Septa. De ere runde, slangeformigt oprullede Organer, der hænge som Proptrækkere frit i Gastralhulheden, Tab. XX, Fig. 8 *c*, og ere tæt besatte med Nematocyster, hvoraf en Mængde havde udslynget sine Traade, Tab. XX, Fig. 10. Disse Acontier benyttes her

is the case in Actinidæ, so that the chambers do not, among themselves, communicate with each other; they are single, not paired, and are placed at uniform distances apart from each other, and are furnished with longitudinal and transversal muscles.

The longitudinal muscles are secured to connective-tissue fillets, which issue from the one surface of the septum, but occasionally it appears, in sections, as if they issue from both surfaces; they form tufts, which are especially prominent at the origin in the inner wall of the body (Pl. XX, fig. 7 *c*), and at the attachment of the septum to the gullet-tube (Pl. XX, fig. 7 *d*), while they are very thin, and do not form tufts in the entire medial portion of the septum (Pl. XX, fig. 7 *e*), but, as it were, divide at their origin, in such a manner, that a pretty thick portion follows the septum, and thus forms the 8 longitudinal muscles on the inner wall of the body, while the other portion forms longitudinal muscles on the septum. The transversal muscles are secured to the septum on the opposite side of the longitudinal muscles, in the form of a very thin, finely folded membrane, which is partly covered by the longitudinal muscles.

In spite of all my efforts I have been unable to discover that any of those septa act as directive septa, as in the specimens I have examined, all the septa appear to be alike, inasmuch that both size and muscular arrangement are the same in them all (Pl. XX, figs. 7, 8, 9). There is no variety, such as is usually the case in Actinidæ, as, for instance, that the longitudinal muscles are placed sometimes on the dextral, sometimes on the sinistral side of the septa, in conformity with the distinctly prominent directive septa. Dr. Andres presents the muscular relations of the septa in *Edwardsia Claparedii* quite differently to what I have observed, and more in conformity with the septal arrangement in Actinidæ. He expresses himself thus: „Tratto caratteristico è l'incongruenza rapporto al setto; nella porzione gastrica è sviluppato egualmente dall' un lato è dall' altro, al disotto si riduce tutto su una faccia er per vero secondo una legge costante: cioè che tre setti di seguito portano il fascio muscolare a destra, il susseguente lo porta a sinistra, il quinto ancora a destra e gli ultimi tre di nuovo a sinistra; cosicchè due paia di setti sono congruenti fra loro e due paia sono solo simmetrici.“

All the septa carry mesenterial filaments (Pl. XX, fig. 2 *b*), which have their origin in the lowest free extremity of the œsophagus, and twine themselves backwards along the free margin until in proximity of the physa. In structure they have a perfect conformity with the mesenterial filaments of the Actinidæ and do not differ from them.

At the sides of the mesenterial filaments there are seen here and there, especially towards their posterior extremities, acontia, which are also attached to the septa; they are round, serpentine coiled organs, hanging freely, like corkscrews, in the gastral cavity (Pl. XX, fig. 8 *c*) and are closely beset with nematocysts, of which a great many had shot forth their filaments (Pl. XX, fig. 10).

visselig som Vaaben til at dræbe de Smaa væsener, der som Næringsmidler føres ind i Gastralhulheden.

Foruden Mesenterialfilamenter og Acontier ere ogsaa Generationsorganerne bundne til Septa; men om alle ere forsynede dermed, kan jeg ikke afgjøre, da jeg kun har iagttaget dem paa 4. Æggestokkene ligge temmelig langt bag, næsten imod Enden af Mesenterialfilamenterne, og have meget tilfælles med dem hos Actinierne. De bestaa af lidt fladtrykte, baandformige Cylindre, der slynge sig bagover langs Septumets fri Rand, bundne ved et tyndt Bindevæv til denne og ere i sit Indre beklædt med et Epithel, dannet af runde, kjerneholdige Celler, Tab. XX, Fig. 9 c. Æggene, der udvikle sig af Epithelcellerne, ligge dels to og to sammen, dels enkeltvis og ere i forskellige Udviklingsstadier. Embryonerne sprænge Æggestokkens Hinder, falde ned i Gastrovascularhulheden, hvor de opholde sig nogen Tid, for derefter gjenne Øsophagus at drage ud i det Fri. Testiklerne ligge længere bag, omtrent ved Begyndelsen af Physa; de ere yderlig smaa, kun synbare gennem Mikroskopet, have et kamformigt Udseende, Tab. XX, Fig. 9 d, og ere ligesom Æggestokkene ved et løst Bindevæv bundne til Septa, Tab. XX, Fig. 11 a, i det Længdefelt, som findes imellem Længdemuskelen, Tab. XX, Fig. 11 b, og den indre, tildels fri Rand af Septumet. Ved stærk Forstørrelse vise de sig at bestaa af en Samling cylinderformede Blindsække, Tab. XX, Fig. 11 c, hvis indvendige Væg er beklædt med runde Celler, hvori en rund Kjerne med sit Kjernelegeme, Tab. XX, Fig. 11 d. I Hulheden sees en Samling af mere og mindre udviklede Spermatozoer, der ere pæreformige med et aflangt Hoved og en kort Hale, Tab. XX, Fig. 11 e. De ligge hyppigst to og to sammen, men ogsaa enkeltvis, og synes at dannes af Epithelcellernes Kjerne, da denne i mange Celler havde forlænget sig og nærmet sig Spermatozoernes Form.

Øsophagus, der er cylindrisk, foldet, indtager i Længden omtrent den forreste Trediedel af Gastrovascularhulheden, og paa den ydre Væg, der er beklædt med et Epithel af cilierende Cylinderceller, Tab. XX, Fig. 12 a, fæster sig 8 Septa, Tab. XX, Fig. 2 c. Indenfor Epithelet er et Bindevævslag, Tab. XX, Fig. 12 b, paa hvis ydre Væg, imellem Epithelet og denne, ligger et Muskellag, bestaaende af Tver- og Længdemuskler, Tab. XX, Fig. 12 c, der ere Fortsættelser af Musklerne paa Septa. Fra den indre Væg af Bindevævet udgaa pyramideformige Forlængelser, Tab. XX, Fig. 12 d, der rage ind i Svælgrørets Hulhed, og som bidrage til at danne Folderne her. Disse Bindevævsforlængelser ere beklædt med høie, cilierende Cylinderceller, imellem hvilke sees hist og her encellede Slimkjertler, Tab. XX, Fig. 12 e. Nogen Svælgrube findes ikke, heller ikke Andres har fundet nogen saadan; men hos hans Art var Svælgrørets indre Væg glat, imedens det er stærkt foldet hos *Edwardsia Andresi*.

These acontia are certainly used here as weapons with which to kill the small organisms that are passed into the gastral cavity as nutriment.

Besides mesenterial filaments and acontia, the reproductive organs are also attached to the septa, but whether all are furnished with them I cannot determine, as I have only observed them on 4. The ovaries are placed pretty far back, almost at the extremity of the mesenterial filaments, and have much in common with those of Actinidæ. They consist of slightly flattened tape-like cylinders that twine themselves backwards along the free margin of the septum, attached to it by a thin connective-tissue, and internally clad with an epithelium formed of round cells containing nuclei (Pl. XX, fig. 9 c). The ova, which develop themselves from the epithelial cells, lie partly two and two together, partly singly, and appear in various stages of development. The embryos burst the membrane of the ovary and fall into the gastro-vascular cavity, where they remain for some time, and subsequently pass out into freedom through the œsophagus. The testicles are placed farther back, at about the commencement of the physa; they are extremely small — only visible under the microscope — and have a comb-like appearance (Pl. XX, fig. 9 d) and are, like the ovaries, attached by a loose connective-tissue to the septa (Pl. XX, fig. 11 a) in the longitudinal area which is found between the longitudinal muscle (Pl. XX, fig. 11 b) and the inner, partly free, margin of the septum. Under powerful magnification they show themselves to consist of a collection of cylindric cæca (Pl. XX, fig. 11 c), whose inner wall is clad with round cells containing a round nucleus with its nucleus-corpuscle (Pl. XX, fig. 11 d). In the cavity there is visible a collection of more or less developed spermatozoa, pyriform in shape, with an oblong head and a short tail (Pl. XX, fig. 11 e). They, most frequently, lie two and two together, but also singly, and appear to be formed of the nuclei of the epithelial cells, as these had, in many cells, become prolonged and approached to the form of the spermatozoa.

The œsophagus, which is cylindrical and folded, occupies, longitudinally, nearly the anterior third part of the gastro-vascular cavity, and on its outer wall, which is clad with an epithelium of ciliating cylinder-cells (Pl. XX, fig. 12 a), 8 septa are attached (Pl. XX, fig. 2 c). On the inside of the epithelium there is a layer of connective-tissue (Pl. XX, fig. 12 b), upon whose outer wall, between the epithelium and it, there lies a muscular layer consisting of transversal and longitudinal muscles (Pl. XX, fig. 12 c), which are prolongations of the muscles of the septa. From the inner wall of the connective-tissue pyramidal prolongations issue (Pl. XX, fig. 12 d), which extend into the cavity of the gullet-tube and contribute to the formation of the folds in this situation. These connective-tissue prolongations are clad with high, ciliating cylinder-cells, between which are seen, here and there, unicellular mucous glands (Pl. XX, fig. 12 e). There is no gullet-groove to be discovered, and neither has Andres discovered one, but in his species the inner wall of the gullet-tube was smooth, whilst in *Edwardsia Andresi* it is strongly folded.

Tentaklerne have et bredt Ectoderm, dannet af høie, cilierende Cylinderceller, imellem hvilke findes en utallig Mængde Nematocyster, Tab. XX, Fig. 13 a. Indenfor Ectodermet sees et lyst Belte, bestaaende af en finkornet Masse, der har Udseende af overskaarne Rør, og som muligens kan være Nervefibriller, Tab. XX, Fig. 13 b. Nervestrænge eller Ganglier har jeg imidlertid ikke iagttaget, saa nogen Sikkerhed for, at dette Belte tilhører Nervesystemet, haves ikke. Indenfor denne kornede Masse ligger et Lag af stærke Længdemuskler, Tab. XX, Fig. 13 c, som støttes af et temmelig smalt Bindevævslag, Tab. XX, Fig. 13 d. Paa dettes indre Væg sees Cirkulærmusklerne, Tab. XX, Fig. 13 e, der langt fra ere saa udviklede som Længdemusklerne, og hvortil fæster sig et indre Epithel, der dannes af lige saa høie, cilierende Cylinderceller som de, der forme Ectodermet, Tab. XX, Fig. 13 f. Ogsaa paa Mundskiven er den ectodermale Beklædning forsynet med en stor Mængde Nematocyster.

Findested.

Station 253. Mange Exemplarer.

Artskarakter.

Legemet 90^{mm} langt. Scapus cylindrisk, 50^{mm} lang, 8—10^{mm} bred, forsynet med et skedeformigt Overtræk, samt 8 Længderibber, der har en Række koniske Papiller, paa hvis Ende sees en fri Aabning. Capitulum 14^{mm} langt, 6^{mm} bredt, cylindrisk, har 8 fine Længdelinier, Fortsættelser af Ribberne paa Scapus. Mundskiven lidt hvælvet, med en lidt aflang Mund. 12 Tentakler, retraktile, stillede i en Række. Hele Capitulum kan inddrages i Scapus. Physa danner en ægformet, vandklar Blære, der kan trækkes ind i Scapus og er forsynet med 8, lidet fremtrædende Linier, Fortsættelser af Ribberne. Udstrakt er Physa 10^{mm} lang, 8^{mm} bred. Farven: Scapus grøn med enkelte brungule Punkter, ligesaa det skedeformige Overtræk; men selve Cutis er aldeles farvefri. Capitulum er vandklart, fuldstændigt gjennemsigtigt, saa det brune Svælgrør skinner igjennem. Mundskiven brun, noget lysere end Øsophagus. Tentaklerne ere ligeledes vandklare, paa Enderne svagt violette; langs den adoral Side en fin, violet Stribe og om Grunden en brun Ring. Ved den øverste Rand af Capitulum en Kreds af temmelig intens brune Punkter, der ere saaledes delte, at det faar Udseende af to Ringe, en brun og en hvid.

The tentacles have a broad ectoderm formed of high, ciliating cylinder-cells, between which there are found an innumerable multitude of nematocysts (Pl. XX, fig. 13 a). To the inside of the ectoderm a light-coloured belt is seen, consisting of a finely granulated substance having the appearance of transected tubes, and which may, possibly, be nervous fibrils (Pl. XX, fig. 13 b). Nerve-cords or ganglia I have, however, not been able to observe, so that I have no distinct evidence that this belt pertains to the nervous system. On the inside of this granular substance there lies a layer of strong longitudinal muscles (Pl. XX, fig. 13 c), which is supported by a rather narrow layer of connective-tissue (Pl. XX, fig. 13 d). On the inner wall of this last-named layer the circular muscles are observed (Pl. XX, fig. 13 e) — which are far from being so developed as the longitudinal muscles are — and to which an inner epithelium secures itself; this epithelium consists of equally high, ciliating cylinder-cells as those that form the ectoderm (Pl. XX, fig. 13 f). On the oral disc, also, the ectodermal covering is supplied with a great abundance of nematocysts.

Habitat.

Station No. 253. Numerous specimens.

Specific characteristics.

The body measures 90^{mm} in length. The scapus cylindrical, measures 50^{mm} in length and 8—10^{mm} in breadth, is furnished with a vaginate covering, as well as 8 longitudinal ribs carrying a series of conical papillæ, on whose extremity a minute aperture is visible. The capitulum measures 14^{mm} in length and 6^{mm} in breadth, is cylindrical, has 8 fine longitudinal lines, prolongations of the ribs of the scapus. The oral disc a little arcuate with a slightly oblong mouth. 12 tentacles, retractile, placed in a single series. The entire capitulum capable of retraction into the scapus. The physa forms an ovate, pellucid vesicle that can be withdrawn into the scapus, and is furnished with 8 little-prominent lines, prolongations of the ribs. When extended the physa measures 10^{mm} in length and 8^{mm} in breadth. *The colour:* The scapus green with a few brownish-yellow clots, that is the vaginate covering especially has that colour, but the cutis proper is quite colourless. The capitulum is pellucid, perfectly transparent, so that the brown gullet-tube appears visible through it. The oral disc brown, somewhat lighter in colour than the œsophagus. The tentacles are also pellucid, pale violet in colour at the extremities, a fine violet stripe along the adoral side, and round the base a brown annulus. At the uppermost margin of the capitulum, there is a ring of rather intense brown dots, distributed in such manner that they acquire the appearance of two annuli, one brown and one white.

Edwardsia fusca.

Tab. V, Fig. 6; Tab. XIX, Fig. 5—9.

Legemet med Tentakler er 55^{mm} langt.

Scapus, der er 28^{mm} lang, cylindrisk, har et skedeformigt Overtræk, der er stærkt inkrusteret af brun Sand og Ler, og er forresten næsten glat, idet der ingen fremtrædende Ribber vise sig, Tab. V, Fig. 6; Tab. XIX, Fig. 5 a. Skeden er fast, membranøs og temmelig stærkt adhæreret til den underliggende Hud. Naar dette Overtræk enten løsnes ved Dyrets stærke Kontraktioner, eller det løsnes paa kunstig Maade (ved Afskrabning), sees indenfor 8 Linier, imellem hvilke der er 8 temmelig brede Længdefelter, hvori ved stærk Loupe iagttages 2 Rækker yderst smaa Papiller, som staa ved Siden af hinanden og synes at have en fin Indsækning (Aabning) i Midten, Tab. XIX, Fig. 6.

Capitulum er 12^{mm} langt, rørformet, kun lidet gjenemsigtigt, men har paa sin ydre Side opimod Mundskiven 12 kastaniebrune Ribber, der et Stykke bagtil smelte sammen til 8, som da blive mindre fremspringende, ja næsten flade, idet de forlænge sig bag til Scapus, Tab. XIX, Fig. 5 b, hvor de fortsætter sig i de paa denne omtalte Linier. Ogsaa paa Capitulum kan ved stærk Loupe iagttages yderst smaa Papiller, der ligeledes her staa i 2 Rækker og ere af samme Beskaffenhed som de paa Scapus, men staa længere fra hverandre i Rækkerne. Mundskiven danner en svag Konus; Munden er lidt aflang, Tab. XIX, Fig. 5, og fra den udgaa 12 fine Folder henimod Peripherien, der indtages af 12 Tentakler, som ere retraktile, staa i en Række, ere tykke ved Grunden og 10^{mm} lange, Tab. V, Fig. 6; Tab. XIX, Fig. 5. Hele Capitulum med Mundskive og Tentakler kan drages ind i Scapus og ganske skjules af denne.

Physa danner en halvkugleformet Blære, 5^{mm} lang, næsten vandklar og forsynet med 8 Længdestriber, der ere Fortsættelser af de paa Scapus antydede Linier, Tab. V, Fig. 6; Tab. XIX, Fig. 5 c; ogsaa Physa kan inddrages i Scapus, og da sees altid en ottefoldet Fordybning, som lettelig i Dyrets sammentukne Tilstand kan tages for den forreste Del, naar man ikke har observeret Blæren, inedens den var ude.

Farven. Capitulum svagt brunrødt med 12 temmelig brede, mørk kastaniebrune Linier, imellem hvilke sees blegere Længdefelter. Mundskiven er kjød rød, har to brune Ringe, den ene i Nærheden af Tentaklernes Grund, den anden længere inde ved Mundaabningen. Disse Ringe bestaa af smaa, brune Flækker, der ved at støde til hverandre danne en sammenhængende Ring. Tentaklerne have 3 merkebrune Ringe, som hver paa den adoral Side egentlig bestaar af 2 triangulære Flækker.

Edwardsia fusca.

Pl. V, fig. 6; Pl. XIX, fig. 5—9.

The body with the tentacles measures 55^{mm} in length.

The scapus measures 28^{mm} in length, is cylindrical, and has a vaginate covering strongly encrusted with brown sand and clay, but otherwise is almost smooth, as no prominent ribs are apparent (Pl. V, fig. 6; Pl. XIX, fig. 5 a). The sheath is firm, membranous, and rather firmly adherent to the integument underneath. When this covering either becomes loosened by the violent contractions of the animal, or is loosened in an artificial way (by scraping), 8 lines are visible underneath, between which there are 8 rather broad longitudinal areas, in which, with the aid of a powerful magnifying glass, 2 series of extremely minute papillæ are observed, placed alongside each other, and appearing to have a fine depression (aperture) in the middle (Pl. XIX, fig. 6).

The capitulum measures 12^{mm} in length, is tubular, only slightly transparent, but it has, on its outer side, up towards the oral disc, 12 chestnut-brown ribs that a little way back resolve themselves into 8, which then become less prominent, indeed almost flat, as they prolong themselves backwards to the scapus (Pl. XIX, fig. 5 b), where they prolong themselves into the previously mentioned lines appearing upon it. Also on the capitulum there can, with the aid of a powerful magnifying glass, be observed extremely minute papillæ, which are likewise, here, placed in 2 series, and are of the same nature as those of the scapus, but placed farther apart from each other in the series. The oral disc forms a gentle cone. The mouth is slightly oblong (Pl. XIX, fig. 5), and from it there issue 12 fine folds towards the periphery, which is occupied by 12 tentacles that are retractile and placed in a single series; they are thick at the base, and measure 10^{mm} in length (Pl. V, fig. 6; Pl. XIX, fig. 5). The entire capitulum with the oral disc and tentacles may be withdrawn into the scapus and be quite concealed by it.

The physa forms a semi-spherical vesicle 5^{mm} in length, almost pellucid, and furnished with 8 longitudinal stripes, which are prolongations of the lines indicated on the scapus (Pl. V, fig. 6; Pl. XIX, fig. 5 c); the physa may also be withdrawn into the scapus, and then there is always visible a depression of 8 folds, which, in the contracted condition of the animal, may easily be mistaken for the anterior portion, if the vesicle had not been observed when it was exposed.

The colour. The capitulum faint brownish-red with 12 rather broad, dark chestnut-brown lines, between which paler longitudinal areas are observed. The oral disc is flesh-coloured, has two brown annuli, the one in the neighbourhood of the base of the tentacles, and the other farther in, near the oral aperture. These annuli consist of small brown patches, which by uniting with each other form one continuous annulus. The tentacles have 3 dark brown annuli, each of which really, on the adoral side,

Scapus er brun; men indenfor den inkrusterede Skede er Huden næsten hvid, spillende noget i det Rosenrøde. Physa spiller svagt i det Kjødbrøde.

Ved Tversnit af Scapus viser det skedeformige Overtræk sig at bestaa af en slimet Membran, hvori er indleiret en Mængde brunagtige Sandkorn samt brunt Ler, uden at der forresten findes i Membranen nogen histologisk Struktur, Tab. XIX, Fig. 7 *a*. Indenfor Membranen iagttages Ectodermet, der bestaar af temmelig høje Cylinder-celler, forsynede med Kjerne og Kjernelegeme, Tab. XIX, Fig. 7 *b*, og imellem disse Celler sees hist og her enkelte Nematocyster. Det til Ectodermet stødende Bindevævslag er meget bredt, fibrillært og temmeligt rigt forsynet med Ernæringskanaler med sit Epithel og Bindevævslegemer med en eller flere Udløbere, Tab. XIX, Fig. 7 *c*. Nedsænket i Bindevævet sees de før omtalte Papiller at være dannet paa en lignende Maade som de hos *Edwardsia Andresi*, nemlig ved en fast, membranøs, ægformet Kapsel, hvis noget smalere Del, der med sin Aabning vender ud mod Ectodermet, passerer igennem dette og Skeden for at aabne sig paa Overfladen i Papillen, Tab. XIX, Fig. 7 *d*. Fra den indre Flade af Kapselen udgaa mange tynde Bindevævstraade, som korrespondere med hverandre og danne Net, Tab. XIX, Fig. 7 *A e*; men der, hvor flere Traade møde hverandre, opstaar en bredere Bindevævsflade, hvori sees Bindevævslegemer. Saavel Kapselens indre Flade som Bindevævstraadene er beklædt med næsten runde Epithelceller, forsynede med en rund Kjerne med sit Kjernelegeme, Tab. XIX, Fig. 7 *A f*. *B e*. I Maskerne synes lignende Epithelceller at ligge løsrevne, sammen med ægformede, tildels mere forlængede Celler, samt kortere eller længere Nematocyster, Tab. XIX, Fig. 7 *B e, f*. De ovale, løsrevne Celler ere upaatvivlelig vordende Nematocyster; thi Overgangene kunde temmelig godt forfølges, idet Cellerne efterhaanden forlængede sig, indtil den lange, stavformede Nematocyst var dannet. Traaden indeni denne syntes at dannes af Kjernelegemet. Paa en næsten fuldt udviklet Nematocyst kunde i den tykke Ende endnu iagttages Rester af Kjernen, Tab. XIX, Fig. 7 *A g*. At Nematocysterne dannes inden disse Kapsler, bekræftes end yderligere ved Observationerne over *Edwardsia fusca*; i flere saadanne Kapsler saaes kun runde, ovale og lidt forlængede Celler, ingen Stave, men vel Begyndelsen til deres Dannelse.

Henimod den indre Flade af det brede Bindevævslag sees et smalt Belte af kun lidet udviklede, cirkulære Muskler, Tab. XIX, Fig. 7 *h*; men paa den indre Flade er et Muskellag, bestaaende af Tver- og Længdemuskler, Tab. XIX, Fig. 7 *i*, noget ligt det, der tilhører *Edwardsia Andresi*, og som er beklædt med cylinderformede, cilierende Endothelceller. Paa Capitulum og Physa er Hudens Struktur

consists of 2 triangular patches. The scapus is brown, but underneath the encrusted sheath the integument is almost white, with a play of colour approaching somewhat to rose-red. The physa has a play of colour approaching a faint flesh-colour.

In a section of the scapus the vaginate covering shows itself to consist of a mucous membrane in which a mass of brownish grains of sand and brown clay is entrenched, without there being observed, otherwise, in the membrane, any histological structure (Pl. XIX, fig. 7 *a*). Inside the membrane the ectoderm is observed; it consists of rather high cylinder-cells furnished with nucleus and nucleus-corpuscle (Pl. XIX, fig. 7 *b*), and between those cells there are observed, here and there, a few nematocysts. The layer of connective-tissue that adjoins the ectoderm is very broad, fibrillous, and rather richly supplied with nutritory ducts and their epithelium, and with connective-tissue corpuscles having one or more prolongations (Pl. XIX, fig. 7 *c*). Embedded in the connective-tissue, the previously mentioned papillæ are seen to be formed in a similar manner to those of *Edwardsia Andresi*, viz. by a firm, membranous, oviform capsule, whose somewhat narrower portion, which with its aperture faces towards the ectoderm, passes through the ectoderm and sheath, in order to debouch on the surface of the papilla (Pl. XIX, fig. 7 *d*). From the inner surface of the capsule there issue numerous connective-tissue rays that correspond with each other and form a reticulation (Pl. XIX, fig. 7 *A e*), but at the spot where several filaments meet each other, there arises a broader surface of connective-tissue in which connective-tissue corpuscles appear. Both the inner surface of the capsule and the connective-tissue rays are clad with, almost round epithelial cells, furnished with a round nucleus and its nucleus-corpuscle (Pl. XIX, fig. 7 *A f, B e*). Similar epithelial cells appear to lie detached in the meshes, together with oviform, partly more-prolongated cells, and shorter or longer nematocysts (Pl. XIX, fig. 7 *B e, f*). The oviform detached cells are, indubitably, prospective nematocysts, because their transitions could pretty well be traced, in so far that the cells became prolonged until the long rod-shaped nematocyst was formed. The filament inside it appears to be formed from the nucleus-corpuscle. In an almost completely developed nematocyst there could still be observed, in the thick extremity, the remains of the nucleus (Pl. XIX, fig. 7 *A g*). That the nematocysts are formed inside those capsules, is still further confirmed by the investigations of *Edwardsia fusca*; in several such capsules only round, oval, and little-prolonged cells were observed, but no rods, only the rudiments of their formation.

Towards the inner surface of the broad layer of connective-tissue a narrow belt of but little-developed circular muscles is observed (Pl. XIX, fig. 7 *h*), but on the inner surface there is a muscular layer consisting of transversal and longitudinal muscles (Pl. XIX, fig. 7 *i*), somewhat like that pertaining to *Edwardsia Andresi*, and which is clad with cylindrical, ciliating endothelial cells. On the

omtrent som paa Scapus, men de mangle Overtrækket; Papillerne staa noget mere spredte, Tab. XIX, Fig. 8 *a*, især paa Physa; dog er Ectodermet meget rigere paa Nematocyster.

Fra Kroppens indre Væg udgaa 8 Septa, der paa Physa ere meget smale, men blive alt bredere og bredere, jo længere de naa frem mod Mundskiven, paa hvis indre Flade og Svælgrørets ydre Væg de fæste sig, hvorved den forreste Del af Gastrovascularhulheden, saalangt som Svælgrøret rækker, deles i 8 Kamre. Disse Septa, der i Midten bestaa af en temmelig fast Bindevævsmembran, Tab. XIX, Fig. 8 *b*, der er Fortsættelse af Hudens Bindevæv, synes paa begge Sider at være beklædte med Tver- og Længdemuskler, hvoraf de sidste ere meget udviklede, især ved Septumets Udspring fra Kropsvæggen og dets Befæstning paa Svælgrøret, hvor de paa begge Steder forme sig i tykke Buske, Tab. XIX, Fig. 8 *c, d*; Fig. 9 *a*. Paa Midten af Septumet, det vil sige imellem Kropsvæggen og Svælgrøret, ere Længdemusklerne meget tynde og danne her ikke de sædvanlige Buske, Tab. XIX, Fig. 8 *e*. Samtlige Septa bære Mesenterialfilamenter, der tage deres Begyndelse fra den nedre Ende af Øsophagus, strække sig bag mod Physa og frembyde intet særegent. Indenfor dem, nemlig imellem dem og Længdemusklerne, ligge Generationsorganerne.

Æggestokkene ligge nærmest Mesenterialfilamenterne, danne slangeformige, noget fladtrykte Rør, der indvendig ere beklædte med runde Epithelceller, hvori Æggene udvikle sig, Tab. XIX, Fig. 9 *b*. Disse laa dels to ved Siden af hinanden, dels enkeltvis, og vare i forskellige Udviklingsstadier. Ved Siden af Æggestokkene ligge Testiklerne, som ormformig slynge sig bagover, saalangt Æggestokkene række. De ere sammensatte af tynde, temmelig lange Blindsække, der indvendig ere beklædte med runde Epithelceller, hvori sees flere punktformige Legemer (Spermatozoer?). Saavel Æggestokkene som Testiklerne ere udvendig beklædte med et cilierende Cylinderepithel. Men foruden disse Organer bære Septa Acontier, der især paa den bagre Del, henimod Physa, ere temmelig hyppige og hænge frit i Gastrovascularhulheden, Tab. XIX, Fig. 9 *c*.

Øsophagus, der er omtrent en Trediedel saa lang som det hele Legeme, er cylindrisk, paa den ydre Flade delt i 8 Felter ved Septainsertionerne og beklædt med høie, cilierende Cylinderceller. Indenfor dette Epithel er et stærkt udviklet Muskellag, bestaaende af Tver- og Længdemuskler, hvilke ligge fæstede til det temmelig brede Bindevæv, fra hvis indre Væg udgaa Forlængelser, der rage ind i Svælget og danne Folderne paa den indre Svælgvæg, som er beklædt med et tykt Epithel. Ingen Svælggrube.

capitulum and physa the structure of the integument is about the same as that of the scapus, but they are deficient in the covering; the papillæ are placed far more dispersed (Pl. XIX, fig. 8 *a*), especially on the physa, but the ectoderm is much richer in nematocysts.

From the inner wall of the body 8 septa issue, which are very narrow on the physa but become broader and broader according as they extend forward towards the oral disc, upon whose inferior surface and the outer wall of the gullet-tube they attach themselves, causing the anterior portion of the gastro-vascular cavity, as far as the gullet-tube extends, to be divided into 8 chambers. These septa, which in the middle consist of a rather firm connective-tissue membrane (Pl. XIX, fig. 8 *b*), a prolongation of the connective-tissue of the integument, appear to be covered, on both sides, with transversal and longitudinal muscles, of which the last-named are very developed, especially at the origin of the septum on the wall of the body and the attachment to the gullet-tube, where they, on both sides, form themselves into thick tufts (Pl. XIX, fig. 8 *c, d*; fig. 9 *a*). At the middle of the septum, that is to say between the wall of the body and the gullet-tube, the longitudinal muscles are very thin and do not form, here, the usual tufts (Pl. XIX, fig. 8 *e*). All the septa carry mesenterial filaments that have their origin in the lower extremity of the œsophagus, extending themselves backwards towards the physa, but presenting nothing special of note. To the inside of them — that is between them and the longitudinal muscles — lie the reproductive organs.

The ovaries lie next to the mesenterial filaments, and form serpentine, somewhat flattened tubes, which are clad internally with round epithelial cells in which the ova develop themselves (Pl. XIX, fig. 9 *b*). These lay partly two alongside each other, partly singly, and appeared in various stages of development. The testicles lie at the side of the ovaries, and twine themselves, in vermiform, backwards, as far as the ovaries extend. They are composed of thin, rather long cæca, clad internally with round epithelial cells in which several dotted corpuscles are visible (spermatozoa). The ovaries as well as the testicles are clad externally with a ciliating cylinder-epithelium. But besides those organs the septa also carry acontia, which, especially on the posterior part, towards the physa, are rather numerous and hang freely in the gastro-vascular cavity (Pl. XIX, fig. 9 *c*).

The œsophagus is about a third-part of the length of the body, and cylindrical; on its outer surface it is divided into 8 areas by the insertions of the septa, and is covered with high, ciliating cylinder-cells. Inside this epithelium there is a strongly developed muscular layer, consisting of transversal and longitudinal muscles that lie secured to the rather broad connective-tissue, from whose inner wall prolongations issue and extend into the œsophagus, forming the folds on the inner wall of the œsophagus; this last is clad with a thick epithelium. No gullet-groove.

Findested.

Station 262. To Exemplarer.

Artakarakter.

Legemet med Tentakler 55^{mm} langt. Scapus 28^{mm} lang, cylindrisk, forsynet med en stærkt inkrusteret Skede og 8 fine Linier, imellem hvilke 8, temmelig brede Længdefelter, hvori 2 Rækker yderst smaa Papiller, staaende ved Siden af hinanden og forsynede med en fin Aabning. Capitulum 12^{mm} langt, rørformet, har opimod Mundskiven 12 kastaniebrune Ribber, der et Stykke bagtil smelte sammen til 8. Mundskiven hvælvet; Munden aflang, og fra den udgaa 12 Folder henimod Peripherien, som indtages af 12 retraktile Tentakler. Hele Capitulum kan inddrages i Scapus. Physa danner en halvkugleformig, vandklar Blære med 8 fine Længdestriber. Saavel paa Capitulum som Physa findes Papiller. Farven: Capitulum svagt brunrød med 12 temmelig brede, mørkt kastaniebrune Linier, imellem hvilke blegere farvede Længdefelter. Mundskiven kjødrød; Tentaklerne have 3 mørkebrune Ringe. Scapus er brun, men indenfor Skeden er Huden næsten hvid, spillende noget i det Rosenrøde. Physa svagt laxerød.

Edwardsia costata.

Tab. XVI, Fig. 11, 12.

Legemets hele Længde er 60^{mm}.

Scapus er cylindrisk, 40^{mm} lang, indtil 10^{mm} bred, men smalner lidt af opimod Capitulum og nedad mod Physa. Den er forsynet med 8 stærkt fremspringende Længderibber, der hver har en Række smaa, faste, lidt koniske Papiller, paa hvis Midte sees ved Hjælp af Loupen en liden rund Fordybning (Aabning?) Tab. XVI, Fig. 11, 12 a, og er beklædt med et noget rynket, lidt inkrusteret, skedeformigt Overtræk, der blev ganske glat, naar Dyret var i Vigor og fuldt udspændt. Imellem Ribberne er der 8 næsten plane Længdefelter, som blive til dybe Furer under Kontraktionerne, Tab. XVI, Fig. 12 b.

Capitulum, der er 12^{mm} langt, omtrent 6^{mm} bredt ved Overgangen til Scapus, men 4^{mm} opimod Mundskivens Rand, er cylindrisk, gjenemsigtigt og forsynet med 8 Ribber, der ere Fortsættelser af de paa Scapus, men rage ikke saa langt frem som disse og strække sig op til den ydre Tentakelrække. Ogsaa paa disse Ribber sees en Række Papiller, der dog her staa mere spredte, Tab. XVI, Fig. 11 b. Mundskiven er stærkt konisk fremspringende med en næsten rund Mundaabning, som har paa Randen 8 tynde Folder,

Habitat.

Station No. 262. Two specimens.

Specific characteristics.

The body with the tentacles, 55^{mm} in length. The scapus 28^{mm} in length, cylindrical, furnished with a strongly encrusted sheath, and 8 fine lines between which 8 rather broad longitudinal folds, in which 2 series of extremely minute papillæ, placed alongside each other and furnished with a minute aperture. The capitulum 12^{mm} in length, tubular; up towards the oral disc has 12 chestnut-brown ribs, which, at a little distance backwards, resolve themselves into 8. The oral disc arcuate. The mouth oblong, and from it 12 folds issue towards the periphery, which is occupied by 12 retractile tentacles. The entire capitulum capable of being withdrawn into the scapus. The physa forms a semi-spherical pellucid vesicle having 8 fine longitudinal stripes. On the capitulum as well as on the physa papillæ visible. *The colour.* The capitulum faint brownish-red, with 12 rather broad dark chestnut-brown lines, between which lighter-coloured longitudinal areas. The oral disc flesh-coloured. The tentacles have 3 dark-brown annuli. The scapus is brown, but inside the sheath the integument is almost white with a play of rose-red colour. The physa pale salmon-colour.

Edwardsia costata.

Pl. XVI, fig. 11, 12.

The entire length of the body is 60^{mm}.

The scapus is cylindrical, 40^{mm} in length, and as much as 10^{mm} in breadth, but diminishes a little in breadth upwards towards the capitulum and downwards towards the physa. It is furnished with 8 strongly prominent longitudinal ribs, each of which has here a series of minute, firm, slightly conical papillæ, in whose middle there is seen, with the aid of the magnifying glass, a small round depression (aperture) (Pl. XVI, fig. 11, 12 a). It is clad with a somewhat wrinkled, slightly encrusted, vaginate covering, which became quite smooth when the animal was in full vigour and fully expanded. Between the ribs there are 8, almost plane, longitudinal areas, which become deep furrows during the contractions (Pl. XVI, fig. 12 b).

The capitulum measures 12^{mm} in length, and about 6^{mm} in breadth at the point where it passes into the scapus, but only 4^{mm} in breadth up towards the margin of the oral disc. It is cylindrical, transparent, and furnished with 8 ribs, which are prolongations of those of the scapus but do not extend so far forward as them, and they extend themselves up towards the outer tentacular series. Upon those ribs, also, there is observed a series of papillæ, but which are placed here more dispersedly (Pl. XVI, fig.

der strække sig hen imod Skivens Rand. Denne udvider sig lidt over den cylindriske Del af Capitulum og har 8 temmelig korte Tentakler; strax indenfor disse, men paa Mundskiven, er der atter 8 Tentakler, som ere længere og noget tyndere, end de i den ydre Række, med hvilke de afvexle. Der er altsaa 2 Rækker Tentakler, 8 i hver, hvilke ere retraktile. Hele Capitulum med Mundskiven og Tentaklerne kan trækkes ind i Scapus.

Physa danner en aflang Blære. 6—8^{mm} lang, er gjen-nemsigtig og har 8, kun lidet fremspringende Ribber, der konvergere mod Enden af Blæren, Tab. XVI, Fig. 11 c. Paa disse Ribber sees ligeledes Papiller.

Farven. Scapus er intens brun, Ribberne violette. Capitulum er smuk kjødrød med noget mørkere Ribber, der spille lidt i det Violette. Mundskiven og Tentaklerne mørkere, kjødrød. Physa er bleg rosenrød.

Findested.

Station 253. Et Exemplar.

Desværre gik dette ene Exemplar tabt ved Uforsigtighed, førend jeg fik det konserveret.

Familie Mardcellidæ, mihi.

Kolonidannende Zoanthider, som ved deres afrundede fælles Basaldel leve frit i eller paa Sandet uden Befæstning.

Dr. August Erdmann har i sin Afhandling „Ueber einige neue Zoantheen“,¹ opstillet en ny Slægt under Familien Sphenopidæ, R. Hertwig, hvilken han dog ikke har givet noget Navn. Materialet er indsamlet i 1882 paa den engelske Expedition med H. M. S. „Triton“ fra en Dybde af 640 engelske Fod. Han karakteriserer Slægten saaledes: „Incrustierte Einzelpolypen, deren Mauerblatt an seinem hinteren versmälerten Ende stets mehrere Knospen trägt; Septenstellung nach dem Macrotypus; Ringmuskel mesodermal und einfach; Geschlechtsorgane gonochoristisch; Mesoderm mit ectodermale Zellhöfen.“

Naar Dr. Erdmann har henført denne sin navnløse Slægt til Familien „Sphenopidæ“, har han sandsynligvis

¹ Dr. August Erdmann. Ueber einige neue Zoantheen. Ein Beitrag zur anatomischen und systematischen Kenntnis der Actinien. Jenaische Zeitschrift für Naturwissenschaft. 19 B. Neue Folge. 12 Band, Pag. 430.

11 b). The oral disc is strongly prominent, in conical form, and has an almost almost round oral aperture, which, on the margin, has 8 thin folds extending towards the margin of the disc. The margin of the disc becomes a little dilated beyond the cylindrical part of the capitulum, and has 8 rather short tentacles; immediately inside these, but on the oral disc, there are, again, 8 tentacles, longer and somewhat thinner than those of the outer series, with which they alternate. There are consequently 2 series of tentacles, 8 in each, which are retractile. The entire capitulum with the oral disc and tentacles may be withdrawn into the scapus.

The physa forms an oblong vesicle 6—8^{mm} in length, is transparent, and has 8, only little-prominent ribs, which converge towards the extremity of the vesicle (Pl. XVI, fig. 11 c). Upon those ribs papillæ are also observable.

The colour. The scapus is intense brown. The ribs are violet. The capitulum is a beautiful flesh-colour with somewhat darker ribs having a violet play of colour. The oral disc and the tentacles darker flesh-colour. The physa is pale rose-red.

Habitat.

Station No. 253. One specimen.

Unfortunately this single specimen was lost, by an inadvertence, before I could get it preserved.

Family Mardcellidæ, mihi.

Zoanthidæ forming colonies, which by means of a common rounded basal part live freely in or upon the sand, without attachment.

Dr. August Erdmann has, in his Memoir „Ueber einige neue Zoantheen“,¹ established a new genus under the family Sphenopidæ, R. Hertwig, but has, however, not given it any designation. The material was collected in 1882, during the English expedition with H. M. S. Triton, at a depth of 640 English feet. He characterizes the genus, as follows: „Incrustirte Einzelpolypen deren Mauerblatt an seinem hinteren versmälerten Ende stets mehrere Knospen trägt; Septenstellung nach dem Macrotypus; Ringmuskel mesodermal und einfach; Geschlechtsorgane gonochoristisch; Mesoderm mit ectodermale Zellhöfen.“

In assigning this, his nameless genus, to the family Sphenopidæ, Dr. Erdmann has probably considered himself

¹ Dr. August Erdmann. Ueber einige neue Zoantheen. Ein Beitrag zur anatomischen und systematischen Kenntnis der Actinien. Jenaische Zeitschrift für Naturwissenschaft. 19 B. Neue Folge. 12 Band, Pag. 430.

følt sig berettiget dertil alene ved at udvide Familiekarak-
 teren, som han angiver saaledes: „Einzellebende Zoantheen,
 welche mit ihrem abgerundeten Körperende im Sande
 stecken, oder mit einer Art Haftscheibe am Boden fest-
 sitzen.“ Professor Rich. Hertwig, der har opstillet Fami-
 lien, karakteriserer den paa følgende Maade: „Solitary Zoan-
 theæ with the posterior end of the body rounded“.¹ Men
 selv med Dr. Erdmanns Udvidelse af Familiemærkerne fore-
 kommer det mig, at hans navnløse Slægt ikke uden nogen
 Vanskelighed kan indregistreres i den nævnte Familie; thi
 Polyperne kunne neppe kaldes „Einzelpolypen“, da de jo
 efter hans egen Angivelse og især efter de med Afhand-
 lingen ledsagende Tegninger at dømme forekomme to eller
 flere samlede. Dette Forhold vil blive end tydeligere ved
 den Slægt, som jeg nu staar i Begreb med at beskrive.

Paa den norske Nordhavsexpedition blev paa flere
 Stationer funden Exemplarer af en Zoantheide, der har
 meget tilfælles med Dr. Erdmanns, ja saa stor Lighed er
 der, at jeg ved en overfladisk Betragtning antog den for
 identisk med denne, — og det tør hende, at ved en nøiere
 Granskning og Sammenligning vil det vise sig at være en
 Slægt, imedens Arterne blive forskellige.

Mardøll² Erdmanni, n. g. et sp.

Tab. VI, Fig. 1; Tab. XXI; Tab. XXII, Fig. 1—7.

Legemet er bægerformet, 35^{mm} langt, 20^{mm} bredt for-
 oven, imedens Foddelen, eller den bagre Del, smalner be-
 tydeligt af og er som oftest ikke over 5^{mm} bred; disse Maal
 gjælde dog den fuldt udvoxne Polyp. Fra Basaldelens
 nederste (bagerste) Ende udgaa en eller flere Polyper, og
 iblandt de flere Hundrede Exemplarer, der bleve indsam-
 lede, findes kun yderst faa, paa hvilke den bagre Ende
 ikke enten er forbunden med en eller flere Polyper, eller
 viser Antydning til en ny, udvoxende Polyp; hvor dette
 sidste er Tilfældet, der er Enden altid noget opsvulmet,
 og fra denne opsvulmede Knop skyder en ny Polyp ud,
 idet Basaldelen forlænger sig efterhaanden og bøier sig,
 hvorved de to sammenvoxede Dyr danne en Bue, Tab.
 XXI, Fig. 13; men paa det Sted, hvorfra en ny Polyp er
 udskudt, viser der sig altid en Fortykkelse, som danner
 Grænsen for begge Polyper.

Det er nu ikke ofte, at der fra Basaldelens bagerste
 Ende kun udvoxer en Polyp; det almindeligste er, at flere
 Polyper springe frem, dels samtidig, dels efter hinanden,
 og da tiltager Forbindelsen imellem dem betydeligt i Bred-

¹ Report on the actinaria dredged by H. M. S. „Challenger“,
 during the years 1873—76, by Professor Richard Hertwig. The
 voyage of H. M. S. „Challenger“, Zoology. Vol. XVI, pag. 120.

² Mardøll = Havboerske. Et Navn, som blandt mange andre
 Freya benyttede, da hun søgte efter sin Mand. Nordisk Mythologi.

justified in doing so, by simply extending the family charac-
 teristic, which he states as follows: „Einzellebende Zoan-
 theen, welche ihren abgerundeten Körperende im Sande
 stecken, oder mit einer Art Haftscheibe am Boden fest-
 sitzen.“ Professor Rich. Hertwig, who has established the
 family, characterizes it thus „Solitary Zoantheid with the
 posterior end of the body rounded“.¹ But even with Dr.
 Erdmann's extension of the family characteristics, it appears,
 to me, that his nameless genus cannot, without some dif-
 ficulty, be included in the family named, because the polyps
 can scarcely be termed „Einzelpolypen“, as they, even ac-
 cording to his own statement, and especially when judged
 by the illustrations accompanying the Memoir, appear two
 or more together. This relation will become more distinct
 in the genus that I am now about to describe.

On the Norwegian North-Atlantic Expedition spec-
 imens of a Zoantheid were found at various stations, which
 has much in common with Dr. Erdmann's, indeed the
 resemblance is so great, that I, on a summary examina-
 tion, assumed it to be identical with his; and it may per-
 haps happen, that it will prove to be of the same genus,
 while the species are different.

Mardøll² Erdmanni, n. g. et sp.

Pl. VI, fig. 1; Pl. XXI; Pl. XXII, figs. 1—7.

The body is formed like a chalice, measures 35^{mm} in
 length, and 20^{mm} in breadth at the top, while the basal
 part, or the posterior part, becomes considerably narrower,
 and is, most frequently, not more than 5^{mm} in breadth.
 These measurements are, however, those of the perfectly
 adult polyp. From the basal part's lowest (posterior) ex-
 tremity one or more polyps issue, and among the several
 hundreds of specimens obtained only extremely few are
 found in which the posterior extremity is not, either united
 to one or more polyps, or shows indication of a new,
 budding polyp; where this last feature appears the extremity
 is always somewhat tumified, and from this swollen bud a
 new polyp springs forth, whilst the basal part becomes
 gradually prolonged and curved, causing the two united
 animals to form an arc (Pl. XXI, fig. 13); but at the
 point where a new polyp has sprung forth, there always
 appears to be a thickening, which forms the margin of
 both polyps.

It is, however, not frequent that only one polyp
 springs from the posterior extremity of the basal part; the
 most common case is, that several polyps appear, partly
 at one and the same time, partly in succession, and then

¹ Report on the Actinaria dredged by H. M. S. „Challenger“
 during the years 1873—1876, by Professor Richard Hertwig. The
 voyage of H. M. S. „Challenger“. Zoology. Vol. XVI, pag. 120.

² Mardøll = sea-nymph. A name used by Freya, among many
 others, when she went in search of her husband. Northern Mythology.

den, saa at der kan dannes et temmeligt tykt Coenenchym, hvortil Polyperne med deres Basaldel ere stærkt bundne, Tab. XXI, Fig. 9, 11, 15. En saadan Gruppe af Polyper har et ganske eiendommeligt Udseende, da den ikke er fæstet til Noget, men ligger løs i Sandet. Den øvre Flade er lidt konkav, idet Polyperne reise sig fra et Midtparti, Tab. XXI, Fig. 11, 14, der dannes af et Coenenchym, som fremstaar derved, at Polypernes Basaldele ere smeltede sammen; den undre Flade er konvex, temmelig jævn, men antyder ved fine Linier de Steder, fra hvilke Polyperne ere udgaaede, Tab. XXI, Fig. 12, 15. Vi skulle senere se, hvorledes Polyperne korrespondere med hinanden; kun her skal antydes, at hvor 2 eller 3 ere forenede, og en af Polyperne trykkes sammen, svulmer den anden og tredie op, idet Fluidumet fra den enes Gastrovascularhulhed gaar over i de andres, men hvor der er 6—8 sammen, er Kommunikationen ikke saa let paaviselig.

Polypkroppen er stærkt inkrusteret af Sand, der gjør, at Huden føles fast og noget ru, men er forresten jævn, det vil sige ikke rynket; opimod Kroppens øverste Rand sees 18 bladformige, inkrusterede Ribber, som strække sig til Mundskivens ydre Rand, og imellem hvilke Huden sees at være nøgen, Tab. VI, Fig. 1; Tab. XXI, Fig. 11, 12, 15. Naar Dyret er indtrukket, forme disse bladformige Ribber sig til 18 Straaler, der konvergere mod Mundskiven, Tab. XXI, Fig. 3, 4, 14. Denne er plan, meget bred, ikke inkrusteret, men forsynet med 18 fine Folder, som gaa fra den indre Tentakelrække til den aflange Mund, der er noget fremstaaende og har en svag Mundvig (Gonidiefure), Tab. XXI, Fig. 14.

Tentaklerne staa i to Rækker, 18 i hver; de ere slanke, noget længere end Skivens Bredde, især gjælder dette den indre Række, som staaar paa Mundskivens ydre Rand, Tab. VI, Fig. 1; Tab. XXI, Fig. 11, 14. Saavel Mundskiven som Tentaklerne kunne fuldstændig drages ind i Kroppen.

Polypkroppene ere i deres Udspring, førend endnu Tentaklerne og Mundskiven er dannet, i Regelen halvkugleformede og meget stærkt inkrusterede.

Farven varierer noget efter de forskjellige Lokaliteter. Kroppen er let brunrød, næsten teglstensrød; Tentaklerne lysere, brunrøde, giennemsigtige. Mundskiven endnu lysere end Tentaklerne, og omkring Mundskivens ydre Rand, lige ved Grunden af den indre Tentakelrække er en smal, lys rosenrød Ring, Tab. VI, Fig. 1. Dette er Regelen; men der findes Individuer, hvis Farve er graaliggrøn, spillende i det Violette, Tab. VI, Fig. 2.

De anatomisk-histologiske Undersøgelser frembyde adskillige Vanskeligheder paa Grund af, at Huden er saa stærkt inkrusteret af Sand (Kisel), at gode Tversnit ikke er let at erholde. Dr. Erdmann udtrykker sig med Hensyn

the connection between them increases considerably in breadth, so that a pretty thick sarcosoma may be formed, to which the polyps are firmly attached by their basal portion, (Pl. XXI, fig. 9, 11, 15). Such a group of polyps has quite a peculiar appearance, as it is not adherent to anything but lies loose in the sand. The superior surface is a little concave, owing to the polyps rising up from a portion in the middle (Pl. XXI, fig. 11, 14), formed of a sarcosoma produced by the basal portions of the polyps concreting together; the inferior surface is convex and pretty even, but indicates by fine lines the spots from which the polyps have issued (Pl. XXI, fig. 12, 15). We shall subsequently see how the polyps correspond with each other, but here we shall only indicate, that where 2 or 3 are united, and one of the polyps is contracted, the second and third ones swell up, owing to the fluid from the gastro-vascular cavity of the one passing into the cavities of the others, but where there are 6—8 polyps together, the communication between them is not so easily distinguished.

The body of the polyp is strongly encrusted with sand, causing the integument to feel firm and somewhat rough, but otherwise it is even, that is to say not wrinkled. Towards the uppermost margin of the body 18 foliiform, encrusted ribs are visible, which extend themselves to the outer margin of the oral disc, and between these the integument is seen to be bare (Pl. VI, fig. 1; Pl. XXI, fig. 11, 12, 15). When the animal is contracted those foliiform ribs resolve themselves into 18 rays, which converge towards the oral disc (Pl. XXI, fig. 3, 4, 14). The oral disc is plane, very broad, not encrusted, but furnished with 18 fine folds that pass from the inner tentacular series to the oblong mouth, which latter is somewhat prominent and has a faint oral angle (gonidial-groove) (Pl. XXI, fig. 14).

The tentacles are placed in two series, 18 in each; they are slender, and somewhat longer than the breadth of the disc; this is especially the case with the inner series, placed on the outer margin of the oral disc (Pl. VI, fig. 1; Pl. XXI, fig. 11, 14). Both the oral disc as well as the tentacles may be completely withdrawn into the body.

The bodies of the polyps are, at their commencement, before the tentacles and the oral disc have yet been formed, usually semispherical in form, and very strongly encrusted.

The colour. This varies somewhat according to the different localities. The body is light brownish-red, almost brick-colour. The tentacles lighter-coloured, brownish-red, and transparent. The oral disc is still lighter in colour than the tentacles, and round the outer margin of the oral disc, exactly at the base of the inner tentacular series, there is a narrow, light-coloured, rose-red annulus (Pl. VI, fig. 1). That is the rule, but there are also found some individuals whose colour is greyish-green, with a violet play of colour (Pl. VI, fig. 2).

The anatomo-histological examination presents considerable difficulties, owing to the fact that the integument is so strongly encrusted with sand (Silex) that satisfactory sections are not easy to obtain. Dr. Erdmann expresses

hertil saaledes: „Wegen der fast steinhartigen Härte der Mauerblattes lassen die Polypen keine Untersuchung mittelst der Schnittmethode zu, und wandte ich deshalb auch hier die Schliffmethode von v. Koch an“. Der var dog blandt mine Exemplarer enkelte, der vare mindre stærkt inkrusterede, saa at jeg kunde erholde adskillige ret gode Tversnit, og i det Hele taget viser Hudens Inkrustation sig hos Mardøll Erdmanni langt fra saa stenagtig haard, som Tilfældet maa have været hos Dr. Erdmanns navnløse Slægt. Saa vanskeligt det er at faa brugbare Tversnit, saa let er det at aabne Polypen efter Længden.

Aabner man to sammenhængende Dyr efter Længden, saaledes som Fig. 4. Tab. XXII udviser, sees begge Polyper ikke at staa i direkte Forbindelse med hinanden, men at hver for sig har sin bestemte Afgrændsning, der danner Polypens egentlige Bund, Tab. XXII, Fig. 3 a, 4 a, og som bestaar af en skiveformet Fortykkelse af Huden, hvori Sandkorn ere inkrusterede; det er Coenenchymet for disse to Polyper, og hvori findes Kanaler, som korrespondere med begge Polypers Kamre, saa at Fluidumet i den ene Polyp med stor Lethed kan gaa over i den anden Polyps Gastralhulhed.

Fra Polypens Bund udgaar 18 Macroseptæer, der ved deres Udspring ere temmelig smale, Tab. XXII, Fig. 3 b, men tiltage snart i Bredden, eftersom de naa længere frem (op) paa Kroppen, Tab. XXII, Fig. 3 c, 4 c, og blive bredest henimod Mundskiven, strax førend de fæste sig paa Svælgrøret, Tab. XXII, Fig. 4 d. Disse 18 Macroseptæer ere fuldstændige Septa, der dele Gastrovascularhulheden i 18 Længdekamre, som foroven ere lukkede, imedens de forneden gaa over i de førnævnte Kanaler i Coenenchymet, Tab. XXII, Fig. 3 d.

Imellem hver 2 af Macroseptæerne er der 1 Microseptum, saa at der af disse ligeledes er 18, Tab. XXII, Fig. 7. De tage deres Udspring nogle Millimeter ovenfor Polypens Bund, ere meget smale, listeformige og tiltage kun lidet i Tykkelse eller Bredde, indtil de have naaet den underste Flade af Mundskiven, paa hvilken de fæste sig, og gaa følgende ikke over paa Svælgrøret, Tab. XXII, Fig. 3 e, 4 e.

Af Macroseptæer er der især to, som udpræge sig ved sin stærkere Bygning, staa længere fra hinanden, Tab. XXII, Fig. 7 a, og fæste sig et paa hver Siderand af Svælgrubens, Tab. XXII, Fig. 7 b, der repræsenterer Bug-siden; disse Septa kunne betragtes som Retningsseptæer. Ligeledes er der to Microseptæer, som strække sig henimod Svælgrørets Rygside uden at fæste sig paa det, Tab. XXI, Fig. 17 b; Tab. XXII, Fig. 7 c; disse Septæer kunne ogsaa ansees som Retningsseptæer; de ere stillede ganske modsat dem paa Bug-siden, staa temmelig langt fra hinanden og imellem to Macroseptæer.

Vil man nu betragte disse Septæer parvis, hvilket synes mig noget søgt, og hvorover jeg senere kommer

himsel in regard to this, as follows: „Wegen der fast steinhartigen Härte der Mauerblattes lassen die Polypen keine Untersuchung mittelst der Schnittmethode zu, und wandte ich deshalb auch hier die Schliffmethode von v. Koch an“. There were, however, among my specimens, a few that were less encrusted than the others, so that I was enabled to obtain several fairly satisfactory sections; and, altogether, the encrustation of the integument of Mardøll Erdmanni does not appear to be so siliciously hard as must have been the case with Dr. Erdmann's nameless genus. Just as difficult as it is to obtain available transverse sections, as easy is it to dissect the polyp longitudinally.

If we open two united animals longitudinally, as shown in fig. 4, Pl. XXII, it is seen that both the polyps do not stand in direct connection with each other, but that each of them has, for itself, its own definite demarcation, forming the real base of the polyp (Pl. XXII, fig. 3 a, 4 a); the latter — the base — consists of a discoidal tumification of the integument, in which grains of sand are encrusted; this tumification is the sarcosoma of those two polyps, and in it are found ducts that correspond with the chambers of both polyps, so that the fluid of the one polyp can with great facility be passed over into the gastral cavity of the other polyp.

From the base of the polyp 18 macroseptæ issue, which at their origin are rather narrow (Pl. XXII, fig. 3 b) but soon increase in breadth as they extend farther forward (upwards) on the body (Pl. XXII, fig. 3 c, 4 c), and become broadest towards the oral disc, immediately before they attach themselves to the gullet-tube (Pl. XXII, fig. 4 d). Those 18 macroseptæ are perfect septæ, which divide the gastro-vascular cavity into 18 longitudinal chambers that are closed at the top, whilst at the foot they pass over into the ducts in the sarcosoma previously spoken of (Pl. XXII, fig. 3 d).

Between each 2 of the macroseptæ there is one microseptum, so that there are also 18 of them (Pl. XXII, fig. 7). They have their origin a few millimetres above that of the polyp; they are very narrow, fillet-formed, and only increase a little in thickness, or breadth, before they have reached the inferior surface of the oral disc, to which they attach themselves, and consequently do not pass over to the gullet-tube (Pl. XXII, fig. 3 e, 4 e).

Of the macroseptæ there are two that especially distinguish themselves by their stronger structure, stand farther apart from each other (Pl. XXII, fig. 7 a), and which secure themselves, one on each lateral margin of the gullet-groove (Pl. XXII, fig. 7 b) that represents the ventral side; these septæ may be considered as directive septæ. There are also two microseptæ that extend themselves towards the dorsal side of the gullet-tube without attaching themselves to it (Pl. XXI, fig. 17 b; Pl. XXII, fig. 7 c); these septæ may also be considered as directive septæ; they are placed quite the contrary of those on the ventral side, and are placed at a considerable distance apart from each other and between two macroseptæ.

If we now consider these septæ in pairs, a thing which appears to me to be somewhat far-fetched — and

til at udtale mig, saa har man to Par Retningssepta og, til hver Side af disse, 8 Septapar, ethvert dannet af 1 Macro- og 1 Microseptum, hvilket jo er det almindelige for Zoanthiderne. Samtlige Macrosepta bære Mesenterialfilamenter og Generationsorganer, der som oftest indtage en saadan Bredde, at de ganske skjule Microsepta, Tab. XXII, Fig. 4.

Paa et Tversnit af Kroppen viser Huden sig at bestaa af et ydre Epithel (Ectoderm), som er dannet af temmelig høie Cylinderceller med sin Kjerne og Kjernelegeme, men uden Cilier, Tab. XXI, Fig. 16 a, 18 a, imellem hvilke Nematocyster ere indleirede. Indenfor Ectodermet er et meget bredt Bindevævsdrag, der danner et fuldkomment Net med store Masker, som ere fyldte med Sandkorn, Tab. XXI, Fig. 18 b. Størstedelen af Bindevævet er inkrusteret; kun nærmest Ectodermet og Endothelet er et Belte, som er kompakt, uden Masker, Tab. XXI, Fig. 18 b. Saavel i Bindevævsbjelkerne, der danne Nettet, Tab. XXI, Fig. 18 c, som i de omtalte Belter, sees Bindevævslegemer, dels stjerneformede, dels spindelformede med Kjerne og Kjernelegeme; men foruden dem sees større og mindre, fordømte afluende Kanaler, der ere mere eller mindre fyldte med Epithelceller, og som sandsynligvis ere Ernæringskanaler, Tab. XXI, Fig. 16 b. De synes at svare til de af Dr. Erdmann omtalte „Zellinseln, Zellhöfen“, og som findes hyppigt hos Zoanthiderne.

Mesodermet (Bindevævet) i den ydre Hud er saaledes for en stor Del udfyldt af Kanaler, hvori som tidligere omtalt er indleiret større og mindre, uregelmæssige Sandkorn, Tab. XXI, Fig. 18 f, der ligge saa tæt sammen, at de saagodt som danne et Pantser. I Bindevævsbeltet, nærmest Endothelet, sees cirkulære Muskelfibre, der ikke synes at være meget udviklede, Tab. XXI, Fig. 18 g. Dr. Erdmann angiver for sin navnløse Slægt, at Ringmusklerne ere mesodermale; hos *Mardell* udgjør Størsteparten af Mesodermet et retikulært Kanalsystem, saa det er rimeligt, at Ringmuskelen hos den maa være endodermal, med andre Ord, der er ikke Plads for den andetsteds end i det indre Bindevævsbelte, nærmest Endothelet. Paa den indre Væg af Bindevævet ligger et Muskellag, der dannes af Tver- og Længdemuskler, Tab. XXI, Fig. 18 h, som beklædes af et Endothel, bestaaende af meget høie, cilierende Cylinderceller, der tungeformigt rage ind i Gastrovascularhulheden, Tab. XXI, Fig. 16 c, 18 i.

Fra Bindevævet indre Væg udsendes listeformede Bindevævsprolongationer, som danne de før nævnte Septa. Macrosepta bestaa saaledes af et Midtparti, der er Bindevævsmembranen (Støttemembranen, Stützlamelle), som er temmelig smal, men bliver noget bredere henimod Insertionen paa Svælggrøret, Tab. XXI, Fig. 16 d, 18 k. Paa denne Membran er placeret baade Tver- og Længdemuskler. Imedens Tvermusklerne ere lidet udviklede, ere Længde-

in regard to which I will subsequently speak — we have, then, two pairs of directive septa, and on each side of them 8 pairs of septa, each pair formed of 1 macro and 1 micro septum, which, indeed, is the common case in Zoanthidæ. All the macrosepta carry mesenterial filaments and reproductive organs which, most frequently, occupy such a breadth, that they quite conceal the microsepta (Pl. XXII, fig. 4).

In a section of the body the integument shows itself to consist of an outer epithelium (ectoderm), which is formed of rather high cylinder-cells with a nucleus and nucleus-corpusele, but without ciliae (Pl. XXI, fig. 16 a, 18 a), between which nematocysts are entrenched. On the inside of the ectoderm there is a layer of very broad connective-tissue, which forms a complete reticulation, with large meshes that are filled with grains of sand (Pl. XXI, fig. 18 b). The greater part of the connective-tissue is encrusted, only next to the ectoderm and the endothelium is there a belt which is compact and without meshes (Pl. XXI, fig. 18 b). Both in the connective-tissue ribs that form the reticulation (Pl. XXI, fig. 18 c) as well as in the belts referred to, connective-tissue corpuseles are seen, partly stelliform, partly fusiform, with nucleus and nucleus corpusele; but besides them, larger and smaller, principally oblong, ducts are observed, filled more or less with epithelial cells, and which probably are nutritory ducts (Pl. XXI, fig. 16 b). They appear to correspond to the „Zellinseln, Zellhöfen“ spoken of by Dr. Erdmann, and which are frequently found in the Zoanthids.

The mesoderm (the connective-tissue) in the outer integument is, thus, in a great measure filled with ducts, in which, as previously stated, larger and smaller irregular grains of sand are entrenched (Pl. XXI, fig. 18 f), lying so closely to each other that they almost form a plating. In the connective-tissue belt, next the endothelium, circular muscle fibres are observed, which do not appear to be much developed (Pl. XXI, fig. 18 g). Dr. Erdmann states in regard to his nameless genus, that the annular muscles are mesodermal; in *Mardell* the greater part of the mesoderm consists of a reticular ductiferous system, so that it is probable the annular muscle in it must be endodermal; in other words, there is no room for it elsewhere than in the inner connective-tissue belt next the endothelium. Upon the inner wall of the connective-tissue there lies a muscular layer, formed of transversal and longitudinal muscles (Pl. XXI, fig. 18 h) that are clothed with an endothelium consisting of very high ciliating cylinder-cells, which extend in linguiform into the gastrovascular cavity (Pl. XXI, fig. 16 c, 18 i).

From the inner wall of the connective-tissue fillet-formed connective-tissue prolongations are projected, forming the previously mentioned septa. The macrosepta consist, thus, of a medial portion, which is the connective-tissue membrane (the supporting membrane, stützlamelle), and is rather narrow, but becomes somewhat broader towards the insertion on the gullet-tube (Pl. XXI, fig. 16 d, 18 k). Upon this membrane there are placed both transversal

musklene meget mere fremtrædende og indtage begge Sider af Septumet, Tab. XXI, Fig. 18 *l*; Tab. XXII, Fig. 6 *a*, saa at de skjule næsten ganske Tvermusklene. Disse Længdemuskler danne egentlig ikke nogen Fane; thi de Bindevævsforlængelser, der udgaa fra Septumets Bindevævs-lamel, og som bære Længdemusklene, ere temmelig korte. Samtlige Macrosepta bære Mesenterialfilamenter og Generationsorganer.

Mesenterialfilamenterne tage deres Begyndelse fra Svælgrørets nederste, fri Ende, Tab. XXI, Fig. 16 *e*; Tab. XXII, Fig. 4 *f*, hvor de udspringe med et nyreformet, kjertelagtigt Organ, Tab. XXII, Fig. 5 *a*, der er forholdsvis meget bredt, og som indad har en temmelig dyb Længdefure, Tab. XXII, Fig. 5 *b*. Dette Organ, der fandtes hos alle de Dyr, jeg undersøgte, bestaar af regelmæssigt ved Siden af hinanden stillede Cylinderceller, som ere smale ved deres Tilhæftning udad til Bindevævet, men bredest indad, have en temmelig stor Kjerne, der er omgivet af en kornet Protoplasmamasse, Tab. XXII, Fig. 5 *c*. Organet tilhører aabenbart Mesenterialfilamentet og udgjør en Del af det; thi Overgangen er meget tydelig, Tab. XXII, Fig. 5 *d*. Mesenterialfilamentet bliver nu meget smalere, slynger sig nedover til den nederste Trediedel af Gastralhulheden, følgende Macroseptet og bundet til dettes Bindevæv ved en tynd Membran. Mesenterialfilamentet har forresten ingen særegen Organisation; det er udvendigt beklædt med et cilierende Cylinderepithel, hvorimellem findes en Mængde Nematocyster.

Ved Siden af Mesenterialfilamentet, men indenfor, nærmere Septumets Insertion tæt ved Kropsvæggen, ligger Generationsorganerne. De fleste Individuer, jeg undersøgte, vare Hunner, kun et Dyr, der tilhørte en anden Gruppe end de, hvori Hunnerne fandtes, var en Han. Kjønnene er adskilt. Æggestokken udspringer ligeledes ved Svælgrørets nederste fri Ende, men lidt nedenfor Mesenterialfilamentet, Tab. XXII, Fig. 5 *e*, danner et lidt fladtrykt Rør, der slynger sig proptrækkerformigt nedover langs Mesenterialfilamentet, tæt til dette og indeholder Æg, kun lidt udviklede, liggende to ved Siden af hianden, Tab. XXI, Fig. 17 *c*; Tab. XXII, Fig. 5 *f*. Æggene ere næsten eliptiske og temmelig klare. Æggestokken strækker sig i Almindelighed lidt nedenfor Mesenterialfilamentet og er ligesom dette udvendigt beklædt med et Endothel af cilierende Cylinderceller, men uden Nematocyster.

Testiklerne have baade samme Form og samme Sæde som Æggestokkene; men istedetfor Æg saaes i det Indre af Røret runde Celler, der beklædte den indre Væg, samt en Mængde smaa, glindsende, runde Legemer — begyndende Spermatozoer. Hannerne ere ifølge mine Undersøgelser meget sjældnere end Hunnerne. Det er at bemærke, at Generationsorganerne ligge indenfor Mesenterialfilamenterne, nærmere Kropsvæggen, hvilket er mod-

and longitudinal muscles. Whilst the transversal muscles are little developed, the longitudinal muscles are much more prominent and occupy both sides of the septum (Pl. XXI, fig. 18 *l*; Pl. XXII, fig. 6 *a*), so that they almost conceal the transversal muscles. These longitudinal muscles do not really form any flag, because the connective-tissue prolongations that issue from the connective-tissue lamella of the septum, and which carry the longitudinal muscles, are rather short. All the macrosepta carry mesenterial filaments and reproductive organs.

The mesenterial filaments have their origin on the lowest free extremity of the gullet-tube (Pl. XXI, fig. 16 *e*; Pl. XXII, fig. 4 *f*), where they issue in the form of a kidney-shaped, glandulous organ (Pl. XXII, fig. 5 *a*), which, relatively, is very broad, and inwards has a rather deep longitudinal furrow (Pl. XXII, fig. 5 *b*). This organ, which was present in all the animals I investigated, consists of cylinder-cells placed in regular arrangement alongside each other; they are narrow at their attachment outwards to the connective-tissue, and broadest inwards, and have a pretty large nucleus surrounded by a granular protoplasmic substance (Pl. XXII, fig. 5 *c*). The organ evidently pertains to the mesenterial filament and forms a part of it, as the transition is very distinct (Pl. XXII, fig. 5 *d*). The mesenterial filament becomes then much narrower, twines itself downwards to the lowest third part of the gastral cavity, following the macroseptum and attached to its connective-tissue by a thin membrane. The mesenterial filament has, otherwise, no peculiar organisation; it is externally clad with a ciliating cylinder-epithelium, between whose cells a multitude of nematocysts are found.

At the side of the mesenterial filament, but inside nearer the insertion of the septum, close to the wall of the body, lie the reproductive organs. Most of the individuals I examined were females, only one animal, which pertained to another group than the one in which the females were found, was a male. The sexes are separated. The ovary, also, originates at the lowest free extremity of the gullet-tube, but a little below the mesenterial filament (Pl. XXII, fig. 5 *e*); it forms a slightly flattened tube that twines itself spirally downwards along the mesenterial filament and close to it, and it contains ova only little-developed, placed two alongside each other (Pl. XXI, fig. 7 *c*; Pl. XXII, fig. 5 *f*). The ova are almost elliptical and rather pellucid. The ovary extends itself, usually, a little way below the mesenterial filament, and is, like it, clad externally with an endothelium of ciliating cylinder-cells, but has no nematocysts.

The testicles have both the same form and the same situation as the ovaries, but instead of ova round cells were observed in the interior of the tube. clothing its inner wall, also a multitude of small, shining, round corpuscles — rudimentary spermatozoa. Males are, according to my observations, much more rare than females. It is to be remarked, that the reproductive organs lie to the inside of the mesenterial filaments, nearer to the wall of

sat af, hvad jeg ellers har fundet at være Tilfældet hos Actiniderne.

Microsepta ere golde, dannede af et Midtparti, bestaaende af en tynd Bindevævslamel, paa hvis Sider findes et Muskellag, dannet af Tver- og Længdemuskler. Disse sidste ere meget mere udviklede end Tvermusklerne og findes paa begge Sider af Microseptumet, Tab. XXI, Fig. 17 *d*, ligesom de ere beklædte af lignende Endothel, som paa de store Septa.

G. v. Koch¹ er den, der først har gjort opmærksom paa Septaordningen hos Zoanthiderne og søgt at bringe den i Overensstemmelse med Actiniernes i Almindelighed, idet han hos Polythoa Axinella paaviste den karakteristiske Stilling, Skillevæggene (Septa) indtage. Dr. Erdmann udtaler sig herom saaledes: „Während bei den Actinien im Allgemeinen die Septen eines Paares gleiche Grösse und gleichen Bau in Bezug auf Mesenterialfilamente und Geschlechtsorgane zeigen, unterscheidet man bei den Zoantheen zwei Arten von Septen: 1. grössere, Mesenterialfäden und Geschlechtsorgane führende fertile Macrosepten, welche sie den Schlundrohr in seiner ganze Länge ansitzen als „vollständig“ zu bezeichnen sind; 2. kleinere, der Mesenterialfäden und Geschlechtsorgane entbährende, sterile Microsepten, welche das Schlundrohr nie erreichen und daher „unvollständig“ genannt werden müssen. Je ein Macroseptum und ein Microseptum bilden ein Paar, d. h. sie kehren sich ihre homologen Seiten, die Seiten ihrer longitudinalen Muskel zu. Solcher Paare sind zahlreiche vorhanden. Nur zwei Paare lassen eine andere Anordnung ihrer Muskeln erkennen, es sind dies die beiden einander opponirten sogenannten Richtungsseptenpaare, welche ihre Longitudinalmuskeln auf abgewandten Seiten tragen.“

Man vil heraf se, at Pardannelsen af Septa væsentligst er begrundet i Muskelanordningen; thi uden at denne svarede til, hvad der er almindeligst ved Septaparrerne hos Actinierne, vilde man vel neppe falde paa at parre sammen et fuldstændigt med et ufuldstændigt Septum. I physiologisk Henseende ere disse to Septaarter temmelig forskjellige; thi imedens de fuldstændige Septa i Regelen ere golde, er det de ufuldstændige Septa, som bære Generationsorganerne; men saaledes forholder det sig ikke hos Zoantheerne, her er det de fuldstændige Septa, der ere fertile, og de ufuldstændige golde. Hvad nu Slægten *Mardöll* angaar, saa forekommer det mig, at her er Pardannelsen endnu vanskeligere at tilveiebringe. For det Første udspringe Macroseptata og Microseptata ikke fra samme Sted; Macroseptata tage sit Udspring fra Polypens Bund, imedens Microseptata udspringe flere Millimeter ovenfor, og oprettholde under hele Fortsættelsen opimod Mundskiven den samme Afstand fra hinanden, — dette sidste tør nu være mindre væsentligt; for det Andet er Muskelanordningen forskjellig fra den, som i Almindelighed finder Sted hos

¹ G. v. Koch. *Polythoa Axinella*. Morph. Jahrb. 1880.

the body; that is the opposite of what I, otherwise, have observed to be the case in Actinidæ.

The microsepta are sterile, and are formed of a medial portion consisting of a thin connective-tissue lamella, on whose sides a muscular layer is found, formed of transversal and longitudinal muscles. The last-named are much more developed than the transversal muscles, and are found on both sides of the microseptum (Pl. XXI, fig. 17 *d*) whilst, also, they are clad with a similar endothelium as on the large septa.

G. v. Koch¹ is the first who has called attention to the arrangement of the septa in Zoanthidæ, and who has endeavoured to bring it into harmony with that of Actinidæ in general, in so far, that in *Polythoa Axinella* he has shown the characteristic situation the divisional walls (septa) occupy. Dr. Erdmann express himself in regard to this, as follows: „Während bei den Actinien im Allgemeinen die Septen eines Paares gleiche Grösse und gleichen Bau ind Bezug auf Mesenterialfilamente und Geschlechtsorgane zeigen, unterscheidet man bei den Zoantheen zwei Arten von Septen: 1. grössere, Mesenterialfäden und Geschlechtsorgane führende fertile Macrosepten, welche sie den Schlundrohr in seiner ganze Länge ansitzen als „vollständig“ zu bezeichnen sind; 2. kleinere, der Mesenterialfäden und Geschlechtsorgane entbährende, sterile Microsepten, welche das Schlundrohr nie erreichen und daher „unvollständig“ genannt werden müssen. Je ein Macroseptum und ein Microseptum bilden ein Paar d. h. sie kehren sich ihre homologen Seiten, die Seiten ihrer longitudinalen Muskel zu. Solcher Paare sind zahlreiche vorhanden. Nur zwei Paare lassen eine andere Anordnung ihrer Muskeln erkennen, es sind dies die beiden einander opponirten sogenannten Richtungsseptenpaare, welche ihre longitudinalmuskeln auf abgewandten Seiten tragen.“

We can see from this, that the formation of septal pairs is principally based in the muscular arrangement, because, unless it corresponded with what is most usual in the case of the septal pairs in Actinidæ, we would scarcely feel inclined to pair a perfect with an imperfect septum. In their physiological aspect these two species of septa are considerably different, as, whilst the perfect septa are, as a rule, sterile, it is the imperfect septa that carry the reproductive organs; but such is not the case in regard to Zoanthidæ; in them it is the perfect septa that are fertile, and the imperfect septa that are sterile. In so far as the genus *Mardöll* is concerned, it appears, to me, that in it the formation of pairs is still more difficult to make out. In the first place the macroseptata and the microseptata do not originate in the same situation. The macroseptata have their origin at the base of the polyp, while the microseptata originate several millimetres above, and maintain throughout their whole course up towards the oral disc, the same interval from each other; this last-named feature may, however, not be of material importance.

¹ G. v. Koch. *Polythoa Axinella*. Morph. Jahrb. 1880.

Actinierne, idet der paa begge Sider af hvert Septum er longitudinelle Muskler, saa at ethvert af dem synes at være forsaavidt selvstændigt, som de ikke for at danne et Par tiltrænge at vende deres homologe Sider, det vil sige de longitudinelle Muskler, mod hverandre, da dette ifølge Anordningen nødvendigvis maa saa være.

Med Hensyn til Længdemusklernes Stilling paa Septa forekommer det mig, at Forholdet ligner overmaade meget det, jeg har angivet baade hos de Edwardsier, jeg har undersøgt, og hos de to nye Slægter Fenja og Ægir, som senere skulle omtales. Hos ingen af disse ere Septa stillede parvis, og jeg er derfor mest tilbøielig til at anse Septaerne hos Mardöll for ikke at være parrede, men at der er 18 fuldstændige og 18 ufuldstændige Septa, hvoraf to af de første og to af de sidste kunne ansees som Retningsseptas, Tab. XXI, Fig. 17 *a, b*. Mardöll har forresten saameget tilfælles med Zoantheerne, at den vistnok bør rækkes ind i denne Gruppe.

Svælgrøret er meget kort, næsten cylindrisk; paa dets udvendige, næsten glatte Side, hvor Macrosepterne ere fæstede, er der et cilierende Epithel, dannet af temmelig korte Cylinderceller med deres Kjerne og Kjernelegeme, Tab. XXI, Fig. 16 *f*; indenfor dette sees transverselle Muskelfibre, Tab. XXII, Fig. 6 *b*, der ligge tæt til det ikke meget brede Bindevævslag, Tab. XXII, Fig. 6 *c*. Paa den indre Flade af dette Bindevæv er der et Lag temmelig stærke Længdemuskler, Tab. XXII, Fig. 6 *d*, som beklædes af et Endothel, bestaaende af meget lange, cilierende Cylinderceller, Tab. XXII, Fig. 6 *e*, hvorimellem sees hist og her encellede, kolbeformede Slimkjertler, Tab. XXII, Fig. 6 *f*, samt en stor Mængde Nematocyster, Tab. XXII, Fig. 6 *g*. Paa Svælgrørets indre Flade er der en Svælggrube (Siphonoglyph), som er temmelig dyb med tykke, afrundede Rande, indtagende hele Rørets Længde, og hvori ikke sees Nematocyster, Tab. XXII, Fig. 7 *b*; den øvrige Del af Fladen er foldet og slimet, Tab. XXII, Fig. 7 *d*.

Tentaklerne ere udvendigt beklædte med et Ectoderm, bestaaende af meget høie Cylinderceller, Tab. XXII, Fig. 2 *a*, hvorimellem sees en utallig Mængde Nematocyster, Tab. XXII, Fig. 2 *b*. Indenfor Ectodermet er et Lag med stærke Længdemuskler, Tab. XXII, Fig. 2 *c*, der støde umiddelbart til et Bindevævslag, forsynet med Bindevævslegemer og Ernæringskanaler, Tab. XXII, Fig. 2 *d*. Paa Bindevævslets indre Væg sees temmelig stærke, cirkulære Muskler, Tab. XXII, Fig. 2 *e*, der beklædes af et Endothel, dannet af meget høie, cilierende Cylinderceller, Tab. XXII, Fig. 2 *f*.

Jeg omtalte tidligere, at Polyperne ikke stode i direkte Forbindelse med hinanden men ved Kanaler, der vare næsten retliniede, hvor der kun var to sammenhængende Polyper, saa at Ernæringsvædsken hos den ene Polyp med Lethed

In the second place, the muscular arrangement is different from that which is usually found in Actinidæ, as there are longitudinal muscles on both sides of each septum, so that each of them appears to be so far independent, that they do not require, in order to form a pair, to turn their homologous sides, that is to say the longitudinal muscles, towards each other, as this according to their arrangement must of necessity be so.

With regard to the situation of the longitudinal muscles on the septa, it appears, to me, that the relations resemble in a great degree those I have stated in respect of the Edwardsiæ I have investigated, and of the two new genera Fenja and Ægir, to be subsequently dealt with in this memoir. In none of these are the septa placed in pairs, and I am, therefore, most disposed to consider, that the septa of Mardöll are not paired, but that there are 18 perfect and 18 imperfect septa, of which two of the first-named and two of the last-named may be considered to be directive septa (Pl. XXI, fig. 17 *a, b*). Mardöll has, otherwise, so much in common with Zoanthidæ that it ought assuredly to be placed in that group.

The gullet-tube is very short, almost cylindrical; upon its external, almost smooth side, where the macrosepta are attached, there is a ciliating epithelium formed of rather short cylinder-cells with their nucleus and nucleus-corpuscle (Pl. XXI, fig. 16 *f*); to the inside of that transversal muscle-fibres are observed (Pl. XXII, fig. 6 *b*), lying close to the not very broad layer of connective-tissue (Pl. XXII, fig. 6 *c*). Upon the inner surface of that connective-tissue there is a layer of rather strong longitudinal muscles (Pl. XXII, fig. 6 *d*), which are clad with an endothelium consisting of very long ciliating cylinder-cells (Pl. XXII, fig. 6 *e*), between which are seen, here and there, unicellular, claviform, mucous glands (Pl. XXII, fig. 6 *f*), also a great multitude of nematocysts (Pl. XXII, fig. 6 *g*). Upon the inner surface of the gullet-tube there is a gullet-groove (siphonoglyph) which is rather deep, with thick rounded margins, and occupies the entire length of the gullet-tube; in it no nematocysts are observed (Pl. XXII, fig. 7 *b*); the remaining part of the surface is folded and viscous (Pl. XXII, fig. 7 *d*).

The tentacles are clad externally with an ectoderm consisting of very high cylinder-cells (Pl. XXII, fig. 2 *a*), between which there are seen an innumerable multitude of nematocysts (Pl. XXII, fig. 2 *b*). Inside the ectoderm there is a layer of strong longitudinal muscles (Pl. XXII, fig. 2 *c*), which immediately unites to a connective-tissue layer furnished with connective-tissue corpuscles and nutritory ducts (Pl. XXII, fig. 2 *d*). Upon the inner wall of the connective-tissue rather strong circular muscles are observed (Pl. XXII, fig. 2 *e*), which are clad with an endothelium formed of very high, ciliating cylinder-cells (Pl. XXII, fig. 2 *f*).

I mentioned, previously, that the polyps did not stand in direct connection with each other, but by ducts that were almost rectilineal, where there were only two united polyps, so that the nutritory fluid of the one polyp could

kunde trykkes over i den anden Polyps Gastrovascularhulhed, hvorved Kroppen svulmede stærkt op. Men hvor flere Polyper hænge sammen, der er dette Kanalsystem noget mere indviklet, idet nemlig Coenenchymet, Tab. XXII, Fig. 1 *f*, der binder Polyperne sammen, er mere eller mindre optaget af Kanaler, som udgaa fra Polypernes Bund, Tab. XXII, Fig. 1 *a*. Disse Kanaler ere tildels temmelig brede, Tab. XXII, Fig. 1 *b, c*, løbe i forskellige Retninger og ere beklædte med et cilierende Epithel, Tab. XXII, Fig. 1 *e*, ligt det, der tapetserer Polypens Gastrovascularhulhed.

Findested.

Station 190.	10 Exemplarer.
— 290.	Nogle Exemplarer.
— 323.	En stor Mængde Exemplarer.
— 363.	20—30 Exemplarer.

Det vil af Figurerne paa Tavle XXI sees, at det er hovedsagelig fra Polypens nederste (bagerste) Ende — dens Basaldel — at der udskyder nye Polyper. I Begyndelsen danner der sig ved Grunden en liden, næsten rund Knop, Tab. XXI, Fig. 6, og undersøger man nu denne vordende Polyp, saa viser det sig, at Moderpolyper fra dens Bund sender nogle Kanaler gennem et yderst smalt Coenenchym til Knoppen, der er en Udbugning af dette, og hvori endnu ingen Septadannelse har fundet Sted. Efterhaanden som Knoppen voxer frem, antager den Cylindrerformen, og naar den har naaet en Længde af nogle Millimeter, Tab. XXI, Fig. 5, 8, sees de fuldstændige Septa som yderst smale Lister, der rage kun lidet frem i Hulheden. Imellem Moderpolyper og Ungen er der en tydelig Grændse, som endog udvendig giver sig tilkjende ved en ringformig Fortykkelse, der danner Coenenchymet imellem begge Polyper, Tab. XXI, Fig. 7. Naar nu den unge Polyp er voxet end mere, gjennembrydes den fri Ende, idet Mundskive, Mund og Tentakler ere dannede, Tab. XXI, Fig. 1, 5, 8. De fuldstændige Septa, Macro-septa, have dog vist sig i en længere Tid, førend dette Gjennembrud finder Sted; men det er at bemærke, hvad jeg forresten tidligere har anført, at imedens de fuldstændige Septa udgaa fra Polypens Bund, er dette ikke Tilfældet med de ufuldstændige.

Ofte bøier den unge Polyp sig under Væksten, saa at dens Basaldel sammen med Moderens danner en Bue, Tab. XXI, Fig. 13. I Regelen er det kun en Knop, som skyder ud fra Moderens Basaldel; men det hænder og, at 2 ja endog 3 udskyder derfra omtrent samtidigt, og da indtager gjerne den ene en Sideplads, Tab. XXI, Fig. 1, 5, 7. Iblandt den store Mængde Exemplarer, jeg har raadet over, findes mange, hvor kun to Polyper ere sammenføjede, og som muligens hele Livet igjennem forblive saaledes parrede; men endnu foregaar Kolonisationen i rigere Maalestok, idet der fra de to Polyper udvoxer flere, Tab. XXI, Fig. 3. 4. 9. Efterhaanden som de unge Polyper voxe, til-

be easily forced into the gastro-vascular cavity of the other polyp, causing the body to become considerably swollen. But when several polyps are united this ductiferous system is somewhat more developed, in so far, that the sarcosoma (Pl. XXII, fig. 1 *f*) which unites the polyps together, is more or less occupied by ducts that issue from the base of the polyps (Pl. XXII, fig. 1 *a*). These ducts are sometimes pretty wide (Pl. XXII, fig. 1 *b, c*), and run in various directions, and they are clad with a ciliating epithelium (Pl. XXII, fig. 1 *e*) like that which coats the gastro-vascular cavity of the polyps.

Habitat.

Station No. 190.	Ten specimens.
.. 290.	A few specimens.
.. 323.	A great many specimens.
.. 363.	Twenty to thirty specimens.

It will be observed from the illustrations on Plate XXI, that it is principally from the lowest (posterior) extremity of the polyp that new polyps are produced. In the commencement there is formed at the base, a small, almost round bud (Pl. XXI, fig. 6), and if we now examine this prospective polyp, it is seen that the parent-polyp sends out from its base a few ducts, through an extremely narrow sarcosoma, to the offspring which is a protuberance upon it, and in which no formation of septa has yet taken place. As the bud increases gradually in growth it assumes the cylindrical form, and, when it has attained a length of a few millimetres (Pl. XXI, fig. 5, 8), the perfect septa become visible, like extremely narrow fillets that only extend a little way into the cavity. Between the parent-polyp and the offspring there is a distinct demarcation, which is even externally recognisable, by an annular thickening that forms the sarcosoma between both polyps (Pl. XXI, fig. 7). When, now, the young polyp has grown still more, its free extremity becomes pierced, and the oral disc, mouth and tentacles are formed (Pl. XXI, fig. 1, 5, 8). The perfect septa (macro-septa) have, however, appeared for some time previous to this perforation taking place; but it is to be noted, what I also already have mentioned, that while the perfect septa issue from the base of the polyp, such is not the case with the imperfect ones.

The young polyp often curves itself during its growth, so that its basal part together with that of the parent-polyp forms an arc (Pl. XXI, fig. 13). Usually there is only one bud that projects from the basal part of the parent-polyp, but it happens, occasionally, that two, indeed even 3, project from it at about the same time, and then the one often occupies a lateral situation (Pl. XXI, fig. 1, 5, 7). Among the very numerous specimens I have had at my disposal, there are many in which only two polyps are united, and which probably, throughout all their existence, remain thus paired; but yet the colonisation proceeds on an extended scale, inasmuch, that from the

tager altid Coenenchymet, som binder dem sammen, baade i Tykkelse og Bredde, Tab. XXI, Fig. 11, 12, 14, 15, men forbliver temmelig glat uden Tendens til at fæste sig, og synes at være saa fast, at det holder Kolonien godt samlet. Kun paa yderst faa Exemplarer har jeg iagttaget, at Knop-skydningen foregaar fra Basaldelens nederste Sidedel, Tab. XXI, Fig. 1, 5, 10; i Regelen foregaar den fra Coenenchymet. Stundom kan Coenenchymet, der sammenbinder flere Polyper, være temmelig smalt, men det er dog altid afrundet, fast og meget stærkt inkrusteret; Inkrustationen er bestandig stærkere end paa selve Polyperne. Disse større eller mindre Kolonier af Polyper holde godt sammen; de ligge løst i Sandet, og de enkelte Individuer i Kolonien viser ingen Tendens til at skille sig fra sine Kamerater.

Dr. Erdmann mener at hos hans Slægt løsriver de enkelte Individuer sig for at danne en ny Koloni, efterat de ere frigjorte. Han ytrer: „Die Abschnürung scheint beständig fortzuschreiten und schliesslich zur gänzlichen Isolation des Töchterthieres zu führen“. Saaledes er i alle Fald ikke Forholdet hos Slægten *Mardöll*. Af de mange Hundrede Exemplarer, jeg har undersøgt, findes der ikke noget, som tyder hen paa en saadan Isolation. Sagens findes der nogle isolerte Polyper, der i deres Basalende har en fin Aabning, som efter Erdmann skulde tyde hen paa en Afløsning fra Moderdyret; men denne Aabning tyder aabenbart hen paa, at Dyret ved ydre Vold er fra-revet Kolonien. Derimod findes flere isolerede Polyper, hos hvem alt peger i den Retning, at de ere udviklede af Æg, og som blive Stampolyper for den vordende Koloni. Disse Stampolyper ere langstrakte, kølleformede og fuldkommen afrundede i deres Basalende, der er jævn og uden Spor af Aabning eller andet, som kunde føre Tanken hen paa en Afløsning, Tab. XXI, Fig. 19, 20. Fra en saadan Moderpolyps Grunddel er det da, den første Knop skyder ud, Tab. XXI, Fig. 6, og fra nu af er Kolonisationen sat i Gang.

For *Mardölls* Vedkommende kan der saaledes ikke godt blive Tale om Enkelpolyper, „Einzelpolyper“, som et Karakteristikon for Slægten; thi aabenbart lever den i Kolonier ligesaa fuldt som Slægterne *Polythoa* og *Epizoanthus*; men hvad der er karakteristisk, er unægtelig den Særegenhed, at imedens de sidstes Kolonier ere fæstede ved et mere eller mindre udbredt Coenenchym til forskellige Gjenstande, ere *Mardöll*kolonierne ikke fæstede, men leve ved deres afrundede, tildels halvkugleformede, egale Coenenchym, frit i eller paa Sandet. Efter dette har jeg ikke kunnet henføre Slægten *Mardöll* til Familien *Sphenopidæ*, Hertwig, da den hverken er en enkeltlevende Zoanthide eller har nogen Hefteskive, der fæster den til Bunden, men har maattet danne en ny Familie for den.

two polyps there spring several (Pl. XXI, fig. 3, 4, 9). As the growth of the young polyps proceeds, so does the sarcosoma which unites them together also increase, both in thickness and breadth (Pl. XXI, fig. 11, 12, 14, 15), but remains pretty smooth, without any tendency to attach itself, and appears to be so firm, that it retains the colony well together. Only in extremely few specimens have I observed the budding proceed from the lowest lateral part of the basal portion (Pl. XXI, fig. 1, 5, 10). It usually proceeds from the sarcosoma. Occasionally the sarcosoma that unites several polyps together may be rather narrow, but it is, however, always rounded, firm, and very strongly encrusted. The encrustation is always stronger than on the polyps themselves. These larger or smaller colonies of polyps hold well together; they lie loose in the sand, and the individuals of the colony show no tendency to separate themselves from their neighbours.

Dr. Erdmann thinks, that in his genus the individual members detach themselves in order to form a new colony after the detachment has taken place. He says: „Die Abschnürung scheint beständig fortzuschreiten und schliesslich zur gänzlichen Isolation des Töchterthieres zu führen“. Such is, at any rate, not the case in the genus *Mardöll*. In the many hundreds of specimens I have examined there is nothing to be observed that indicates any such an isolation. True enough, there are found a few isolated polyps that in their basal extremity have a minute aperture, which, according to Erdmann, would indicate a separation from the parent animal; but this aperture evidently points to the animal having become detached from the colony owing to external violence. On the other hand, several isolated polyps are found, regarding which everything points in the direction that they have been developed from ova, and which become the parent polyps of the prospective colony. Those parent polyps are elongate, claviform, and perfectly rounded in their basal extremity, which is even and without trace of aperture or any feature that could lead to the thought of a detachment having occurred (Pl. XXI, fig. 19, 20). It is from such a parent polyp's base that the first bud therefore shoots forth (Pl. XXI, fig. 6), and from that time the colonisation progresses.

There can, therefore, in regard to *Mardöll*, scarcely be any talk of single polyps, „Einzelpolyper“, as a characteristic feature of the genus; because they evidently exist in colonies just as well as the genera *Polythoa* and *Epizoanthus*; but what is a characteristic feature, is, indisputably, the peculiarity, that while the colonies of the last-named are attached by a more or less broad sarcosoma to various objects, the *Mardöll* colonies are not attached, but exist with their round, sometimes semispherical, even sarcosoma free, in or upon the sand. For these reasons I have not been able to assign the genus *Mardöll* to the family *Sphenopidæ*, Hertwig, as it is neither an isolated Zoanthid nor has it any attachment-disc that secures it to the sea-bottom, and I have therefore been obliged to form a new family for it.

Slægtskarakter.

Mardøllider med fast, inkrusteret Hud, endodermale Cirkulærmuskler; Macrosepta fuldstændige, bærende Generationsorganer og Mesenterialfilamenter, Microsepta ufuldstændige, golde. En Svælgrube. Adskilt Kjon.

Artskarakter.

Legemet bægerformet, 35^{mm} langt, 20^{mm} bredt foroven; den smale Basaldel omtrent 5^{mm} bred, stærkt inkrusteret af Sand. Kroppens øverste Rand forsynet med 18 bladformede, inkrusterede Ribber, strækkende sig til Mundskivens ydre Rand. Imellem Ribberne er Huden nøgen, ligesaa Mundskiven, der er plan, forsynet med 18 fine Folder, udgaaende fra den noget fremstaaende Mund imod den indre Tentakelrække. En lidet udpræget Gonidiefure. Tentaklerne i to Rækker, slanke, længere end Skivens Bredde, 18 i hver Række, de i den indre længst. Farven: Kroppen er let brunrød, næsten teglstensrød, Tentaklerne lysere, brunrøde; Mundskiven endnu lysere end Tentaklerne, og omkring Mundskivens ydre Rand, lige ved den indre Tentakelrække, en smal, lys, rosenrød Ring. Paa de unge Polyper ere Farverne noget intensere.

Epizoanthus arborescens, n. sp.

Tab. VI, Fig. 6; Tab. XXIV, Fig. 1—4.

Coenenchymet er tyndt, membranøst udbredt snart paa en større eller mindre Sten, snart spundet om tynde Gjenstande, saasom Serpularør og andet lignende, Tab. VI, Fig. 6; Tab. XXIV, Fig. 1 a. Fra dette Coenenchym reiser flere Polyper sig dels lodret, dels mere krybende, hvorved hele Kolonien faar et grenet Udseende, Tab. VI, Fig. 6; Tab. XXIV, Fig. 1.

Polyperne ere kølleformede, og de fuldvoxne Individder 35^{mm} lange med en forholdsvis meget smal Basaldel, kun 5^{mm} bred, imedens den øverste Ende er 12^{mm} bred. Hele Legemet er inkrusteret af mer eller mindre grov Sand, der dog ikke danner et tykkere Lag end at, naar Dyret er udstrakt og i fuld Vigør, den hvidrøde Hud skinner igjennem. Opimod Kroppens øverste Rand sees 16 temmelig lange, lancetformede Ribber, der vende deres spidse Del mod Mundskiven, Tab. VI, Fig. 6 b, og som, naar Tentaklerne ere indtrukne, bidrage til at give den øverste, afrundede Kropsdel et straalet Udseende.

Mundskiven er temmelig flad og fint foldet, og Munden er næsten rund. Tentaklerne ere retraktile, sidde i 2 Rækker, 16 i hver; de ere længere end Mundskivens Bredde,

Generic characteristics.

Mardöllidæ with firm, encrusted integument; endodermal circular muscles. Macrosepta perfect, carrying reproductive organs and mesenterial filaments. Microsepta imperfect, sterile. A gullet-groove. Separated sexes.

Specific characteristics.

The body chalice-formed, 35^{mm} in length, 20^{mm} in breadth at the top; the narrow basal part about 5^{mm} in breadth, strongly encrusted with sand. The uppermost margin of the body furnished with 18 foliform, encrusted ribs, extending themselves to the outer margin of the oral disc. Between the ribs the integument is bare, also the oral disc is bare; this last is plane, furnished with 18 fine folds issuing from the somewhat projecting mouth towards the inner tentacular series. A little-distinguished gonidial-groove. The tentacles in two series, slender, longer than the breadth of the disc, 18 in each series, those of the inner series being longest. *The colour.* The body is a light brownish-red almost brick-red, the tentacles lighter coloured brownish-red; the oral disc still lighter in colour than the tentacles, and round the outer margin of the oral disc, close to the inner tentacular series, there is a narrow, light-coloured rose-red annulus. In the young polyps the colours are somewhat more intense.

Epizoanthus arborescens, n. sp.

Pl. VI, fig. 6; Pl. XXIV, figs. 1—4.

The sarcosoma is thin and membranaceously expanded, sometimes over a greater or a smaller stone, or sometimes twined round a small object such as a serpula-tube or similar object (Pl. VI, fig. 6; Pl. XXIV, fig. 1 a). From this sarcosoma several polyps rise up, sometimes erect, sometimes somewhat trailing, producing a ramificated appearance in the entire colony (Pl. VI, fig. 6; Pl. XXIV, fig. 1).

The polyps are claviform; the fully adult individuals measure 35^{mm} in length, and have a, relatively, very narrow basal part, only 5^{mm} in breadth, while the uppermost extremity measures 12^{mm} in breadth. The entire body is encrusted with more or less coarse sand, which does not, however, form a thicker layer than, when the animal is extended and in full vigour, permits the whity-red integument to shine through it. Towards the uppermost margin of the body 16 rather long, lanceolate ribs are observed; these turn their acuminate portion towards the oral disc (Pl. VI, fig. 6 b), and when the tentacles are retracted they contribute to impart to the superior, rounded portion of the body a radiate appearance.

The oral disc is rather flat, and finely folded; the oral aperture is almost circular. The tentacles are retractile and situated in two series, 16 tentacles in each; they are

især ere de i den inderste Række meget lange. Farven: Den inkrusterede Del af Kroppen er graa, spillende lidt i det Grønne. Mundskiven er næsten hvid, med et svagt rødt Skjær. Tentaklerne ere bleg rosenrøde, Tab. VI, Fig. 6.

Anatomisk-histologisk Undersøgelse. Kroppens Hud har et ydre Epithellag, bestaaende af Cylinderceller med deres aflange Kjerne, Tab. XXIV, Fig. 2 a, indenfor hvilket er et ikke meget bredt Bindevæv (Mesoderm), Tab. XXIV, Fig. 2 b, der ligefra Ectodermet til Entodermet er saagodtsom ganske opfyldt af uorganiske Bestanddele — Kvartstumper, Sandkorn, Skjæl af Foraminiferer, Kiselnaale o. s. v. Bindevævet er derved betydeligt reduceret; kun hist og her sees enkelte Lameller, der ligge imellem de fremmede Legemer, ligesom der opimod Mundskiven, hvor Inkrustationen er mindre kompakt, iagttages enkelte Masker, der ogsaa ere opfyldte, Tab. XXIV, Fig. 2 c. Henimod Bindevævet indre Flade sees paa enkelte Steder Ringmuskelfibre, der ere endog meget spredte, Tab. XXIV, Fig. 2 d, men samle sig til en stærk Muskel paa Mundskiven, imedens de ganske forsvinde ned imod Polypens Grunddel.

Det har ikke været muligt at opdage de for Zoantherne saa særegne store Celler (Zellhöfe) i Bindevævet, ligesom Bindevævslegemerne synes at være sparsomme; men som tidligere anført, Bindevævet er saa optaget af fremmede, uorganiske Bestanddele, at dets Struktur vanskelig kan udgranskes, Tab. XXIV, Fig. 2 e.

Paa Bindevævet indre Flade ligger det sædvanlige Muskellag, der dog ikke er meget fremtrædende og bestaar af Tver- og Længdemuskler, hvoraf de sidste ere mest udviklede, Tab. XXIV, Fig. 2 f. Hele Gastrovascularhulhedens Vægge ere beklædte med et Endothel, der dannes af cilierende Cylinderceller.

Der er 16 fuldstændige Septa og ligesaa mange ufuldstændige, eller, om man vil, 16 Par Septa, som dannes af 16 Macroseptia og 16 Microseptia, Tab. XXIV, Fig. 3, (paa et Exemplar var der 18 Septapar). Af disse Septapar er der 2, som maa betragtes som Retningsseptia, nemlig et Par, der bestaar af Macroseptia og ere fæstede til den Del af Svælgrøret, paa hvis indre Flade Svælgruben findes, og angiver Bugsiden, Tab. XXIV, Fig. 3 a, og det andet Par, som bestaar af Microseptia og vender til Rygsiden, Tab. XXIV, Fig. 3 b.

Heller ikke paa denne Art finder jeg, at Benævnelsen Septapar er stærkt begrundet i de naturlige Forholde; thi her, ligesom hos Mardöll, tage ei alene Septaerne ikke deres Udspring fra samme Sted (saaledes udgaa de fuldstændige Septa, Macroseptia, fra Bunden af Gastrovascularhulheden, imedens de ufuldstændige, Microseptia, tage deres Begyndelse lidt længere oppe paa Kroppsvæggen), men de

longer than the breadth of the oral disc, and in the inner series, especially, they are much longer. *The colour.* The encrusted portion of the body is grey, with a play of greenish colour. The oral disc is almost white with a faint reddish tinge. The tentacles are pale rosy-red (Pl. VI, fig. 6).

Anatomo-histological Investigation. The integument of the body has an external epithelial layer consisting of cylinder-cells with their oblong nuclei (Pl. XXIV, fig. 2 a), inside of which there is a not very broad connective-tissue (mesoderm) (Pl. XXIV, fig. 2 b), which is, quite from the ectoderm to the entoderm, almost completely occupied by inorganic substances, such as fragments of quartz, grains of sand, shells of foraminifera, needles of silicon, etc. The connective-tissue is, therefore, considerably diminished in quantity; only here and there a few lamellæ are observed lying between the foreign substances; while, also, up towards the oral disc, where the encrustation is not so compact, there are observed a few meshes that are also occupied (Pl. XXIV, fig. 2 c). In proximity to the internal surface of the connective-tissue, annular muscle-fibres are observed in a few places; these are, however, much scattered (Pl. XXIV, fig. 2 d) but collect themselves into a powerful muscle on the oral disc, while they completely disappear down towards the basal portion of the polyp.

It has not been possible to discover the large cells (Zellhöfe) in the connective-tissue that are so characteristic of the Zoantidæ, while the connective-tissue corpuscles, also, appear to be sparingly present; but, as previously stated, the connective-tissue is so occupied with foreign inorganic substances, that its structure can with difficulty be investigated (Pl. XXIV, fig. 2 e).

Upon the internal surface of the connective-tissue the usual muscular layer lies, but is, however, not very prominent, and consists of transversal and longitudinal muscles, of which the last-named are the most developed (Pl. XXIV, fig. 2 f). The entire walls of the gastrovascular cavity are clad with an endothelium formed of ciliating cylinder-cells.

There are 16 perfect septa and the same number of imperfect ones, or, as we may say, 16 pairs of septa, formed of 16 macroseptia and 16 microseptia (Pl. XXIV, fig. 3); in a single specimen there were 18 pairs of septa. Of these pairs of septa, there are two pairs which must be regarded as directive septa; thus, one pair that consists of macroseptia, and which are secured to the portion of the œsophagus upon whose inner surface the gullet-groove is found, indicating the ventral side (Pl. XXIV, fig. 3 a), and the other pair, that consists of microseptia and face to the dorsal side (Pl. XXIV, fig. 3 b).

Neither do I find in this species that the appellation — pair of septa — is fully warranted by the natural relations, as here, as in Mardöll, the septa not only do not originate from the same situation (the perfect septa — macroseptia — issue from the bottom of the gastrovascular cavity, while the imperfect septa — microseptia — originate a little farther up on the body-wall), but the

ufuldstændige Septa ere saa lidet udviklede, at de rage som tynde Lister kun et lidet Stykke ind i Gastrovascularhulheden og staa temmelig langt fra de fuldstændige Septa, — og endelig er Muskelanordningen omtrent saaledes som angivet for *Mardöll*, og neppe som *Hertwig* og *Erdmann* angiver for de af dem beskrevne Arter.

Macrosepta bestaa af en Bindevævs-lamelle (Stützmembran) temmelig smal ved deres Udspring, men som bliver meget bredere, jo længere den kommer op paa Kropsvæggen, saa at den indtager den største Bredde nogle Millimeter fra Svælgrøret, Tab. XXIV, Fig. 3 c; her spalter Bindevævs-lamellen sig saa, at der synes at fremkomme en Kanal, Tab. XXIV, Fig. 3 d, paa hvis Vægge jeg dog ikke har kunnet iagttage noget Epithel; heller ikke findes en saadan Spaltning af Bindevævs-membranen paa alle Septa. *Erdmann* har hos flere af hans Arter fundet en saadan Kanal; men den har altid været beklædt med Epithel; jeg tør saaledes ikke med Sikkerhed paastaa, at der er en virkelig Kanal i de fuldstændige Septa hos *Epizoanthus arborescens*, — det kan nemlig hænde, at den paa Tver-snittet fremstillede Spalte er en Tilfældighed.

Som sædvanligt ere Septaerne forsynede med Tver- og Længdemuskler; Tvermusklerne ere visselig lidet udviklede og ganske skjulte af Længdemusklerne, der synes at beklæde begge Sider og ere ingenlunde meget fremtrædende. Det er derfor ikke muligt hos denne Art at kunne bestemme, hvorvidt Længdemusklerne paa Macrosepta staa i et saadant Forhold til dem paa Microsepta, der skal betinge *Pardannelsen*. Samtlige Macrosepta bære Mesenterialfilamenter og Generationsorganer.

Mesenterialfilamenterne tage deres Udspring lidt nedenfor Svælgrørets fri Ende, ere ved tyndt Bindevæv bundne til Septumets Bindevævs-lamel og følger Septumet et langt Stykke ned i Gastrovascularhulheden, men frembyder forøvrigt intet Særegent i sin Bygning, Tab. XXIV, Fig. 4 a. Generationsorganet, som hos de undersøgte Individuer bestod af et cylindrisk Rør, der slyngede sig proptrækkerformigt nedover langs Mesenterialfilamentet, var fyldt med Æg, som vare kun lidet udviklede, Tab. XXIV, Fig. 4 b. Kjønnen synes at være adskilt. Paa Tversnit sees saavel Mesenterialfilamenterne som Kjønsorganerne at være stærkt sammenrullede paa Septa, hvorved disse faa Udseende af et stilket Blomkaalshoved, Tab. XXIV, Fig. 4; men denne stærke Sammentrækning er sandsynligvis Virkningen af Alkohol, hvori Dyrene have været opbevarede.

Microsepta danne yderst smale, listeformige Frem-spring, Tab. XXIV, Fig. 3 e, der ere omtrent lige brede fra deres Begyndelse og til de fæste sig paa Mundskivens Underflade — kan hænde, at de blive lidt bredere opimod denne. Ogsaa her forekommer det mig, at Længdemusklerne beklæde begge Sider af Septum og dække Tvermusklerne; men hverken det ene eller andet Slags Muskler ere

imperfect septa are so little developed, that they penetrate, like thin fillets, only a little way into the gastro-vascular cavity, and stand at a considerable distance from the perfect septa; and, finally, the muscular arrangement is nearly the same as that indicated for *Mardöll*, and is scarcely like what *Hertwig* and *Erdmann* have stated for the species described by them.

The macrosepta consist of a connective-tissue lamella, (stützmembran) rather narrow at their origin, but this becomes much broader the farther up the body-wall it proceeds, so that it attains its greatest breadth a few millimetres from the œsophagus (Pl. XXIV, fig. 3 c). The connective-tissue lamella becomes here split up, in such a manner, that it appears to produce a channel (Pl. XXIV, fig. 3 d), on whose walls I have, however, not been able to observe any epithelium, and neither is such a splitting of the connective-tissue membrane found on all the septa. *Erdmann* has found, in several of his species, a similar channel, but it has always been clothed with epithelium. I dare not, therefore, with certainty, affirm that there is a real channel in the perfect septa of *Epizoanthus arborescens*; it may, perhaps, be the case that the fissure presented in the section is accidental.

The septa are, as usual, furnished with transversal and longitudinal muscles; the transversal muscles are evidently little developed, and are quite concealed by the longitudinal muscles, which appear to clothe both sides and are by no means very prominent. It is, therefore, not possible in this species to determine whether the longitudinal muscles of the macrosepta stand in such a relation to those of the microsepta, that they occasion the formation of pairs. All the macrosepta carry mesenterial filaments and reproductive organs.

The mesenterial filaments have their origin a little below the free extremity of the œsophagus, and are attached by a thin connective-tissue to the connective-tissue lamella of the septum, and accompany it a long way down into the gastro-vascular cavity, but present, otherwise, nothing peculiar in their structure (Pl. XXIV, fig. 4 a). The organ of reproduction, which, in the specimens examined, consisted of a cylindrical tube that twined itself, spirally, like a cork-screw, down along the mesenterial filament, was filled with ova that were only little developed (Pl. XXIV, fig. 4 b). The sexes appear to be separated. In transversal sections, both the mesenterial filaments and the reproductive organs appear to be strongly coiled together upon the septa, so that these last acquire the appearance of a cauliflower head seated on a stalk (Pl. XXIV, fig. 4); but that great contraction is probably due to the action of the alcohol in which the animals have been preserved.

The microsepta form extremely narrow fillet-formed protuberances (Pl. XXIV, fig. 3 e), which are nearly uniform in breadth from their commencement until they attach themselves to the under surface of the oral disc; they are perhaps very slightly broader close up to it. Here also, it appears, to me, that the longitudinal muscles cloth both sides of the septum, and cover the transversal muscles, but

meget udviklede. Microsepta ere golde, bære heller ikke Mesenterialfilamenter.

Svælgrøret er cylindrisk, ikke meget langt, stærkt foldet paa indre Flade og har en udpræget Svælggrube, Tab. XXIV, Fig. 3 f.

Tentaklerne ere udvendig beklædte med et Epithel, bestaaende af høie, cilierende Cylinderceller (Ectodermet), imellem hvilke er en stor Rigdom af Nematocyster. Indenfor Ectodermet er et stærkt Lag af Længdemuskler, der støtter sig til et temmelig bredt Bindevævslag, paa hvis indre Væg findes Cirkulærmuskler, som ere beklædte med cilierende Cylinderepithel (Endothelet), der udfylder en stor Del af Hulheden.

Findested.

Station 149. Nogle Exemplarer.

Artskarakter.

Fra det tynde, membranøse Coenenchym reise sig flere Polyper, dels lodret, dels mere horizontalt, hvorved Kolonien faar et grenet Udseende. Polyperne kølleformede, indtil 35^{mm} lange, med en kun 5—6^{mm} bred Grunddel. Hele Legemet inkrusteret af Sand. Opimod Kroppens øverste Rand sees 16 lancetformede Ribber. Mundskiven flad og fint foldet. Munden næsten rund. Tentaklerne retraktile, sidde i to Rækker, 16 i hver. Farven: Den inkrusterede Del af Legemet er graa, spillende lidt i det Grønne. Mundskiven næsten hvid med et rødligt Skjær. Tentaklerne bleg rosenrøde.

Epizoanthus glacialis, n. sp.

Tab. VI, Fig. 7—9; Tab. XXIV, Fig. 5—8; Tab. XXV, Fig. 1—3.

Coenenchymet er ikke meget udbredt og sees snart paa flade Stene, snart spundet om tomme Tubularierør eller andre tynde Gjenstande, Tab. VI, Fig. 7, 8; Tab. XXIV, Fig. 5, 6. Det er temmelig tyndt og tildels saa gjennemsigtigt, at det er let at se, hvorledes det bestaar af Længdekanaler, der ved Tvergrene kommunikere med hverandre og derved danne et sirligt Netværk, Tab. VI, Fig. 8; Tab. XXIV, Fig. 6 a, hvorigjennem den ene Polyp kommunikerer med den anden. Polyperne sidde i Regelen isolerede, temmelig langt fra hinanden; selv om der paa en Sten findes mange Individuer, sidde de dog adskilte, idet 2 og 3 Polyper hyppigst have deres eget Coenenchym, der ikke korresponderer med de øvrige tilstedeværende Grupper.

neither the one nor the other kind of muscles are much developed. The microsepta are sterile, and neither do they carry mesenterial filaments.

The œsophagus is cylindrical, not very long, and is strongly folded on the inner surface; it has a distinguished gullet-groove (Pl. XXIV, fig. 3 f).

The tentacles are clad externally with an epithelium consisting of high ciliating cylinder-cells (the ectoderm), between which there is a great wealth of nematocysts. On the inside of the ectoderm there is a strong layer of longitudinal muscles, which unite themselves to a rather broad layer of connective-tissue on whose inner wall circular muscles are found, and which is clad with a ciliating cylinder-epithelium (endothelium) that occupies a great part of the cavity.

Habitat.

Station No. 149. A few specimens.

Specific characteristics.

From the thin membranous sarcosoma several polyps rise up, sometimes vertically erect, sometimes more horizontally placed, imparting to the colony a ramificated appearance. The polyps are claviform, measure up to 35^{mm} in length, and have a basal part only 5—6^{mm} in breadth. The entire body is encrusted with sand. Towards the uppermost margin of the body 16 lanceolate ribs are observed. The oral disc is flat and finely folded. The oral aperture almost circular. The tentacles retractile, situated in two series, 16 in each series. *The colour.* The encrusted portion of the body is grey with a play of a slightly greenish colour. The oral disc is almost white with a reddish tinge. The tentacles pale rosy-red.

Epizoanthus glacialis, n. sp.

Pl. VI, figs. 7—9; Pl. XXIV, figs. 5—8; Pl. XXV, figs. 1—3.

The sarcosoma is not widely distributed, and appears sometimes on flat stones sometimes twined round empty tubes of Tubularia or other thin objects (Pl. VI, figs. 7—8; Pl. XXIV, figs. 5, 6). It is rather thin and partly so transparent, that it is easy to observe how it consists of longitudinal ducts, which by means of transversal branches communicate with each other, and in that manner produce an elegant reticulation (Pl. VI, fig. 8; Pl. XXIV, fig. 6 a) through which the one polyp communicates with the other. The polyps are, as a rule, placed singly, pretty far apart from each other; even if many individuals are found upon one stone, they are still seated separately, so that 2 and 3 polyps have most frequently their own sarcosoma, which does not correspond with the other groups present on the same spot.

Polyperne hæve sig soileformet fra Coenenchymet, ere cylindriske og lidt indknæbne paa Midten, Tab. VI, Fig. 7, 8. Columnen er inkrusteret med Sand, omkring 20^{mm} høi, 6^{mm} bred ved Basis, 6—7^{mm} bred ved den øverste Ende og 4^{mm} paa Midten. Naar Polyphen er indtrukket, er den øverste Ende tvers afskaaren med en liden Fordybning i Midten og afrundet Rand, der har 18 Straaler, Tab. VI, Fig. 9. Er Polyphen udstrakt, danne disse Straaler ligesaa mange inkrusterede Ribber, som strække sig et Stykke ned paa Kroppen, og imellem hvilke der er et temmelig bredt, nøgent Felt, Tab. VI, Fig. 7, 8; Tab. XXV, Fig. 5 a. Mundskiven er næsten flad og foldet. Folderne udgaa fra den lidt aflange Mund mod Peripherien.

Tentaklerne ere temmelig lange, sidde i 3 Rækker; de ere tykke ved Grunden, men ende konisk tilspidsede. Den første, yderste, Række har 18, den anden 12, — kun enkelte Exemplarer 18 — og i begge disse Rækker ere Tentaklerne omtrent lige lange; men den tredje, inderste, Række har kun 6, og disse ere baade de længste og tykkeste, — næsten lige saa lange som Mundskivens Bredde.

Naar den inkrusterede Sand er delvis afskrabet, sees paa Kroppens Overflade 18 Længdelinier, der staa tæt til hverandre og kun adskilte ved en fin, lysere Linie. Farven: Den inkrusterede Kropsdel er gulgrønlig, og naar Dyret er udstrakt, næsten gul, kun ved Grunden spillende noget i det Grønlig. Mundskiven er svag teglstensrød med mørkere Folder omkring Munden. Tentaklerne ere intensere røde end Mundskiven, men ere i Enderne noget blegere, Tab. VI, Fig. 7, 8, 9.

Anatomisk-histologisk Undersøgelse. Ved Tversnit af Kropshuden viser denne sig at bestaa af et ydre Epithel, dannet af Cylinderceller med deres lidt aflange Kjerne og et rundt Kjernelegeme. Indenfor dette er et temmelig bredt Bindevævslag, Tab. XXIV, Fig. 7 a, hvori findes foruden Bindevævslegemer og Ernæringskanaler i stor Mængde, Tab. XXIV, Fig. 7 b, c, indleirede større og mindre Sandkorn, der ere trængt igjennem hele Bindevævet lige til dets indre Flade, Tab. XXIV, Fig. 7 d, men ligge dog saa spredte, at der kan være større Mellemrum, hvori der ingen saadan Indleiring af fremmede Legemer finder Sted, og i disse Mellemrum sees et bredt Belte af Ringmuskler, som indtage Midten af Bindevævslaget, Tab. XXIV, Fig. 7 e; Tab. XXV, Fig. 1 a. Imellem den indvendige Flade af Bindevævet og Endothelet, der bestaar af temmelig smale, cilierende Cylinderceller, Tab. XXIV, Fig. 7 f; Tab. XXV, Fig. 1 b, ligger det sædvanlige Muskellag, som heller ikke hos denne Art er stærkt repræsenteret.

Der er 18 Macroseta og ligesaa mange Microseta, eller om man vil 18 Septapar. Macroseta, som ere fuld-

The polyps rise up like columns from the sarcosoma; they are cylindrical and a little constricted at the middle (Pl. VI, figs. 7, 8). The column is encrusted with sand; it measures about 20^{mm} in height, 6^{mm} in breadth at the base, 6—7^{mm} broad at the uppermost extremity, and 4^{mm} broad at the middle. When the polyp is retracted the uppermost extremity appears truncated, but with a little depression in the middle and a rounded margin carrying 18 radii (Pl. VI, fig. 9). When the polyp is extended, these radii form the same number of encrusted ribs, which extend themselves a small piece down the body and between which there is a pretty broad bare area (Pl. VI, figs. 7, 8; Pl. XXV, fig. 5 a). The oral disc is almost flat, and folded. The folds issue from the slightly oblong mouth towards the periphery.

The tentacles are pretty long and are placed in 3 series; they are thick at the base but terminate conically acuminated. The outermost series contains 18 and the second series 16, only occasional specimens containing 18 tentacles; in both those series the tentacles are about uniform in length; but the third, innermost series, has only 6 tentacles, and they are both the longest and the thickest, almost as long as the oral disc is broad.

When the encrusted sand has been partially scraped away, 18 longitudinal furrows are observed upon the surface of the body; these are placed close to each other and are only separated by a fine, lighter-coloured line. *The colour.* The encrusted portion of the body is greenish-yellow, but when the animal is extended almost yellow, having a somewhat greenish play of colour at the base only. The oral disc is faint brick-red, with darker folds around the oral aperture. The tentacles are more intensely red than the oral disc, but are somewhat paler in colour at the extremities (Pl. VI, figs. 7, 8, 9).

Anatomo-histological Investigation. In a transversal section of the integument of the body, the integument shows itself to consist of an external epithelium formed of cylinder-cells with their slightly oblong nuclei and a round nucleus-corpuscle. To the inside of that there is a rather broad layer of connective-tissue (Pl. XXIV, fig. 7 a), in which are found, besides connective-tissue corpuscles and nutritory ducts in great abundance (Pl. XXIV, fig. 7 b, c), larger and smaller grains of sand entrenched; these have forced themselves through the entire body of the connective-tissue, quite to its inner surface (Pl. XXIV, fig. 7 d) but are, yet, placed so scatteredly, that there may occur great intervals in which no such entrenchment of foreign bodies takes place, and in these interspaces a broad belt of annular muscles is observed occupying the middle of the connective-tissue layer (Pl. XXIV, fig. 7 e; Pl. XXV, fig. 1 a). Between the inner surface of the connective-tissue and the endothelium, which consists of rather narrow ciliating cylinder-cells (Pl. XXIV, fig. 7 f; Pl. XXV, fig. 1 b), lies the usual muscular layer, which is not either in this species strongly represented.

There are 18 macroseta, and the same number of microseta or, as we may say, 18 pairs of seta. The

stændige og fæste sig paa Svælgrøret, ere ikke meget brede og have Længde- og Tvermuskler, der ikke ere synderlig udviklede. Længdemusklerne indtage Størstedelen af Septumets ene Side og ere fjærformede; fra den anden Side, hvor Tvermusklerne ere fæstede, udgaa yderst smale Bindevævsmembraner, som bære Mesenterialfilamenterne og Generationsorganerne, Tab. XXIV, Fig. 8 a; Tab. XXV, Fig. 1 c. Mesenterialfilamenterne frembyde intet Særegent: de udspringe lige ved den nederste, fri Ende af Svælgrøret, ligge inderst mod Kropsvæggen og strække sig ned mod Gastrovascularhulhedens Bund.

Generationsorganerne udgaa omtrent fra samme Sted som Mesenterialfilamenterne, kun lidt nedenfor disse og ligge udenfor dem, altsaa fjernere Kropsvæggen. Kjønnene er sandsynligvis adskilt. Paa de undersøgte Individuer iagttoges kun Æggestokke; disse slyngede sig proptrækkerformet nedover Septum og indeholdt Æg i forskellige Udviklingsstadier, men som oftest var kun 1 Æg fuldt udviklet, og dette laa da indeni en temmelig rummelig Kapsel, Tab. XXV, Fig. 1 d.

Af de 18 fuldstændige Septa er der to Retningsseptas, som ere fæstede til Svælgrørets ydre Side just der, hvor Svælgrubben findes paa dettes indre Flade, Tab. XXIV, Fig. 8 b. Paa disse Septa er Muskelanordningen saaledes, som Dr. Erdmann har fundet den hos de af ham beskrevne Arter; de longitudinelle Muskler ere fæstede paa Septumets ydre Side og vende fra hverandre, imedens de transverselle findes paa den indre Side og saaledes vende mod hverandre; saavidt mine Undersøgelser gaa, er dette ogsaa Tilfældet med de øvrige Septa.

Microseptas ere ligeledes 18, hvoraf 2, der ere fæstede til Rygsiden, ere Retningsseptas og have Musklerne placerede som paa de fuldstændige Retningsseptas, Tab. XXIV, Fig. 8 c. Disse ufuldstændige Septas, der ere golde, ere meget smale, listeformige og placerede imellem de fuldstændige Septas, Tab. XXIV, Fig. 8 d. De ere dannede ligesom Macroseptas af en tynd Bindevævsmembran, hvis begge Sider ere beklædte med Muskler saaledes, at paa den ene Side ere Længdemusklerne fæstede og paa den anden Tvermusklerne. Her synes Musklerne, som i det Hele taget kun ere lidet udviklede, at være ordnede saaledes, at Længdemusklerne vende mod Længdemusklerne, og Tvermusklerne mod Tvermusklerne paa Macroseptas. Herfra gjør dog Retningsseptas en Undtagelse, hvilket ovenfor er antydnet. Jeg indrømmer, at hos denne Art er der stærkere Grund end hos de to tidligere beskrevne Arter til at parre Macro- og Microseptas sammen. Samtlige Septas ere beklædte med et Endothel, bestaaende af cilierende Cylinderceller, der egentlig beklæde hele Gastrovascularhulheden.

macroseptas, which are perfect and attach themselves to the œsophagus, are not very broad, and have longitudinal and transversal muscles that are, however, not particularly well developed. The longitudinal muscles occupy the greater part of the one side of the septum and are feather-shaped; from the other side, where the transversal muscles are secured, extremely narrow connective-tissue membranes issue, bearing the mesenterial filaments and reproductive organs (Pl. XXIV, fig. 8 a; Pl. XXV, fig. 1 c). The mesenterial filaments present nothing peculiar; they issue close to the lowest free extremity of the œsophagus, lie next to the body-wall, and extend themselves down towards the bottom of the gastro-vascular cavity.

The organs of reproduction issue from about the same situation as the mesenterial filaments, but a little below them and lying outside, consequently farther from the body-wall. The sexes are most probably separated. In the individuals examined, ovaries only were observed; those twined themselves spirally, like a cork-screw, down the septum, and contained ova in various stages of development, but most frequently one ovum only was fully developed, and that one then lay inside a pretty roomy capsule (Pl. XXV, fig. 1 d).

Of the 18 perfect septa, there are 2 directive septa which are secured to the outer side of the œsophagus, just at the point where the gullet-groove is found upon its inner surface (Pl. XXIV, fig. 8 b). Upon these septa the muscular arrangement is like what Dr. Erdmann has found it to be in the species described by him; the longitudinal muscles are secured to the outer side of the septum and turn away from each other, whilst the transversal muscles are found upon the inner side, and consequently face towards each other; so far as my investigations extend that is also the case with the remaining septa.

Of microseptas there are likewise 18, of which 2 that are secured to the dorsal side are directive septa and have the muscles placed in same manner as on the perfect directive septa (Pl. XXIV, fig. 8 c). These imperfect septa, which are sterile, are very narrow, fillet-formed, and are placed between the perfect septa (Pl. XXIV, fig. 8 d). They are formed, like the macroseptas, of a thin connective-tissue membrane, both of whose sides are clad with muscles in such manner, that on the one side longitudinal muscles are attached, and on the other side transversal muscles. Here the muscles, which, upon the whole, are only little developed, appear to be arranged in such manner, that the longitudinal and transversal muscles respectively face towards the longitudinal and transversal muscles of the macroseptas. From that rule, however, the directive septa form an exception, which has been indicated above. I confess that in this species there is stronger reason than in the previously described species, to pair the macroseptas and the microseptas together. All the septas are clad with an endothelium consisting of ciliating cylinder-cells, which indeed clothe the entire gastro-vascular cavity.

Svælgrøret danner en lidt fladtrykt Cylinder, som udvendigt er forsynet med Endothelbeklædning, indenfor hvilken er et Muskellag, der er Fortsættelse af Musklerne paa de fuldstændige Septa, og som er fæstet til et Bindevævslag, Tab. XXIV, Fig. 8 e, der tiltager betydeligt i Bredde mod Bugsiden, Tab. XXIV, Fig. 8 f, netop der, hvor de to fuldstændige Retningsseptata fæste sig. Den indre Flade frembyder en udpræget Svælgrube, Tab. XXIV, Fig. 8 g, som er forsynet med høje, smale Cylinderceller, der bære lange Cilier; den øvrige Del af den indre Svælgrubevæg er foldet og beklædt med meget lavere Cylinderceller, Tab. XXIV, Fig. 8 h, som have korte Cilier, og imellem hvilke der sees en stor Mængde encellede, kolbeformede Slimkjertler.

Tentaklerne ere paa sin ydre Væg beklædte med et Epithel, som bestaar af høje, smale, cilierende Cylinderceller, imellem hvilke der er en stor Mængde Nematocyster. Indenfor Ectodermet er et Lag stærke Længdemuskler, som ere fæstede til Bindevævet, der er temmelig bredt, forsynet med Bindevævslegemer og Ernæringskanaler, og paa hvis indre Flade cirkulære Muskler inserere sig. Disse ere beklædte med et Endothel, dannet af temmelig høje, smale, cilierende Cylinderceller, som rage langt ind i Tentakelhulheden.

Findested.

Station 164. Mange Exemplarer.
— 200. Nogle faa Exemplarer.

Artskarakter.

Coenenchymet ikke meget udbredt, dels fæstet paa Stene, dels omspundet tynde Gjenstande, saasom Tubularierør. Polyperne i Regelen isolerede, cylindriske, lidt indknebne paa Midten. Kolumnen inkrusteret med Sand, er 20^{mm} høj, 6^{mm} bred ved Grunden, 6—7^{mm} bred ved den øverste Ende og 4^{mm} paa Midten. Opimod dens øverste Rand 18 inkrusterede Ribber, imellem hvilke ligesaa mange nøgne Felter. Mundskiven næsten flad, foldet. Folderne udgaa fra den lidt aflange Mund til Peripherien. Tentaklerne sidde i 3 Rækker, ere temmelig lange, tykke ved Grunden, men ende konisk tilspidsede. I den yderste Række er der 18, i den mellemste 12, i begge disse Rækker ere Tentaklerne lige lange, men den inderste, 3die Række har kun 6, der ere de længste og tykkeste, næsten ligesaa lange som Mundskivens Bredde. Farven: Den inkrusterede Kropsdel er gulgrønlig; naar Dyret er udstrakt er den næsten gul, kun ved Grunden spillende noget i det Grønne. Mundskiven svag tegelstensrød med mørkere Mundrand og Folder. Tentaklerne ere intensere røde end Mundskiven, men i Enderne noget blegere.

The œsophagus forms a slightly flattened cylinder that is furnished externally with a covering of endothelium, on the inside of which there is a muscular layer, a continuation of the muscles of the perfect septa, and its muscles are attached to a layer of connective-tissue (Pl. XXIV, fig. 8 e) that increases considerably in breadth towards the ventral side (Pl. XXIV, fig. 8 f), just at the point where the two perfect directive septa attach themselves. The inner surface presents a distinguished gullet-groove (Pl. XXIV, fig. 8 g) furnished with high narrow cylinder-cells carrying long cilia; the remainder of the gullet-wall is folded, and is clad with much lower cylinder-cells (Pl. XXIV, fig. 8 h) with short cilia, between which a great multitude of unicellular, claviform mucous glands are observed.

The tentacles are, upon their external wall, clad with an epithelium that consists of high, narrow, ciliating cylinder-cells, between which there is a great abundance of nematocysts. On the inside of the ectoderm there is a layer of strong longitudinal muscles, which are attached to the connective-tissue; the latter is pretty broad and furnished with connective-tissue corpuscles and nutritory ducts, and circular muscles insert themselves on its inner surface. These are clad with an endothelium formed of rather high, narrow, ciliating cylinder-cells that project far into the tentacular cavity.

Habitat.

Station No. 164. Many specimens.
— „ 200. A few specimens.

Specific characteristics.

The sarcosoma not widely distributed, sometimes attached to stones sometimes twined round other objects, such as tubes of Tubularia. The polyps placed singly, as a rule, cylindrical, slightly constricted at the middle. The column encrusted with sand, measures 20^{mm} in height, 6^{mm} in breadth at the base, 6—7^{mm} in breadth at the uppermost extremity, and 4^{mm} at the middle. Up towards the uppermost margin there are 18 encrusted ribs, between which there are the same number of bare areas. The oral disc almost flat, folded. The folds issue from the slightly oblong oral aperture to the periphery. The tentacles are placed in 3 series, are rather long, thick at the base, but terminate conically acuminate. In the outermost series there are 18 tentacles, in the intermediate series 12; in both of those series the tentacles are uniform in length, but the innermost, the third series, contains only 6 tentacles, and they are the longest and thickest, being almost as long as the oral disc is broad. *The colour.* The encrusted portion of the body greenish-yellow, but when the animal is extended it is almost yellow with a slightly greenish play of colour at the base only. The oral disc is faint brick-red with a darker margin

Paa Æggestokkene hos *Epizoanthus glacialis* fandtes en Parasit, der var temmelig hyppig, og som jeg er i Tvivl om, hvorvidt den tilhører Plante- eller Dyreriget. Den sad imellem Endothelcellerne, der beklæde Æggestokkene og syntes at være klæbet sammen med dem ved en kort Stilk, saa det havde sine Vanskeligheder at isolere den ganske. Den var overmaade liden og kunde ikke iagttages uden ved meget stærke Forstørrelser, og da den frembød forskellige Udviklingsstadier, er det sandsynligt, at den udvikler sig hos den Vært, der har Æren af at være gjæstet af den.

Jeg skal nu beskrive den, saagodt Materialet tillader det. Sporerne ere runde, mørke, næsten uigjennemsigtige, uden nogen Membran og bestaar af en tilsyneladende jevn Protoplasmamasse, Tab. XXV, Fig. 1 *e*. Disse Sporer forlænge sig i to modsatte Retninger og antage en elliptisk Form. Der danner sig nu en Membran omkring den forlængede Spore, hvilken er ganske klar, og Indholdet viser sig da at bestaa af en brun, næsten homogen Protoplasmamasse, Tab. XXV, Fig. 1 *f*; paa et længere fremskredet Stadium bliver Membranen overmaade tydelig, og det indeholdte Protoplasma har kornet sig, Tab. XXV, Fig. 1 *g*, 2.

Nu udvider Ellipsens begge Ender sig, blive spidsere og ganske klare, Tab. XXV, Fig. 3 *a*. Membranen har tiltaget i Tykkelse, men er temmelig klar, og indenfor den har Protoplasmaet differentieret sig saaledes, at der i Midten sees to tydelige Kjerner, Tab. XXV, Fig. 3 *b*, og to særregne Legemer (muligens vordende Embryoner), Tab. XXV, Fig. 3 *c*, i Protoplasmamassen, samt to Vacuoler, som ligge mod begge Ender og egentlig udenfor Protoplasmaet, Tab. XXV, Fig. 3 *d*. Det forekommer mig, at denne parasitære Skabning nærmest maa henføres til tidligere Stadier af en Gregarine, som har fundet sin Regning i at tage Bolig hos en *Epizoanthus*, der lever i den kolde Area paa 457 Favnes Dyb. De for Gregarinerne saa eiendommelige, forlængede Sække (Schleuche) eller Indkapslinger fandt jeg ikke; men ser man til Sporerens Beskaffenhed, den tykke, klare Membran, der omgiver Protoplasmaindholdet (Embryonet) og senere dettes Differentieren, saa vil man heri finde saa megen Lighed med, hvad der er kjendt af enkelte Gregarineformers (Sporocoernes) Udvikling, at det nok tør hænde, at min Antagelse er rigtig.

round the oral aperture, and with darker folds. The tentacles are more intensely red than the oral disc, but somewhat paler in colour at the extremities.

On the ovaries of *Epizoanthus glacialis* a parasite was observed, appearing with considerable frequency, regarding which I am in doubt whether it pertains to the vegetable or the animal kingdom. It was seated between the endothelial cells that clothe the ovaries, and appeared to be glued to them by means of a short stalk, so that it was not an easy matter to isolate it completely. It was extremely small and could not be observed except under great magnification, and, as it presented itself in various stages of development, it is probable that it develops itself at the expense of the host who has the honour of entertaining it.

I shall now describe it, as well as the material at my disposal permits. The spores are round, dark, almost opaque, have no membrane, and consist of an apparently uniform protoplasmic substance (Pl. XXV, fig. 1 *e*). These spores become prolonged in two contrary directions and assume an elliptical form. A membrane is now formed round the prolonged spore, which is quite translucent, and the contents then show themselves to consist of a brown, almost homogeneous protoplasmic substance (Pl. XXV, fig. 1 *f*); in a more advanced stage the membrane becomes extremely distinct, and the protoplasmic substance contained has become granular (Pl. XXV, fig. 1 *g*, 2).

Then both extremities of the ellipsis become widened out, become more acuminate and quite translucent (Pl. XXV, fig. 3 *a*). The membrane has increased in thickness but is pretty translucent, and inside it the protoplasm has become differentiated in such manner, that in the middle there are observed two distinct nuclei (Pl. XXV, fig. 3 *b*), and two peculiar bodies (possibly future embryos) (Pl. XXV, fig. 3 *c*) in the protoplasmic substance, also two vacuoli that lie towards both extremities but really outside the protoplasm (Pl. XXV, fig. 3 *d*). It appears, to me, that this parasitical creature must, as the most obvious course, be assigned to the early stages of a Gregarine that has found it advantageous to take up its residence with an *Epizoanthus*, dwelling in the cold area at a depth of 457 fathoms. The prolonged sacs so peculiar to the Gregarines (Schleuche), or capsules, I did not discover; but if we regard the nature of the spores, the thick translucent membrane that surrounds the protoplasmic contents (the embryo), and the subsequent differentiation, we will, in those features, find so much similarity with what is known of the development of a few forms of Gregarines (the sporozoa), that it may well be, perhaps, that my supposition is correct.

Epizoanthus roseus, n. sp.

Tab. VI, Fig. 10; Tab. XXV, Fig. 4—6.

Coenenchymet, der er temmelig tyndt, membranøst og fast, er ikke meget udbredt over den lille Sten, som det tildels omfatter, Tab. VI, Fig. 10; Tab. XXV, Fig. 4. Fra det reiser sig 4 Polyper, der ere næsten pæreformige, indtil 15^{mm} lange og dobbelt saa brede i den øverste som i den nederste Ende. Kolumnen er inkrusteret med fin graalig-gul Sand, der dog ei er saa tæt sammenpakket, at ikke den rosenrøde Hud skinner igjennem, naar Dyret er fuldt udstrakt. Kolumnens øverste Rand er forsynet med 12 inkrusterede, lancetformede Ribber, imellem hvilke sees ligesaa mange nøgne, rosenrøde Felter, Tab. VI, Fig. 10; Tab. XXV, Fig. 4 a; dens nederste Del, Basaldelen, er rund, smal og temmelig fast paa Grund af det stærkt inkrusterede Sand.

Mundskiven er temmelig flad og i dens Midte er en aflang Mundaabning, hvorfra udgaa Folder henimod Skivens Peripheri. Der er to Rækker Tentakler, som staa afvexlende, 12 i hver Række; de i den ydre Række ere temmelig tykke, afstumpede og omtrent halvt saa lange som Skivens Bredde, Tab. XXV, Fig. 4 b, imedens de i den indre ere længere, naa næsten Skivens hele Bredde og ere slankere, Tab. XXV, Fig. 4 c. Naar Polyphen er ganske sammentrukket, har den en elliptisk Form, med sin smaleste Del nedad.

Farven. Coenenchymet er halvt gjenemsigtigt, graaligt. Polyphen er graagul af det inkrusterede Sand, men den rosenrøde Hud skinner igjennem. Mundskiven rosenrød med blegere Radier. Tentaklerne er paa den nederste, bredere Del rosenrøde som Mundskiven, men paa den øverste Halvdel ere de blegere og i Spidsen næsten hvide.

Ved den anatomisk-histologiske Undersøgelse viser det sig, at hele Legemet som sædvanligt er beklædt med et Ectoderm, Tab. XXV, Fig. 5 a, der bestaar af Cylinder-celler, hvilke paa Mundskiven og Tentaklerne ere meget høje, ligesom der paa de sidste findes en stor Mængde Nematocyster imellem Cylindercellerne. Indenfor Ectodermet er et bredt, hyalint Bindevæv, hvori er indsænket større og mindre Sandkorn, som strække sig igjennem Bindevævet hele Bredde, Tab. XXV, Fig. 5 b, 6 a. Disse Sandkorn ligge dog tildels noget spredte, saa at Bindevævet kommer godt tilsyne, og da sees i dets Midte et Belte af cirkulære Muskler, der ikke synes at være meget udviklede, Tab. XXV, Fig. 6 b. Paa den indre Flade af Bindevævet er fæstet et Muskellag, dannet af Længde- og Tvermuskler, beklædt af Endothelet, Tab. XXV, Fig. 6 c.

Epizoanthus roseus, n. sp.

Pl. VI, fig. 10; Pl. XXV, figs. 4—6.

The sarcosoma, which is rather thin, is membranous and firm, and not widely distributed over the small stone that it partially embraces (Pl. VI, fig. 10; Pl. XXV, fig. 4). From the sarcosoma there arise 4 polyps; these are almost piriform, measure up to 15^{mm} in length, and are twice as broad in the superior as in the inferior extremity. The column is encrusted with fine greenish-yellow sand, which is, however, not so closely crowded together but that it permits the rosy-red integument to shine through when the animal is fully extended. The uppermost margin of the column is furnished with 12 encrusted lanceolate ribs between which the same number of bare rosy-red areas are observed (Pl. VI, fig. 10; Pl. XXV, fig. 4 a). Its lowest part, the basal portion, is round, narrow, and pretty firm owing to the strong encrustation of sand.

The oral disc is rather flat, and in its middle there is an oblong oral aperture from which folds issue towards the periphery of the disc. There are two series of tentacles, placed alternately, 12 in each series; those of the outer series are pretty thick and blunted, and about half the length of the breadth of the disc (Pl. XXV, fig. 4 b); while those of the inner series are longer, attain to nearly the entire breadth of the disc, and are slenderer (Pl. XXV, fig. 4 c). When the polyp is quite contracted it has an elliptic form, with its narrowest portion at the foot.

The colour. The sarcosoma is semi-transparent, greyish. The polyp is greyish-yellow owing to the encrusted sand, but the rosy-red integument shines through. The oral disc is rose-red, with lighter-coloured radii. The tentacles are, upon their lowest broad part, rose-red like the oral disc, but upon their superior half they are paler in colour, and almost white at the point.

Upon making the anatomo-histological investigation it is seen, that the entire body is, as usual, clad with an ectoderm (Pl. XXV, fig. 5 a) that consists of cylinder-cells, which, upon the oral disc and tentacles, are very high; while, also, there are found on the last-named a great multitude of nematocysts distributed between the cylinder-cells. On the inside of the ectoderm there is a broad hyaline connective-tissue in which are embedded larger and smaller grains of sand that penetrate through the complete thickness of the connective-tissue (Pl. XXV, figs. 5 b, 6 a). Those grains of sand lie, however, partly somewhat scatteredly, so that the connective-tissue is quite freely visible, and there is, thus, observed in its middle a belt of circular muscles that do not appear to be very much developed (Pl. XXV, fig. 6 b). Upon the inner surface of the connective-tissue there is a muscular layer attached, formed of longitudinal and transversal muscles clad with the endothelium (Pl. XXV, fig. 6 c).

Fra den indre Krosvæg udgaa 24 Septa, hvoraf 12 ere fuldstændige, Tab. XXV, Fig. 5. Af disse Macroseptæ, Tab. XXV, Fig. 5 c, er der 2, som ved sin stærke Bygning udmærke sig fremfor de øvrige. Disse, der ere Retningsseptæ, fæste sig paa den ydre Side af Svælgrøret paa det Sted, som svarer til Svælggruben paa den indre Side (Bugsiden), Tab. XXV, Fig. 5 d. Samtlige Macroseptæ ere beklædte med Længde- og Tvermuskler, hvoraf de første ere stærkt udviklede, især ved deres Udspring fra Krosvæggen, hvor de tildels danne en større eller mindre Busk; men foruden den stærke Muskulatur bære alle Macroseptæ Mesenterialfilamenter og Generationsorganer. Disse sidste vare kun lidt udviklede; de indeholdt Æg i det begyndende Stadium.

De 12 ufuldstændige Septa (Microseptæ) danne listeformige Fremspring fra den indre Krosvæg; de ere stillede imellem Macroseptæ enkeltvis, naar undtages 2, der staa sammen imellem 2 Macroseptæ og maa betragtes som Retningsseptæ, der tilhører Rygsiden, Tab. XXV, Fig. 5 e, idet de ere stillede ligeoverfor de 2 fuldstændige Retningsseptæ paa Bugsiden. Ogsaa Microseptæ ere forsynede med Muskulatur, som bestaar af Længde- og Tvermuskler; men den egentlige Anordning var forrykket paa Tversnittene — det har nemlig sine store Vanskeligheder at faa rene Tversnit paa Grund af Inkrustationen. Microseptæ ere golde. Svælgrøret er lidt fladtrykt og paa dets indre Flade, der er foldet, er en tydelig udpræget Svælggrube, Tab. XXV, Fig. 5 f.

Findested.

Station 200. En Gruppe, bestaaende af 4 Polyper, netop den, som er tegnet.

Artskarakter.

Coenenchymet tyndt, ikke meget udbredt over Stenen. Polyperne, der staa i en liden Gruppe, ere pæreformede, indtil 15^{mm} lange. Den øverste Ende dobbelt saa bred som Basaldelen. Kolumnen inkrusteret med fin, graagul Sand, der dog lader den røde Hud gennemskinne, og paa dens øverste Rand 12 inkrusterede Ribber, hvorimellem ligesaamange nøgne Felter. Mundskiven flad, fint foldet; Munden aflang. 2 Rækker Tentakler, 12 i hver; de i den inderste Række længst. Farven: Coenenchymet graaligt; Polyperne graagule af det inkrusterede Sand, men selve Huden laxerød. Mundskiven som Huden med blegere Radier. Tentaklerne ved Grunden laxerøde, paa Midten blegere, næsten hvide i Spidsen.

From the inner wall of the body 24 septa issue, of which 12 are perfect septa (Pl. XXV, 5). Of those macroseptæ (Pl. XXV, fig. 5 c), there are 2, which by their strong structure distinguish themselves from the others. These, which are directive septæ, attach themselves to the external side of the œsophagus, in the situation that corresponds to the gullet-groove on the internal side (the ventral side) (Pl. XXV, fig. 5 d). All the macroseptæ are clad with longitudinal and transversal muscles, of which the first-named are strongly developed, especially at their origin in the wall of the body, where they partly form a greater or lesser tuft, but besides their great musculosity all the macroseptæ carry mesenterial filaments and reproductive organs. These last were only little developed; they contained ova in the rudimentary stage.

The 12 imperfect septa (microseptæ) form fillet-formed projections from the inner wall of the body. They are placed singly, between the macroseptæ, except 2 that are placed together, between 2 macroseptæ, and must be regarded as directive septæ that pertain to the dorsal side (Pl. XXV, fig. 5 e), as they are placed exactly opposite the 2 perfect directive septæ of the ventral side. The microseptæ are also furnished with a musculosity consisting of longitudinal and transversal muscles, but the proper arrangement was disturbed in the transversal sections. It is a matter of the greatest difficulty to obtain clean-cut sections owing to the encrustation. The microseptæ are sterile. The œsophagus is a little flattened, and on its inner surface, which is folded, there is a distinctly prominent gullet-groove (Pl. XXV. fig. 5 f).

Habitat.

Station No. 200. A group, consisting of 4 polyps, precisely the one that is illustrated.

Specific characteristics.

The sarcosoma thin, not widely distributed over the stone. The polyps, which stand in a small group, are piriform, measure up to 15^{mm} in length. The superior part is twice the breadth of the basal part. The column is encrusted with fine sand of a greyish-yellow colour, which permits, however, the red integument to become visible through the encrustation; on its uppermost margin there are 12 encrusted ribs, between which there are the same number of bare areas. The oral disc is flat, finely folded. The oral aperture oblong. Two series of tentacles, 12 in each, those of the innermost series being the longest. *The colour.* The sarcosoma greyish. The polyps greyish-yellow owing to the encrusted sand, but the integument itself is salmon-red colour. The oral disc same colour as the integument, with paler-coloured radii. The tentacles salmon-red colour at their base, paler in colour in the middle and almost white at the point.

Foruden de her beskrevne Zoanthider fandtes paa Station 252 et Exemplar af Epizoanthus (*Zoanthus*) arcticus, M. Sars, og paa Station 260 nogle Exemplarer af *Polythoa arenacea*, Delle Chiaje, (*Mamillifera incrustata*, *Zoanthus incrustatus*, Düb. et Kor.).

Ceriantheæ, Hertwig.

Familie *Cerianthidæ*, Hertwig.

Slægt *Cerianthus*, Delle Chiaje.

Professor Carl Vogt har i Archives de Biologie leveret en yderst interessant Afhandling over Slægterne *Arachnactis* og *Cerianthus* og paavist til Evidents ikke alene en gennemgaaende bilateral Symetri hos disse Slægter, men at de ogsaa i morphologisk Henseende staa hinanden saa nær, at der kunde være nogen Grund til at antage *Arachnactis* for en svømmende Larve af *Cerianthus*, dersom ikke de fuldt udvoxne Dyr paa det Bestemteste afvise et saadant Forhold. Naar jeg nedenfor beskriver to nye Arter af *Cerianthus* fra den norske Nordhavsexpedition, maa jeg henvise til de fortrinlige Arbejder over denne Slægt, som ere leverede af Jules Haine¹, A. von Heider² og Carl Vogt³; thi det Material, jeg har havt at raade over, er saa lidet og dertil saa stærkt medtaget af Bundskrabben, der har beskadiget Dyrene, som sandsynligvis sidde i den løse, dyndede Bund, at Undersøgelserne ikke kunne være udtømmende. Begge Arter ere hentede fra den kolde Area i en Dybde fra 480—693 Favne med en Temperatur ÷ 1.2 C. Naar der undtages 1 Exemplar, der angives af Moseley fra Challenger-Expeditionen, og som forresten er et tvivlsomt Specimen, der tilhører de store Dyb, saa er alle hidtil kjendte Former af *Cerianthus* fra temmelig ringe Dybder, og forsaavidt kan de to Arter, jeg nu skal beskrive, ogsaa have sin Interesse.

¹ Jules Haine, Memoire sur le Cerianthe (*Cerianthus membranaceus*). Annales des Sciences natur. 4me série. 1854.

² A. von Heider, *Cerianthus membranaceus*, Haine. Ein Beitrag zur Anatomie der Actinien. Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der K. K. Akademie der Wissenschaften in Wien. Vol. 79, 1te Abtheilung 1879. Pag. 204.

³ Carl Vogt, Professeur à Genève. Des genres *Arachnactis* et *Cerianthus*. Archives de Biologie, pub. par Ed. van Beneden et Charles van Bambeke. Tome VIII. Fascicule 1. Pag. 1. Liège 1888.

Besides the Zoanthidæ described here, there were found, at station 252, a specimen of Epizoanthus (*Zoanthus*) arcticus M. Sars; and at station 260 a few specimens of *Polythoa arenacea*, Delle Chiaje (*Mamillifera incrustata*, *Zoanthus incrustatus*, Düb. et Kor.).

Ceriantheæ, Hertwig.

Family *Cerianthidæ*, Hertwig.

Genus *Cerianthus*, Delle Chiaje.

Professor Carl Vogt has, in „Archives de Biologie“, given an extremely interesting Paper on the genera *Arachnactis* and *Cerianthus*, and shown, most conclusively, not only a generally pervading bilateral symmetry in those genera, but also, that they, in morphological respects, are so closely related to each other, that there might be good reason to take *Arachnactis* to be a swimming larva of *Cerianthus*, if the fully developed animal did not, in the most distinct manner, disprove such a relation. While I now describe, in what follows, two new species of *Cerianthus* from the Norwegian North-Atlantic Expedition, I would refer the reader to the admirable works on the genus that have been published by Jules Haine¹, A. von Heider² and Carl Vogt³, as the material I have had at my disposal is so small, and is, besides, so much injured by the dredge, which has destroyed the animals that probably have been seated in the loose slimy bottom, that the investigations have not been exhaustive. Both the species are obtained from the cold area at a depth of from 480—693 fathoms, and a temperature of ÷ 1.2 C. When we except a single specimen, mentioned by Moseley, from the „Challenger“ expedition, and which is, besides, a doubtful one, that pertains to the great deep, all the hitherto known forms of *Cerianthus* have come from pretty shallow waters; the two species I purpose now to describe are therefore, so far, of peculiar interest.

¹ Jules Haine, Memoire sur le Cerianthe (*Cerianthus membranaceus*). Annales des Sciences natur. 4me série. 1854.

² A. von Heider, *Cerianthus membranaceus*, Haine. Ein Beitrag zur Anatomie der Actinien. Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der K. K. Akademie der Wissenschaften in Wien. Vol. 79, 1te Abtheilung 1879. Pag. 204.

³ Carl Vogt, Professeur à Genève. Des genres *Arachnactis* et *Cerianthus*. Archives de Biologie, pub. par Ed. van Beneden et Charles van Bambeke. Tome VIII. Fascicule 1, Pag. 1. Liège 1888.

Cerianthus Vogti¹, n. sp.

Tab. V, Fig. 8, 9; Tab. XXV, Fig. 7-14.

Legemet er cylindrisk, lidt traktformigt, henved 80^{mm} langt, 20^{mm} bredt i den øverste Ende og 6^{mm} i den nederste. Kroppens udvendige Flade er glat til opimod 10^{mm} fra Mundskiven, hvor den bliver foldet paalangs. Folderne ere omtrent lige lange og lige fremtrædende, naar undtages en, der er bredere end de øvrige og strækker sig længere ned paa Kroppen. Ligeover for denne brede Fold sees paa den modsatte Side af Kroppen en yderst smal, men dyb Fure, der strækker sig fra Tentakelranden til et Stykke nedenfor Legemets Midte, hvor den bliver meget utydelig, saa at det ikke kan afgjøres, om den naar lige ned til den aborale Ende. Denne er forsynet med en rund, temmelig stor Aabning, som udvider og sammentrækker sig, saa den synes at have en Sphincter.

Kolumnens øverste Ende udvider sig traktformigt og paa dens krenulerede Rand er der en Række Tentakler. Indenfor denne sees den noget fordybde Mundskive med den lidt aflange Mund med sine to Mundvinkler; omkring Munden er en Række Tentakler, og fra denne til den ydre Tentakelrække har Mundskiven en Glorie af fine Folder, hvis Antal svarer til Tentaklernes, Tab. V, Fig. 8.

Randtentaklerne, der danne en uafbrudt Række og ikke staa i flere Cykler, ere 36 i Antal, ikke retraktile, have en Længde af omkring 30^{mm} og ere temmelig tykke ved Grunden, men smalne betydeligt af, saa at de i Spidsen ere yderst fine, traadformige, Tab. V, Fig. 8. Der er kun en Randtentakel, der staa ligesom isoleret og støder til den omtalte brede Fold paa Kroppens ydre Flade; denne Tentakel er meget kortere end de øvrige.

Mundtentaklerne heller ikke retraktile, ere baade meget kortere og tyndere end Randtentaklerne, men tilstede i samme Antal som disse (36). De staa i en Række, men ikke lige langt fra hverandre, idet omtrent en Trediedel staa temmelig langt fra hverandre og ere noget længere end de øvrige, Tab. XXV, Fig. 9 a, der staa tættere og ere tildels kortere, Tab. XXV, Fig. 9 b. De længere og mere fra hverandre staaende Mundtentakler svare til den ydre Kropsside, hvor den omtalte fine Længdefure findes.

Farven. Kroppen er bleggul, spillende lidt i det Rosenrøde. Randtentaklerne ere paa deres aborale Flade

¹ Arten er opkaldt efter den geniale Naturforsker Carl Vogt. Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

Cerianthus Vogti¹, n. sp.

Pl. V, figs. 8, 9; Pl. XXV, figs. 7-14.

The body is cylindrical, slightly infundibuliform, measures about 80^{mm} in length, 20^{mm} in breadth at the uppermost and 6^{mm} in breadth at the lowest extremity. The external surface of the body is smooth until within a distance of 10^{mm} from the oral disc, where it becomes folded longitudinally. The folds are about uniform in length and equally prominent, with the exception of a single one, which is broader than the others and extends itself farther down the body. Opposite this broad fold, on the opposite side of the body, an extremely narrow but deep furrow is observed, which stretches from the tentacular margin to a spot below the middle of the body, where it becomes very indistinct, so that it is impossible to determine whether it reaches quite down to the aboral extremity or not. The latter is furnished with a round, rather large aperture which dilates and contracts itself, so that it appears to be supplied with a sphincter.

The uppermost extremity of the column becomes dilated in infundibuliform, and upon its crenated margin there is placed a series of tentacles. To the inside of this is observed the somewhat depressed oral disc with the slightly oblong oral aperture and its two oral angles; round the oral aperture there is a series of tentacles, and from it to the exterior tentacular series the oral disc has a halo of fine folds, whose number corresponds with that of the tentacles (Pl. V, fig. 8).

The marginal tentacles, which form an uninterrupted series and are not placed in several cycles, are 36 in number, non-retractile, measure about 30^{mm} in length, are pretty thick at the base but diminish considerably in thickness upwards, so that at the point they become extremely fine and filamentous (Pl. V, fig. 8). There is only a single marginal tentacle, which, as it were, stands isolated and unites to the broad fold on the external surface of the body previously spoken of; this tentacle is much shorter than the others.

Neither are the oral tentacles retractile, they are both much shorter and thinner than the marginal tentacles, but are present to the same number as those (36). They are placed in a single series, but not at uniform intervals apart from each other, as about one third of them are placed pretty far apart from each other, and these are somewhat longer than the others (Pl. XXV, fig. 9 a), which stand closer together and are partly shorter (Pl. XXV, fig. 9 b). The longer oral tentacles, placed more apart from each other, correspond to the outer side of the body, where the fine longitudinal furrow already spoken of is found.

The colour. The body is pale-yellow with a slight rose-red play of colour. The marginal tentacles are, on

¹ The species is designated after the genial Naturalist Carl Vogt.

smukt rosenrøde, paa den adorale Flade lysebrune. Mundtentaklerne ere smukt kastaniebrune, ligesaa Mundskiven med lysere Straaler, Tab. V, Fig. 8, 9.

Røret, hvori *Cerianthus Vogti* bor, er ikke synderligt længere end Kroppen. Det er ganske lukket forneden, og foroven er der en Aabning, stor nok til at Dyret kan strække sig ud og trække sig ind, naar det vil skjule sig. Da Røret er saa kort, at Dyret med dets Tentakler ikke uden at trække sig betydelig sammen kan skjule sig deri, sker denne Sammentrækning spiralførmigt, saa at Dyret ligger i en Spiral inde i Røret. Dette er udvendigt ujevnt og sammensat af brunagtigt Ler med iblandet Sand; men paa dets indvendige Flade er det beklædt med en glat, glinsende Slimmembran, der er temmelig stærk.

Ved Tversnit af Kropshuden sees, at denne er dannet af et Ectoderm, som bestaar af lange, smale Cylinder-celler med deres Kjerne og Kjernelegeme, Tab. XXV, Fig. 7 *b*, imellem hvilke er en stor Mængde kolbeformede, encellede Slimkjertler, Tab. XXV, Fig. 7 *c*, samt Nematocyster. Ectodermets ydre Flade er dækket af en strukturløs Cuticula, Tab. XXV, Fig. 7 *a*. Indenfor Ectodermet er et bredt Lag af Længdemuskler, der danne Bundter, Tab. XXV, Fig. 7 *d*, som ligge dels ganske tæt til hverandre, dels saavidt spredte, at Cylindercellerne med deres smale, indre Ender kunne træde imellem, Tab. XXV, Fig. 7 *e*. Dette Muskellag støder umiddelbart til Bindevævet, hvortil det er fæstet, og som er hyalint, temmelig smalt og kun ringe forsynet med Bindevævslegemer og Ernæringskanaler, Tab. XXV, Fig. 7 *f*. Paa dette Bindevævs (Mesoderms) indre Flade ligge Tvermusklerne, der bestaa af enkelte Fibre, som danne en tynd Lamel, Tab. XXV, Fig. 7 *g*, og ere kun lidet udviklede, imedens Længdemusklerne ere særdeles stærke; Tvermuskellaget er beklædt af Endothelet.

Svælgrøret er cylindrisk, omtrent 20^{mm} langt. Paa dets indre Væg iagttages 2 Svælgruber, der af Heider benævnes den store og lille Mundvinkelgrube, og som allerede af Haine er iagttaget. Den store Svælgrube er paa Grund af sin Form og Størrelse strax iøinefaldende, naar Svælgrøret aabnes efter Længden. Den følger Bugfladen, har en dyb Rende i Midten, og til begge Sider af denne er en bred, glat Vold, der strækker sig omtrent 1^{mm} til Siden, hvor Svælgrøret er stærkt foldet efter Længden, Tab. XXV, Fig. 8 *a*. Ligeoverfor den store Svælgrube er den lille, som svarer til Rygsiden og derfor kan kaldes den dorsale Svælgrube. Denne er kun lidet dyb og temmelig trang, men giver sig dog tilkjende ved sit glatte Udseende, Tab. XXV, Fig. 8 *b*, i Modsætning til Sidepartierne, der ere stærkt foldede, Tab. XXV, Fig. 8 *c*.

their aboral surface, a beautiful rose-red; on the adoral surface light brown. The oral tentacles as well as the oral disc are beautiful chestnut brown, the latter having lighter-coloured radii (Pl. V, figs. 8, 9).

The tube, in which *Cerianthus Vogti* dwells, is not much longer than the body; it is quite closed at the foot, but at the top there is an opening sufficiently large to admit of the animal extending itself out and retracting itself inside again, when it desires to conceal itself. As the tube is so short that the animal, with its tentacles, cannot, without contracting itself greatly together, conceal itself in the tube, the contraction proceeds spirally, and the animal lies coiled like a spiral in the tube. The tube is rough externally, and is composed of brownish clay with sand mixed in it; on its interior surface, however, the tube is coated with a smooth shining mucous-membrane, which is pretty strong.

Upon transversal section of the integument of the body it is seen, that the integument consists of an ectoderm consisting of long narrow cylinder-cells with their nuclei and nucleus-corpuscles (Pl. XXV, fig. 7 *b*), between which there are a great multitude of claviform, unicellular mucous glands (Pl. XXV, fig. 7 *c*), and also nematocysts. The outer surface of the ectoderm is covered by a structureless cuticulum (Pl. XXV, fig. 7 *a*). On the inside of the ectoderm there is a broad layer of longitudinal muscles that form fasciculi (Pl. XXV, fig. 7 *d*), which lie, partly quite close to each other, but partly so widely distributed that the cylinder-cells with their narrow, inner extremities appear visible between (Pl. XXV, fig. 7 *e*). This muscular layer unites immediately to the connective-tissue, to which it becomes attached, and which is hyaline, rather narrow, and only poorly furnished with connective-tissue corpuscles and nutritory ducts (Pl. XXV, fig. 7 *f*). Upon the inner surface of this connective-tissue (mesoderm) the transversal muscles are placed; they consist of single fibres that form a thin lamella (Pl. XXV, fig. 7 *g*), and are only little developed, while the longitudinal muscles are particularly strong. The layer of transversal muscles is clothed with the endothelium.

The œsophagus is cylindrical, and measures about 20^{mm} in length. Upon its inner wall 2 gullet-grooves are observed; these have been termed by Heider, the great and the little oral-angle-cavities, and they have already been noticed by Heine. The great gullet-groove is, owing to its form and size, immediately prominent to the eye when the œsophagus is dissected longitudinally. It follows the ventral surface, has a deep channel in the middle, and on both sides of this channel there is a broad, smooth rampart that, for about 1^{mm}, extends itself to the side, where the gullet-tube is strongly folded longitudinally (Pl. XXV, fig. 8 *a*). Just opposite the great gullet-groove is the small one, which corresponds to the dorsal side and may, therefore, be termed the dorsal gullet-groove. This is of only little depth and pretty narrow, but yet it makes itself apparent by its smooth appearance (Pl. XXV, fig. 8 *b*).

Ved yderst tynde Tversnit viser sig Svælgrøret histologisk at bestaa af en Epithelbeklædning paa dets ydre Flade (indre, Vogt), dannet af et cylindercellet Endothel, lignende det, som beklæder hele Gastrovascularhulhedens Vægge. Tab. XXV, Fig. 12 a; til dette Endothel støder et Lag af Længdemuskler, Tab. XXV, Fig. 12 b, der ere fæstede til et hyalint Bindevævslag, Tab. XXV, Fig. 12 c, paa hvis indre Flade findes en Epithelialbeklædning, som er forskjellig paa de forskjellige Steder; Bindevævet i den store Svælggrube er lidt bredere end paa de øvrige Steder, Tab. XXV, Fig. 12 d, og her sees Epithelet at bestaa af temmelig brede, ikke meget høje Cylinderceller, der ere forsynede med Cilier og danne en jævn Flade mod Svælgørørshulheden, Tab. XXV, Fig. 12 e; ogsaa i den lille Svælggrube er et lignende Epithel, Tab. XXV, Fig. 11 a; men til Siderne af begge Svælggruber, hvor Væggen er meget foldet og derfor ujævn, dannes disse Folder af smale, listeformige Forlængelser fra Bindevævet, der rage ind i Hulheden og ere beklædte med temmelig lange Cylinderceller, som vifteformigt ere fæstede til Bindevævslisterne, Tab. XXV, Fig. 11 b, 12 f.

Der er 36 fuldstændige Septa, hvoraf 4 kunne betragtes som Retningsseptas, eller et Par ventrale og et Par dorsale, og paa hver Side af disse, 8 Par laterale Septa. Alle disse Septa, der tage deres Udspring fra Kropsvæggens indre Flade og fæste sig paa Underfladen af Mundskiven og paa Svælgrørets ydre Væg, have en forskjellig Længde. De ventrale Retningsseptas, som fæste sig paa Svælgrøret just paa det Sted, der indvendig svarer til den ventrale Svælggrube, ere tykke, Tab. XXV, Fig. 8 d, 11 c, 12 g, og paa deres ydre Side, den der vender mod det tilstødende, interseptale Kammer, forsynede med Længdemuskler, Tab. XXV, Fig. 12 h, som henimod Svælgørørinsertionen og ved Udspringet af Kropsvæggen ere temmelig tykke; paa deres indre Side, der vender mod det intraseptale Kammer, ligge fine Tvermuskelfibre i Form af en yderst tynd Membran, Tab. XXV, Fig. 12 i. Dette intraseptale Kammer, Tab. XXV, Fig. 8 e; Tab. XXV, Fig. 11 d, 12 k, som Professor C. Vogt med Rette kalder „la loge ventrale impaire“, har en aflang, næsten triangulær Form, og adskiller sig let fra de øvrige. De ventrale Retningsseptas strække sig et Stykke nedover (bagover) Kroppens Bugflade, hvor de bidrage til at danne en indre Bugfure, som senere skal omtales.

De dorsale Retningsseptas, Tab. XXV, Fig. 8 f, 11 e, ere temmelig tynde; Længdemusklerne ligge ogsaa her paa den ydre Side, imedens Tvermusklerne beklæde den indre, som vender mod det intraseptale, dorsale Kammer, der er aflangt, meget bredere end de nærmest tilstødende Kamre,

contrasted with the lateral portions, which are strongly folded (Pl. XXV, fig. 8 c).

In extremely thin transversal sections the œsophagus shows itself, histologically speaking, to consist of an epithelial covering on its outer surface (inner, Vogt.), formed of an endothelium of cylinder-cells resembling that which clothes the walls of the entire gastro-vascular cavity (Pl. XXV, fig. 12 a). To this endothelium a layer of longitudinal muscles unites (Pl. XXV, fig. 12 b); these are adherent to a layer of hyaline connective-tissue (Pl. XXV, fig. 12 c) upon whose inner surface an epithelial covering is found, which is, however, different in the different situations. The connective-tissue in the large gullet-groove is a little broader than in the other situations (Pl. XXV, fig. 12 d), and here the epithelium is seen to consist of pretty broad, not very high cylinder-cells, which are furnished with ciliæ and form an even surface towards the cavity of the gullet-tube (Pl. XXV, fig. 12 e); in the small gullet-groove, also, there is a similar epithelium (Pl. XXV, fig. 11 a); but to the sides of both the gullet-grooves, where the wall is much folded and therefore uneven, these folds are formed of narrow fillet-formed prolongations from the connective-tissue, that project into the cavity and are clad with rather long cylinder-cells, which, fan-like, are secured to the connective-tissue fillets (Pl. XXV, fig. 11 b, 12 f).

There are 36 perfect septa, of which 4 may be regarded as directive septa, or one pair ventral and one pair dorsal; and upon each side of these again 8 pairs of lateral septa. All those septa, which have their origin in the inner surface of the wall of the body and secure themselves to the under surface of the oral disc and the outer wall of the œsophagus, have different lengths. The ventral directive septa, which attach themselves to the œsophagus just in the situation that corresponds, internally, to the ventral gullet-groove are thick (Pl. XXV, fig. 8 d, 11 c, 12 g), and on their outer side, that which faces towards the adjoining interseptal chamber, are furnished with longitudinal muscles (Pl. XXV, fig. 12 h), which, towards their insertion in the œsophagus and at the origin in the wall of the body, are pretty thick; upon their inner side, which faces towards the intraseptal chamber, there lie delicate transversal muscle-fibres in the form of an extremely thin membrane (Pl. XXV, fig. 12 i). This intraseptal chamber (Pl. XXV, fig. 8 e, 11 d, 12 k) which Prof. O. Vogt rightly terms „la loge ventrale impaire“ has an oblong, almost triangular form, and is easily distinguished from the others. The ventral directive septa stretch themselves a little way downwards (backwards) along the ventral surface of the body, where they contribute to form an internal ventral furrow, which will subsequently be spoken of.

The dorsal directive septa (Pl. XXV, fig. 8 f, 11 e) are pretty thin; also here the longitudinal muscles are situated on the outer side, while the transversal muscles clothe the inner one, which faces towards the intraseptal, dorsal chamber; this is oblong, much broader than the

og som Vogt har kaldet „la loge dorsale impaire“, der støder til den lille dorsale Svælgrube, Tab. XXV, Fig. 8, 11 *f*. Om denne Del udtaler Vogt sig saaledes: „c'est cette partie qui est de la plus haute importance pour la consideration morphologique du Cerianthe;“ thi derfra er det, siger han, at ikke alene Skillevæggene og Kamrene udvikle sig og stadig tiltage i Antal; men ogsaa Tentaklernes Fremvæxt og Tiltagen udgaar væsentlig derfra, et Forhold, der er fuldkomment ligt det, han har beskrevet med saamegen Nøiagtighed hos Slægten Arachnactis. Dette er jo en Udviklingsmaade, som er meget forskjellig fra den, der finder Sted hos Actinierne i Almindelighed, og ganske modsat den hos Zoanthiderne, forsaavidt som hos disse, ifølge Erdmanns Angivelse, de nye Septa optræde i to Interseptalkamre, nemlig i hvert Sidekammer, der støder til de ventrale Retningssepta.

Hos Cerianthus Vogti har jeg ikke med fuld Sikkerhed kunnet bekræfte Rigtigheden af Vogts Iagttagelser, da jeg dertil har manglet tilstrækkeligt Materiale; men naar jeg ser hen til Anordningen af Septa og Kamre hos nævnte Art, saa nærer jeg ingen Tvivl om Rigtigheden. I det dorsale, uparrede Kammer syntes jeg at opdage et begyndende Septum, men jeg var ikke sikker og forblev derfor staaende med at antage det for en Epithelialdannelse; den før omtalte, isolerede, dorsale Råndtentakel i Forening med den Omstændighed, at især Mundtentaklerne staa baade meget tættere og ere tildels mindre paa Rygsiden end paa Bugsiden, synes at tyde hen paa, at den af Vogt omtalte Udviklingsmaade, ogsaa foregaar hos Cerianthus Vogti.

De to Septa, Tab. XXV, Fig. 8 *h*, 11 *g*, 12 *l*, et paa hver Side af de ventrale Retningssepta, forlænge sig ved Siden af disse nedover den indre Kropsvæg lige til den aborale Aabning, og ere blevne kaldte de „kontinuerende Septa“, Tab. XXV, Fig. 10 *a*. Der, hvor de foroven slutte sig til Retningssepta, Tab. XXV, Fig. 10 *b*, er en Fordybning omgivet af en halvmaaneformig Vold, Tab. XXV, Fig. 10 *c*, og i denne Fordybning synes der at være en fin Aabning udad. Jeg angav tidligere, at de to ventrale Retningssepta ere temmelig korte, men tykke; naar de forlænge sig nedover, lægge de sig sammen saaledes, at der imellem dem bliver en Rende, ligesom de kontinuerende Septa omgive dem, hvorved der imellem disse og Retningssepta bliver en Fure, Tab. XXV, Fig. 10 *d*. Den nysnævnte Rende, Tab. XXV, Fig. 10 *e*, fortsættes, efterat Retningssepta ere ophørte, imellem de kontinuerende Septa lige til Caudalaabningen, og det er denne Rende, der er kaldet Bugrenden, som aabner sig i den ovenomtalte Grube, Tab. XXV, Fig. 10 *c*.

Foruden disse to kontinuerende Septa er der paa hver Side af dem 3—4 Septa, som strække sig saa langt ned mod Caudalaabningen, at de paa nogle Millimeter nær naa denne, Tab. XXV, Fig. 8 *i*. Disse Septa, ligesom

next adjoining chambers, which Vogt has termed „la loge dorsale impaire“, and which adjoins the small dorsal gullet-groove (Pl. XXV, fig. 8, 11 *f*). Regarding this part Vogt expresses himself thus: „c'est cette partie qui est de la plus haute importance pour la consideration morphologique du Cerianthe“ as it is, he says, from it, that not only do the divisional walls and the chambers develop themselves and steadily increase in number, but also the development of the tentacles and their increase in number principally arises; a relation that is perfectly like what he has described, with so much exactness, in the genus Arachnactis. This is certainly a mode of development very different from that which occurs in the Actinaria in general, and quite the opposite of what occurs in the Zoanthidæ, in so far, that in these, according to Erdmann's statement, the new septa appear in two interseptal chambers, viz. in each lateral chamber that adjoins the ventral directive septa.

In Cerianthus Vogti I have not been able, with perfect certainty, to confirm the correctness of Vogt's observations, as I have not had sufficient material at my disposal for that purpose; but when I consider the arrangement of the septa and chambers in the species named, I can have no doubt of their correctness. In the dorsal unpaired chamber, I fancied I observed a rudimentary septum but was not certain about it, and contented myself, therefore, with assuming it to be an epithelial formation; the previously mentioned isolated marginal tentacle, in conjunction with the circumstance that the oral tentacles, especially, are placed, both much more compactly, while they are also partly smaller on the dorsal side than on the ventral side, appears to point to the mode of development spoken of by Vogt also occurring in Cerianthus Vogti.

The two septa (Pl. XXV, fig. 8 *h*, 11 *g*, 12 *l*), one on each side of the ventral directive septa, prolong themselves on the side of these last, down along the inner wall of the body quite to the aboral aperture, and have been termed „the continuing septa“ (Pl. XXV, fig. 10 *a*). At the top, where they unite to the directive septa (Pl. XXV, fig. 10 *b*), there is a depression surrounded by a semi-lunar shaped rampart (Pl. XXV, fig. 10 *c*), and in that depression there appears to be a minute aperture outwards. I stated, previously, that the two ventral directive septa are rather short, but thick; when they prolong themselves downwards they close together in such a manner, that a channel becomes formed between them, whilst, also, the continuing septa close round them, producing, thus, between them and the directive septa, a furrow (Pl. XXV, fig. 10 *d*). The channel just mentioned (Pl. XXV, fig. 10 *e*) is continued, after the directive septa have ceased, between the continuing septa, quite to the caudal aperture, and it is this channel that opens into the cavity spoken of above (Pl. XXV, fig. 10 *c*).

Besides these two continuing septa there are, on each side of them, 3—4 septa that stretch themselves so far down towards the caudal aperture that they reach to within a few millimetres of it (Pl. XXV, fig. 8 *i*). Those

de to kontinuerende, staa langt fra hverandre, hvoraf Følgen er, at baade de inter- og intraseptale Kamre blive meget vide, Tab. XXV, Fig. 8 *k*, 11 *h*. De øvrige 6 Par Side-septa, der vende væsentligt mod Dorsalsiden, staa tættere sammen, hvorfor ogsaa Kamrene her er meget trangere, Tab. XXV, Fig. 8 *l*, 11 *i*. De 8 Par Septa, som gruppere sig paa hver Side af de dorsale og ventrale Retnings-septa, have en Muskulatur, der ikke synes at afvige fra det almindelige. Længdemusklerne ere temmelig meget udviklede og danne tildels henimod Svælgrøret tynde Buske (Faner), Tab. XXV, Fig. 12 *h*, imedens de transverselle Muskler ere meget tynde, fattige paa Fibre og synes tildels at være dækkede af Længdemusklerne, som da indtage Septumets begge Sider.

Samtlige Septa ere, som før nævnt, fuldstændige, det vil sige, de fæste sig alle paa Svælgrøret; ufuldstændige Septa har jeg ikke kunnet opdage paa de Exemplarer, jeg har undersøgt, og naar undtages de 2 Par Retnings-septa (dorsale og ventrale), saa bære alle de øvrige Mesenterial-filamenter og Generationsorganer. Mesenterialfilamenterne tage deres Udspring paa Septaerne lige ved deres Insertionssteder paa Svælgrørets nederste, fri Ende og følge proptrækkerformigt langs Septaernes fri Rand et Stykke nedover denne for at ende omtrent 15^{mm} fra deres Udspring, Tab. XXV, Fig. 13 *a*. Strax nedenfor, hvor Mesenterial-filamenterne ende, tage Generationsorganerne deres Begyndelse; de følge Septumets fri Rand og ligge langs denne som en Perlesnor, indtil nogle Millimeter fra dens Ophør; paa de kontinuerende Septa gik Generationsorganet næsten lige ned til Caudalaabningen.

Æggestokken danner et fladtrykt Rør, hvori sees Æg i forskellige Udviklingsstadier, Tab. XXV, Fig. 13 *b*, 14. Jeg undersøgte paa et Exemplar Kjønnsorganet paa hvert eneste Septum, og Resultatet var, at de alle bar kun Æggestokke; dette Exemplar var ikke Hermaphrodit, og paa et Par andre Exemplarer fandt jeg ligeledes kun Æggestokke, ikke Spor til Testikler. Heider og Vogt angive, at *Cerianthus membranaceus*, som er den Art, der er undersøgt af de Forskere, som specielt have beskæftiget sig dermed, er Hermaphrodit, og jeg havde derfor ventet at finde det samme Forhold hos min Art; naar nu ikke dette har været Tilfældet, saa kan to Ting tænkes, enten at Testiklerne ei har været saa udviklede, at de lod sig opdage, hvilket jeg imidlertid ikke anser for sandsynligt, eller at Dybvandsformerne af *Cerianthus* have særskilt Kjøn, medens de øvrige ere tvekjønnede, et Forhold, der ikke er ganske fremmed for de lavere Dyr, nemlig at en Art har særskilt Kjøn og en anden er Hermaphrodit.

Heider inddeler Septaerne i „Filamentsepta og Genitalsepta“; han har fundet hos *Cerianthus membranaceus*, at hvert andet Septum bærer Kjønnsorganer og hvert andet

septa, like the two continuing ones, stand far apart from each other, in consequence of which both the interseptal and the intraseptal chambers become very wide (Pl. XXV, fig. 8 *k*, 11 *h*). The remaining 6 pairs of lateral septa, which principally face towards the dorsal side, stand closer together, so that the chambers here become also much narrower (Pl. XXV, fig. 8 *l*, 11 *i*). The 8 pairs of septa, which group themselves upon each side of the dorsal and ventral directive septa, have a musculosity that does not appear to differ from the common. The longitudinal muscles are pretty well developed, and partly form, towards the œsophagus, thin tufts (flags) (Pl. XXV, fig. 12 *h*), while the transversal muscles are very thin, poor in fibres and appear to be partly covered by the longitudinal muscles, which then occupy both sides of the septum.

As before mentioned, all the septa are perfect, that is to say they all attach themselves to the œsophagus. I have been unable to detect imperfect septa in the specimens I have investigated, and when we except the two pairs of directive septa (dorsal and ventral), all the others carry mesenterial filaments and reproductive organs. The mesenterial filaments have their origin on the septa, just at their points of insertion on the lowest free extremity of the œsophagus, and follow, spirally, along the free margin of the septa a little way down it, terminating about 15^{mm} from their commencement (Pl. XXV, fig. 13 *a*). Immediately below the point where the mesenterial filaments terminate, the reproductive organs have their origin; they follow the free margin of the septum and lie along it like a string of pearls, extending to within a few millimetres of its cessation; upon the continuing septa the reproductive organ extended almost quite down to the caudal aperture.

The ovaries form a flattened tube in which ova are observed in various stages of development (Pl. XXV, fig. 13 *b*, 14). In one specimen I investigated the reproductive organ on every individual septum, and the result was that all of them proved to carry ovaries only. That specimen was not hermaphroditic, and in a couple of other specimens, also, I found ovaries only, not a trace of testicles. Heider and Vogt state, that *Cerianthus membranaceus*, which is the species that has been investigated by the naturalists who have devoted special attention to the subject, is hermaphroditic, and I had therefore expected to find the same relation in my species. But when this has proved not to be the case, we may suppose two alternatives; either that the testicles have not been so developed that they were capable of being observed, a thing I do not, however, think probable; or that the deep-water forms of *Cerianthus* have separate sexes whilst the others are bi-sexual, a relation that is not quite unknown in the lower animals, viz. that one species has separate sexes while another is hermaphroditic.

Heider distinguishes the septa into „Filamentsepta and Genitalsepta“; he has found in *Cerianthus membranaceus*, that every alternate septum carries reproductive

Mesenterialfilamenter, men et saadant Forhold finder ingenlunde Sted hos *Cerianthus Vogti*, hvilket jeg ovenfor har paavist. Saavel Mesenterialfilamenterne som Æggestokkene ere beklædte med et Epithel, bestaaende af cilierende Cylinderceller, imellem hvilke sees dels spredte, dels i Grupper staaende Nematocyster.

Af den ovenfor givne Beskrivelse fremgaar det formentlig, at den bilaterale Symetri, som Vogt har gjort gjældende for *Cerianthus membranaceus*, ogsaa er gennemgaaende hos *Cerianthus Vogti*.

Findested.

Station 87. Nogle Exemplarer, hvoraf 1, nemlig det som blev tegnet, var aldeles ubeskadiget og levede nogle Dage i Observationskarret; de øvrige vare mere eller mindre molesterede.

C. Vogt karakteriserer Familien *Cerianthidæ* paa følgende Maade: Actiniens libres à symétrie bilaterale persistante, à pore terminal donnant accès dans la cavité générale, ayant un disque buccal ample, concave, entouré de deux couronnes de tentacules, marginaux et buccaux, séparés par un large péristome lisse. Les tentacules sont appareillés deux à deux de manière que dans chaque loge latérale débouche un tentacule de chaque sorte. Les cloisons n'atteignent pas le fond de la cavité générale, sauf deux continues correspondant au tentacule impair, lesquelles constituent une rigole interne conduisant au pore.

Cerianthus Vogti.

Artskarakter.

Legemet cylindrisk, udvider sig traktformigt foroven, 80^{mm} langt, 20^{mm} bredt i øverste og 6^{mm} i nederste Ende. Kroppen udvendig glat til opimod 10^{mm} fra Mundskiven, hvor den bliver foldet paalangs. Folderne lige lange og lige brede, naar undtages en, der er bredere og strækker sig længere ned paa Kroppens Rygside. Modsat denne Fold er paa Bugsiden en fin Fure. Den aborale Ende forsynet med en stor, rund Aabning. Kroppens øverste Rand bærer en Række lange, ikke retraktile Tentakler i et Antal af 36. Mundskiven noget fordybet. Munden aflang, omgivet af 36 mindre og tyndere Tentakler. Farven: Kroppen er bleg gul, spillende lidt i det bleg-rosenrøde. Randtentaklerne paa deres aborale Side smukt rosenrøde; paa den adorale Side lysbrune. Mundtentaklerne ere smukt kastaniebrune, ligesaa Mundskiven med lysere Straaler. Røret, hvori Dyret opholder sig, er ikke længere end Kroppen, dannet af Slim, Ler, Sand og andre fremmede Legemer.

organs, and every other intermediate one mesenterial filaments, but such a relation does not at all occur in *Cerianthus Vogti*, as I have shown above. The mesenterial filaments as well as the ovaries are clad with an epithelium consisting of ciliating cylinder-cells, between which nematocysts are observed, placed, partly scattered about partly in groups.

From the description given above it proceeds, presumably, that the bilateral symmetry, which Vogt has established for *Cerianthus membranaceus*, is also generally present in *Cerianthus Vogti*.

Habitat.

Station No. 87. A few specimens of which 1, the one that has been illustrated, was perfectly uninjured and lived for several days in the glass vessel; the others were more or less injured.

C. Vogt characterizes the family *Cerianthidæ* in the following manner: Actiniens libres à symétrie bilaterale persistante, à pore terminal donnant accès dans la cavité générale, ayant un disque buccal ample, concave, entouré de deux couronnes de tentacules, marginaux et buccaux, séparés par un large péristome lisse. Les tentacules sont appareillés deux à deux de manière que dans chaque loge latérale débouche un tentacule de chaque sorte. Les cloisons n'atteignent pas le fond de la cavité générale, sauf deux continues correspondant au tentacule impair, lesquelles constituent une rigole interne conduisant au pore.

Cerianthus Vogti.

Specific characteristics.

The body, cylindrical, dilates itself in infundibuliform at the top, measures 80^{mm} in length, 20^{mm} in breadth at the uppermost and 6^{mm} in breadth at the lowest extremity. Externally the body is smooth until within about 10^{mm} of the oral disc, where it becomes longitudinally folded. The folds uniform in length as well as in breadth, with exception of a single one, which is broader and extends itself farther down the dorsal side of the body. Opposite this fold there is a fine furrow on the ventral side. The aboral extremity is furnished with a large round aperture. The uppermost margin of the body carries a series of long non-retractile tentacles, to the number of 36. The oral disc somewhat depressed. The oral aperture oblong, surrounded by 36 smaller and thinner tentacles. *The colour.* The body is pale yellow with a pale rose-red play of colour. The marginal tentacles are, upon their aboral side, a beautiful rose-red, and on the adoral side light-brown. The oral tentacles are a beautiful chestnut-brown colour; also the oral disc, but with lighter-coloured radii. The tube in which the animal dwells is not longer than the body, and is formed of slime, clay, sand and other foreign substances.

Cerianthus abyssorum, n. sp.

Tab. V, Fig. 7.

Kroppen, som er cylindrisk men udvider sig stærkt traktformigt foroven, er 65^{mm} lang, 25^{mm} bred i den øverste Ende og 8^{mm} bred i den nederste, noget tilspidsede Ende, der er forsynet med en stor, rund Aabning, som udvider og sammentrækker sig. Huden er glat, men har paa den øverste Fjerdedel stærkt udprægede Længdefolder, der synes at svare til Tentakelantallet. Kroppens øverste Rand bærer en Række af 40 Tentakler, som ikke ere retraktile, temmelig tynde og omtrent saa lange som Mundskivens Bredde, Tab. V, Fig. 7. Denne sænker sig traktformig ned mod den aflange Mund, som er omgivet af 40 Tentakler, der kanske ere lidt tyndere end Randtentaklerne, men af omtrent samme Længde som disse. Perisomet er forsynet med fine Folder, der løber viftformigt ud fra den indre Tentakelrække mod Randtentaklerne. Farven: Kroppen er bleg brunlig, men dens øverste Rand er i nogle Millimeters Bredde hvid. Mundskiven mørkebrun; omkring Munden en lysere Ring. Tentaklerne mørk rødbrune. Røret, som Dyret bebor, er henvend en Fod langt og er sammensat af brungult Ler, temmelig ujævnt, ligesom filtret paa dets udvendige Side, imedens det er glat, glinsende og membranøst paa dets indre Væg.

Findested.

Station 251. Kun et Exemplar, og det var saavidt ilive ved dets Udtagelse af Skraben, at det kunde tegnes og for en Del observeres; mange af Randtentaklerne vare afrevne. Af tomme Rør fandtes flere.

Da jeg ikke har villet ødelægge det eneste Exemplar, som haves, og da jeg antager, at Dyret i anatomisk-histologisk Henseende ikke adskiller sig væsentlig fra *Cerianthus Vogti*, har jeg ingen intimere Undersøgelse foretaget. At Arten er forskjellig fra *Cerianthus Vogti* fremgaar formentlig af Tentaklernes Antal og Beskaffenhed, af Farven, af det lange Rør, den bebor og endelig af den yderst forskjellige Lokalitet, paa hvilken den fandtes.

Ægirea¹, Danielssen.

Actinida med fuldstændig Kropshulhed (Coelom) og et udviklet Digestionsapparat, bestaaende af Svælgrør, Tarm og Anus.

¹ Ægir = Havets Gud.**Cerianthus abyssorum**, n. sp.

Pl. V, fig. 7.

The body is cylindrical, but dilates itself strongly at the top in infundibuliform; it measures 65^{mm} in length, 25^{mm} in breadth at the uppermost and 8^{mm} in breadth at the lowest, acuminated extremity, which latter is furnished with a large round aperture that dilates and contracts itself. The integument is smooth, but upon its uppermost fourth-part has strongly distinguished longitudinal folds that appear to correspond in number to that of the tentacles. The uppermost margin of the body carries a series of 40 tentacles, which are non-retractile, rather thin, and about as long as the breadth of the oral disc (Pl. V, fig. 7). This sinks in infundibuliform towards the oblong oral aperture, which is surrounded by 40 tentacles that are, perhaps, a little thinner than the marginal tentacles, but of about the same length as these. The peristome is furnished with fine folds that issue, fan-like, from the inner tentacular series towards the marginal tentacles. *The colour.* The body is pale brownish, but its uppermost margin is, for a few millimetres of its breadth, white. The oral disc is dark-brown, with a lighter coloured annulus round the oral aperture. The tentacles dark reddish-brown. The tube that the animal dwells in is about a foot long, and is constructed of brownish-yellow clay, pretty rough, appearing porous on its external side, whilst upon its inner wall it is smooth, shining and membranous.

Habitat.

Station No. 251. Only one specimen, and it was so far animate when removed from the dredge, that it could be drawn and to some extent observed. Many of the marginal tentacles were torn away. Several empty tubes were found.

As I have been unwilling to destroy the solitary specimen we have, and as I imagine that the animal does not, in anatomico-histological respects, materially distinguish itself from *Cerianthus Vogti*, I have not made any particularly close investigation of it. That the species differs from *Cerianthus Vogti* is probable from the number and nature of the tentacles, from the colour of the long tube in which the animal dwells and, finally, from the extremely different locality in which it was found.

Ægirea¹, Danielssen.

Actinida with a perfect body-cavity (Coelom) and a developed digestive apparatus, consisting of œsophagus, intestine and anus.

¹ Ægir = The god of the sea in Scandinavian mythology.

Familie Ægiridæ. Dan.

Ægireæ, hvis Legeme er cylindrisk, ormformet; 12 enkle Septa med Coelomet opdelt i 12 Længdekamre.

Slægt Fenja¹. Dan.

Legemet cylindrisk, langstrakt, forsynet med 12 Længdefurer imellem hvilke 12 Længdefelter, besatte med Sugevorter. En Række faa, retraktile Tentakler. Anus. 12 fuldstændige Septa. 12 Længdemuskler, imellem hvilke stærkt udprægede Tvermuskler. 12 Genitalporer omkring Anus, udenfor Rectum. Mesodermale Cirkulærmuskler. Hermaphrodit.

Fenja mirabilis, n. sp.

Tab. V, Fig. 2; Tab. XVII, Fig. 1—14; Tab. XVIII, Fig. 1—4.

Legemet er cylindrisk, 70^{mm} langt, 15^{mm} bredt i den forreste Ende, imedens den bage Del er temmelig smal, dels afrundet, dels konisk tilspidset, alt efter Kontraktionernes Beskaffenhed, Tab. V, Fig. 2. Kroppens Overflade er glat, glinsende og har 12 Længdefurer, imellem hvilke sees ligesaa mange brede Længdefelter, der strække sig ligesom Furerne fra Mundskiven bag til Dyrets yderste Ende, Tab. V, Fig. 2, og ere forsynede med en Mængde yderst smaa Sugevorter, som kun kunne iagttages med stærk Loupe og synes ikke at staa i nogen bestemt Orden, Tab. XVII, Fig. 14. Paa den forreste Del af Kroppen derimod ere Sugevorterne noget større og synes at ordne sig i Rækker.

Den forreste Trediedel af Kroppen er, naar Tentaklerne ere udstrakte, noget opsvulmet, og da er Huden saavidt gjennemsigtig, at Septa, som vise sig at svare til Længdefurerne, der angive deres Insertioner, kunne skjelnes. Den midterste Del af Kroppen er ikke fuldt saameget udvidet og er mindre gjennemsigtig; men den bagerste Del, som udgjør omtrent en Fjerdedel af Kroppens hele Længde, er smalere, aldeles opak, kan ikke indtrækkes, men udvider sig vel stundom, og da bliver Huden her noget gjennemsigtig, imedens Midtpartiet trækker sig sammen, bliver smalere og saagodtsom ganske opakt; i det Hele taget forandrer Kroppen temmelig meget sin Form, eftersom den udvider eller sammentrækker sig.

Paa Enden af den bagerste Del sees en fin, rund Aabning, Tab. V, Fig. 2 a; Tab. XVII, Fig. 4 a, omgivet

¹ Fenja = En Trækvinde af Jøtunætten, der sidder paa Havets Bund og maler Salt. (Nordisk Mythologie).

Family Ægiridæ. Dan.

Ægireæ, whose body is cylindrical, vermiform; 12 single septa, with the Coelom divided into 12 longitudinal chambers.

Genus Fenja¹. Dan.

The body cylindrical, elongate, furnished with 12 longitudinal grooves, between which 12 longitudinal areas covered with suckers. A series of a few retractile tentacles. Anus. 12 perfect septa. 12 longitudinal muscles, between which strongly prominent transversal muscles. 12 genital pores around the anus, outside the rectum. Mesodermal circular-muscles. Hermaphrodite.

Fenja mirabilis, n. sp.

Pl. V, fig. 2; Pl. XVII, fig. 1—14; Pl. XVIII, fig. 1—4.

The body is cylindrical, 70^{mm} in length, and 15^{mm} in breadth at the anterior extremity, whilst the posterior part is rather narrow, partly rounded and partly conically acuminate, according to the nature of the contractions (Pl. V, fig. 2). The exterior surface of the body is smooth and shining, and it has 12 longitudinal furrows between which the same number of broad longitudinal areas are seen extending, like the furrows, from the posterior oral disc to the outermost extremity of the animal (Pl. V, fig. 2), and furnished with a multitude of extremely small suckers, only to be observed with the aid of a powerful magnifying glass, and which do not appear to be placed in any systematic arrangement (Pl. XVII, fig. 14). On the anterior part of the body, on the contrary, the suckers are somewhat larger and appear to arrange themselves in series.

When the tentacles are extended the anterior third part of the body is somewhat tumified, and the integument becomes, then, so far transparent, that septa, which show themselves to correspond to the longitudinal furrows, which indicate their insertions, may be distinguished. The medial part of the body is not quite so much expanded, and not quite so transparent; but the posterior part, which composes about a fourth part of the whole length of the body, is narrower, perfectly opaque, and incapable of being retracted, although it still becomes expanded occasionally, and its integument then becomes partially transparent; whilst the medial part contracts, at same time becoming narrower and almost perfectly opaque. Altogether the body alters its form very considerably, according as the animal expands or contracts itself.

At the extremity of the posterior part a minute round aperture is seen (Pl. V, fig. 2 a; Pl. XVII, fig. 4 a)

¹ Fenja. = A sorceress of the Jötun race, dwelling in the depths of the sea grinding salt. Scandinavian mythology.

af 12 yderst smaa Folder eller Papiller, Tab. XVII, Fig. 4 b. Naar Aabningen udvider sig, er den altid stjerneformig, og ofte udstødes der da Grus eller Excrementer, hvorefter den lukker sig meget stærkt, saa at der kun vises en stjerneformet Fordybning.

Mundskiven er konisk fremspringende, Tab. V, Fig. 2, forsynet med 12 temmelig brede Folder, der koncentrere sig imod Munden, Tab. XVII, Fig. 3, som er næsten rund og har jævne men tykke Læber uden Gonidier. Skivens Rand er rund, og paa den sidder i en Række 12 Tentakler, der indtage en Længde af omtrent Trediedelen af Kroppens, Tab. V, Fig. 2; Tab. XVII, Fig. 3. De ere retraktile, cylindriske, temmelig slanke og ende næsten traadformigt. Ikke alene Tentaklerne men ogsaa Mundskiven kan indtrækkes og skjules ganske af Kroppens øverste Rand.

Naar Dyret ved Sammentrækninger forkorter sig, bliver Huden stærkt foldet baade paalangs og paatvers og faar et rudet Udseende; i Ruderne træde da Sugvorterne skarpt frem. Forresten bestaar Bevægelserne i Forlængelser og Forkortninger, i Udvidning og Sammentrækning af Kroppen; men den bagerste Ende trækkes aldrig ind i Legemet. Dyret lever i Sand paa stenet Grund, og efter hvad jeg iagttag ved at have det levende i nogen Tid i Observationskarret, væltede det sig ovenpaa Sandet uden at grave sig ned i dette. Kun af og til hævede det sin forreste Del af Kroppen og udstrakte Tentaklerne livligt, imedens Mundskiven skjød sig stærkt frem; men i Almindelighed laa det udstrakt paa Sandets Overflade og væltede sig til Siderne.

Farven. Den forreste Del af Legemet er næsten vandklar, spillende lidt i det Røde; den midterste Del er kjødrød med lysere Længdestriber, og den bagerste Del har, naar den er udvidet, omtrent samme Farve som den forreste; naar den derimod er sammentrukken, er den ogsaa kjødrød. Mundskiven er næsten vandklar, med bleg-rosenrøde i det Violette spillende Straaler (Folder). Tentaklerne ere lyserøde, næsten vandklare, have ved Grunden en brun-violet Flæk, der som en Stribe forlænger sig langs den adoral Side lige til Spidsen, Tab. V, Fig. 2.

Legemets Overflade er overalt beklædt med et bredt Ectoderm, der bestaar af lange, cilierende Cylinderceller med Kjerne og Kjernelegeme i en finkornet Protoplasma-masse, Tab. XVII, Fig. 6 a; Tab. XVIII, Fig. 1 a. Imellem Cellerne sees hist og her flaskeformede, encellede Slimkjertler, hvoraf mange ere fyldte med en finkornet, seig Masse, der skjuler ganske Kjernen, imedens andre ere ganske tomme. Den lidt forlængede Hals munder ud paa Overfladen, Tab. XVIII, Fig. 1 b. Men foruden Slimkjertlerne er der indleiret imellem Ectodermets Cylinderceller en stor Mængde Nematocyster, Tab. XVIII, Fig. 1 c, som dog ere i rigest Mængde tilstede paa Mundskiven

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

surrounded by 12 extremely small folds or papillæ (Pl. XVII, fig. 4 b). When the aperture dilates itself it is always stelliform, and there is, when in that state, frequently ejected sand or excremента, after which it is very firmly closed so that there, then, is only a stelliform depression visible.

The oral disc is conically protuberant (Pl. V, fig. 2) and furnished with 12 rather broad folds that collect round the oral aperture (Pl. XVII, fig. 3), which is rather round, with smooth but thick lips and no gonidia. The margin of the disc is round, and upon it there is seated a cycle of 12 tentacles, occupying a space equal to about one third of the length of the body (Pl. V, fig. 2; Pl. XVII, fig. 3). The tentacles are retractile, cylindrical, and tolerably slender, and terminate almost filamentously. Not only the tentacles but also the oral disc may be retracted and quite concealed by the superior margin of the body.

When the animal, by its contraction, shortens itself, the integument becomes strongly folded, both longitudinally and transversally, and acquires a chequered appearance, and the suckers then come prominently out in the checks. The movements of the animal, otherwise, consist of prolongations and shortenings, expansions and contractions of the body, but the posterior extremity is never retracted into the body. The animal lives in the sand of stony bottom, and, from what I observed whilst I had it alive some time in the glass vessel, it rolled about on the surface of the sand and did not burrow into it. Only now and then did it raise the anterior part of the body and extend the tentacles vigorously, whilst the oral disc projected itself prominently forward; but in general it lay extended on the surface of the sand and rolled itself to the sides.

The colour. The anterior part of the body is almost pellucid, with a reddish play of colour; the medial part is flesh-coloured with lighter coloured longitudinal stripes, and the posterior part has, when it is expanded, about the same colour as the anterior part; but when, on the other hand, it is contracted it, also, is flesh-coloured. The oral disc is almost pellucid, with pale rosy-red rays (folds) having a violet play of colour. The tentacles are light red, almost pellucid, and at their base have a brown-violet patch which, like a stripe, extends itself along the adoral side right up to the point (Pl. V, fig. 2).

The external surface of the body is everywhere clad with a broad ectoderm, consisting of long, ciliating cylinder-cells with nucleus and nucleolus surrounded by a finely granulated protoplasmic mass (Pl. XVII, fig. 6 a; Pl. XVIII, fig. 1 a). Between the cells there are here and there seen bottle-shaped, unicellular mucous glands, many of which are filled with a finely granulated viscid mass that quite conceals the nucleus, whilst others are quite empty. The slightly elongated throat opens on to the external surface (Pl. XVIII, fig. 1 b). But besides the mucous glands there lie entrenched, between the cylinder-cells of the ectoderm, a great abundance of nematocysts (Pl. XVIII, fig. 1 c).

og Tentaklerne. Indenfor Ectodermet er et bredt Lag fibrillært Bindevæv, Tab. XVII, Fig. 6 *b*. i hvis Midte sees et Belte, bestaaende af cirkulære Muskelfibre, der synes at samle sig i fine Bundter, Tab. XVII, Fig. 6 *c*. Fra den indre Flade af dette Bindevæv udgaa 12 Septa, som staa i lige Afstand fra hverandre og ei danne Par, heller ikke er der noget, som tyder hen paa, at enkelte af dem optræde som Retningsseptas, saaledes som Tilfældet i Almindelighed er hos Actinierne; men de strække sig fra den bagerste Ende til Mundskiven og fæste sig paa Tarmkanalen og Svælgrøret i deres hele Længde, Tab. XVII, Fig. 7, 11, 12 *a*, hvorved Kropshulheden bliver delt i 12 Kamre, Tab. XVII, Fig. 7 *b*, der foroven omkring Svælgrøret ere temmelig brede, men yderst smale omkring Rectum.

Disse Septa ere som sædvanligt forsynede med Tver- og Længdemuskler, men Anordningen er dog noget afvigende fra det Almindelige. Tvermusklerne synes at være lidet udviklede og ere saagodtsom ganske dækkede af Længdemusklerne, som indtage Skillevæggens begge Flader. Ved Septumets Udspring fra Kropsvæggen dele Længdemusklerne sig saaledes, at en Del følge langs Kropsvæggens indre Flade og danne de 12 stærke, longitudinelle Muskler, der ved løst Bindevæv ere fæstede til den, Tab. XVII, Fig. 1 *a*, Fig. 5 *a*, 7 *c*, og som endog give sig tilkjende i de 12 Længdefelter paa Kroppens Ydre; en anden Del udbreder sig over Septumets begge Flader, Tab. XVII, Fig. 7 *d*, og følger disse til Svælgrøret (Øsophagus) og Tarmen, Tab. XVIII, Fig. 2 *a*. Fra Septumets Bindevæv (Støttemembranen) udgaa Forlængelser, der forgrene sig, og paa disse ere Muskelfibrene fæstede, Tab. XVIII, Fig. 2 *b*, hvorved Længdemusklerne faa det buskede Udseende, Tab. XVIII, Fig. 2, som forøvrigt er temmelig almindeligt hos Actiniderne. De ere stærkest udviklede ved Udspringet og henimod Øsophagus og Tarmkanalen, meget tyndere ere de paa Midten, hvor i det Hele taget Bindevævsmembranen synes at være tyndere, Tab. XVII, Fig. 7; Tab. XVIII, Fig. 2. Men foruden de 12 Længdemuskler, som følge Kropsvæggens indre Flade, er der tillige paa denne et Lag stærkt udviklede Tvermuskler, som samle sig til regelmæssige Baand, der staa lige langt fra hverandre, Tab. XVII, Fig. 5 *b*, og gaa under Længdemusklerne hen til Septum, Tab. XVII, Fig. 5 *c*. De ligge altsaa i hvert Kammer og give Hudens indre Flade, baade ved deres Regelmæssighed og ved at overskjæres af Længdemuskler, et gitret Udseende, Tab. XVII, Fig. 5. Muskelaget er overalt baade paa Septa og Kropsvæggen beklædt med et Endothel, bestaaende af lange, cilierende Cylinder-celler; men hvorvidt disse hvile umiddelbart paa Musklerne, eller der er et intermediært Lag, en Bughinde (Peritonæum), hvortil de ere fæstede, saaledes som senere skal paavises at være Tilfældet med Øsophagus og Tarmkanalen, kan ikke her afgjøres.

which are, however, present in richest abundance on the oral disc and the tentacles. Inside of the ectoderm there is a broad layer of fibrillar connective-tissue (Pl. XVII, fig. 6 *b*), in whose middle is seen a belt consisting of circular muscle-fibres, which appear to collect into fine bundles (Pl. XVII, fig. 6 *c*). From the inner surface of this connective-tissue 12 septa issue, standing at a uniform distance apart from each other, and which do not form pairs; neither is there anything that serves to indicate that any of them take the place of directive septa, as is usually the case in Actinidæ; but they extend themselves from the posterior part to the oral disc, and secure themselves to the intestine and the gullet-tube (oesophagus) throughout the whole of their length (Pl. XVII, figs. 7, 11, 12 *a*), causing the body-cavity to be divided into 12 chambers (Pl. XVII, fig. 7 *b*), which at the top, round the gullet-tube, are rather broad, but extremely narrow round the rectum.

These septa are usually furnished with transversal and longitudinal muscles, but still the arrangement is somewhat different from the usual one. The transversal muscles appear to be little developed and are almost entirely covered by the longitudinal muscles, which occupy both surfaces of the septa. At the origin of the septum in the wall of the body, the longitudinal muscles divide themselves in such a manner, that one portion extends along the the inner surface of the wall of the body and form the 12 strong, longitudinal muscles, which are attached by loose connective-tissue to it (Pl. XVII, fig. 1 *a*, 5 *a*, 7 *c*), and which may even be recognised in the 12 longitudinal areas on the exterior surface of the body; another portion distribute themselves over both surfaces of the septum (Pl. XVII, fig. 7 *d*) and follow these to the gullet-tube (oesophagus) and intestine (Pl. XVIII, fig. 2 *a*). From the connective-tissue of the septum (the supporting membrane) prolongations issue, which become ramified, and the muscle-fibres are secured to these (Pl. XVIII, fig. 2 *b*), causing the longitudinal muscles to acquire a fruticous appearance (Pl. XVIII, fig. 2), which indeed is rather common among the Actinidæ. They are most fully developed at the origin and in proximity to the oesophagus and intestinal canal; in the middle they are much thinner, where the connective-tissue membrane appears altogether to be thinner (Pl. XVIII, fig. 7; Pl. XVIII, fig. 2). But besides the 12 longitudinal muscles that follow the inner surface of the wall of the body, there is, besides, upon it, a layer of strongly developed transversal muscles which collect together into regular ribbons, placed at uniform distances apart (Pl. XVII, fig. 5 *b*), and pass under the longitudinal muscles to the septum (Pl. XVII, fig. 5 *c*). They lie, therefore, in each chamber, and impart to the inner surface of the integument, both by their regularity and transection by the longitudinal muscles, a trellised appearance (Pl. XVII, fig. 5). The muscular layer is everywhere, both on the septa and the wall of the body, clad with an endothelium consisting of long, ciliating cylinder-cells, but how far these rest directly upon the muscles, or

Samtlige Septa bære Mesenterialfilamenter og Generationsorganer, Tab. XVII, Fig. 1. De tage deres Udspring lige ved Spiserørets øverste Del, strax under Mundskiven, og ere fæstede paa den ene Flade af Septum, imellem Muskelfibrene, ved en membranøs Forlængelse af Septumets Bindevæv. Septumerne have ikke her som ellers hos Actiniderne en fri Rand, hvortil de nævnte Organer ere bundne; thi, som man erindrer, er hos Fenja intet Gastrovascularium, hvori Skillevæggene kunne hænge frit; tvertimod ere de overalt fæstede udad til Kropsvæggen og indad til Spiserør og Tarmkanal. Mesenterialfilamenterne ere placerede nærmest Spiserøret og strække sig proptrækkerformigt bagover (nedover) til omtrent Midten af Rectum uden at være bundne til denne, Tab. XVII, Fig. 1 *b*; deres Bygning afvige ikke fra den sædvanlige.

Generationsorganerne ligge udenfor Mesenterialfilamenterne og ere ligeledes bundne til Septum ved en Bindevævsforlængelse, der er beklædt med Endothel, Tab. XVII, Fig. 8, 9, 10 *a*. Æggestokkene danne baandformige, noget fladtrykte Rør, som slynge sig nedover Septum, lige fra Mundskiven og langt længere end Mesenterialfilamenterne, Tab. XVII, Fig. 8 *b*. Jeg har saaledes paa et Exemplar seet Æggestokke paa et Par Septa ende i Nærheden af Krophulhedens Bund. Disse Rør ere indvendig beklædte med et Epithel, bestaaende af store, runde Celler med Kjerne og Kjernelegeme, og her sees Æggene i forskellige Udviklingsstadier at ligge i Almindelighed to sammen, Tab. XVII, Fig. 1 *c*, 10 *b*.

Testiklerne ligge yderst, Tab. XVII, Fig. 1 *d*, 8 *c*, saaledes at Æggestokkene ligge imellem disse og Mesenterialfilamenterne. De tage deres Udspring lige ved Ovariernes, men strække sig længere bagtil end disse. De ere ligesom Æggestokkene fæstede til Septum ved en Forlængelse af dettes Bindevæv, Tab. XVII, Fig. 9 *a*, og bestaa af to slyngeformede, næsten runde Rør, der udvendigt ere beklædte med cylinderformede Endothelceller, som ogsaa beklæde Mesenteriet, og imellem hvilke sees en Mængde Nematocyster; indvendigt ere de tapetserede med Epithel, der dannes af store, runde Celler med en rund, excentrisk Kjerne, hvori et rundt Kjernelegeme. Tab. XVII, Fig. 9 *b*. Mange af disse Celler ere fyldte med runde, glinsende Legemer (uudviklede Spermatozoer), Tab. XVII, Fig. 9 *c*, andre ere saagodtsom tomme, men udenfor dem sees store Hobe med lignende, glinsende Legemer som de, der findes indeni Cellerne, Tab. XVII, Fig. 9 *d*. Blandt disse Hobe sees mange af de runde, glinsende Legemer at være forsynede med en kort Hale (mere udviklede Spermatozoer), Tab. XVII, Fig. 9 *e*. Det ser her ud, som om Spermato-genesen foregaar af Spermato-blaster-

whether there is an intermediate layer, a ventral layer, (Peritoneum) to which they are attached, in the manner that will subsequently be shown to be the case with the oesophagus and the intestinal canal, can not be here determined.

All the septa carry mesenterial filaments and reproductive organs (Pl. XVII, fig. 1). These have their origin exactly at the uppermost part of the gullet-tube, just below the oral disc, and are secured to the one surface of the septum, between the muscle-fibres, by a membranous prolongation of the connective-tissue of the septum. The septa have not here, as usually is the case with Actinida, a free margin to which the organs named are attached; it will be remembered that there is in Fenja no gastro-vascular cavity in which the septa could freely hang; on the contrary they are everywhere secured, exteriorly, to the body-wall, and, interiorly, to the gullet-tube and the intestinal canal. The mesenterial filaments are placed next to the gullet-tube, and extend themselves spirally, backwards (downwards), to nearly the middle of the rectum without, however, being secured to it (Pl. XVII, fig. 1 *b*). Their structure presents no divergence from the common.

The reproductive organs are situated outside the mesenterial filaments, and are also secured to the septum by a connective-tissue prolongation, which is clad with endothelium (Pl. XVII, figs. 8, 9, 10 *a*). The ovaries form ribbon-shaped, somewhat adpressed tubes which twine themselves down along the septum, quite from the oral disc and much farther than the mesenterial filaments (Pl. XVII, fig. 8 *b*). I have seen, indeed, in one specimen, the ovary on a couple of septa terminate in proximity to the bottom of the body-cavity. These tubes are clad internally with an epithelium consisting of large, round cells with nucleus and nucleolus, and here the ova are seen in various stages of development, usually lying two together (Pl. XVII, fig. 1 *c*, 10 *b*).

The testicles lie outermost (Pl. XVII, fig. 1 *d*, 8 *c*), so that the ovaries are situated between them and the mesenterial filaments. They have their origin exactly at the same point as the ovaries, but extend themselves farther backwards than the latter do. They are, like the ovaries, secured to the septum by a prolongation of its connective-tissue (Pl. XVII, fig. 9 *a*), and consist of two spiriform, almost round tubes, clad externally with cylindrical endothelial cells, which also cloth the mesentery, and between which a multitude of nematocysts are visible. Internally, they are coated with epithelium formed of large round cells with a round excentric nucleus in which there is a round corpuscle (Pl. XVII, fig. 9 *b*). Many of those cells are occupied by round shining bodies (undeveloped spermatozoa) (Pl. XVII, fig. 9 *c*). Others are almost perfectly empty, but outside them there are seen great crowds of shining bodies, similar to those found in the cells (Pl. XVII, fig. 9 *d*). Among those crowds, many of the round shining bodies are seen to be furnished with a short tail (more perfectly developed spermatozoa) (Pl. XVII, fig. 9 *e*). It appears, here, as if the spermatogenesis proceeds from

nes Protoplasmaindhold, ganske forskjelligt fra, hvad jeg omtalte at være Tilfældet hos *Edwardsioides vitrea*, hvor Spermatozoen antages væsentlig at dannes af Cellekjernen.

Ved at aabne Dyret efter Længden viser det sig, at der ikke som hos Coelenteraterne findes nogen saakaldet Gastrovascularhulhed, Tab. XVII, Fig. 1. Spiserøret, Tab. XVII, Fig. 1 *e*, er cylindrisk, omtrent 10^{mm} bredt ved dets Begyndelse, men aftager lidt i Tykkelse i en Længde af 8—10^{mm}, hvor det gaar over i en tyk Tarm, Tab. XVII, Fig. 1 *f*, som bliver efterhaanden lidt smalere, idet den i en næsten ret Linie strækker sig ned imod den bagerste Ende, hvor den gaar over i Rectum, Tab. XVII, Fig. 1 *g*, der udmunder i den før beskrevne, runde Anus, Tab. XVII, Fig. 1 *h*.

Paa Spiserørets og Tarmkanalens ydre Flade fæste sig 12 Septa, der som tidligere berørt, tage deres Udspring fra Kroppens indre Væg og strække sig lige fra den bagerste Ende til Mundskivens Underflade, hvortil de ligeledes ere bundne. Disse Septa dele Kropshulheden (Coelomet) i 12 Længdekamre, som foroven, lige under Mundskiven, kommunikere med hverandre, idet der i ethvert Septum er en oval Aabning, just paa det Sted, hvor dette fæster sig paa Mundskiven (Oral-Stomata). Bagtil er der ingen saadan Kommunikation; her slutte Kamrene sig omkring Rectum, men i deres Bund, der dannes af Kropshuden, som her er noget fortyndet, findes imellem de før beskrevne Papiller, eller egentlig Endeinsertionerne for Septa bagtil, en fin Spalte, der lukkes og aabnes ved en Fold, som synes at danne en Slags Klappe, Tab. XVII, Fig. 12 *a*, 13 *a*. Denne Spalte sætter hver Kam i Forbindelse med det ydre Medium (Søvandet), og maa egentlig betragtes som Genitalpore. Hvorvidt der igjennem disse Spalter strømmer Søvand ind i Kamrene, er vel meget tvivlsomt; jeg har Intet kunnet iagttage i saa Henseende. Paa et Exemplar er den yderste Ende af Rectum med sin Anus skudt lidt frem ved Kontraktion, og en Excrementprop af slimholdigt Sand udfyldte Anus. Ved at borttage denne Prop sees Folderne paa Rectums indre Væg, Tab. XVII, Fig. 4 *c*.

Paa Spiserørets indre Væg er der overmaade mange Længdefolder, der ere afbrudte ved Kontraktioner af Tvermuskler, hvorved Folderne faa Udseende af at løbe paa tværs, Tab. XVII, Fig. 2 *a*. Dette Forhold forandrer sig, saa snart Øsophagus er gaaet over i Tarmen, thi her fremtræder Længdefolderne meget tydeligere, om end de ogsaa her paa Grund af Tvermusklernes Virkning har et bølgeformigt Udseende, Tab. XVII, Fig. 2 *b*; men i Rectum ere de endnu tydeligere, tykkere og løbe i næsten rette Linier ned til Anus, Tab. XVII, Fig. 2 *c*, hvorom de samle sig, Tab. XVII, Fig. 2 *d*. Der er ingen Svælgrube.

the spermatoblast's protoplasmic contents, perfectly different, therefore, from what I stated to be the case in *Edwardsioides vitrea*, where the spermatozoa is supposed to originate principally in the cellular nucleus.

On dissecting the animal longitudinally it appears, that unlike the Coelenterata, there is no so-called gastrovascular cavity to be found (Pl. XVII, fig. 1). The gullet-tube (Pl. XVII, fig. 1 *e*) is cylindrical, and about 10^{mm} in breadth at its origin, but diminishes a little in thickness for a distance of 8—10^{mm}, and then passes over into a thick intestine (Pl. XVII, fig. 1 *f*), which becomes gradually narrower as it, in almost a straight line, extends itself down towards the posterior extremity, where it passes over into the rectum (Pl. XVII, fig. 1 *g*), which opens into the previously described round anus (Pl. XVII, fig. 1 *h*).

Upon the outer surface of the gullet-tube and intestinal canal 12 septa are adherent, which, as previously mentioned, have their origin in the inner wall of the body and extend themselves quite from the posterior extremity to the under surface of the oral disc, to which also they are attached. These septa divide the body-cavity (the Coelom) into 12 longitudinal chambers, which, at the top, just under the oral disc, communicate with each other, in as much, that there is, in each septum, an oval aperture just at the point where the septum is secured to the oral disc (oral-stomata). There is no such communication posteriorly; here the chambers close round the rectum, but at their bottom — formed by the body integument, which is here somewhat less thick — between the previously mentioned papillæ or, really, the terminal posterior insertions of the septa, there is found a fine fissure, which is opened and closed by a fold that appears to form a kind of valve (Pl. XVII, fig. 12 *a*, 13 *a*). This fissure places each chamber in communication with the external medium (the sea-water), and must be regarded as really a genital pore. Whether the sea-water flows into the chambers through these fissures is, indeed, very doubtful; I have been unable to detect any indications of this. In one specimen the extreme end of the rectum with its anus, is a little projected by contraction, and an excrementary plug of slimy sand occupies the anus. On removing this plug the folds of the inner wall of the rectum become visible (Pl. XVII, fig. 4 *c*).

On the inner wall of the gullet-tube there are an immense number of longitudinal folds, which are broken off by the contractions of the transversal muscles causing the folds to acquire the appearance of running transversally (Pl. XVII, fig. 2 *a*). This relation changes as soon as the œsophagus passes over into the intestine; the longitudinal folds appear, here, much more prominently, although they also, here, have a bulging appearance, owing to the action of the transversal muscles (Pl. XVII, fig. 2 *b*), but in the rectum they are still more distinct and thicker, and extend in nearly straight lines down to the anus (Pl. XVII, fig. 2 *c*), round which they collect (Pl. XVII, fig. 2 *d*). There is no gullet-groove (syphonoglyphe).

Ved Tversnit sees paa Spiserørets og Tarmkanalens ydre Væg listeformede Fremstaaenheder af fibrillært Bindevæv, Tab. XVII, Fig. 7 e, 11, 12 b, der har sin Epithelialbeklædning, bestaaende af lange, smale Cylinder-celler, som have en meget tynd Membran og en aflang Kjerne med Kjernelegeme, omgivet af en gjennemsigtig Protoplasmamasse, Tab. XVIII, Fig. 2 d. Bindevævslisterne ere ordnede saaledes, at enkelte ere mere fremspringende end andre, og det ser ud, som de afbrydes ved Skillevæggene; thi i det Rum, der dannes imellem to Septa, rage Listerne langt frem i Midten af Kammeret, ligesom de aftage i Bredde, jo mere de nærme sig Septa, Tab. XVIII, Fig. 2. Det Hele faar et Udseende i Mikroskopet, som om Spiserøret og Tarmkanalen ere omgivne af en Bindevævskrave, dækket af Cylinder-celler, forsynede med Cilier; men om der kun er en eller flere Cilier paa hver Celle, har det ikke været muligt at iagttage. Egentlig kunne disse Bindevævslister betragtes som rudimentære Septa; men saa er der det Særegne ved dem, at de udgaa fra Spiserøret og Tarmkanalen og ikke fra Kropsvæggen, og at de tiltage i Bredde, jo mere de nærme sig Dyrets Bagdel, saa at de ere bredest omkring Rectum. Imellem Epithelet og Bindevævet er der en yderst fin Membran (Peritonæum), hvortil Cylinder-cellerne ere fæstede, og som dækker et tyndt Lag cirkulære Muskelfibre, Tab. XVIII, Fig. 2 e, der synes at være Fortsættelse af Skillevæggenes Muskulatur, og som støde til et meget bredt Bindevævslag, Tab. XVIII, Fig. 2 f. Dette er stærkt fibrillært og forsynet med en Mængde Bindevævslegemer med en eller flere Udløbere, samt Ernæringskanaler med deres Epithel. Fra dette Bindevævslag udgaa temmelig lange, koniske Prolongationer, Tab. XVIII, Fig. 2 g, som i væsentlig Grad bidrage til at danne Folderne paa Spiserørets og Tarmkanalens indre Væg, Tab. XVII, Fig. 7 f; Tab. XVIII, Fig. 2 g. Paa den indre Flade af Bindevævet og dets Forlængelser er et stærkt udviklet Muskellag, Tab. XVIII, Fig. 2 h, der dannes af Tver- og Længdefibre, og som er beklædt med et tykt Epithel, bestaaende af forholdsvis brede Cylinder-celler, forsynede med temmelig lange Cilier, Tab. XVII, Fig. 7 g; Tab. XVIII, Fig. 2 i. Imellem Cellerne sees aflange, encellede Slimkjertler, der med sin Udførselsgang munder ud paa Epithelets Overflade.

Hvad nu Nervesystemet angaar, saa har jeg ikke ret meget at berette derom; imidlertid viser dog det Lidet, jeg kan meddele, at Fenja mirabilis ikke i saa Henseende atviger væsentlig fra det af Brødrene Hertwig først paaviste Nervesystem hos Actinierne. Lige under Mundskiven, umiddelbart indenfor (under) Ectodermet, imellem dette og Bindevævet, iagttages et smalt Lag, der er finkornet, og som ved Maceration fulgte med Ectodermet. Foruden de fine, runde, glinsende Korn (overskaarne Nervefibriller) sees hist og her store Ganglieceller med en stor, næsten rund Kjerne,

On transversal section of the outer wall of the gullet-tube and intestinal canal, fillet-formed protuberances of fibrillous connective-tissue are seen (Pl. XVII, fig. 7 e, 11, 12 b), whose epithelial covering consists of long, narrow, cylinder-cells with a very thin membrane, and an oblong nucleus with corpuscle surrounded by a transparent protoplasmic mass (Pl. XVIII, fig. 2 d). The connective-tissue fillets are arranged in such manner, that a few of them are more prominent than others, and it appears as if they are broken off by the septa, as in the space formed between two septa the fillets reach far forward into the middle of the chamber, whilst they also diminish in breadth the closer they approach to the septa (Pl. XVIII, fig. 2). The whole object appears, under the microscope, as if the gullet-tube and intestinal canal are surrounded by a collar of connective-tissue, covered by cylinder-cells furnished with ciliæ, but whether there is only one, or several ciliæ on each cell, it has not been possible for me to observe. These connective-tissue fillets may be regarded as really rudimentary septa, but there is this peculiarity about them, that they issue from the gullet-tube and intestinal canal and not from the wall of the body, and that they increase in breadth the nearer they approach to the posterior part of the body of the animal, so that they are broadest round the rectum. Between the epithelium and the connective-tissue there is an extremely fine membrane (Peritoneum) to which cylinder-cells are attached, and which covers a thin layer of circular muscle fibres (Pl. XVIII, fig. 2 e) that appear to be a continuation of the musculosity of the septa, and unite to a very broad layer of connective-tissue (Pl. XVIII, fig. 2 f). This layer is strongly fibrillous, and is furnished with a multitude of connective-tissue corpuscles having one or several prolongations, and also with nutritory ducts with their epithelium. From this connective-tissue layer, pretty long, conical prolongations issue (Pl. XVIII, fig. 2 g), which in a material degree contribute to form the folds on the inner wall of the gullet-tube and intestinal canal (Pl. XVII, fig. 7 f; Pl. XVIII, fig. 2 g). On the inner surface of the connective-tissue and its prolongations, there is a strongly developed muscular layer (Pl. XVIII, fig. 2 h), formed of transversal and longitudinal fibres, and which is clad with a thick epithelium consisting of relatively broad cylinder-cells furnished with rather long ciliæ (Pl. XVII, fig. 7 g; Pl. XVIII, fig. 2 i). Between the cells oblong unicellular mucous glands are seen, whose excremental ducts open upon the surface of the epithelium.

As regards the nervous system, I have not very much to say; however, the little I have to report enables me to say, that in Fenja mirabilis the nervous system does not differ materially from that of the Actinæ first shown by the Brothers Hertwig. Just below the oral disc, immediately inside (below) the ectoderm, between it and the connective-tissue, a narrow layer is observed, which is finely granular and upon maceration followed with the ectoderm. Besides the minute, round, shining grains (transsected nerve-fibrills), there are seen, here and there,

indesluttende Kjernelegemet og omgivet af en mørk Protoplasmamasse, Tab. XVIII, Fig. 4. Ved Siden af disse Ganglier med deres 3—4 Udløbere, Tab. XVIII, Fig. 4 *a*, vise sig lange Nervetraade krydsende hverandre, og som synes at udgaa fra aflange, ganglionære Knuder, der ere rige paa Protoplasma, Tab. XVIII, Fig. 4 *b*. Nogen Kjerne har det ikke været muligt at opdage i disse Knuder, og det kan hændes, at de kun ere kunstige, varikøse Udvindinger.

Men ikke alene ved Mundskiven iagttages disse Ganglier og Nervefibriller; de findes paa flere Steder af Kroppen, endog langt bag paa denne, hvor de vise sig temmelig tydeligt paa meget tynde Tversnit; men tydeligst paa Macerationspræparater, behandlede med svag Osmiumsyre. Det forekommer mig med temmelig Sikkerhed, at der er et rigt Nervenet med korresponderende Ganglier udbredt over hele Legemet, og vi skulle se, at noget lignende vistnok finder Sted for Spiserørets og Tarmkanalens Vedkommende. Paa den øverste Del af Spiserørets indre Flade, imellem Epithelet og Muskellaget, sees et fint Nervenet, Tab. XVIII, Fig. 3, hvis Grene udbrede sig dels til Epithelet, Tab. XVIII, Fig. 3 *b*, dels til Muskelaget, Tab. XVIII, Fig. 3 *c*, og over dette Nervenet ligger spredt store Ganglier med store, runde Kjerner, der indeslutte et rundt Kjernelegeme, og som ere omgivet af en finkornet Protoplasmamasse, Tab. XVIII, Fig. 3 *d*. Gangliacellerne have forskjellig Form, ere mere eller mindre udviklede og udsende flere Udløbere, der ere meget rige paa Protoplasmaindhold. Nogen Forbindelse imellem Gangliacellerne og Nervenettet har jeg ikke kunnet iagttage, omendskjønt det er nok saa rimeligt, at en saadan findes. Længere nede paa Tarmen sees lignende Nerveudbredninger, saa jeg er tilbøielig til at tro, at hele Tarmtrakten er vel forsynet dermed. Paa et Tversnit af den øverste Del af Spiserøret forekom det mig, at der paa dettes indvendige Side, indenfor Epithelet og vel dækket af dette, laa en Gruppe mindre, næsten pæreformede Ganglier, der havde en temmelig stor Kjerne med Kjernelegeme; men da de vare temmelig utydelige, og da der af dette Parti ikke lykkedes at faa brugelige Macerationspræparater, maa jeg indskrænke mig til at antyde, at der paa denne Vei sandsynligvis sker en Nerveudbredning til Septa og de til disse knyttede Organer.

Findested.

Station: 173—174. Flere Exemplarer, men kun nogle faa (2 Voxne, 1 Unge) vare ubeskadigede. Hos de fleste var Huden revnet paa den forreste Del af Kroppen henimod Mundskiven, og igjennem Revnerne vare Mesenterialfilamenterne og tildels Generationsorganerne udjagede og laa ganske blottede.

ganglial cells containing a large, almost round nucleus enclosing the nucleal corpuscle and surrounded by a dark protoplasmic mass (Pl. XVIII, fig. 4). Alongside these ganglia with their 3 or 4 prolongations (Pl. XVIII, fig. 4 *a*), long nerve filaments appear crossing each other, and seem to issue from oblong, ganglial nodules rich in protoplasm (Pl. XVIII, fig. 4 *b*). It has not been possible to detect any nucleus in these nodules, and it may be that they are only artificial varicose dilations.

But not only on the oral disc are these ganglia and nervous fibrils observed; they are also found upon several parts of the body, even far back upon it, and they show themselves pretty distinctly in very thin transverse sections, but most distinctly in macerated preparations treated with weak osmic acid. It appears to me, with considerable certainty, that there is a rich nervous reticulation with corresponding ganglia distributed over the whole body, and that we ought to find that something like it certainly occurs on the gullet-tube and intestinal canal. On the uppermost part of the inner surface of the gullet-tube, between the epithelium and the muscular layer, a fine nervous reticulation is observed (Pl. XVIII, fig. 3), whose filaments extend themselves partly to the epithelium (Pl. XVIII, fig. 3 *b*) and partly to the muscular layer (Pl. XVIII, fig. 3 *c*), and over this reticulation lie scattered, large ganglia with large, round nuclei enclosing round nucleus-corpuscles, surrounded by a finely granular protoplasmic mass (Pl. XVIII, fig. 3 *d*). The ganglial cells have various forms, are more or less angular and project several prolongations, which are very rich in protoplasmic contents. I have not been able to detect any connection between the ganglial cells and the nervous reticulation, although it is sufficiently probable that such a connection exists. Farther down the intestine similar nervous distributions are seen, so that I am disposed to believe, that the entire intestinal tube is will supplied with them. In a transverse section of the uppermost part of the gullet, it appeared, to me, that upon its exterior side, inside of the epithelium and well covered by it, there lay a group of small, almost piriform ganglia, which had a pretty large nucleus with nucleus-corpuscle; but as they were rather indistinct, and I did not succeed in obtaining from this part satisfactory macerated preparations, I must confine myself to indicating, that probably in that way a nervous distribution takes place to the septa and to the organs attached to them.

Habitat.

Stations No. 173 and 174. Several specimens but only a few of them (2 adult and 1 young) were brought up undamaged. In most of them the integument was torn on the anterior part of the body towards the oral disc, and through the rifts the mesenterial filaments, and partly also the reproductive organs, were forced out and lay quite exposed.

Artskarakter.

Legemet cylindrisk, 70^{mm} langt, 15^{mm} bredt i den forreste, konisk tilspidset i den bagre Ende, der er forsynet med 12 Papiller, givende Anus et stjerneformet Udseende. Kroppens Overflade glat med 12 Længdefurer og spredte Sugevorter, som paa den forreste Kropsdel ordne sig i Rækker. Huden er, naar Dyret er i fuld Vigør med udstrakte Tentakler, gjennemsigtig saavidt, at Septa med Mesenterialfilamenter kunne skjelnes. Mundskiven konisk fremspringende med en næsten rund Mund, hvorfra udgaa 12 Folder mod Peripherien. Ingen Gonidier. 12 Tentakler, omtrent en Trediedel saa lange som Kroppen, retraktile, slanke, endende næsten traadformigt. Kroppens øverste Rand kan trækkes over Mundskiven. Under Sammentrækningerne antager Huden en rudet Form. Farven: Den forreste Del af Legemet er næsten vandklar, spillende lidt i det Røde; den midterste Del kjødrød med lysere Længdestriber; den bagerste Del har, naar den er udvidet, omtrent samme Farve som den forreste, men kontraheret er ogsaa den kjødrød. Mundskiven næsten vandklar med blegt rosenrøde, i det Violette spillende Straaler. Tentaklerne lyserøde, næsten vandklare; ved Grunden en brunviolet Flæk, forlængende sig som en Stribe langs den adorale Side lige til Spidsen.

Slægt Ægir.

Legemet langstrakt, cylindrisk, med et slimet, skedeformet Overtræk samt 12 Længderibber, imellem hvilke spredte, smaa Sugevorter. En Række faa Tentakler. Paa den bagerste Del af Tarmrøret (Rectum) strax ovenfor Anus 12 fine Spalter, der kommunisere direkte med Tarm-lumenet; 12 ligestillede, fuldstændige Septa. Endodermale Cirkulærmuskler. Hermaphrodit.

Ægir frigidus.

Tab. V, Fig. 4; Tab. XVIII, Fig. 5—10; Tab. XIX, Fig. 1—4.

Legemet cylindrisk, omkring 30^{mm} langt, 8—10^{mm} bredt i den forreste og 4—5^{mm} bredt i den bagerste, noget afrundede Ende, Tab. V, Fig. 4. Kroppens Overflade har et yderst tyndt, slimet, lidt inkrusteret Overtræk og er forsynet med 12 temmelig fremspringende Ribber, Tab. XVIII, Fig. 5 *a*, imellem hvilke findes lidt fordybede Længdefelter, Tab. XVIII, Fig. 5 *b*, hvori der ved Hjælp af stærk Loupe sees smaa, spredte Sugevorter, som synes at staa to og to sammen. Det nævnte Overtræk, der er temmelig fast bundet til Ribberne, dækker ikke hele Kroppen; thi dennes øverste Del er nøgen i en Længde af

Specific characteristics.

The body cylindrical, 70^{mm} in length, 15^{mm} in breadth at the anterior extremity, conically acuminated at the posterior extremity, which, latter, is furnished with 12 papillæ, giving to the anus a stelliform appearance. The external surface of the body smooth, with 12 longitudinal furrows and scattered suckers, which in the anterior part of the body are arranged in series. The integument, when the animal is in full vigour and has its tentacles extended, transparent, so much so, that the septa with the mesenterial filaments may be distinguished. The oral disc conically protuberant, has an almost round oral aperture from which 12 folds issue towards the periphery. No gonidia. 12 tentacles of about a third part the length of the body, retractile, attenuated, terminating almost filamentously. The uppermost margin of the body may be drawn over the oral disc. During the contractions the integument acquires a chequered form. *The colour.* The anterior part of the body is almost pellucid, with a reddish play of colour; the medial part is flesh-coloured with lighter coloured longitudinal stripes; the posterior part has, when it is extended, about the same colour as the anterior part, but when contracted is also flesh-coloured. The oral disc is almost pellucid, with faint rosy-red rays having a violet play of colour. The tentacles light-red, almost pellucid; at their base a brown, violet patch prolonging itself as a stripe along the adoral side right up to the point.

Genus Ægir.

The body elongate, cylindrical, with a mucous vaginal covering, and 12 longitudinal ribs between which small suckers are scattered. One cycle of few tentacles. In the posterior part of the intestinal canal (rectum), immediately above the anus, 12 slender fissures that communicate directly with the intestinal passage. 12 similarly situated perfect septa. Endodermal circular muscles. Hermaphrodite.

Ægir frigidus.

Pl. V, fig. 4; Pl. XVIII, figs. 5—10; Pl. XIX, figs. 1—4.

The body cylindrical, about 30^{mm} in length, 8—10^{mm} in breadth at the anterior extremity, and 4—5^{mm} in breadth at the posterior, somewhat rounded extremity (Pl. V, fig. 4). The external surface of the body has an extremely thin, slightly encrusted, mucous covering, and is furnished with 12 rather protuberant ribs (Pl. XVIII, fig. 5 *a*) between which slightly depressed longitudinal areas are found (Pl. XVIII, fig. 5 *b*), in which, with the aid of a powerful magnifying glass, small, scattered suckers are seen, which appear to stand two and two together. The covering mentioned is pretty firmly attached to the ribs, and does

4—5^{mm} fra Mundskiven, Tab. XVIII, Fig. 5 c, hvorimod det findes paa hele den bagre Del, naar undtages dennes Ende, som er forsynet med en rund Aabning (Anus), der udvider og sammentrækker sig, og hvorigjennem udskydes Excrementpropper, bestaaende af Grus og Slim, Tab. XVIII, Fig. 5 d. Paa den øverste (forreste) nøgne Del, som udvider sig noget op imod Mundskiven, fremtræde de 12 Ribber end tydeligere, og imellem dem sees Sugevorterne tydeligere og ere lidt større end paa den øvrige Del af Kroppen.

Mundskiven er en god Del bredere end Kroppens forreste Rand; den er temmelig plan, men foldet og lidt fordybet mod den i Centrum værende, lidt aflange Mundaabning, Tab. V, Fig. 4; Tab. XVIII, Fig. 5, 7. Folderne, der udgaa fra Munden straaformigt mod Peripherien, ere smalest ved deres Udspring, men blive alt bredere mod Mundskivens Rand, som er forsynet med 12 Tentakler, der staa i en Række, Tab. V, Fig. 4; Tab. XVIII, Fig. 7. Disse ere temmelig korte, tykke ved Grunden og retraktile. Saavel Tentaklerne som Mundskiven og hele den forreste, nøgne Kropsdel kunne trække sig ind i det skedeformige, slimede Overtræk, der da synes at danne et Rør, som lukker sig foroven. Dette Rør er forresten meget tyndt, gjennemsigtigt og løsner meget let fra Kroppen, men er dog saavidt fæstet til Længderibberne, at Dyret ikke ganske kan skille sig ved det. Løsrevne Stykker erstattes hurtigt ved Afsondring af en seig Materie fra den blottede Krops-overflade.

Farven. Røret eller det slimede Overtræk er skjønt, dybt kastaniebrunt, spillende lidt i det Violette. Kroppens Hūd bleg rosenrød. Mundskiven og Tentaklerne ere intens karmosinrøde, dog er Skiven lidt blegere end Tentaklerne, Tab. V, Fig. 4.

Ved at aabne Dyret efter Længden falder det strax i Øinene, at man her har med en indre Ordning, lig den, der er beskrevet for Fenja mirabilis. Her er ingen Gastrovascularhulhed, idet nemlig Spiserøret gaar umiddelbart over i en vel udviklet Tarm, som ender i en Anus, Tab. XVIII, Fig. 7.

Spiserøret er cylindrisk, 8^{mm} langt, 4^{mm} bredt lige ved Mundaabningen, Tab. XVIII, Fig. 7 a, men aftager noget i Tykkelse, idet det gaar over i Tarmen, Tab. XVIII, Fig. 7 b. Denne udvider sig lidt, strax nedenfor Øsophagus, og gaar i næsten lige Retning henimod den bagerste Ende, hvor den atter udvider sig en Smule, for som Rectum, Tab. XVIII, Fig. 7 c, at ende i den runde Anus. Paa den udvendige Side af Spiserør og Tarm sees Insertionerne for 12 Septa, Tab. XVIII, Fig. 7 d, som dele hele Digestionsapparatet i 12 Længdefelter, Tab. XVIII, Fig. 7; i en Afstand af et Par Millimeter fra Anus iagttages paa Tarmen (Rectum), just i hvert Længdefelt, altsaa imellem hver 2 Septainsertioner, en yderst fin Spalte, der er omtrent 2^{mm} lang, Tab. XVIII, Fig. 7 e, og som vi senere skulle

not cover the whole of the body, as the uppermost part is exposed for a length of 4—5^{mm} from the oral disc (Pl. XVIII, fig. 5 c), but, on the other hand, it is found covering the whole of the posterior part, with exception of the extremity, which is furnished with a round aperture (anus) that dilates and contracts itself, and through which the excrements are ejected in the shape of plugs of coarse sand and mucous (Pl. XVIII, fig. 5 d). In the superior (anterior) naked part, which dilates itself somewhat towards the oral disc, the 12 ribs appear still more distinctly, and between them the suckers are more distinctly observed, and are a little larger than on the rest of the body.

The oral disc is a good deal broader than the anterior margin of the body; it is rather plane, but folded, and is a little depressed towards the slightly oblong, oral aperture situated in the middle (Pl. V, fig. 4; Pl. XVIII, figs. 5, 7). The folds, which issue from the oral aperture, radially, towards the periphery, are narrowest at their origin, but gradually become broader towards the margin of the oral disc, which is furnished with 12 tentacles standing in a series (Pl. V, fig. 4; Pl. XVIII, fig. 7). These are rather short, thick at the base and retractile. The tentacles as well as the oral disc and the entire anterior exposed part of the body, are capable of being withdrawn into the vaginal mucous covering, which then appears to form a tube that closes itself at the top. This tube is, otherwise, very thin, transparent, and easily detached from the body, but is, yet, so well secured to the longitudinal ribs that the animal cannot quite throw it off. Detached portions are quickly replaced by exudation of a viscid substance from the naked exterior surface of the body.

The colour. The tube, or the mucous covering, is a beautiful, chestnut brown, having a violet play of colour. The integument of the body is pale rosy-red. The oral disc and the tentacles are an intense crimson-red, but the disc is a little paler in colour than the tentacles (Pl. V, fig. 4).

Upon dissecting the animal longitudinally, it immediately becomes evident, that we have, here, an internal arrangement like that described in connection with Fenja mirabilis. Here there is an absence of any gastro-vascular cavity, as the gullet-tube passes immediately over into a well-developed intestine that terminates in an anus (Pl. XVIII, fig. 7).

The gullet-tube (oesophagus) is cylindrical, 8^{mm} in length, and 4^{mm} in breadth just at the oral aperture (Pl. XVIII, fig. 7 a), diminishing somewhat in thickness as it passes over into the intestine (Pl. XVIII, fig. 7 b). The intestine becomes a little dilated immediately below the oesophagus, and passes, in almost a straight line, towards the posterior extremity, where it again dilates itself a little, in order to, as a rectum (Pl. XVIII, fig. 7 c), terminate in the round anus. On the exterior side of the gullet-tube and intestine the insertions of 12 septa are observed (Pl. XVIII, fig. 7 d), which divide the entire digestive apparatus into 12 longitudinal areas (Pl. XVIII, fig. 7); at a distance of a couple of millimetres from the anus, there is seen on the intestine (rectum), exactly in each longitudinal belt,

se fører lige ind i Rectum. Spiserørets indre Flade er foldet efter Længden, og Folderne ere forholdsviis meget brede, Tab. XVIII, Fig. 6 a; idet Spiserøret gaar over i Tarmen, blive Folderne smalere, men et Stykke bag i Tarmen rage de mere frem og antage næsten Bladformen, Tab. XVIII, Fig. 6 b, imedens de i den bagerste Del, Rectum, blive overordentlig smale, staa tættere sammen og ere i en langt rigere Mængde tilstede, Tab. XVIII, Fig. 6 c.

Legemets Overtræk er dannet af en seig Slimmasse, hvori sees indleiret paa den ydre Flade spredte Sandkorn, imedens den indre Flade er glat og uden organisk Forbindelse med Kropshuden. Denne har et temmelig tykt Ectoderm, bestaaende af et Lag høje, smale, cilierende Cylinderceller med Kjerne og Kjernelegeme, Tab. XVIII, Fig. 8 a. Imellem Cellerne og tildels dækket af dem sees kolbeformede, encellede Slimkjertler, Tab. XVIII, Fig. 8 b, samt en Mængde Nematocyster, Tab. XVIII, Fig. 8 c. Disse sidste ere især rigeligt tilstede paa Tentaklerne og Mundskiven. Indenfor Ectodermet er et fibrillært Bindevævs-lag, Tab. XVIII, Fig. 8 d, der er rigt paa Bindevævs-legemer med Udlobere, samt Ernæringskanaler. Henimod den indre Flade af dette Bindevæv findes et temmelig smalt Belte af Cirkulærmuskler, som synes at ligge i Bundter, men ere ikke meget udviklede, Tab. XVIII, Fig. 8 e. Paa Bindevævs indre Flade er fæstet Længde- og Tvermuskler, Tab. XVIII, Fig. 8 f, der ere beklædte med Cylinderepithel, Tab. XVIII, Fig. 8 g.

Der er 12 Septa, som tage deres Begyndelse fra Kroppens indre Væg og strække sig lige fra Analaabningen og op til Mundskivens Underflade, hvortil de fæste sig, ligesom de alle inserere sig paa Spiserørets og Tarmens ydre Flade, Tab. XIX, Fig. 2, 3, 4. Herved deles Kroppshulheden i 12 Kamre, Tab. XIX, Fig. 2, 3, 4 a, der kommunikere med hverandre igjennem en liden, halvmaaneformig Aabning (Oral-Stomata), som findes paa Septa netop der, hvor de fæste sig paa Mundskiven; forøvrigt synes Kamrene at være aflukkede. Fortil, eller foroven, omkring Spiserøret ere de meget brede, men jo mere de nærme sig den bagerste Ende, desto trangere blive de, saa at de omkring Rectum ere yderst trange. Septumerne staa lige langt fra hverandre, ere ikke parrede, ligesaa lidt som der er noget af dem, der kan betragtes som Retningsseptum, Tab. XIX, Tab. 2, 4. Paa et Exemplar syntes nogle Septa at være noget afvigende fra de øvrige, idet de vare noget kortere, saa Afstanden imellem Kroppsvæggen og Tarmen blev mindre, og de tilsvarende Kamre som Følge deraf trangere; men det tør hiende, at denne Afvigelse var opstaaet ved en uregelmæssig og voldsom Kontraktion, saa man Intet kan slutte deraf.

consequently between each two septal insertions, an extremely fine fissure about 2^{mm} in length (Pl. XVIII, fig. 7 e), and, as we shall subsequently see, it leads right into the rectum. The inner surface of the gullet-tube is longitudinally folded and the folds are relatively very broad (Pl. XVIII, fig. 6 a); as the gullet-tube passes over into the intestine the folds become narrower, but a little way back in the intestine they project more forward and assume almost the foliaceous form (Pl. XVIII, fig. 6 b), whilst they in the posterior part (rectum) become extremely narrow, stand closer together, and are present in far greater abundance (Pl. XVIII, fig. 6 c).

The covering of the body is formed of a mucous mass on whose exterior surface scattered granules of sand are seen to be entrenched, whilst the interior surface is smooth, and has no organic connection with the integument of the body. The latter has a pretty thick ectoderm, consisting of a layer of long, narrow, ciliating cylinder-cells with nucleus and nucleus-corpuscle (Pl. XVIII, fig. 8 a). Between the cells, and partly covered by them, claviform unicellular mucous glands are observed (Pl. XVIII, fig. 8 b), also a multitude of nematocysts (Pl. XVIII, fig. 8 c). These last are especially richly present on the tentacles and oral disc. Inside of the ectoderm there is a fibrillous connective-tissue layer (Pl. XVIII, fig. 8 d) rich in connective-tissue bodies with prolongations, and also nutritory ducts. Towards the inner surface of this connective-tissue there is found a rather narrow belt of circular muscles which appear to be situated in bundles but are not much developed (Pl. XVIII, fig. 8 e). On the inner surface of the connective-tissue longitudinal and transversal muscles are secured (Pl. XVIII, fig. 8 f), and are covered with cylinder-epithelium (Pl. XVIII, fig. 8 g).

There are 12 septa, which have their origin in the inner wall of the body and extend quite from the anal aperture and up to the under surface of the oral disc, to which they attach themselves, whilst, also, they all insert themselves on the exterior surface of the gullet-tube and intestine (Pl. XIX, fig. 2, 3, 4). The cavity of the body is thus divided into 12 chambers (Pl. XIX, figs. 2, 3, 4 a) that communicate with each other through a small semi-lunar opening (oral-stomata) which is found on the septa, exactly at the point where they attach themselves to the oral disc; the chambers appear otherwise to be closed. Anteriorly, or at the top round the gullet-tube, they are very broad, but the more they approach to the posterior extremity the narrower do they become, so that around the rectum they are extremely narrow. The individual septa are placed at uniform distances apart, and not in pairs, whilst, also, there are none of them that can be considered as directive septa (Pl. XIX, figs. 2, 4). In one specimen a few septa appeared to be somewhat different from the rest as they were a little shorter, so that the distance between the wall of the body and the intestine became less, and, as a consequence of that, the corresponding chambers became narrower, but it may perhaps be, that this difference has arisen from an irregular and violent

Septa ere dannede af fibrillært Bindevæv, der her er temmelig tykt og egentlig Fortsættelse af Kropsvæggens Bindevæv og har en Muskelanordning ganske lig den hos *Fenja mirabilis*, idet begge Sider ere beklædte med longitudinelle Muskler, imedens de transverselle, som kun indtage en Side, synes at være lidet udviklede og dækkede af de longitudinelle Muskler, Tab. XIX, Fig. 1—4. Fra begge Sider af Septa udgaa en Mængde tynde Bindevævsgrene, Tab. XIX, Fig. 1 *a*, og paa disse sidde Muskelfibrillerne, Tab. XIX, Fig. 1 *b*, hvorved det Hele faar et smukt, busket Udseende. Men idet Længdemusklerne udgaa fra Kropsvæggen for at udbrede sig paa begge Sider af Septa, sende de langs deres Insertioner en Samling af stærke Muskelbundter, der danne Kropsvæggens Længdemuskler, som strække sig fra den bagerste Ende til Mundskivens Underflade, hvor de udbrede sig. Disse 12 Længdemuskler ere saa brede, at de, naar Dyret er udspændt, kunne sees igjennem Huden.

Længdemusklerne, som følge begge Sider af Septa, ere omtrent lige brede overalt, Tab. XIX, Fig. 2—4; men henimod Spise- og Tarmrøret ligesom samle de sig mere og afgive stærke Muskelbundter, der følge Septainserterionerne paa Digestionsapparatet, Tab. XVIII, Fig. 7 *d*; Tab. XIX, Fig. 1 *c*. Her virke de som 12 særegne Længdemuskler, der bidrage til at forkorte Spise- og Tarmrøret.

Men foruden de 12 Septa, som dele hele Kropsheden i 12 afsluttede Længdekamre, sees paa Spise- og Tarmrørets ydre Væg, imellem hver 2 Septa, en Samling af listeformige Fremspring, der udgaa fra Digestionsapparatets Bindevæv, Tab. XIX, Fig. 1 *d*, 2—4 *b*, er dannet af dette og beklædes af temmelig korte, cilierende Cylinder-celler, Tab. XIX, Fig. 1 *e*. Disse Fremspring rage temmelig langt ind i Kammeret, ja i den bagerste Del af Kamrene naa de næsten hen til Kropsvæggen; de ere temmelig faste og dele sig stundom gaffelformigt uden derfor at tabe noget af Karakteren, Tab. XIX, Fig. 1 *f*.

Jeg har gjort opmærksom paa et lignende Forhold hos *Fenja mirabilis*; men hos denne er det dog langt fra saa fremtrædende. Jeg ved ikke at sammenligne disse særegne Fremspring med noget andet end med uudviklede, ufuldstændige Septa, som man stundom finder hos Actiniderne; men, vel at mærke, altid udgaaende fra Kropsvæggen. Her, som paavist, udgaa de fra Spise- og Tarmrøret og har ingen anden histologisk Bygning end den omtalte. Muskler har det ikke været mig muligt at opdage paa disse Organer, der, saavidt jeg kan skjønne, ikke kan have nogen anden Opgave end at dele Kamrene saaledes, at der bliver et langt større Fladerum, som Ernæringsvædsken kan komme i Berørelse med. Nogen korresponderende

contraction, so that we are not in a position to form a definite conclusion from it.

The septa are formed of fibrillous connective-tissue, which is here pretty thick and is really a continuation of the connective-tissue of the wall of the body, with a muscular arrangement quite like that of *Fenja mirabilis*, as both sides are clad with longitudinal muscles, whilst the transversal muscles, which only occupy one side, appear to be little developed and are covered by the longitudinal muscles (Pl. XIX, figs. 1—4). From both sides of the septa a multitude of thin connective-tissue ramifications issue (Pl. XIX, fig. 1 *a*), and on these sit the muscle-fibrils (Pl. XIX, fig. 1 *b*), causing the whole to acquire a beautiful fruticous appearance. But as the longitudinal muscles issue from the wall of the body, in order to distribute themselves on both sides of the septa, they send along their insertions a collection of strong muscular bundles, which form the longitudinal muscles of the wall of the body and extend from the posterior extremity to the under surface of the oral disc, where they distribute themselves. Those 12 longitudinal muscles are so broad, that, when the animal is dilated, they may be observed through the integument.

The longitudinal muscles, which pass along both sides of the septa, are about uniform in breadth everywhere (Pl. XIX, fig. 2—4), but towards the gullet-tube and intestinal canal they, as it were, collect more together, and give off strong muscular bundles which accompany the insertions of the septa on the digestive apparatus (Pl. XVIII, fig. 7 *d*; Pl. XIX, fig. 1 *c*). Here they operate as 12 special, longitudinal muscles, which assist in shortening the gullet-tube and intestinal canal.

But besides the 12 septa, which divide the entire cavity of the body into 12 closed longitudinal chambers, there is seen, on the exterior wall of the gullet-tube and intestinal canal between each two septa, a collection of fillet-formed prominences that issue from the connective-tissue of the digestive-apparatus (Pl. XIX, fig. 1 *d*, 2—4 *b*), are formed by the connective-tissue, and are clad with rather short ciliating cylinder-cells (Pl. XIX, fig. 1 *e*). These prominences extend pretty far into the chamber, indeed, in the posterior part of the chamber they extend almost to the wall of the body; they are pretty firm, and sometimes divide themselves bifurcately without, however, losing anything of their special character (Pl. XIX, fig. 1 *f*).

I have called attention to a similar relation in *Fenja mirabilis*, but in that animal they are not nearly so prominent. I do not know with what to compare those peculiar prominences, unless it be with undeveloped, imperfect septa, such as are sometimes met with in the Actinida, but, it must be remembered, always issuing from the wall of the body. Here, as has been shown, they issue from the gullet-tube and intestinal canal, and have no other histological structure than the one spoken of. It has not been possible, for me, to discover muscles on these organs, which, so far as I can make out, can have no other function than to divide the chambers in such a manner, that a far larger surface arises with which the nutritory fluids

Forbindelse imellem dem og Tarmens Lumen existerede ikke; thi der er et meget bredt Bindevævslag, som skarpt adskiller disse Dele fra hinanden.

Spiserørets og Tarmens Bindevæv er meget bredt, stærkt fibrillært, rigt paa Bindevævslegemer og Ernæringskanaler, og paa dets ydre Væg findes longitudinelle og transverselle Muskler. Fra dette Bindevævs indre Flade udgaa tykke, lange Forlængelser, der rage ind i Spiserørets og Tarmens Lumen og danne de betydelige Folder, som her findes, Tab. XIX, Fig. 1 *g*. Disse Bindevævsbjælker ere beklædte med temmelig høie Cylinderceller, der bære Cilier, Tab. XIX, Fig. 1 *h*, og imellem hvilke iagttages hist og her encellede Slimkjertler; især synes den bagre Del af Tarmen at være rig paa saadanne Kjertler.

Tversnit af den bagre Del af Rectum, just hvor der paa den ydre Flade findes de omtalte fine Spalter, viser, at disse Spalter føre direkte ind i Tarmen. Denne er paa dette Sted meget udvidet, og fra dens indre Flade bugter ud 12 Kanaler, som ere aflange, passere igjennem Bindevævet, der her ikke er meget bredt og munder ud netop i Mellemrummet af 2 Septa, hvor den nævnte Spalte findes, Tab. XIX, Fig. 3 *c*. Disse Kanaler ere beklædte med Epithel, bestaaende af cilierende Cylinderceller, Tab. XIX, Fig. 3 *d*, lig det, der beklæder den indre Tarmvæg, og imellem sees hist og her enkelte aflange, ganske klare og tomme Celler, som sandsynligvis ere Slimkjertler, Tab. XIX, Fig. 3 *e*. Her synes næsten at være en Slags Kloakdannelse, hvori Spalterne aabne sig. Paa det afbildede Tversnit sees kun 4 saadanne Kanaler; men der er virkelig 12, som ere paa viselike ved at sammenholde flere paa hinanden følgende Snit, hvorved det sande Antal fremkommer. Her findes altsaa en direkte Kommunikation imellem Kamrene og Tarmen, hvilket ikke er Tilfældet hos *Fenja mirabilis*, hvor de antagne Genitalspalter, som findes i Bunden af Kamrene udenfor Rectum, aabne sig omkring denne, imellem de beskrevne Hudpapiller eller Folder, og saaledes kommunikere direkte med det ydre Medium (Sø vandet). Men begge disse Slags Spalter udføre visselig den samme Funktion, nemlig at føre Afkommet udenfor Legemet.

De 12 Septa bære alle Mesenterialfilamenter og Generationsorganer, Tab. XVIII, Fig. 7. De første udspringe ved Spiserørets forreste Del, lige under Mundaabningen, ere fæstede til Bindevævsmembranen, der danner Septum, og strække sig slangeformigt bagover til omtrent Midten af Tarmen.

Æggestokkene ligge udenfor Mesenterialfilamenterne, længere fjernede fra Spiserøret og Tarmen, men udspringe forrest ved Spiserøret under Mundskiven og strække sig bagover, næsten lige til Genitalspalterne. Paa enkelte Septa vare de dog ikke saa lange, men strakte sig kun noget bagenfor den forreste Halvdel af Tarmen; dog tør

may come in contact. No correspondent connection between them and the channel of the intestine exists, as there is a very broad connective-tissue layer, which sharply defines those parts from each other.

The connective-tissue of the gullet-tube and the intestine is very broad, strongly fibrillous, and rich in connective-tissue corpuscles and nutritory ducts, on upon its exterior surface longitudinal and transversal muscles are found. From the inner surface of this connective-tissue, thick, long prolongations issue, which extend into the channels of the gullet and intestine and form the large folds that are here observed (Pl. XIX, fig. 1 *g*). These connective-tissue beams are clad with pretty long cylinder-cells carrying cilia (Pl. XIX, fig. 1 *h*) between which unicellular mucous glands are here and there observed; especially does the posterior part of the intestine appear to be rich in such glands.

A transversal section of the posterior part of the rectum, just at the point where the fine fissures previously mentioned are found upon the exterior surface, shows, that those fissures lead direct into the intestine. In this situation the intestine is much dilated, and from its inner surface 12 canals bulge out; these are oblong, penetrate through the connective-tissue, which is here not very broad, and open out exactly in the interval between 2 septa, where the fissure named is found (Pl. XIX, fig. 3 *c*). These canals are clad with epithelium consisting of ciliating cylinder-cells (Pl. XIX, fig. 3 *d*), like that which clothes the inner wall of the intestine, and in it there are seen here and there, a few oblong, quite clear and empty cells, which are, presumably, mucous glands (Pl. XIX, fig. 3 *e*). Here there appears to be almost a kind of cloacum into which the fissures open. In the transversal section illustrated 4 such canals are seen, but there are really 12, which may be observed on comparison of several closely continuous sections, by which the true number is brought out. Here, therefore, a direct communication between the chambers and the intestine is found, which is not the case in *Fenja mirabilis*, where the presumable genital fissures found in the bottom of the chambers, outside the rectum open around it, between the integumental papillæ or folds described, and thus communicate direct with the external medium (the sea-water). But both those descriptions of fissures certainly perform the same function viz. to lead the offspring out of the body.

All the 12 septa carry mesenterial filaments and reproductive organs (Pl. XVIII, fig. 7). The first issue from the anterior part of the gullet-tube, exactly under the oral aperture, and are secured to the connective-tissue membrane that forms the septum, and retreat sinuously backwards, to about the middle of the intestine.

The ovaries are situated outside the mesenterial filaments, farther from the gullet-tube and the intestine, but issue in front at the gullet-tube, under the oral disc, and extend backwards almost right to the genital fissures. In a few septa, however, they were not so long, but extended only a little way behind the anterior half-part of the

det hælde, at disse kortere Æggestokke ikke vare fuldt udviklede. De ere bundne til Septavæggen ved et overmaade lost, yderst fint Bindevæv, der som en baandformet Membran følger den, Tab. XVIII, Fig. 9 a. Fra denne Membran udgaa stilkede, navleformede Kapsler, en paa hver Side, Tab. XVIII, Fig. 7 f, 9 b, og i enhver saadan Kapsel udvikles der et Æg, Tab. XVIII, Fig. 9 c.

Man ser, at Æggestokkene her ere meget forskellige fra dem, som findes hos *Fenja mirabilis*, hvor de ikke afvige synderligt fra Æggestokkarakteren hos Actiniderne i Almindelighed, imedens de hos *Ægir frigidus* nærme sig overmaade meget den Form, der er gennemgaaende for Alcyoniderne.

Testiklerne ligge endnu længere ud fra Spiserør og Tarm og tage deres Begyndelse et Stykke bagenfor Mundskiven, bagenfor baade Æggestokke og Mesenterialfilamenter. De ere byggede paa samme Vis som Actinidernes i Almindelighed og slynge sig bagover i samme Længde som Æggestokkene, Tab. XVIII, Fig. 10. Testikkelfolliklerne ere temmelig store og indeholde runde Celler med særdeles stor Kjerne; i disse Celler udvikle Spermatozoerne sig. Hos det undersøgte Exemplar ere Spermatozoerne kun lidt udviklede og vise sig som yderst smaa, runde, glinsende Molekyler.

Findested.

Station 124. Et Par Exemplarer, hvoraf det ene var stærkt medtaget af Skraben.

Station 200. Flere Exemplarer, men som alle vare mere eller mindre beskadigede, idet en stor Del af Kroppshuden var revet bort, saa at kun Mundskiven, Tentakler, samt Spiserør og Tarm med paahængende Septa vare tjenlige til Undersøgelse. Det er muligt, at Dyret borer sig med den bagre Ende ned i Sandet, og at derfor Skraben, idet den tager det med sig, river Huddækket istykker.

Artskarakter.

Legemet cylindrisk, 30^{mm} langt, 8—10^{mm} bredt i den forreste og 4—5^{mm} bredt i den bagerste Ende, der er forsynet med en rund Anus. Kroppens Overflade har et tyndt, slimet, skedeformet Overtræk, samt 12 Ribber, imellem hvilke fordybede Længdefelter, hvori spredte, yderst smaa Sugevorter; den forreste Del nøgen. Mundskiven bredere end Kroppens forreste Rand, foldet, lidt fordybet mod den aflange Mundaabning. 12 temmelig korte, tykke, retraktile Tentakler, staaende i en Række. Farven: Skeden er dyb, skøn kastaniebrun, spillende lidt i det Violette. Kroppens Hud laxerød. Tentaklerne intens karmosinrøde. Mundskiven lidt blegere.

Hvad nu disse mærkelige Dyrs systematiske Stilling angaar, saa maa jeg tilstaa, at jeg har været i stor

intestine, but it may be, that those short ovaries are not fully developed. They are attached to the septal walls by an extremely loose, very delicate connective-tissue, which as a tape-like membrane accompanies them (Pl. XVIII, fig. 9 a). From this membrane, pedunculated, navel-shaped capsules issue, one on each side (Pl. XVIII, fig. 7 f, 9 b), and in each of these capsules an ovum is developed (Pl. XVIII, fig. 9 c).

We see that the ovaries here are different from those found in *Fenja mirabilis*, where they do not differ materially from the ovarian character of the Actinida in general; whilst in *Ægir frigidus* they greatly approach the form that is general in the Alcyonida.

The testicles lie still farther from the gullet-tube and intestine and have their origin a little way behind the oral disc, behind both the ovaries and mesenterial filaments. They are formed in the same manner as in the Actinida usually, and twine backwards for the same length as the ovaries (Pl. XVIII, fig. 10). The follicles of the testicles are pretty large, and contain round cells with a particularly large nucleus; the spermatozoa develop themselves in those cells. In the specimen examined the spermatozoa are but slightly developed, and appear as extremely small round shining molecules.

Habitat.

Station No. 124. A couple of specimens, of which one was much injured by the dredge.

Station No. 200. Several specimens, but all of them more or less injured, inasmuch as a large part of the body-integument is torn away; so that only the oral disc and tentacles, also the gullet-tube and intestine with attached septa, are serviceable for investigation. It is possible that the animal bores itself into the sand with its posterior extremity, and that the dredge, therefore, as it dragged it along, tore the integumental covering in pieces.

Specific characteristics.

The body cylindrical, 30^{mm} in length, 8—10^{mm} in breadth at the anterior extremity, and 4—5^{mm} in breadth at the posterior extremity, which is furnished with a round anus. The exterior surface of the body, has a thin, mucous vaginal covering, also 12 ribs, between which depressed longitudinal belts in which scattered, extremely small, suckers appear. The anterior part bare. The oral disc broader than the anterior margin of the body, folded, and a little depressed towards the oblong oral aperture. 12 rather short, thick, retractile tentacles, situated in a series. *The colour.* The sheath has a deep, beautiful chestnut brown colour with a violet play. The integument of the body salmon-red. The tentacles intense crimson-red. The oral disc somewhat paler in colour.

In respect of the systematic position of those remarkable animals, I must confess, that I have been in

Forlegenhed. En Ting kan ansees som sikkert, og det er, at de henhøre til den store Dyregruppe „Radiata“. Der er Intet, som tyder hen paa en bilateral Symetri, ikke engang en Tendens til at nærme sig denne er tilstede hos de udviklede Dyr, imedens dog Embryonerne frembyde en saadan.

Der blev paa Expeditionen opsamlet ikke saa ganske faa Exemplarer af begge Slægter; men de allerfleste vare mere eller mindre ødelagte ved Skrabningen, saa jeg kun havde et Par levende Exemplarer til Observation. Det varede næsten et Døgn, efter at de vare bragte i Observationskarret, førend Dyrene begyndte at røre paa sig ved at udstrække Tentaklerne. Skibet rullede jo noget, saa ganske roligt var der ikke i Karret; men efter et Par Døgn syntes Fenja mirabilis at være i fuld Vigør og blev da tegnet og observeret. Ved denne Undersøgelse kom jeg foreløbig til det Resultat, at jeg havde med en Actinide at gjøre, og at det sandsynligvis var en Halcampa, hvorfor jeg i min Notisebog opførte den midlertidig som saadan. Lidt anderledes forholdt det sig med Ægir frigidus; den var trægere i sine Bevægelser, udstrakte vel efter længere Tid sine Tentakler, men syntes i det Hele taget ikke at befinde sig vel, da den jævnlig holdt sig temmelig meget kontraheret; Observationerne gik dog i den bestemte Retning, at jeg ogsaa her havde for mig en Actinide, der nærmest maatte henføres til Cerianthiderne, og som saadan blev den opført i min Notisebog. De i levende Live observerede Exemplarer bleve omhyggelig konserverede i Alkohol, og det er da disse, der væsentlig have tjent til den mere detaillerede Undersøgelse. Af denne fremgaar det da, at man her har for sig ret mærkelige Overgangsformer, der ikke uden Vanskelighed kunne henføres til de for Tiden opstillede Dyrefdelinger.

Huden med dens Epithel, Nematocyster, Slimkjertler og Bindevæv, Tentakelform, Septadannelse, Generationsorganer og Nervesystem, Alt er i den fuldkomneste Overensstemmelse med Coelenteraternes Type; men det, der dog er opstillet som Hovedkarakter for denne, nemlig „Gastrovascularhulheden“ mangler, eller er her omdannet til en virkelig Kropshulhed (Coelom), samtidig med at der er en fuldt udviklet Tarmkanal, som tager sin Begyndelse ved Munden og ender i en Anus, og som for Fenjas Vedkommende ikke kommunikerer direkte med Kropshulheden, men denne er ved 12 fuldstændige Septa delt i 12 Længdekamre.

Hos Slægten Ægir er der længst bag paa Rectum, nogle Millimeter foran Anus, 12 fine, knapt en Millimeter lange Spalter, hvorved Kropshulhedens Kamre staa i direkte Kommunikation med Tarmhulheden. Her er et Forhold, som ogsaa med Hensyn til Fordøielsesapparatet nærmer sig noget Coelenteraterne, især Ctenophorerne, der som bekjendt har et langt Svælgrør, der strækker sig næsten gjennem Kroppens hele Længde, og som udmunder i de laterale Gastrovascularrum med to trange Sidespalter. Men hvad der dog udgjør en stor Forskjel, er den Omstændig-

great dubiety. One thing may be considered as certain and that is, that they belong to the great animal-group „Radiata“. There is nothing that points to a bilateral symmetry, not even any tendency to it is apparent in the developed animals, whilst the embryos, however, present such an indication.

There were collected during the expedition not so very few specimens of both genera, but the greater number were more or less injured by the dredge, so that I only obtained a couple of animate specimens for my investigations. It was nearly 24 hours after the animals had been placed in the glass vessels before they began to show animation by extending the tentacles. The ship, it is true, rolled a good deal, so that it was not altogether quiescent in the glass jars, but after a couple of days and nights Fenja mirabilis appeared to be in full vigour, and was then drawn and observed. Upon this observation, I arrived at the preliminary conclusion, that I had to do with an Actinida, and that it was probably a Halcampa, for which reason I entered it as such, temporarily, in my Note-Book. The case was, however, a little different with Ægir frigidus; it was more sluggish in its movements, and, although it extended its tentacles after a considerable time it did not appear to be at all comfortable, as it generally kept itself pretty much contracted; the observations, however, led in the distinct direction that here, also, I had to do with an Actinida, which ought most properly to be assigned to the Cerianthida, and as such, therefore, it was entered in my Note-Book. The specimens examined during life were carefully preserved in alcohol, and it is therefore those that have principally served for my subsequent, more detailed investigations. From these it results that we have here, very remarkable transition forms, which cannot, without difficulty, be assigned to the present existent, established animal divisions.

The integument with its epithelium, nematocysts, mucous glands and connective-tissue, the tentacular form, septal formation, reproductive organs and nervous system, are all in perfect harmony with the Coelenterata type, but the feature which is, however, established as the chief characteristic of that type viz. the gastro-vascular cavity, is wanting, or is here transformed into a real body-cavity (Coelome), whilst, at same time, there is a fully developed intestinal canal, with its origin at the mouth and terminating in an anus that, in Fenja mirabilis, does not directly communicate with the body-cavity, which is divided by 12 perfect septa into 12 longitudinal chambers.

In the genus Ægir there are at the extremity of the rectum, a few millimetres in front of the anus, 12 minute, scarcely a millimetre long, fissures, by which the chambers of the the body-cavity are placed in direct communication with the intestinal cavity. Here therefore, we have a relation which, also, in respect of the digestive apparatus approaches somewhat to that of the Coelenterata, especially to that of the Ctenophora, which, as is well known, has a long gullet-tube extending almost the whole length of the body and opening into the lateral

hed, at hos Ægir er der en fuldstændig udviklet Tarm, som munder ud i en virkelig Anus, uafhængig af Kropshulheden, imedens hos Ctenophorerne Svælgrøret aabner sig i Gastrovascularrummet. Slægten Fenjas Tarmapparat er derimod ganske afstængt fra Kropshulheden og fjerner sig forsaavidt længere fra Coelenteraterne end Ægir.

Skal Coelomet være det Afgjørende, saa er det klart, at mine to Slægter maa udaf Coelenteraternes Rækker; men hvor de da skulle henføres, ved jeg sandelig ikke at angive. Det tør imidlertid hælde, at man har tillagt det saakaldte Gastrovascularapparat en altfor stor systematisk Betydning ved at betegne hele den Dyregruppe, Cuvier kaldte Zoophyter, som Coelenterater. Hvad der kaldes Svælgrør hos Actiniderne er muligens en begyndende Tarmdannelse, og de, Kamre, som findes til Siderne af Svælgrøret, kunne maaske betragtes som en begyndende Coelomdannelse. Tydeligere bliver dette hos Ctenophorerne, hvor Svælgrøret ikke blot har Formen, men ogsaa Funktionen af en virkelig Fordøielseskanal, om den end mangler Anus og staar i direkte Kommunikation med Gastrovascularhulheden. I ethvert Fald er der her i Grunden ikke langt til en fuldstændig Sondring imellem Tarm og Kropshulhed. Muligvis vil man selv inden Actinidernes Gruppe kunne paavise en forskjellig Udvikling af Svælgrøret og en hermed i Forbindelse staaende mere eller mindre stærk Sondring af den saakaldte Gastrovascularhulhed, hvorved Forholdet hos Slægterne Ægir og Fenja ville kunne opfattes som Enderesultatet af en Udviklingsproces, der allerede er forberedt hos andre Actinider. Men sikker Kundskab om disse Forhold vil neppe kunne vindes uden gennem embryologiske Undersøgelser; thi da vil det vise sig, om de udvikle sig som virkelige Coelenterater, eller om de muligens vise sig at tilhøre enten Pseudocoelier eller Enterocoelier. Jeg vil imidlertid lade mig nøie med at henføre dem til Actinidernes store Afdeling, men har dog fundet det nødvendigt at danne en særskilt Stamme (Tribus) for dem.

gastro-vascular space by two narrow lateral fissures. But what, however, marks an important difference is, the circumstance, that in Ægir there is a perfectly developed intestine which opens into a real anus independent of the body-cavity, whilst in Ctenophora the gullet-tube opens into the gastro-vascular space. The intestinal apparatus of the genus Fenja is, on the other hand, quite shut off from the body cavity, and therefore distinguishes itself more from the Coelenterata than Ægir does.

If we make the Coelome the decisive feature, it is then evident, that my two species must be removed from the ranks of the Coelenterata, but where they should then be placed I can really not indicate. It may, however, be the case, that too much stress has been laid on the so-called gastro-vascular apparatus as a systematic feature in naming the whole of the animal group that Cuvier called Zoophytes, Coelenterata. What is called gullet-tube in Actinida is possibly a rudimentary intestinal formation, and those at the sides of the adjoining chambers may perhaps be considered as a beginning formation of the coelome. This is still more distinct in the Ctenophora, where the gullet-tube not only has the form of an intestine, but also the function of a real digestive canal, even though anus is wanting, and is placed in direct communication with the gastro-vascular cavity. In any case there is, here, in reality, no great step to a complete separation between the intestine and the body-cavity. Probably, even in the group of the Actinida it may be possible to show a different development of gullet-tube, and, in connection with it, a more or less distinct separation of the so-called gastro-vascular cavity; thus leading the relation in the genera Ægir and Fenja to be regarded as the final stage of a process of development that has already begun in other Actinidæ. But certain knowledge in respect of those relations will scarcely be obtained except by investigations of embryos, as, then, it will be seen whether they develop themselves as genuine Coelenterata, or whether they possibly show themselves to belong to either Pseudocoelia or Enterocoelia. In the meantime I am satisfied with their assignment to the great division Actinida, but have, however, found it necessary to form a new race (tribus) for them.

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Tab. IX.

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Tab. X.

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- " 3. Tversnit af den samme, forstørret. *a.* Ectoderm; *b.* Cirkulærmuskler; *c.* Bindevæv; *d.* Endothel.
- " 4. *Sagartia abyssicola*, noget sammentrukket og berøvet det slimede Overtræk. En stor Mængde Acontier ere slyngede ud igjennem Cinclides.

Plate IX.

- Fig. 1. *Allantactis parasitica*. Transversal section of the uppermost part of the body and gullet-tube, magnified. *a.* Directive septa; *b.* The same.
- " 2. Do., Transversal section of the integument of the body, magnified. *a.* Ectoderm; *b.* Circular muscles in the connective-tissue; *c.* Endothelium; *d.* Longitudinal muscles of the septum; *e.* Ovary; *f.* Testicles.
- " 3. Do., the testicles, magnified.
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- " 8. *Kadosactis rosea*. Transversal section of the body and the gullet-tube, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles; *d.* Perfect septum with connective-tissue prolongations. *d*¹. Endothelium of the inner wall of the body. *e.* Longitudinal muscles of the septum; *f.* Transversal muscles of the septum; *g.* Outer wall of the gullet-tube; *h.* Pigment cells of the inner wall of the gullet-tube; *i.* Unicellular mucous glands on the same; *k.* Nematocysts on the same; *l.* The endothelium of the inner wall of the gullet-tube.

Plate X.

- Fig. 1. *Anthosactis Jan Mayeni*; semi-transversal semi-longitudinal section of the integument of the body, magnified. *a.* Connective-tissue; *b.* Circular muscles; *c.* Connective-tissue corpuscles and nutritory ducts; *d.* Longitudinal muscles of a septum; *e.* Transversal muscles of the same.
- " 2. *Sagartia repens*; longitudinal section of the integument of the body, magnified. *a.* Ectoderm; *b.* Circular muscles; *c.* Connective-tissue.
- " 3. Do., Transversal section, magnified. *a.* Ectoderm; *b.* Circular muscles; *c.* Connective-tissue; *d.* Endothelium.
- " 4. *Sagartia abyssicola*; somewhat contracted and deprived of the mucous covering. A very great number of acontia are projected through the cinclides.

- Fig. 5. *Sagartia abyssicola*. Længdesnit af Kropshuden af den samme, forstørret. *a.* Ectoderm; *b.* Cirkulærmuskler i Midten af Bindevævet; *c.* Endothel.
6. Tversnit af den samme, forstørret. *a.* Ectoderm; *b.* Cirkulærmuskler; *c.* et Septum; *d.* Endothel.
7. *Sagartia abyssicola*, stærkt sammentrukket.
8. Længdesnit af Kropshuden af *Bunodes abyssorum*, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler; *d.* et Septum med Æggestok.
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10. *Sagartia splendens*, siddende paa *Stylaster gemmaceus*, naturlig Størrelse. *a.* Et ungt Exemplar.
11. Tversnit af Krop og Svælgrør af den samme forstørret. *R. R.* Retningssepta. 1. De 4 fuldstændige, principale Septapar. 2. De 2 Par fuldstændige, secundære Septa med Acontier. 3. De 3 ufuldstændige Septa af 3die Orden med Acontier og Generationsorganer. 4. De smaa, ufuldstændige Septapar af 4de Orden. 5. Svælgrøret. *a.* Kjønorganer; *b.* Acontier.
12. 13. Tversnit af Kropshuden, forstørret. *a.* Bindevæv; *b.* Cirkulærmuskler; *c.* Ectoderm; *d.* Endoderm.

Tab. XI.

- Fig. 1. *Andvakia mirabilis*, lidt forstørret. *a.* Capitulum; *b.* Scapus; *c.* Physa; *d.* Bryozoe, som snylter paa Capitulum.
2. Den samme, hvor Capitulum er indtrukket i Scapus. *b.* Scapus; *c.* Physa, berøvet sin Kruste.
3. Tversnit af Capitulum med Svælgrøret, forstørret. 1. 1. Retningssepta. 2. 2. De 2 Par Sidessepta, som alle fæste sig paa Svælgrøret og følgelig ere fuldstændige. *a.* Transverselle Muskler paa den indre Flade af Retningssepta; *b.* longitudinelle Muskler paa den ydre Flade af samme; *c.* longitudinelle Muskler paa den indre Flade af de øvrige 4 Par fuldstændige Septa; *d.* transverselle Muskler paa den ydre Flade af samme; *e.* sekundære, ufuldstændige, listeformige Septapar med deres Muskulatur; *f.* Svælgrør.
4. Tversnit, af en Tentakel, forstørret. *a.* Encellede Slinkjertler i Ectoderm; *b.* Nematocyster; *c.* longitudinelle Muskler; *d.* Bindevævsforlængelser beklædte med Epithel, hvilke danne et Kanalsystem; *e.* transverselle Muskler.

- Fig. 5. *Sagartia abyssicola*. Longitudinal section of the body, magnified. *a.* Ectoderm; *b.* Circular muscles in the middle of the connective-tissue; *c.* Endothelium.
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7. Do., greatly contracted.
8. *Bunodes abyssorum*. Longitudinal section of the body, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles; *d.* A septum with ovary.
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10. *Sagartia splendens*; seated on *Stylaster gemmaceus*, life size. *a.* A young specimen.
11. Do., Transversal section of the body and gullet-tube, magnified. *R. R.* Directive septa. 1. The 4 perfect, principal pairs of septa. 2. The 2 perfect, secondary septa with acontia. 3. The 3 pairs of imperfect septa of the 3rd order with acontia and reproductive organs. 4. The small, imperfect pair of septa of the 4th order. 5. The gullet-tube. *a.* The reproductive organs. *b.* Acontia.
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Plate XI.

- Fig. 1. *Andvakia mirabilis*; slightly magnified. *a.* Capitulum; *b.* Scapus; *c.* Physa; *d.* Bryozoa, existing as a parasite on the capitulum.
2. Do., the capitulum withdrawn into the scapus; *b.* Scapus; *c.* The physa, deprived of its crust.
3. Do., transversal section of the capitulum, with the gullet-tube, magnified. 1. 1. Directive septa. 2. 2. The two pairs of lateral septa, all of which are adherent to the gullet-tube, and, consequently, are perfect ones. *a.* Transversal muscles on the inner surface of the directive septa; *b.* Longitudinal muscles on the outer surface of the same; *c.* Longitudinal muscles on the inner surface of the remaining 4 pairs of perfect septa; *d.* Transversal muscles on the outer surface of same; *e.* Secondary, imperfect, fillet-formed pairs of septa with their musculosity; *f.* gullet-tube.
4. Do., Transversal section of a tentacle, magnified. *a.* Unicellular mucous glands of the ectoderm; *b.* Nematocysts; *c.* Longitudinal muscles; *d.* Connective-tissue prolongations clothed with epithelium, forming a ductiferous system; *e.* Transversal muscles.

- Fig. 5. Længdesnit af Scapus af *Andraskia mirabilis*, forstørret. *a.* Krustelaget; *b.* Ectodermet; *c.* Bindevæv; *d.* Cirkulærmuskler.
- „ 6. Tværsnit af den samme, forstørret. *a.* Krustelaget; *b.* Ectoderm; *c.* Bindevæv; *d.* Cirkulærmuskler.
- „ 7. En Acontie med sit Nematocystbatteri, forstørret.
- „ 8. Tværsnit af den nederste Del af Scapus, forstørret. 1—6. Fuldstændige Septapar. *a.* Ufuldstændige, listeformige Septapar.
- „ 9. Tværsnit af Physa, efter at den er berøvet Krusten, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Gangliaceller; *d.* Nerveceller; *e.* et Septum med Muskler og Endothel.
- „ 10. *Andraskia mirabilis*, aabnet efter Længden, forstørret. *a.* Mesenterialfilamenter; *b.* Længdemuskler paa de fuldstændige Septa; *c.* ufuldstændige, listeformige Septa; *d.* Acontier.
- „ 11. Tværsnit af Capitulum med Svælgrøret, forstørret. *a.* fuldstændigt Septapar; *b.* longitudinelle Muskler paa samme; *c.* Mesenterialfilamenter; *d.* ufuldstændige, listeformige Septapar.
- „ 12. Mundskiven med Tentakler, forstørret. *a.* Læbeflignene med deres Fure; *b.* Gonidielknude.

Tab. XII.

- Fig. 1. *Phellia flexibilis*, lidt forstørret. *a.* Skedens øverste Rand; *b.* Kroppens nøgne Del.
- „ 2. Den samme, noget kontraheret, lidt forstørret. *a.* Skedens øverste Rand; *b.* Kroppens nøgne Del.
- „ 3. Den samme fuldstændig indtrukken i Skeden, lidt forstørret.
- „ 4. Tværsnit af den af Skeden bedækkede Kropsdel, forstørret. *a.* Skeden; *b.* Cuticula; *c.* Ectoderm; *d.* Bindevæv; *e.* Cirkulærmuskler.
- „ 5. Tværsnit af Kroppens øverste Del med Svælgrøret. 1. Retningssept. 2. fuldstændige Septa. 3. Sekundære, ufuldstændige Septa. 4. Tertiære Septa. *a.* Transverselle Muskler paa Retningssept; *b.* longitudinelle Muskler paa samme; *c.* Mesenterialfilamenter; *e.* longitudinelle Muskler paa de øvrige 4 Par fuldstændige Septa.
- „ 6. *Phellia margaritacea*, lidt forstørret. *a.* Skedens øverste Rand; *b.* Kroppens nøgne Del.
- „ 7. Halvdelen af et Tværsnit af den midterste Del af Kroppen af *Phellia margaritacea*, stærkt forstørret. *R.* Retningssept. 1. De øvrige 2 Par

- Fig. 5. *Andraskia mirabilis*. Longitudinal section of the scapus, magnified. *a.* The encrusted covering; *b.* The ectoderm; *c.* Connective-tissue; *d.* Circular muscles.
- „ 6. Do., transversal section, magnified. *a.* The encrusted covering; *b.* The ectoderm; *c.* Connective-tissue; *d.* Circular muscles.
- „ 7. Do., Acontia with its nematocyst battery, magnified.
- „ 8. Do., transversal section of the lowest portion of the scapus, magnified. 1—6. Pairs of perfect septa. *a.* Pairs of imperfect fillet-formed septa.
- „ 9. Do., transversal section of Physa after being deprived of the crust, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Ganglia cells; *d.* Nerve cells; *e.* A septum with muscles and endothelium.
- „ 10. Do., dissected longitudinally, magnified. *a.* Mesenterial filaments; *b.* Longitudinal muscles on the perfect septa; *c.* Imperfect fillet-formed septa; *d.* Acontia.
- „ 11. Do., transversal section of the capitulum with the gullet-tube, magnified. *a.* Perfect pair of septa; *b.* longitudinal muscles of the same; *c.* Mesenterial filaments; *d.* Imperfect fillet-formed pair of septa.
- „ 12. Do., oral disc with tentacles, magnified. *a.* The labial lobes with their grooves; *b.* Gonidial nodule.

Plate XII.

- Fig. 1. *Phellia flexibilis*; somewhat magnified. *a.* Uppermost margin of the sheath; *b.* The bare part of the body.
- „ 2. Do., somewhat contracted, slightly magnified. *a.* Uppermost margin of the sheath; *b.* The bare part of the body.
- „ 3. Do., completely withdrawn into the sheath, slightly magnified.
- „ 4. Do., transversal section of the portion of the body covered by the sheath, magnified. *a.* The sheath; *b.* Cuticulum; *c.* Ectoderm; *d.* Connective-tissue; *e.* Circular muscles.
- „ 5. Do., transversal section of the uppermost part of the body with the gullet-tube. 1. Directive septa. 2. Perfect septa. 3. Secondary, imperfect septa. 4. Tertiary septa. *a.* Transversal muscles of the directive septa; *b.* Longitudinal muscles of the same; *c.* Mesenterial filaments; *e.* Longitudinal muscles of the remaining 4 pairs of perfect septa.
- „ 6. *Phellia margaritacea*; slightly magnified. *a.* Uppermost margin of the sheath; *b.* The bare portion of the body.
- „ 7. Do., the half of the medial portion of the body, greatly magnified. *R.* Directive septa. 1. The remaining 2 pairs of perfect septa. 2. Septa

fuldstændige Septa. 2. Septa af anden Orden, ufuldstændige. 3. 4. 5. Septa af tredje Orden. *a.* Ydre Lag af den inkrusterede Skede; *b.* Cuticula; *c.* Ectoderm; *d.* Bindevæv; *e.* Cirkulærmuskler; *f.* transverselle Muskler; *g.* longitudinelle Muskler paa Retningssepta; *h.* longitudinelle Muskler; *i.* transverselle Muskler paa de øvrige, fuldstændige Septa.

- Fig. 8.** *Acontia*, stærkt forstørret.
 „ 9. *Acontiekapsler*, do.
 „ 10. *Acontiekapsel* med en udslynget Neldetraad, do.
 „ 11. En Del af en Æggestok, do.
 „ 12. Tversnit af Kroppen og Svælgrøret, lidt forstørret. *R.* Retningssepta. 1. De øvrige, fuldstændige Septa. 2. Sekundære, ufuldstændige Septa.
 „ 13. *Phellia arctica*, noget indtrukken. *a.* Den nøgne Del.
 „ 14. Sugevorterne paa Kroppens ydre Flade, forstørret.

Tab. XIII.

- Fig. 1.** *Phellia arctica*, naturlig Størrelse. *a.* Skedens øverste Rand; *b.* Kroppens nøgne Del.
 „ 2. Tversnit af Kroppens midterste Del, forstørret. *a.* Ectodermet, berøvet Skeden; *b.* Bindevæv med Bindevævslegemer og Ernæringskanaler; *c.* Cirkulærmuskler.
 „ 3. Længdesnit fra samme Sted, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler.
 „ 4. Tversnit af Kroppen og Svælgrøret, forstørret. *a.* Længdemuskler paa et fuldstændigt Septum; *b.* Tvermuskler paa samme; *c.* ufuldstændige Septa; *d.* Længdemuskler paa et ufuldstændigt Septum; *e.* Tvermuskler paa samme; *f.* fuldstændige Septa af 3^{die} Orden med deres Muskulatur; *g.* Svælgrør.
 „ 5. *Phellia crassa*, lidt forstørret. *a.* Skedens fri Rand; *b.* Kroppens øverste, nøgne Del.
 „ 6. Den samme, stærkt kontraheret. *a.* Skeden borttaget for at vise Sugevorterne paa Kroppen.
 „ 7. *Phellia bathybia*, naturlig Størrelse. *a.* Rester af Skeden; *b.* den øverste, nøgne Kroppedel; *c.* Kroppen blottet for Skeden.
 „ 8. Skraasnit af Huden af den samme, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler.
 „ 9. Tversnit af Hud og Svælgrør af den samme, forstørret. *a.* Svælgrør; *b.* Svælgrube; *c.* Længdemuskler paa Retningssepta. *R.* Retningssepta.

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of the second order, imperfect. 3, 4, 5. Septa of the third order. *a.* The exterior layer of the encrusted sheath; *b.* Cuticulum; *c.* Ectoderm; *d.* Connective-tissue; *e.* Circular muscles; *f.* Transversal muscles; *g.* Longitudinal muscles of the directive septa; *h.* Longitudinal muscles; *i.* Transversal muscles of the remaining perfect septa.

- Fig. 8.** *Phellia margaritacea*; *Acontia*, greatly magnified.
 „ 9. Do., Capsules of *acontia*, greatly magnified.
 „ 10. Do., Capsule of an *acontia*, greatly magnified.
 „ 11. Do., Portion of an ovary, greatly magnified.
 „ 12. Do., Transversal section of the body and the gullet-tube, somewhat magnified. *R.* Directive septa. 1. The remaining perfect septa. 2. Secondary imperfect septa.
 „ 13. *Phellia arctica*; somewhat retracted. *a.* The bare portion.
 „ 14. Do., the suckers on the exterior surface of the body, magnified.

Plate XIII.

- Fig. 1.** *Phellia arctica*; life size. *a.* Uppermost margin of the sheath; *b.* The bare portion of the body.
 „ 2. Do., transversal section of the medial portion of the body, magnified. *a.* Ectoderm, deprived of the sheath; *b.* Connective-tissue, with connective-tissue corpuscles and nutritory ducts; *c.* Circular muscles.
 „ 3. Do., Longitudinal section from the same situation, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles.
 „ 4. Do., Transversal section of the body and the gullet-tube, magnified. *a.* Longitudinal muscles of a perfect septum; *b.* Transversal muscles of same; *c.* Imperfect septa; *d.* Longitudinal muscles of an imperfect septum; *e.* Transversal muscles of the same; *f.* Imperfect septa of the third order, showing their musculosity; *g.* The œsophagus.
 „ 5. *Phellia crassa*; somewhat magnified. *a.* Free margin of the sheath; *b.* Uppermost bare portion of the body.
 „ 6. Do., strongly contracted. *a.* The sheath removed here in order to show the suckers on the body.
 „ 7. *Phellia bathybia*; life size. *a.* Remnants of the sheath; *b.* The superior, bare portion of the body; *c.* The body with the sheath removed.
 „ 8. Do., oblique section of the integument, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles.
 „ 9. Transversal section of the integument, magnified. *a.* The œsophagus; *b.* Gullet-groove; *c.* Longitudinal muscles of the directive septa. *R.* Dir-

1. Principale, fuldstændige Septa. 2. Sekundære, fuldstændige Septa.
 „ 10. *Phellia violacea*, indtrukken i Skeden, naturlig Størrelse.

Tab. XIV.

- Fig. 1. Tversnit af en Tentakel af *Phellia crassa*, forstørret. *a.* Ectodermceller; *b.* Nematocyster; *c.* Bindevæv med Bindevævslegemer og Ernæringskanaler; *d.* Længdemuskler; *e.* Tvermuskler; *f.* Endothel.
 „ 2. Tversnit af en Del af Kroppen med Svælgrøret, forstørret. *a.* Svælggrube; *b.* Folder paa Svælgrørets indre Væg; *c.* Retningssepta; *d.* longitudinelle Muskler paa samme; *e.* transverselle Muskler paa samme; *f.* longitudinelle Muskler paa de øvrige, fuldstændige Septa; *g.* transverselle Muskler paa samme; *h.* et Par ufuldstændige Septa; *i.* Generationsorganer.
 „ 3. Do., af Kroppens nøgne Del, forstørret. *a.* Ectoderm; *b.* Nematocyster; *c.* Bindevæv; *d.* Cirkulærmuskler
 „ 4. Længdesnit af samme, forstørret. *a.* Cirkulærmuskler.
 „ 5. Tversnit af en Fold paa Svælgrøret, forstørret. *a.* Endothel paa Svælgrørets ydre Flade; *b.* Bindevæv; *c.* listeformig Forlængelse af Bindevævet; *d.* Cirkulærmuskler; *e.* longitudinelle Muskelfibre; *f.* Epithellet paa Svælgrørets indre Flade; *g.* en tom, encellet Slimkjertel; *h.* en saadan fyldt.
 „ 6. *Phellia norvegica*, omtrent naturlig Størrelse. *a.* Den nøgne Kroppsdel; *b.* den af Skeden bedækkede Kroppsdel, hvor en stor Del af Skeden er borttaget.
 „ 7. Tversnit af Kroppshuden, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler; *d.* Endothel.
 „ 8. Do., af Kroppen med Svælgrøret, forstørret. *a.* Retningssepta; *b.* fuldstændige Septa; *c.* Mesenterialfilamenter; *d.* ufuldstændige Septa; *e.* Acontier; *f.* Generationsorganer; *g.* Svælgrøret.
 „ 9. Do., af den med Skeden beklædte Hud af *Phellia violacea*, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler; *d.* Entoderm.
 „ 10. Do., af Kroppens og Svælgrørets midterste Del af *Phellia violacea*, forstørret. *R.* Retningssepta; *a.* Længdemuskler paa samme; *b.* Tvermuskler paa samme; *c.* de 4 Par principale, fuldstændige Septa; *d.* Længdemusklerne paa samme; *e.* de 6 Par sekundære, fuldstændige Septa; *f.* Længdemusklerne paa samme; *g.* de 4 Par tertiære, ufuldstændige Septa med deres

- ective septa. 1. Principal, perfect septa. 2. Secondary, perfect septa.

- Fig. 10. *Phellia violacea*; withdrawn into the sheath, life size.

Plate XIV.

- Fig. 1. *Phellia crassa*; transversal section of tentacle, magnified. *a.* Ectoderm cells; *b.* Nematocysts; *c.* Connective-tissue, with connective-tissue corpuscles and nutritory ducts; *d.* Longitudinal muscles; *e.* Transversal muscles; *f.* Endothelium.
 „ 2. Do., transversal section of a portion of the body with the gullet-tube, magnified. *a.* Gullet-groove; *b.* Folds on the inner wall of the œsophagus; *c.* Directive septa; *d.* Longitudinal muscles of same; *e.* Transversal muscles of same; *f.* Longitudinal muscles of the remaining perfect septa; *g.* A pair of imperfect septa; *i.* Reproductive organs.
 „ 3. Do., transversal section of the bare portion of the body, magnified. *a.* Ectoderm; *b.* Nematocysts; *c.* Connective-tissue; *d.* Circular muscles.
 „ 4. Do., longitudinal section of the same, magnified. *a.* Circular muscles.
 „ 5. Do., transversal section of a fold of the gullet-tube, magnified. *a.* Endothelium on the outer surface of the gullet-tube; *b.* Connective-tissue; *c.* Fillet-formed prolongation of the connective-tissue; *d.* Circular muscles; *e.* Longitudinal muscle-fibres; *f.* The epithelium on the inner surface of the gullet-tube; *g.* An empty unicellular mucous gland; *h.* Another such gland filled.
 „ 6. *Phellia norvegica*; about life size. *a.* The bare portion of the body; *b.* The portion of the body clothed with the sheath, but with a large part of the sheath removed.
 „ 7. Do., transversal section of the integument of the body, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles; *d.* Endothelium.
 „ 8. Do., transversal section of the body with the gullet-tube, magnified. *a.* Directive septa; *b.* Perfect septa; *c.* Mesenterial filaments; *d.* Imperfect septa; *e.* Acontia; *f.* Reproductive organs; *g.* The gullet-tube.
 „ 9. *Phellia violacea*; transversal section of the integument covered by the sheath, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles; *d.* Endoderm.
 „ 10. Do., transversal section of the medial portion of the body and gullet-tube, magnified. *R.* Directive septa. *a.* Longitudinal muscles of same; *b.* Transversal muscles of same; *c.* The 4 pairs of principal perfect septa; *d.* The longitudinal muscles of the same; *e.* The 6 pairs of secondary perfect septa; *f.* The longitudinal muscles of the same; *g.* The 4 pairs of tertiary imper-

Længde- og Tvermuskler; *h.* Svælgruberne; *i.* de 24 Længdefolder paa Svælgrørets indre Væg.

Tab. XV.

- Fig. 1. *Phellia spitzbergensis*, lidt forstørret.
- " 2. Tversnit af Huden med Skede af den samme, forstørret. *a.* Skedens ydre, slimede, inkrusterede Lag; *b.* Skedens indre, fibrillære, membranøse Lag (Cuticula); *c.* Ectoderm; *d.* Bindevæv; *e.* Cirkulærmuskler; *f.* Endothel.
- " 3. Do., af den halve Krop og Svælgrør, forstørret. *R.* Retningssepta. *a.* Principale, fuldstændige Septa; *b.* sekundære, fuldstændige Septa; *c.* ufuldstændige, tertiære Septa; *d.* Acontier; *e.* Generationsorganer.
- " 4. *Halcampoides abyssorum*, opbevaret i Spiritus.
- " 5. Et Stykke Hud af den samme, forstørret. *a.* Længdefure; *b.* Felt imellem Furerne med spredte Sugevorter.
- " 6. Mundskiven med Tentakler af den samme, seet fra oven, forstørret.
- " 7. Tversnit af Kropshuden af den samme, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler.
- " 8. Længdesnit af samme, forstørret. *a.* Cirkulærmuskler.
- " 9. *Halcampoides abyssorum*, aabnet efter Længden, Huden slaaet til Siden. *a.* Septa ved deres Udspring nær Caudalaabningen; *b.* Septumets største Bredde; *c.* Septumet aftaget lidt i Bredde, idet det fæster sig paa Svælgrøret, *d.*; *e.* Septumets Insertion paa Mundskiven; *f.* Længdemuskel; *g.* Mesenterialfilamenter; *h.* Kjønsorganer; *i.* Mesenterialfilamentets Begyndelse paa Svælgrøret.
- " 10. Et Tversnit af den øverste Kropsdel med Svælgrøret, forstørret. *a.* Retningssepta, *V.* Ventral-siden. *D.* Dorsalsiden; *b.* de fire øvrige Par Septa; *c.* Længdemusklerne paa Retningssepta; *d.* Tvermusklerne paa samme; *e.* Længdemusklerne paa de øvrige Septa; *f.* Tvermusklerne paa samme; *g.* Udvidning af Svælgrøret paa Dorsalenden; *g*¹. Udvidning af Svælgrøret paa Ventral-siden (Rectum); *h.* Bindevævet, hvorved Rectum er forenet med Svælgrøret; *i.* Svælgrøret; *k.* Svælgrørsgrube.
- " 11. Tversnit af Rectum og en Del af Svælgrøret, forstørret. *a.* Den afrundede Del af Rectum; *b.* Bindevævet, der adskiller Rectum fra Svælgrøret; *c.* Bindevævslaget; *d.* Svælgrøret; *e.* Epithellet, bestaaende af lange Pidskeceller, der beklæde Rectums indre Flade; *f.* Slim i Rectum;

fect septa with their longitudinal and transversal muscles; *h.* The gullet-grooves; *i.* The 24 longitudinal folds of the inner wall of the gullet-tube.

Plate XV.

- Fig. 1. *Phellia spitzbergensis*; somewhat magnified.
- " 2. Do., transversal section of the integument and sheath, magnified. *a.* External, viscous, encrusted layer of the sheath; *b.* Internal, fibrillar, membranous layer of the sheath (cuticulum) *c.* Ectoderm; *d.* Connective-tissue; *e.* Circular muscles; *f.* Endothelium.
- " 3. Do., transversal section of the half of the body and gullet-tube, magnified. *R.* Directive septa; *a.* principal, perfect septa; *b.* Secondary, perfect septa; *c.* Imperfect, tertiary septa; *d.* Acontia; *e.* Reproductive organs.
- " 4. *Halcampoides abyssorum*; preserved in alcohol.
- " 5. Do., a portion of the integument, magnified. *a.* Longitudinal furrow; *b.* Area between the furrows showing suckers distributed about them.
- " 6. Do., Oral disc with tentacles, superior aspect, magnified.
- " 7. Do., transversal section of the integument of the body, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles.
- " 8. Do., longitudinal section, magnified. *a.* Circular muscles.
- " 9. Do., dissected longitudinally and the integument pushed aside. *a.* Septa, at their origin near the caudal aperture; *b.* Greatest breadth of the septum; *c.* Diminished breadth of the septum at the point where it attaches itself to the gullet-tube (*d.*); *e.* The insertion of the septum on the oral disc; *f.* Longitudinal muscle; *g.* Mesenterial filaments; *h.* Reproductive organs; *i.* Mesenterial filaments at their origin in the gullet-tube.
- " 10. Do., transversal section of the superior portion of the body with the gullet-tube, magnified. *a.* Directive septa. *V.* The ventral side. *D.* The dorsal side. *b.* The four remaining pairs of septa; *c.* Longitudinal muscles of the directive septa; *d.* Transversal muscles of same; *e.* Longitudinal muscles of the remaining septa; *f.* Transversal muscles of the same; *g.* Dilation of the gullet-tube on the dorsal side; *g*¹. Dilation of the gullet-tube on the ventral side; *h.* The connective-tissue; *i.* The gullet-tube; *k.* gullet-groove.
- " 11. Do., transversal section of the rectum and a portion of the gullet-tube, magnified. *a.* The rounded portion of the rectum; *b.* The connective-tissue separating the rectum from the gullet-tube; *c.* The connective-tissue layer; *d.* The gullet-tube; *e.* The epithelium, consisting of long

g. Rectums Lumen, hvori sees Grus; *h.* Epithellet, der beklæder Svælgrørets indre Flade, bestaaende af korte, cilierende Cylinderceller.

Tab. XVI.

- Fig. 1. *Halcampoides abyssorum*. Et Tversnit af Dyrets bagerste Ende, der viser Aabningen, omgivet af stærke Muskelfibre, forstørret. *a.* Muskler.
- " 2. Et Tversnit af den sammes Tentakler, forstørret. *a.* Ectodermets Cylinderceller med Cilier; *b.* Slimkjertler; *c.* Nematocyster; *d.* Længdemuskler; *e.* Nervefibriller; *f.* Bindevæv; *g.* Tvermuskler; *h.* Endothel.
- " 3. Et Tversnit af Mundskiven af den samme, forstørret. *a.* Store Ganglieceller med Udløbere; *b.* Udløbere fra den brede Ende; *c.* en Udløber fra Gangliets smale Ende; *d.* Nervenet, dannet af Gangliernes Udløbere; *e.* mindre Ganglier, der afveksle med de store; *f.* Udløbere fra de mindre Ganglier.
- " 4. *Edwardsioides vitrea*, efter et Spiritusexemplar, forstørret. *a.* Stykker af det tynde Overtræk; *b.* Længdefurer; *c.* Længdefelter med Sugevorter; *d.* Overtrækkets øverste, fri Rand; *e.* Physa; *f.* Capitulum.
- " 5. Et Stykke Hud af den samme, forstørret. *a.* Sugevorter.
- " 6. Tversnit af Kropshuden, forstørret. *a.* Ectoderm; *b.* Bindevæv med Bindevævslegemer og Ernæringskanaler; *c.* Cirkulærmuskler.
- " 7. Tversnit af den halve Krop med Svælgrør, forstørret. *a.* Retningssepta; *b.* Svælgrube; *c.* Længdemuskler paa Septa; *d.* Tvermuskler paa samme; *e.* Generationsorganer.
- " 8. Et Stykke af et Septum med Generationsorganer, forstørret. *a.* Længdemuskler; *b.* Testikler; *c.* Æggestokke.
- " 9. En Testikel, forstørret. *a.* Celler; *b.* Celle, hvori Spermatozoe; *c.* frie Spermatozoer.
- " 10. Et Stykke af Overtrækket, hvori sees løsrevne Cylinderceller og Nematocyster fra Ectodermet, forstørret.
- " 11. *Edwardsia costata*, naturlig Størrelse. *a.* Scapus med Ribber; *b.* Capitulum; *c.* Physa.
- " 12. Et Stykke af Huden med dens Ribber, forsynet med Papiller, forstørret. *a.* Ribber med Papiller; *b.* Længdefelter imellem Ribberne.

flagellate cells, covering the inner surface of the rectum; *f.* Mucus of the rectum; *g.* The passage of the rectum, containing small gravel; *h.* The epithelium that covers the inner surface of the gullet-tube, consisting of short ciliating cylinder-cells.

Plate XVI.

- Fig. 1. *Halcampoides abyssorum*; A transversal section of the posterior extremity of the animal, showing the aperture surrounded by strong muscle fibres, magnified. *a.* Muscles.
- " Do., transversal section of the tentacles, magnified. *a.* The cylinder-cells of the ectoderm with cilia; *b.* Mucous glands; *c.* Nematocysts; *d.* Longitudinal muscles; *e.* Nerve fibrils; *f.* Connective-tissue; *g.* Transversal muscles; *h.* Endothelium.
- " 3. Do., transversal section of the oral disc, magnified. *a.* Large ganglial cells with prolongations; *b.* Prolongations from the broad extremity; *c.* A prolongation from the narrow extremity of the ganglion; *d.* Nervous reticulation formed of the prolongations of the ganglia; *e.* Small ganglia that alternate with the larger ones; *f.* Prolongations of smaller ganglia.
- " 4. *Edwardsioides vitrea*; illustrated from a specimen preserved in alcohol, magnified. *a.* Portions of the thin outer covering; *b.* Longitudinal furrows; *c.* Longitudinal areas with suckers; *d.* The superior free margin of the covering; *e.* Physa; *f.* Capitulum.
- " 5. Do., a portion of the integument, magnified. *a.* Suckers.
- " 6. Do., transversal section of the integument of the body, magnified. *a.* Ectoderm; *b.* Connective-tissue, with connective-tissue corpuscles and nutritory ducts; *c.* Circular muscles.
- " 7. Do., transversal section of a half of the body with gullet-tube, magnified. *a.* Directive septa; *b.* Gullet-groove; *c.* Longitudinal muscles of the septa; *d.* Transversal muscles of same; *e.* Reproductive organs.
- " 8. Do., portion of a septum with reproductive organs, magnified. *a.* Longitudinal muscles; *c.* Testicles; *c.* Ovaries.
- " 9. Do., a testicle, magnified. *a.* Cells; *b.* Cell containing spermatozoa; *c.* Loose spermatozoa.
- " 10. Do., a portion of the external covering in which cylinder-cells, that have been torn loose, and nematocysts from the ectoderm are observed, magnified.
- " 11. *Edwardsia costata*; life size. *a.* Scapus with ribs; *b.* Capitulum; *c.* Physa.
- " 12. Do., a portion of the integument with its ribs, furnished with papillæ, magnified. *a.* Ribs with papillæ; *b.* Longitudinal areas between the ribs.

Tab. XVII.

- Fig. 1. *Fenja mirabilis*, opskåret efter Længden og lidt forstørret. *a.* Længdemuskler; *b.* Mesenterial-filamenter; *c.* Æggestokke; *d.* Testikler; *e.* Spiserør; *f.* Tarm; *g.* Rectum; *h.* Anus.
- „ 2. Den samme; baade Hud og Tarmkanal aabnet efter Længden. *a.* Spiserørets indre Flade med dets Længdefolder; *b.* Tarmens indre Flade med dens Folder; *c.* Rectums indre Flade med dens Folder; *d.* Anus.
- „ 3. Mundskiven med Tentakler, seet fra oven, forstørret.
- „ 4. Dyrets bagerste Ende, forstørret. *a.* Anus; *b.* Papiller rundt Anus; *c.* Folder paa Rectum.
- „ 5. Et Stykke Hud af den samme, seet fra den indre Flade, forstørret. *a.* Længdemuskel med Septuminsertionen; *b.* Tvermuskler; *c.* Tvermuskler, som gaa under Længdemuskelen henimod Septum.
- „ 6. Tversnit af Huden af den samme, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* Cirkulærmuskler.
- „ 7. Tversnit af Hud og Tarmkanal af den samme, forstørret. *a.* Den midterste Del af et Septum (Længdemusklerne ere bortrevne); *b.* Kamrene imellem Septa; *c.* Længdemusklerne paa Kropsvæggen; *d.* Længdemusklerne paa begge Sider af Septa; *e.* listeformige Fremspring paa Tarmkanalens ydre Væg; *f.* Bindevævsforlængelser fra Tarmkanalens indre Væg, hvilke danne Folderne paa samme; *g.* Epithel paa samme.
- „ 8. Et Stykke af den Bindevævsmembran, der binder Generationsorganerne til Septum, forstørret. *a.* Bindevævsmembran; *b.* Æggestokke; *c.* Testikler.
- „ 9. Bindevævsmembran med Testikler, forstørret. *a.* Bindevæv; *b.* Celler paa Testikelrørens indre Væg (Spermatoblaster); *c.* lignende Celler fyldte med udviklede Spermatozoer; *d.* frigjorte, udviklede Spermatozoer; *e.* mere udviklede Spermatozoer.
- „ 10. Bindevævsmembran med Æggestokke, forstørret. *a.* Bindevæv; *b.* Æg.
- „ 11. Tversnit af Hud og Tarm af Kroppens bagerste Del, forstørret. *a.* Midterste Del af et Septum; *b.* listeformige Bindevævsforlængelser paa Rectums ydre Væg. Paa Septa sees tilhæftede Æg.
- „ 12. Tversnit af Krop og Tarm nær Anus, forstørret. *a.* Spalte i Bunden af et Kammer; *b.* listeformige Bindevævsforlængelser paa Rectums ydre Flade.

Plate XVII.

- Fig. 1. *Fenja mirabilis*; dissected longitudinally and slightly magnified. *a.* Longitudinal muscles; *b.* Mesenterial filaments; *c.* Ovaries; *d.* Testicles; *e.* Gullet-tube; *f.* Intestine; *g.* Rectum; *h.* Anus.
- „ 2. Do., the integument and intestinal canal, dissected longitudinally. *a.* Inner surface of the gullet-tube, showing its longitudinal areas; *b.* Inner surface of the intestine with its folds; *c.* Inner surface of the rectum with its folds; *d.* Anus.
- „ 3. Do., Oral disc with tentacles, superior aspect, magnified.
- „ 4. Do., posterior extremity, magnified. *a.* Anus; *b.* Papillæ round the anus; *c.* Folds of the rectum.
- „ 5. Do., portion of the integument viewed from the inner surface, magnified. *a.* Longitudinal muscle with the insertion of the septum; *b.* Transversal muscles; *c.* Transversal muscles, which pass under the longitudinal muscle towards the septum.
- „ 6. Do., transversal section of the integument magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Circular muscles.
- „ 7. Do., transversal section of the integument and intestinal canal, magnified. *a.* The middle portion of a septum with the longitudinal muscles removed. *b.* The chambers between the septa; *c.* The longitudinal muscles on the wall of the body; *d.* The longitudinal muscles on both sides of the septa; *e.* Fillet-formed projection on the outer wall of the intestinal canal; *f.* Connective-tissue prolongations from the inner wall of the intestinal canal, which form its folds; *g.* The epithelium on same.
- „ 8. Do., a portion of the connective tissue membrane that connects the reproductive organs with the septum, magnified. *a.* Connective-tissue membrane; *b.* Ovaries; *c.* Testicles.
- „ 9. Do., connective-tissue with testicles, magnified. *a.* Connective-tissue; *b.* Cells on the inner wall of the testicular tubes (spermatoblasts); *c.* Similar cells filled with undeveloped spermatozoa; *d.* Liberated undeveloped spermatozoa; *e.* More fully developed spermatozoa.
- „ 10. Do., Connective-tissue membrane with ovaries, magnified. *a.* Connective-tissue; *b.* Ova.
- „ 11. Do., transversal section of the integument and intestine of the posterior part, magnified. *a.* The middle portion of a septum; *b.* Fillet-formed connective-tissue prolongations on the outer wall of the rectum. Ova are seen attached to the septum.
- „ 12. Do., transversal section of the body and intestine near the anus, magnified. *a.* Fissure at the bottom of a chamber; *b.* fillet-formed connective-tissue prolongations on the outer surface of the rectum.

Fig. 13. Tversnit af Bunden af et Kammer med et Stykke af Rectum. *a.* Spalten i Bunden af Kammeret; *b.* Rectum.

„ 14. Et Stykke af Hudens ydre Flade, hvorpaa sees Sugevorter, forstørret.

Tab. XVIII.

Fig. 1. Tversnit af Kropshuden af *Fenja mirabilis*, forstørret. *a.* Cylinderepithel (Ectoderm); *b.* encellede Slimkjertler; *c.* Nematocyster.

„ 2. Et Stykke af et Tversnit af Krop og Tarmkanal, forstørret. *a.* Længdemuskler paa Septa; *b.* de forgrenede Bindevævsforlængelser fra Septa, paa hvilke Muskelfibre ere fæstede; *c.* Bindevævsforlængelser paa Tarmens ydre Væg; *d.* Epithel paa samme; *e.* cirkulære Muskelfibre paa Tarmen; *f.* Bindevævslag; *g.* Bindevævsforlængelser fra Tarmens indre Væg; *h.* Længde- og Tvermuskelfibre paa den indre Væg af Bindevævslaget og dets Forlængelser; *i.* Epithel.

„ 3. Tversnit af den øverste Del af Spiserøret, nærmest Mundskiven (Macerationspræparat), forstørret. *a.* Nervenet; *b.* Epithel; *c.* Muskler; *d.* Gangliceller. Epithelet er rykket langt fra Muskellaget.

„ 4. Nerveganglier og opsvulmede Nervetraade fra den underste Del af Mundskiven og den tilstødende Del af Kropshuden, forstørret. *a.* Nerveganglier; *b.* opsvulmede Nervetraade.

„ 5. *Ægir frigidus*, forstørret. *a.* Fremspringende Ribber; *b.* Længdefelter med Sugevorter; *c.* den nøgne Del af Kroppen; *d.* en Excrementprop, der passerer Anus.

„ 6. Fordøiellesapparatet, aabnet efter Længden, forstørret. *a.* Spiserørets Folder; *b.* Tarmens Folder; *c.* Rectums Folder.

„ 7. Spiserør, Tarm, Mundskive og Tentakler, forstørret. *a.* Spiserøret; *b.* Tarmen; *c.* Rectum; *d.* Septainsertion; *e.* Spalter paa Rectum; *f.* Æggestokke.

„ 8. Tversnit af Kroppens Hud. *a.* Ectodermets Cylinderceller; *b.* Slimkjertler, *c.* Nematocyster; *d.* Bindevæv; *e.* Cirkulærmuskler; *f.* Længde- og Tvermuskler; *g.* Endothel.

„ 9. En Del af en Æggestok, løsrevet fra Septum, forstørret. *a.* Bindevæv; *b.* stilket Æggekapsel; *c.* Æg.

„ 10. Et Stykke af en Testikel, forstørret.

Fig. 13. *Fenja mirabilis*; transversal section of the bottom of a chamber with a portion of the rectum. *a.* The fissure at the bottom of the chamber; *b.* Rectum.

„ 14. Do., portion of the external surface of the integument, upon which suckers are observed, magnified.

Plate XVIII.

Fig. 1. *Fenja mirabilis*; transversal section of the integument of the body, magnified. *a.* Cylinder-epithelium (ectoderm); *b.* Unicellular mucous glands; *c.* Nematocysts.

„ 2. Do., portion of a transversal section of the body and intestinal canal, magnified. *a.* Longitudinal muscles of the septum; *b.* The ramificated connective-tissue prolongations of the septa, upon which the muscle-fibres are attached; *c.* Connective-tissue prolongations on the outer wall of the intestine; *d.* Epithelium of the same; *e.* Circular-muscle fibres of the intestine; *f.* Connective-tissue layer; *g.* Connective-tissue prolongations from the inner wall of the intestine; *h.* Longitudinal and transversal muscle-fibres on the inner wall of the connective-tissue layer; *i.* Epithelium.

„ 3. Do., transversal section of the superior portion of the œsophagus, next the oral disc. *a.* macerated preparation, magnified. *a.* Nervous reticulation; *b.* Epithelium; *c.* Muscles; *d.* Gangliacells. The epithelium is removed far from the muscular layer.

„ 4. Do., Nervous ganglia and tumified nervous filaments from the inferior portion of the oral disc and the adjoining part of the integument of the body, magnified. *a.* Nervous ganglia; *b.* Tumified nervous filaments.

„ 5. *Ægir frigidus*; magnified. *a.* Protuberant ribs; *b.* Longitudinal folds with suckers; *c.* The bare portion of the body; *d.* An excremental plug passing from the anus.

„ 6. Do., the digestive apparatus, dissected longitudinally, magnified. *a.* Folds of the gullet-tube; *b.* Folds of the intestine; *c.* Folds of the rectum.

„ 7. Do., œsophagus, intestine, oral disc and tentacles, magnified. *a.* The œsophagus; *b.* The intestine; *c.* Rectum; *d.* Septal insertion; *e.* Fissures of the rectum; *f.* Ovaries.

„ 8. Do., transversal section of the integument of the body. *a.* Cylinder-cells of the ectoderm; *b.* Mucous glands; *c.* Nematocysts; *d.* Connective-tissue; *e.* Circular muscles; *f.* Longitudinal and transversal muscles; *g.* Endothelium.

„ 9. Do., portion of an ovary, detached from the septum, magnified. *a.* Connective-tissue; *b.* Pedunculated ovarian capsule; *c.* Ova.

„ 10. Do., portion of a testicle, magnified.

Tab. XIX.

- Fig. 1. Tversnit af Hud og Tarm af *Ægir frigidus*, forstørret. *a.* Bindevævsforlængelser, udgaaende fra Septum; *b.* Længdemuskler fæstede paa disse Forlængelser; *c.* Længdemuskler paa begge Sider af Septum, dannende Buske; *d.* Bindevævsforlængelse, udgaaende fra Tarmens ydre Væg; *e.* Epithel paa samme; *f.* en saadan Bindevævsforlængelse, gaffelformigt delt; *g.* Bindevævsforlængelse, udgaaende fra Tarmens indre Væg, dannende en Tarmfold; *h.* Epithelbeklædningen paa samme.
- „ 2. Et Tversnit af Kroppens bagre Del af *Ægir frigidus*, fremstillende Huden, Skillevæggene og Tarmen, i hvis Hulhed sees Excrementer, forstørret. *a.* Et Kammer; *b.* de listeformede Bindevævsforlængelser fra Tarmens ydre Væg.
- „ 3. Do., af Kroppen og Tarmen, nogle Millimeter foran Rectum. *a.* Kamre; *b.* de listeformede Bindevævsforlængelser fra Tarmens ydre Væg; *c.* Kanaler, hvorved Tarmen kommuniserer med Kamrene, og som udmunde i de paa Rectum værende Spalter; *d.* Epithel, beklædende Kanalernes Vægge; *e.* Slimkjertler.
- „ 4. Tversnit af Kroppens bagre Del noget længere foran Fig. 2, hvorpaa sees Kropshuden, Septa, Kamrene og Tarmen med dens mange, meget fremragende Folder beklædte med Epithel, imellem hvis Celler sees Slimkjertler. *a.* Kamre; *b.* listeformede Forlængelser fra Tarmens ydre Væg.
- „ 5. *Edwardsia fusca*, naturlig Størrelse. *a.* Det skedeformige Overtræk paa Scapus; *b.* De kastaniebrune Linier paa Capitulum; *c.* Physa.
- „ 6. Et Stykke Hud, indenfor Skeden, lidt forstørret. Paa den ydre Flade sees de 2 Rækker Papiller.
- „ 7. Et Tversnit af Huden, forstørret. *a.* Den skedeformige Del, hvori sees inkrusteret Sand; *b.* Ectoderm; *c.* Bindevæv med Ernæringskanaler og Bindevævslegemer med Udløbere; *d.* Nematocystkapselen; *e.* A. Bindevævsnet; *e.* B. Epithel; *f.* løsrevne Epithelceller, hvoraf enkelte ere meget forlængede; *g.* Nematocyster; *h.* Cirkulærmuskler; *i.* Muskellaget paa den indre Væg.
- „ 8. Tversnit af Krop og Svælgrør, forstørret. *a.* Papiller med deres Nematocystkapsler; *b.* Septum; *c.* Længdemuskler paa samme; *d.* Septumets

Plate XIX.

- Fig. 1. *Ægir frigidus*; transversal section of the integument and intestine, magnified. *a.* Connective-tissue prolongations issuing from the septum; *b.* Longitudinal muscles attached to these prolongations; *c.* Longitudinal muscles on both sides of the septum, forming tufts; *d.* Connective-tissue prolongation issuing from the outer wall of the intestine; *e.* Epithelium of the same; *f.* One of these connective-tissue prolongations bifurcated; *g.* Connective-prolongation issuing from the inner wall of the intestine, forming an intestinal fold; *h.* Epithelial covering of same.
- „ 2. Do., transversal section of the posterior portion of the body, magnified; showing the integument, divisional walls and intestine, in whose cavity excrementa are observed. *a.* A chamber; *b.* The fillet-formed connective-tissue prolongations from the outer wall of the intestine.
- „ 3. Do., transversal section of the body and intestine a few millimetres in front of the rectum. *a.* Chambers; *b.* The fillet-formed connective-tissue prolongations from the outer wall of the intestine; *c.* Ducts through which the intestine communicates with the chambers, and which debouch into the fissures appearing in the rectum; *d.* Epithelium clothing the walls of the ducts; *e.* Mucous glands.
- „ 4. Do., transversal section of the posterior part of the body — somewhat in front of fig. 2 — in which is seen the integument of the body, septa, chambers, and the intestine with its numerous, very prominent folds clad with epithelium, between whose cells mucous glands are seen. *a.* Chambers; *b.* Fillet-formed prolongations from the outer wall of the body.
- „ 5. *Edwardsia fusca*; life size. *a.* The vaginate covering of the scapus; *b.* The chestnut-brown lines on the capitulum; *c.* Physa.
- „ 6. Do., A portion of the integument, inside the sheath, a little magnified. On the outer surface the two series of papillæ are observed.
- „ 7. Do., transversal section of the integument, magnified. *a.* The vaginate portion, showing sand encrusted in it; *b.* Ectoderm; *c.* Connective-tissue with nutritory ducts, and connective-tissue corpuscles with prolongations; *d.* The nematocyst capsule; *e.* A. The connective-tissue reticulation; *e.* B. Epithelium; *f.* Detached epithelial cells, of which some are a little prolonged; *g.* Nematocysts; *h.* Circular muscles; *i.* Muscular layer of the inner wall.
- „ 8. Do., transversal section of the body and œsophagus, magnified. *a.* Papillæ with their nematocyst capsules; *b.* Septum; *c.* Longitudinal

Insertion paa Øsophagus med dets Længdemuskler; e. Midtpartiet af Septum.

- Fig. 9. Længdesnit af den bagerste Halvdel af Kroppen, forstørret. a. Længdemuskler paa Septa; b. Æggestokke med Æg; c. Acontier.

Tab. XX.

- Fig. 1. *Edwardsia Andresi*, naturlig Størrelse. a. Scapus; b. Physa; c. Capitulum.
- " 2. Den samme aabnet efter Længden, lidt forstørret. a. Septa i den bagerste Ende; b. Septa længere fortil med Længdemuskler og Mesenterialfilamenter; i. Svælgrør med Septainserterioner.
- " 3. Tversnit af Huden paa den midterste Del af Kroppen, forstørret. a. Det skedeformige Overtræk; b. Ectoderm; c. Bindevæv; d. Cirkulærmuskler; e. Endothel; f. Nematocystkapsel, ned-sænket i Bindevævet; g. Bindevævslegemer med Udløbere; h. Epithel.
- " 4. Tver- og Længdemuskler paa den indvendige Kroppsvæg, forstørret. a. Tvermuskler; b. Længdemuskler.
- " 5. Tversnit af Kroppshuden, forstørret. a. Skedeformigt Overtræk; b. Ectoderm; c. Bindevæv; d. Cirkulærmuskler; e. Endothel; f. Nematocystkapsel; g. Bindevævslegemer med Udløbere; h. Epithel; i. Nematocyster; k. Nematocyster i Udvikling.
- " 6. En Nematocyst fra Kapselen, stærkt forstørret. Zeiss. Homogen. Immers. 2.0^{mm}. Ocul. 4.
- " 7. Tversnit af Dyrets forreste Del, gennem Hud og Svælgrør, forstørret. a. Septum; b. Kamre; c. Længdemusklerne ved Septumets Udspring fra Kroppsvæggen; d. Septumets Insertion paa Spiserøret med dets Længdemuskel; e. Septumets midterste Del.
- " 8. Tversnit af Kroppen længere bag, hvor Svælgrøret er ophørt. a. Ectoderm; b. Nematocystkapsel i Bindevævet; c. Acontier, fæstede til Septa; d. Længdemuskler paa Septa.
- " 9. Tversnit fra Kroppens bagre Del, forstørret. a. Ectoderm; b. Nematocyster i Bindevævet; c. Æggestokke, fæstede til Septa; d. Testikler ligesaa.
- " 10. En Acontie, stærkt forstørret.
- " 11. Et Stykke af et Septum med Længdemuskler og Testikel, forstørret. a. Bindevævsmembran; b. Længdemuskel; c. Blindsække; d. Epithelialbeklædningen paa Blindsækkenes indre Væg; e. Spermatozoer.

muskler of same; d. Insertion of the septum on the œsophagus with its longitudinal muscles; e. Mesial portion of the septum.

- Fig. 9. *Edwardsia fusca*; longitudinal section of the posterior half portion of the body, magnified. a. Longitudinal muscles of the septa; b. Ovaries containing ova; c. Acontia.

Plate XX.

- Fig. 1. *Edwardsia Andresi*; life size
- " 2. Do., dissected longitudinally, slightly magnified. a. Septa of the posterior portion; b. Septa farther forward, with longitudinal muscles and mesenterial filaments; c. Gullet-tube with septal insertions.
- " 3. Do., transversal section of the integument on the middle portion of the body, magnified. a. The vaginate covering; b. Ectoderm; c. Connective-tissue; d. Circular muscles; e. Endothelium; f. Nematocyst capsule embedded in the connective-tissue; g. Connective-tissue corpuscles with prolongations; h. Epithelium.
- " 4. Do., transversal and longitudinal muscles on the internal wall of the body, magnified. a. Transversal muscles; b. Longitudinal muscles.
- " 5. Do., transversal section of the integument of the body, magnified. a. The vaginate covering; b. Ectoderm; c. Connective-tissue; d. Circular muscles; e. Endothelium; f. Nematocyst capsule; g. Connective-tissue corpuscles with prolongations; h. Epithelium; i. Nematocysts; k. Nematocysts in course of development.
- " 6. Do., a nematocyst from the capsule, greatly magnified. Zeiss. Homogen. Immert. 2.0^{mm} Ocul. 4.
- " 7. Do., transversal section of the anterior part of the animal, through the integument and œsophagus, magnified. a. Septum; b. Chambers; c. The longitudinal muscles at the origin of the septum in the body wall; d. The insertion of the septum on the œsophagus with its longitudinal muscle; e. Middle portion of the septum.
- " 8. Do., transversal section of the body farther back, where the gullet-tube ceases. a. Ectoderm; b. Nematocyst capsule in the connective-tissue; c. Acontia attached to the septum; d. Longitudinal muscles on the septa.
- " 9. Do., transversal section of the posterior part of the body, magnified. a. Ectoderm; b. Nematocysts in the connective-tissue; c. Ovaries attached to septa; d. Testicles, attached in same manner.
- " 10. Do., An acontia greatly magnified.
- " 11. Do., portion of a septum with longitudinal muscle and testicle, magnified. a. Connective-tissue membrane; b. Longitudinal muscle; c. Cæcum; d. Epithelial covering on the inner wall of the cæcum; e. Spermatozoa.

Fig. 12. Tversnit af en Del af Svælgrøret, forstørret. *a.* Epithel; *b.* Bindevæv; *c.* Muskellag; *d.* pyramidformige Bindevævsfremspring fra Bindevævs indre Væg; *e.* Epithel med Cilier.

„ 13. Tversnit af en Tentakel, forstørret. *a.* Ectoderm med Nematocyster; *b.* kornet Lag (Nervesystem?); *c.* Længdemuskler; *d.* Bindevæv; *e.* Tvermuskler; *f.* cilierende Endothel.

Tab. XXI.

Fig. 1-10. *Mardöll Erdmanni*, mere eller mindre sammentrukne af Opbevaringen i Spiritus.

„ 11. Den samme. En Koloni Polyper, seet fra oven, naturlig Størrelse.

„ 12. Samme Koloni, seet fra neden og lidt til Siden, naturlig Størrelse.

„ 13. To sammenhængende Polyper af den samme; Spiritusexemplar.

„ 14. En Koloni Polyper af den samme, seet fra oven, naturlig Størrelse.

„ 15. Den samme seet fra neden, naturlig Størrelse.

„ 16. Et Tversnit af Hud og Svælgrør af den samme, forstørret. *a.* Ectoderm; *b.* Ernæringskanaler i Bindevævet, fyldte med Celler; *c.* Epithel, beklædende den indre Kropsvæg; *d.* Septum med Muskler og Epithel; *e.* Generationsorganer og Mesenterialfilamenter; *f.* Epithel paa Svælgrørets ydre Flade.

„ 17. Et Tversnit af Kroppen længere nede, hvor Svælgrøret er ophørt, forstørret. *a.* To Macrosepta paa Bug siden (Retningssepta), bærende Generationsorganer, hvori Æg, samt Mesenterialfilamenter; *b.* Microsepta paa Rygsiden (Retningssepta); *c.* Æg; *d.* Microsepta med Muskulatur.

„ 18. Tversnit af Huden og et Septum, stærkt forstørret. *a.* Ectoderm; *b.* Bindevæv, der ved et Bjælkenet danner Kanaler; *c.* Bindevævsbjælke; *d.* Bindevævslegeme; *e.* Kanal i Bindevævet, udfyldt med Celler; *f.* Sandkorn, der udfylde Maskerne (Kanalerne); *g.* Cirkulærmuskler; *h.* Længdemuskler paa Hudens indre Flade; *i.* Epithel, beklædende denne; *k.* Septumets Bindevæv; *l.* Længdemuskler.

„ 19. En Enkeltpolyp udviklet af et Æg, naturlig Størrelse.

„ 20. Den samme, forstørret.

Tab. XXII.

Fig. 1. Halvt Tver-, halvt Længdesnit af den nederste Basaldel med det dertil stødende Coenenchym af *Mardöll Erdmanni*, forstørret. *a.* Gastro-

Den norske Nordhavsexpedition. D. C. Danielssen: Actinida.

Fig. 12. *Edwardsia Andresi*; transversal section of a portion of the oesophagus, magnified. *a.* Epithelium; *b.* Connective-tissue; *c.* Muscular layer; *d.* Pyramidal connective-tissue prominence on the inner wall of the connective-tissue; *e.* Epithelium with cilia.

„ 13. Do., transversal section of a tentacle, magnified. *a.* Ectoderm with nematocysts; *b.* Granular layer (Nerve-system?); *c.* Longitudinal muscles; *d.* Connective-tissue; *e.* Transversal muscles; *f.* Ciliating endothelium.

Plate XXI.

Fig. 1-10. *Mardöll Erdmanni*; more or less shrunk from its preservation in alcohol.

„ 11. Do., superior aspect of a colony of polyps, life size.

„ 12. Do., inferior, semi-lateral aspect of the same colony, life size.

„ 13. Do., two united polyps. Specimen preserved in alcohol.

„ 14. Do., superior aspect of a colony of polyps, life size.

„ 15. Do., inferior aspect of the colony, life size.

„ 16. Do., transversal section of the integument and oesophagus, magnified. *a.* Ectoderm; *b.* Nutritory ducts in the connective-tissue, filled with cells; *c.* Epithelium clothing the inner wall of the body; *d.* Septum with muscles and epithelium; *e.* Reproductive organs and mesenterial filaments; *f.* Epithelium of the outer surface of the gullet-tube.

„ 17. Do., transversal section of the body lower down, where the gullet-tube ceases, magnified. *a.* Two macrosepta on the ventral side (directive septa) carrying reproductive organs, containing ova, and mesenterial filaments; *b.* Microsepta on the dorsal side (directive septa); *c.* Ova; *d.* Microsepta with musculosity.

„ 18. Do., transversal section of the integument and a septum, greatly magnified. *a.* Ectoderm; *b.* Connective-tissue, which by a reticulation of beams forms ducts; *c.* Connective-tissue beams; *d.* The connective-tissue layers; *e.* Duct in the connective-tissue, filled with cells; *f.* Grains of sand that fill the meshes (the ducts); *g.* Circular muscles; *h.* Longitudinal muscles on inner surface of the integument; *i.* Epithelium clothing same; *k.* Connective-tissue of the septum; *l.* Longitudinal muscles.

„ 19. Do., a single polyp developed from an ovum, life size.

„ 20. Do., the same, magnified.

Plate XXII.

Fig. 1. *Mardöll Erdmanni*; semi-transversal, semi-longitudinal section of the polyp's basal part with the adjoining sarcosoma, magnified. *a.* Gastro-

- vaskularhulheden, samt Septa; *b.* en Kanal fra Gastrovaskularhulheden ind i Coenenchymet, beklædt med Epithel; *c. d.* lignende Kanaler; *e.* Epithelet, som beklæder Kanalens Vægge; *f.* Coenenchymet.
- „ 2. Tversnit af en Tentakel, stærkt forstørret. *a.* Ectoderm; *b.* Nematocyst; *c.* Længdemuskler; *d.* Bindevæv; *e.* Tvermuskler; *f.* Epithel, som beklæder Tentakelens indre Væg.
- „ 3. Tversnit af Polypkroppens nederste Basaldel. *a.* Polypens Bund; *b.* Macroseptum, der tager sit Udspring fra Bunden; *c.* Septumets bredere Del langs Kropsvæggen; *d.* Aabning imellem to Macrosepta, der fører ind til Coenenchymets Kanaler; *e.* Microseptum og Huden, slaaet til Siden.
- „ 4. To sammenhængende Polyper, aabnet efter Længden, forstørret. *a.* Polypernes Bund (Grændse); *b.* Macrosepta, der udgaa fra Bunden; *c.* Macroseptum længere oppe paa Polypkroppens indre Flade; *d.* Macroseptum, insereret paa Svælgrøret og bærende Generationsorganer og Mesenterialfilamenter; *e.* Microseptum; *f.* Svælgrøret.
- „ 5. Et Macroseptum med Generationsorganer og Mesenterialfilamenter, forstørret. *a.* Kjertelformigt Organ, hvorfra Mesenterialfilamentet, *d.* udgaa; *b.* Furen paa samme; *c.* Celler; *e.* Æggestok; *f.* Æg.
- „ 6. Et Tversnit af Svælgrøret og et paa dette fæstet Septum. *a.* Længdemuskler paa Septum; *b.* Tvermuskler paa Svælgrøret; *c.* dettes Bindevæv; *d.* Længdemuskler paa Svælgrørets indre Væg; *e.* Epithel paa samme; *f.* encellede Slimkjertler; *g.* Nematocyster.
- „ 7. Tversnit af Kroppens øverste Del med Svælgrøret lige under Mundskiven, forstørret. *a.* To Macrosepta paa Bugsiden, der fæste sig et paa hver Side af Svælgruben; *b.* Svælgruben; *c.* Microsepta paa Rygsiden; *d.* Svælgrøret, krænget udad, saa at dets indre Væg med Folder kunne sees.
- „ 8. *Kodioides pedunculata*, noget forstørret og berøvet en Del af sin Kruste, hvorved Sugevorterne komme tilsyne.
- „ 8*a.* Et Stykke af Hudens Overflade af den samme for at vise Sugevorterne, forstørret.
- „ 9. Den samme opskåret efter Længden til Stilkens Begyndelse. *a.* Fuldstændige Septa; *b.* ufuldstændige Septa; *c.* et Par Septa (Retningssepta); *d.* det spaltede Svælgrør; *e.* Folderne paa Svælgrørets indre Væg.
- „ 10. En Acontie, forstørret.
- vascular cavity and septa; *b.* A duct from the gastro-vascular cavity leading into the sarcosoma, clad with epithelium; *c. d.* Similar ducts; *e.* The epithelium that clothes the walls of the ducts; *f.* The sarcosoma.
- Fig. 2. *Mardöll Erdmanni*; transversal section of a tentacle, greatly magnified. *a.* Ectoderm; *b.* Nematocyst; *c.* Longitudinal muscles; *d.* Connective-tissue; *e.* Transversal muscles; *f.* Epithelium that clothes the inner wall of the tentacle.
- „ 3. Do., transversal section of the lowest part of the basal portion of the polyp's body. *a.* The bottom of the polyp; *b.* Macroseptum, which has its origin in the bottom; *c.* The broader part of the septum along the wall of the body; *d.* Aperture between two macrosepta, leading to the ducts of the sarcosoma; *e.* Microseptum.
- „ 4. Do., two united polyps, dissected longitudinally and the integument pushed aside, magnified. *a.* The bottom of the polyps (Margin); *b.* Macrosepta issuing from the bottom; *c.* Macroseptum farther up on the inner surface of the body of the polyp; *d.* Macroseptum, inserted in the œsophagus and carrying reproductive organs and mesenterial filaments; *e.* Microseptum; *f.* The œsophagus.
- „ 5. Do., a macroseptum with reproductive organs and mesenterial filaments, magnified. *a.* Glandular organ from which the mesenterial filament (*d.*) issues; *b.* The groove of the same; *c.* Cells; *e.* Ovary; *f.* Ova.
- „ 6. Do., transversal section of the œsophagus and a septum attached to it. *a.* Longitudinal muscles of the septum; *b.* Transversal muscles of the œsophagus; *c.* Connective-tissue of the œsophagus; *d.* Longitudinal muscles of the inner wall of the œsophagus; *e.* Epithelium on same; *f.* Unicellular mucous glands; *g.* Nematocysts.
- „ 7. Do., transversal section of the superior portion of the œsophagus just below the oral disc, magnified. *a.* Two macrosepta on the ventral side, which attach themselves one on each side of the gullet-cavity; *b.* Gullet-cavity; *c.* Macrosepta on the dorsal side; *d.* The gullet-tube, turned outwards so that the inner wall with its folds may be seen.
- „ 8. *Kodioides pedunculata*; somewhat magnified, and deprived of a portion of its crust, permitting the suckers to be seen.
- „ 8*a.* Do., a portion of the outer surface of the integument, showing the suckers, magnified.
- „ 9. Do., the same dissected longitudinally as far as the commencement of the stem. *a.* Perfect septa; *b.* Imperfect septa; *c.* A couple of septa (directive septa); *d.* The fissured œsophagus; *e.* Folds on the inner wall of the gullet-tube.
- „ 10. Do., an acontia, magnified.

Fig. 11 Tversnit af den inkrusterede Kropshud, forstørret. *a.* Slimmembranen, hvori de fremmede Legemer ere indleirede; *b.* Ectodermet; *c.* en Sugevorte, lidt indtrukken, og i hvis Fordybning sees Slimmembranen med de inkrusterede Sandkorn og Foraminiferer; *d.* Bindevævslag; *e.* mesodermale Ringmuskler; *f.* Muskellaget paa den indre Kropsvæg; *g.* Endothelet; *h.* et Septum med sine Tvermuskler; *i.* Bindevævet, der danner Septumets Midtparti; *k.* Endothelet, som beklæder Septa og hele Gastralhulheden; *l.* Æggestok.

Tab. XXIII.

- Fig. 1.** Tversnit af den indre Flade af Fodskiven hos *Kodioides pedunculata*, forstørret. *a.* Et Septum i sit Udspring fra den centrale Del af Gastrovascularhulhedens Bund.
2. Tversnit af Kropshuden, berøvet sin Kruste, forstørret. *a.* Ectoderm; *b.* encellede Slimkjertler; *c.* en Sugevorte med sin ydre Epithelbeklædning; *d.* en gennemskaaret Sugevorte, hvorved sees Hulheden med dens Epithelbeklædning af runde Celler; *e.* en Sugevorte, lidt nedsænket i Bindevævet; *f.* Bindevævslag; *g.* mesodermale Ringmuskler; *h.* Stykke af et Septum.
3. Tversnit af Stilkens Hud ned imod Fodskiven, forstørret. *a.* Ectoderm; *b.* Bindevæv; *c.* mesodermale Ringmuskler; *d.* Stykke af et Septum.
4. Tversnit af Stilkens midterste Del, forstørret. *a.* Et Par Septa; *b.* Stilkens Hulrum; *c.* Retningsseptia; *d.* Længdemuskler paa samme; *e.* Tvermuskler paa samme; *f.* Længdemuskler paa de øvrige Septa.
5. *Cactosoma abyssorum*, noget forstørret og berøvet en Del af sit inkrusterede Overtræk. *a.* Den nøgne Del; *b.* Sugevorter; *c.* Grube, hvori flere Sugevorter ere indtrukne.
6. Tversnit af Huden af den samme, forstørret. *a.* Slimmembranen med indleirede Sandkorn; *b.* Ectoderm; *c.* Nematocyster; *d.* encellede Slimkjertler; *e.* Bindevæv; *f.* Cirkulærmuskler; *g.* Længdemuskler paa Kropsvæggens indre Flade; *h.* et Septum.
7. Et Tversnit af Kroppens midterste Del, forstørret. *a.* Retningsseptia; *b.* Længdemuskler paa samme; *c.* den smalere Del af samme Septa; *d.* Længdemusklerne paa den bredere Del af samme, dannende Buske; *e.* de øvrige 4 fuldstændige Septa med deres mod hverandre stillede Længdemuskler; *f.* de ufuldstændige Septa med

Fig. 11. *Kodioides pedunculata*; transversal section of the encrusted integument of the body, magnified. *a.* The viscous membrane in which the foreign bodies are embedded; *b.* The ectoderm; *c.* A sucker slightly retracted, in whose depression the viscous membrane is seen containing the encrusted grains of sand and foraminifera; *d.* Connective-tissue layer; *e.* Mesodermal annular muscles; *f.* The muscular layer on the inner wall of the body; *g.* The endothelium; *h.* A septum with its transversal muscles; *i.* The connective-tissue forming the medial part of the septum; *k.* The endothelium that coats the septa and entire gastral cavity; *l.* Ovary.

Plate XXIII.

- Fig. 1.** *Kodioides pedunculata*; transversal section of the inner surface of the pedal disc, magnified. *a.* A septum at its origin in the central part of the bottom of the gastro-vascular cavity.
2. Do., transversal section of the integument of the body, deprived of its crust, magnified. *a.* Ectoderm; *b.* Unicellular mucous glands; *c.* A sucker with its external epithelial covering; *d.* A transsected sucker, showing the cavity with its epithelial coating of round cells; *e.* A sucker, slightly depressed in the connective-tissue; *f.* Connective-tissue layer; *g.* Mesodermal annular muscles; *h.* Portion of a septum.
3. Do., transversal section of the integument of the stem down towards the pedal disc, magnified. *a.* Ectoderm; *b.* Connective-tissue; *c.* Mesodermal annular muscles; *d.* A portion of a septum.
4. Do., transversal section of the middle portion of the stem, magnified. *a.* A couple of septa; *b.* The hollow of the stem; *c.* Directive septa; *d.* Longitudinal muscles of same; *e.* Transversal muscles of same; *f.* Longitudinal muscles on the other septa.
5. *Cactosoma abyssorum*; somewhat magnified, and deprived of a portion of its encrusted covering. *a.* The bare portion; *b.* Suckers; *c.* Cavity into which several suckers are withdrawn.
6. Do., transversal section of the integument, magnified. *a.* The viscous membrane with grains of sand embedded in it; *b.* Ectoderm; *c.* Nematocysts; *d.* Unicellular mucous glands; *e.* Connective-tissue; *f.* Circular muscles on the inner surface of the wall of the body; *h.* A septum.
7. Do., transversal section of the middle part of the body, magnified. *a.* Directive septa; *b.* Longitudinal muscles of same; *c.* The narrow part of the same septa; *d.* The longitudinal muscles on the broad part of same, forming tufts; *e.* The other 4 perfect septa with their longitudinal muscles standing opposite each other; *f.* The

deres Længdemuskler: *g.* Endothel, der beklæder hele indre Kropsvæg.

Fig. 8. Tversnit af en Del af Kroppen noget længere oppe, forstørret. *a.* Retningssepta; *b.* Binde-vævslamellen; *c.* Længdemuskler; *d.* den smalere Del af Septumet; *e.* Længdemusklerne i Form af Buske paa Septumets bredere Del; *f.* Binde-vævsstræng, udgaaende fra Septum og dannende en Membran, *g.* hvori Mesenterialfilamenter og Generationsorganer ligge; *h.* Æggestok; *i.* ufuldstændige Septa; *k.* Længdemuskler paa samme; *l.* Endothel, beklædende Kropsvæggen indre Flade.

Tab. XXIV.

- Fig. 1. *Epizoanthus arborescens*, lidt forstørret. *a.* Coenenchym, der har omspundet et Serpularør.
- „ 2. Tversnit af Huden, forstørret. *a.* Ydre Epithel (Ectoderm); *b.* Bindevæv; *c.* fremmede Legemer, som udfylder Maskerne i Bindevævet; *d.* mesodermale Ringmuskler; *e.* kompakt Inkrustation af Bindevævet; *f.* Muskellaget paa Bindevævet indre Flade.
- „ 3. Tversnit af Krop med Svælgrør, forstørret. *a.* Retningssepta paa Bugsiden; *b.* Retningssepta paa Rygsiden; *c.* Macrosepta; *d.* en Kanal i Bindevævsmembranen; *e.* Microsepta; *f.* Svælgruben med sit Epithel.
- „ 4. Tversnit af Kroppens nedre (bage) Del, forstørret. *a.* Mesenterialfilamenter; *b.* Mesenterialfilamenter og Generationsorganer.
- „ 5. *Epizoanthus glacialis* med Coenenchymet omspundet et Tubularierør, naturlig Størrelse. *a.* Ribber paa Kroppens øverste Rand.
- „ 6. Samme siddende paa en Sten. *a.* Coenenchymet med sit udbredte Net, bestaaende af rørformede Kanaler og Masker.
- „ 7. Tversnit af Kroppshuden af den samme, forstørret. *a.* Bindevæv; *b.* Bindevævslegemer med Udløbere; *c.* Ernæringskanaler; *d.* fremmede Legemer i Bindevævet; *e.* mesodermale Ringmuskler; *f.* Epithel paa den indre Flade af Kropsvæggen.
- „ 8. Tversnit af Krop og Svælgrør af den samme, forstørret. *a.* Macrosepta med Mesenterialfilamenter og Generationsorganer; *b.* Retningssepta paa Bugsiden; *c.* Retningssepta paa Rygsiden; *d.* Microsepta; *e.* Bindevævet paa Svælgrøret; *f.* Svælgrørets Bindevæv, betydelig udvidet i

imperfect septa with their longitudinal muscles; *g.* Endothelium that clothes the entire inner wall of the body.

Fig. 8. *Cactosoma abyssorum*; transversal section of a part of the body somewhat farther up, magnified. *a.* Directive septa; *b.* The connective-tissue lamella; *c.* Longitudinal muscles; *d.* The narrow part of the septum; *e.* Longitudinal muscles, appearing like tufts, on the broad part of the septum; *f.* Connective-tissue cord issuing from the septum and forming a membrane (*g.*), in which mesenterial filaments and reproductive organs lie; *h.* Ovary; *i.* Imperfect septa; *k.* Longitudinal muscles on same; *l.* Endothelium coating the inner surface of the wall of the body.

Plate XXIV.

- Fig. 1. *Epizoanthus arborescens*; somewhat magnified. *a.* The sarcosoma, which has entwined a tube of Serpula.
- „ 2. Do., transversal section of the integument, magnified. *a.* Outer epithelium (ectoderm); *b.* Connective-tissue; *c.* Foreign bodies that occupy the meshes of the connective-tissue; *d.* Mesodermal annular muscles; *e.* Compact encrustation of the connective-tissue; *f.* The muscular layer of the inner surface of the connective-tissue.
- „ 3. Do., transversal section of the body with the œsophagus, magnified. *a.* Directive septa on the ventral side; *b.* Directive septa on the dorsal side; *c.* Macrosepta; *d.* A channel in the connective-tissue membrane; *e.* Microsepta; *f.* The gullet-groove with its epithelium.
- „ 4. Do., transversal section of the lower (posterior) part of the body, magnified. *a.* Mesenterial filaments and reproductive organs.
- „ 5. *Epizoanthus glacialis*; with the sarcosoma coiled spirally round a tube of Tubularia, life size. *a.* Ribs on the uppermost margin of the body.
- „ 6. Do., seated on a stone. *a.* The sarcosoma with its extended reticulation, consisting of tubular ducts and meshes.
- „ 7. Do., transversal section of the integument of the body, magnified. *a.* Connective-tissue; *b.* Connective-tissue corpuscles with prolongations; *c.* Nutritory ducts; *d.* Foreign bodies in the connective-tissue; *e.* Mesodermal annular muscles; *f.* Epithelium on the inner surface of the wall of the body.
- „ 8. Do., transversal section of the body and œsophagus, magnified. *a.* Macrosepta with mesenterial filaments and reproductive organs; *b.* Directive septa of the ventral side; *c.* Directive septa of the dorsal side; *d.* Microsepta; *e.* Connective-tissue on the œsophagus; *f.* Connective-tissue

Bredden; *g.* Sælgruben med sine Cylinderceller, der bære lange Cilier; *h.* Epithelet paa den øvrige Del af Svælgrørets indre Flade.

Tab. XXV.

- Fig. 1. Et Tversnit af Kroppen af *Epizoanthus glacialis*, forstørret. *a.* Cirkulærmuskler; *b.* Endothel paa den indre Kropsvæg; *c.* Mesenterialfilamenter og Æggestokke; *d.* Æg; *e.* Spore af en Parasit (Gregarin?); *f.* Sporen forlænget; *g.* en videre Udvikling.
- „ 2. Parasiten stærkere udviklet, forstørret.
- „ 3. Fremdeles en videre Udvikling af Parasiten, isoleret og forstørret. *a.* De elliptisk udvidede Ender; *b.* Kjerne; *c.* muligens begyndende Embryodannelse; *d.* Vacuoler.
- „ 4. *Epizoanthus roseus*; naturlig Størrelse. *a.* De inkrusterede, lancetformede Ribber; *b.* ydre Tentakler; *c.* indre Tentakler.
- „ 5. Tversnit af Krop og Svælgrør af den samme, forstørret. *a.* Ectoderm; *b.* Bindevæv, hvori fremmede Legemer ere indleirede; *c.* fuldstændige Septa (Macroseptia); *d.* ventrale Retningsseptia; *e.* dorsale Retningsseptia; *f.* Svælgruben med sit Epithel; *g.* ufuldstændige Septa (Microseptia).
- „ 6. Tversnit af Kropshuden, forstørret. *a.* Sandkorn i Bindevævet; *b.* Cirkulærmuskler; *c.* Muskellag paa Bindevævet indre Væg, beklædt med Epithel.
- „ 7. Tversnit af Huden af *Cerianthus Vogti*, forstørret. *a.* Cuticula; *b.* Epithel (Ectoderm); *c.* encellede Slimkirtler, *d.* Længdemuskler; *e.* forlænget Epithelcelle; *f.* Bindevæv; *g.* Muskellag paa dettes indre Væg.
- „ 8. Tversnit af Krop med Svælgrør strax under Mundskiven, lidt forstørret. *a.* Ventral Svælgrube med sine glatte Sidevolde; *b.* dorsal Svælgrube; *c.* Svælgrørets indre Sidefolder; *d.* ventrale Retningsseptia; *e.* det store, ventrale Kammer (loge ventrale impaire) imellem Retningsseptia; *f.* de dorsale Retningsseptia; *g.* det dorsale, uparrede Kammer (loge dorsale impaire); *h.* Septumet nærmest de ventrale Retningsseptia, hvilket danner det kontinuerende Septum; *i.* de øvrige ventrale Septa; *k.* de inter- og intraseptale, ventrale Kamre; *l.* de inter- og intraseptale, dorsale Kamre.
- „ 9. Mundtentaklerne, lidt forstørret. *a.* De, der omgive den ventrale Side; *b.* de, der omgive den dorsale Side.

on the œsophagus, greatly dilated in breadth; *g.* Gullet-groove with its cylinder-cells carrying long ciliæ; *h.* The epithelium on the rest of the inner surface of the œsophagus.

Plate XXV.

- Fig. 1. *Epizoanthus glacialis*; transversal section of the body magnified. *a.* Circular muscles; *b.* Endothelium on the inner wall of the body; *c.* Mesenterial filaments and ovaries; *d.* Ova; *e.* Spore of a parasite (Gregarine); *f.* The spore prolonged; *g.* A more advanced development.
- „ 2. Do., the parasite still more developed, magnified.
- „ 3. Do., a still greater development of the parasite, isolated and magnified. *a.* The elliptically dilated extremities; *b.* Nuclei; *c.* Possibly a rudimentary embryonal formation; *d.* Vacuoli.
- „ 4. *Epizoanthus roseus*: life size. *a.* The encrusted lanceolate ribs; *b.* Outer tentacles; *c.* Inner tentacles.
- „ 5. Do., transversal section of the body and œsophagus, magnified. *a.* Ectoderm; *b.* Connective-tissue in which foreign bodies are entrenched; *c.* Perfect septa (Macroseptia); *d.* Ventral directive septa; *e.* Dorsal directive septa; *f.* The gullet-groove with its epithelium; *g.* Imperfect septa (Microseptia).
- „ 6. Do., transversal section of the integument of the body, magnified. *a.* Grains of sand in the connective-tissue; *b.* Circular muscles; *c.* Layer of muscles on the inner wall of the connective-tissue, clothed with epithelium.
- „ 7. *Cerianthus Vogti*; transversal section of the integument, magnified. *a.* Cuticulum; *b.* Epithelium (Ectoderm); *c.* Unicellular mucous glands; *d.* Longitudinal muscles; *e.* Prolongated epithelial cell; *f.* Connective-tissue; *g.* The muscular layer upon its inner wall.
- „ 8. Do., transversal section of the body and œsophagus immediately below the oral disc, somewhat magnified. *a.* Ventral gullet-groove with its smooth lateral ramparts; *b.* Dorsal gullet-groove; *c.* Folds on the inner side of the œsophagus; *d.* Ventral directive septa; *e.* The large chamber (loge ventrale impaire) between the directive septa; *f.* The dorsal directive septa; *g.* The dorsal unpaired chamber (loge dorsale impaire); *h.* The septum next to the ventral directive septa, which forms the continuing septum; *i.* The remaining ventral septa; *k.* The inter- and intra-septal, ventral chambers; *l.* The inter- and intra-septal, dorsal chambers.
- „ 9. Do., oral tentacles, slightly magnified. *a.* The tentacles that surround the ventral side; *b.* Those that surround the dorsal side.

Fig. 10. Den øverste Del af Kroppen aabnet langs Rygsiden, Svælgrøret borttaget, lidt forstørret. *a.* De kontinuerende Septa; *b.* Retningsseptata; *c.* Buggruben, hvori en fin Aabning udad; *d.* Furen imellem Retningsseptum og det kontinuerende Septum; *e.* Bugrenden, der ender i Buggruben.

„ 11. Tversnit af Krop med Svælgrør, noget længere nede end Fig. 8, forstørret. *a.* Dorsal Svælggrube; *b.* Sidefolderne paa Svælgrørets indre Væg; *c.* ventrale Retningsseptata; *d.* det uparrede, ventrale Kammer; *e.* dorsale Retningsseptata; *f.* det uparrede, dorsale Kammer; *g.* de kontinuerende Septata; *h.* ventrale, inter- og intraseptale Kamre; *i.* dorsale, inter- og intraseptale Kamre.

„ 12. Tversnit af Kroppens Bugside med Svælgrøret, forstørret. *a.* Epithelet paa Svælgrørets ydre Flade; *b.* Muskellaget paa samme; *c.* Bindevævet; *d.* det brede Bindevævslag ved Svælggruben; *e.* Svælggruben med sit Epithel; *f.* Folderne med deres Epithel paa Svælgrørets indre Sidevægge; *g.* ventrale Retningsseptata; *h.* Længdemuskler paa samme; *i.* Tvermuskler paa samme; *k.* det ventrale, uparrede Kammer (loge ventrale impaire, Vogt); *l.* de kontinuerende Septata.

„ 13. Et isoleret Septum, forstørret. *a.* Mesenterialfilamenter; *b.* Æggestok; *c.* Æg.

„ 14. Et Tversnit af Kroppen paa dennes nedre (bage) Trediedel, forstørret, visende Septaparrerne med Æggestokke og de deri udviklede Æg.

Fig. 10. *Cerianthus Vogti*; the uppermost part of the body dissected along the dorsal side, the œsophagus removed, slightly magnified. *a.* The continuing septa; *b.* The directive septa; *c.* The ventral groove, in which there is a fine opening outwards; *d.* The furrow between the directive septum and the continuing septum; *e.* The ventral channel that terminates in the ventral cavity.

„ 11. Do., transversal section of the body with the œsophagus, taken somewhat lower down than in fig. 8, magnified. *a.* Dorsal gullet-groove; *b.* Lateral folds of the inner wall of the œsophagus; *c.* Ventral directive septa; *d.* The unpaired ventral chamber; *e.* Dorsal directive septa; *f.* The unpaired dorsal chamber; *g.* The continuing septa; *h.* Ventral, inter- and intraseptal chambers; *i.* Dorsal, inter- and intraseptal chambers.

„ 12. Do., transversal section of the ventral side of the body with the œsophagus, magnified. *a.* The epithelium on the outer surface of the œsophagus; *b.* The muscular layer of the same; *c.* The connective-tissue; *d.* The broad layer of connective-tissue on the gullet-groove; *e.* The gullet-groove with its epithelium; *f.* The folds with their epithelium on the inner lateral wall of the œsophagus; *g.* Ventral directive septa; *h.* Longitudinal muscles on same; *i.* Transversal muscles on same; *k.* The ventral unpaired chamber (Loge ventrale impaire, Vogt); *l.* The continuing septa.

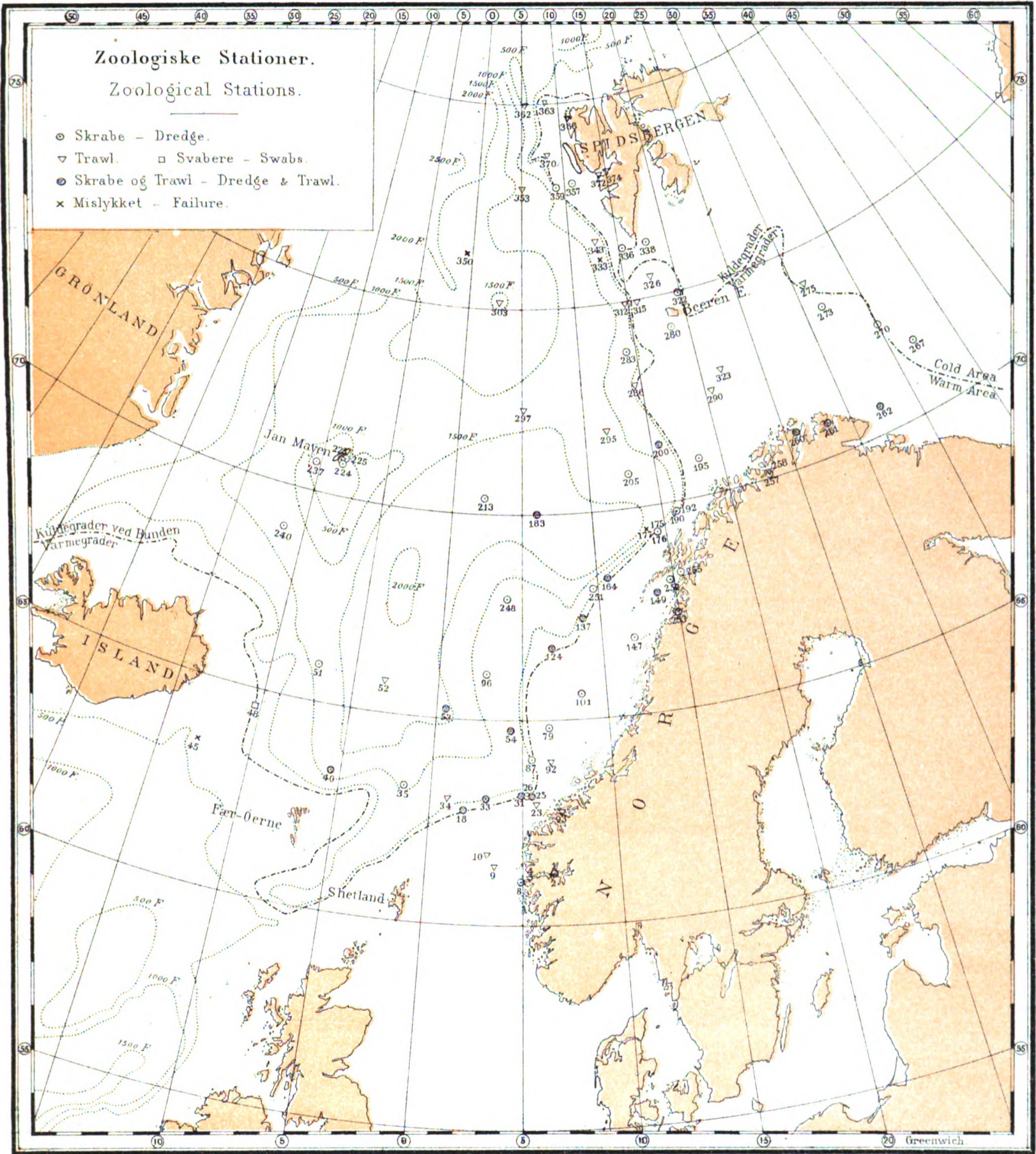
„ 13. Do., an isolated septum, magnified. *a.* Mesenterial filaments; *b.* Ovary.

„ 14. Do., a transversal section of the body, from its lower (posterior) third-part, magnified, showing the pairs of septa with ovaries and the ova developed in them.

Translated into English by Thomas M. Wilson.

Zoologiske Stationer. (Zoological Stations.)										
Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)	Længde fra Greenwich. (Longitude.)	Dybde. (Depth.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)	
				Engl. Favne. (Fathoms.)	Meter. (Metres.)					
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.	Sabulous Clay, 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	Mørkegraat 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	Blødt 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	Sandholdigt 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 sabulous Clay.	S.	
(Jan Mayen).										
224	" 1	70 51	8 20 W.	95	174	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay.	S.	
225	" 2	70 58	8 4 W.	195	357	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay.	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.)		Bundens Temperatur. (Temperature at Bottom.) °C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)
				Engl. Favne. (Fathoms.)	Meter. (Metres.)				
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12'	15° 40' E.	341	624	6.05	Ler.	Clay.	S.
257	(June) 21	70 4	23 2 E.	160	293	3.9	Ler.	Clay.	S.
258	" 21	70 13	23 3 E.	230	421	4.0	Ler.	Clay.	T.
260	" 24	70 55	26 11 E.	127	232	3.5	Ler.	Clay.	S. T.
261	" 25	70 47	28 30 E.	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.	35	64	1.1	Sten.	Stones.	S.
		(Beeren Eiland).							
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.	Haard.	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.	Haard.	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	1.0	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.
		Magdalene 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.	129	236	1.2	Ler.	Clay.	T.
		(Tsfjord).							
374	" 22	78 16	15 33 E.	60	110	0.7	Ler.	Clay.	T.
		(Advent Bay).							



Den private Opmålings Isth. Anstalt, Kristiania.



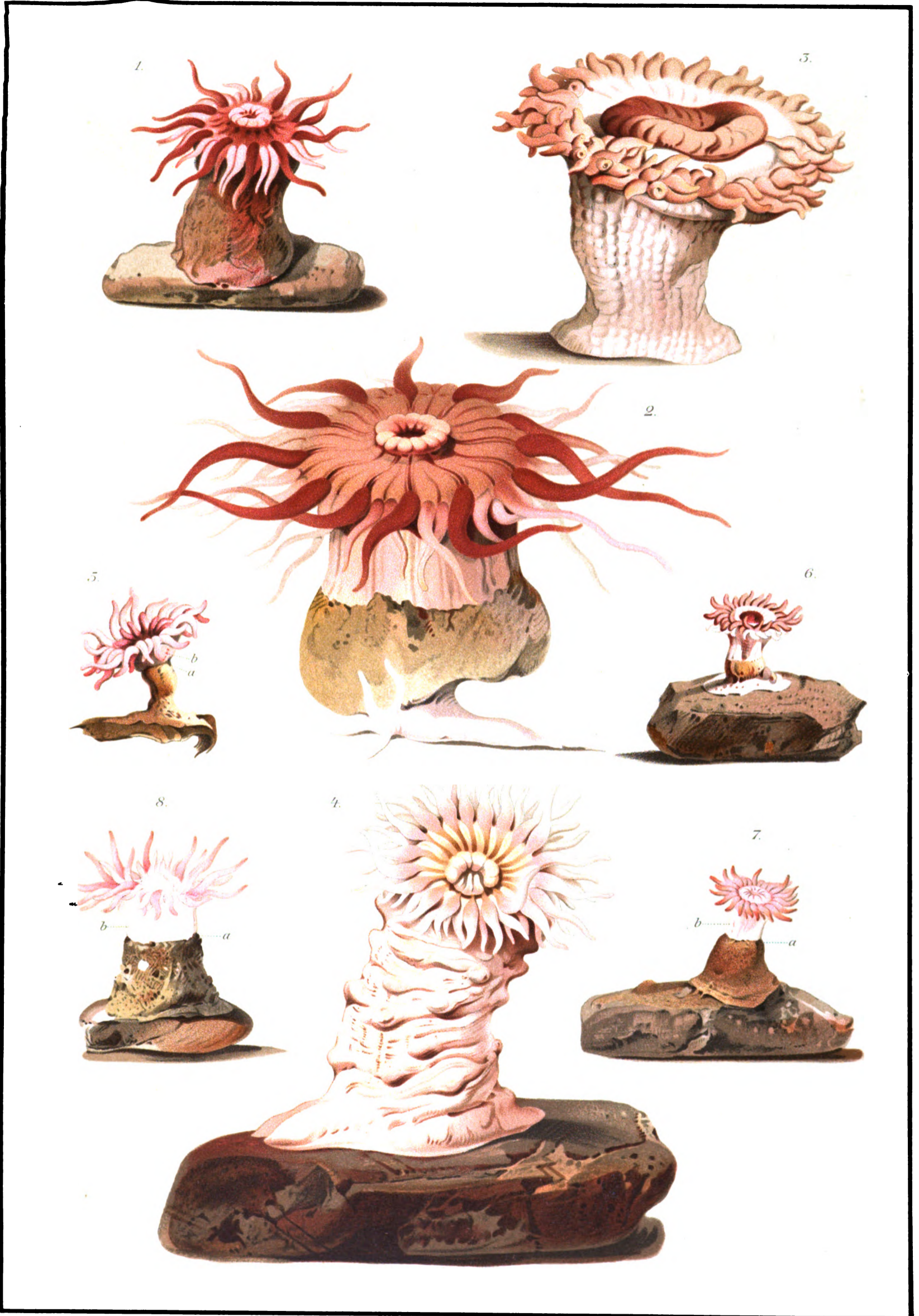
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 4. *Korema margaritacea* n. g. et sp. 5. *Madoniaactis lolotensis* n. g. et sp.
 6. *Sagartia repens* n. g. et sp. 7. 8. *Tealiopsis polaris* n. g. et sp.



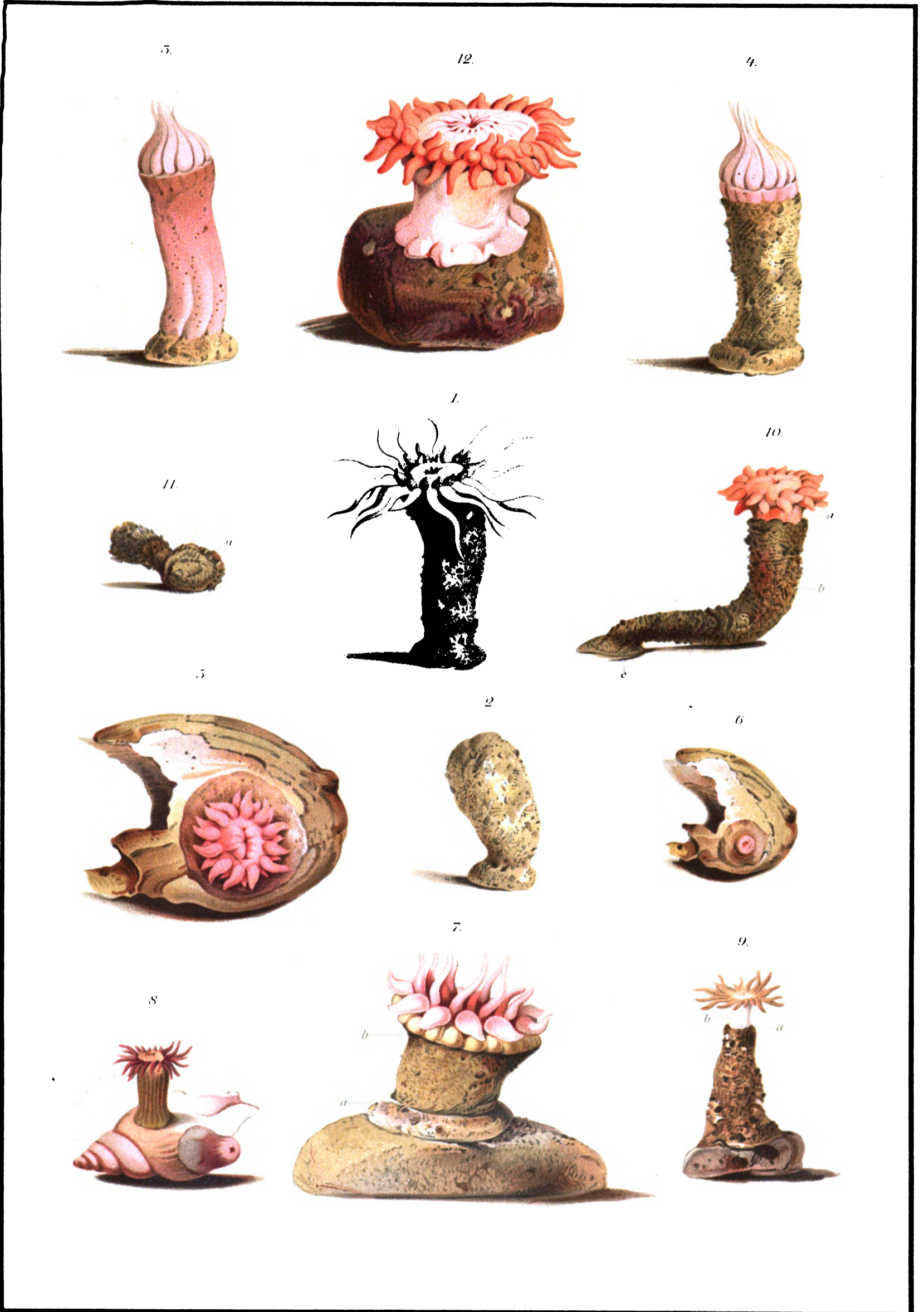
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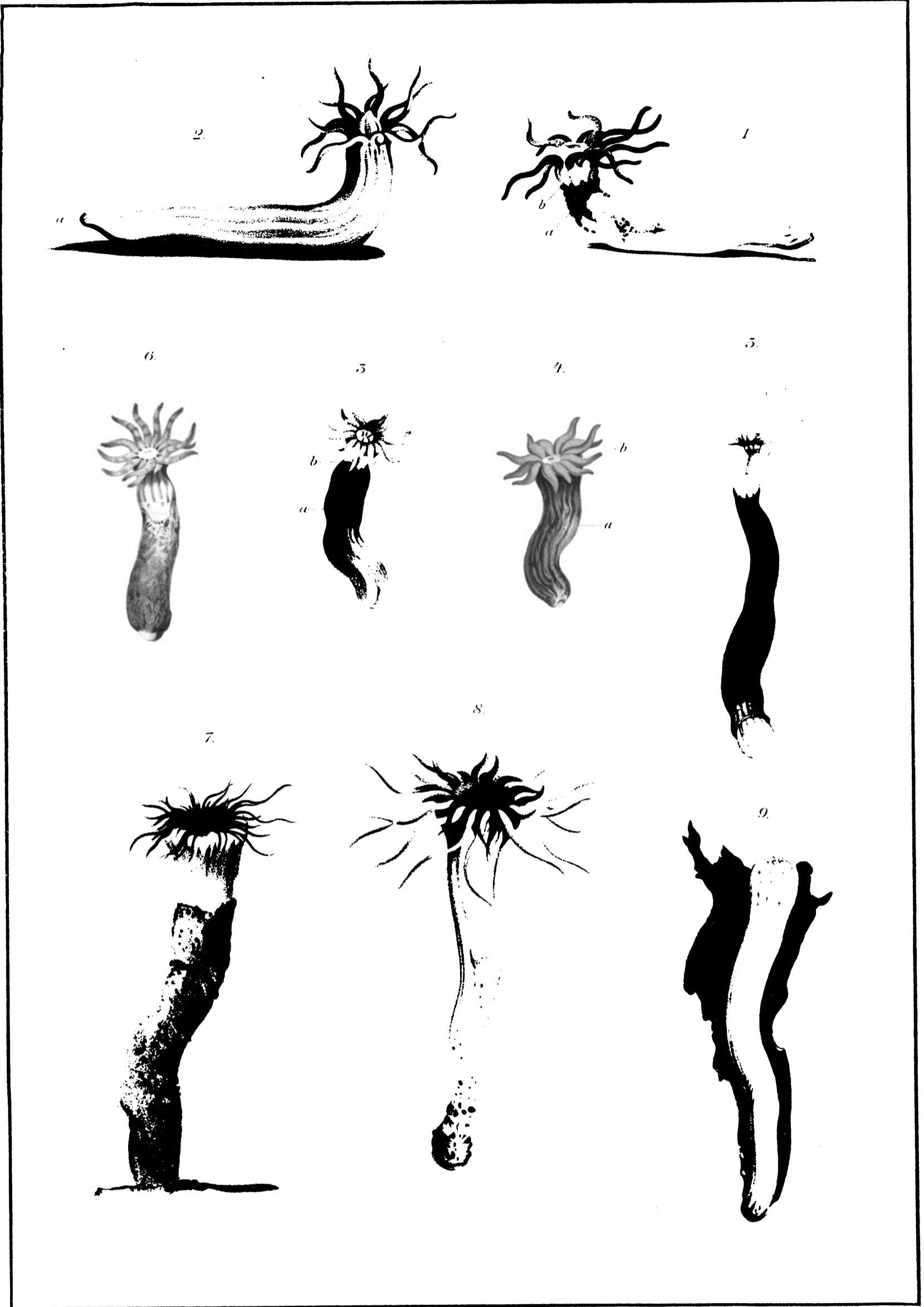
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 4. 5. *Stilidiactis Mopsea* n.g. et. sp. 6. 7. *Stilidiactis Tubularia* n. sp.
 8. *Kylindrosactis elegans* n.g. et. sp.



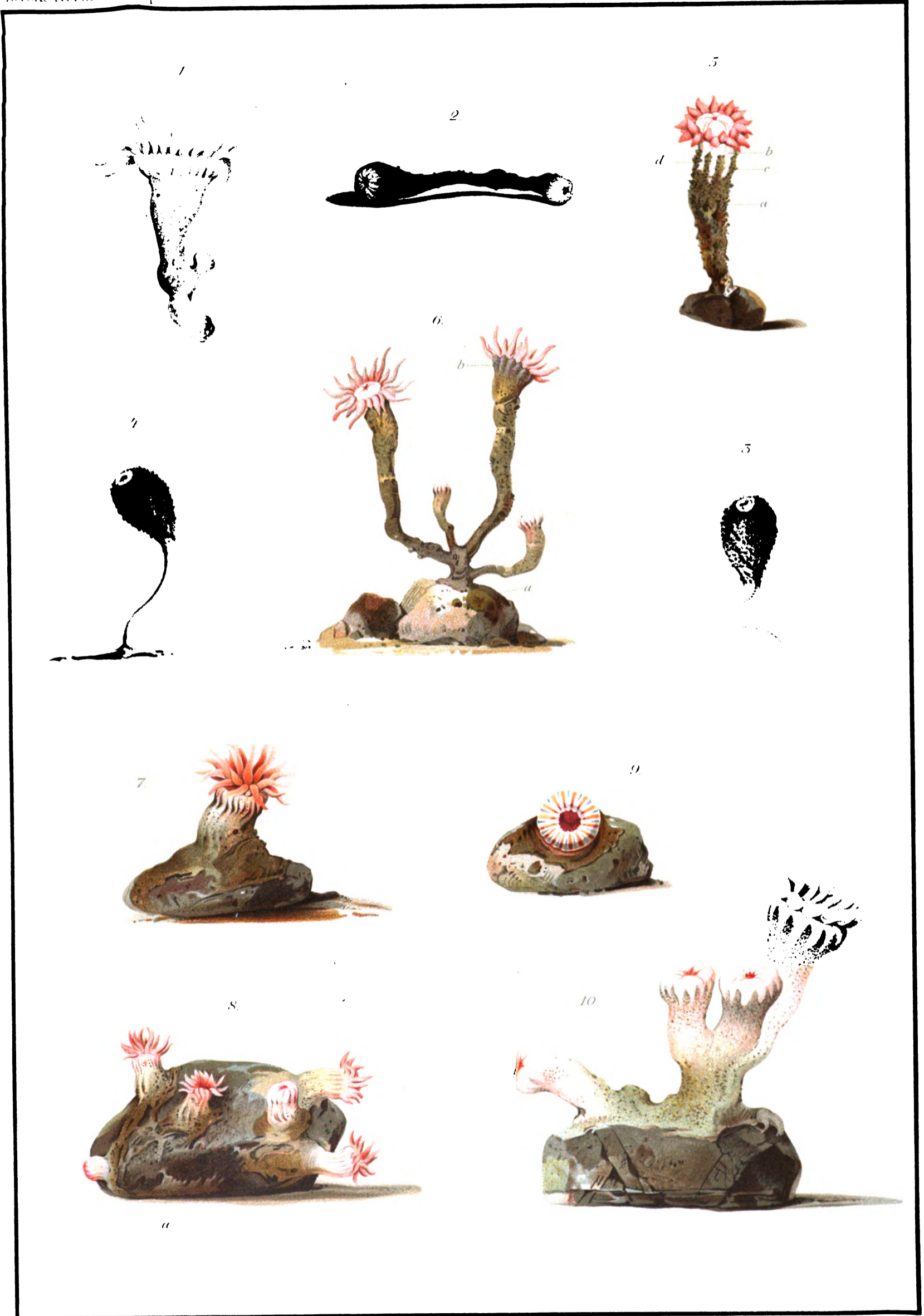
1, 2. *Sagartia abyssicola* n. sp. 3. *Bunodes abyssorum* n. sp. 4. *Actinauge nodosa*
 5. *Phellia flexibilis* n. sp. 6. *Phellia flexibilis* variet. 7. *Phellia margaritacea* n. sp.
 8. *Phellia arctica* n. sp.



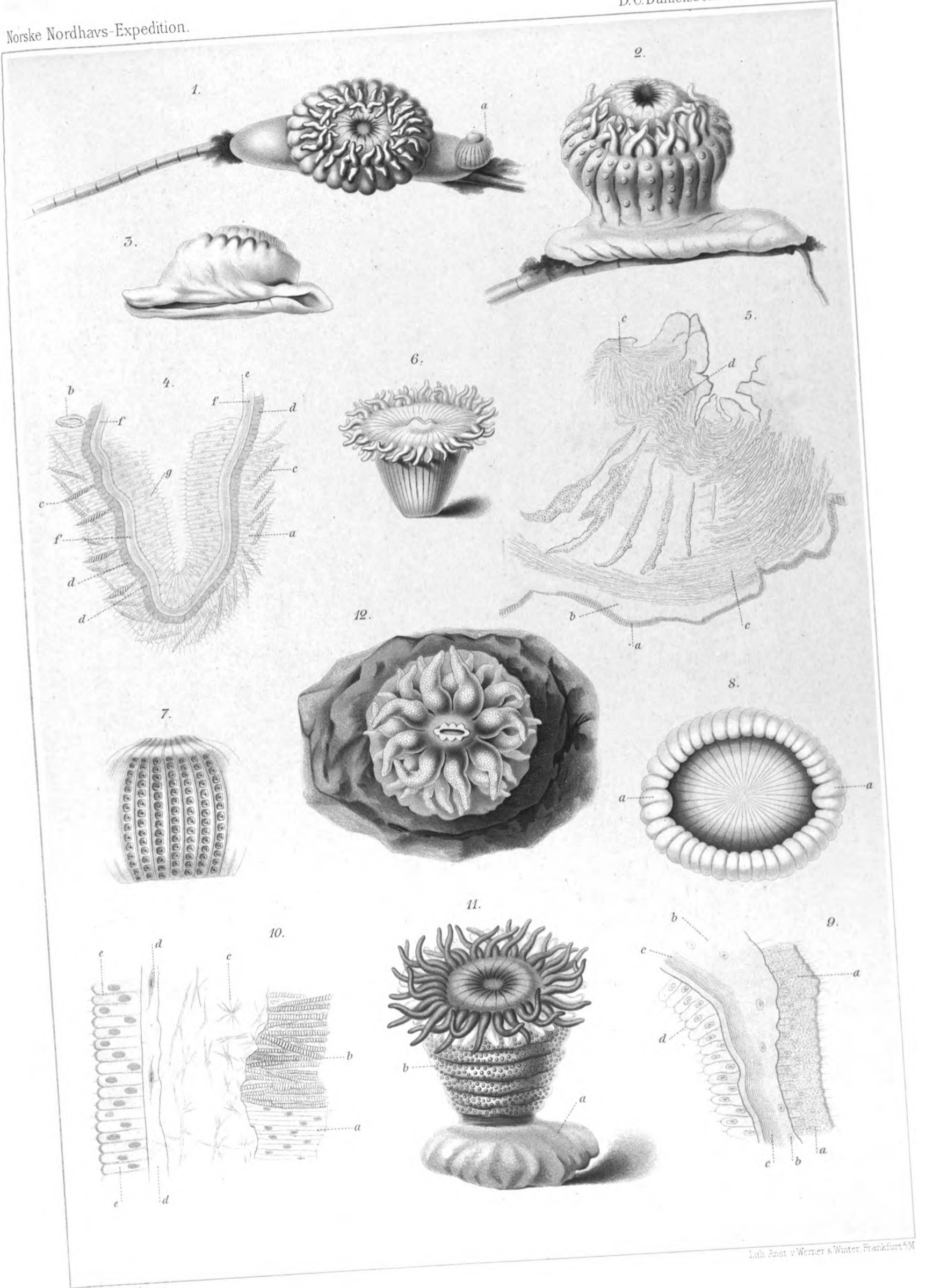
1 2. 5. 4. *Phellia bathybia* n. sp. 5. 6. *Phellia norvegica* n. sp. 7. *Phellia violacea* n. sp.
 8. *Phellia spitsbergensis* n. sp. 9. *Phellia crassa* n. sp. 10. 11. *Andvakia mirabilis* n. g. et sp.
 12. *Sagartia splendens* n. sp.



1. Halcampoides abyssorum. 2. Fenja mirabilis. 3. Edwardsioides vitrea
4. Aegir frigidus. 5. Edwardsia Andresi. 6. Edwardsia fusca
7. Cerianthus abyssorum. 8. 9. Cerianthus Vogti



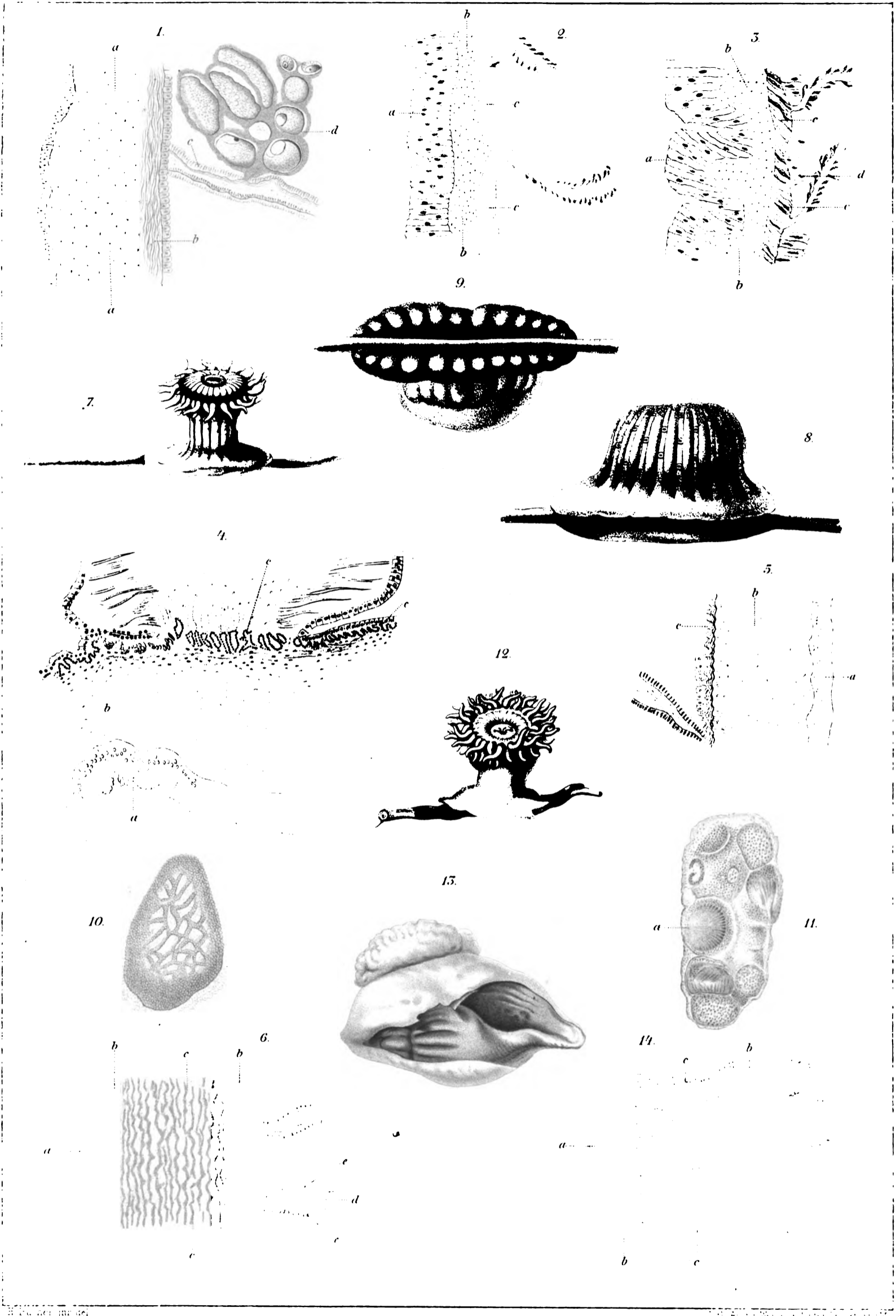
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 6 Epizoanthus arborescens 7 9 Epizoanthus glacialis
 10 Epizoanthus roseus



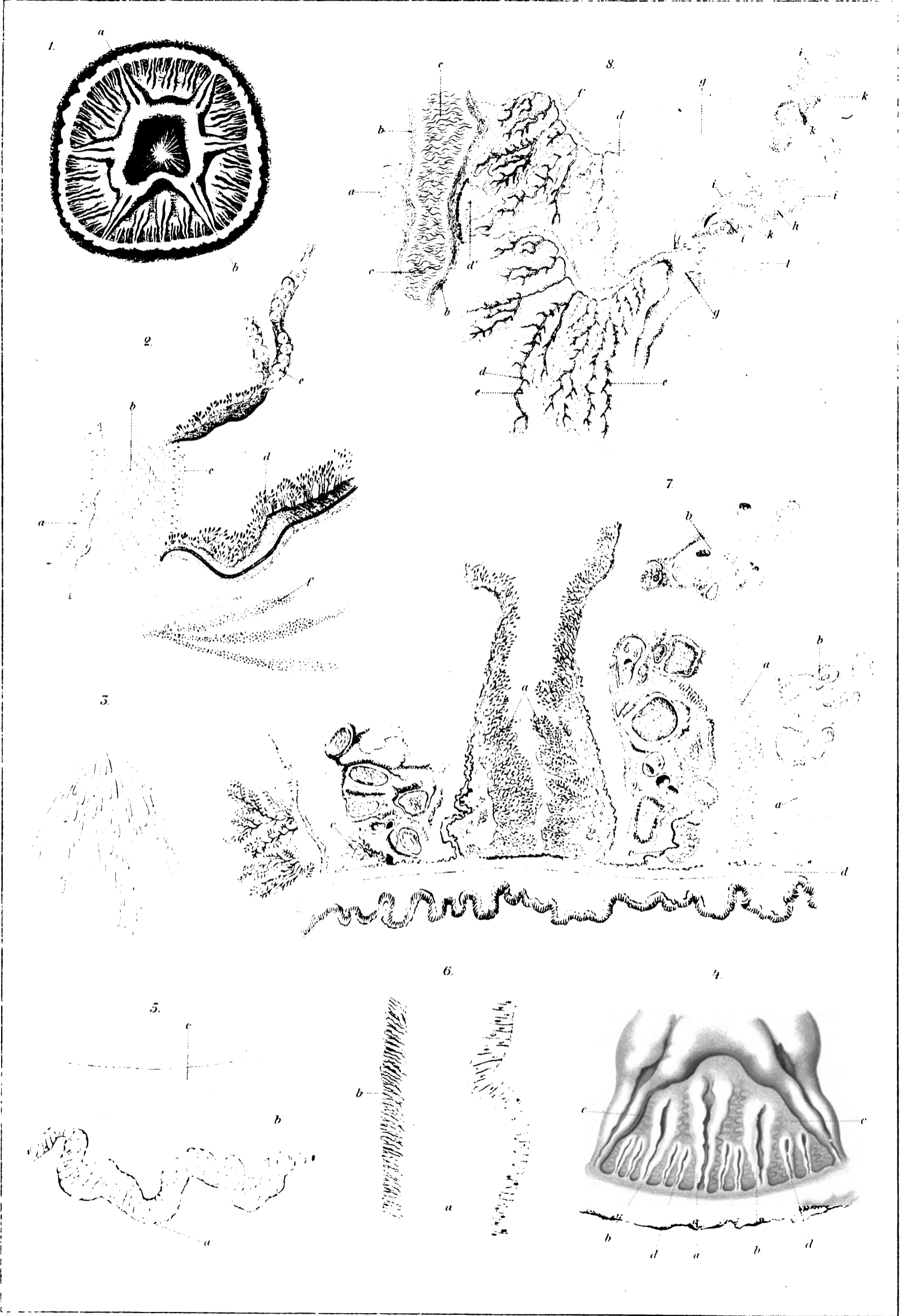
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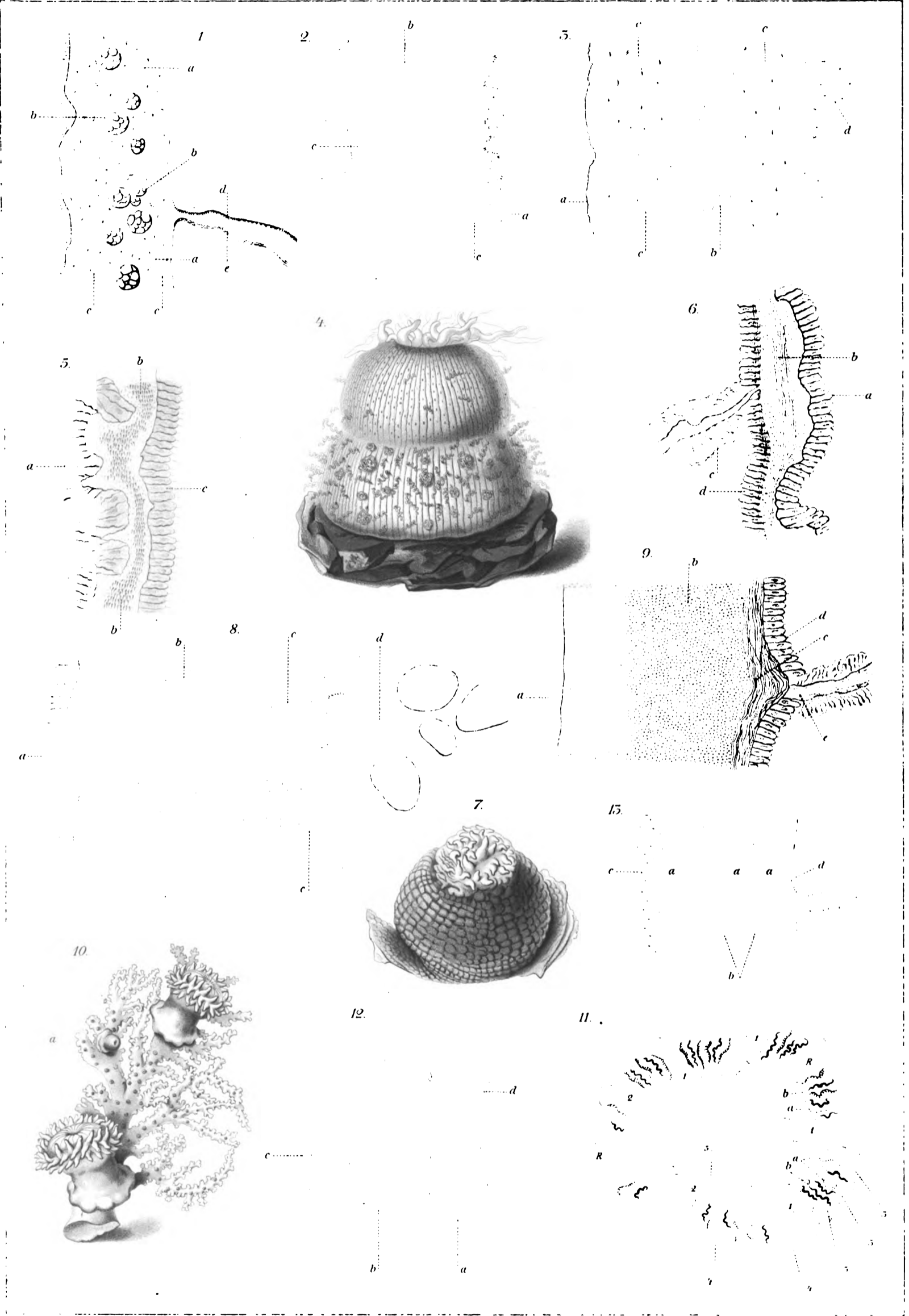
1-5. *Korenia margaritacea*. 6-9. *Kyathactis hyalina*. 10. *Sideractis glacialis*. 11. *Kadosactis rosea*.
12. *Sideractis glacialis*.



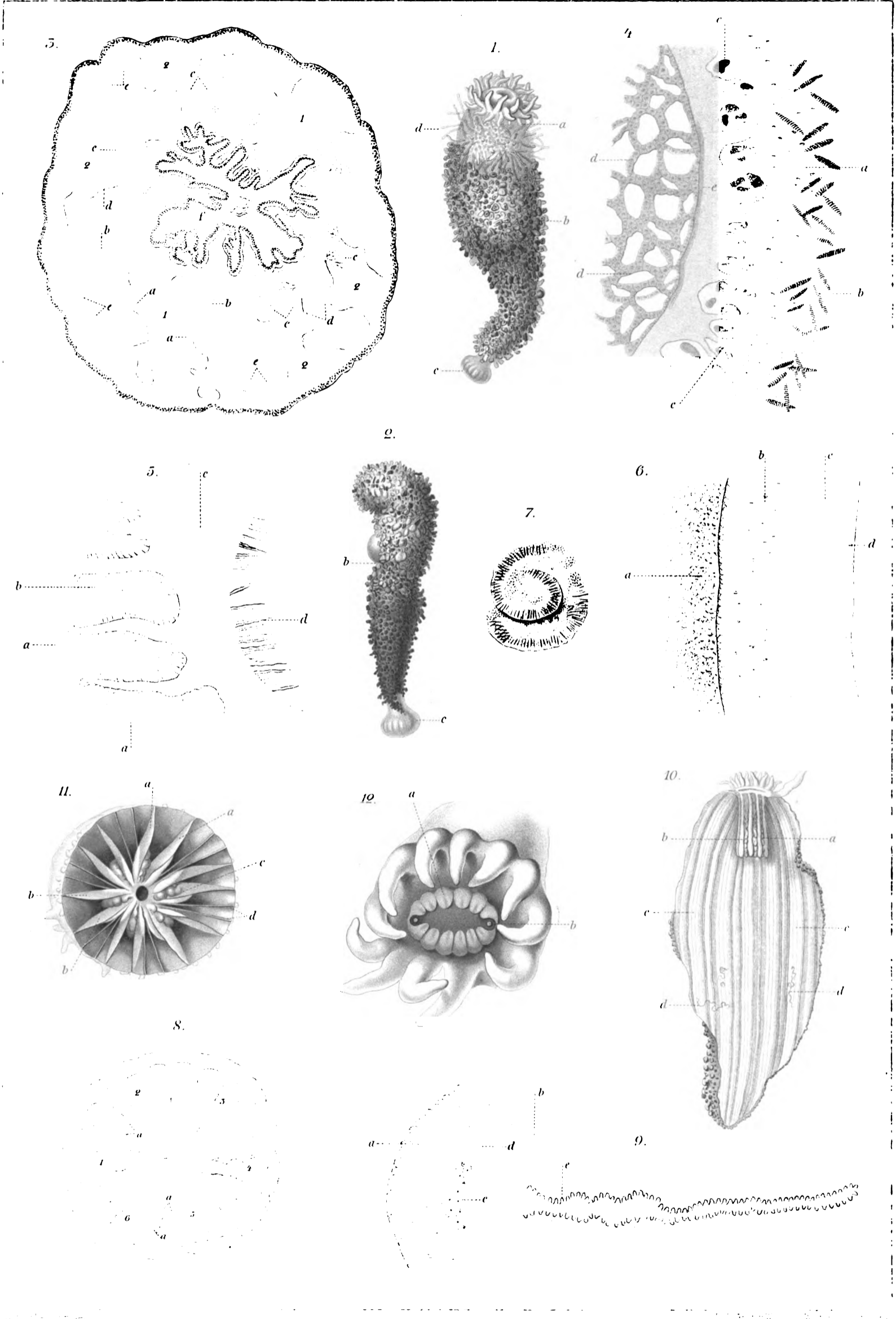
1. Madoniactis Iofotensis. 2-5. Tealiopsis polaris. 4-5. Kylirosactis elegans.
 6. Calliactis Krøyeri. 7-11. Stolidiactis Mopsea. 12. Stolidiactis Tubularia.
 13-14. Calliactis Krøyeri.



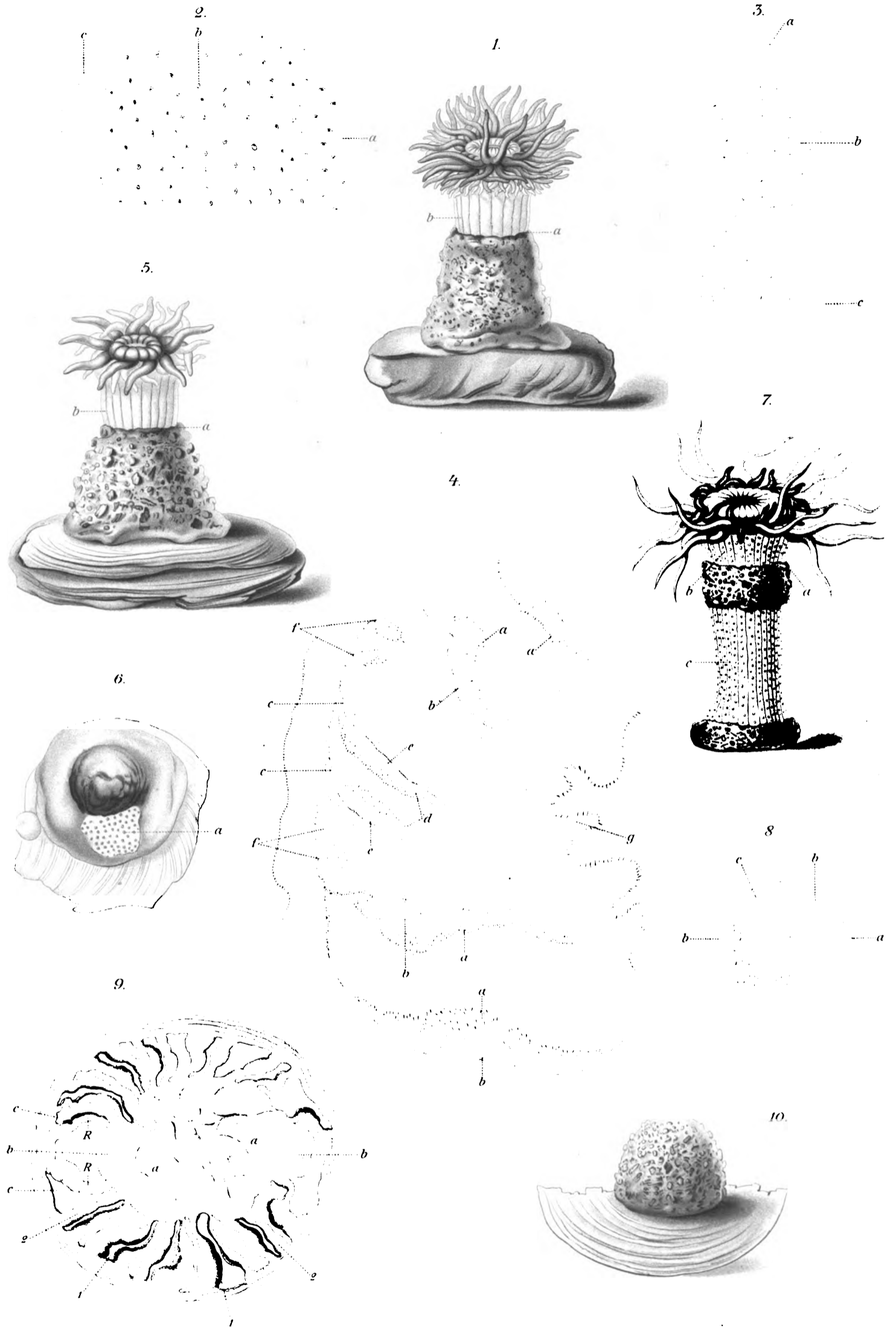
1-4. *Allantactis parasitica*. 5-7. *Kylandrosactis elegans*. 8. *Kadosactis rosea*



1 Anthosactis Jan Mayeni. 2-5. Sagartia repens. 4-7. Sagartia abyssicola
 8-9. Bunodes abyssorum. 10-15. Sagartia splendens



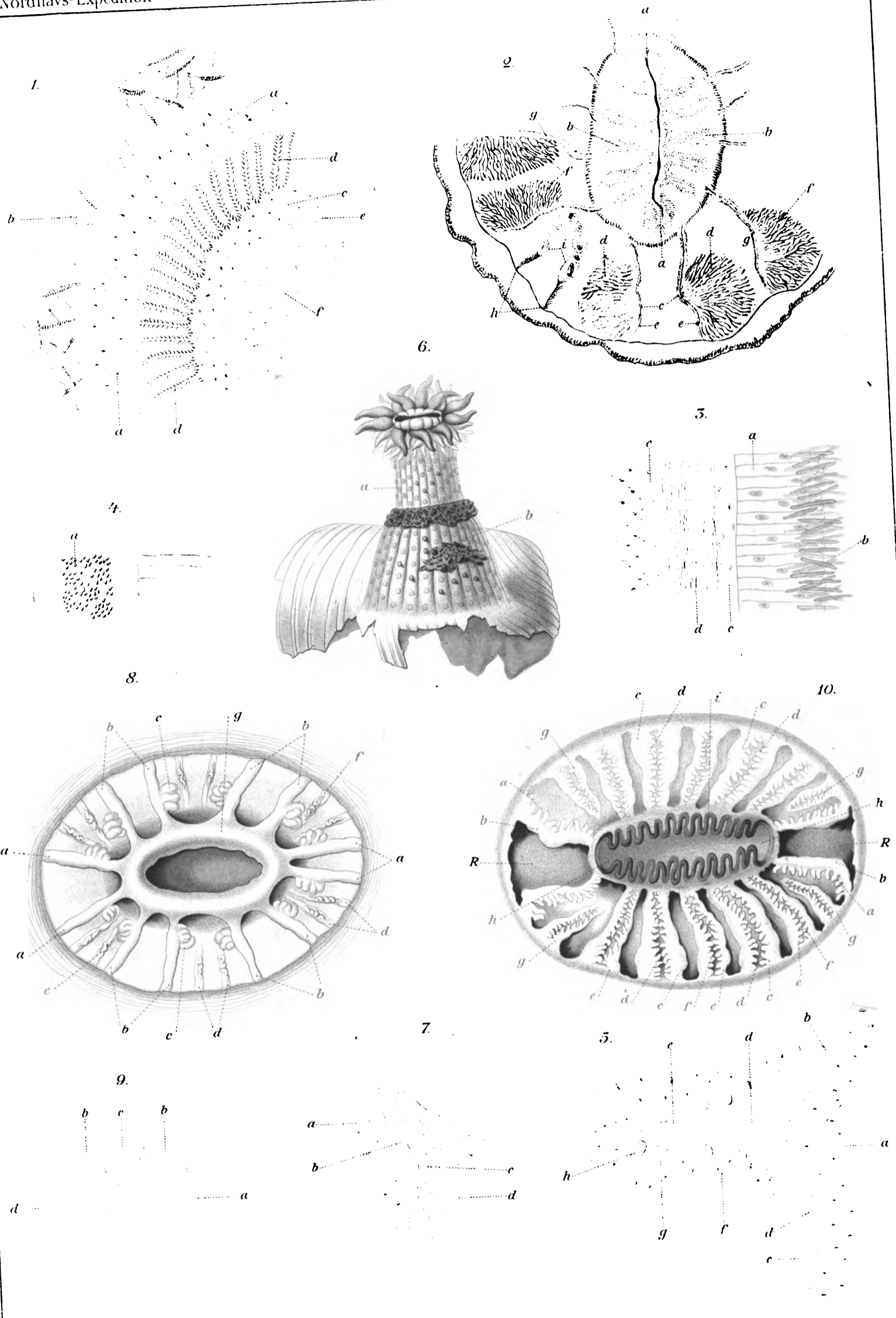
Andvakia mirabilis n. g. et sp.



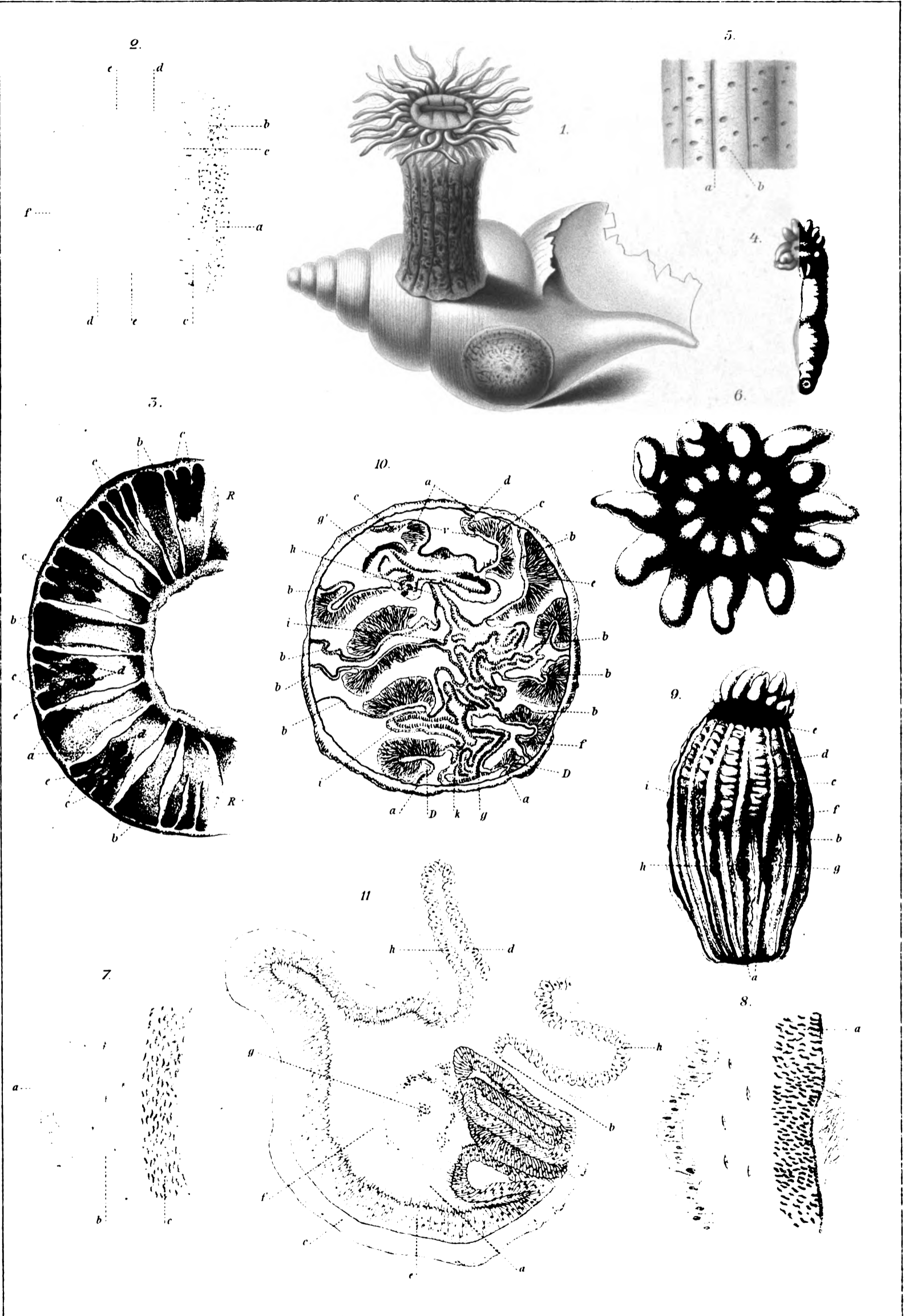
H. J. Müller del. sc.

Lith. E. A. von der Harth, Berlin 1861.

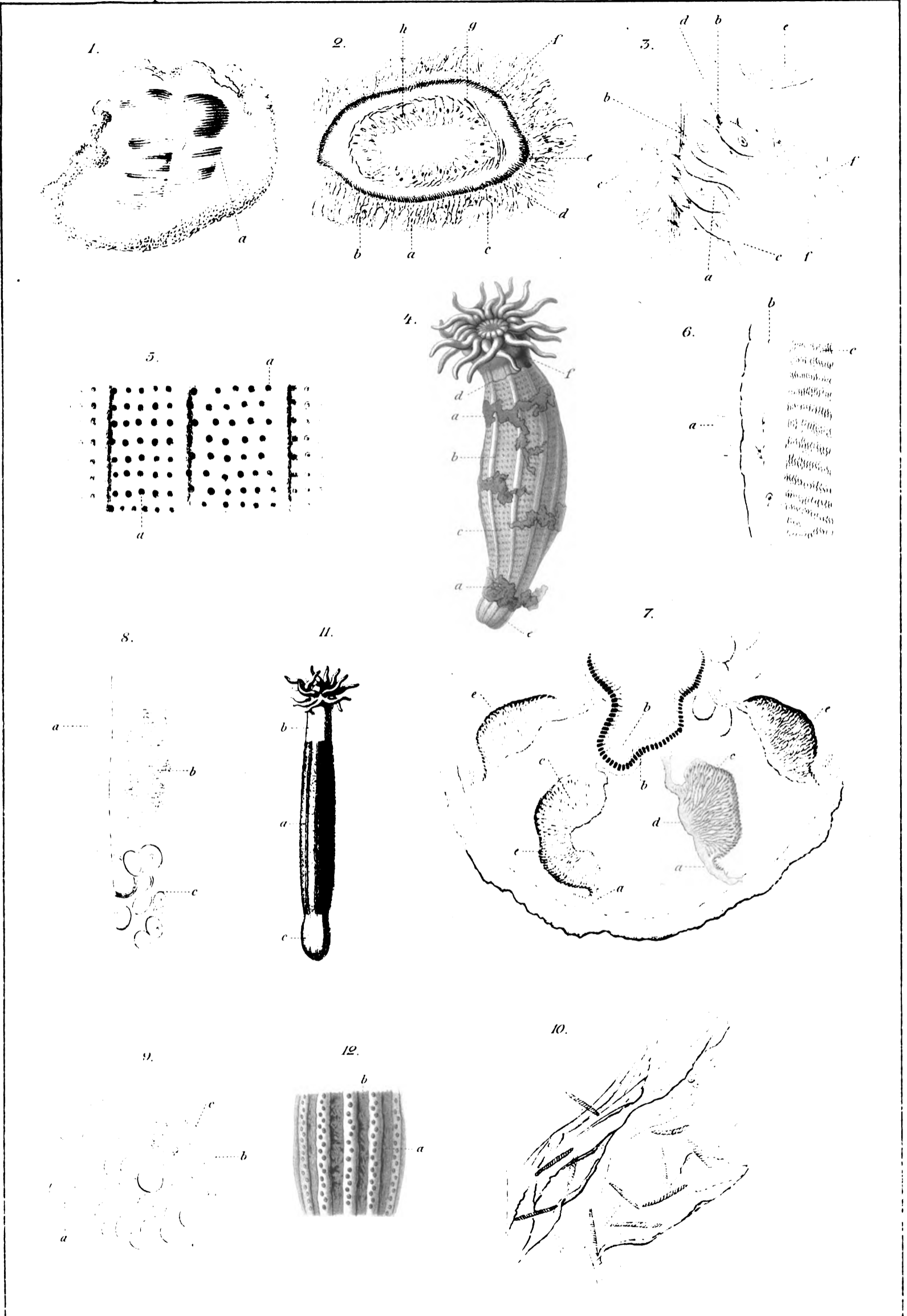
1-4. Phellia arctica. 5-6. Phellia crassa. 7-9. Phellia bathybia. 10. Phellia violacea.



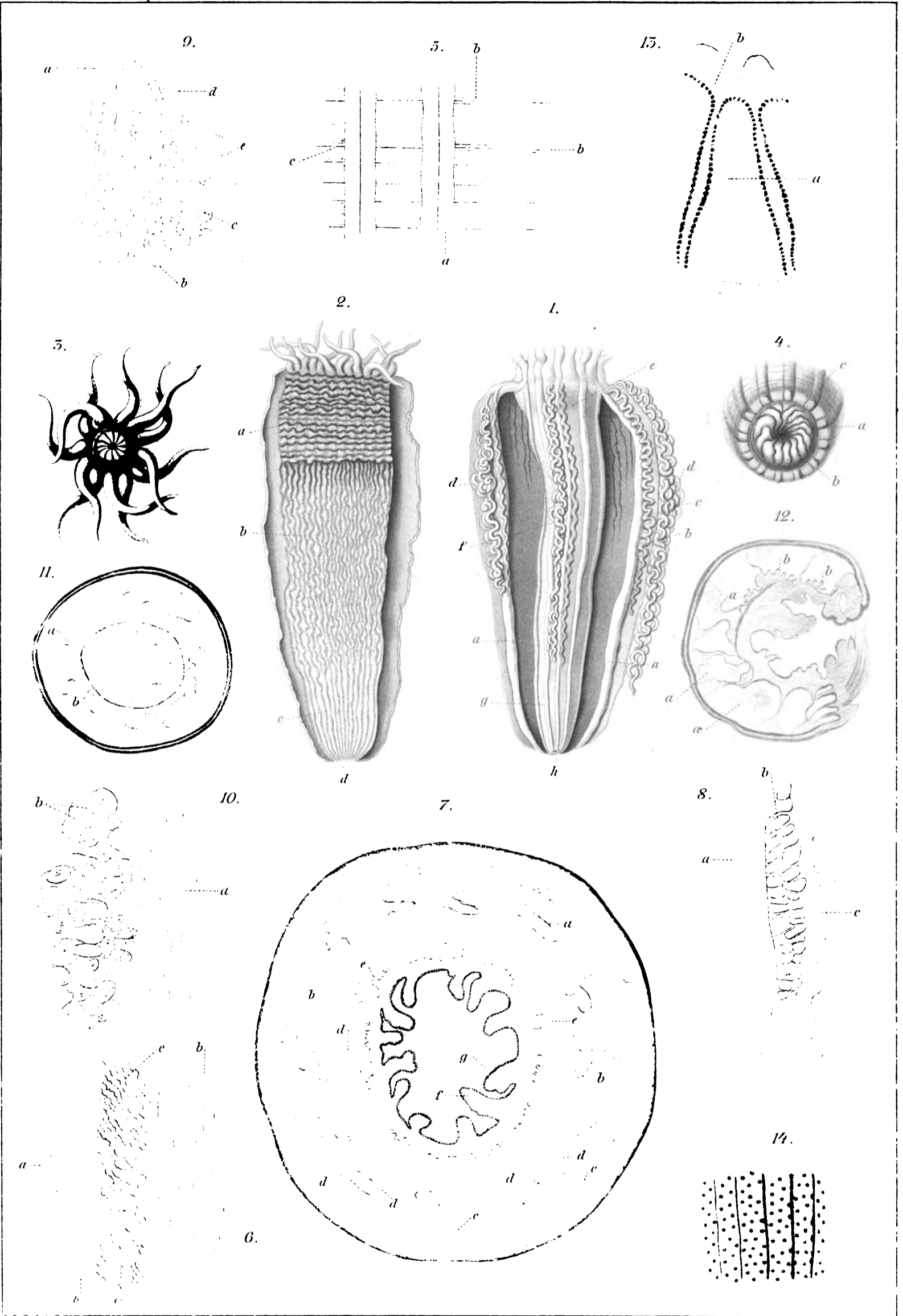
1-5 *Phellia crassa*. 6-8 *Phellia norvegica*. 9-10 *Phellia violacea*.



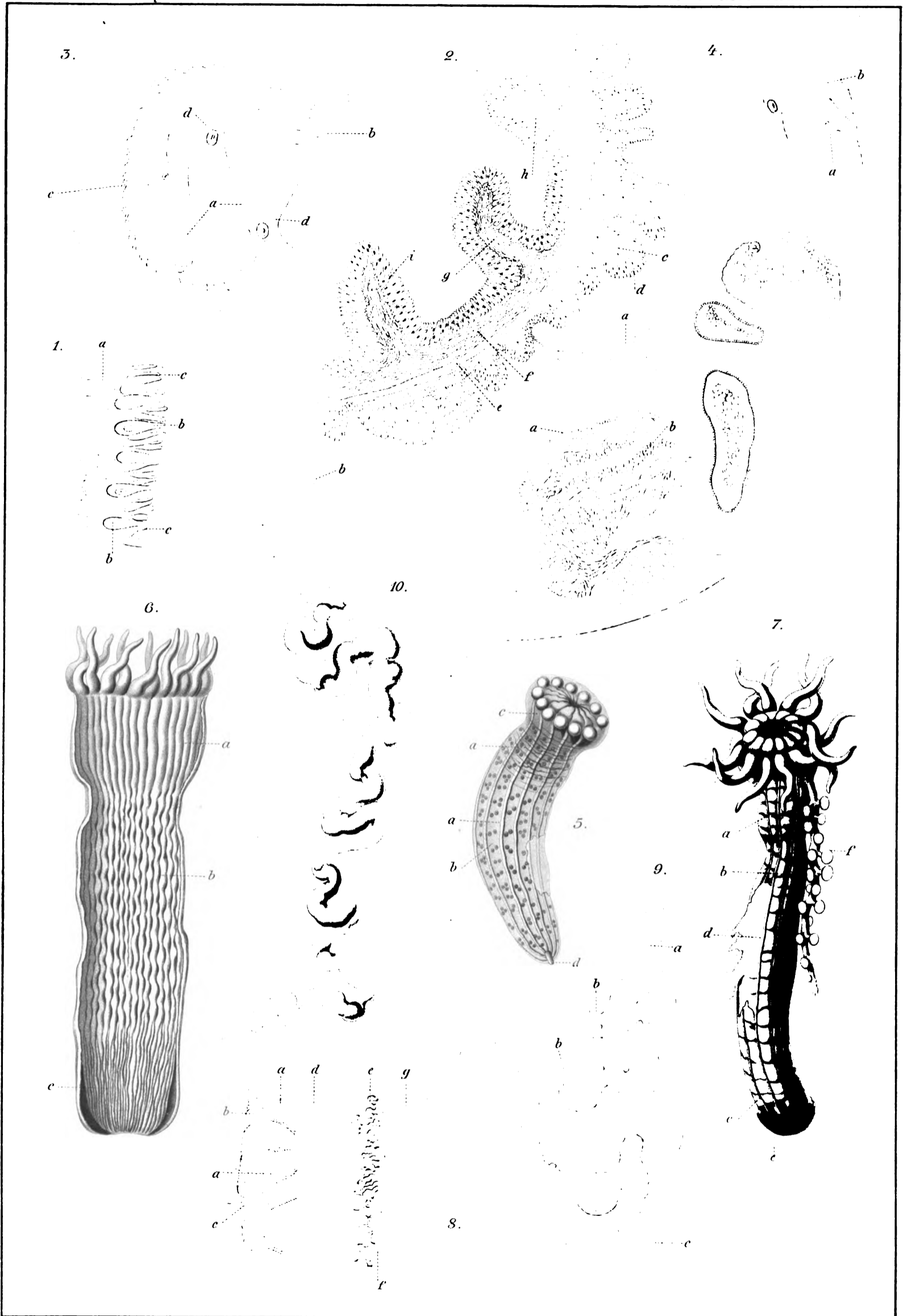
1-3. Phellia spitsbergensis. 4-11 Halcampoides abyssorum.



1-5. Halcampoides abyssorum. + 10. Edwardsioides vitrea. 11-12. Edwardsia costata.



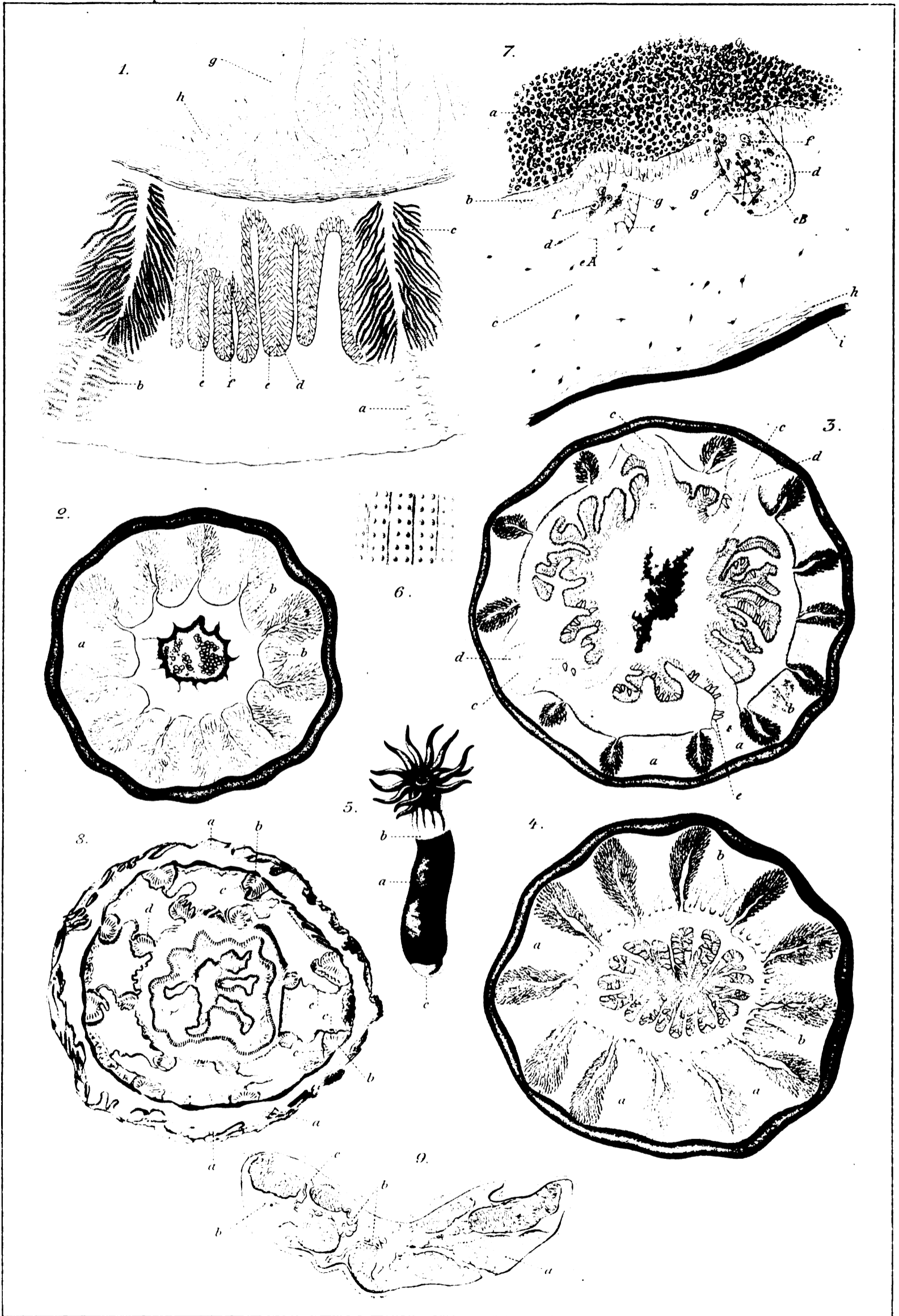
Fenja mirabilis.



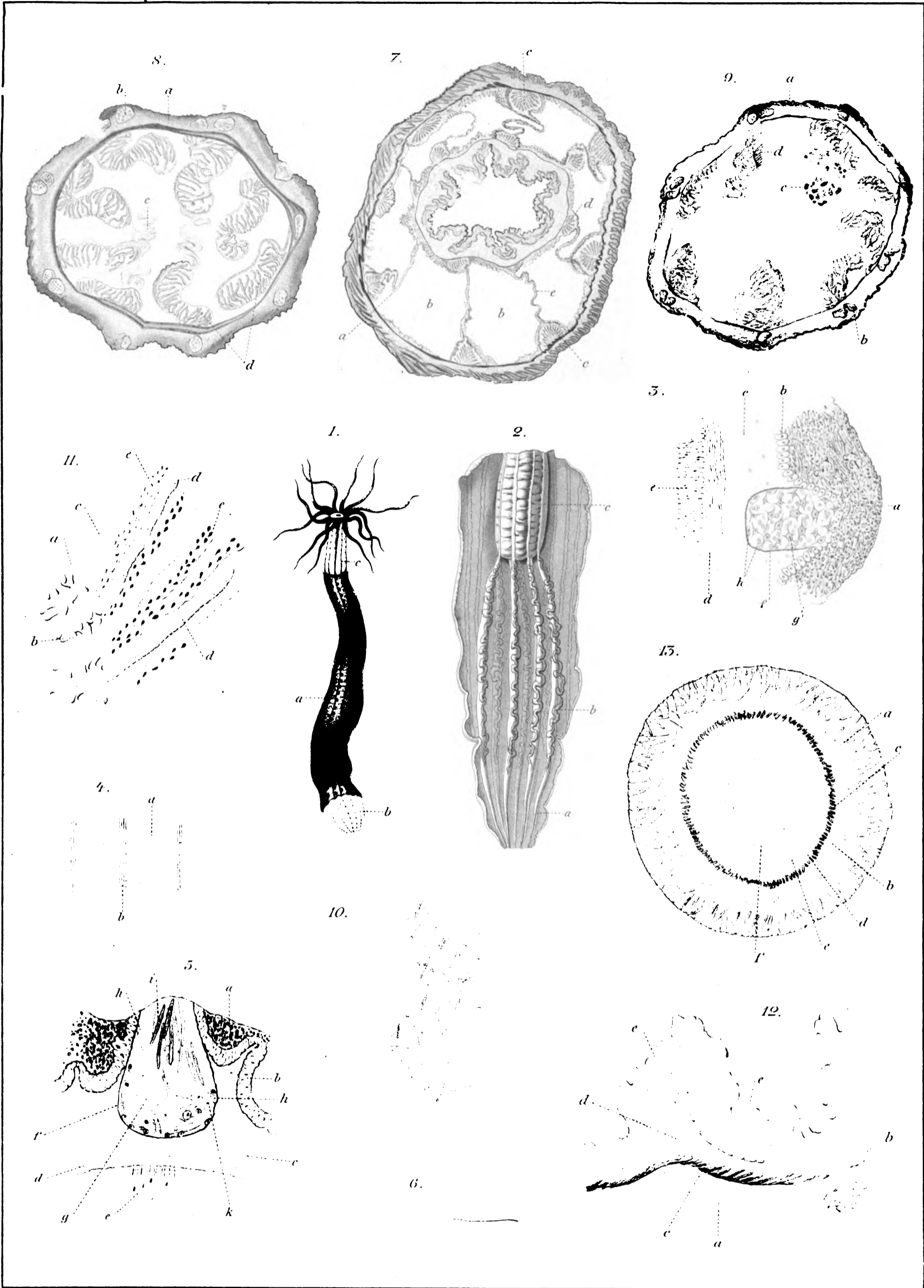
1. *Fenja mirabilis*.

2. *Agir frigidus*.

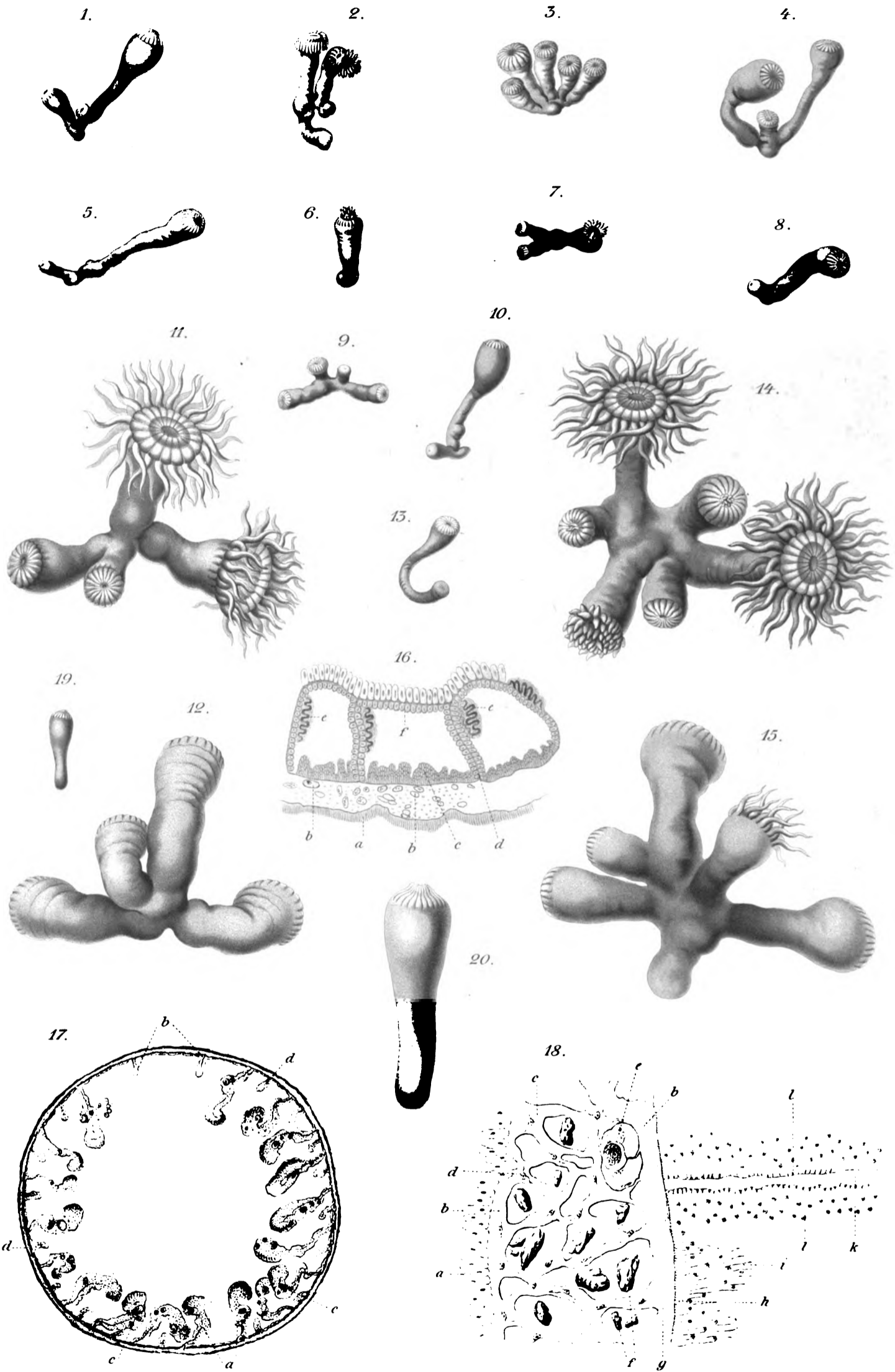
1-4. *Fenja mirabilis*. 5-10. *Agir frigidus*.



14. *Aegir frigidus*. 5-9. *Edwardsia fusca*.

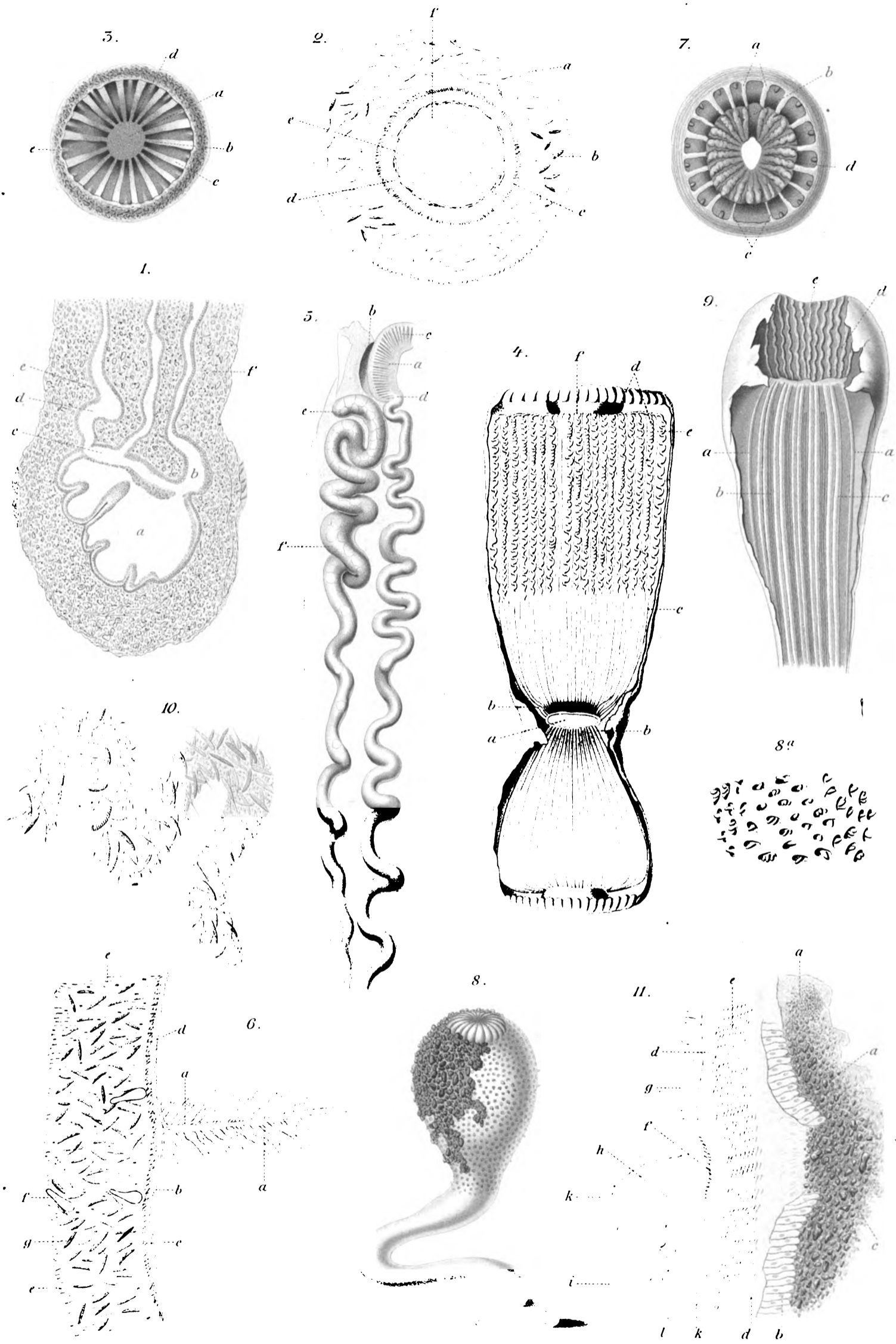


Edwardsia Andresi.

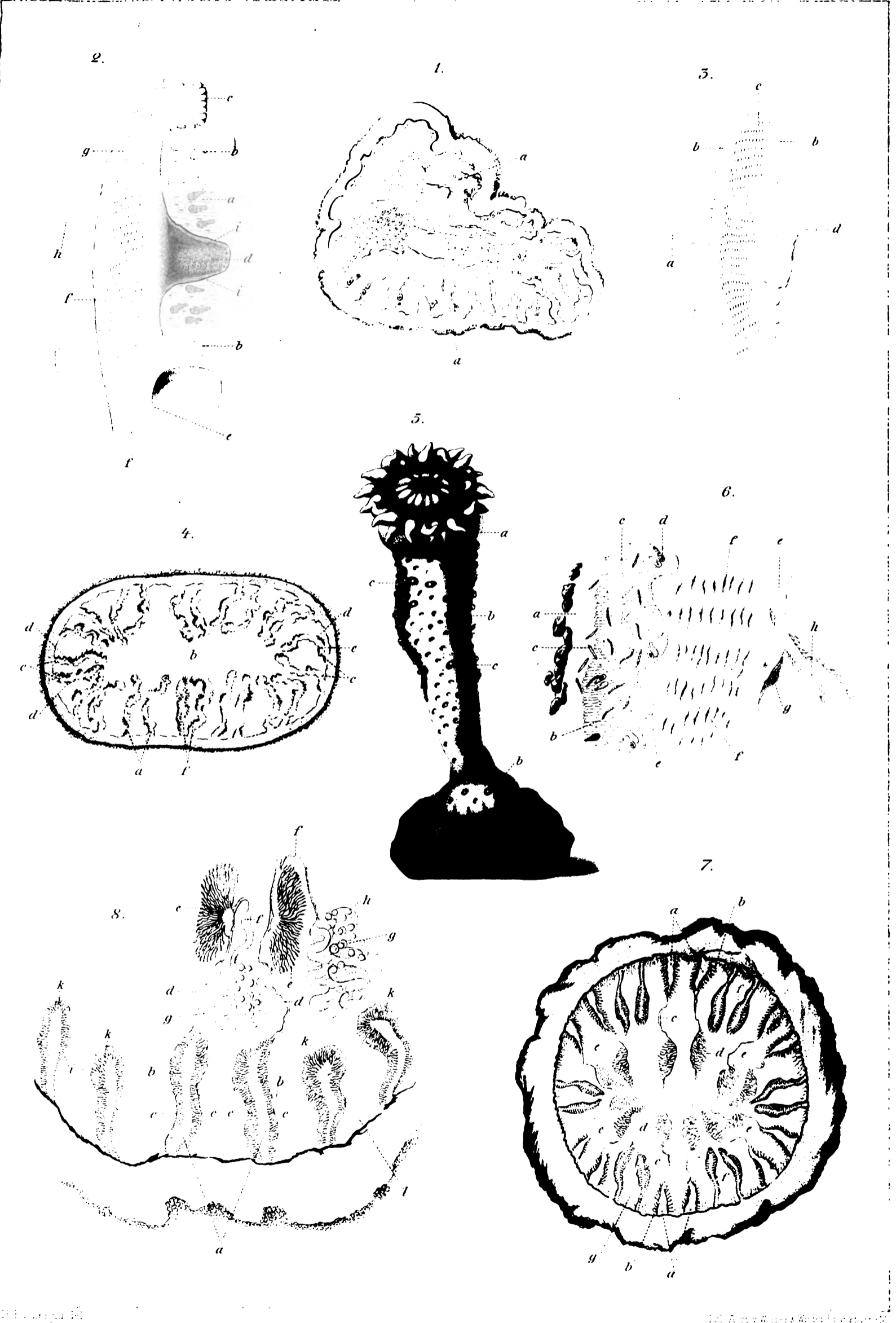


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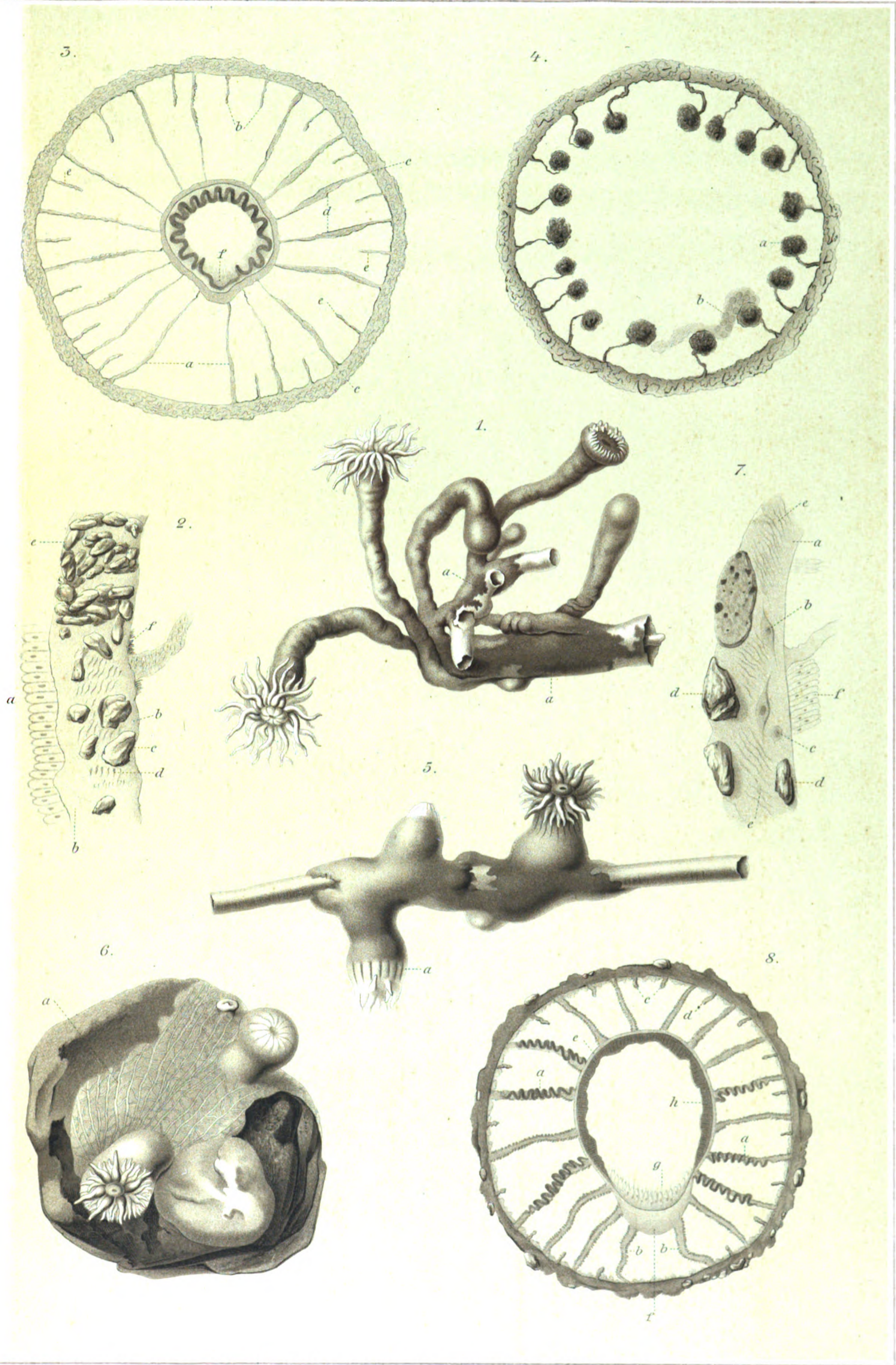
Lith. Anst. v. Weyers & Neuberger, Kjöbenhavn.



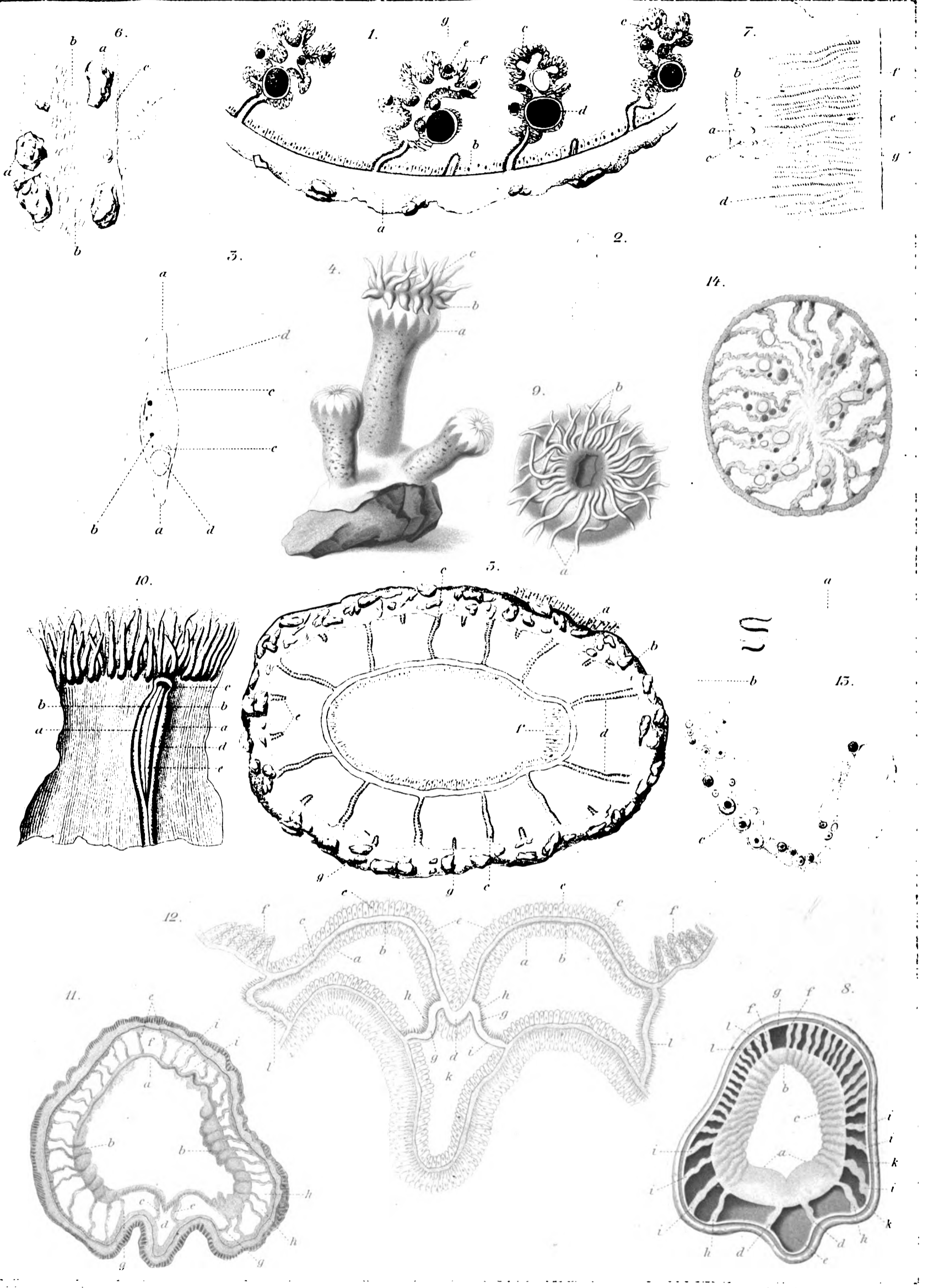
1 7. Mardöll Erdmanni. 8 11. Kodioides pedunculata.



1-4. Kodioides pedunculata. 5-8. Cactosoma abyssorum.



1-4. *Epizoanthus arborescens*. 5-8. *Epizoanthus glacialis*.



1-3. Epizoanthus glacialis. 4-6. Epizoanthus roseus. 7-14. Cerianthus Vogti.

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D. C. DANIELSSEN.

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BY

D. C. DANIELSSEN.

WITH 5 PLATES AND 1 MAP.



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Bathycrinus Carpenteri.

Syn. *Ilycrinus Carpenteri*, Danielssen & Koren.

I nyt Magazin for Naturvidenskaberne¹ leverede jeg sammen med min afdøde Ven, Dr. J. Koren, en foreløbig Beskrivelse over en Søllilie, som vi kaldte *Ilycrinus Carpenteri*. Vi antog, at den maatte være saa forskjellig fra den af Wyville Thomson beskrevne *Bathycrinus gracilis*², at den ikke kunde henføres til denne Slægt. Imidlertid viste det sig senere, at Thomsons Exemplar var et ungt, lidet udviklet og beskadiget Dyr, og som Følge deraf var Beskrivelsen høist mangelfuld. *Bathycrinus gracilis* blev fundet i den biscaiske Bugt af Porcupine-Expeditionen 1869 og beskrevet i 1872. Senere blev ved Challenger-Expeditionen opdaget to Arter, henhørende til denne Slægt, nemlig *Bathycrinus aldrichiani* og *Bath. campbelliani*.³ Af den første udkastede Wyville Thomson en Beskrivelse i „Journal of the Linnean Society, 1876“, hvorved han yderligere begrundede Slægten *Bathycrinus*. Omtrent samtidigt indleverede vi til Magazin for Naturvidenskaberne vor foreløbige Meddelelse om *Ilycrinus Carpenteri*, uden at være vidende om W. Thomsons sidste, noget mere udførlige Beskrivelse af *Bathycrinus aldrichiani*, men da jeg ved at korrespondere med Hr. Dr. P. Herbert Carpenter og ved at sende ham en Del af et Hoved til Sammenligning, samt endelig ved Gjennemgaaelsen af hans ypperlige Værk over Crinoiderne, er jeg bleven fuldt overbevist om, at *Ilycrinus* falder sammen med Slægten *Bathycrinus* og maa derfor inddrages.

¹ Danielssen og J. Koren. Fra den norske Nordhavsexpedition. Nyt Magazin for Naturvidenskaberne. 23 Bd., 3die Hefte, Side 45. 1877.

² Proceed. Roy. Soc. Edin. Vol. VII, pag. 722. The Depths of the Sea — pag. 450, fig. 73. 1873.

³ Report upon the Crinoidea, collected during the Voyage of H. M. S. Challenger, during the years 1873—76, by P. Herbert Carpenter.

Den norske Nordhavsexpedition. D. C. Danielssen: Crinoida.

Bathycrinus Carpenteri.

Syn. *Ilycrinus Carpenteri*, Danielssen & Koren.

In „Nyt Magazin for Naturvidenskaberne“¹ I, together with my deceased friend Dr. J. Koren, delivered a precursory description of a sea-lily which we called *Ilycrinus Carpenteri*. We supposed it to be so different from the *Bathycrinus gracilis* described by Wyville Thomson² that it could not be assigned to that genus. It appeared, however, subsequently, that Thomson's specimen was a young, little developed, injured animal, and in consequence thereof the description was very defective. *Bathycrinus gracilis* was found by the Porcupine expedition in the Bay of Biscay, in 1869, and was described in 1872. On the Challenger expedition, subsequently, there were discovered two species pertaining to that genus, viz. *Bathycrinus aldrichiani* and *Bath. campbelliani*.³ Of the first-named, Wyville Thomson gave a description in „Journal of the Linnean Society, 1876“, in which he still further substantiated the genus *Bathycrinus*. About the same time we forwarded to „Nyt Magazin for Naturvidenskaberne“ our precursory report on *Ilycrinus Carpenteri* without being aware of W. Thomson's last, somewhat more detailed description of *Bathycrinus aldrichiani*; I have since, by correspondence with Dr. P. Herbert Carpenter and sending him a portion of a head for comparison, and, finally, from the study of his able work on the Crinoids, become fully convinced that *Ilycrinus* coincides with the genus *Bathycrinus* and must therefore be included in it.

¹ Danielssen and J. Koren. Fra den norske Nordhavsexpedition. „Nyt Magazin for Naturvidenskaberne“. Vol. 23, Part 3, page 45. 1877.

² Proceed. Roy. Soc. Edin. Vol. VII, page 722. The Depths of the Sea — page 450. Fig. 73. 1873.

³ Report upon the Crinoidea, collected during the Voyage of H. M. S. Challenger, during the years 1873—1876, by P. Herbert Carpenter.

Saa vel Wyville Thomson som vi henførte vore Slægter til Apiocrinidernes store Familie, ihvorvel vi antydede, at baade Thomsons og vor Slægt, ligesom Slægten Rhizocrinus, havde meget tilfælles med Slægten Bourgueticrinus; men Herbert Carpenter har nu med fuld Ret optaget dem i Loriol's Familie Bourgueticrinidæ. Jeg skal nu levere en Beskrivelse med saavidt mulig anatomisk-histologiske Under søgelser over Bathycrinus Carpenteri.

Stilken er slank, høi, temmelig bøielig, tykkere forneden, smalere foroven, næsten cirkelrund paa den øverste, lidt aflang paa den midterste og fuldkommen elliptisk paa den nederste Trediedel. Roden er lang, mere eller mindre forgrenet. Kronen (Hovedet) er 10-armet. Armene bære Pinnuler, Tab. I, Fig. 1.

Paa et Exemplar, hvor Stilken er 200^{mm} høi, er denne sammensat af 118 Led. Det øverste Led, som altid er det længste — indtil 4^{mm} — er cirkelrundt, lidt udvidet opad, hvorfra Basalerne udgaa, og paa unge Exemplarer sees tydeligt, at dette Led egentligt bestaar af mange Led, der ere sammensmeltede og have efterladt Spor af smale Ringe, som alene kunne iagttages ved stærk Loupe, Tab. I, Fig. 2 a, 3 a. Under dette Led følger nu 4—8 ligeledes cirkelrunde Led; der ere fra 0.5—1.0^{mm} lange, og hvis Bredde er lig med Længden, Tab. I, Fig. 2 b, 3 b.

Nu begynde Leddene at blive længere og længere, alt eftersom de komme ned paa Stilken, saa at de endog ved Enden af den øverste Trediedel ere dobbelt saa lange som brede, Tab. I, Fig. 2 c, 3 c. De ere i Regelen lige tykke overalt, dog hænder det, at de ere lidt udvidede mod Enderne. Leddenes saavel øverste som underste Flade er næsten rund, Tab. I, Fig. 4.

Fra Leddenes indvendige Vægge udgaar paa hver Side, diametralt modsat, en temmelig bred Kalkkam, Tab. I, Fig. 4 a, der gaar henimod Midten, hvor den kredsførmigt udvider sig og hjælper derved til at danne en cirkelrund Kalkkanal, som optager Midten af Leddefluden, og hvorigjennem Centralstrængen løber, Tab. I, Fig. 4 b. Denne Kalkkam er lidt hvælvet paa den ene Leddeflade, og har en tilsvarende Fordybning paa den anden, hvorved Leddet befæstes. Paa hver Side af Kalkkanalen sees en stor, halvmaaneformig Hulhed, som tjener til Insertion for Muskler og mangfoldige, senede Strænge, der holde Leddet sammen og bidrage til dets ringe Bevægelighed, Tab. I, Fig. 4 c, 5 a.

Leddene paa Stilkens midterste Trediedel afvige kun fra de nys beskrevne derved, at de ere noget længere, antage en mere aflang Form, Tab. I, Fig. 2 d, 3 d, der især er fremtrædende paa deres noget udvidede Ender, hvor Leddefluden frembyder en tydelig aflang Figur, paa hvis største Axe den før beskrevne Kalkkam danner en liden Fremstaaenhed, som endog giver sig tilkjende paa Leddets ydre Flade, Fig. 5 b.

Both Wyville Thomson and we, assigned our genera to the large family of Apiocrinidæ, although we indicated that both Thomson's and our genus, like the genus Rhizocrinus, had much in common with the genus Bourgueticrinus; but Herbert Carpenter has now, with perfect propriety, included them in Loriol's family Bourgueticrinidæ¹. I shall now give a description accompanied, as far as possible, with anatomo-histological observations on Bathycrinus Carpenteri.

The stalk is slim, high, pretty flexible, thickest below and thinnest at the top, almost circular in its uppermost part, slightly oblong in the middle portion, and completely elliptic in the lowest third part. The root is long, and more or less ramified. The crown (the head) is 10-armed. The arms carry pinnules. (Pl. I, fig. 1).

In one specimen in which the stalk is 200^{mm} in height, it is composed of 118 joints. The uppermost joint, which is always the longest one — as much as 4^{mm} — is circular, a little expanded upwards, from which situation the basals issue; and in young specimens it is distinctly seen, that this joint really consists of many joints which have coalesced and left traces of narrow rings that could only be distinguished with the aid of a powerful magnifier (Pl. I figs. 2 a, 3 a,). Below that joint now come 4—8, also circular joints, which are from 0.5—1.0^{mm} in length, with a breadth equal to the length (Pl. I, figs 2 b, 3 b,).

The joints then begin to become longer and longer — according as they descend on the stalk — so that at the extremity of the uppermost third part they are even twice as long as they are broad (Pl. I, figs. 2 c, 3 c). They are, generally, everywhere the same in thickness, although it sometimes happens that they are slightly expanded towards the extremities. The uppermost, as well as the lowest surfaces of the joints are almost round (Pl. I, fig. 4).

From the inner walls of the joints there issues on each side, diametrically opposite to each other, a pretty broad calcareous ridge (Pl. I, fig. 4 a) which passes towards the middle where it expands annularly, and thereby aids in forming a circular calcareous canal which occupies the middle of the surface of the joint, and through which the central cord runs (Pl. I, fig. 4 b). This calcareous ridge is slightly arcuated on the one articular surface, and has a corresponding depression on the other surface, by which the joint is secured. On each side of the calcareous canal there is visible a large peltiform cavity, which serves for the insertion of muscles and multitudinous sinewy cords which keep the joint together, and contribute to its small flexibility (Pl. I, figs. 4 c, 5 a).

The joints on the medial third part of the stalk only differ from those just described, in being somewhat longer and in assuming a more oblong form (Pl. I, figs. 2 d, 3 d); the difference being especially prominent in their somewhat expanded extremities, where the articular surface presents a distinct oblong figure, on whose greatest axis the calcareous ridge previously described forms a small projection whose presence is even felt on the outer surface of the joint (Pl. I, fig. 5 b).

Leddene paa den nederste Trediedel af Stilken ere væsentlig forskellige fra de øvrige. De ere tykkere, grovere bygget, 3^{mm} lange, 2^{mm} brede i Enderne og paa Midten 1^{mm}, Tab. I, Fig. 1 a, 2 e, 3 e, 6. De ere fuldstændigt elliptiske og meget udvidede i begge Ender, medens de ere næsten runde og indknebne paa Midten, Tab. I, Fig. 3 e, hvilket ovennævnte Maal ogsaa udviser. Men foruden dette er der ogsaa det mærkelige ved disse Led, at Retningen af den øverste Leddeflade er ganske modsat den nederste, saaledes at de krydse hinanden under rette Vinkler, Tab. I, Fig. 3 f.

Leddeforbindelsen paa denne Del af Stilken bliver derfor særegen, idet hvert andet Leds (Ellipsens) største Axe følger Stilkenes Længdeaxe, imedens hvert andet følger Tveraxen, Tab. I, Fig. 3 g. Stilken faar derved et vredent Udseende. Paa unge Exemplarer ser det ud, som hvert saadant Led har været delt i to Stykker, Tab. I, Fig. 2 f, hvoraf den ene, øvre Ende — den egentlige Leddeflade — er elliptisk, Tab. I, Fig. 2 g, den anden, nedre, næsten rund; de to runde Ender danne i Begyndelsen en syzygial Forbindelse, men senere voxer de saa nøie sammen, at de ofte ikke engang efterlade Spor af den tidligere adskilte Tilstand, Tab. I, Fig. 3 h.

Ligesom Leddene i deres ydre Form ere saa høist forskellige fra de højere oppe paa Stilken værende Led, saaledes ere de ogsaa forskellige i deres indre Bygning. Leddefladen er fuldstændig elliptisk, Tab. I, Fig. 6, og fra dens indre Væg udgaar paa hver Side fra diametralt modsatte Punkter en Kalkkam, Tab. I, Fig. 6 a, der er pyramidedannet, med sin bredere Del eller Basis fastvoxet til Væggen, og den tilspidsede, fri Del ragende frem i Leddets Hulhed til henimod dennes Midte, Tab. I, Fig. 6 b, hvorved der imellem begge Spidser kun bliver et smalt Rum, som udfyldes af Centralstrængen, der her løber i en stærk, membranøs Skede og ikke i en Kalkkanal, som Tilfældet er højere oppe paa Stilken.

Paa den øverste Leddeflade har denne fremragende Kalkkam paa Midten en langsgaaende, ophøiet Kalkliste, Tab. I, Fig. 6 c, der er forsynet med en Række Tænder paa hver Side, og paa den underste Leddeflade findes paa Kalkkammen en paalangsgaaende Fure med Sideindsnit, som optager Listen og Tænderne paa den tilsvarende, underliggende Leddeflade saaledes, at hvert Led paa denne Maade faar en meget fast Forbindelse. Paa Siderne af Kalkkammen er Leddehulhederne, Tab. I, Fig. 6 d, udfyldte af stærke, tendinøse Strænge. Hvor Leddefladen har sin længste Axe, danner Kalkkammen med sin brede Basis en liden Fremstaaenhed, der paa Leddets ydre Flade, lige ved Ledderanden, danner en liden Knop.

Det nederste Led paa Stilken, det egentlige Rodled, er meget kort, omtrent lige tykt som langt, og har stundom en trekantet Form, Tab. I, Fig. 3 i. Dets underste Ende er afdelt i 2, sjældnere 3, næsten runde, lidt fordybele

The joints on the lowest third part of the stalk are materially different from the others. They are thicker, coarser in structure, 3^{mm} in length, 2^{mm} in breadth at the extremities and 1^{mm} in the middle (Pl. I, figs. 1 a, 2 e, 3 e, 6). They are perfectly elliptical and greatly expanded at both extremities, while they are almost round and constricted in the middle (Pl. I, fig. 3 e), which the above given measurements also shows. But, besides that, there is also in these joints the remarkable feature, that the direction of the uppermost articular surface is directly the opposite of the lowest one, so that they cross each other at right angles (Pl. I, fig. 3 f).

The articular connection on this part of the stalk is therefore peculiar, in as much that the greatest axis of every second joint (the ellipse) follows the longitudinal axis of the stalk, whilst each of the others follows the transversal axis (Pl. I, fig. 3 g). The stalk thus acquires a twisted appearance. In young specimens it appears as if each such joint had been divided into two pieces (Pl. I, fig. 2 f), of which the one, superior extremity — the real articular surface — is elliptical (Pl. I, fig. 2 g), the other, the inferior, almost round; the two round extremities form at the commencement a syzygial connection, but subsequently grow so intimately together that they frequently do not even leave a trace of the earlier separate condition (Pl. I, fig. 3 h).

Just as the joints are so highly different in their external form from the joints higher up the stalk, so are they also different in their inner structure. The articular surface is perfectly elliptical (Pl. I, fig. 6), and their issues from its inner wall on each side, from diametrically opposite points, a calcareous ridge (Pl. I, fig. 6 a), formed pyramidically, with its broader part or base firmly concreted to the wall and the acuminate free portion projecting into the cavity of the joint to nearly its middle (Pl. I, fig. 6 b), so that between both points there only remains a narrow space that is occupied by the central cord, which here runs in a strong membranous sheath and not in a calcareous canal as is the case higher up the stalk.

On the uppermost articular surface this projecting calcareous ridge has a longitudinal, elevated calcareous fillet in the middle (Pl. I, fig. 6 c), which is furnished with a series of teeth on each side; and on the lowest articular surface there is found, on the calcareous ridge, a longitudinal groove with lateral incision which takes in the fillet and the teeth of the corresponding subjacent articular surface, in such a manner that each joint obtains a very firm connection. On the sides of the calcareous ridge are the articular cavities (Pl. I, fig. 6 d), occupied by strong, tendinous cords. Where the articular surface has its greatest axis, the calcareous ridge with its broad base forms a small projection which, on the outer surface of the joint, just at the articular margin, forms a little bud.

The lowest joint on the stalk — the real root-joint — is very short, about as thick as it is long, and occasionally has a triangular shape (Pl. I, fig. 3 i). Its lowest extremity is divided into 2, more rarely 3, almost round, slightly

Syzygialflader, der svare til Røddernes første Led. Som oftest er der to Hovedrødder, som have en forskellig Længde, fra 20—30^{mm}, og ere sammensatte af omtrent 20—30 Led, Tab. I, Fig. 1 b, 3. Disse have en forskellig Størrelse og Tykkelse. De øverste ere de tykkeste, deres Længde er dels 0.5^{mm} og Tykkelsen 1.0^{mm}, dels kunne de være dobbelt saa lange; men længere ned paa Roden blive de meget lange, indtil 2.5^{mm} og 1.0^{mm} tykke. De ere runde, lidt smalere paa Midten og advidede mod begge Ender. Leddefladerne ere kompakte, cirkelrunde og have i Midten en liden, rund Aabning, hvorigjennem Fortsættelsen af Centralstrængen løber; de ere lidt ujævne og fast forenede ved en organisk Masse uden nogen Ledbevægelse, Tab. I, Fig. 3 k.

Længere nede paa Roden udspringe fra disse Leds dels midterste, dels øverste Del Grene, som ligeledes bestaa af Led, der i Begyndelsen have samme Bygning som Hovedrodens, men forandres dog, naar Grenen har antaget en haarformig Finhed. Fra disse Grene udløbe igjen mange yderst fine, indtil haartukke Smaagrene, Tab. I, Fig. 1 c. Disse, saavel som de yderste Ender af Grenene, ere sammensatte af meget lange, smale Led, der ere forenede med hinanden ved en elastisk Masse.

Selve Leddene dannes af tykke, runde, lange, noget vredne Kalkbjelker, der ere forenede med korte Tverstokke, hvorved fremkommer et Kalknet med aflange Masker, som ere noget større end Kalkbjelkernes Tykkelse. Baade i Grenene og i Smaagrenene er der en Kanal i Midten, hvis Vægge ere tapetserede med en Membran, hvori sees aflange Celler med Kjerne og et gult, kornet Indhold. Ogsaa paa den ydre Flade ere Grenene saavel som Hovedrødderne forsynede med en tynd, gjennemsigtig Membran, der sandsynligvis er en Fortsættelse af den, som beklæder den hele Stilk.

Hovedet (Kronen) er paa det største Exemplar 30^{mm} langt; det er sammensat af 5 Grundled (Basalia) og 3 Rækker Straaleled (Radialia), 5 i hver Række. Den tredje Rækkes Straaleled ere tillige Axillariet og bære 10 Arme, forsynede med Pinnuler. Indenfor Radialerne er Kroppulheden, dækket af Perisomet.

Basalerne ere meget smaa, femkantede, med fuldstændigt sammenvoxede Siderande, saa at de danne en rund, glat Ring, som er meget udvidet foroven, Tab. I, Fig. 3 l. Paa meget unge Individuer kan med meget stærk Loupe sees 5 yderst fine Sømme, Tab. I, Fig. 2 h, der vise paa det Bestemtteste, at de have været adskilte, men som ganske forsvinde hos ældre Dyr. Den øverste Basalrand er paa Midten afrundet og skraaner lidt af til Siderne mod de tilstødende Basaler, hvorved Leddefladerne for de første Radialer fremkomme. Den inderste Rånd er afstumpet og støder til den cirkelrunde Centralkanal. Basalernes øverste Rand danner en Pentagonal, Tab. I, Fig. 3 m, 7, i hvis Indskjæring Leddefladene findes for de 1ste Radia-

depressed syzygial surfaces, which correspond to the first joint of the roots. Most frequently there are two chief roots, with a different length, from 20—30^{mm}, and composed of about 20—30 joints (Pl. I, figs. 1 b, 3). These have a variable size and thickness. The uppermost ones are the thickest, their length is partly 0.5^{mm} and the thickness 1.0^{mm}, partly they may be twice as long; but farther down on the root they become very long, up to 2.5^{mm}, and 1.0^{mm} in thickness. They are round, a little narrower in the middle and expanded towards both extremities. The articular surfaces are compact, circular, and in the middle have a small round aperture through which the continuation of the central cord runs; they are somewhat uneven, and are firmly united by an organic substance without any articular flexibility (Pl. I, fig. 3 k).

Farther down the root there issue, partly from the medial partly from the uppermost part of these joints, branches, also composed of joints which at the commencement have the same structure as those of the main root, but become changed, however, when the branch has assumed a capilliform fineness. From those branches there again issue many extremely delicate — some not thicker than a hair —, small branches (Pl. I, fig. 1 c). These, as well as the outermost extremities of the branches are composed of very long, narrow joints, which are united to each other by an elastic mass.

The joints themselves are formed of thick, round, long, somewhat twisted calcareous beams which are united by short transversal rods, thereby causing the production of a calcareous reticulation with oblong meshes which are somewhat larger than the thickness of the calcareous beams. Both in the branches and in the small sub-branches there is a canal in the middle, whose walls are lined with a membrane in which are seen oblong cells with nucleus and a yellow granular substance. Also on the outer surface the branches as well as the main roots are furnished with a thin, transparent membrane, which is probably a continuation of that which clothes the entire stalk.

The head (the crown) is, in the largest specimens, 30^{mm} in length; it is composed of 5 main joints (Basalia) and 3 series of radiate joints (Radialia), 5 in each series. The third series of the radial joints are also axillaria, and carry 10 arms furnished with pinnules. Inside of the radials the body-cavity is covered by the perisome.

The basals are very small, pentagonal, with completely concreted lateral margins, so that they form a round, smooth ring which is somewhat expanded at the top (Pl. I, fig. 3 l). In very young individuals there may be seen, with the aid of a very powerful magnifier, 5 extremely fine seams (Pl. I, fig. 2 h) — showing in the most conclusive manner that they have been separated, — but which quite disappear in the older animals. The uppermost basal margin is rounded in the middle, and slopes off a little to the sides towards the adjacent basalia, producing thereby the articular surfaces for the first radials. The innermost margin is obtuse and unites to the circular central canal. The uppermost margin of the basalia forms a pentagon

ler, medens de svagt afrundede Fremstaaenheder paa Pentagonalen falder sammen med Længdesømmene mellem de 1ste Radialer. De sammensmeltede Basaler danne forneden en rund, lidt excaveret Flade, der ved en Søm forener dem med Stilkens øverste Led.

Det første Radial er noget forskjelligt i Størrelse efter Hovedets Længde; paa det Exemplar, der er 140^{mm} langt, er det 1.0^{mm} langt, 0.9^{mm} bredt forneden, Tab. II, Fig. 1 a, 2 a. Det er kiledannet. Dets dorsale Flade er paa Midten convex, lidt afplaneret til Siderne, Tab. II, Fig. 2 a. Den ventrale Flade er paa den nederste Halvdel convex, paa den øverste findes en dyb Fure, som fremkommer derved, at den øverste Leddeflades Rand her er spaltet, Tab. I, Fig. 8 a. Sidefladerne ere smale, yderst svagt concave, næsten plane, og der, hvor de støde til den dorsale Flade, dannes en temmelig skarp Kant. Saavel denne som selve Sidefladen er sammenvoxet med det tilstødende Side-Radiale, hvorved fremkommer det egentlige Bæger (Calyx), som er meget lidet, og paa hvis udvendige Side der er 5 yderst fine Linier, som betegne Sømmene for Sammenvoxningen, Tab. I, Fig. 2 i. Tab. II, Fig. 1 b.

Den øverste (distale) Flade er ved en næsten trekantet, glat, hvælvet Kam, som indtager Størstedelen af Fladens Tvervidde, egentlig delt i to Dele, en ventral og en dorsal. Den dorsale Del optages næsten ganske af en halvrund Fordybning, der tilkjendegiver sig paa den dorsale Flades øvre Rand som en halvmaaneformig Indskjæring, Tab. II, Fig. 1 c, 2 b, og paa den ventrale Del sees Forlængelsen af den paa den ventrale Flade omtalte Fure, ved hvis Sider Muskler fæste sig. Paa hver Side af Kammen, mellem denne og den distale Flades afrundede Rand, er en lang Fure, som har en skjæv Retning udenfra indad, ovenfra nedad, der støder sammen med Midtfuren, og som tjener til Insertion for stærke, senede Baand. Den afrundede, glatte Rand, der mod Dorsalfladen er afskaaren ved det halvmaaneformige Indsnit og mod Ventralfladen ved Furen, danner i Forening med den glatte, hvælvede Kam, den egentlige Artikulationsflade. Imellem Kammen og den halvrunde Fordybning, lige i Centrum, findes et lidet, rundt Hul til Gjennemgang for Centralstrængens Forgrening. Den underste (proximale) Flade er lidt ophøiet paa Midten, skraaner af til Siderne og er fast forenet ved en Søm til to Basaler.

Det andet Radiale er lidt længere, bredere, noget tykkere og nærmer sig næsten Firkanten; det er 1.2^{mm} langt, 1.0^{mm} bredt foroven og 0.9^{mm} bredt forneden, Tab. II, Fig. 1 d, 2 c; dets dorsale Flade er lidt concav ovenfra nedad, paa Midten convex fra den ene Side til den anden, men bliver til Siderne lidt concav, Tab. II, Fig. 2 d. Den ventrale Flade har paa Midten et convex Fremspring, hvorpaa iagttages en Længdefure, Tab. I, Fig. 9. Sidefladerne ere svagt convexe, have en skraa Retning udenfra indad, ere lidt bredere end de paa første Radiale og gaa næsten

(Pl. I, figs. 3 m, 7) in whose concavities the articular surfaces for the 1st radials are found, while the faintly rounded projections on the pentagon coincide with the longitudinal seams between the 1st radials. The coalesced basalia form at the bottom a round, slightly excavated surface, which by a seam unites them to the uppermost joint of the stalk.

The first radial is somewhat variable in size, according to the length of the head; in the specimen that is 140^{mm} in length, it is 1^{mm} long, and 0.9^{mm} broad at the bottom (Pl. 2, figs. 1 a, 2 a). It is cuneiform. Its dorsal surface is convex in the middle, slightly planed off towards the sides (Pl. II, fig. 2 a). The ventral surface is convex in the lowest half part, in the uppermost half part a deep groove appears, which is produced by the margin of the uppermost articular surface being here fissured (Pl. I, fig. 8 a). The lateral surfaces are narrow, extremely faintly concave, almost plane, and, at the point where they unite to the dorsal surface a pretty sharp edge is formed. Both that, as well as the lateral surface itself are concreted with the adjacent lateral radials, thereby producing the cup-proper (the calyx), which is very small, and upon whose exterior side there are 5 extremely fine lines indicating the seams of the concretion (Pl. I, fig. 2 i. Pl. II, fig. 1 b).

The uppermost (distal) surface is really divided by an almost triangular, smooth, arcuate ridge that occupies the greater part of the transversal width of the surface, into two portions, a ventral and a dorsal. The dorsal portion is almost entirely occupied by a semi-circular cavity, which makes itself apparent on the superior margin of the dorsal surface as a peltiform concavity (Pl. II, figs. 1 c, 2 b); and on the ventral portion is seen the prolongation of the groove spoken of as appearing on the ventral surface, upon whose sides muscles secure themselves. On each side of the ridge, between it and the rounded margin of the distal surface, there is a long groove, having an oblique direction from outside inwards and from upwards downwards, which unites with the medial groove and serves as the insertion for strong, sinuous bands. The rounded, smooth margin, which towards the dorsal surface is transected by the peltiform incision and towards the ventral surface by the groove, forms, in connection with the smooth arcuate ridge, the real articular surface. Between the ridge and the semi-circular cavity, exactly in the centre, there is visible a small round hole for the passage of the ramification of the central cord. The lowest (proximal) surface is a little elevated in the middle and slopes off to the sides; it is firmly united by a seam to two basalia.

The second radial is a little longer, broader, somewhat thicker, and almost approaches a quadrangle in form; it is 1.2^{mm} long, 1.0^{mm} broad at the top and 0.9^{mm} broad at the bottom (Pl. II, figs. 1 d, 2 c); its dorsal surface is slightly concave, from above downwards, in the middle convex, from the one side to the other, but at the sides becomes slightly concave (Pl. II, fig. 2 d). The ventral surface has a convex projection in the middle on which a longitudinal groove is observed (Pl. I, fig. 9). The lateral surfaces are faintly convex, have an oblique direction from

umærkeligt over i den ventrale Flade. Der, hvor Sidefladerne støde til den dorsale Flade, er en afrundet, fri Rand, som er bøiet lidt opad og udad, hvorved der fremkommer en Spalte imellem den anden Radialrækkes enkelte Stykker, saa at Skivens Perisom kommer tilsyne, Tab. II, Fig. 1. Den underste Flade, der er en fuldstændig Leddeflade, svarer til den øverste Flade paa første Radiale, hvormed den artikulerer, Tab. I, Fig. 2 k; Tab. II, Fig. 1 c, 2 b. Den øverste Flade derimod har paa Midten en konvex Fremstaaenhed, er til Siderne næsten plan og er ved en organisk Masse fast forenet til det tredje Radiale, hvorved fremkommer et Syzygium, Tab. II, Fig. 1 e, 2 e.

Det tredje Radiale (Radiale axillare) er bredere og meget kortere, end andet Radiale, 1.5^{mm} langt, 2.0^{mm} bredt foroven, 1^{mm} bredt forneden, Tab. II, Fig. 1 f, 2 f. Den dorsale og ventrale Flade har omtrent samme Form som andet Radiale, Tab. I, Fig. 10. Den underste Flade svarer til andet Radiales øverste Flade, hvormed den er fast forenet. Den øverste Flade har paa Midten en konvex Forhøining, der indtager Fladens korteste Axe, og som paa den dorsale Sides øverste Rand tilkjendegiver sig med en konisk Fremstaaenhed, Tab. II, Fig. 1 g, 2 g. Paa hver Side af denne Forhøining er en halvrund Fordybning, Tab. I, Fig. 10 c, der tjener til Befæstning for senede Baand og Muskelfibre, og udenfor denne Fordybning er den egentlige Leddeflade for Armen. Imellem Fordybningen og denne Leddeflade er der en rund Aabning til Gjennemgang for en Gren af Centralstrængen. Paa den øverste Flade af tredje Radiale er der altsaa to virkelige Artikulationsflader.

Fra Radiale axillare udgaa 2 Arme, der have forskjellig Længde efter Individets Størrelse og Alder. Paa det største Hoved (Krone) vare Armene indtil 30^{mm} lange. Hver Arm var sammensat af 55 enkelte Led, foruden det yderste Led, som ender i en liden, konisk Spids. De 10 nederste Led ere blottede for Pinnuler og ere ordnede paa følgende Maade. Det første og andet Led er sammenvoxet ved en Søm, hvorved et Slags Syzygium fremkommer; mellem andet og tredje Led er der en virkelig Artikulation, ligesaa mellem tredje og fjerde; men mellem fjerde og femte er igjen et Syzygium; saa kommer mellem femte og sjette og mellem sjette og syvende en virkelig Artikulation, mellem syvende og ottende et Syzygium, og endelig mellem ottende og niende, samt mellem niende og tiende virkelige Artikulationer. Der er altsaa syv virkelige, bevægelige Led, naar Leddet mellem tredje Radiale og første Brachiale medregnes, og tre med Sømme sammenvoxede og ubevægelige Led. Dette gjælder gamle Individuer, Tab. I, Fig. 1; Tab. II, Fig. 2 h, i. Hos yngre Individuer ere Syzygierne mindre fremtrædende, og hos ganske unge, lidet udviklede, existere de ikke; hos dem er der Artikulationer overalt, Tab. I, fig. 2.

outwards inwards, are a little broader than those of the first radial, and pass almost imperceptibly over into the ventral surface. In the situation where the lateral surfaces unite to the dorsal surface there is a rounded free margin, which is curved a little upwards and outwards, producing thereby a fissure between the individual portions of the second radial series, so that the perisome of the disc becomes visible (Pl. II, fig. 1). The lowest surface, which is a perfect articular surface, corresponds to the uppermost surface of the first radial, with which it articulates (Pl. I, fig. 2 k, Pl. II, figs. 1 c, 2 b). The uppermost surface, on the contrary, has a convex projection in the middle, is almost plane at the sides, and is firmly united by an organic mass to the third radial, producing thus a syzygium (Pl. II, figs. 1 e, 2 e).

The third radial (radiale axillare) is broader and much shorter than the second radial; it is 1.5^{mm} long, 2^{mm} broad at the top and 1^{mm} broad at the bottom (Pl. II, figs. 1 f, 2 f). The dorsal and ventral surfaces, have nearly the same shape as those of the second radial (Pl. I, fig. 10). The lowest surface corresponds to the uppermost surface of the second radial, to which it is firmly united. The uppermost surface has a convex projection in the middle, which occupies the shortest axis of the surface and evinces itself by a conical projection on the uppermost margin of the dorsal side (Pl. II, figs. 1 g, 2 g). Upon each side of this projection there is a semi-circular cavity (Pl. I, fig. 10c), which serves for the attachment of sinuous bands and muscular fibres, and outside this cavity is the real articular surface for the arm. Between the cavity and this articular surface there is a round aperture for the passage of a branch of the central cord. On the uppermost surface of the third radial there are, therefore, two real articular surfaces.

From the radiale axillare 2 arms issue, of variable length according to the size and age of the individual. On the largest head (crown) the arms were as much as 30^{mm} in length. Each arm was composed of 55 individual joints, besides the outermost joint, which terminates in a small conical point. The 10 lowest joints are devoid of pinnules and are arranged in the following manner. The first and second joints are concreted by a seam, which produces a kind of syzygium; between the second and third joints there is a real articulation, likewise between the third and fourth; but between the fourth and fifth there again comes a syzygium; then there comes between the fifth and sixth, and between the sixth and seventh, a real articulation; between the seventh and eighth a syzygium; and, finally, between the eighth and ninth, and also between the ninth and tenth, real articulations. There are thus seven real, flexible joints, when the joint between the third radial and first brachial is included, and three, concreted by seams and inflexible joints. This refers to old individuals (Pl. I, fig. 1. Pl. II, fig. 2 h, i). In younger individuals the syzygia are less prominent, and in perfectly young, little developed specimens they do not exist; in them there are articulations everywhere (Pl. I, fig. 2).

Ellevte Led er syzygialt og bærer Pinnuler, og fra nu af ere Leddene regelmæssigt afvejlende, saaledes nemlig, at et virkeligt Led afløser et syzygialt Led, Tab. II, Fig. 1, 3 a, b. Pinnulerne, hvoraf der paa det omtalte Exemplar var 11 paa hver Side, sidde afvejlende og bæres altid af et Dobbeltleds epizygiele Del, og da paa dennes øverste og udvendige Rand, Tab. II, Fig. 3 c, c, fig. 4. Det første Brachiale er 1^{mm} langt og 0.8^{mm} bredt. Dets dorsale Flade er paa Midten saa meget konvex, at det her danner en skarp Kjøl, men skraaner jævnt af til Siderne henimod de tynde, skarpe Siderande, Tab. II, Fig. 1, 2 k. Den udvendige Siderand er ganske fri og skilt fra den tilsvarende paa Sidebrachialet i omtrent 0.5^{mm} Afstand, imedens den indvendige Rand støder til den indvendige Rand paa det tilsvarende Brachiale. Disse to indvendige Siderande af de første Brachialer slutte sig i Regelen saa tæt sammen, at de faa Udseende af at være sammenvoxede; men en saadan Sammenvoxning finder kun undtagelsesvis Sted, og da er det alene den nederste Fjerdedel af Randene, der ere sammenvoxede, Tab. II, Fig. 2 l.

Den ventrale Flade er forsynet med to konvexe Frem-spring, et paa hver Side. Tab. I, Fig. 11 a, og som egentlig ere Fortsættelser af Sidefladerne. Disse Frem-spring gaa henimod Midten, hvor de bidrage til at danne den dybe Midtfure, Tab. I, Fig. 11 b. Sidefladerne ere meget smale og kun lidet konvexe, og der, hvor disse støde sammen med Dorsalfladen, fremkommer den tidligere omtalte, skarpe Rand. Den distale Flade er næsten jævn, har i Midten en liden rund Aabning for Centralstrængens Gjennemgang, og er forresten ved fast Bindevæv forenet til anden Brachiales proximale Flade. Den underste (proximale) Flade er en sand Artikulationsflade og artikulerer med tilsvarende Led-flade paa tredje Radiale. Paa Midten af Fladen findes en paatværs gaaende, lidet ophøiet, glat Kam, der deler den i en dorsal og ventral Del. Paa den dorsale Del er en liden, halvrund Fordybning, som tilkjendegiver sig paa den dorsale Flades underste Rand ved et halvmaaneformigt Indsnit, Tab. II, Fig. 2 m, og som tjener til Insertion for tendinøse Baand. Paa den ventrale Del findes en aflang Fordybning paa hver Side af Midtfuren, hvilke Fordybninger tjene til Befæstning for to stærke Muskler. Imellem Kammen og den halvrunde Fordybning er den runde Aabning for Centralstrængen. Den proximale Flade begrænses af en rund Rand, der er lidt konvex henimod det halvmaaneformige Indsnit. Denne Rand danner den egentlige Artikulationsflade.

Derved at den ventrale Flade er meget konvex, faar det første Brachiale en halvrund Form og er langt fra saa sammentrykt fra den ene Flade til den anden, som Tilfældet er med tredje Radiale.

Det andet Brachiale er lidt kortere og smalere, men forresten ligt det første, kun med den Forskjel, at begge Siderandene ere fuldkommen fri, Tab. II, Fig. 1.

Det fjerde og til det ellevte Brachiale er synbart smalere, nærmer sig mere Cylinderformen og er paa den

The eleventh joint is syzygial and carries pinnules, and from this point the joints become regularly alternating in such a manner that a real joint replaces a syzygial one (Pl. II, figs. 1, 3 a, b). The pinnules, of which, in the specimen spoken of, there were 11 on each side, are seated alternately, and are always borne by the epizygieal portion of a double joint, and then on its uppermost and exterior margin (Pl. II, fig. 3 c, c, fig. 4). The first brachial is 1^{mm} long and 0.8^{mm} broad. Its dorsal surface is so greatly convex in the middle that it forms here a sharp carina, but slopes evenly off to the sides towards the thin, sharp lateral margins (Pl. II, figs. 1, 2 k). The exterior lateral margin is quite independent, and is separated from the corresponding one on the lateral brachial by an interval of about 0.5^{mm}, while the interior margin unites to the interior margin of the corresponding brachial. These two interior lateral margins of the first brachials close, as a rule, so tightly together that they acquire the appearance of being concreted, but such a concretion only takes place exceptionally, and then it is only the lowest fourth part of the margins that are concreted (Pl. II, fig. 2 l).

The ventral surface is furnished with two convex projections, one on each side (Pl. I, fig. 11 a), which are really continuations of the lateral surfaces. These projections reach to near the middle, where they contribute to form the deep medial groove (Pl. I, fig. 11 b). The lateral surfaces are very narrow and only slightly convex, and in the situation where they unite with the dorsal surface the sharp margin previously spoken of appears. The distal surface is almost even, has a small round aperture in the middle for the passage of the central cord, and is otherwise united to the proximal surface of the second brachial by firm connective-tissue. The lowest (proximal) surface is a true articular surface, and articulates with a corresponding articular surface on the third radial. In the middle of the surface an oblique, slightly elevated, smooth ridge is found, which divides it into a dorsal and a ventral portion. In the dorsal portion there is a small semi-circular cavity, which evinces itself on the lowest margin of the dorsal surface by a peltiform incision (Pl. II, fig. 2 m), and which serves for the insertion of tendinous bands. In the ventral portion an oblong cavity is found on each side of the medial groove; these cavities serve for the attachments of two powerful muscles. Between the ridge and the semi-circular cavity is the round aperture for the central cord. The proximal surface is bounded by a round margin, which is slightly convex near the peltiform incision. This margin forms the real articular surface.

As the ventral surface is very convex the first brachial acquires a semi-circular shape, and is not nearly so compressed from the one surface to the other as is the case with the third radial.

The second brachial is a little shorter and narrower, but otherwise like the first one, with the difference only, that both the margins are perfectly free (Pl. II, fig. 1).

The fourth, and as far as the eleventh brachial are perceptibly narrower, approaching more to the cylindrical form,

ventrale Flade forsynet med næsten ægformige Kalkplader, der sidde paa hver Side af Midtfuren og tjene for en Del til at dække denne. De sidde afvekslende og ere befæstede med den smalere Ende til Randene af den ventrale Flade, nærmest Midtfuren.

Det ellefte Brachiale danner et Syzygialled, og her tager den første Pinnula sit Udspring fra Leddets epizygi-ale Del, Tab. II, Fig. 3 c. Denne afviger noget i Form fra de foregaaende Led derved, at der paa den distale Ende er et buet Indsnit, som optager omtrent Halvdelen af Sideranden, og som udgjør Leddefluden for Pinnulens første Led, Tab. II, Fig. 3 d. De epizygi-ale Led ere derfor temmelig usymmetriske, idet den Rand, hvor Indsnittet findes og Pinnulaen insererer sig, er meget kortere end den modsatte, hvor ingen Pinnula findes. Som ovenfor nævnt sidde Pinnulerne i to hinanden modsatte, afvekslende Rækker, og dette i Forening med det Usymmetriske i Leddenes Siderande giver Armen tildels et noget vredent Udseende. Som jeg ovenfor har nævnt, tog Pinnulerne, der vare 22 i Antal paa en Arm af 26^{mm}'s Længde, deres Begyndelse fra det 11te Led's epizygi-ale Ende.

Pinnulerne have en Retning opad og lidt udad, noget bøiede efter Længden, ere lancetformede, stærkt hvælvede til Siderne og meget hule paa Ventralfladen, Tab. II, Fig. 3 c, c. De første Pinnuler have en Længde fra 2—3^{mm}, ere omtrent 1^{mm} brede; de derpaa følgende 4 ere de længste, 4^{mm} lange, 1^{mm} brede paa Midten og 0.5^{mm} ved Basis; efterhaanden aftage de nu saavel i Længde som i Bredde, saa at den øverste er 1.2^{mm} lang. De 3 nederste bestaa af 7 lange, smale Led, de 4 længste af 9 Led, og de øverste kun af 4 og 3. Mellem første og andet Led er et Syzygium. Endeledet er temmeligt afstumpet.

Det første Led's proximale Ende har en Leddeflade, der mod Dorsalfladen har et halvrundt Indsnit for Insertion af elastiske Baand, og mod Ventralfladen to smaa Sidefordybninger for Muskelinsertioner; imellem disse en liden, rund Aabning til Gjennemgang for en Gren af Centralstrængen. Leddenes dorsale Flade er meget konvex, den ventrale meget konkav og Siderne konvexe, hvorved en dyb Længdefure fremkommer, som er forsynet med to Rækker temmelig lange, cylindriske Tentakler, der paa deres udvendige Flade ere besatte med smaa, koniske Papiller, Tab. I, Fig. 12 t. Denne ventrale Fure kan for Størstedelen lukkes af to Rækker Klapper, en paa hver Side.

Disse Klapper ere i Antal forskellige efter Pinnulaens Længde; i Regelen er der to Klapper paa hvert Led, men de midterste Led ere tildels forsynede med fire saadanne, to paa hver Side. De ere ovale, længere end Furens Bredde, og vende med den smalere Del mod deres Insertionspunkt, medens den bredere, næsten runde Del har sin fri Rand vendt indad mod Furen. De ere fæstede

and are furnished on the ventral surface with almost ovi-form calcareous plates, which are seated on each side of the medial groove and partially serve to cover it. They are seated alternately, and are attached with the narrower extremity to the margins of the ventral surface, next to the medial groove.

The eleventh brachial forms a syzygial joint, and here the first pinnule has its origin in the epizygi-ale portion of the joint (Pl. II, fig. 3 c). This differs somewhat in shape from the preceding joint, from there being, on the distal extremity, a curved incision which occupies nearly the half of the lateral margin and forms the articular surface for the first joint of the pinnule (Pl. II, fig. 3 d). The epizygi-ale joints are therefore pretty unsymmetrical, as the margin where the incision is found and the pinnule inserts itself, is much shorter than the opposite one, where no pinnules are found. As stated above, the pinnules are seated in two alternating series opposite to each other, and that, in connection with the absence of symmetry in the lateral margins of the joints, imparts to the arm, partly, a somewhat twisted appearance. As I have mentioned above, the pinnules — which were 22 in number on an arm 26^{mm} long — commence on the epizygi-ale extremity of the eleventh joint.

The pinnules are directed upwards and slightly outwards, are somewhat longitudinally curved and lanceolate, are strongly arcuated to the sides, and very hollow on the ventral surface (Pl. II, fig. 3 c, c). The first pinnules are 2—3^{mm} in length, and about 1^{mm} in breadth; the 4 following thereafter are the longest, 4^{mm} long, 1^{mm} broad in the middle and 0.5^{mm} at the base, they then gradually diminish, both in length and breadth, so that the length of the uppermost ones is 1.2^{mm}. The three lowest pinnules consist of 7 long, narrow joints; the four longest ones of 9 joints, and the uppermost ones of only 4 and 3 joints. Between the first and second joint there is a syzygium. The terminal joint is pretty obtuse.

The proximal extremity of the first joint has an articular surface which, towards the dorsal surface, has a semi-circular incision for the insertion of elastic bands, and towards the ventral surface has two small lateral cavities for muscular insertions; between these there is a small round aperture for the passage of a branch of the central cord. The dorsal surface of the joints is very convex, the ventral surface very concave and the sides convex, producing, thus, a deep longitudinal groove which is furnished with two series of pretty long, cylindrical tentacles that, on the outer surface, are covered with small conical papillæ (Pl. I, fig. 12 t). This ventral groove may, for the greater part, be closed by two series of valves, one on each side.

These valves are variable in number according to the length of the pinnules; as a rule there are two valves on each joint, but the medial joint is partly furnished with four such valves, two on each side. They are oval, longer than the breadth of the groove, and face with the narrowest extremity towards their point of insertion, whilst the broadest, almost round portion, has its free margin turned

paa den indvendige Side af den Rand, der begrænder Furen, og som egentlig er Sidefladernes Begrænsning indad. De sidde noget afvejlende, saa at, naar de lukke Furen, ligger den ene skraa over paa den anden, Tab. I, Fig. 12 k. Disse Klapper dannes af et fint, smukt Kalknet og ere beklædte med en yderst fin, næsten gjennemsigtig Membran, der er Fortsættelse af den Membran, som beklæder saavel Armene som Pinnulerne, Tab. I, Fig. 13 c, 14.

Paa de 7 nederste Pinnuler findes Generationsorganet, der er tapformigt og indtager næsten hele Ventralfladen under Kjønnsproduktets Udvikling, Tab. I, Fig. 12 l. Paa flere af Pinnulerne vare Æg i fast alle Stadier udviklede; paa andre Individuer fandtes Testikler, der mikroskopisk havde samme Udseende som Æggestokken.

Skiven er meget hvælvet, strækker sig op imod 4de Brachiale, naar Armene ere lukkede, og danner da næsten en Konus; med 'aabne Arme er den muligvis lidt mindre konvex, Tab. I, Fig. 15 a. Den dannes af en temmelig fast Membran, Perisomet, hvori forskjelligtformede, smaa Kalkplader ere leirede. Perisomet gaar over paa Radialerne, hvortil det fæster sig, og forlænger sig op langs hele Ventralfuren saavel paa Armene som paa Pinnulerne. Skivens Sider, der kommer tilsyne mellem Armene og den øverste Række Radialer, ere ligesom foldede paalangs, det vil sige, der dannes 5 Længdefolder, som ere de egentlige 5 Interpalmarfelter, der rage med sin runde, fri Rand udover Munden, og hvori sees en stor, netformig Kalkplade (Oralplade). Under disse 5 Klapper, lidt nedsunket i Perisomet, findes lige i Skivens Centrum den runde Mund-aabning, der er omgivet af en ringformig Fordybning, hvori mange Tentakler tage Plads, Tab. I, Fig. 15 b. Disse Tentakler adskille sig ikke fra de tidligere omtalte, som findes i Ventralfuren paa Armene og Pinnulerne. De ere alle temmelig lange, cylindriske, forsynede med smaa, koniske Papiller, der maaske paa Mundtentaklerne ere noget længere end paa de øvrige og have i Huden enkelte Kalkspikler. Fra Randen af den ringformige Fure gaa imellem Interpalmarfelterne 5 dybe Længdefurer henimod Skivens Periferi, hvor de dele sig i to, en til hver Arm, Tab. I, Fig. 15 c. Temmelig nær Munden, i et Interpalmarrum, rager Rectum snabelformigt 3—4^{mm} over Skiven, og paa Enden af denne snabelformede Rectum danner Analaabningen en Tverspalte, Tab. I, Fig. 15 d.

Dr. P. Herbert Carpenter tør vel ansees for den største Autoritet, naar Talen er om Crinoiderne, baade med Hensyn til deres Systematik og anatomiske Bygning. Hans sidste Arbeide over de paa Challenger Expeditionen indsamlede Crinoider er klassisk og vil gennem alle Tider hævde sin Rang. Det er derfor ikke uden en vis Ængstelse, at jeg rører ved hans Undersøgelser over Slægten Bathyrinus. Imidlertid tror jeg efter fornyede Undersø-

Den norske Nordhavsexpedition. D. C. Danielssen: Crinoida.

towards the groove. They are attached to the inner side of the margin that bounds the groove, and which is really the boundary of the lateral surfaces inwards. They are seated somewhat alternately so that, when they close the groove, the one lies obliquely over the other (Pl. I, fig. 12 k). These valves are formed of a fine, beautiful calcareous reticulation, and are covered with an extremely delicate, almost transparent membrane, which is the continuation of the membrane that covers the arms as well as the pinnules (Pl. figs. 13 c, 14).

The reproductive organ is found on the 7 lowest pinnules; it is tenon-shaped, and during the development of the sexual product occupies nearly the entire ventral surface (Pl. I, fig. 12 l). Upon several pinnules there were ova in almost every stage of development; in other individuals testicles were found which, under the microscope, had the same appearance as the ovary.

The disc is much arcuated and, when the arm is closed, stretches itself up towards the 4th brachial, and forms then almost a cone; with the arms open it is, possibly, a little less convex (Pl. I, fig. 15 a). It is formed of a pretty firm membrane, the perisome, in which variably formed, small calcareous plates are embedded. The perisome passes over to the radials, to which it attaches itself, and prolongs itself up along the entire ventral groove on the arms as well as on the pinnules. The sides of the disc, which become visible between the arms and the uppermost series of radials, are, as it were, folded longitudinally, that is to say, 5 longitudinal folds are formed, which are the 5 real interpalmar areas that, with their round, free margin project beyond the mouth and in which a large, reticulate calcareous plate (the oral plate) is seen. Below these 5 valves, sunk a little in the perisome, is the round oral aperture, exactly in the centre of the disc; it is surrounded by an annular cavity which is occupied by many tentacles (Pl. I, fig. 15 b). These tentacles do not differ from those previously mentioned as found in the ventral groove on the arms and the pinnules. They are all pretty long and cylindrical, are furnished with small conical papillæ which are, perhaps, a little longer on the oral tentacles than on the others, and they have occasional calcareous spicules in the integument. From the margin of the annular groove 5 deep longitudinal grooves pass between the interpalmar areas towards the periphery of the disc, where they divide into two, one to each arm (Pl. I, fig. 15 c). In one interpalmar space, pretty near to the mouth, the rectum projects in proboscis-shape 3—4^{mm} above the disc, and at the extremity of this proboscis-shaped rectum the anal aperture forms a transversal fissure (Pl. I, fig. 15 d).

Dr. P. Herbert Carpenter may, presumably, be regarded as the greatest authority on the subject of the crinoids, both in regard to their system and anatomical structure. His latest work, on the crinoids collected by the Challenger expedition, is a classical one, which will in all time coming take the highest rank. It is, therefore, not without a certain feeling of trepidation that I touch upon his investigations of the genus Bathyrinus. In the meantime I believe,

gelsers at kunne konstatere Rigtigheden af de af mig tidligere beskrevne Syzygier, saavel mellem 1ste og 2det Radiale som imellem 1ste og 2det Brachiale samt imellem 4de og 5te og saa fremdeles. Dr. Carpenter siger med Hensyn hertil: „To the kindness of Dr. Danielssen I have been able to satisfy myself that these „syzygial unions“ in the arms of *Bathycrinus carpenteri* are really trifacial articulations like that between the two outer radials of *Bathycrinus aldrichianus*. If, however, this term be substituted for syzygy in the description by Danielssen and Koren, their statements respecting the grouping of the brachials would be perfectly correct, i. e. in the nine lowest brachials there are alternations of a pair of joints united by trifacial articulations and a single joint with muscular articulations at both ends. Beyond the ninth brachial the two forms of articulation alternate with great regularity. Apart from the question of nomenclature, therefore, the Norwegian naturalists were the first who correctly described the grouping of the joints in the arms of *Bathycrinus*; for I find that their description of *Bathycrinus carpenteri*, applies both to the little *Bathycrinus gracilis* dredged by the Porcupine and to the two Challenger species, *Bathycrinus aldrichianus* and *Bathycrinus campbellianus*. The non-syzygial nature of the paired unions in the arms of the two last has been determined by actual investigation of the joint faces; while careful microscopic examination of the small individual of *Bathycrinus gracilis* has convinced me that it resembles the other three species in this respect“.

Dr. Carpenter har med Hensyn til Leddene saavel i Radialerne som i Armene hos *Bathycrinus Carpenteri* baade Ret og Uret. Det forholder sig ganske rigtig saa, at hos unge Individuer er der virkelig de af ham paaviste Artikulationer og ikke, som jeg har beskrevet, Syzygier. ja hos ganske unge Individuer er der ikke engang den mindste Antydning til Syzygier; men anderledes forholder det sig med gamle Individuer, hos dem er nemlig de af Carpenter beskrevne „trifacial articulations“ fuldstændigt ankyloserede og danne sande Syzygier, hvori ingen Bevægelse findes. Muskulaturen er ogsaa her saagodtsom ganske atrofieret, medens den hos de unge Dyr er i fuld Vigør.

Forbindelsen (Suturen) imellem de første Radialer og Basalerne er meget løsere end mellem disse og det øverste Stamled, hvorfor Kronen temmelig let løsrides fra Stilken saaledes, at Basalerne sidde igjen paa denne. Dette Forhold synes at være Tilfældet med flere stilkede Crinoider; saaledes viste det sig, at af de to Exemplarer af *Bathycrinus gracilis*, der i 1869 blev fundet paa Porcupine-Expeditionen, var det enes Krone løsrevet paa den omtalte Maade, og af *Bathycrinus campbellianus*, hvoraf kun en Krone er kjendt, viser denne sig at være skilt fra Stilken med Basalerne. Men det mærkeligste i dette Tilfælde indtraf dog ved Station 146 i det stille Ocean, hvor Skraben maa have gaaet over en lille Skov af *Bathycrinus aldrichianus*. Dr. Carpenter meddeler med Hensyn hertil: „About a dozen tolerably perfect individuals were obtained, together with a considerable number of stems retaining the basal ring

after renewed investigations, that I am able to confirm the correctness of the syzygia previously described by me, both between the 1st and 2nd radials as well as between the 1st and 2nd brachials, also between the 4th and 5th, and so onwards. Dr. Carpenter says with regard to this: „To the kindness of Dr. Danielssen I have been able to satisfy myself that these „syzygial unions“ in the arms of *Bathycrinus carpenteri* are really trifacial articulations like that between the two outer radials of *Bathycrinus aldrichianus*. If, however, this term be substituted for syzygy in the description by Danielssen and Koren, their statements respecting the grouping of the brachials would be perfectly correct, i. e. in the nine lowest brachials there are alternations of a pair of joints united by trifacial articulations and a single joint with muscular articulations at both ends. Beyond the ninth brachial the two forms of articulation alternate with great regularity. Apart from the question of nomenclature, therefore, the Norwegian naturalists were the first who correctly described the grouping of the joints in the arms of *Bathycrinus*; for I find that their description of *Bathycrinus carpenteri* applies both to the little *Bathycrinus gracilis* dredged by the Porcupine and to the two Challenger species, *Bathycrinus aldrichianus* and *Bathycrinus campbellianus*. The non-syzygial nature of the paired unions in the arms of the two last has been determined by actual investigation of the joint faces; while careful microscopic examination of the small individual of *Bathycrinus gracilis* has convinced me that it resembles the other three species in this respect“.

Dr. Carpenter is, in regard to the joints, in the radials as well as in the arms of *Bathycrinus carpenteri*, both right and wrong. It is quite the case that in young individuals there are really the articulations he has shown, and not syzygia as I have described; indeed in perfectly young individuals there is not even the least indication of syzygia, but it is different in the case of old individuals; in them the „trifacial articulations“ described by Carpenter are completely ankylosed, and form real syzygia in which no mobility exists. The musculosity is here, also, almost perfectly atrophied, while in young animals it is in full vigour.

The connection (the suture) between the first radials and the basals is much looser than between these and the uppermost stalk-joint, so that the crown permits itself to be easily detached from the stalk in such a manner that the basals are left behind. That relation seems to be the case in several stalked crinoids; it thus appeared, that of the two specimens of *Bathycrinus gracilis* which were found on the Porcupine expedition in 1869, the crown of the one was detached in the manner spoken of, and *Bathycrinus campbellianus*, of which only one crown is known, shows the crown to have been separated from the stalk at the basals. But the most remarkable circumstance in that relation took place at station 146, in the Pacific Ocean, where the dredge must have passed over a small forest of *Bathycrinus aldrichianus*. Dr. Carpenter states in regard to this: „About a dozen tolerably perfect individuals were

at their upper ends. This fact is one of no little importance from the light which it throws on the supposed composition of the calyx in the fossil genus *Eugeniocrinus* and its allies *Phyllocrinus* and *Tetracrinus*. These genera are very common in the Jurassic and Lower Cretaceous rocks, especially of the Continent, but by far the greater number of calyces which are met with consist of the radials alone, just like that of *Bathycrinus campbellianus*, and the family has accordingly been described as distinguished by the absence of basals. De Lorial says, for example, „Le calice est formé de pièces radiales seulement sans pièces basales.“¹

Mærkeligt nok finde vi et lignende Forhold paa den norske Nordhavsexpedition. Ved Station 303, 1200 Favne, Temperatur -1.4 C., bragte Skraben op henved 20 Stilke, enkelte Kroner og kun et Par fuldstændige Exemplarer. Den var aabenbart gaaet over en liden Skov af Bathycriner; thi de laa alle samlet i Skraben. Paa samtlige Stilke iagttoges Basalerne, medens de to Kroner kun havde de 1ste Radialer, ingen Basaler. En af disse Stilke er afbildet paa Plade I, Fig. 3. Men foruden paa denne Station fandtes ogsaa paa andre enkeltvis lignende Stilke uden Krone, og iblandt disse var der Stilke, som vel havde tabt sin Krone (Hoved), men hvor en ny saadan var begyndt at dannes. Paa Station 205, 1287 Favne, Temperatur -1.7 C., bragte Skraben op et Par haandfuld Ler, hvori fandtes nogle Stilke med Basaler og et Par Kroner uden saadanne. Men imellem Stilkene var der en, paa hvilken en ny Krone var begyndt at dannes. Stilken var 110^{mm} høi, Kronen 2.5^{mm} høi og Roden 20^{mm} lang, Tab. III, Fig. 1. Kronens Radialer vare ved en temmelig bred Søm fæstede til Basalerne, Tab. III, Fig. 2 a, der vare sammenvoxede og dannede en fast Ring som paa ældre Individuer, Tab. III, Fig. 2 c, og som tydeligt viste, at medens Radialerne vare Nydannelse, tilhørte Basalerne den ældre, affaldne Krone og udgjorde det egentlige Bæger (Calyx), hvorfra den nye Krone udgik. Imellem 1ste og 2det og imellem dette og 3die Radial var der en tydelig Leddeflade, Tab. III, Fig. 2 b, ligesom 3die Radiale (Radiale axillare) havde som sædvanligt en dobbelt Leddeflade, hvorfra udgik 2 Grene. Hver af disse havde endnu kun 4 Led, og følgelig vare heller ingen Pinnuler dannede. Skiven (Perisomet) var næsten plan, og paa Midten iagttoges Mundaabningen, hvorfra udgik 5 Linier (Radialfurerne), der gik over paa Armenene. I et Radialfelt henimod Skivens Periferi saaes en yderst liden, fremstaaende Knop, der sandsynligvis var Rectum. Tentaklerne kunde ikke iagttages; forøvrigt var det yderst vanskeligt at kunne faa observere Skiven, da den var stærkt lukket ved de korte Arme, som ikke uden at molesteres kunde fjernes fra hverandre. Paa Armenene saaes vel Ambulacralfuren, men ingen Tentakler. At en ny Krone paa dette Exemplar var ifærd med at dannes, synes at være

obtained, together with a considerable number of stems retaining the basal ring at their upper ends. This fact is one of no little importance from the light which it throws on the supposed composition of the calyx in the fossil genus *Eugeniocrinus* and its allies *Phyllocrinus* and *Tetracrinus*. These genera are very common in the Jurassic and lower cretaceous rocks, especially of the Continent, but by far the greater number of calyces which are met with consist of the radials alone, just like that of *Bathycrinus campbellianus*, and the family has accordingly been described as distinguished by the absence of basals. De Lorial says, for example: „Le calice est formé de pièces radiales seulement sans pièces basales.“¹

Strangely enough, we find a similar relation on the Norwegian North Atlantic expedition. At station 303, in 1200 fathoms, temperature -1.4 C., the dredge brought up about 20 stalks, a few crowns, and only a couple of complete specimens. It had evidently passed over a small forest of Bathycrinidæ, because they lay all together collected in the dredge. The basals were observed on all the stalks, whilst the two crowns had only the 1st radials and no basals. One of these stalks is illustrated in Plate I, fig. 3. But, besides at that station, there were found at others occasional similar stalks without crown, and amongst these were found stalks which, it is true, had lost their crown but in which a new crown had begun to be formed. At station 205, in 1287 fathoms, temperature -1.7 C., the dredge brought up a couple of handfuls of clay in which a few stalks with basals were found, and a couple of crowns without any such. But among the stalks there was one in which a new crown was begun to be formed. The stalk was 110^{mm} in height, the crown 2.5^{mm} high, and the root 20^{mm} in length (Pl. III, fig. 1). The radials of the crown were attached to the basals by a pretty broad seam (Pl. III, fig. 2 a), the basals being concreted and forming a firm ring as upon old individuals (Pl. III, fig. 2 c), which distinctly showed that, while the radials were a new formation, the basals pertained to the old detached crown and formed the real cup (calyx) from which the new crown issued. Between the 1st and 2nd, and between that and the third radial there was a distinct articular surface (Pl. III, fig. 2 b), while also the 3rd radial (radiale axillare) had, as usual, a double articular surface from which 2 branches issued. Each of these had still only 4 joints and, consequently, neither were there any pinnules formed. The disc (the perisome) was almost plane, and in the middle was observed the oral aperture, from which 5 lines issued (the radial grooves) and passed over on to the arms. In one radial area near the periphery of the disc, an extremely small projecting bud was seen, which probably was the rectum. The tentacles could not be observed; it was otherwise extremely difficult to observe the disc, as it was strongly closed by the short arms, which could not, without

¹ Report upon the Crinoidea collected during the Voyage of H. M. S. Challenger — by P. Herbert Carpenter. Zoology Vol. XI pag. 227.

¹ Report upon the Crinoidea collected during the Voyage of H. M. S. Challenger — by P. Herbert Carpenter. Zoology Vol. XI page 227.

utvivlsomt. Den store, fuldt udviklede Stilk og den i Forhold dertil saa yderst lille Krone hentydede allerede derpaa, og naar man tillige saa hen til Kronens Dannelse, at Radialerne vare forholdsvis temmelig lange og smale, at Basalerne vare sammenvoxede til en fast Ring uden Spor af Sømme, og at Armene vare kun lidet udviklede, saa synes enhver Tvivl at maatte svinde.

Sammenligner man dette Exemplar med et normalt udviklet Individ af samme Størrelse, saa er Kronen paa dette omkring 15^{mm} høi med Arme forsynede med Pinnuler, Ambulacralfure og Tentakler. Der er vel heller ikke noget væsentligt til Hinder for en saadan ny Kronedannelse; thi Basalerne paa den gamle Stilk danner jo den nederste Del af Calyx, som indeslutter det femkamrede Organ med sit Centralnervesystem, og Centralkarret i Stilken, der fører Næringsvædsken til det femkamrede Organ, vil jo forsyne Nydannelsen med de fornødne Næringsmidler. Iblandt Echinodermerne er det især for Asteridernes Vedkommende, at flere Forskere ere af den Mening, at en løsrevne Arm er istand til at producere en ny Skive, og jeg er ikke i Tvivl om, at dette forholder sig saa. Jeg har iagttaget paa *Asterias Mülleri*, at den afkastede dels 1, dels 2 Arme, og at der fra den løsrevne Arm, som levede 3—4 Uger efter Løsrivelsen, begyndte at udskyde en Knop, der antog en aflang Form, og som var Anlægget til den vordende Skive. I Knoppens Hulhed var den begyndende Mave, en Forlængelse af det i Armen værende Maveappendix, der korresponderede med Hulheden. Jeg kunde ikke holde den løsrevne Arm længere i Live, særegne Omstændigheder bidrog dertil, saa en fuldstændig Skivedannelse ikke kom istand. Den ny Kronedannelse paa den gamle Stilk hos *Bathycrinus Carpenteri* staar saaledes ikke som noget isoleret Phænomen men finder sit Tilknytningspunkt i den omtalte Skivedannelse hos enkelte Asterider. Dersom jeg kun havde det ene Exemplar at støtte mig til med Hensyn til den nye Kronedannelse, saa kunde man tænke sig, at man havde med en særegen, isoleret Abnormitet, men saa er ikke Tilfældet; thi paa to andre Stationer fandtes lignende Exemplarer, kun lidt forskjellig i Størrelse og Udvikling.

Paa Station 295, 1110 Favne, Temperatur —1.2 C., opfangedes med Travlen i tyndt Ler flere Exemplarer af *Bathycrinus Carpenteri*, hvoraf de fleste vare uden Krone, men alle Stilke vare forsynede med Basaler; iblandt disse var der en, som frembød en ny Kronedannelse. Stilken var 122^{mm} høi, Roden 35^{mm} lang og Kronen 3.5^{mm} høi, Tab. III, Fig. 3. Stilken havde Udseende af at være temmelig gammel; paa flere Steder af den havde der fæstet sig smaa Alcyonarie-Kolonier, Tab. III, Fig. 3 a, hvoraf den ene, den største nemlig, visselig daterer sig fra en ældre Tid. Leddene vare meget store og lidet bøielige, saaledes som Tilfældet er hos gamle Individuer, og Basalerne vare fuld-

damaging them, be separated from each other. On the arms, it is true, the ambulacral groove was seen, but no tentacles. That a new crown was in course of formation in that specimen seems to be indubitable. The large, fully developed stalk with the relatively so small crown already indicated that, and when, besides, we regard the formation of the crown, that the radials were relatively pretty long and narrow, that the basals were concreted into a firm ring without trace of seams, and that the arms were only little developed, it appears as if every doubt must disappear.

If we compare that specimen with a normally developed individual of the same size, the crown upon the latter is about 15^{mm} in height, with arms furnished with pinnules, ambulacral grooves and tentacles. Neither is there, probably, any essential hindrance to the formation of such a new crown, because the basals on the old stalk form, of course, the lowest part of the calyx, which encloses the five-chambered organ with its central nervous system, and the central vessel in the stalk which leads the nutritory fluid to the five-chambered organ will, of course, supply the new formation with the necessary nutriment. Among the Echinoderms it is especially in regard to the Asterids that several naturalists hold the opinion that a detached arm is able to produce a new disc, and I entertain no doubt that it is so. In *Asterias Mülleri* I have observed that it threw off, partly 1, partly 2 arms, and that on the detached arm, which survived for 3—4 weeks after the detachment, a bud began to grow, which assumed an oblong form and was the rudiment of the future disc. In the cavity of the bud was the rudimentary stomach, a prolongation of the stomach-appendix situated in the arm, which corresponded with the cavity. I could not maintain the detached arm longer alive, special circumstances contributed to that, so that a complete formation of disc did not take place. The new formation of crown on the old stalk of *Bathycrinus carpenteri* does not, therefore, stand as an isolated phenomenon, but finds its connecting point of resemblance in the discal formation spoken of in a few Asterids. If I only had had the one specimen upon which to base my opinion in regard to the formation of the new crown, then it might be supposed that one had to do with a special, isolated abnormality; but that is not the case, as at two other stations similar specimens were found, differing only a little in size and development.

At station 295, in 1110 fathoms, temperature —1.2 C., several specimens of *Bathycrinus carpenteri* were secured by the trawl in thin clay, of which the greater number were without crown, but all the stalks were furnished with basals; among these was one that presented a new formation of crown. The stalk was 122^{mm} in height, the root 35^{mm} long, and the crown 3.5^{mm} high (Pl. III, fig. 3). The stalk had the appearance of being pretty old: on several portions of it colonies of Alcyonaria had attached themselves (Pl. III, fig. 3 a), of which one, the oldest namely, evidently dated from an older period. The joints were very large and little flexible, like what is the case in old individuals,

stændigt sammenvoxede og dannede udvendig en glat Ring, hvor selv ved stærk Forstørrelse ingen Sømme var at opdage, Tab. III, Fig. 4 a. Radialerne vare lange, saaledes som de almindelig ere hos unge Individier, Tab. III, Fig. 4 b, og der var fuldstændig Ledbevægelse baade mellem 1ste og 2det, og mellem dette og 3die Radial, Tab. III, Fig. 4 c. Armene havde 7, temmelig lange Led, som alle vare bevægelige, og intet Syzygium var endnu dannet. Armene vare uden Pinnuler, og paa deres ventrale Flade saaes en Ambulacralfure, der ikke var meget dyb, men hvori enkelte smaa, koniske Fremstaaenheder viste sig, hvilke vare de fremtrædende Tentakler. Skiven var som paa den foregaaende, dog kunde Antydninger til Tentakler iagttages ved Munden.

Paa Station 353, i en Dybde af 1330 Favn, Temperatur -1.0 , hvor Bunden var Ler med smaa Rullestene, fandtes en Del Stilke, hvorpaa Basalerne vare fæstede, men ingen Kroner. Paa en af disse Stilke var en begyndende Kronedannelse. Stilken var 170^{mm} høi, Roden 15^{mm} lang, og Kronen 7^{mm} høi. Stilkens øverste Del var besat med Hydroider, hvorefter de fleste vare uddøde og havde tilbage ladt de chitinagtige Rør, imedens enkelte endnu vare ilive, Tab. III, Fig. 5, 6. Ogsaa paa dette Exemplar viste Stilken sig at være meget gammel i Forhold til Kronen. Basalerne vare sammenvoxede, og det var ikke muligt at opdage de 5 Længdesømme, hvilket jo er temmelig let paa unge Individier. Der var intet Syzygium imellem 2det og 3die Radial, saaledes som man altid finder hos gamle Dyr; tvertimod var der en temmelig udpræget Leddeflade, Tab. III, Fig. 6 a. Armene havde 17—18 Led; heller ikke paa dem fandtes noget Syzygium; men fra det 11te Led saaes 3 Pinnuler afvekslende paa hver Side af hver Arm. Ambulacralfuren, som var temmelig dyb, var forsynet med Tentakler, der ogsaa iagttoges enkeltvis paa Pinnulerne. Skiven var noget mere hvælvet end paa de to foregaaende og havde faaet et Par Mundtentakler, ligesom Radialfurene, som udgik fra Munden, vare temmelig tydelige. Der var endnu ingen Oralplader dannet, men paa den papilleformede Rectum saaes den runde Analaabning. Jeg var ikke saa heldig at finde tidligere Udviklingsstadier, end de tre ovenfor beskrevne; men jeg tør antage, at de afgive tilstrækkeligt Vidnesbyrd om, at Stilken med Basaler vil, efter at den paa en eller anden Maade er bleven skilt ved sit Hoved (Kronen), kunne reproducere et nyt saadant. Af de mange Stilke, som fangedes paa Expeditionen, var der neppe en, som var uden Basaler, og det er da et Spørgsmaal, om ikke *Bathycrinus Carpenteri* frivillig kaster sin Krone for af en eller anden Grund at danne en ny. Det kan da antages, at den formerer sig foruden paa den almindelige, kjønslige Vei, ogsaa ved en Slags Knopskydning. Paa flere af de løse Kroner, jeg fandt, vare Pinnulerne uden udviklede Kjønnsorganer paa samme Tid, som de paa Stilkene siddende Kroner bare Pinnuler, hvor Kjønnsorganerne vare stærkt opsvulmede af Kjønnsprodukter; var nu dette tilfældigt, eller var Kronen kastet, fordi den var for gammel til at forplante Slægten?

and the basals were perfectly concreted, and formed exteriorly a smooth ring where, even on powerful magnification, no seams could be discovered (Pl. III, fig. 4 a). The radials were long, like what they generally are in young individuals (Pl. III, fig. 4 b) and there was perfect articular flexibility both between 1st and 2nd, and between that and the 3rd radial (Pl. III, fig. 4 c). The arms had 7, pretty long joints, which were all flexible, and no syzygium was yet formed. The arms were devoid of pinnules, and on their ventral surface an ambulacral groove was observed, which was not very deep, but in which a few small conical projections showed themselves; these were the advancing tentacles. The disc was like that of the preceding specimen, but indications of tentacles could be observed at the mouth.

At station 353, at a depth of 1330 fathoms, temperature -1.0 C., where the bottom was clay with small gravel, some stalks were found on which the basals were attached, but no crowns. On one of those stalks there was a rudimentary formation of crown. The stalk was 170^{mm} in height, the root 15^{mm} long, and the crown 7^{mm} high. The uppermost portion of the stalk was beset with Hydroids, of which most were dead and had left behind the chitinous tube, while a few of them were still alive (Pl. III, figs. 5, 6). Also on that specimen the stalk showed itself to be very old in relation to the crown. The basals were concreted, and it was not possible to observe the 5 longitudinal seams, which is, of course, pretty easy in the case of young individuals. There was no syzygium between the 2nd and 3rd radials, like what we always find in old animals; on the contrary there was a pretty prominent articular surface (Pl. III, fig. 6 a). The arms had 17—18 joints; neither upon them was there any syzygium found, but from the 11th joint 3 pinnules were seen alternating upon each side of each arm. The ambulacral groove, which was pretty deep, was furnished with tentacles, and these were also observed, singly, on the pinnules. The disc was somewhat more arcuate than in the two preceding specimens, and had obtained a couple of oral tentacles, while, also, the radial grooves which issued from the mouth were pretty distinct. No oral plates were yet formed, but on the papilliform rectum the round anal aperture was observed. I was not so fortunate as to find earlier stages of development, other than the three described above, but I venture to think that these afford sufficient evidence that the stalk with the basals will, after in some manner or other having become separated from its head (the crown), be able to reproduce a new one. Of the many stalks secured on the expedition there was scarcely one that was without basals, and it becomes therefore a question, whether *Bathycrinus carpenteri* does not voluntarily cast its crown in order, for some reason or other, to form a new one. It may be assumed then that it reproduces itself, besides in the usual sexual manner, also by a kind of budding process. On several of the detached crowns I found that the pinnules had no developed sexual organs, while at the same time the crowns seated on the stalk carried pinnules in which the sexual organs were greatly swollen by

Naar Bathycrinus Carpenteri udvikler sig paa almindelig Vis, finder man aldrig en meget lang, fuldt udvoxet Stilk, bærende en yderst liden Krone. Saavidt jeg tør drage en Slutning fra de Individer af forskjellig Størrelse, der fangedes paa Expeditionen, udvikler Stilk og Krone sig proportionalt, saaledes nemlig, at hverken den ene eller anden overskrider det indbyrdes Forhold, hvori de ifølge Lovmæssigheden ere bundne til hinanden. Paa et Individ, der var 49^{mm} høit, var Stilken 30^{mm}, Kronen 9^{mm} høi, og Roden 10^{mm} lang, Tab. III, Fig. 7. Stilken havde omtrent 32 tydeligt udprægede Led, der havde antaget Formen som hos det fuldvoxne Dyr, Tab. III, Fig. 8 a, og som indtog de nederste $\frac{4}{5}$ Parter, medens Leddene paa den øverste Femtepart vare yderst utydelige, — og det var efter al Sandsynlighed paa denne Del, at nye Led dannedes, efterhaanden som Stilken voxede. Basalerne vare sammenvoxede, men man kunde dog endnu se fine Længdelinier eller Sømme paa de Steder, hvor Sammenvoxningen havde fundet Sted, Tab. III, Fig. 8 b. Armene vare noget forskellige i Længde, alt eftersom de vare mere eller mindre udviklede; thi det var synbart, at Udviklingen ikke var skreden lige langt frem paa alle Arme. Nogle havde 14—15 Led, andre havde 17—20, og det var at mærke, at de yderste Led vare noget kortere, end de længere nede paa Armen, saaledes at Nydannelsen af Led her, ligesom paa Stilken, foregik paa den øverste Del. Paa 11te Led udgik fra dets distale Side en Pinnul, som var knapt 1^{mm} lang, og paa de Arme, der havde 16—20 Led viste der sig dels 1, dels 2 Pinnuler desforuden, imedens de Arme, som kun havde 14—15 Led endnu ikke havde faaet mere, end denne ene Pinnul paa 11te Led. Saavel Radial- som Brachialfurerne vare temmelig dybe og forsynede med udviklede Tentakler, ligesom der ved den runde Mund saaes en Begyndelse til Oralpladen, og langs Brachialfurerne de for det voxne Individ særegne Kalkklapper, Tab. III, Fig. 8 c.

Vil man nu sammenligne det nys beskrevne, unge Dyr, der havde udviklet sig paa sædvanlig Vis af et Æg, med de, hvor en ny Krone efter min Formening er dannet paa en gammel Stilk, saa antager jeg, at der ikke vil kunne reises synderlig Tvivl om, at den sidstnævnte Udviklingsmaade maa betragtes som en Slags Knopskydning.

Anatomisk-histologiske Notitser.

Der er leveret af D'Herrer Professorer W. A. H. Carpenter, Ludvig, Perrier, C. Vogt og Hamann temmelig udtømmende, anatomisk-histologiske Undersøgelser af Crinoiderne, saa at, hvad jeg kan meddele, kun kan være dels for at konstatere, hvad der tidligere er gjort, dels for at hen-

the sexual products; now, was that an accidental circumstance, or was the crown thrown off because it had become too old to reproduce the genus?

When Bathycrinus carpenteri develops itself in the usual manner we never find a very long, fully developed stalk carrying an extremely small crown. So far as I may draw a conclusion from the individuals of various size that were secured by the expedition, the stalk and the crown develop themselves proportionally to each other, in such a manner namely, that neither the one nor the other exceeds the mutual relation in which they by nature's law are bound to each other. In an individual which was 49^{mm} in height, the stalk was 30^{mm} long, the crown 9^{mm} in height, and the root 10^{mm} in length (Pl. III, fig. 7). The stalk had about 32 distinctly prominent joints, which had assumed the same form as in the full grown animal (Pl. III, fig. 8 a) and occupied the lowest four-fifths portion, whilst the joints on the uppermost fifth portion were extremely indistinct. — and it was on this portion that, in all probability, new joints formed themselves, according as the stalk grew. The basals were concreted, but fine longitudinal lines or seams could still be observed in those situations where the concretion had taken place (Pl. III, fig. 8 b). The arms were somewhat variable in length, according as they were more or less developed, as it was evident that the development had not advanced equally far on all the arms. A few had 14—15 joints, others had 17—20, and it was to be noted that the outermost joints were somewhat shorter than those farther down on the arm, so that the new formation of joints here, like as on the stalk, took place in the uppermost part. On the 11th joint there issued from its distal side a pinnule, which was barely 1^{mm} long; and on the arms, which had 16—20 joints, there appeared partly 1 partly 2 additional pinnules, whilst the arms that had only 14—15 joints had not yet obtained more than that single pinnule on the 11th joint. Both the radial, as well as the brachial grooves are pretty deep, and are furnished with developed tentacles, whilst also the commencement of an oral plate is observed at the round mouth, and along the brachial grooves the calcareous valves peculiar to the full grown individual are seen (Pl. III, fig. 8 c).

If we now compare the young animal just described, which had developed itself in the ordinary way from an ovum, with those in which a new crown has, in my opinion, been formed upon an old stalk, then, I believe, there can not be raised any material doubt that the last-named mode of development must be regarded as a kind of budding process.

Anatomo-histological Remarks.

Pretty exhaustive anatomo-histological investigations of the Crinoids have been published by Messieurs, Professor W. A. H. Carpenter, Ludvig, Perrier, C. Vogt and Hamann, so that what I have to report can only serve to partly confirm what has been done previously, and partly

lede Opmærksomheden paa enkelte Særegenheder ved *Bathycrinus Carpenteri*.

Stilken er udvendig beklædt med en yderst tynd, hyalin, strukturløs Cuticula, indenfor hvilken er et Lag Epithel, dannet af temmelig regelmæssige, kubiske Celler med et kornet, plasmatisk Indhold og en næsten centralliggende, rund Kjerne med sit Kjernelegeme. Indenfor Epithellet og overtrukket af dette findes det egentlige Kalkskelet, som er sammensat af de tidligere omtalte Led, dannet af stærke Bindevævsnet, i hvis Masker Kalken er afleiret, Tab. III, Fig. 9 a. Imellem Leddene findes stærke, elastiske Fibre, der binde Leddene sammen, Tab. III, Fig. 9 b, men paa samme Tid bidrage til at gjøre Stilken temmelig bøielig. Naar det netformede Bindevæv nærmer sig Stilkens Centraldel, antager det en tættere og fastere Form, hvorved dannes en temmelig fast Membran, Tab. III, Fig. 9 c, 10 a, der beklæder hele Centralaxen og kan betragtes som en Skede for det indenfor værende Kar. Dette består af en tynd Membran; hvis indre Væg er beklædt med et Epithel, dannet af temmelig smaa, næsten runde Celler med deres Kjerne og Kjernelegeme, Tab. III, Fig. 9 d, 10 b; Tab. IV, Fig. 1 a, og paa hvis ydre Væg, imellem denne og Skeden, findes Nervefibriller og spredte Gangliceller, Tab. III, Fig. 9 e, 10 c. I Karrets Lumen cirkulerer en Vædske, der indeholder klare, runde Legemer med et kornet Indhold, Tab. III, Fig. 9 f, 10 d, og som efter Døden samler sig i større eller mindre Klumper, Tab. IV, Fig. 1 b. Nerveforgreningen strækker sig langs Karret, beklæder dette til omtrent Midten af den nederste Fjerdedel af Stilken, hvorefter den bliver mere spredt og yderst vanskelig at iagttage; i Rødderne er den ganske forsvunden, ligesaa lidt som der i disse kan iagttages noget Kar, imedens dog de smaa, runde, klare Legemer med kornet Indhold findes der, men sparsomme end i Centralkarret. Dette løber nu uforandret op imod det femkamrede Organs nedre Forlængelser, hvormed det forener sig.

Det femkamrede Organ er placeret i den nederste Halvdel af Calyx og dannes af en fast Bindevævsmembran, hvis udvendige Væg er ved Bindevævsstraade fæstet til Calyxvæggen, og fra hvis indre Væg udgaa vifteformigt mod Centrum 5 Skillevægge, Tab. IV, Fig. 2 a, som forener sig indad og danner derved Centralkanalen, Tab. IV, Fig. 2 b, hvori det saakaldte Dorsalorgan findes. Opad forlænger det kamrede Organ sig i 5 smale, pølseformige Blindsække, der følge Dorsalorganet op imod 2det Radiale, og nedad forlænger det sig ligeledes med 5 Kanaler, som blive alt smalere og smalere jo længere de naa ned i Stilken, indtil de, omtrent $1-1\frac{1}{2}$ Centimeter fra Basalerne, gaa over i Centralkarret. Hele Kammerorganet med dets Skillevægge er beklædt med Epithel, der består af temmelig lave Cylinderceller, men hvorvidt disse vare forsynede med Cilier, kunde ikke iagttages. Det kamrede Organ er opad ganske afsluttet; thi det har ikke været muligt at opdage nogen Aabning, som kunde sætte det i direkte Forbindelse med det af Professor Perrier paaviste Irrigationsapparat,

to direct attention to a few peculiarities in *Bathycrinus carpenteri*.

The stalk is covered exteriorly with an extremely thin, hyaline, structureless cuticulum, inside of which there is a layer of epithelium formed of pretty regular cubical cells containing a granular plasmatic substance and an almost centrally situated round nucleus with its corpuscle. Inside of the epithelium, and clad by it, the real calcareous skeleton is found, which is composed of the previously mentioned joints, formed of strong connective-tissue reticulation in whose meshes the lime is deposited (Pl. III, fig. 9 a). Strong elastic fibres which bind the joints together (Pl. III, fig. 9 b), are found between the joints, but at same time contribute to make the stalk pretty flexible. When the reticulated connective-tissue approaches the central portion of the stalk, it acquires a denser and firmer form, which causes a pretty firm membrane to be produced (Pl. III, figs. 9 c, 10 a), that clothes the entire central axis and may be considered a sheath for the vessel lying inside. This consists of a thin membrane whose inner wall is clad with an epithelium formed of pretty small, almost round cells with their nuclei and corpuscles (Pl. III, figs. 9 d, 10 b; Pl. IV, fig. 1 a), and upon whose outer wall, between it and the sheath, nerve-fibrils and scattered ganglial cells are found (Pl. III, fig. 9 e, 10 c). In the channel of the vessel a fluid circulates, which contains clear round bodies with a granular substance (Pl. III, fig. 9 f, 10 d) and which after the animal's death collects into larger or smaller clumps (Pl. IV, fig. 1 b). The nervous ramification stretches itself along the vessel, and clothes it until about the middle of the lowest fourth part of the stalk, after which it becomes more spread and extremely difficult to observe; in the roots it entirely disappears, and just as little can any vessel be observed in these, whilst, however, the small, round clear bodies with granular substance are found there, but more sparingly than in the central vessel. That passes now without change, up towards the lower prolongations of the five-chambered organ, with which it unites.

The five-chambered organ is situated in the lowest half part of the calyx, and is formed by a firm connective-tissue membrane whose exterior wall is secured to the wall of the calyx by connective tissue filaments, and from whose inner wall 5 divisional walls issue in flabelliform towards the centre (Pl. IV, fig. 2 a) and unite themselves inwards, thereby forming the central canal (Pl. IV, fig. 2 b) in which the so-called dorsal organ is found. At the top the chambered organ prolongs itself into 5 narrow, sausage-shaped caeca, which follow the dorsal organ up towards the 2nd radial; and it likewise prolongs itself downwards with 5 canals which become narrower and narrower the farther they reach down the stalk, until they, at about $1-1\frac{1}{2}$ centimetres from the basals, pass over into the central vessel. The entire chambered organ with its divisional walls is clad with epithelium which consists of pretty low cylinder-cells, but whether these were furnished with cilia could not be observed. The chambered organ is quite closed at the top, as it has not been possible to discover

imedens det nedad staar i Forbindelse med det ovenfor beskrevne Centralkar. I den Del af Kamret, der forlænger sig ned i Stilken, ere Skillevæggene forsynede med paa-tversløbende Muskelfibriller, som dog findes kun paa Septumets ene Side, Tab. IV, Fig. 2 c. Imedens disse Muskelfibriller ere temmelig tydeligt at iagttage paa Skillevæggene i Stilken, har det ikke været muligt med Sikkerhed at paa-vise dem længere oppe i den store, brede Del af Kammerorganet, hvor Skillevæggene synes at være stærkest udviklede. I Kammerorganet findes det samme Fluidum med sit globulære Indhold, som ovenfor er omtalt i Centralkaret, og saavidt jeg har kunnet erfare, sættes dette Fluidum kun ved Endosmose i Forbindelse med den almindelige Cirkulation.

Det saakaldte Dorsalorgan (kjertelformige Organ), der har været Gjenstand for saa forskellige Tydninger, og som der først i den seneste Tid er bragt nogen Klarhed over, væsentlig af Professor Perrier, har hos Bathycrinus Carpenteri ikke været saa særdeles vanskeligt at faa Rede paa, da Materialet har været baade godt konserveret og nogenlunde rigeligt. Dorsalorganet er beliggende i den før beskrevne Centralkanal, Tab. IV, Fig. 2 d, dannet af Kammerorganets Septa. Det er langstrakt, omgivet af en Bindevævs-membran, der ligger temmelig tæt ved Kanalens Væg og udvendig beklædt med Epithel af lave, næsten kubiske Celler, Tab. IV, Fig. 3 a. Det er dannet af en Mængde slangeformige Blindsække, adskilte ved yderst tynde Membraner, der ere Forlængelser af den ydre Bindevævsmembrans indre Væg, hvorved det paa Tversnit faar et lappet Udseende, Tab. IV, Fig. 3 b. Disse Blindsække ere indvendig beklædte med et Epithel, der bestaar af temmelig store, runde Celler med Kjerne og Kjernelegeme, og hvis Indhold er et yderst fint kornet Protoplasma, Tab. IV, Fig. 3 c. Naar Dorsalorganet er kommet ovenfor det femkamrede Organ, lægger det sig lidt til Siden imellem to Tarmslynger, Tab. IV, Fig. 3 d, 4 a, og stiger nu op mod Mundskiven i Høide med Forbindelsen imellem 2det og 3die Radiale, hvor det afgiver 5 Stammer, som synes at være forbundne med Tvergrene, Tab. IV, Fig. 4 b. Hver af disse 5 Stammer dele sig ved den øverste Del af det 3die Radiale i to Grene, der gaa til hver sin Arm, Tab. IV, Fig. 4 c; hver Gren fortsætter nu Løbet i Genitalkanalen, som ligger i Skillevæggen imellem Dorsal- og Ventralkanalen, og forlænger sig ind i Pinnulen, hvor den udvider sig noget og danner her det egentlige Kjønnsorgan.

Saa vel de 5 Stammer som senere deres to Grene er paa deres indre Væg, altsaa ogsaa paa det indre Genitalrørs Væg, beklædt med et lignende Epithel, som det, der er beskrevet ovenfor ved det kjertelformige Organ (Dorsalorganet). Det indre Genitalrørs ydre Væg ligger ganske til det ydre Genitalrørs indre Væg, saa at det er yderst

any aperture that could place it in direct connection with the irrigation apparatus described by Professor Perrier, whilst at the foot it is placed in connection with the central vessel described above. In that portion of the chamber that prolongs itself down in the stalk, the divisional walls are furnished with obliquely running muscular fibres, which are, however, only found on the one side of the septum (Pl. IV, fig. 2 c). Whilst these muscular fibres may be pretty distinctly observed on the divisional walls in the stalk, it has not been possible to discover them, with certainty, farther up in the large, broad portion of the chambered organ, where the divisional walls appear to be most developed. The same fluid with its globular contents, as is spoken of previously as contained in the central vessel, is found in the chambered organ, and, so far as I have been able to experience, this fluid is placed in connection with the general circulation only by endosmose.

The so-called dorsal organ (gland-shaped organ) which has been the object of such different explanations, and in regard to which there first in quite late times has been thrown some light, chiefly by Professor Perrier, has as regards Bathycrinus carpenteri not been so very difficult to elucidate, as the material has been both somewhat abundant and well preserved. The dorsal organ is situated in the first described central canal (Pl. IV, fig. 2 d) formed by the septa of the chambered organ. It is elongate, and surrounded by a connective-tissue membrane that lies pretty close to the wall of the canal, and is exteriorly clad with an epithelium of low, almost cubical cells (Pl. IV, fig. 3 a). It is formed by a multitude of anguilliform cæca separated by extremely thin membranes, which are prolongations of the inner wall of the exterior connective-tissue membrane, whereby, a patched appearance is imparted to transversal sections (Pl. IV, fig. 3 b). Those cæca are clad internally with an epithelium consisting of pretty large, round cells with nucleus and corpuscle, and containing an extremely finely granulated protoplasm (Pl. IV, fig. 3 c). When the dorsal organ has arrived above the five-chambered organ, it lays itself a little to the side between two intestinal twistings (Pl. IV, fig. 3 d, 4 a), and then rises up towards the oral disc to a level with the connection between the 2nd and 3rd radials, where it gives off 5 stems which appear to be connected by cross-branches (Pl. IV, fig. 4 b). Each of those 5 stems divides itself at the uppermost part of the 3rd radial into two branches, each of which passes over to an arm (Pl. IV, fig. 4 c); each branch then continues its course in the genital canal, which is situated in the divisional wall between the dorsal and ventral canal, and prolongs itself into the pinnule, where it expands itself somewhat and forms here the real sexual organ.

The 5 stems as well as, subsequently, their two branches are, upon their inner wall, consequently also on the inner wall of the genital tube, clad with an epithelium similar to that described above in connection with the gland-shaped organ (the dorsal organ). The outer wall of the inner genital tube lies quite in to the inner wall of

vanskeligt at iagttage noget Rum imellem, og heller ikke nogen Epithelbeklædning, saaledes som Dr. Hamann¹ angiver at være Tilfældet hos *Antedon rosea*, imedens det ydre Genitalrør, der baade paa sin udvendige og indvendige Væg er beklædt med Epithel, hvis Celler ere lave, næsten kubiske, er saavidt fjernet fra Genitalkanalens Væg, at et smalt Rum bliver synbart imellem dem. I dette Rum sees flere tynde Bindevævstraade at løbe fra den ene Væg til den anden og danne paa enkelte Steder et Net (Plexus genitales?). Noget særskilt Kar, hvori Rachis skulde ligge, har jeg ikke fundet.

Det fremgaar af ovenstaaende korte Beskrivelse, at Genitalrøret staar i umiddelbar Forbindelse med det saakaldte Dorsalorgan og er en Fortsættelse af dette ind i Pinnulerne, hvor de specielle Kjønsorganer, Æggestok og Testikler, udvikler sig hos det kjønsmodne Individ. Det gaadefulde Dorsalorgan maa vel nu ansees for at være opklaret. Perrier er den Første, der har paavist Sammenhængen imellem Dorsalorganet, som han kalder „Stolon genital“ og Genitalrøret (Rachis genital, Per.) hos unge Individuer. I sit sidste Arbeide² har han paavist, at et lignende Forhold finder Sted hos fuldvoxne Individuer af *Antedon rosea*. Dr. O. Hamann antager, at det kjertelformige Organ (Dorsalorganet) tilhører Generationsapparatet, og han udtrykker sig herom paa følgende Maade: „Somit vereinigen sich bei den Crinoiden ebenso, wie ich dies für die Asteriden und Echiniden nachgewiesen habe, die Genitalschläuche im Kelch, und es fragt sich nun, ob sie in Verbindung stehen mit dem Ende des drüsigen Organes. Ich habe sie bis in die nächste Nähe desselben verfolgt; einem Uebergang etwa des einen Organes in das andere nicht beobachtet.“³ Jeg maa forresten henvise til de to nævnte Forfattere, især Prof. Perrier, hvis Iagttagelser falder i det Væsentlige sammen med, hvad jeg har observeret hos *Bathycrinus Carpenteri*, hvorfor jeg ikke finder det nødvendigt at gaa nærmere i Detail med Hensyn til den histologiske Bygning af Dorsalorganet og dets Fortsættelse i Genitalrøret.

Som bekjendt er Kjønnen hos Crinoiderne adskilt, og anderledes forholder det sig ikke med *Bathycrinus Carpenteri*. Naar Dyret er fuldt modent til at forplante sig, svulmer det indre Genitalrør i Pinnulen temmelig betydeligt op, afgrænses baade i den Ende, der vender mod Armen, og i den, som vender mod Pinnulens fri Ende, saa at derved fremkommer et afsluttet Hulrum. Genitalrørets indre Væg er, som tidligere omtalt, rigt beklædt med et Epithel, der bestaar af flere Lag temmelig store, runde Celler, som

the outer genital tube, so that it is extremely difficult to detect any space between, or any epithelial covering, such as Dr. Hamann¹ describes to be the case in *Antedon rosea*; whilst the outer genital tube, which, both upon its external and internal walls, is clothed with epithelium whose cells are low, almost cubical, is so far removed from the wall of the genital canal that a narrow space is visible between them. In that space several thin connective-tissue filaments are observed passing from the one wall to the other, and forming in some places a reticulation (Plexus genitales?). A separate vessel, in which the rachis might lie, I have not been able to discover.

It appears from the above short description, that the genital tube is placed in immediate connection with the so-called dorsal organ, and is a continuation of it into the pinnules, where the special sexual organs, the ovary and testicles, develop themselves in the sexually ripe individual. The mysterious dorsal organ must now, surely, be considered as being elucidated. Perrier is the first who has shown the connection between the dorsal organ, which he calls „stolon genital“, and the genital tube (rachis genital, Per.) in young individuals. In his latest work² he has shown that a similar relation takes place in fully grown individuals of *Antedon rosea*. Dr. O. Hamann assumes that the gland-shaped organ (the dorsal organ) pertains to the reproductive apparatus, and he expresses himself in regard to this in the following manner: „Somit vereinigen sich bei den Crinoiden ebenso, wie ich dies für die Asteriden und Echiniden nachgewiesen habe, die Genitalschläuche im Kelch, und es fragt sich nun, ob sie in Verbindung stehen mit dem Ende des drüsigen Organes. Ich habe sie bis in die nächste Nähe desselben verfolgt; einem Uebergang etwa des einen Organes in das andere nicht beobachtet.“³ I must otherwise refer the reader to the two authors named, especially Prof. Perrier, whose observations coincide, in all material points, with what I have observed in *Bathycrinus Carpenteri*; for which reason I do not find it necessary to go more into details with regard to the histological structure of the dorsal organ and its continuation in the genital tube.

As is known the sexes in the crinoids are separated, and the case is not different in *Bathycrinus Carpenteri*. When the animal is fully ripe to reproduce itself, the inner genital tube in the pinnule swells up pretty considerably, and becomes bounded both in the extremity that faces towards the arm and in that which faces towards the free extremity of the pinnule, so that there is thus produced a closed cavity. The inner wall of the genital tube is, as previously mentioned, richly clothed with an epithelium

¹ Beiträge zur Histologie der Echinodermen, 4 Heft. Anatomie und Histologie der Ophiuren und Crinoiden von Dr. O. Hamann. Jena, 1890.

² Mémoire sur l'organisation et le développement de la Comatule de la Méditerranée par Edv. Perrier. Troisième partie; Organisation de l'antedon adult. Nouvelles Archives du Museum d'histoire naturelle. 3 Série, Tome deuxième. Paris 1890.

³ l. c. pag. 119.

Den norske Nordhavsexpedition. D. C. Danielssen: Crinoida.

¹ Beiträge zur Histologie der Echinodermen, 4 Heft. Anatomie und Histologie der Ophiuren und Crinoiden von Dr. O. Hamann. Jena, 1890.

² Mémoire sur l'organisation et le développement de la Comatule de la Méditerranée par Edv. Perrier. Troisième partie; Organisation de l'antedon adult. Nouvelles Archives du Museum d'histoire naturelle. 3 Série, Tome deuxième. Paris 1890.

³ l. c. pag. 119.

have en stor, rund Kjerne med Kjernelegeme, og som er omgivet af et fint granuleret Protoplasma. Hos Hunnen begynder nu Ovariet at dannes. Af de nævnte Celler, der maa betragtes som ovigene Dannelser (Urkeimcellen), sees mange, baade de, der ligge periferisk til Væggen og de, som nærme sig Midten af Æggestokken, at udvikle sig til Æg. De Epithelceller, der ligger nærmest det i Udvikling værende Æg, omfatter nu mere eller mindre ganske Ægget, Tab. V, Fig. 1 a, 2 a, som, idet dette voxer, skyder Epithellet foran sig, hvorved en Follikel dannes, Tab. V, Fig. 1 b, 2 b. Hos *Bathycrinus Carpenteri* er denne Follikeldannelse temmelig regelmæssig, omendskjønt der ogsaa hos denne Art forekommer nogen Uregelmæssighed. Det viser sig nemlig, at enkelte Æg kun delvis ere omgivet af den epitheliale Membran, saaledes at deres Halvdel kan være ubedækket, imedens Mængden er fuldkommen indesluttet i en Follikel, Tab. V, Fig. 2 b. Denne udvides, efterhaanden som Ægget voxer, men bliver alt tyndere og tyndere, indtil den ved dettes Fuldmødenhed brister. Ægget gennemgaar sin fulde Udvikling i Follikelen, hvad enten denne dækker helt eller halvt Ægget, og først naar Kimblæren er forsvunden og Retningslegemerne ere udtraadte, brister den follikulære Membran, for at det fuldmødne Æg kan træde udenfor Ovariet. Nogen Oviduct findes ikke, ligesaa lidt som det har været muligt at opdage nogen Aabning paa Æggestokkens Ydre. Ovariet hos *Bathycrinus Carpenteri* synes saaledes at have et Slags Stroma, bestaaende af de ovenfor beskrevne, epitheliale Follikeldannelser.

Naar Æggestokken er fuldt udviklet, har den antaget en ellipsoid Form og fylder næsten hele Pinnulen, Tab. 1, Fig. 12, saa at baade Dorsal- og Ventralkanalene er betydeligt sammentrængt, Tab. V, Fig. 1. Det ydre Genitalrør har tiltaget betydeligt i Tykkelse og danner en fast Bindevævsmembran, som egentlig udgjør Ovariets ydre Begrænsning, og hvori der synes at have udviklet sig fine Muskel-fibre, Tab. V, Fig. 2 c. Men imedens der i Æggestokken hos *Bathycrinus Carpenteri* foregaar en temmelig regelmæssig Follikeldannelse, er Forholdet noget anderledes hos *Antedon petasus* og *Antedon prolixa*. Her er det ikke Regelen, at Ægget er fuldt omgivet eller indesluttet i en Follikel, tværtom hører det næsten til Sjældenhederne, at man hos disse to Arter træffer paa Æg, der har en fuldt udviklet Follikel. Det almindelige er, at det begyndende Æg blir delvis omgivet af de nærmest tilgrænsende Epithelialceller, der efterhaanden som Ægget voxer, danner om dette en halv eller hel Membran, en Slags Follikel, Tab. IV, Fig. 5, 6, ja man ser endogsaa Æg, som lige fra Begyndelsen og til sin fulde Modenhed aldeles intet saadant Overtræk (Follikel) har.

Testikelen dannes ligesom Æggestokken af det udviklede indre Genitalrør; men her er ingen Follikeldannelse. Fra Genitalrørets indre Væg udgaa en Mængde yderst fine, listeformige Bindevævsforlængelser, der forgrene sig i forskellige Retninger, Tab. V, Fig. 3, 4 a. Paa disse Binde-

consisting of several layers of pretty large, round cells having a large round nucleus with corpuscle which is surrounded by a fine granulated protoplasm. In the female the ovary begins now to be formed. Many of the cells spoken of, which must be regarded as ovigenous formations (Urkeimcellen), both those lying peripherically to the wall and those that approach the middle of the ovary, are seen to develop themselves into ova. The epithelial cells that lie nearest to the ovum in course of development, now enclose the ovum more or less completely (Pl. V, fig. 1 a, 2 a), which, as it grows, pushes the epithelium in front of it, thereby producing a follicle (Pl. V, fig. 1 b, 2 b). In *Bathycrinus Carpenteri* this follicular formation is pretty regular, although there also appears in this species some irregularity. It appears, namely, that a few ova are only partially surrounded by the epithelial membrane, in such manner that the half of the ovum may be uncovered, while the bulk are perfectly enclosed in a follicle (Pl. V, fig. 2 b). This becomes gradually expanded according as the egg grows, but becomes thinner and thinner until, on the maturity of the ovum, it bursts. The egg undergoes its complete development in the follicle, whether the latter covers it entirely or only half of it, and first when the germinative sac has disappeared and the directional bodies have appeared, does the follicular membrane burst, so that the fully grown ovum may leave the ovary. An oviduct is not found, and just as little has it been possible to observe any aperture on the exterior of the ovary. The ovary in *Bathycrinus Carpenteri* seems thus to have a kind of stroma, consisting of the above described epithelial follicular formations.

When the ovary is fully developed it assumes an ellipsoid form and occupies nearly the entire pinnule (Pl. I, fig. 12), so that both the dorsal and ventral canals are considerably compressed (Pl. V, fig. 1). The outer genital tube increases considerably in thickness and forms a firm connective-tissue membrane, which really forms the exterior boundary of the ovary, and in which delicate muscular fibres appear to have developed themselves (Pl. V, fig. 2 c). But whilst there, in the ovary of *Bathycrinus Carpenteri*, takes place a pretty regular follicular formation, the relation is somewhat different in *Antedon petasus* and *Antedon prolixa*. In these it is not the rule that the ovum is entirely surrounded or enclosed in a follicle, on the contrary, it is quite exceptional that we, in those two species, meet with ova that have a fully developed follicle. The usual case is, that the rudimentary ovum is partially surrounded by the nearest adjacent epithelial cells, which, as the egg grows, gradually form round it a half or entire membrane, a kind of follicle (Pl. IV, figs. 5, 6), indeed we even see ova which, quite from the commencement and to their full maturity, have no such covering (follicle) whatever.

The testicle, like the ovary, is formed by the expanded inner genital tube, but there is here no follicular formation. From the inner wall of the genital tube there issue a multitude of extremely fine fillet-formed connective-tissue prolongations, which ramify in various directions (Pl. V,

vævsforlængelser, som sees bedst paa Tversnit, Tab. V, Fig. 5, 6 a, fæster sig et Epithel, der bestaar af næsten runde, store Celler, hvis Membran er tynd og vandklar, og hvis store, runde, centralliggende Kjerne med sit runde Kjernelegeme er omgivet af fintkornet Protoplasma, Tab. V, Fig. 4, 5 b. I mange Celler sees Kjernen at være delt i mange smaa, runde Legemer, som er den begyndende Spermatozoiddannelse, Tab. V, Fig. 6 b. Disse spermatogene Celler danne flere Lag og udfylde en god Del af Genitalrørets Lumen, i hvis Midte sees en stor Mængde Spermatozoer med deres lange Haler, Tab. V, Fig. 3 b, 4 c. For Størstedelen ligge Spermatozoerne i Bundter, ligesom sammenklistrede, og kunne forfølges hen til Cellerne, hvorfra de ere udgaaede. Genitalrørets Væg er betydelig fortykket og forsynet med spindelformige Bindevævslegemer, Tab. V, Fig. 4 d.

Jeg har havt Anledning til at undersøge Generationsorganet hos *Antedon Eschrichti*, *petasus* og *prolixa*, og har for Testikelens Vedkommende ikke fundet noget væsentligt forskjelligt fra, hvad jeg har angivet for *Bathycrinus Carpenteri*. Hos dem alle udgaar der fra det indre Genitalrørs Væg Bindevævslister, paa hvilke de spermatogene Celler ere fæstede. Disse Lister synes ikke at forgrene sig, saaledes som Tilfældet er hos *Bathycrinus Carpenteri*, men ere noget bredere og staar mere regelmæssigt ud fra Væggen, Tab. IV, Fig. 7, 8 a, og naa kanske noget længere ind i Genitalrørets Lumen, Tab. IV, Fig. 7, 8. Baade ved deres Regelmæssighed og ved deres Tykkelse ser det ud paa Snitobjekter, som der fra Testikelens (Genitalrørets) indre Væg reiser sig en Mængde Pyramider til Befæstning for Cellerne.

Crinoidernes Nervesystem er først opdaget af Professor W. Carpenter, der allerede i 1865 paaviste, at den Mantel, der omslutter det femkamrede Organ, og hvorfra Forgreninger udgaa, er det egentlige Nervesystem. Der hengik jo adskillig Tid, inden dette blev fuldt ud anerkjendt; thi der var flere betydningsfulde Forskere, som havde beskæftiget sig med Crinoidernes Anatomi, der bestred det. Men nu synes al Tvivl at være hævet, idet P. H. Carpenter, Jickeli, Perrier, O. Hamann, C. Vogt, Young og fl. ikke alene have konstateret Rigtigheden af Prof. W. Carpenters Iagttagelser, men ogsaa yderligere udvidet Undersøgelserne i histologisk Retning og derved været istand til at opstille et meget sammensat og temmelig høit udviklet Nervesystem.

For *Bathycrinus Carpenteri*'s Vedkommende afviger Nervesystemet ikke i nogen væsentlig Grad fra de tidligere undersøgte Crinoiders, og forsaavidt kan jeg henvise til de seneste af Carpenter, Perrier og Hamann leverede udførlige Beskrivelser over samme.

Hamann inddeler Nervesystemet i et Dorsalnervesystem, et Ventral- og et Ambulacralnervesystem¹, og Perrier tiltræder med god Grund denne Inddeling.

¹ l. c. pag. 63.

figs. 3, 4 a). Upon those connective-tissue prolongations, which are best seen in transversal sections (Pl. V, figs. 5, 6 a), 'an epithelium attaches itself, which consists of almost round, large cells whose membrane is thin and pellucid, and whose large, round, centrally situated nucleus with its round corpuscle is surrounded by finely granulated protoplasm (Pl. V, figs. 4, 5 b). In numerous cells the nucleus is seen to be divided into many small, round bodies, which are the rudimentary formation of spermatozoa (Pl. V, fig. 6 b). Those spermatogenous cells form several layers, and occupy a large part of the channel of the genital tube, in whose middle a great quantity of spermatozoa with their long caudal appendages are visible (Pl. V, figs. 3 b, 4 c). The spermatozoa lie for the greater part in bundles, as if agglutinated, and may be traced up to the cells from which they have issued. The wall of the genital tube is considerably thickened, and is furnished with fusiform connective-tissue bodies (Pl. V, fig. 4 d).

I have had an opportunity of examining the reproductive organs in *Antedon eschrichti*, *petasus* and *prolixa*, and have, in regard to the testicles, found nothing materially different from what I have stated concerning *Bathycrinus Carpenteri*. In all of them there issue, from the wall of the inner genital tube, connective-tissue fillets to which the spermatogenous cells are attached. These fillets do not appear to ramify, as is the case in *Bathycrinus Carpenteri*, but they are somewhat broader and stand more regularly out from the wall (Pl. IV, figs. 7, 8 a), and they extend, perhaps, somewhat farther into the channel of the genital tube (Pl. IV, figs. 7, 8). Both by their regularity and by their thickness, it appears, in sectional preparations, as if from the inner wall of the testicle (the genital tube) there arise a multitude of pyramids for the attachment of the cells.

The nervous system of the Crinoids was first discovered by Professor W. Carpenter, who, already in 1865, showed that the covering which enclosed the five-chambered organ and from which the ramifications issue, was the real nervous system. A considerable time passed, to be sure, before that was fully acknowledged, as there were several renowned naturalists that had studied the anatomy of the Crinoids who denied it. But now all doubt seems to have disappeared, as P. H. Carpenter, Jickeli, Perrier, O. Hamann, C. Vogt, Young and others, have not only confirmed the correctness of Professor W. Carpenter's observations, but have, still further extended the investigations in a histological direction, and have thus been able to establish a very complex and pretty highly developed nervous system.

As far as regards *Bathycrinus Carpenteri*, the nervous system does not differ in any material degree from the previously investigated crinoids, and I may therefore refer the reader to the latest detailed descriptions of the same published by Carpenter, Perrier and Hamann.

Hamann divides the nervous system into a dorsal nervous system, a ventral, and an ambulacral nervous system¹, and Perrier, with good reason, adopts that system of division.

¹ l. c. page 63.

Hos *Bathycrinus Carpenteri* gjenfinde vi disse 3 Systemer vel udviklede.

Omkring det femkamrede Organ er det dorsale Nerve-systems Centralorgan leiret og omslutter det tæt som en Kappe. At det virkelig er Nervemasse, det her gjælder, fremgaar tydeligt nok af Strukturen, der bestaar af Nerve-fibriller med indblandede Nerveceller. Fra denne Nervemasses dorsale Del udgaar en tyk Stamme, som følger og omgiver det femkamrede Organs Forlængelser i Stilken, Tab. III, Fig. 9 e, 10 c, og hvor disse ophører, ser man Nervemassen fortsætte sit Løb, omgivende Centralkarret, til ned imod Roden. Centralkarret er ligesom indkapslet af Nervemasse, hvorfra sees hist og her enkelte Grene udgaa til de nærmest omgivende Dele. Imod den ventrale Del antage Nervefibrillerne en mere koncentrisk, næsten ringformig Retning, og herfra udspringe 5 temmelig tykke Stammer, hvorved en tydelig femkantet Ring dannes, Tab. IV, Fig. 9 a. Disse 5 Stammer, Tab. IV, Fig. 9 b, der tage sin Begyndelse i den øverste Del af 1ste Radiale, tiltage nu i Tykkelse som Radialnerve, efterhaanden som de stige op i 2det og 3die Radiale. Men førend de gaa over i 2det Radiale afgive de en Tvergren, der som en Kommissur gaar fra den ene Gren til den anden, hvorved en udpræget femkantet Ring dannes. Kommen op til øverste Trediedel af 3die Radiale, deler hver Stamme sig i to store Grene, som gaa til hver sin Arm og er den egentlige dorsale Brachialnerve. Hamann angiver, at de 5 Stammer, der udgaa fra Centralmassen hos *Antedon rosacea*, strax dele sig dichotomisk for atter igjen at forene sig til en tyk Stamme (Radialnerven). Denne Deling har det ikke været mig muligt at iagttage, omenskjønt jeg er tilbøielig til at tro, at den ogsaa finder Sted hos *Bathycrinus Carpenteri*. Efterat Radialnerven har delt sig i 2 Grene, men førend disse forlade 3die Radiale, foregaar der imellem dem en yderst mærkelig Anastomosing, som først udførlig er beskrevet af Professor Ludvig under Navnet *Chiasma nervorum brachialium*, idet der fra den ene Arm gaar en tynd Gren, som krydser en lignende fra den modsvarende Arm og hvorved Chiasmaet dannes. Strax ovenfor Chiasmaet sees en temmelig tyk Kommissur der forener begge Armgrenene¹. Foruden denne Kommissur, skal der ifølge Perrier² endnu være en, som er kortere og tykkere, end den ovenfor beskrevne, hvilken baade Ludvig og Hamann skal have overseet. Det er ikke lykket mig at finde denne Kommissur, medens Krydsningen (Chiasmaet) ikke var saa særdeles vanskeligt at iagttage hos *Bathycrinus Carpenteri*.

Hver Armgren forlader nu det 3die Radiale og gaar ind i Armen, hvor den følger Dorsalfladen over Dorsalka-

¹ Otto Hamann, Beiträge zur Histologie der Echinodermen. Heft 4. Anatomie und Histologie der Ophiuren und Crinoiden, Pag. 65. Jena 1889.

² Nouvelles Archives du Museum. T. IX, pag. 197. Tab. 18, Fig. 147, ch, en.

In *Bathycrinus Carpenteri* we again recognise these 3 systems well developed.

The central organ of the dorsal nervous system is found entrenched round the five-chambered organ, enclosing it closely like a cloak. That it is really nervous substance we have here to do with, appears distinctly enough from the structure, which consists of nerve-fibres with nerve-cells mixed up with them. From the dorsal portion of this nervous mass there issues a thick stem, which follows and encloses the five-chambered organ's prolongations in the stalk (Pl. III, fig. 9 e, 10 c), and where these cease we observe the nervous mass continuing its course, surrounding the central vessel, to down near the root. The central vessel is, as it were, encapsuled by the nervous mass, from which a few branches are seen to issue here and there to the nearest surrounding parts. Towards the ventral part the nerve-fibrils assume a more concentric, almost annular direction, and from here 5 pretty thick stems issue, thereby producing a distinct five-sided ring (Pl. IV, fig. 9 a). These 5 stems (Pl. IV, fig. 9 b), which originate in the uppermost part of the 1st radial, increase now in thickness, as radial nerves, as they gradually ascend in the 2nd and 3rd radials. But before they pass over to the 2nd radial they give off a transversal branch which, like a commissure, passes from the one branch to the other, whereby a distinct five-sided ring is formed. Arrived at the uppermost third-part of the 3rd radial, each stem divides itself into two large branches, each of which passes to an arm and forms the real dorsal brachial nerve. Hamann states that the 5 stems which issue from the central mass in *Antedon rosacea*, immediately divide themselves dichotomically, becoming again united into a thick stem (the radial nerve). It has not been possible, for me, to discover this division, although I am disposed to believe that it also occurs in *Bathycrinus Carpenteri*. After the radial nerve has divided itself into 2 branches, but before these abandon the 3rd radial, there takes place between them an extremely remarkable anastomosis, which has first been fully described by Professor Ludvig under the designation *chiasma nervorum brachialium*, at there passes from the one arm a thin branch which crosses a similar one from the corresponding opposite arm, thereby producing the chiasma. Immediately above the chiasma a pretty thick commissure is observed, which unites both the branches of the arm.¹ Besides this commissure there is, according to Perrier², yet another one, which is shorter and thicker than the one described, and which both Ludvig and Hamann have omitted to observe. I have not been fortunate enough to discover that commissure, while it was not particularly difficult to observe the inter-crossing (the chiasma) in *Bathycrinus Carpenteri*.

Each brachial branch now leaves the 3rd radial and passes into the arm, where it follows the dorsal surface

¹ Otto Hamann, Beiträge zur Histologie der Echinodermen. Heft 4. Anatomie und Histologie der Ophiuren und Crinoiden, Pag. 65. Jena 1889.

² Nouvelles Archives du Museum. T. IX, pag. 197. Pl. 18, fig. 147, ch, en.

nalene lige til Armenes yderste Ende, Tab. II, Fig. 4 a. Paa denne Strækning indtager selve Nervegrenen omtrent den samme Tykkelse; men den er forsynet med en Mængde Ganglier, som væsentlig ligge paa dens ventrale Side, Tab. IV, Fig. 4 b. Foruden mange Smaagrener afgives til hver Pinnul en Hovedgren, der følger dennes Dorsalflade, og paa hvis ventrale Side ligger lignende Ganglier som i Armen. Disse Ganglier ere elliptiske, indtage omtrent Midten af ethvert Led og udsende Grene til Epithel og Muskler, af hvilke dog der er 4, som ere meget fremtrædende, og som Professor Carpenter allerede forlængst har gjort opmærksom paa, Tab. III, Fig. 11 a, b. Men foruden disse 4, der udspringe fra Dorsal- og Ventralsiden, udgaa der ogsaa til hver Side mindst 2, næsten ligesaa tykke som de nævnte 4, Tab. III, Fig. 11 c, c. Alle disse Grene, der tage deres Udspring fra Ganglionperiferien, løbe udelte et kort Stykke Vei, men dele sig saa dichotomisk for senere at forsyne Epithel og Muskler med Nervefibriller, Tab. III, Fig. 11 d. Et Længdesnit af Nerven med det aflange Ganglion har et Udseende, som om Gangliet laa aldeles udenpaa Nerven, Tab. V, Fig. 7, hvilket dog ikke er Tilfældet. Nervestammen er sammensat af en Mængde fine Fibriller, der ligge ved Siden af hverandre uden nogen Forbindelse mellem dem, Tab. V, Fig. 7 a; men dels ind imellem Fibrillerne, dels udenpaa dem, sees større og mindre aflange, tildels bipolare Ganglioceller med sine store, mørkefarvede Kjerner. Gangliet bestaar af mange store Ganglioceller, der ligge paa Nervestammen, hvorfra det faar flere Fibriller, som blande sig ind imellem Cellerne, Tab. V, Fig. 7 b. Paa et Tversnit af en lignende Nerve med Ganglion sees Nervefibrillerne som stærkt farvede Punkter, der synes at omgive de store, dels bi- dels multipolære Celler med deres næsten centralbeliggende, lidt aflange Kjerner, Tab. III, Fig. 11. Samtlige Nervestammer og deres Forgreninger danne faste, cylinderformede Traade uden at indslutte noget Kar eller have noget hult Rum, saaledes som enkelte Forskere har angivet.

Centralorganet for det ventrale Nervesystem ligger mesodermalt omkring Svælget, hvor det danner en femkantet Ring, og er først paavist af Dr. Jickeli, Tab. IV, Fig. 10. Imedens enkelte Forskere har benægtet Rigtigheden af Jickeli's Iagttagelser, ere disse dog senere konstaterede saavel af Hamann som Perrier. Hos *Bathycrinus Carpenteri* ligger den nævnte centrale Ring strax under Mundaabningen, omgiver Svælget og er indsluttet af Bindevævet, ligesom den tildels dækker Vandkarringen, Tab. IV, Fig. 10 a. Den er temmelig tyk og afgiver en Mængde Grene, hvoraf 10 ere tykkere end de øvrige og følge de 5 Vandkargrene, en paa hver Side. Idet disse Nervegrene ere naaede hen mod Midten af 3die Radiale, dele de sig atter i 2, saaledes at hver af disse gaa ind i Armenes ventrale Væg ved Siden af Vandkarret, Tab. II, Fig. 4 c. Hver Arm har altsaa 2 ventrale og 1 dorsal Nervegren. Armenes ventrale Nervegrene give til hver Pinnul 2 Grene, der

across the dorsal canal, quite to the outermost extremity of the arm (Pl. II, fig. 4 a). Upon this stretch the nerve-branch itself retains about the same thickness, but is furnished with a multitude of ganglia, situated chiefly on its ventral side (Pl. IV, fig. 4 b). Besides many small branches, a chief branch is given off to each pinnule, which follows the dorsal surface of the latter, and on whose ventral side similar ganglia to those of the arm are situated. These ganglia are elliptical, occupy nearly the middle of each joint and send out branches to the epithelium and muscles; of which, however, there are 4 that are very prominent and which Professor Carpenter has already, long ago, called attention to (Pl. III, fig. 11 a, b). But besides these 4, which spring from the dorsal and ventral side, there also issue, to each side, at least 2 ganglia, almost as thick as the 4 named (Pl. III, fig. 11 c, c). All these branches, which have their origin in the periphery of the ganglion, run a short distance without division, but they then divide themselves dichotomically, so as to subsequently supply the epithelium and muscles with nerve-fibrils (Pl. III, fig. 11 d). A longitudinal section of the nerve with the oblong ganglion has the appearance, as if the ganglion lay entirely on the outside of the nerve (Pl. V, fig. 7), which is, however, not the case. The nervous stem is composed of a multitude of delicate fibrils which lie alongside each other, without any connection taking place between them (Pl. V, fig. 7 a), but partly in between the fibrils partly outside them, larger or smaller oblong, partly bipolar ganglial cells with their large dark-coloured nuclei are observed. The ganglion consists of many large ganglial cells which lie upon the nervous stem, whence it receives many fibrils which mix themselves in between the cells (Pl. V, fig. 7 b). In a transverse section of such a nerve with ganglion, the nerve-fibrils are seen like dark-coloured points, which seem to indicate the large, partly bipolar partly multipolar cells with their nearly centrally situated, slightly oblong nuclei (Pl. III, fig. 11). All the nerve-stems and their ramifications form firm cylindrical threads, without enclosing any vessel, nor have they any hollow space, as has been stated by some investigators.

The central organ of the ventral nervous system lies mesodermally round the œsophagus, where it forms a five-sided ring, and has been first shown by Dr. Jickeli (Pl. IV, fig. 10). Although a few investigators have denied the correctness of Jickeli's observations these have subsequently been confirmed by Hamann as well as Perrier. In *Bathycrinus Carpenteri*, the central ring spoken of lies immediately below the oral aperture, surrounds the œsophagus and is enclosed by the connective-tissue, while it also partly covers the water-vessel ring (Pl. IV, fig. 10 a). It is pretty thick, and gives off a multitude of branches, of which 10 are thicker than the rest and follow the 5 water-vessel branches, one on each side. When these nervous branches have reached as far as to near the middle of the 3rd radial, they again divide themselves into 2, in such a manner that each of these passes into the ventral wall of the arm at the side of the water-vessel (Pl. II, fig. 4 c). Each

ligeledes løbe ved Siden af Pinnulens Vandkar. Tab. II, Fig. 4 d. De ventrale Nervegrene hos Bathycrinus Carpenteri ere ligesaa tykke om ikke tykkere, end den dorsale Gren, men have langt færre Ganglier end denne.

Fra Armens ventrale Nervegrene udgaa en stor Mængde Grene, hvoraf flere korrespondere med Grene fra Dorsalnerven og desforuden afgive Grene til Hud og Tentakler. Da Pinnulerne egentlig ere Fortsættelser af Armene, saa faa de ogsaa sine Nervegrene fra disse. Fra Nervegrenen i Tentaklerne synes fine Udløbere at strække sig ind i Papillernes Basaldel. Hver Papille har paa sin yderste Ende 4 haarfine Børster, hvoraf den Midterste er den længste og synes at være en Fortsættelse af den af Perrier omtalte Centralstræng. Jickeli er den Første, som har undersøgt disse Papiller mere nøiagtigt og slutter sig med Hensyn til deres physiologiske Betydning til flere Forskere, idet han antager dem for sensitive Organer. Hos Hamann¹ ere lignende Papiller nærmere beskrevne og afbildede, hvortil henvises.

Endelig er der endnu et 3die Nervesystem hos Bathycrinus Carpenteri, som svarer nogenlunde til det af Professor Ludvig først paaviste Ambulacralnervesystem. Det af ham angivne, subepitheliale Plexus skulde danne en pentagonal Svælgring, der laa under Svælgepithelet og sendte Grene ud til Ambulacralfuren. Jickeli og Hamann have ikke fundet nogen saadan Svælgring og mene, at Ambulacralnerverne efter at have passeret Mundskiven udbreder sig paa Spiserøret for at fortsættes paa Tarmen uden at danne nogen Svælgring; ligesaa paaviser Hamann, at disse Nerver ikke ere subepitheliale men vel epitheliale. Hos Bathycrinus Carpenteri ere disse Ambulacralnerver meget tydelige — der ere de aabenbart epitheliale —, men om de udgaa fra en Svælgring eller de simpelthen komme fra Armene og udbrede sig i Svælgvæggen, kan jeg ikke afgjøre; paa et Snit saa det virkelig ud, som om der var en epithelial Svælgring, men paa mange andre fandtes den ikke, saa jeg er tilbøielig til at antage, at en saadan Nervering ikke findes hos Bathycrinus Carpenteri.

Farven. Den er helt igjennem smuk straagul, kun Rodpartiet er lidt mørkere end den øvrige Del af Stilken. Kronen er kanske lidt blegere; men naar Kjønnsorganerne ere fuldt udviklede med Kjønnsprodukter har Pinnulerne en meget mørkere Farve. Spiritus forandrer Farven yderst lidet.

¹ l. c. 84.

arm has thus 2 ventral and 1 dorsal nerve-branch. The ventral nervous branches of the arm give off 2 branches to each pinnule, which also run at the side of the water-vessel of the pinnule (Pl. II, fig. 4 d). The ventral nervous branches in Bathycrinus Carpenteri are quite as thick, if not thicker than the dorsal branch, but have far fewer ganglia than it.

From the ventral nervous branches of the arm there issue a great multitude of branches, of which several correspond with branches from the dorsal nerve, and give off, besides, branches to the integument and the tentacles. As the pinnules are really continuations of the arms, they also obtain from them their nervous branches. From the nervous branch in the tentacles, delicate prolongations appear to stretch themselves into the basal part of the papilla. Each papilla has 4 bristles, as fine as a hair, seated on its outermost extremity, of which the middle one is the longest and appears to be a continuation of the central cord mentioned by Perrier. Jickeli is the first who has investigated those papillæ more exactly, and in regard to their physiological importance he agrees with several investigators, as he assumes them to be sensory organs. Similar papillæ are fully described and illustrated by Hamann¹, to whose works I therefore refer.

Finally, there is yet a 3rd nervous system in Bathycrinus Carpenteri, which corresponds in some degree with the ambulacral nervous system first shown by Professor Ludvig. The sub-epithelial plexus mentioned by him was stated to form a pentagonal œsophageal ring that lay below the epithelium of the œsophagus, and sent out branches to the ambulacral groove. Jickeli and Hamann have not discovered any such œsophageal ring, and believe that the ambulacral nerves, after having passed the oral disc, distribute themselves on the gullet-tube for continuation on the intestine, without forming any œsophageal ring; while Hamann also shows that those nerves are not sub-epithelial ones, but really epithelial. In Bathycrinus Carpenteri those ambulacral nerves are very distinct — there they are evidently epithelial — but whether they issue from an œsophageal ring, or simply come from the arms and distribute themselves in the wall of the œsophagus, I am unable to decide; in one section it really appeared as if there were an epithelial œsophageal ring, but in many others it was not found, so that I am disposed to assume that such a nerve-ring does not exist in Bathycrinus Carpenteri.

The Colour: It is everywhere a beautiful straw-yellow, the root portion, only, being a little darker than the rest of the stalk. The crown is perhaps a little paler in colour; but when the sexual organs are fully developed with sexual products the pinnules have a much darker colour. The colour changes extremely little in alcohol.

¹ l. c. 84.

Findested.

- Station 35. Flere Stilke, samt en affalden Krone.
 — 40. En lang Stilk.
 — 51. Et helt Exemplar, flere Stilke med Rod.
 — 53. Et Par defekte Exemplarer, flere Stilke.
 — 205. Flere Stilke og et Par Kroner.
 — 240. Et Stykke af en Stilk.
 — 283. Et lidet Exemplar.
 — 295. Mange Stilke, enkelte Kroner.
 — 303. Mange Stilke, kun et Par hele Exemplarer.
 — 343. To afbrækkede Stilke.
 — 353. Endel Stilke.

Med Stilkene fulgte bestandigt Basalerne, imedens de løsrevne Kroner altid vare uden samme.

Foruden de stilkede Crinoider, *Bathycrinus Carpenteri*, og *Rhizocrinus lofotensis*, indsamledes paa Expeditionen Følgende:

- Station 8. *Antedon tenella*, Retzius.
 Syn. *Antedon dentata*, Say; *Antedon Sarsi*, Düb. et Koren.
 Flere Exemplarer.
 — Husøen, Sognefjord. 100 Favne, Temperatur + 5^o.6 C. Et Par Exemplarer samt et Exemplar i Pentacrinstadiet.
 — Husøen, Sognefjord. *Antedon petasus*, Düb. et Koren. Et Par Exemplarer.
- Station 18. *Antedon proluxa*, Duncan et Sladen.
 8 Exemplarer.
 — 31. — — 4 Exemplarer.
 — 286. — — 5 Exemplarer.
 — 312. — — nogle Exemplarer.
 — 337. — — 3 Exemplarer.
 — 343. — — talrige Exemplarer.
 — 359. — — 2 Exemplarer.
 — 362. — — talrige Exemplarer.
 — 363. — — 3 defekte Exemplarer.
 — 366. — — 4 Exemplarer.
 — 48. *Antedon quadrata*, Carpenter; *Antedon celtica*, auctor. 8 Exemplarer.
 — 223. *Antedon Eschrichti*, Müller.
 Et Kjempe-Exemplar.
 — 336. — — Flere afbrækkede Exempl.
 — 343. — — Nogle mindre Exemplarer.
 — 359. — — Et defekt Exemplar.
 — 363. — — Et defekt Exemplar, et Exemplar i Pentacrinstadiet.
 — 370. — — Store Mængder; Svabberterne ganske besat.
 — 374. — — Et stort Exemplar.
 — Advent Bay, Spitzbergen. Et Exemplar.

Distribution.

- Station 35. Several stalks, as well as a detached crown.
 — 40. A long stalk.
 — 51. A complete specimen, several stalks with root.
 — 53. A couple of defective specimens, several stalks.
 — 205. Several stalks, and a couple of crowns.
 — 240. A portion of a stalk.
 — 283. A small specimen.
 — 295. Many stalks, a few crowns.
 — 303. Many stalks, only a couple of entire specimens.
 — 343. Two broken stalks.
 — 354. A number of stalks.

The basals always came along with the stalks, while the detached crowns were always without them.

Besides the stalked crinoids, *Bathycrinus Carpenteri* and *Rhizocrinus lofotensis*, the following were collected during the expedition.

- Station 8. *Antedon tenella*, Retzius.
 Syn. *Antedon dentata*, Say; *Antedon Sarsi*, Düb. et Koren.
 Several specimens.
 — Husøen, Sognefjord. 100 fathoms, temperature + 5^o.6 C. A couple of specimens, also a specimen in the pentacrine stage.
 — Husøen, Sognefjord. *Antedon petasus*, Düb. et Koren. A couple of specimens.
- 18. *Antedon proluxa*, Duncan et Sladen.
 8 specimens.
 — 31. — — 4 specimens.
 — 286. — — 5 specimens.
 — 312. — — A few specimens.
 — 337. — — 3 specimens.
 — 343. — — Numerous specimens.
 — 359. — — 2 specimens.
 — 362. — — Numerous specimens.
 — 363. — — 3 defective specimens.
 — 366. — — 4 specimens.
 — 48. *Antedon quadrata*, Carpenter; *Antedon celtica*, auctor. 8 specimens.
 — 223. *Antedon eschrichti*, Müller.
 A gigantic specimen.
 — 336. — — Several broken specimens.
 — 343. — — A few small specimens.
 — 359. — — A defective specimen.
 — 363. — — A defective specimen; an example of the pentacrine stage.
 — 370. — — great multitudes; the swabs quite covered.
 — 374. — — A large specimen.
 — Advent Bay, Spitzbergen. One specimen.

Forklaring over Figurerne.

- Tab. I, Fig. 1. Bathyrinus Carpenteri i naturlig Størrelse.
a. Led paa den nederste Trediedel af Stilken. *b.* En af Hovedrødderne. *c.* En Rodgrens yderste, haarfine Ende.
- 2. Et ungt Exemplar af Bathyrinus Carpenteri, forstørret.
a. Ringene paa Stilkens øverste Led. *b.* Korte, cirkelrunde Led. *c.* Længere, cirkelrunde Led ved Enden af den øverste Trediedel. *d.* Leddene paa Stilkens midterste Del. *e.* Leddene paa Stilkens nederste Del. *f.* Midtpartiet af et Led, der henlyder paa, at Leddet har været delt. *g.* Leddets elliptiske Del. *h.* Basalerne med deres Sidesømme. *i.* 1ste Radiale. *k.* Leddet imellem 1ste og 2det Radiale.
- 3. En Stilk uden Krone, forstørret.
a. Ringene paa Stilkens øverste Led. *b.* Korte, cirkelrunde Led. *c.* Længere, cirkelrunde Led ved Enden af den øverste Trediedel. *d.* Leddene paa Stilkens midterste Del. *e.* Leddene paa den nederste Trediedel. *f.* Leddeflade. *g.* Leddets elliptiske Del. *h.* Midtpartiet af et Led. *i.* Det egentlige Rodled. *k.* Den nederste Ende af en Rodgren, hvor Leddene ere ubevægelige. *l.* De sammenvoxede Basaler. *m.* Basalernes pentagonale Flade.
- 4. En Leddeflade af et Led paa den øverste Trediedel af Stilken, forstørret.
a. Kalkkammen. *b.* Aabning for Centralkanalen. *c.* Sidefordybning for Muskelinsertioner.
- 5. En Leddeflade af et Led paa midterste Trediedel af Stilken, forstørret.
a. Sidefordybning for Muskelinsertion. *b.* Kalkkam.
- 6. En Leddeflade af et Led paa den nederste Trediedel af Stilken, forstørret.

Explanation of the Plates.

- Pl. I, Fig. 1. Bathyrinus Carpenteri in life size.
a. Joint on the lowest third part of the stalk. *b.* One of the chief roots. *c.* The outermost hair-fine extremity of a root-branch.
- 2. A young specimen of Bathyrinus Carpenteri, magnified.
a. The rings on the uppermost joint of the stalk. *b.* Short circular joint. *c.* Long circular joint at the extremity of the uppermost third part. *d.* The joints on the middle portion of the stalk. *e.* The joints on the lowest portion of the stalk. *f.* The middle portion of a joint, indicating a previous division of the joint. *g.* The elliptical portion of the joint. *h.* The basals with their lateral seams. *i.* 1st radial. *k.* The joint between the 1st and 2nd radials.
- 3. A stalk without crown, magnified.
a. The rings on the uppermost joint of the stalk. *b.* Short circular joint. *c.* Longer circular joint at the extremity of the uppermost third part. *d.* The joints on the middle portion of the stalk. *e.* The joints on the lowest third part. *f.* Articular surfaces. *g.* The elliptical portion of the joint. *h.* The middle portion of a joint. *i.* The real root-joint. *k.* The lowest extremity of a root-joint, where the joints are non-flexible. *l.* The concreted basals. *m.* The pentagonal surface of the basals.
- 4. Articular surface of a joint on the uppermost third part of the stalk, magnified.
a. The calcareous ridge. *b.* The aperture of the central canal. *c.* The lateral cavity for the insertions of muscles.
- 5. Articular surface of a joint on the middle third part of the stalk, magnified.
a. Lateral cavity for insertion of muscles. *b.* Calcareous ridge.
- 6. Articular surface of a joint on the lowest third part of the stalk, magnified.

a. Kalkkam. *b.* Den nedre, frie Ende af samme. *c.* Kalkliste med Tænder. *d.* Hulheden.

Fig. 7. Basalernes Pentagonal, forstørret.

- 8. Ventralfladen af 1ste Radiale, forstørret.
a. Spalte.
- 9. Ventralfladen af 2det Radiale, forstørret.
- 10. Ventralfladen af 3die Radiale, forstørret.
a. Sidedelen. *b.* Furen. *c, c.* Fordybninger for Muskelinsertioner.
- 11. Ventralfladen af det 1ste Brachiale, forstørret.
a. Fremspring. *b.* Furen *c, c.* Aflange Fordybninger for Muskelinsertioner. *d.* Kalkkam.
- 12. En Pinnula med sine Kalkklapper og Tentakler seet fra Siden, forstørret.
k, k. Kalkklapper, som dække Ventralfuren. *l.* Generationsorganet. *t, t.* Tentakler.
- 13. Et Stykke af en Arm, seet halvt fra Siden, halvt fra Ventralfladen, forstørret.
a. Led. *b.* Muskler. *c.* Kalkklapper. *d.* Tentakler. *e.* Elastiske Fibre.
- 14. Kalkklapper, stærkt forstørret.
- 15. Mundpartiet, seet fra oven, forstørret.
a. Peristomet. *b.* Mundtentakler. *c.* Længdefurerne imellem Interpalmarfelterne, delende sig i Skivens Periferi i to, nemlig en til hver Arm. *d.* Rectum.
- 16. Et Stykke af de fine Rodtrevler, forstørret.

Tab. II, Fig. 1. En Krone uden Basaler, forstørret.

a. 1ste Radiale. *b.* Sømmene for Sammenvoxingen af 1ste Radiales Sider. *c.* Ledet imellem 1ste og 2det Radiale. *d.* 2det Radiale. *e.* Syzygiet imellem 2det og 3die Radiale. *f.* 3die Radiale. *g.* Konisk Fremstaenhed paa den dorsale Sides øverste Rand af 3die Radiale.

- 2. Radialerne og Brachialerne, forstørret.
Bogstaver *a—g* som paa Fig. 1. *h, h.* Syzygier. *i, i, i.* Artikulationer. *k.* Skarp Siderand af 1ste Brachiale. *l.* Sammenvoxing imellem de indre Rande af 1ste Brachiale. *m.* Halvmaaneformigt Indsnit paa 1ste Brachiales underste Rand.
- 3. De øverste Dele af to Arme med Pinnuler, forstørret.
a, a. Artikulationsflader. *b, b.* Syzygier. *c, c.* Pinnuler. *d.* Befæstningspunktet for en Pinnula.

a. The calcareous ridge. *b.* The lower, free extremity of the same. *c.* Calcareous fillet with teeth. *d.* The cavity.

Fig. 7. The pentagon of the basals, magnified.

- 8. The ventral surface of 1st radial, magnified.
a. Fissure.
- 9. The ventral surface of 2nd radial, magnified.
- 10. The ventral surface of 3rd radial, magnified.
a. The lateral portion. *b.* The groove. *c, c.* Cavities for insertions of muscles.
- 11. The ventral surface of the 1st brachial, magnified.
a. Projection. *b.* The groove. *c, c.* Oblong cavities for insertions of muscles. *d.* Calcareous ridge.
- 12. A pinnule with its calcareous valves and tentacles; lateral aspect, magnified.
k, k. Calcareous valves which cover the ventral groove. *l.* The reproductive organ. *t, t.* Tentacles.
- 13. A portion of an arm, viewed half from the side and half from the ventral surface; magnified.
a. Joint. *b.* Muscles. *c.* Calcareous valves. *d.* Tentacles. *e.* Elastic fibres.
- 14. Calcareous valves, greatly magnified.
- 15. The oral portion, superior aspect, magnified.
a. The peristome. *b.* Oral tentacles. *c.* The longitudinal grooves between the interpalmar areas, which divide in the disc of the periphery into two, namely one to each arm. *d.* The rectum.
- 16. A portion of the delicate root-filaments, magnified.

Pl. II, Fig. 1. A crown without basals, magnified.

a. 1st radial. *b.* The seams for the concretion of the sides of the 1st radial. *c.* The joint between the 1st and 2nd radials. *d.* The 2nd radial. *e.* The syzygium between the 2nd and 3rd radials. *f.* 3rd radial. *g.* Conical projection on the dorsal side's uppermost margin of the 3rd radial.

- 2. The radials and brachials, magnified.
The letters *a—g* have the same indications as in fig. 1. *h, h.* Syzygia. *i, i, i.* Articulations. *k.* Sharp lateral margin of the 1st brachial. *l.* Concretion between the inner margins of the 1st brachial. *m.* Peltiform incision on the lowest margin of the 1st brachial.
- 3. The uppermost portions of two arms with pinnules, magnified.
a, a. Articular surfaces. *b, b.* Syzygia. *c, c.* Pinnules. *d.* The point of attachment of a pinnule.

Fig. 4. Et Stykke af en Arm med Pinnuler, forstørret.

a. Dorsalnerven. *b, b.* Ganglierne paa Dorsalnerven. *c.* Ventralnerven. *d.* Fortsættelse af Ventralnerven i Pinnulen.

Tab. III, Fig. 1. En Bathycrinus Carpenteri med ny Krone-dannelse paa en gammel Stilk, naturlig Størrelse.

- 2. Den sammes øverste Del, forstørret.
 - a.* Sømmen imellem Basalerne og 1ste Radiale. *b.* Leddeflade imellem 1ste og 2det og imellem dette og 3die Radiale. *c.* Basalerne paa den gamle Stilk, dannende en fast, glat Ring.
- 3. En Bathycrinus Carpenteri med ny Krone-dannelse paa en gammel Stilk, naturlig Størrelse.
 - a.* En Alcyonidekoloni.
- 4. Den sammes øverste Del, forstørret.
 - a.* Basalerne. *b.* Radialerne. *c.* Fuldstændige Led imellem 1ste og 2det og imellem dette og 3die Radiale.
- 5. En Bathycrinus Carpenteri med ny Krone-dannelse paa en gammel Stilk, besat med Hydroider, naturlig Størrelse.
- 6. Den sammes øverste Del, forstørret.
 - a.* Tydeligt Led imellem 2det og 3die Radiale. *b.* Hydroiderør.
- 7. En normal udviklet, ung Bathycrinus, naturlig Størrelse.
- 8. Den samme, forstørret.
 - a.* Stilkens Led. *b.* Sømmene paa de sammenvoxede Basaler. *c.* Kalkklapper og Tentakler.
- 9. Længdesnit af et Stilkled, forstørret.
 - a.* Netformigt Bindevæv. *b.* Elastiske Fibre. *c.* Bindevævsmembran (Skede). *d.* Karret med dets indre Epithelialbeklædning. *e.* Nervefibriller. *f.* Karrets Indhold (Blodlegemer).
- 10. Tversnit af Stilkens Centraldel, forstørret.
 - a.* Bindevævsmembran (Skede). *b.* Karret med dets Epithel. *c.* Nervefibre og Ganglier. *d.* Karrets Indhold.
- 11. Tversnit af et Nerveganglion i en Pinnula, forstørret.
 - a, b.* Nervegrene fra Dorsal- og Ventral-siden (de 4 af Carpenter først beskrevne). *c, c.* Sidegrene. *d.* Grene, der dele sig.

Tab. IV, Fig. 1. Længdesnit af et Stykke af Stilkens Centralaxe, forstørret.

Fig. 4. A portion of an arm with pinnules, magnified.

a. The dorsal nerve. *b, b.* The ganglia on the dorsal nerve. *c.* The ventral nerve. *d.* Continuation of the ventral nerve in the pinnule.

Pl. III, Fig. 1. A Bathycrinus Carpenteri, with a new crown formation on an old stalk, life size.

- 2. Uppermost portion of the same, magnified.
 - a.* The seam between the basals and 1st radial. *b.* The articular surface between 1st and 2nd, and between that and the 3rd radial. *c.* The basals on the old stalk, forming a firm, smooth ring.
- 3. A Bathycrinus Carpenteri, with a new formation of crown upon an old stalk; life size.
 - a.* A colony of Alcyonids.
- 4. The uppermost part of the same, magnified.
 - a.* The basals. *b.* The radials. *c.* Perfect joint between the 1st and 2nd radials, and between that and the 3rd radial.
- 5. A Bathycrinus Carpenteri with a new formation of crown upon an old stalk, covered with Hydroids; life size.
- 6. The uppermost part of the same, magnified.
 - a.* Distinct joint between the 2nd and 3rd radials. *b.* Tubes of Hydroids.
- 7. A normally developed young Bathycrinus, life size.
- 8. The same, magnified.
 - a.* Joint of the stalk. *b.* The seams on the concreted basals. *c.* Calcareous valves and tentacles.
- 9. Longitudinal section of a stalk joint, magnified.
 - a.* Reticular connective-tissue. *b.* Elastic fibres. *c.* Connective-tissue membrane (sheath). *d.* The vessel with its inner epithelial covering. *e.* Nervous fibrils. *f.* Contents of the vessel (blood corpuscles).
- 10. Transversal section of the central portion of the stalk, magnified.
 - a.* Connective-tissue membrane (sheath). *b.* The vessel with its epithelium. *c.* Nervous fibres and ganglia. *d.* Contents of the vessel.
- 11. Transversal section of a nerve ganglion in a pinnule, magnified.
 - a, b.* Nervous branches from the dorsal and ventral side (the 4 described first by Carpenter). *c, c.* Lateral branches. *d.* Branches that divide themselves.

Pl. IV, Fig. 1. Longitudinal section of a portion of the central axis of the stalk, magnified.

a. Centralkarret. *b.* Dets koagulerede Indhold.

Fig. 2. Tversnit af det femkamrede Organ, forstørret.

a. De vifteformige Skillevægge. *b.* Centralkanal. *c.* Muskelfibre. *d.* Dorsalorganet.

— 3. Tversnit af to Tarmslynger, hvorimellem Dorsalorganet ligger, forstørret.

a. Epithel paa Dorsalorganets ydre Bindevæsvæg. *b.* Dorsalorganets Kjertelstruktur. *c.* Epithelet i Blindsækken. *d.* Tarmens indre Epithelbeklædning.

— 4. Tversnit af to Tarmslynger høiere oppe, imellem hvilke Dorsalorganet ligger, forstørret.

a. Dorsalorganet. *b.* En af de 5 Hovedstammer, som udgaa fra Dorsalorganet op imod Mundskiven. *c.* En af de 5 Hovedstammer, der deler sig i to Grene, gaaende hver til sin Arm.

— 5. Tversnit af en Æggestok af *Antedon petasus*, forstørret.

— 6. Det samme, stærkt forstørret.

— 7. Længdesnit af en Testikel af *Antedon petasus*, forstørret.

a. Bindevævsforlængelser.

— 8. Det samme, stærkt forstørret.

a. Bindevævsforlængelser. *b.* Spermatogene Celler, hvori Kjernen har delt sig i flere smaa, runde Legemer. *c.* Spermatozoer.

— 9. Tversnit af det dorsale Nervesystems Centraldel.

a. Dets femkantede Ring. *b.* De 5 Hovedstammer, der bidrage til at danne Ringen.

— 10. Tversnit af det ventrale Nervesystems Centraldel, forstørret.

a. Nerveringen om Svælget. *b.* Indre Svælgvæg med sit Epithel.

— 11. Et Stykke af Nerveringen, omgivende Svælget, stærkt forstørret.

a. Svælgvæggen med sit ydre og indre Epithel. *b.* Nervefibriller og Ganglier i Nerveringen. *c.* En Gren, udgaaende fra Nerveringen.

Tab. V, Fig. 1. Tversnit af en Æggestok af *Bathycrinus Carpenteri*, forstørret.

a. Epithel. *b.* Follikeldannelse.

— 2. Den samme, stærkere forstørret.

a. Epithel. *b.* Follikeldannelse. *c.* Muskelfibre.

— 3. Længdesnit af en Testikel af *Bathycrinus Carpenteri*, forstørret.

a. The central vessel. *b.* Its coagulated contents.

Fig. 2. Transversal section of the five-chambered organ, magnified.

a. The flabelliform divisional walls. *b.* The central canal. *c.* Muscle fibres. *d.* The dorsal organ.

— 3. Transversal section of two intestinal twistings, between which the dorsal organ is situated, magnified.

a. Epithelium on the outer connective-tissue wall of the dorsal organ. *b.* Glandular structure of the dorsal organ. *c.* The epithelium of the cæca. *d.* The internal epithelial covering of the intestine.

— 4. Transversal section of two intestinal twistings higher up, between which the dorsal organ lies, magnified.

a. The dorsal organ. *b.* One of the 5 chief stems that issue from the dorsal organ up towards the oral disc. *c.* One of the 5 chief stems that divide themselves into two branches, each passing to an arm.

— 5. Transversal section of an ovary of *Antedon petasus*, magnified.

— 6. The same, greatly magnified.

— 7. Longitudinal section of a testicle of *Antedon petasus*, magnified.

a. Connective-tissue prolongations.

— 8. The same, greatly magnified.

a. Connective-tissue prolongations. *b.* Spermatogenous cells in which the nucleus has divided itself into several small round corpuscles. *c.* Spermatozoa.

— 9. Transversal section of the central portion of the dorsal nervous system.

a. Its five-sided ring. *b.* The 5 chief stems that contribute to form the ring.

— 10. Transversal section of the central portion of the ventral nervous system, magnified.

a. The nervous ring round the œsophagus. *b.* The inner œsophageal wall with its epithelium.

— 11. A portion of the nervous ring surrounding the œsophagus, greatly magnified.

a. The œsophageal wall with its outer and inner epithelium. *b.* Nerve-fibrils and ganglia in the nervous ring. *c.* A branch, issuing from the nervous ring.

Pl. V, Fig. 1. Transversal section of an ovary of *Bathycrinus Carpenteri*, magnified.

a. Epithelium. *b.* Follicular formation.

— 2. The same, more powerfully magnified.

a. Epithelium. *b.* Follicular formation. *c.* Muscle fibres.

— 3. Longitudinal section of a testicle of *Bathycrinus Carpenteri*, magnified.

a. Bindevævsforlængelser. *b.* Spermatozoer.
c. Dorsalnerven med sine Ganglier.

Fig. 4. Det samme, stærkt forstørret.

a. Bindevævsforlængelser. *b.* Epithelceller (spermatogene Oeller). *c.* Spermatozoer.
d. Bindevævsmembran.

— 5. Tversnit af en Testikel af Bathyrinus Carpentèri, forstørret.

a. Bindevævsforlængelser. *b.* Epithel.

— 6. Det samme, stærkt forstørret.

a. Bindevævsforlængelser. *b.* Spermatogene Celler, hvori Kjernen er delt i mange smaa, kornede Legemer (begyndende Spermatozoedannelse). *c.* Spermatozoer.

— 7. Et Længdesnit af Dorsalnerven med det aflange Ganglion, forstørret.

a. Nervestamme. *b.* Ganglieceller.

a. Connective-tissue prolongations. *b.* Spermatozoa. *c.* The dorsal nerve with its ganglia.

Fig. 4. The same, greatly magnified.

a. Connective-tissue prolongations. *b.* Epithelial cells (spermatogenous cells). *c.* Spermatozoa. *d.* Connective-tissue membrane.

— 5. Transversal section of a testicle of Bathyrinus Carpenteri, magnified.

a. Connective-tissue prolongations. *b.* Epithelium.

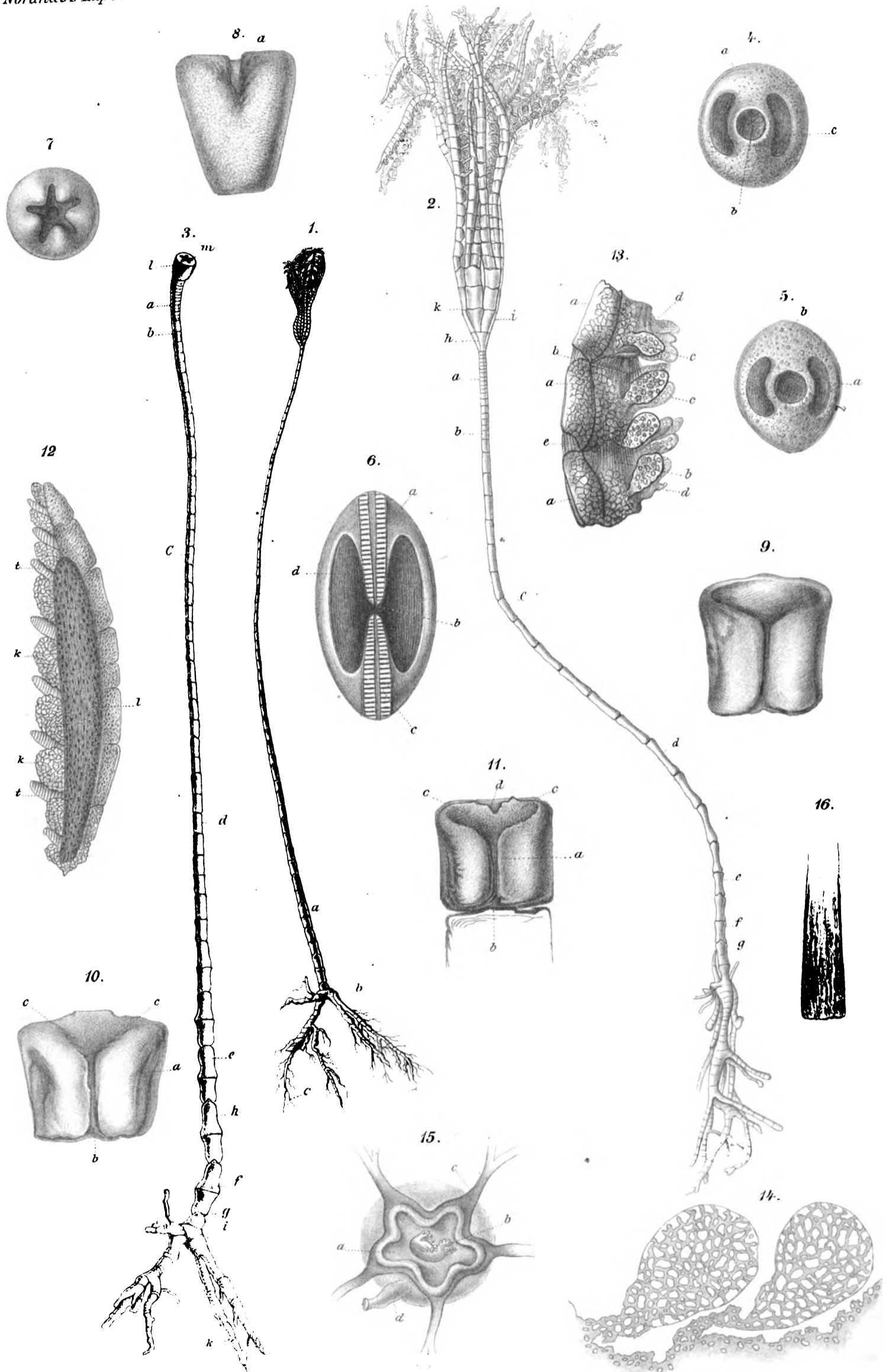
— 6. The same, greatly magnified.

a. Connective-tissue prolongations. *b.* Spermatogenous cells, in which the nucleus is divided into many small, granular corpuscles (rudimentary formation of spermatozoa). *c.* Spermatozoa.

— 7. A longitudinal section of the dorsal nerve with the oblong ganglion, magnified.

a. Nervous stems. *b.* Ganglial cells.

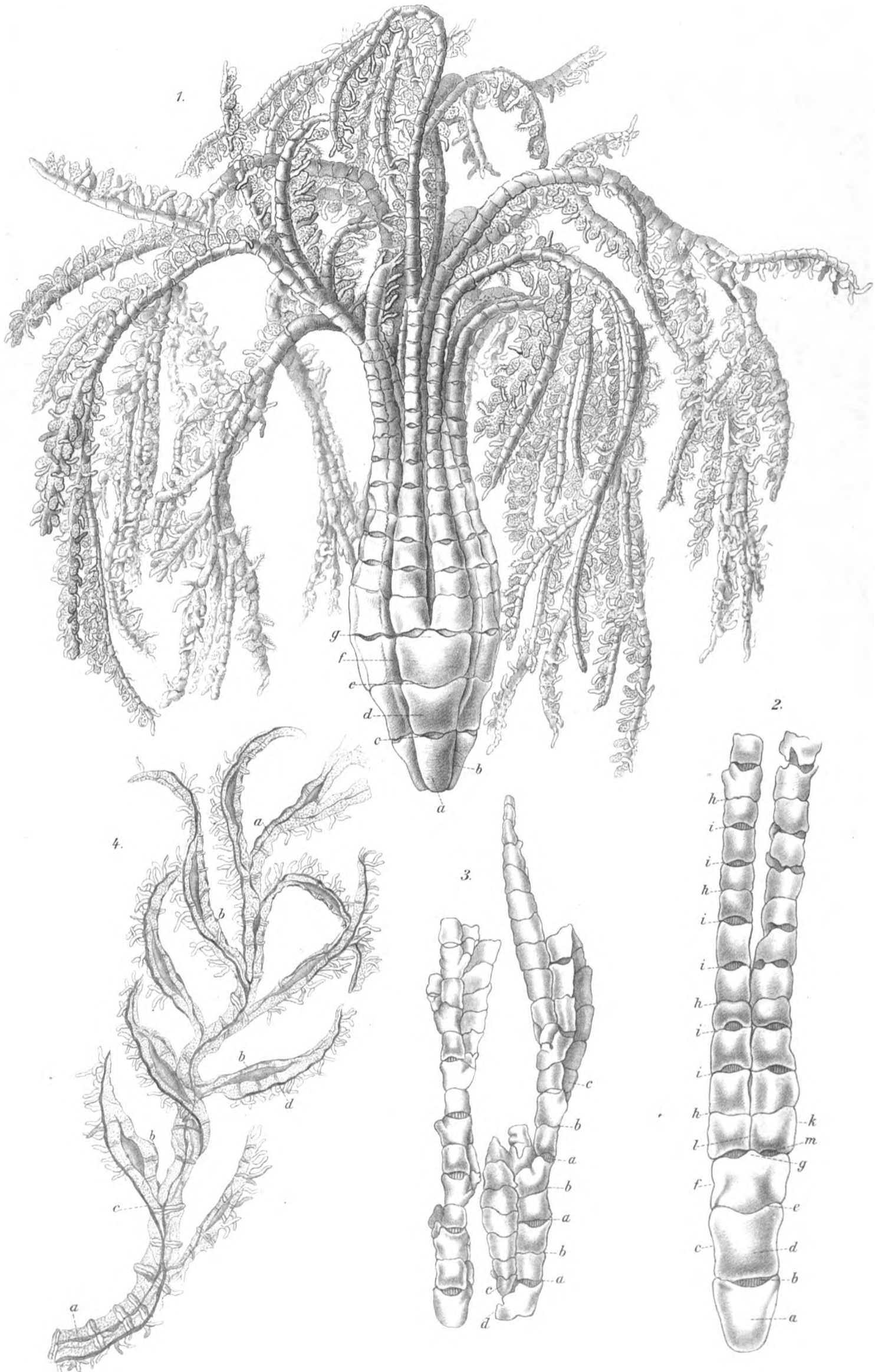
Norske Nordhavs Expedition.



Lehmann's Lith. Anstalt, Kopenhagen 1873

H. S. J. J. J.

Bathycrinus carpenteri.

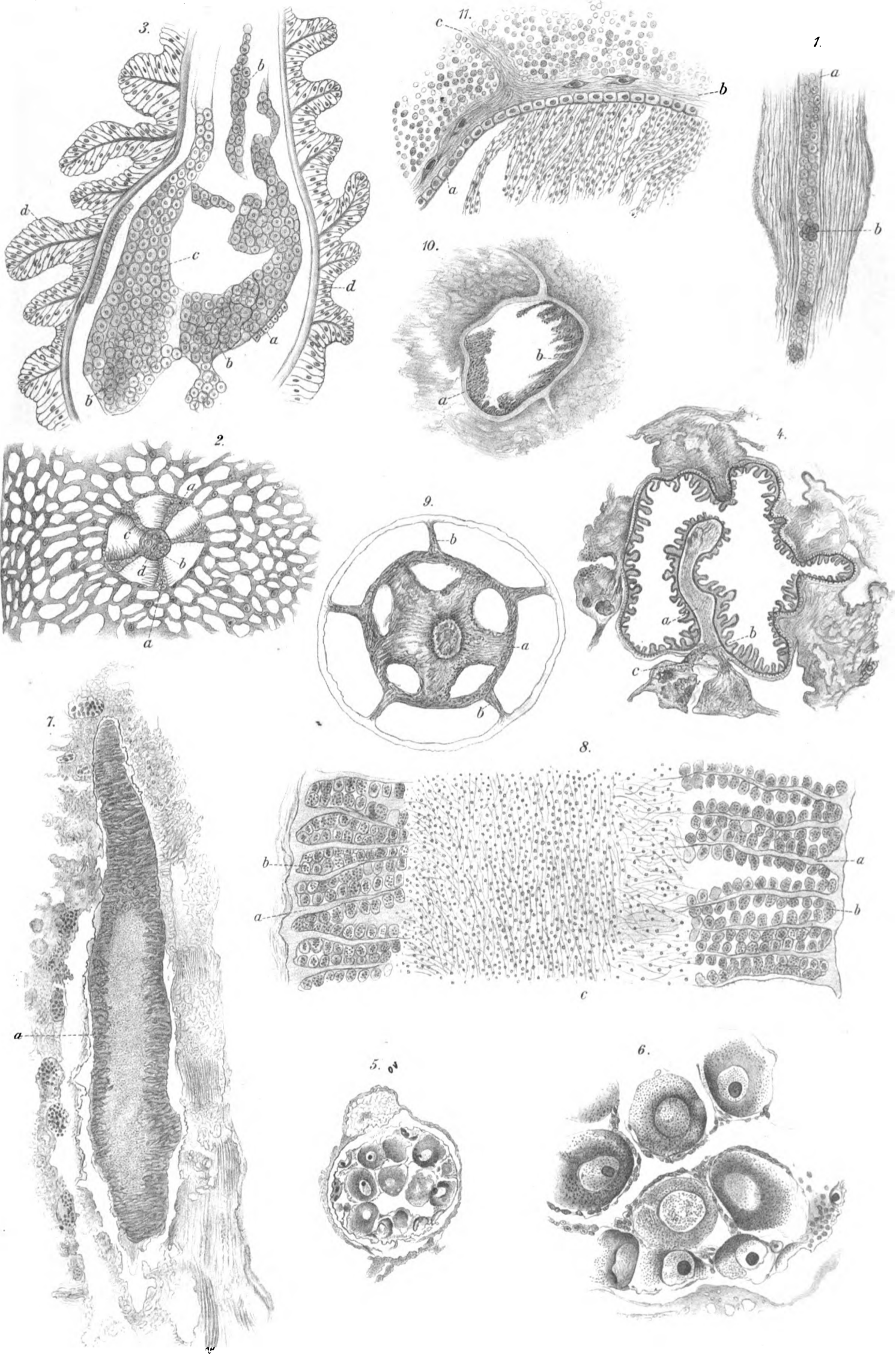


H. Bucher jnr. del.

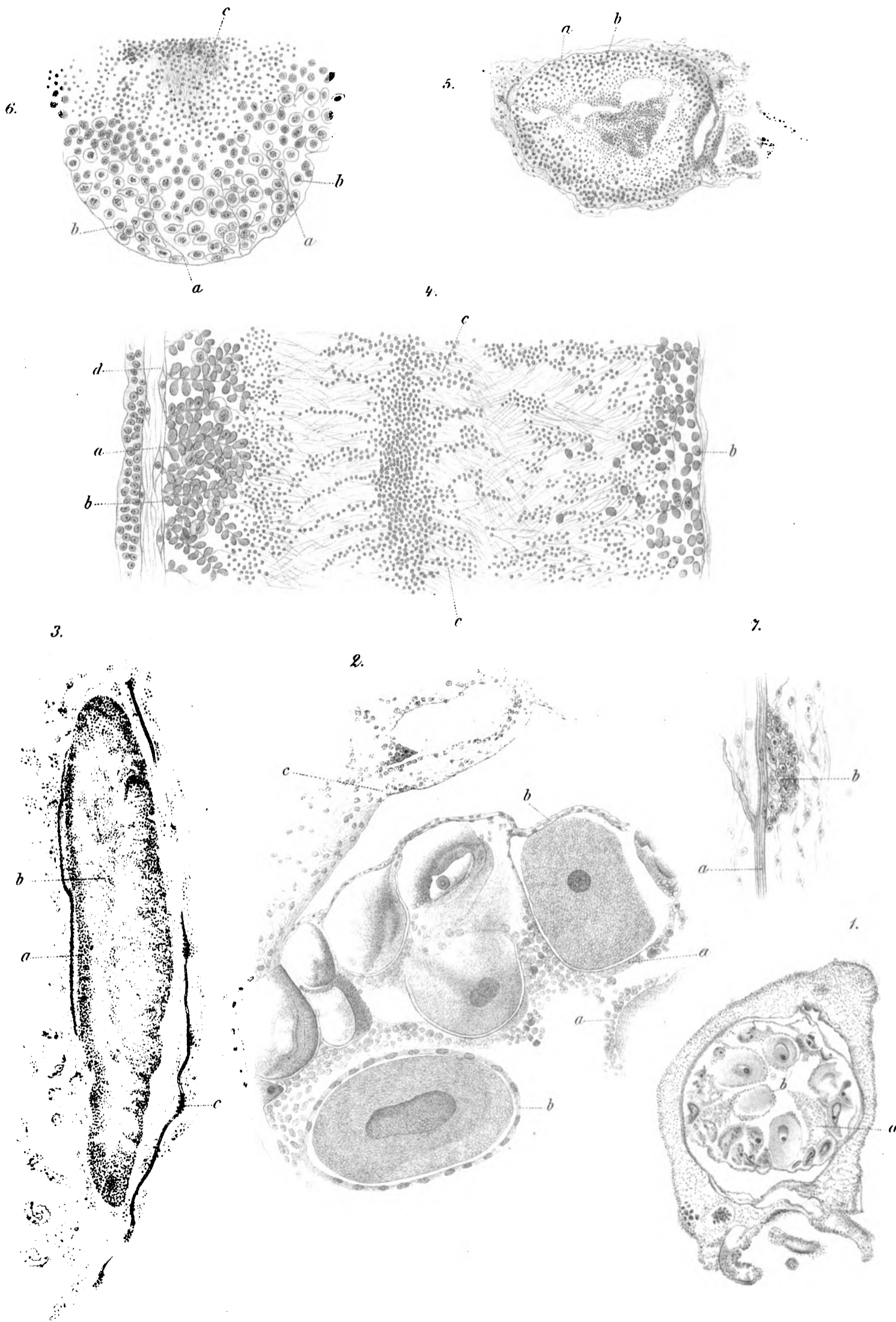
Bathycrinus carpenteri.



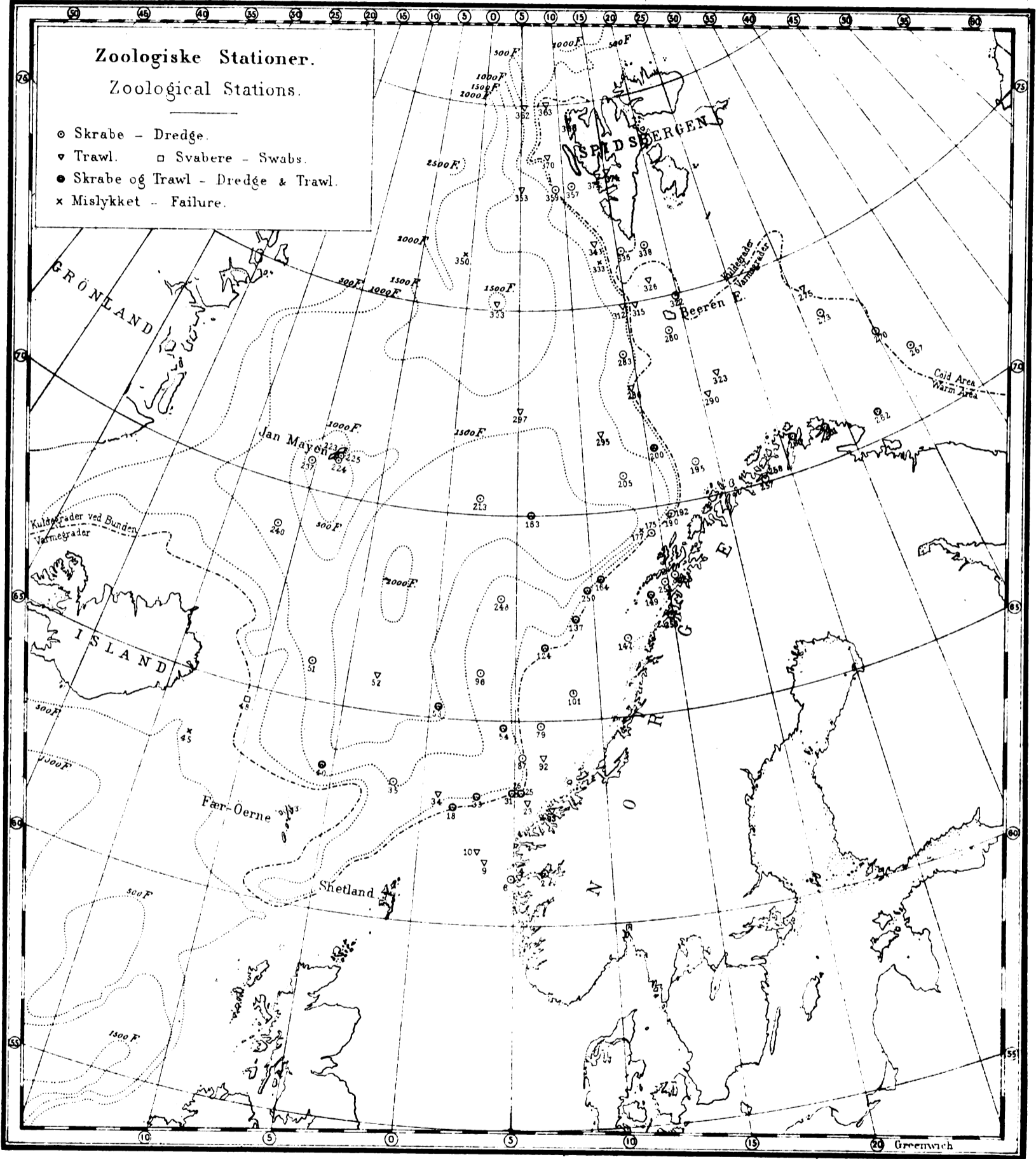
Bathycrinus carpenteri.



Norske Nordhavs-Expedition.



Bathycrinus carpenteri.



Den private Opmålings Isth. Instit. Kristiania.

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

ECHINIDA.

VED

D. C. DANIELSSEN.

MED EN PLANCHE.



CHRISTIANIA.

GRØNDAHL & SØNS BOGTRYKKERI.

1892.

I COMMISSION HOS H. ASCHEHOUG & Co.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

ZOOLOGY.

ECHINIDA.

BY

D. C. DANIELSEN.

WITH ONE PLATE.



CHRISTIANIA.

PRINTED BY GRØNDAHL & SØN.

1892.

LEIPZIG,
K. F. KÖHLER.

LONDON,
SAMPSON, LOW, MARSTON, SEARLE
& RIVINGTON.

PARIS
K. NILSON.

Echinida.

Echinus Alexandri¹. Dan. et Kor.

Tab. I.

Foreløbig er denne smukke Echinide beskrevet af min afdøde Ven Koren og mig i „Nyt Magazin for Naturvidenskaberne, 27 B., Side 294, 1883.

Skallet (*Perisoma*) er nedtrykt, 45^{mm} høit, 86^{mm} i Diameter. Periferien (*Ambitus*) er lidt femkantet med stumpe Kanter. Mundmembranen (*Actinostoma*) er 23^{mm} i Diameter, tyk og tæt besat med Pedicellariier. Skallets Plader ere ikke meget bøiede, men temmelig brede, Tab. I, Fig. 1, 2.

Interambulacralpladerne bære en stor primær Tuberkel, der rager op fra en ringformig Fordybning, hvis Rand er omgivet af 6—7 sekundære Knuder, Tab. I, Fig. 3 a. Paa den primære Tuberkels ydre Side (den nærmest Ambulacralporerne) er der paa de fleste Plader, naar undtages de nærmest Mundmembranen og Analfeltet, 4 temmelig store, sekundære Tuberkler, Tab. I, Fig. 3 b, som staa uregelmæssigt, og paa dens indre Side 1—3 lignende, Tab. I, Fig. 3 c. Imellem disse sekundære Tuberkler grupperer sig mange større og mindre Miliartuberkler. De primære Tuberkler, der er størst paa Periferien og aftage i Størrelse mod begge Ender, danne en regelmæssig Længderække, Tab. I, Fig. 3.

Ambulacralpladerne bære ligeledes en primær Tuberkel, der dog er langt mindre end den paa Interambulacralpladerne, er stillet i en Længderække og aftager saabydeligt i Størrelse mod Analfeltet, at den paa de øverste Plader neppe har Omfanget af en liden, sekundær Tuberkel, Tab. I, Fig. 3 d. Der er dog enkelte Ambulacralplader, hvor de primære Tuberkler mangle ganske. Til Siderne af den primære Tuberkel sees en og to sekundære, en paa den udvendige og to paa den indvendige Side, men heller ikke dette er konstant; imellem de sekundære Tuberkler findes mange, uregelmæssigt stillede Miliartuberkler, Tab. I, Fig. 3.

¹ Arten er benevnt efter den berømte amerikanske Naturforsker, Professor, Dr. Alexander Agassiz.

Den norske Nordhavsexpedition. D. C. Danielssen: Echinida.

Echinida.

Echinus Alexandri¹. Dan. et Kor.

Pl. I.

This beautiful Echinid has been precursorially described by my deceased friend Koren and myself in „Nyt Magazin for Naturvidenskaberne“, Vol. 27, page 294, 1883.

The shell (*perisoma*) is flattened, 45^{mm} in height, 86^{mm} in diameter. The periphery (*ambitus*) is slightly pentagonal, with blunt edges. The oral membrane (*actinostoma*) is 23^{mm} in diameter, thick and closely beset with pedicellaria. The plates of the shell are not much curved, but pretty broad (Pl. I, figs. 1, 2).

The interambulacral plates carry a large primary tubercle, which projects upwards from an annular depression whose margin is surrounded by 6—7 secondary nodules (Pl. I, fig. 3 a). Upon the outer side of the primary tubercle (that next the ambulacral pores) there are found on most of the plates, except those nearest to the oral membrane and the anal area, 4 rather large, secondary tubercles (Pl. I, fig. 3 b), placed irregularly; and upon the inner side 1—3 tubercles similar to those illustrated on Pl. I, fig. 3 c. Between these secondary tubercles there are grouped many larger and smaller miliary tubercles. The primary tubercles, which are largest on the periphery and diminish in size towards both extremities, form a regular longitudinal series (Pl. I, fig. 3).

The ambulacral plates likewise carry a primary tubercle, which is, however, much smaller than the one on the interambulacral plates, is situated in a longitudinal series, and diminishes so considerably in size towards the anal area that, on the uppermost plates, it is barely the size of a small, secondary tubercle (Pl. I, fig. 3 d). There are, however, a few ambulacral plates in which the primary tubercle is entirely wanting. At the sides of the primary tubercle there are visible one and two secondary ones, one on the outer and two on the inner side, but neither is that feature a constant one; between the secondary tubercles there are many irregularly placed miliary tubercles visible (Pl. I, fig. 3).

¹ The species is designated after the celebrated American naturalist, Professor, Dr. Alexander Agassiz.

De sekundære Tuberkler, saavel paa Ambulacral- som Interambulacralpladerne, ere i det Hele større og ordne sig mere i Rækker under Periferien, end over denne.

Ambulacralporerne ere i Regelen stillede i 3 lidt paaskraa gaaende Rækker, kun undtagelsesvis er der 4, Tab. I, Fig. 3 e; men oftere sees et Par imellem to Tre-rækker, Tab. I, Fig. 3 f.

De primære Pigge ere paa Interambulacralpladerne længst, opnaa indtil 45^{mm} i Længde, have en temmelig bred Basaldel og ere efter Længden forsynede med omtrent 25 Længdefurer og ligesaa mange Længderibber, der nede ved Basaldelen udvider sig noget, hvorved det faar et Udseende, som om der rundt Basalens øverste Rand er en Krands af 25, eller ligesaa mange smaa, runde Knuder, som der gives Ribber paa Piggen, Tab. I, Fig. 4 a; en Anordning, som forresten er temmelig almindelig ved Echinidernes Pigge.

Analfeltet (abactinal System) er vidt, den membranøse Del (Periprocte) er tæt besat med runde Kalkkar, der have omtrent samme Størrelse i Periferien som Centrum, kun staa de længere fra hverandre omkring Analaabningen, hvor de ere lidt større, Tab. I, Fig. 5 a.

Den egentlige Analring dannes af 5 Genitalplader; disse ere septagonale, 9^{mm} brede, 6^{mm} høje, have en stor aflang Pore paa Midten, Tab. I, Fig. 3 g, 5 b. Opimod enhver Plades øverste Rand er der 3 Tuberkler, Tab. I, Fig. 3 h, 5 c, og hvor 2 Plader støde sammen, er henimod Sideranden 1 lignende Tuberkel, Tab. I, Fig. 3 i. Alle disse Tuberkler, 20 i Antal, bære en Pig, der hjælper til at danne den Pigring, som omgiver det membranøse Analfelt, Tab. I, Fig. 1. Imellem de nysnævnte Randtuberkler sees enkelte, spredte Miliartuberkler, forresten ere Genitalpladerne ganske glatte. Paa den ene af Genitalpladernes øverste Del, imellem de omtalte 3 Tuberkler og Genitalporen, iagttages Madreporepladen, der har en kornet, temmelig ophøiet, hvælvet og aflang Overflade, er 5^{mm} bred og 2^{mm} høi, Tab. I, Fig. 5 d. Ocularpladerne ere 4^{mm} høje og 4^{mm} brede, have 7 Hjørner, hvoraf det øverste er indkilet imellem 2 Genitalpladers skjæve, ydre Rande; paa det nederste Hjørne er den runde Pore, og paa den ydre Flades øverste Del er en Del Miliartuberkler, Tab. I, Fig. 5 e.

Skallet er særdeles rigt besat med treklappede Pedicellariier, men rigest er dog Underfladen, ligesom Interambulacralfeltet er tættere besat end Ambulacralfeltet. De ere uregelmæssigt stillede og kunne henføres til 3 Former, der alle ere afbildede, og til hvilke Figurer henvises, Tab. I, Fig. 6, 7, 8, 9.

Farven. Grundfarven er smuk kjødrød. Analfeltet mørkt kastaniebrunt, hvorfra udgaa lysere kastaniebrune, brede Rande langs Ambulacrerne og de primære Pigge til den mørke, kastaniebrune Mundmembran. Ambulacrerne vjolette med kastaniebrun Ring om den yderste Ende, samt en næsten hvid Sugeskive. De primære Pigge jævnt kastan-

The secondary tubercles, both on the ambulacral and interambulacral plates, are altogether larger and arranged more in series under the periphery than above it.

The ambulacral pores are usually placed in 3, somewhat obliquely running series, only occasionally are there 4 series (Pl. I, fig. 3 e), but frequently a pair are seen between two triple oblique series (Pl. I, fig. 3 f).

The primary spines are longest on the interambulacral plates, reaching up to 45^{mm} in length, have a pretty broad basal portion, and are furnished longitudinally with about 25 longitudinal grooves and a similar number of longitudinal ribs, which become somewhat expanded down in the basal part, causing an appearance as if there were, round the uppermost margin of the basal part, a wreath of 25, or same number of small, round nodules as there are ribs on the spine (Pl. I, fig. 4 a); an arrangement which is otherwise pretty common in the spines of Echinidæ.

The anal area (abactinal system) is wide; the membranous portion (periprocte) is closely covered with round calcareous vessels, which have about the same size in the periphery as in the centre, but stand farther apart from each other round the anal aperture, where, also, they are a little larger (Pl. I, fig. 5 a).

The real anal ring is formed of 5 genital plates; these are septagonal, 9^{mm} broad, 6^{mm} high, and have a large oblong pore in the middle (Pl. I, figs. 3 g, 5 b). Towards the uppermost margin of each plate there are 3 tubercles (Pl. I, figs. 3 h, 5 c), and where 2 plates unite there is, near the lateral margin, 1 similar tubercle (Pl. I, fig. 3 i). All those tubercles, 20 in number, carry a spine, which aids in forming the spinal ring that surrounds the membranous anal area (Pl. I, fig. 1). Between the marginal tubercles just mentioned, a few scattered miliary tubercles are visible; the genital plates are otherwise quite smooth. On the uppermost part of one of the genital plates, between the 3 tubercles spoken of and the genital pore, the madrepore-plate is observed. It has a granular, pretty elevated, arcuate and oblong surface, is 5^{mm} in breadth and 2^{mm} in height (Pl. I, fig. 5 d). The ocular plates are 4^{mm} high and 4^{mm} broad, have 7 corners, the uppermost one of which is wedged in between the distorted outer margins of 2 genital plates; the round pore is on the lowest corner, and on the uppermost part of the outer surface a number of miliary tubercles are visible (Pl. I, fig. 5 e).

The shell is particularly richly covered with trilobate pedicellaria, but the inferior surface is, yet, the most richly covered, while, also, the interambulacral area is more densely covered than the ambulacral area. They are irregularly placed and may be assigned to 3 forms, all of which are illustrated, and to the figures of which the reader is referred (Pl. I, figs. 6, 7, 8, 9).

The Colour. The ground-colour is a beautiful carmine red. The anal area is dark, chestnut brown, from which issue lighter, chestnut-brown, broad margins along the ambulacra and the primary spines to the dark, chestnut-brown oral membrane. The ambulacra are violet, with chestnut-brown ring on the outermost extremity, and an

iebrune paa den yderste Halvdel; den inderste Halvdel er bleg rosenrød med kastaniebrune Furer. De mindre Pigge ligesom Pedicellariene ere rosenrøde.

Findested: Station 176. Kun et Exemplar.

Af andre Echinider bleve følgende fundne:

1. *Echinus norvegicus*, Düb. et Kor. Station 8. 4 store og 1 lidet Exemplar.
- — Husøen, Sognefjord, nogle smaa Exemplarer.
- — Station 9. Et Par Exemplarer.
- — — 10. Nogle Exemplarer.
- — — 25. Flere store Exemplarer.
- — — 26. En Mængde Exemplarer af forskjellig Størrelse, hvorfra de største havde en Bredde af 52^{mm} og en Høide af 30^{mm}.
- — Station 79. Nogle meget store Exemplarer.
- — Station 101. Temmelig almindelig.
- — — 147. Mange Exemplarer.
- — — 173. Flere temmelig store Exemplarer.
- — Station 252. Et stort Exemplar.
- — — 262. Hyppig, men temmelig smaa Exemplarer.
- — Station 267. Flere smaa Exempl.
- — — 273. Nogle smaa Exempl.
- — — 275. Nogle smaa Exempl.
- — — 290. Enkelte smaa Exempl.
- — — 323. Et lidet Exemplar.

Af de mangfoldige Exemplarer, der bleve fundne af *Echinus norvegicus*, var der kun faa, som helt igjennem svarede til de af Düb. et Kor. beskrevne typiske Exemplarer. Paa Undtagelser nær vare de meget større, havde alle de Karakterer, som de nævnte Forfattere angive at tilhøre den store Form fra Storæggen, en Havbro, som i aabne Havet følger Norges Vestkyst i større eller mindre Afstand fra denne.

Echinus norvegicus er overordentlig udbredt, den gaar i Syd ned til Bohuslehn (Sverige), hvor den dog forekommer sjældent og langs Norges hele Vestkyst til opimod Beeren-Island. Den forekommer mig at være en nordisk Art, der egentlig har sit Hjem i eller ved det aabne Hav; thi imedens de Exemplarer, som findes ved den sydlige Del af Norge og i Bohuslehn ere meget smaa (Düb. et Kor. Typer) tiltage de i Størrelse fra Storæggen — 8—10 Mile ud for Christianssund — og op til Vestfjorden, hvor den synes at kulminere i Størrelse. Fra Vestfjorden bliver den nordefter efterhaanden mindre, dog aldrig saa liden som de typiske Exemplarer. Det største Exemplar fandtes i den aabne Vestfjord, og blev af Professor G. O. Sars erklæret for at være hans *Echinus rarispinus*, og ved den første

almost white sucking-disc. The primary spines are uniform chestnut-brown on the outermost half part; the innermost half part is pale rose-red, with chestnut-brown grooves. The round spines, as well as the pedicellaria are rose-red.

Distribution. Station 176. Only one specimen.

Of other echinidæ the following were found:

1. *Echinus norvegicus*, Düb. et Kor. Station 8. 4 large and 1 small specimen.
- — Husøen, Sognefjord. A few small specimens.
- — Station 9. A couple of specimens.
- — — 10. A few specimens.
- — — 25. Several large specimens.
- — — 26. A multitude of specimens of different sizes, of which the largest were 52^{mm} in breadth and 30^{mm} in height.
- — Station 79. A few very large specimens.
- — Station 101. Pretty common.
- — — 147. Many specimens.
- — — 173. Several pretty large specimens.
- — Station 252. A large specimen.
- — — 262. Frequent, but rather small specimens.
- — Station 267. Several small specimens.
- — Station 273. A few small specimens.
- — — 275. A few small specimens.
- — — 290. Occasional small specimens.
- — Station 323. A small specimen.

Of the multitudinous specimens of *Echinus norvegicus* which were found, there were only a few that entirely corresponded to the typical specimens described by Düb. and Kor. — With only a few exceptions they were very large, and possessed all the characters the authors named report as pertaining to the large form from the great bank „Storæggen“, a bank which, in the open sea, lies off the west coast of Norway at a greater or smaller distance from it.

Echinus norvegicus is extremely widely distributed; it passes southwards to Bohuslehn (in Sweden) — where, however, it appears only rarely — and along the entire coast of Western Norway as far north as to the vicinity of Beeren Island. It appears to me to be a northern species whose proper home is in, or near the open sea; because, whilst the specimens found in the southern portion of Norway and in Bohuslehn are very small (Düb. and Kor. types) they increase in size from Storæggen — 30—40 miles (Eng.) off Christianssund — and as far north as Vestfjord, where the size appears to culminate. From Vestfjord, northwards, it becomes gradually smaller in size, yet never so small as the typical specimens. The largest specimen was found in the open Vestfjord, and was

Betragtning syntes den at maatte være en distinkt Art; Skallets Diameter 54^{mm}, dets Høide 31^{mm}, Mundaabningen 14^{mm}, de længste Pigge 25^{mm}. Men naar man sammenholder disse store Exemplarer fra Storæggen og Vestfjorden med Rækker af nedadstigende, mindre Exemplarer, saa kommer man til en Størrelse, hvor Overgangen fra Sars's *Echinus rarispinus* til den typiske Form synes noget tvivlsom, med andre Ord, jeg har nemlig ikke fundet med Sikkerhed noget Overgangsstadium. Er *Echinus rarispinus* ikke en distinkt Art, saa er den under alle Omstændigheder en udpræget Varietet, der synes at arbeide sig op til en selvstændig Art, forudsat at Dübens og Korens Art virkelig er typisk. Men gaar man ud fra, at Sars's *Echinus rarispinus* er den virkelige typiske Art, saa maa Dübens og Korens Art betragtes som en dvergagtig Afart, der under sit indesluttede Fjordliv er degenereret.

2. *Echinus Flemingii*, Forbes, Husøen, Sognefjord. 100 Favne, flere store Exemplarer.
3. *Echinus esculentus*, Linné, Husøen, 1 Exemplar.
 — — Station 23, nogle Exemplarer.
 — — — 149, et mindre og et meget lidet Exemplar.
 — — Station 173—74, meget smaa Exemplarer.
4. *Echinus elegans*, Düb. et Kor. Station 8, et stort og et lidet Exemplar.
 — — Station 9, et lidet Exemplar.
 — — — 25, et lidet Exemplar.
 — — — 79, et lidet Exemplar.
 — — — 101, et lidet Exemplar.
5. *Strongylocentrotus Dröbachiensis* (Müller), Brandt, Station 48, flere smaa Exemplarer.
 — — Røst, Lofoten, 3—5 Favne, mange, men smaa Exempl.
 — — Station 173, et Par smaa Exemplarer.
 — — Station 224, mange store Exemplarer.
 — — Station 237, mange, men smaa Exemplarer.
 — — Station Saltstrømmen (Lofoten) 90 Favne, i stor Mængde og i mange Farvevarieteter.
 — — Station 257, flere Exemplarer.
 — — Station 280, mange Exempl.
 — — Station 315, et Exemplar.
 — — — 322, et Exemplar.
 — — — 336, nogle Exempl., varierende baade i Størrelse og Farve.
 — — Station 357, et Exemplar.

declared by Professor G. O. Sars to be his *Echinus rarispinus*, and on the first observation it seemed as if it were a distinct species; diameter of the shell 54^{mm}, the height 31^{mm}; the oral aperture 14^{mm}; the longest spines 25^{mm}. But when we compare these large specimens from Storæggen and Vestfjord, with series of diminishing, smaller specimens, we then arrive at a size where the transition from Sars's *Echinus rarispinus* to the typical form appears somewhat doubtful; in other words, I have not, with certainty, found any transition stage. If *Echinus rarispinus* is not a distinct species, it is, in any case, a distinguished variety that appears to work itself up to an independent species, provided that Düb. and Koren's species really is typical. But if we take it for granted that Sars's *Echinus rarispinus* is the genuine typical species, then Düb. and Koren's species must be regarded as a dwarfish variety which, under its confined life in the fiords, has degenerated.

2. *Echinus Flemingii*, Forbes. Husøen, Sognefjord. 100 fathoms. Several large specimens.
3. *Echinus esculentus*, Linné. Husøen. 1 specimen.
 — — Station 23. A few specimens.
 — — — 149. A smallish and a very small specimen.
 — — Stations 173, 174. Very small specimens.
4. *Echinus elegans*, Düb. et Kor. Station 8. A large and a small specimen.
 — — Station 9. A small specimen.
 — — — 25. A small specimen.
 — — — 79. A small specimen.
 — — — 101. A small specimen.
5. *Strongylocentrotus Dröbachiensis* (Müller). Brandt. Station 48. Several small specimens.
 — — Røst, Lofoten; 3—5 fathoms. Many, but small specimens.
 — — Station 173. A couple of small specimens.
 — — Station 224. Many large specimens.
 — — Station 237. Many, but small specimens.
 — — Station, Saltstrømmen (Lofoten), 90 fathoms. Great quantities, and in many varieties of colour.
 — — Station 257. Several specimens.
 — — Station 280. Many specimens.
 — — Station 315. One specimen.
 — — — 322. One specimen.
 — — — 336. A few specimens, differing both in size and colour.
 — — Station 357. One specimen.

<i>Strongylocentrotus Dröbachiensis</i> , Station 359, nogle smaa Exemplarer.	
— — Station 362, nogle smaa Exemplarer.	
— — Station 363, nogle smaa Exemplarer.	
— — Station 370, mange smaa, varierende Exemplarer.	
— — Station 372, uhyre Mængder.	
— — Station 374, mange Exempl.	

Spatangida.

Spatangidæ.

- Pourtalesia Jeffreysii*, A. Agass. Station 31, et Exemplar.
 — — Station 35, nogle Exemplarer.
 — — — 137, flere Exemplarer, hvoraf de fleste vare knuste.
 — — Station 205, et Exemplar.
 — — — 295, flere Exemplarer.
 — — — 303, nogle Exemplarer.
 — — — 312, nogle Exemplarer.
- Spatangus purpureus*, Leske. Station Husøen, nogle smaa Exemplarer.
 — — Station 25, 7 Exemplarer af almindelig Størrelse.
- Spatangus Raschii*, Lovén, Station 9, et Exemplar.
 — — Station 10, mange store Exemplarer.
 — — — 25, en Del Exemplarer.
 — — — 79, et Par Exemplarer.
 — — — 92, en stor Mængde.
 — — — 96, nogle Exemplarer.
 — — — 147, nogle Exemplarer.
 — — — 174, nogle Exemplarer.
- Echinocardium (Amphidetus) ovatum*, Leske, Station 8, et lidet Exemplar.
 — — Station Husøen, 150 Favne, et Par Exemplarer.
 — — Station Røst, Lofoten, 5 Favne, 2 Exemplarer.
 — — Station 174, 2 Exemplarer.
- Brissopsis lyrifera* (Forbes) L. Agass et Des. Station Husøen, et Par Exemplarer.
 — — Station 147, et Exemplar.
- Schizaster (Brissus) fragilis*, Düb. et Korn, Station 2, et stort Exemplar.
 — — Station 10, enkelte Exemplarer.
 — — Station 147, nogle smaa Exemplarer.
 — — Station 153, mange Exemplarer.

<i>Strongylocentrotus Dröbachiensis</i> , Station 359. A few small specimens.	
— — Station 362. A few small specimens.	
— — Station 363. A few small specimens.	
— — Station 370. Many small, variable specimens.	
— — Station 372. Immense quantities.	
— — Station 374. Many specimens.	

Spatangida.

Spatangidæ.

- Pourtalesia Jeffreysii*, A. Agass. Station 31. One specimen.
 — — Station 35. A few specimens.
 — — — 137. Several specimens, of which most were broken.
 — — Station 205. One specimen.
 — — — 295. Several specimens.
 — — — 303. A few specimens.
 — — — 312. A few specimens.
- Spatangus purpureus*, Leske. Station, Husøen. A few small specimens.
 — — Station 25. 7 specimens of ordinary size.
- Spatangus Raschii*, Lovén. Station 9. One specimen.
 — — Station 10. Many large specimens.
 — — — 25. Some specimens.
 — — — 79. A couple of specimens.
 — — — 92. A great many specimens.
 — — — 96. A few specimens.
 — — — 147. A few specimens.
 — — — 175. A few specimens.
- Echinocardium (Amphidetus) ovatum*, Leske, Station 8. A small specimen.
 — — Station, Husøen; 150 fathoms. A couple of specimens.
 — — Station, Røst, Lofoten; 5 fathoms. 2 specimens.
 — — Station 174. 2 specimens.
- Brissopsis lyrifera* (Forbes) L. Agass et Des. Station Husøen. A couple of specimens.
 — — Station 147. One specimen.
- Schizaster (Brissus) fragilis*, Düb. et Kor. Station 2. A large specimen.
 — — Station 10. A few specimens.
 — — Station 147. Some small specimens.
 — — Station 153. Many specimens.

Schizaster (Brissus) *fragilis*, Station 255, et knust Exemplar.
 — — Station 257, et Exemplar.
 — — — 260, mange Exempl.
 — — — 261, flere store Exemplarer.
 — — Station 290, enkelte Exempl.
 — — — 323, et stort Exempl.

Clypeastridæ.

1. *Echinocyamus angulosus*, Leske, Station 174, et Exempl.
 — — Station 260, et dødt Exemplar.

Cidaridæ.

1. *Dorocidaris papillata* (Leske), A. Agass, Station 25, i stor Mængde.
 — — Station 92, 4 Exemplarer.

Schizaster (Brissus) *fragilis*, Station 255. A broken specimen.
 — — Station 257. One specimen.
 — — — 260. Many specimens.
 — — — 261. Several large specimens.
 — — Station 290. A few specimens.
 — — Station 323. A large specimen.

Clypeastridæ.

1. *Echinocyamus angulosus*, Leske. Station 174. One specimen.
 — — Station 260. One dead specimen.

Cidaridæ.

1. *Dorocidaris papillata* (Leske), A. Agass. Station 25. In great quantities.
 — — Station 92. 4 specimens.

Forklaring over Figurerne.

Tab. I.

- Fig. 1. *Echinus Alexandri*, seet ovenfra, naturlig Størrelse.
 „ 2. Den samme, seet underfra
 „ 3. Et Stykke af Skallet, lidt forstørret.
 a. primær Tuberkel paa Interambulacralpladen.
 b, c. Sekundære Tuberkler paa Interambulacralpladen. d. primær Tuberkel paa Ambulacralpladen. e. 3 Par Ambulacralporer. f. Et Par Ambulacralporer imellem 2 Rækker af 3 Par Ambulacralporer. g. Genitalpore. h. i. Tuberkler opimod Genitalpladens øverste Rand.
 „ 4. En primær Pig, forstørret.
 a. Basaldelen.
 „ 5. Analfeltet, naturlig Størrelse.
 a. Periproct. b. Genitalplade. c. Tuberkler paa denne. d. Madreporplade. e. Ocularplade.
 „ 6. En lukket Pedicellarie fra Regionen omkring Munden, forstørret.
 „ 7. Den samme aaben, forstørret.
 „ 8. En Pedicellarie med lang, blød Stilk, i hvis Hud Spikler, forstørret.
 „ 9. En Pedicellarie med lang Kalkstilk, forstørret.
 „ 10. Kalkskiven i en Fod, forstørret.

Explanation of the Plates.

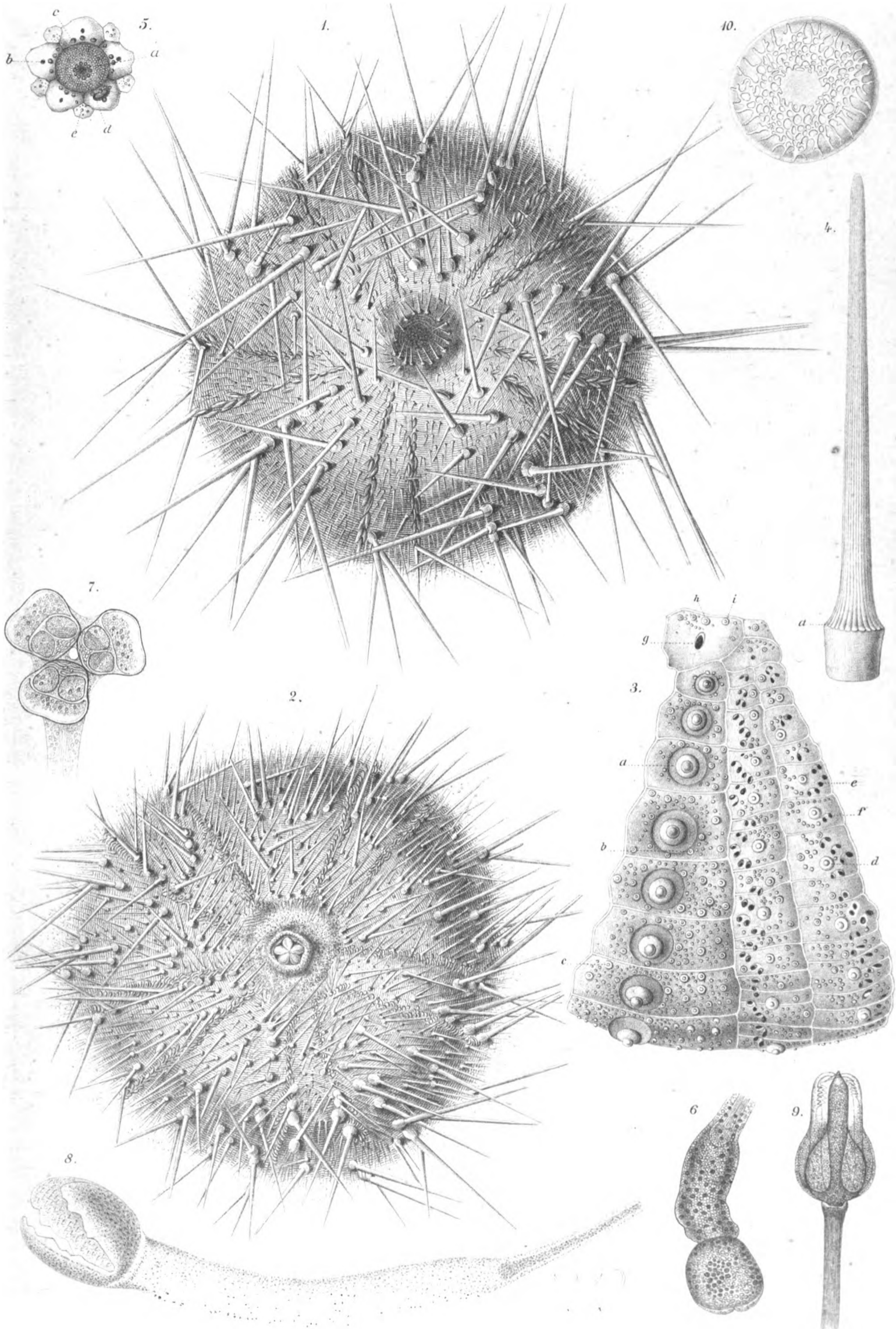
Pl. I.

- Fig. 1. *Echinus Alexandri*: superior aspect; life size.
 „ 2. Inferior aspect.
 „ 3. A portion of the shell, slightly magnified.
 a. Primary tubercle on the interambulacral plate.
 b, c. Secondary tubercles on the interambulacral plate. d. Primary tubercle on the ambulacral plate. e. 3 pairs of ambulacral pores. f. A pair of ambulacral pores, between 2 series of 3 pairs of ambulacral pores. g. Genital pore. h. i. Tubercles towards the uppermost margin of the genital plate.
 4 4. A primary spine, magnified.
 a. The basal portion.
 „ 5. The anal area, natural size.
 a. The periproct. b. Genital plate. c. Tubercles on the genital plate. d. The madrepor-plate. e. The ocular plate.
 „ 6. A closed pedicellaria from the region round the oral aperture, magnified.
 „ 7. The same in an open state, magnified.
 „ 8. A pedicellaria with long soft stalk, in whose integument there are spines, magnified.
 „ 9. A pedicellaria with long calcareous stalk, magnified.
 „ 10. The calcareous disc of a foot, magnified.

Zoologiske Stationer.
(Zoological Stations.)

Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)		Længde fra Greenwich. (Longitude.)		Dybde. (Depth)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)
				Engl. Favne. (Fathoms.)	Meter. (Metres)						
1876											
1	Juni 3	61° 13'	6° 36'	E.	650	1189	6.06	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.	Sabulous Clay, 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	Morkegraat 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	Blødt 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, Smaaasten.	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	1501	-1. 2	Sandholdigt 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	3210	-1. 2	Biloculinler.	Biloculina Clay.	S.	
223	Aug. 1	70 54	8 24	W.	70	128	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay	S.	
(Jan Mayen).											
224	" 1	70 51	8 20	W.	95	174	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay	S.	
225	" 2	70 58	8 4	W.	195	357	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay	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.)		Bundens Tempe- ratur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)
				Engl. Favne. (Fathoms.)	Meter. (Metres.)				
253b	Aug. 17	Saltstrømmen.		90	165		Sten.	Stones.	S.
	1878.								
255	Juni 19	68° 12'	15° 40' E.	341	624	6.05	Ler.	Clay.	S.
257	(June) 21	70 4	23 2 E.	160	293	3.9	Ler.	Clay.	S.
258	" 21	70 13	23 3 E.	230	421	4.0	Ler.	Clay.	T.
260	" 24	70 55	26 11 E.	127	232	3.5	Ler.	Clay.	S. T.
261	" 25	70 47	28 30 E.	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.	35	64	1.1	Sten.	Stones.	S.
		(Beeren Eiland).							
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.
		Magdalene 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.	129	236	1.2	Ler.	Clay.	T.
		(Isfjord).							
374	" 22	78 16	15 33 E.	60	110	0.7	Ler.	Clay.	T.
		(Advent Bay).							



Echinus Alexandri.

DEN NORSKE NORDHAVS-EXPEDITION

1876—1878.

ZOOLOGI.

OPHIUROIDEA.

VED

JAMES A. GRIEG.

MED 3 TAVLER OG 1 KART.



CHRISTIANIA.

GRØNDAHL & SØNS BOGTRYKKERI.

1893.

THE NORWEGIAN NORTH-ATLANTIC EXPEDITION

1876—1878.

ZOOLOGY.

OPHIUROIDEA.

BY

JAMES A. GRIEG.

WITH 3 PLATES AND 1 CHART.



CHRISTIANIA.

PRINTED BY GRØNDAHL & SØN.

1893.

Af *Ophiuroidea* indsamlede den norske Nordhavs-expedition nedenstaaende 24 Arter og en Varietet, repræsenterende 13 Slægter:

- Zygophiuræ*: *Ophiopleura borealis* Dan. & Kor.
Ophioglypha sarsii (Ltk.).
 — *carnea*¹⁾ (M. Sars).
 — *robusta* (Ayres).
 — *affinis* (Ltk.).
Ophiocten sericeum (Forbes).
Amphiura chiajii Forbes.
 — *filiformis* (O. F. Müll.).
 — *elegans* (Leach).
 — *borealis* (G. O. Sars).
Amphilepis norvegica Ljungm.
Ophiactis abyssicola (M. Sars).
Ophiopus arcticus Ljungm.
Ophiopholis aculeata (Lin.).
Ophiacantha bidentata (Retz.).
 — *spectabilis* G. O. Sars.
 — *abyssicola* G. O. Sars.
Ophiotrix fragilis (O. F. Müll.).
Streptophiuræ: *Ophioscolex glacialis* Müll. & Tr.
 — *purpurea* Düb. & Kor.
Cladophiuræ: *Asteronyx lovéni* Müll. & Tr.
Gorgonocephalus lamarckii (Müll. & Tr.).
 — *eucnemis* (Müll. & Tr.).
 — — var. *malmgrenii*
 (Dan. & Kor.).
 — *agassizii* (Stimps.).

I en foreløbig Beretning fra Nordhavsexpeditionen, som Danielssen og Koren publicerede i 1877, beskrives *Ophiopleura borealis* og *Gorgonocephalus malmgrenii* for første Gang¹⁾; de øvrige Arter er derimod vel kjendte Former, som allerede tidligere var fundne inden det af Expeditionen undersøgte Område.

I systematisk Henseende har jeg fulgt Jeffrey Bell: „A Contribution to the Classification of Ophiuroids“²⁾

¹⁾ Nyt Mag. for Naturvidenskab, vol. XXIII.

²⁾ Proceed. Zool. Soc. 1892. Part II, pag. 175.

Of *Ophiuroidea* there were collected by the Norwegian North Atlantic Expedition the undernoted 24 species and one variety, representing 13 genera:

- Zygophiuræ*: *Ophiopleura borealis* Dan. & Kor.
Ophioglypha sarsii (Ltk.).
 — *carnea* (M. Sars).
 — *robusta* (Ayres).
 — *affinis* (Ltk.).
Ophiocten sericeum (Forbes).
Amphiura chiajii Forbes.
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Amphilepis norvegica Ljungm.
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 — *spectabilis* G. O. Sars.
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Ophiotrix fragilis (O. F. Müll.).
Streptophiuræ: *Ophioscolex glacialis* Müll. & Tr.
 — *purpurea* Düb. & Kor.
Cladophiuræ: *Asteronyx lovéni* Müll. & Tr.
Gorgonocephalus lamarckii (Müll. & Tr.).
 — *eucnemis* (Müll. & Tr.).
 — — var. *malmgrenii*
 (Dan. & Kor.).
 — *agassizii* (Stimps.).

In a preliminary report from the North Atlantic Expedition, which Messrs. Danielssen and Koren published in 1877, *Ophiopleura borealis* and *Gorgonocephalus malmgrenii* were described for the first time¹⁾; the other species are, on the other hand, well-known forms which had already, previously, been found within the area investigated by the expedition.

In respect of system I have followed Jeffrey Bell “A Contribution to the Classification of Ophiuroids”²⁾

¹⁾ Nyt Mag. for Naturvidenskab, vol. XXIII.

²⁾ Proceed. Zool. Soc. 1892. Part II, page 175.

og „Catalogue of British Echinoderms“; dog har jeg ikke benyttet denne Forfatters Nomenclatur, men væsentlig rettet mig efter Lyman: „Ophiuroidea and Astrophytidæ“¹⁾ og „Report on the Ophiuroidea“²⁾. I Synonomilisterne er som Regel kun de vigtigere Arbejder optagne, en udførligere Fortegnelse vil man finde i sidstnævnte Arbejde af Jeffrey Bell samt i Lymans Arbejder. I Ludwigs: „Die Echinodermen des Mittelmeeres“³⁾ vil man ligeledes finde meget udførlige Fortegnelser. Dette Arbejde indeholder desuden en meget fuldstændig Literaturfortegnelse vedrørende de europæiske Echinodermer.

Tilslut maa jeg bringe Herr Overlæge Dr. med. og philos. D. C. Danielssen, efter hvis Opfordring jeg overtog Bearbejdelsen af denne Dyregruppe, min bedste Tak for de mange værdifulde Raad og Oplysninger, hvormed han stadig stod til Tjeneste. Specielt maa jeg takke for den Liberalitet, hvormed Herr Overlægen stillede de af ham som Deltager i Nordhavsexpeditionen førte Dagbogsop-tegnelser til min Disposition.

Bergen, Marts 1893.

James A. Grieg.

¹⁾ Ill. Cat. Mus. Comp. Zool., vol. I, no 1. Cfr. „Supplement to the Ophiuridæ and Astrophytidæ“ op. c. vol. II, no. 6.

²⁾ Chall. Exp., Zool., vol. V, part 14.

³⁾ Mitth. Zool. Stat. Neapel, vol. I, pag. 523.

and „Catalogue of British Echinoderms“; I have not, however, adopted that writer's nomenclature, but in that respect have been chiefly guided by Lyman „Ophiuroidea and Astrophytidæ“¹⁾, and „Report on the Ophiuroidea“²⁾. Only the more important works are, as a rule, included in the lists of synonyms: a more detailed list will be found in the last-named work by Jeffrey Bell, as well as in Lyman's works. In Ludwig's „Die Echinodermen des Mittelmeeres“³⁾ there will also be found very complete lists. That work contains, besides, a very complete list of literature concerning the European echinoderms.

Finally, I would take this opportunity of conveying my warmest thanks to Herr D. C. Danielssen, Dr. Med. et Phil. — at whose request I undertook the investigation of this animal-group — for the great amount of valuable advice and information which he has constantly placed at my disposal. I would especially thank him for the liberality with which he placed at my disposal the notes made by him, in his journal, as a member of the North Atlantic Expedition.

Bergen, March 1893.

James A. Grieg.

¹⁾ Ill. Cat. Mus. Comp. Zool., vol. 1, No. 1 comp. „Supplement to the Ophiuridæ and Astrophytidæ“ op. c. vol. II, No. 6.

²⁾ Chall. Exp. Zool. vol. V, part 14.

³⁾ Mitth. Zool. Stat. Neapel, vol. I, page 523.

Zygophiuræ Bell.

Ophiopleura borealis Dan. & Kor.

(Tab. I, fig. 1—5).

1877. *Ophiopleura borealis*, Danielssen & Koren, Nyt Mag. f. Naturvidensk. vol. XXIII pag. 77. Tab. V, fig. 1—4.
1878. *Lütkenia arctica*, Duncan, Ann. og Mag. Nat. Hist. Ser. 5 vol. II pag. 188. Tab. IX.
1878. *Ophiopleura arctica*, Duncan, ibid. pag. 266.
1881. — — Duncan & Sladen, Memoir on the Echinodermata of the arctic Sea etc., pag. 55. Tab. IV, fig. 1-2c.
1882. — — Hoffmann, Die Echinodermen gesammelt während der Fahrten des „Willem Barents“ in den Jahren 1878—79, pag. 4.
1882. *Ophioglypha sarsii*, var. *arctica*, Stuxberg, „Vega“ Expeditionens vetensk. Arbeten, vol. I pag. 749.
1886. *Ophiopleura borealis*, Fischer, Die österreich. Polarstation Jan Mayen, vol. III pag. 35.
1887. — — Levinsen, „Dijmphna“ Togtets zool. bot. Udbytte, pag. 403. Tab. XXXV, fig. 1—2.

Siden 1876, da de første Exemplarer af denne Art fandtes af den norske Nordhavs Expedition, er *Ophiopleura borealis* bleven gjenfundet af de fleste senere arktiske Expeditioner, og der foreligger nu flere udtømmende Beskrivelser over den, hvortil jeg kun skal tilføje nogle korte Bemærkninger. De af Danielssen og Koren samt Duncan og Sladen omtalte små pæreformede eller triangulære Radialskjolde er i Virkeligheden kun den frie, nøgne Del af disse, hvis største Del er dækket af Rygsidens Hud, hvorom man let kan overbevise sig ved forsigtig at løsne denne. Er Skiven, særlig Interbrachialrummene, kontraheret, er det klart, at Radialskjoldene træder skarpere og tydeligere frem, saaat de kommer at danne ophøiede Ribber (cfr. Levinsen). Skivens Kontraktionstilstand synes endvidere at indvirke paa dens Form, denne er dog mest betinget af Individets Alder. Lige i Skivens Centrum ligger der et forholdsvis stort, rundt, nøgent Skjæl, hvorom der grupperer sig mere eller

Zygophiuræ Bell.

Ophiopleura borealis Dan. & Kor.

(Pl. I, figs. 1—5).

1877. *Ophiopleura borealis*, Danielssen & Koren, Nyt Mag. f. Naturvidensk. vol. XXIII pag. 77. Pl. V, figs. 1—4.
1878. *Lütkenia arctica*, Duncan, Ann. and Mag. Nat. Hist. Ser. 5 vol. II pag. 188. Pl. IX.
1878. *Ophiopleura arctica*, Duncan, ibid. pag. 266.
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1882. — — Hoffmann, Die Echinodermen gesammelt während der Fahrten des „Willem Barents“ in den Jahren 1878—79, pag. 4.
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1886. *Ophiopleura borealis*, Fischer, Die österreich. Polarstation Jan Mayen, vol. III pag. 35.
1887. — — Levinsen, „Dijmphna“ Togtets zool. bot. Udbytte, pag. 403. Pl. XXXV, figs. 1—2.

Since 1876, when the first specimens of this species were found by the Norwegian North Atlantic Expedition, *Ophiopleura borealis* has been re-discovered by most of the subsequent arctic expeditions, and there exist now several detailed descriptions of it, to which I shall only add a few short remarks. The small piriform or triangular radial scapuli mentioned by Danielssen and Koren as well as by Duncan and Sladen, are, in reality, only the free bare portion of these, their greater part being covered by the integument of the dorsal side, a thing which can be easily proved by carefully removing the latter. If the disc, especially the interbrachial spaces, is contracted, it becomes clear that the radial scapuli come more sharply and distinctly out, so that they form raised ribs (cfr. Levinsen); the contracted condition of the disc appears, further, to have an effect on the form, but that is, however, chiefly dependent upon the age of the individual. There lies,

mindre regelmæssigt en hel Del mindre, som oftest runde Skjæl, der ligeledes er nøgne. Denne centrale Skjælgruppe synes at være mere karakteristisk og konstant end de af Levinsen paa pegede „langstrakte, afrundede Skjælgrupper, som omtrent indtage Rummet mellem to Radialskjoldes brachiale Rande“. Disse kan nemlig meget ofte gaa aldeles umærkeligt over i de Skjælgrupper eller rettere Skjælansamlinger, som findes i de interbrachiale Rum, hvis Rand særlig er tæt opfyldt med temmelig store Skjæl, der dog som Regel er ovale, medens de brachiale er runde. Undertiden kan de interbrachiale Skjælgrupper endog være større og distinctere end de brachiale.

I anatomisk Henseende slutter *Ophiopleura borealis* sig nær til Slægten *Ophioglypha*.

Findested.			
Station	No.	33	3 Exemplarer.
—	„	34	3 —
—	„	137	17 —
—	„	251	1 —
—	„	312	1 —
—	„	362	9 —

Udbredelse.

Denne Art er funden ved Taimurøen, 5—10 Fv. (Stuxberg); Kysten af Novaja Zemlia og Karahavet, 10—106 Fv. (Levinsen); Barentshavet (Hoffmann); Jan Mayen, 115 Fv. (Fischer) og ved Discovery Bay, Grønlands Vestkyst, 25 Fv. (Duncan & Sladen). *Ophiopleura borealis* er saaledes en ægte arktisk Form, der kun er funden i den kolde Area i en Dybde af 5—660 Favne.

Ophioglypha sarsii (Ltk.) Lyman.

1853. *Ophiopsis ciliata*, Stimpson, Syn. Mar. Invert. Gr. Manan, Smithson. Contrib., vol. VI pag. 13.
1854. *Ophiura coriacea*, Lütken, Bidrag til Kundskab om Slangestjernerne, Vidensk. Meddel. pag. 101.
1854. — *sarsii*, id. *ibid.*
1857. — — id., Oversigt over Grønlands Echinodermata, *ibid.* pag. 49.
1858. — — id. Addit. ad Hist. Ophiurid., part I pag. 42. Tab. I fig. 3—4.
1865. — — Norman, Ann. og Mag. Nat. Hist. Ser. 3 vol. XV, pag. 113.

exactly in the middle of the disc, a relatively large, round, bare scapulum, around which there are grouped, more or less regularly, a large number of small, most frequently round plates, which are likewise bare. That central group of plates seems to be more characteristic and constant than those pointed out by Levinsen, „langstrakte, afrundede, Skjælgrupper, som omtrent indtage Rummet mellem to Radialskjoldes brachiale Rande“. — These may, namely, very frequently pass perfectly imperceptibly over into the groups of plates, or more correctly the collections of plates, which are found in the interbrachial space, whose margin especially is densely occupied with pretty large scales, which are, however, as a rule, oval, whilst the brachial ones are round. Sometimes the interbrachial groups may even be larger and more distinct than the brachial.

In anatomical respects *Ophiopleura borealis* allies itself closely to the genus *Ophioglypha*.

Localities.				
Station	No.	33	3	specimens.
—	„	34	3	—
—	„	137	17	—
—	„	251	1	—
—	„	312	1	—
—	„	362	9	—

Distribution.

This species is found at Taimyr Island, 5—10 fath. (Stuxberg); on the coast of Nova Zembla and in the Kara Sea, 10—106 fath. (Levinsen); the Barents Sea (Hoffmann); Jan Mayen, 115 fath. (Fischer) and at Discovery Bay, West coast of Greenland, 25 fath. (Duncan and Sladen). *Ophiopleura borealis* is thus a genuine arctic form, which is only found in the cold area at a depth of 5—660 fathoms.

Ophioglypha sarsii (Ltk.) Lyman.

1853. *Ophiopsis ciliata*, Stimpson, Syn. Mar. Invert. Gr. Manan, Smithson. Contrib., vol. VI pag. 13.
1854. *Ophiura coriacea*, Lütken, Bidrag til Kundskab om Slangestjernerne, Vidensk. Meddel. pag. 101.
1854. — *sarsii*, id. *ibid.*
1857. — — id. Oversigt over Grønlands Echinodermata, *ibid.* pag. 49.
1858. — — id. Addit. ad Hist. Ophiurid., part I pag. 42. Pl. I, figs. 3—4.
1865. — — Norman, Ann. and Mag. Nat. Hist. Ser. 3 vol. XV, pag. 113.

1865. *Ophioglypha sarsii*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1 pag. 41, fig. 2, 3.
 1877. — — Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX, pag. 461.
 1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea etc., pag. 60. Tab. IV, fig. 3—4.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 23. Tab. II, fig. 2.
 1892. *Ophiura sarsii*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 109.

Findested.

- Station Flesje, Sogn, 100—130 Fv. 6 mindre Exemplarer.
 — Husøen, 100—150 Fv. Nogle faa Exemplarer.
 — No. 60 1 Exemplar.
 — " 79 Nogle faa Exemplarer.
 — " 92 2 Exemplarer.
 — " 223 3 store Exemplarer.
 — " 224 6 — —
 — " 226 3 — —
 — " 257 Nogle Exemplarer.
 — " 261 Nogle meget store Exemplarer.
 — " 262 2 store og nogle mindre Exemplarer.
 — " 267 3 Exemplarer.
 — " 273 Nogle større Exemplarer.
 — " 290 1 Exemplar.
 — " 323 4 Exemplarer.
 — " 326 Nogle større Exemplarer.
 — " 337 — —
 — " 357 Almindelig, store Exemplarer.
 — " 359 Nogle mindre Exemplarer.
 — " 363 3 store Exemplarer.

Udbredelse.

Ifølge M. Sars forekommer denne Art langs hele den norske Kyst fra Bunden af Christianiafjorden (20—50 Fv.) til Varangerfjorden (20—100 Fv.). Det største Dyb, den er tagen paa ved vor Kyst, er 300 Fv. (M. Sars).

Arten kjendes endvidere fra Karahavet, 20—100 Fv. (Stuxberg); Franz Josefsland, 105 Fv. (Marenzeller); Barentshavet, 100—210 Fv. (Hoffmann); Spitzbergen, Jan Mayen, 25—75 Fv. (Fischer); Færøkanalen, 64(ell. 75)—345 Fv. (Hoyle); Shetlandsøerne, 80—100 Fv. (Norman); Nordsøen mellem Norge og Skotland, 69 Fv., Doggerbanken, 12 Fv., Helgolandsdybet, 19½ Fv.; Havet udenfor Skagen og Hirshals, Jylland, 52—80 Fv. (Möbius & Bütschli); Gulmaren, Bohuslän (Ljungman); Kattegat 14 til 100 Fv. (Petersen); Grønlandskyster, 8—35 Fv. (Lütken, Duncan & Sladen); Nord- og Østkysten af Nordamerika, hvor dens Sydgrændse er 35° 45' 30" N. Br. (Murdoch, 13½ Fv. Stimpson, 60 Fv. Verrill, 30—358 Fv.

1865. *Ophioglypha sarsii*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1 pag. 41, figs. 2, 3.
 1877. — — Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 461.
 1881. — — Duncan and Sladen, Memoir on the Echinodermata of the Arctic Sea etc. pag. 60. Pl. IV, figs. 3, 4.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 23. Pl. II, fig. 2.
 1892. *Ophiura sarsii*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 109.

Localities.

- Station Flesje, Sogn, 100—130 fath. 6 small specimens.
 — Husøen, 100—150 fath. A few specimens.
 — No. 60 1 specimen.
 — " 79 A few specimens.
 — " 92 2 specimens.
 — " 223 3 large specimens.
 — " 224 6 — —
 — " 226 3 — —
 — " 257 A few specimens.
 — " 261 A few very large specimens.
 — " 262 2 large and a few small specimens.
 — " 267 3 specimens.
 — " 273 A few large specimens.
 — " 290 1 specimen.
 — " 323 4 specimens.
 — " 326 A few large specimens.
 — " 337 — —
 — " 357 General, large specimens.
 — " 359 A few small specimens.
 — " 363 3 large specimens.

Distribution.

According to M. Sars this species appears along the Norwegian coast from the head of the Christiania fiord (20—50 fath.) to the Varanger fiord (20—100 fath.). The greatest depth from which it has been taken on the Norwegian coast is 300 fath. (M. Sars).

The species is further known from the Kara Sea, 20—100 fath. (Stuxberg); Frantz Joseph's Land, 105 fath. (Marenzeller); Barents Sea, 100—210 fath. (Hoffmann); Spitzbergen, Jan Mayen, 25—75 fath. (Fischer); the Færø channel 64(or 75)—345 fath. (Hoyle); the Shetland Islands, 80—100 fath. (Norman); the North Sea, between Norway and Scotland, 69 fath., the Dogger Bank, 12 fath., the sea off Heligoland, 19½ fath.; the sea off Skagen and Hirshals, Jutland, 52—80 fath. (Möbius & Bütschli); Gulmaren, Bohuslän (Ljungman); Kattegat, 14—100 fath. (Petersen); the coasts of Greenland, 8—35 fath. (Lütken, Duncan & Sladen); the north and east coasts of North America, where its southern limit is at 35° 45' 30" N. Lat. (Murdoch,

Challenger Expeditionen, 83 Fv. Blake, 44—306 Fv. Albatross, 30—1608 Fv.); Behringsstrædet (Ludwig). Den skal endvidere være funden i det Ochotske Hav.

Ophioglypha sarsii er saaledes en circumpolar Form, der tilhører saavel den kolde som den varme Area og synes at være lige hyppig i begge Zoner.

Ophioglypha carnea (M. Sars [msc.]) Lyman.

1858. *Ophiura carnea*, Lütken, Addit. ad Hist. Ophiurid., Part I, pag. 41. Tab. I, fig. 6.
 1861. — — M. Sars, Oversigt af Norges Echinodermer, pag. 24.
 1865. *Ophioglypha carnea*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 10.

Findested.

- Station Flesje, Sogn, 100—130 Fv. Almindelig
 — Husøen, 100—150 Fv. Almindelig.
 — Saltstrømmen, 90 Fv. 1 Exemplar.

Udbredelse.

Denne Art, som kun er funden i de skandinaviske Farvande, forekommer mere eller mindre talrig langs hele vor Vest- og Nordkyst fra Hardangerfjorden (Danielssen) til Vadsø, 30—300 Fv. (M. Sars); hyppigst optræder den paa en Dybde af 50—80 Fv. Desuden er den funden i Skagerak (Ljungman).

Ophioglypha robusta (Ayres) Lyman.

1851. *Ophiopsis robusta*, Ayres, Proc. Boston Soc. Nat. Hist., vol. IV pag. 134.
 1854. *Ophiura fasciculata*, Forbes, Sutherlands Journ. Voy. Baffins Bay, vol. II pag. CCXIV.
 1854. — *squamosa*, Lütken, Bidr. til Kundsk. om Slangestjerne, Vidensk. Meddel., pag. 100.
 1857. — — id., Oversigt over Grønlands Echinodermata, ibid. pag. 50.
 1858. — — id., Addit. ad Hist. Ophiurid., part. I, pag. 46. Tab. I, fig. 7.
 1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV, pag. 114.

13 $\frac{1}{2}$ fath. Stimpson, 60 fath. Verrill, 30—358 fath. The Challenger expedition, 83 fath. Blake, 44—306 fath. Albatross, 30—1608 fath.); Behrings Straits (Ludwig). It is said to have been found, further, in the Sea of Okhotsk.

Ophioglypha sarsii is thus a circumpolar form which belongs both to the cold as well as the warm area, and appears to be equally frequent in both zones.

Ophioglypha carnea (M. Sars [msc.]) Lyman.

1858. *Ophiura carnea*, Lütken, Addit. ad Hist. Ophiurid., part I pag. 41. Pl. I, fig. 6.
 1861. — — M. Sars, Oversigt af Norges Echinodermer, pag. 24.
 1865. *Ophioglypha carnea*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 10.

Localities.

- Station Flesje, Sogn, 100—130 fath. General.
 — Husøen, 100—150 fath. General.
 — Saltstrømmen, 90 fath. 1 specimen.

Distribution.

This species, which is only met within the Scandinavian waters, appears more or less abundantly along the entire Norwegian west and north coasts, from the Hardanger fiord (Danielssen) to Vadsø, 30—300 fath. (M. Sars); it frequently appears at a depth of 50—80 fath. It is also found, besides, in the Skager Rack (Ljungman).

Ophioglypha robusta (Ayres) Lyman.

1851. *Ophiopsis robusta*, Ayres, Proc. Boston Soc. Nat. Hist., vol. IV pag. 134.
 1854. *Ophiura fasciculata*, Forbes, Sutherland's Journ. Voy. Baffins Bay, vol. II pag. CCXIV.
 1854. — *squamosa*, Lütken, Bidr. til Kundsk. om Slangestjerne, Vidensk. Meddel., pag. 100.
 1857. — — id., Oversigt over Grønlands Echinodermata, ibid. pag. 50.
 1856. — — id., Addit. ad Hist. Ophiurid., part I, pag. 46. Pl. I, fig. 7.
 1865. — — Norman, Ann. and Mag. Nat. Hist., ser. 3, vol. XV, pag. 114.

1865. *Ophioglypha robusta*, Lyman, Ill. Cat. Mus. Comp. Zool. Vol. I. No. 1 pag. 45.
 1877. — — Duncan & Sladen, Ann. og Mag. Nat. Hist., ser. 4, vol. XX pag. 463.
 1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea etc., pag. 62. Tab. IV, fig. 5—7.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 24. Tab. II, fig. 4.
 1892. *Ophiura robusta*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 109.

Findested.

- Station Husøen, 20—100 Fv. Nogle Exemplarer.
 — No. 26 1 Exemplar.
 — „ 257, 30—40 Fv. Ret almindelig.

Udbredelse.

Denne Art forekommer mere eller mindre talrig langs hele Kysten fra Christianiafjorden til Varangerfjorden; i største Mængde optræder den ved Nordlands og Finmarkens Kyster, 10—50 Fv. (M. Sars), dog kan den ogsaa i det sydlige Norge være meget almindelig, saaledes fandt Professor G. O. Sars den i enorme Masser paa Stor-eggen, 100 Fv.

Udenfor Norge kjendes *Ophioglypha robusta* fra Karahavet, 40—50 Fv. (Stuxberg); Vestkysten af Novaja Semlja, 85 Fv. (Marenzeller); Barentshavet (Hoffmann); Spitsbergen, Jan Mayen, 12 $\frac{1}{2}$ —90 Fv. (Fischer); Island, Færøerne, Shetlandsøerne, Østkysten af Skotland og det nordlige England (Norman); Skagen og Hirshals, 52—80 Fv. (Möbius & Bütschli); Kattegat, 11—45 Fv. (Petersen); Store Belt, 25 Fv. (Möbius & Bütschli); Øresund 10—18 Fv. (Lütken); Kullen, Skåne (Lilljeborg); Bohuslän (Lovén); Grønland (Lütken, Duncan & Sladen); den nordlige og østlige Kyst af Nordamerika indtil Cape Cod (Lyman). Ligesom *Ophioglypha sarsii* tilhører saaledes ogsaa *Ophioglypha robusta* saavel den kolde som den varme Area, talrigt synes den at optræde paa Grændsen mellem begge Zoner.

***Ophioglypha affinis* (Ltk.) Lyman.**

1858. *Ophiura affinis*, Lütken, Addit. ad Hist. Ophiurid., part I pag. 45. Tab. II, fig. 10.
 1862. — grubei, Heller, Lit. Fauna d. Adriat. Meeres, pag. 431. Tab. II, fig. 13—16.

1865. *Ophioglypha robusta*, Lyman, Ill. Cat. Mus. Comp. Zool. Vol. I. No. 1 pag. 45.
 1877. — — Duncan & Sladen, Ann. and Mag. Nat. Hist., ser. 4, vol. XX pag. 463.
 1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea etc., pag. 62. Pl. IV, figs. 5—7.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 24. Pl. II fig. 4.
 1892. *Ophiura robusta*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 109.

Localities.

- Station Husøen, 20—100 fath. A few specimens.
 — No. 26 1 specimen.
 — „ 257, 30—40 fath. Quite general.

Distribution.

This species appears more or less abundantly along the entire coast from the Christiania fiord to the Varanger fiord; it appears in the greatest quantity on the coasts of Nordland and Finmark, 10—50 fath. (M. Sars) but it can also be very common in southern Norway; it was, for instance, met with in enormous quantities on Stor-eggen, 100 fath., by Professor G. O. Sars.

Beyond Norway *Ophioglypha robusta* is known from the Kara Sea, 40—50 fath. (Stuxberg); the west coast of Nova Zembla, 85 fath. (Marenzeller); the Barents Sea (Hoffmann); Spitzbergen, Jan Mayen, 12 $\frac{1}{2}$ —90 fath. (Fischer); Iceland, the Færoe Islands, the Shetland Islands, the east coast of Scotland and the north of England (Norman); Skagen and Hirshals, 52—80 fath. (Möbius & Bütschli); Öresund, 10—18 fath. (Lütken); Kullen, Skåne (Lilljeborg); Bohuslän (Lovén); Greenland (Lütken, Duncan & Sladen); the northern and eastern coasts of North America, as far as Cape Cod, (Lyman). Just as *Ophioglypha sarsii*, so does *Ophioglypha robusta* belong to both the cold area as well as the warm area. It seems to appear most abundantly on the boundary between both zones.

***Ophioglypha affinis* (Ltk.) Lyman.**

1858. *Ophiura affinis*, Lütken, Addit. ad Hist. Ophiurid., part I, pag. 45. Pl. II, fig. 10.
 1862. — grubei, Heller, Lit. Fauna d. Adriat. Meeres, pag. 431. Pl. II, figs. 13—16.

1863. *Ophiura normani*, Hodge, Trans. Tyneside. Nat. F. Club., vol. V, part 4 pag. 296. Tab. XVI, fig. 1—3.
1864. — *affinis*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 360.
1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV, pag. 113.
1865. *Ophioglypha affinis*, Lyman. Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 52.
1890. — — Fjelstrup, Zoologia Danica, Pighudedede, pag. 24. Tab. II, fig. 3.
1892. *Ophiura affinis*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 111.

Findested.

Station Flesje, Sognefjord, 100—130 Fv.	1 Exemplar.
— Husøen, 40—100 Fv.	1 Exemplar.
— No. 54	1 Exemplar.
— „ 257	1 Exemplar.
— Kjosen	4 Exemplarer.

Exemplaret fra Station 257 viste i levende Live en ganske eiendommelig Farvevarietet, der fuldstændig afveg fra de hidindtil beskrevne Exemplarer. Skivens Ryg var nemlig teglstenrød med et brunsort Centrum, hvorfra der gik fem korte Forlængelser henimod Armene. Armene var noget lysere rød end Skiven. Bugfladen var hvid. I Alkohol er Exemplaret gulagtigt hvidt med et graablaat Centrum paa Skivens Ryg. Skivens Diameter var 7^{mm}, Armenes Længde 16^{mm}.

Udbredelse.

Ophioglypha affinis er tidligere funden ved Loppen, Finmarken, 20—30 Fv. (Lovén); Balsholmen, 60 Fv. (Göes & Malmgren); Lofoten, Slotsholmen, Nordland (Danielssen); forskellige Lokalteter i Trondhjemsfjorden, 20—120 Fv. (Storm); Mebotten, 50—60 Fv. (G. O. Sars); Molde, Christianssund, 20—50 Fv. (M. Sars); Florø, 50 til 200 Fv. (Hansen & Friele); Manger (M. Sars); Bergen (Friele); Hougesund, 106 Fv., Farsund (Lindstrøm); Christianssand, 294 Fv. (Möbius & Bütschli); Christianiafjorden, 20—30 Fv. (M. Sars).

Arten er endvidere funden ved Shetlandsøerne (Norman); paa forskellige Lokalteter ved de britiske Kyster (Norman, 20—40 Fv. Leslie & Herdman, 24 Fv. Hodge, Möbius & Bütschli, 24—30 Fv.); Doggersbanken, 13 Fv. Hanstholmen, 36—49 Fv. Hirshals, 267 Fv. (Möbius & Bütschli); Skagerak, Kattegat, 7—125 Fv. (Petersen); Bohuslän, 10—18 Fv. (Ljungman); Øresund, 10—18 Fv. (Lütken); Adriaterhavet (Heller, Ludwig); Nordamerikas Østkyst (Lyman). Arten synes saaledes fortrinsvis at være en nordisk Form, som kun undtagelsesvis forekommer i den kolde Area (Stat. 54, 601 Fv., ÷ 1.2° Cel.).

1863. *Ophiura normani*, Hodge, Trans. Tyneside. Nat. F. Club., vol. V, part 4 pag. 296. Pl. XVI, figs. 1—3.
1864. — *affinis*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 360.
1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV, pag. 113.
1865. *Ophioglypha affinis*, Lyman. Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 52.
1890. — — Fjelstrup, Zoologia Danica, Pighudedede, pag. 24. Pl. II, fig. 3.
1892. *Ophiura affinis*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 111.

Localities.

Station Flesje, Sognefjord, 100—130 fath.	1 specimen.
— Husøen, 40—100 fath.	1 specimen.
— No. 54	1 specimen.
— „ 257	1 specimen.
— Kjosen	4 specimens.

In the live state the specimen from station 257 showed quite a peculiar variety of colouring, which completely differed from the specimens hitherto described. The back of the disc was, namely, brick-red, with a brown-black centre from which five short prolongations proceeded towards the arms. The arms had a somewhat lighter red colour than the disc. The ventral surface was white. In alcohol the specimen is yellowish white with a greyish-blue centre on the back of the disc. The diameter of the disc was 7^{mm}, the length of the arms 16^{mm}.

Distribution.

Ophioglypha affinis has been previously found at Loppen in Finmark, 20—30 fath. (Lovén); Balsholmen, 60 fath. (Göes & Malmgren); Lofoten, Slotsholmen, Nordland (Danielssen); at different localities in the Trondhjem fiord, 20—120 fath. (Storm); Mebotten, 50—60 fath. (G. O. Sars); Molde, Christianssund, 20—50 fath. (M. Sars); Florø, 50—200 fath. (Hansen & Friele); Manger (M. Sars); Bergen (Friele); Hougesund, 106 fath., Farsund (Lindstrøm); Christianssand, 294 fath. (Möbius & Bütschli); Christiania fiord, 20—30 fath. (M. Sars).

The species has been, further, found at the Shetlands Islands (Norman); in different localities on the British coasts (Norman, 20—40 fath. Leslie & Herdman, 24 fath. Hodge, Möbius & Bütschli, 24—30 fath.); the Dogger Bank, 13 fath. Hanstholmen, 36—49 fath. Hirshals, 267 fath. (Möbius & Bütschli); the Skager Rack, Kattegat, 7—125 fath. (Petersen); Bohuslän, 10—18 fath. (Ljungman); Öresund, 10—18 fath. (Lütken); the Adriatic Sea (Heller, Ludwig); the east coast of North America (Lyman). The species appears, thus, to be preferably a northern form which only exceptionally appears in the cold area (Stat. 54, 601 fath., ÷ 1.2° Cel.).

Ophiocten sericeum (Forbes) Ljungman.

1852. *Ophiura sericea*, Forbes, Sutherlands Journ. Voy. Baffins Bay, vol. II, App.
 1854. *Ophiocten kröyeri*, Lütken, Bidr. til Kundsk. om Slangestjernerne, Vidensk. Meddel. pag. 102.
 1857. — — id. Oversigt over Grønlands Echinodermata, ibid. pag. 52.
 1858. — — id. Addit. ad Hist. Ophiurid., part. I, pag. 52. Tab. I, fig. 5.
 1864. — *sericeum*, Ljungman, Öfversigt Kongl. Vetensk. Akad. Förhandl., pag. 360.
 1865. — *kröyeri*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 52.
 1871. *Ophioglypha gracilis*, G. O. Sars, Nye Echinoderm fra den norske Kyst, pag. 18.
 1877. *Ophiocten sericeum*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 464.
 1878. — — Lyman, Bull. Mus. Comp. Zool., vol. V, No. 7 pag. 102.
 1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea, pag. 65. Tab. IV, fig. 8—10, 14.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part. 14, pag. 79.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 113. Tab. XIII, fig. 1—2.

Den af G. O. Sars beskrevne *Ophioglypha gracilis* maa betragtes som identisk med *Ophiocten sericeum*, hvad allerede Lyman har gjort opmærksom paa. Sars bemærker selv: „Saavel den almindelige Habitus (Skivens eiendommelige Form og de lange spinkle Arme) som de fleste finere Detailler, saasom Mundskjoldene, Mund- og Fodpapillerne, Armenes Plader og Forholdet af det inderste Par Ambulacralporer er næsten fuldkommen ligedan hos begge disse Former“. Forskjellen mellem dem skulde være Forholdet ved Armenes Insertion samt Anordningen af den Rad Papiller, som kanter Skiven og de tre første Armryglader. Det sidste Karaktermærke finder Lyman er det eneste, der skulde adskille *Ophioglypha gracilis* fra *Ophiocten sericeum*, men gjør samtidig opmærksom paa at Anordningen af Papillerne er underkastet mange Variationer, saaat den neppe kan bruges som Artsmærke.

Foruden Nordhavsexpeditionens righoldige Materiale har jeg havt Anledning at undersøge Exemplarer af *Ophiocten sericeum* fra Grønland og Sognefjorden samt tre Typeexemplarer af *Ophioglypha gracilis* fra Lofoten, der opbevares i Bergens Museum. Sammenligner man dette Materiale, finder man, at Indsnittet i Skiven ved Armenes Basis hos alle disse Exemplarer er underkastede

Den norske Nordhavsexpedition. James A. Grieg: Ophiuroidea.

Ophiocten sericeum (Forbes) Ljungman.

1852. *Ophiura sericea*, Forbes, Sutherland's Journ. Voy. Baffins Bay, vol. II, App.
 1854. *Ophiocten kröyeri*, Lütken, Bidr. til Kundsk. om Slangestjernerne, Vidensk. Meddel. pag. 102.
 1857. — — id. Oversigt over Grønlands Echinodermata, ibid. pag. 52.
 1858. — — id. Addit. ad Hist. Ophiurid., part. I, pag. 52. Pl. I, fig. 5.
 1864. — *sericeum*, Ljungman. Öfversigt Kongl. Vetensk. Akad. Förhandl., pag. 360.
 1865. — *kröyeri*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 52.
 1871. *Ophioglypha gracilis*, G. O. Sars, Nye Echinoderm fra den norske Kyst, pag. 18.
 1877. *Ophiocten sericeum*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 464.
 1878. — — Lyman, Bull. Mus. Comp. Zool., vol. V, No. 7 pag. 102.
 1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea, pag. 65. Pl. IV, figs. 8—10, 14.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exped. Zool., vol. V, part. 14, pag. 79.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 113. Pl. XIII, figs. 1—2.

The *Ophioglypha gracilis* described by G. O. Sars must be considered as identical with *Ophiocten sericeum*, a thing which Lyman has already drawn attention to. Sars himself remarks “Both the general habitus (the peculiar form of the disc and the long slender arms) as well as most of the minuter details, such as the oral shields, oral and pedal papillæ, the plates of the arms, and the relation of the innermost pair of ambulacral pores is almost completely similar in both those forms”. The difference between them is supposed to be the relation of the insertion of the arm and the arrangement of the row of papillæ which edge the disc, and the three first brachial dorsal plates. Lyman considers that the last-named characteristic is the only one which might distinguish *Ophioglypha gracilis* from *Ophiocten sericeum*, but at same time he draws attention to the circumstance that the arrangement of the papillæ is subjected to many variations, so that it can scarcely be used as a specific characteristic.

Besides the abundant material of the North Atlantic Expedition, I have had an opportunity of examining specimens of *Ophiocten sericeum* from Greenland and the Sognefiord, as well as three typical specimens of *Ophioglypha gracilis* from Lofoten, which are preserved in Bergens Museum. If we compare this material we find, that the incision in the disc at the base of the arm is, in all

saa mange Variationer, at dette Mærke ikke kan bruges ved Artsdiagnosen. Papillernes Anordning er ligeledes underkastede mange Variationer selv paa samme Individ; hos et forøvrigt typisk Exemplar af *Ophiocten sericeum* fra Grønland var der saaledes ved en af Armenes Insertioner en continuerlig Rad med Papiller, medens Raden ved de øvrige var afbrudt i Midten ved et mere eller mindre bredt Mellemrum, ganske som hos *Ophioglypha gracilis*; en lignende Variation fandtes ogsaa hos adskillige Exemplarer fra Nordhavsexpeditionen. Hos mange Exemplarer var heller ikke Papillerne langs den ydre Rand af de tre første Armrygplader altid ordnede i continuerlige Rækker. Endvidere minder Forholdet ved Armenes Forbindelse med Skiven hos ovennævnte tre Typeexemplarer af *Ophioglypha gracilis* mere om Slægten *Ophiocten* end *Ophioglypha*; den inderste Armrygplade ligger nemlig hos samtlige tre Exemplarer ikke i Høide med Skiven, men denne hvælver sig tværtom ud over den, saaat Armene alene kommer at udgaa fra Skivens Bugside, hvad de jo ifølge Sars's Beskrivelse ikke skulde gjøre.

Findested.

Station	Husøen, 100—150 Fv.	1 Exemplar.
—	No. 10	1 Exemplar.
—	" 18	2 Exemplarer.
—	" 31	Meget almindelig.
—	" 34	3 Exemplarer.
—	" 40	1 Exemplar.
—	" 48	3 Exemplarer.
—	" 54	2 —
—	" 79	1 Exemplar.
—	" 87	Nogle Exemplarer.
—	" 96	— —
—	" 124	Almindelig.
—	" 164	Nogle Exemplarer.
—	" 176	2 Exemplarer.
—	" 226	Nogle store Exemplarer.
—	" 248	Yderst almindelig.
—	" 262	Nogle Exemplarer.
—	" 267	— —
—	" 283	Almindelig.
—	" 286	Nogle Exemplarer.
—	" 312	Uhyre Mængde.
—	" 315	6 Exemplarer.
—	" 323	Nogle Exemplarer.
—	" 336	— —
—	" 337	Nogle store Exemplarer.
—	" 343	2 Exemplarer.
—	" 357	2 —
—	" 359	5 —
—	" 362	1 Exemplar.
—	" 363	Nogle mindre og 5 store Exemplarer.
—	Magdalene Bay, 50—70 Fv.	Nogle store Exemplarer.
—	No. 374	Almindelig.

those specimens, subjected to so many variations that that characteristic cannot be used in diagnosis of species. The arrangement of the papillæ is also subjected to many variations even in the same individual. In an otherwise typical specimen of *Ophiocten sericeum* from Greenland, there was, thus, at the insertions of one of the arms a continuous series of papillæ, whilst the series on the others was interrupted in the middle by a more or less broad interval, quite as in *Ophioglypha gracilis*. A similar variation was also found in several specimens from the North Atlantic Expedition. Neither were the papillæ along the outer edge of the three first brachial dorsal plates, in many specimens, always arranged in continuous series. Further, the relation of the connection of the arm with the disc, in the above-named three typical specimens of *Ophioglypha gracilis*, reminds more of the genera *Ophiocten* and *Ophioglypha*; the innermost brachial dorsal plate lies, namely, in all the three specimens, not on a level with the disc, but, on the contrary, the latter arches itself over the former so that the arms only come to issue from the ventral side of the disc, which they should, according to Sars's description, of course not do.

Localities.

Station	Husøen, 100—150 fath.	1 specimen.
—	No. 10	1 specimen.
—	" 18	2 specimens.
—	" 31	Very general.
—	" 34	3 specimens.
—	" 40	1 specimen.
—	" 48	3 specimens.
—	" 54	2 —
—	" 79	1 specimen.
—	" 87	A few specimens.
—	" 96	— —
—	" 124	General.
—	" 164	A few specimens.
—	" 176	2 specimens.
—	" 226	A few large specimens.
—	" 248	Very general.
—	" 262	A few specimens.
—	" 267	— —
—	" 283	General.
—	" 286	A few specimens.
—	" 312	Immense quantity.
—	" 315	6 specimens.
—	" 323	A few specimens.
—	" 336	— —
—	" 337	Some large specimens.
—	" 343	2 specimens.
—	" 357	2 —
—	" 359	5 —
—	" 362	1 specimen.
—	" 363	A few small and 5 large specimens.
—	Magdalene Bay, 50—70 fath.	A few large specimens.
—	No. 374	General.

Udbredelse.

Arten er tidligere funden ved Lofoten, 200—300 Fv. (S. Lovén, G. O. Sars); Bodø, 150 Fv., Havdybet udenfor Storeggen, 400 Fv., Christianssund, 10 Fv. (G. O. Sars); 6 Mil vest af Sognefjorden (Hansen & Friele); Lervik, Hardangerfjorden, 180 Fv. (Norman); Drøbak, 100—120 Fv. (G. O. Sars). Ifølge Konservator Storm er den meget almindelig ved Rødbjerget, Trondhjemsfjorden (250—300 Fv.).

Ophiocten sericeum forekommer endvidere i Karahavet (Stuxberg, 5—60 Fv., Levinsen, 12—100 Fv.); Vestkysten af Novaja Semlja, 42 $\frac{1}{2}$ —57 $\frac{1}{2}$ Fv. (Marenzeller); Barentshavet (Hoffmann); Spitzbergen (Lütken); Jan Mayen, 50—125 Fv. (Fischer); Island; Færøkanalen, 542—705 Fv. (Hoyle); den nordøstlige Del af Atlanterhavet, 1207—2435 Fv. (Porcupine); Skagerak (Ljungman); Grønlandskyster (Duncan & Sladen, 11—80 Fv., Lütken, 15—50 Fv.); Arktisk Amerika, Kysten af Massachusetts, U. S. A. (Lyman); Marion Island, 50—75 Fv. (Challenger).

Amphiura chiajii Forbes.

1825. *Asterias filiformis*, Delle Chiaje, Mem. stor. anat. anim. Napoli, tome II pag. 359.
 1843. *Amphiura chiajii*, Forbes, Trans. Linn. Soc., vol. XIX, pag. 151. Tab. XIV, fig. 14—18.
 1843. — *florifera*, id. ibid. pag. 150.
 1846. *Ophiolepis filiformis*, Düben & Koren, Zool. Bidrag, pag. 234 (partim).
 1857. *Amphiura chiajii*, M. Sars, Nyt Mag. for Naturvidensk., vol. X, pag. 30. Tab. I, fig. 8—10.
 1858. — — Lütken, Addit. ad Hist. Ophiurid., part I, pag. 57. Tab. II, fig. 12.
 1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 119.
 1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV pag. 108.
 1869. — *stepanovii*, Tscherniavsky, Protocol der Moskauer Naturf. Versamml., pag. XLV.
 1890. — *chiajii*, Fjelstrup, Zoologia Danica, Pighudedede, pag. 27. Tab. III, fig. 2.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 117.

Findested.

Station No. 1 Nogle Exemplarer.
 — Husøen, 100—150 Fv. Almindelig.

Distribution.

The species has been previously found at Lofoten, 200—300 fath. (S. Lovén, G. O. Sars); Bodø, 150 fath., the ocean depths off Storeggen, 400 fath., Christianssund, 10 fath. (G. O. Sars); 6 miles west of the Sognefjord (Hansen & Friele); Lervik, the Hardanger fiord, 180 fath. (Norman); Drøbak, 100—120 fath. (G. O. Sars). According to Mr. Storm, Curator, it is very common at Rødbjerget, the Trondhjem fiord (250—300 fath.).

Ophiocten sericeum appears, further, in the Kara Sea (Stuxberg, 5—60 fath., Levinsen, 12—100 fath.); the west coast of Nova Zembla, 42 $\frac{1}{2}$ —57 $\frac{1}{2}$ fath. (Marenzeller); the Barents Sea (Hoffmann); Spitzbergen (Lütken); Jan Mayen, 50—125 fath. (Fischer); Iceland; the Færø channel, 542—705 fath. (Hoyle); the north-eastern portion of the Atlantic Ocean, 1207—2435 fath. (Porcupine); the Skager Rack (Ljungman); the coasts of Greenland (Duncan & Sladen, 11—80 fath., Lütken, 15—50 fath.); Arctic America, the coast of Massachusetts, U. S. A. (Lyman); Marion Island, 50—75 fath. (Challenger).

Amphiura chiajii Forbes.

1825. *Asterias filiformis*, Delle Chiaje, Mem. stor. anat. anim. Napoli, tome II pag. 359.
 1843. *Amphiura chiajii*, Forbes, Trans. Linn. Soc., vol. XIX, pag. 151. Pl. XIV, figs. 14—18.
 1843. — *florifera*, id. ibid. pag. 150.
 1846. *Ophiolepis filiformis*, Düben & Koren, Zool. Bidrag, pag. 234 (partim).
 1857. *Amphiura chiajii*, M. Sars, Nyt Mag. for Naturvidensk., vol. X, pag. 30. Pl. 1, fig. 8—10.
 1858. — — Lütken, Addit. ad Hist. Ophiurid., part. I pag. 57. Pl. II, fig. 12.
 1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 119.
 1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV pag. 108.
 1869. — *stepanovii*, Tscherniavsky, Protocol der Moskauer Naturf. Versamml., pag. XLV.
 1890. — *chiajii*, Fjelstrup, Zoologia Danica, Pighudedede, pag. 27. Pl. III, fig. 2.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 117.

Localities.

Station No. 1. A few specimens.
 — Husøen, 100—150 fath. General.

Udbredelse.

Arten er meget almindelig langs vor Syd- og Vestkyst, fra Christianiafjorden, 10—50 Fv. (M. Sars) til Trondhjemsfjorden, 20—100 Fv. (V. Storm). Dens bathymetriske Udbredelse ved vore Kyster er 10—650 Fv. (Stat. 1, Sognefjorden).

Amphiura chiajii forekommer endvidere i Færøkanalen ned til 555 Fv. Dyb (Hoyle); ved Shetlandsøerne, de britiske Kyster, 20—120 Fv. (Norman, Forbes m. fl.); Jylland, 15—22 Fv. (Möbius & Bütschli); Skagerak, Kattegat, 10—100 Fv. (Petersen); Bohuslän (Ljungman); Middelhavet, 0—100 Fv. (M. Sars, Ludwig); Adriaterhavet; Ægæerhavet (Forbes); Sortehavet (Tscherniavsky).

***Amphiura filiformis* (O. F. Müll.) Forbes.**

1776. *Asterias filiformis*, O. F. Müller, Zool. Dan. Prod., pag. 235.
 1788. — — id. Zool. Dan., vol. II pag. 24. Tab. LIX.
 1837. *Ophiura* — Lamarck, Hist. nat. anim. sans vert. 3die Udg., vol. I pag. 476.
 1841. *Ophiocoma* — Forbes, British Starfishes, pag. 40.
 1842. *Ophiolepis* — Müll. & Tr., Syst. der Aster., pag. 94.
 1843. *Amphiura* — Forbes, Trans. Linn. Soc., vol. XIX pag. 151.
 1846. *Ophiolepis* — Düben & Koren, Zool. Bidrag, pag. 234 (partim).
 1857. *Amphiura* — M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 28.
 1858. — — Lütken, Addit. ad Hist. Ophiurid., part I pag. 56. Tab. II, fig. 11.
 1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV pag. 107.
 1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1 pag. 116.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 27. Tab. III, fig. 1.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 119.

Findested.

Station Husøen, 100—150 Fv. Nogle Exemplarer.
 — No. 79 1 Exemplar.

Distribution.

The species is very common along the Norwegian south and west coasts, from the Christiania fiord, 10—50 fath. (M. Sars) to the Trondhjem fiord, 20—100 fath. (V. Storm). Its bathymetric distribution on the Norwegian coasts is 10—650 fath. (Stat. 1, Sognefiord).

Amphiura chiajii is met with, further, in the Færø channel, up to 555 fath. deep (Hoyle); the Shetland Islands, the British coasts, 20—120 fath. (Norman, Forbes, and others); Jutland, 15—22 fath. (Möbius & Bütschli); the Skager Rack, Cattegat, 10—100 fath. (Petersen); Bohuslen (Ljungman); the Mediterranean, 0—100 fath. (M. Sars, Ludwig); the Adriatic Sea; the Ægean Sea (Forbes); the Black Sea (Tscherniavsky).

***Amphiura filiformis* (O. F. Müll.) Forbes.**

1776. *Asterias filiformis*, O. F. Müller, Zool. Dan. Prod., pag. 235.
 1788. — — id. Zool. Dan., vol. II pag. 24. Pl. LIX.
 1837. *Ophiura* — Lamarck, Hist. nat. anim. sans vert. 3de edition, vol. I pag. 476.
 1841. *Ophiocoma* — Forbes, British Starfishes, pag. 40.
 1842. *Ophiolepis* — Müll. & Tr., Syst. der Aster., pag. 94.
 1843. *Amphiura* — Forbes, Trans. Linn. Soc., vol. XIX pag. 151.
 1846. *Ophiolepis* — Düben & Koren, Zool. Bidrag, pag. 234 (partim).
 1857. *Amphiura* — M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 28.
 1858. — — Lütken, Addit. ad Hist. Ophiurid., part. I pag. 56. Pl. II, fig. 11.
 1865. — — Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV pag. 107.
 1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1 pag. 116.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 27. Pl. III, fig. 1.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 119.

Localities.

Station Husøen, 100—150 fath. A few specimens.
 — No. 79 1 specimen.

Udbredelse.

Denne Art er mere eller mindre almindelig langs den norske Kyst fra Christianiafjorden, 5—20 Fv. (M. Sars) til Christianssund (M. Sars, 30—60 Fv., Dr. Danielssen, 50—80 Fv.). Ved Bergenskysten er den, omend ikke sjelden, dog ikke saa almindelig som foregaaende Art.

Udenfor Norge er Arten funden i Færøkanalen, 555 Fv. (Hoyle); ved Shetlandsøerne, de britiske Kyster (Norman, Leslie & Herdman o. fl.); de tyske og danske Nordsøkyster, 15—52 Fv. (Möbius & Bütschli); Kattegat, 10—70 Fv. (Petersen); Øresund (Lütken); Kullen i Skåne, Bohuslän (Ljungman); Middelhavet, 220 Fv. (Porcupine); Adriaterhavet, 5—100 Fv. (M. Sars, Ludwig). Ligesom foregaaende Art tilhører saaledes ogsaa denne blot den varme Area, og er dens Hovedudbredelse muligens noget sydligere end *Amphiura chiajii*'s, som synes at optræde i størst Mængde i de nordiske Farvande, medens *Amphiura filiformis* synes at være talrigst i Middelhavet.

Amphiura elegans (Leach) Norman.

1815. *Ophiura elegans*, Leach, Zool. Miscell., vol. II pag. 59.
 1825. *Asterias squamata*, Delle Chiaje, Mem. stor. anat. anim. Napoli, vol. II pag. 77. Tab. XXX, fig. 1.
 1835. *Ophiura neglecta*, Johnston, Mag. Nat. Hist., vol. VIII pag. 467.
 1837. — — Lamarck, Hist. Nat. Anim. sans Vert., 3die Udgave, vol. I pag. 476.
 1840. — *moniliformis*, Grube, Aktin. Echin. & Würmer, pag. 18.
 1841. — *squamata*, Delle Chiaje, Descrizione & Notomia Anim. Invert. Sicilia, vol. IV pag. 62. Tab. CXXXI, fig. 1—4.
 1841. *Ophiocoma neglecta*, Forbes, British Starfishes, pag. 30.
 1842. *Ophiolepis squamata*, Müll. & Tr., Syst. der Aster., pag. 92.
 1843. *Amphiura neglecta*, Forbes, Trans. Linn. Soc., vol. XIX pag. 150.
 1852. *Ophiolepis tenuis*, Ayres, Proceed. Boston Soc. Nat. Hist., vol. IV pag. 133.
 1859. — *squamata*, M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 28.
 1859. *Amphiura tenuis*, Lyman, Proceed. Boston Soc. Nat. Hist., vol. VII pag. 194.
 1859. — *tenera*, Lütken, Addit. ad Hist. Ophiurid., part II pag. 226. Tab. III, fig. 5.

Distribution.

This species is more or less common along the Norwegian coast from the Christiania fiord, 5—20 fath. (M. Sars) to Christianssund (M. Sars, 30—60 fath., Dr. Danielssen, 50—80 fath.). On the Bergen coast it is, although not rare, yet not so common as the preceding species.

Beyond Norway the species is met with in the Færø channel, 555 fath. (Hoyle); the Shetland islands, the British coasts (Norman, Leslie & Herdman, and others); the Danish and German North Sea coasts, 15—52 fath. (Möbius & Bütschli); the Kattegat, 10—70 fath. (Petersen); Øresund (Lütken); Kullen in Skåne, Bohuslän (Ljungman); the Mediterranean, 220 fath. (Porcupine); the Adriatic Sea, 5—100 fath. (M. Sars, Ludwig). Like the preceding species, this one also belongs only to the warm area, and its chief distribution is possibly somewhat more southerly than *Amphiura chiajii*, which seems to appear in the greatest abundance in the Northern waters, while *Amphiura filiformis* seems to be most abundant in the Mediterranean Sea.

Amphiura elegans (Leach) Norman.

1815. *Ophiura elegans*, Leach, Zool. Miscell., vol. II pag. 59.
 1825. *Asterias squamata*, Delle Chiaje, Mem. stor. anat. anim. Napoli, vol. II pag. 77. Pl. XXX, fig. 1.
 1835. *Ophiura neglecta*, Johnston, Mag. Nat. Hist., vol. XIII pag. 467.
 1837. — — Lamarck, Hist. Nat. Anim. sans Vert., 3me edition, vol. I pag. 476.
 1840. — *moniliformis*, Grube, Aktin. Echin. & Würmer, pag. 18.
 1841. — *squamata*, Delle Chiaje, Descrizione & Notomia Anim. Invert. Sicilia, vol. IV pag. 62. Pl. CXXXI, figs. 1—4.
 1841. *Ophiocoma neglecta*, Forbes, British Starfishes, pag. 30.
 1842. *Ophiolepis squamata*, Müll. & Tr., Syst. der Aster., pag. 92.
 1843. *Amphiura neglecta*, Forbes, Trans. Linn. Soc., vol. XIX pag. 150.
 1852. *Ophiolepis tenuis*, Ayres, Proceed. Boston Soc. Nat. Hist., vol. IV pag. 133.
 1859. — *squamata*, M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 28.
 1859. *Amphiura tenuis*, Lyman, Proceed. Boston Soc. Nat. Hist., vol. VII pag. 194.
 1859. — *tenera*, Lütken, Addit. ad Hist. Ophiurid., part. II pag. 226. Pl. III, fig. 5.

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| <p>1861. <i>Amphiura squamata</i>, M. Sars, Oversigt af Norges Echinodermer, pag. 21.</p> <p>1863. — — Heller, Untersuch. über die Litoralfauna des adriat. Meeres, pag. 426. Tab. II, fig. 9.</p> <p>1864. — — Ljungman, Öfversigt Kongl. Vetensk. Akadem. Förhandl., pag. 362. Tab. XV, fig. 2.</p> <p>1864. — <i>tenuispina</i>, id. <i>ibid.</i>, pag. 360. Tab. XV, fig. 1.</p> <p>1865. — <i>squamata</i>, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 121.</p> <p>1865. — <i>tenera</i>, id. <i>ibid.</i>, pag. 123.</p> <p>1865. — <i>elegans</i>, Norman, Ann. & Mag. Nat. Hist., ser. 3. vol. XV pag. 109.</p> <p>1869. <i>Amphipholis neglecta</i>, Fischer, Actes de la Soc. Linn. de Bordeaux, vol. XXVII pag. 361.</p> <p>1871. — <i>elegans</i>, Lütken, Vidensk. Meddel., pag. 140.</p> <p>1871. — <i>squamata</i>, Ljungman, Öfversigt Kongl. Vetensk. Akadem. Förhandl., pag. 633.</p> <p>1871. — <i>lineata</i>, id. <i>ibid.</i>, pag. 634.</p> <p>1871. — <i>kinbergi</i>, id. <i>ibid.</i>, pag. 646.</p> <p>1871. — <i>appressa</i>, id. <i>ibid.</i>, pag. 647.</p> <p>1890. <i>Amphiura squamata</i>, Fjelstrup, Zoologia Danica, Pighudedede, pag. 26. Tab. II, fig. 6.</p> <p>1892. — <i>elegans</i>, Jeffrey Bell, Catalogue of British Echinoderms, pag. 119.</p> | <p>1861. <i>Amphiura squamata</i>, M. Sars, Oversigt af Norges Echinodermer, pag. 21.</p> <p>1863. — — Heller, Untersuch. über die Litoralfauna des adriat. Meeres, pag. 426. Pl. II, fig. 9.</p> <p>1864. — — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 362. Pl. XV, fig. 2.</p> <p>1864. — <i>tenuispina</i>, id. <i>ibid.</i>, pag. 360. Pl. XV, fig. 1.</p> <p>1865. — <i>squamata</i>, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 121.</p> <p>1865. — <i>tenera</i>, id. <i>ibid.</i>, pag. 123.</p> <p>1865. — <i>elegans</i>, Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV pag. 109.</p> <p>1869. <i>Amphipholis neglecta</i>, Fischer, Actes de la Soc. Linn. de Bordeaux, vol. XXVII pag. 361.</p> <p>1871. — <i>elegans</i>, Lütken, Vidensk. Meddel., pag. 140.</p> <p>1871. — <i>squamata</i>, Ljungman, Öfversigt Kongl. Vetensk. Akadem. Förhandl., pag. 633.</p> <p>1871. — <i>lineata</i>, id. <i>ibid.</i>, pag. 634.</p> <p>1871. — <i>kinbergi</i>, id. <i>ibid.</i>, pag. 646.</p> <p>1871. — <i>appressa</i>, id. <i>ibid.</i>, pag. 647.</p> <p>1890. <i>Amphiura squamata</i>, Fjelstrup, Zoologia Danica, Pighudedede, pag. 26. Pl. II, fig. 6.</p> <p>1892. — <i>elegans</i>, Jeffrey Bell, Catalogue of British Echinoderms, pag. 119.</p> |
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Findested.

Station Flesje, Sognefjord, 100 Fv. 1 lidet Exemplar.
 — Husøen, 4—5 Fv. . . . 3 Exemplarer.
 — Do. 100—150 Fv. . . . 3 —
 — No. 26 1 Exemplar.

Det ene af Dybvandsexemplarerne fra Husøen mindede ved en skarp tydelig udpræget Rand mellem Ryg- og Bugsiden meget om Dybvandsvarietet, *Amphiura tenuispina*, Ljungman, men da alle de øvrige Karakterer samstemmede ganske med Hovedformen, bør vel ogsaa dette Exemplar henføres til denne.

Udbredelse.

Arten er tidligere kjendt fra Skraaven, Lofoten, 300 Fv. (G. O. Sars); Christianssund og det nærliggende Frskevær Grip (Düben, M. Sars); Molde (Lilljeborg); Florø, fra Litoralbæltet ned til 200 Fv.; Holmengraa (Hansen & Friele); Bergen, 50—200 Fv.; Hvitingsø, 150—200 Fv. (G. O. Sars); Farsund, 50—55 Fv. (Lindström). Ifølge Norman forekommer den ogsaa i Hardanger- og Christiania Fjorden, 50—180 Fv. (Hoyle).

Localities.

Station, Flesje, Sognefiord, 100 fath. A small specimen.
 — Husøen, 4—5 fath. . . . 3 specimens.
 — Do. 100—150 fath. . . . 3 —
 — No. 26 1 specimen.

One of the deep-water specimens from Husøen reminded, by its sharp, distinctly marked margin between the dorsal and ventral surfaces, much of the deep-water variety *Amphiura tenuispina*, Ljungman, but as all the other characteristic features quite corresponded with the normal chief form, this specimen must also presumably be assigned to it.

Distribution.

The species is previously known from Skraaven, Lofoten, 300 fath. (G. O. Sars); Christianssund and the adjacent fishing station Grip (Düben, M. Sars); Molde (Lilljeborg); Florø, from the littoral belt down to 200 fath.; Holmengraa (Hansen & Friele); Bergen, 50—200 fath.; Hvitingsø, 150—200 fath. (G. O. Sars); Farsund, 50—55 fath. (Lindström). According to Norman it appears also in the Hardanger and Christiania fiords, 50—180 fath. (Hoyle).

Amphiura elegans er endvidere funden ved Bohuslän, hvor den gaar ned til 120—130 Favnes Dyb (Lovén); Kattegat (Petersen); Øresund, 15 Fv. (Lütken); Shetlandsøerne (Norman); de britiske Kyster (Forbes, Norman m. fl.); Holland (Horst); Frankriges Vestkyst (Fischer); Middelhavet, 0—5 Fv. (M. Sars, Ludwig); Adriaterhavet (Graeffe); Ægæerhavet, Azorerne, 0—15, 200—300 Fv. (Ljungman); Nordamerikas Østkyst (Lyman, Ljungman, 36—38 Fv., Verrill, 115—487 Fv.); Vestindien (Lütken, Lyman, Ljungman); Brasilien (Ljungman); Kap det Gode Haab (Kinberg, Challenger, 98 Fv.); Sydøst af Australien, 120 Fv. (Challenger). Der er saaledes neppe nogen Ophiuride, som har en saa stor geografisk Udbredelse som *Amphiura elegans*, da den sandsynligvis neppe mangler i noget Farvand, naar undtages de arktiske og de mere indelukkede som Østersøen. Dens bathymetriske Udbredning er 0—487 Fv.

***Amphiura borealis* (G. O. Sars) Ljungman.**

1871. *Ophiopeltis borealis*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 16.
 1871. *Amphiura* — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 643 & 655.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 144.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 121.

Findested.

Station No.	8	1	Exemplar.
—	101	1	—
—	147	4	Exemplarer.
Imellem	173 & 174	1	Exemplar.
—	195	2	Exemplarer.

Udbredelse.

Amphiura borealis er tidligere funden ved Lofoten, 80—300 Fv., Bodø, 80—120 Fv. (G. O. Sars); Rødbjergsbugten i Trondhjemsfjorden, 200—300 Fv. (V. Storm); Havdybet udenfor Storeggen, 400 Fv. (G. O. Sars); Korsfjorden, 120 Fv. (Norman); Hvitingsø, 150 Fv. (G. O. Sars). Arten synes saaledes at være udbredt langs hele vor Vestkyst, den synes dog overalt at være sjelden.

Udenfor Norge er den kun funden en Gang i Færøkanalen (Porcupine 1869, Stat. 74, 203 Fv.). Samtlige Findesteder ligger indenfor den varme Area.

Amphiura elegans is further met with at Bohuslän, where it passes down to a depth of 120—130 fath. (Lovén); the Kattegat (Petersen); Öresund, 15 fath. (Lütken); the Shetlands Islands (Norman); the British coasts (Forbes, Norman, and others); Holland (Horst); the west coast of France (Fischer); the Mediterranean, 0—5 fath. (M. Sars, Ludwig); the Adriatic Sea (Graeffe); the Ægean Sea, the Azores, 0—15, 200—300 fath. (Ljungman); the east coast of North America (Lyman, Ljungman, 36—38 fath. Verrill, 115—487 fath.); the West Indies (Lütken, Lyman, Ljungman); the Brazils (Ljungman); the Cape of Good Hope (Kinberg, Challenger, 98 fath.); the south-east of Australia, 120 fath. (Challenger). There is, therefore, scarcely any Ophiuridean which has such a wide geographical distribution as *Amphiura elegans*, as it is probably scarcely absent in any waters with the exception of the Arctic seas, and the more enclosed seas, such as the Baltic. Its bathymetrical distribution is 0—487 fath.

***Amphiura borealis* (G. O. Sars) Ljungman.**

1871. *Ophiopeltis borealis*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 16.
 1871. *Amphiura* — Ljungman, Öfversigt Kongl. Vedensk. Akadm. Förhandl., pag. 643 & 655.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 144.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 121.

Localities.

Station No.	8	1	specimen.
—	101	1	—
—	147	4	specimens.
Between	173 & 174	1	specimen.
—	195	2	specimens.

Distribution.

Amphiura borealis has been previously found at Lofoten, 80—300 fath.; Bodö, 80—120 fath. (G. O. Sars); Rødbjerg Bay in the Trondhjem fiord, 200—300 fath. (V. Storm); the ocean depths off Storeggen, 400 fath. (G. O. Sars); the Korsfiord, 120 fath. (Norman); Hvitingsö, 150 fath. (G. O. Sars). The species appears, therefore, to be distributed along the entire Norwegian coast. It everywhere appears, however, to be rare.

Beyond Norway it has only once been met with, in the Færø channel (Porcupine, 1869, Stat. 74, 203 fath.). All the localities lie within the warm area.

Amphilepis norvegica (Ljungman).

1864. *Amphiura norvegica*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 363. Tab. XV, fig. 3 a—d.
 1866. *Amphilepis* — id. *ibid.*, pag. 322.
 1871. — — id. *ibid.*, pag. 632.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 149.

Findested.

Station No. 1	5 Exemplarer.
— „ 2	1 Exemplar.
— Husøen, 100—150 Fv.	Nogle Exemplarer.
— No. 10	1 Exemplar.
— „ 101	2 Exemplarer.
— „ 147	1 Exemplar.
— „ 255	1 —

Udbredelse.

Arten er tidligere funden i Trondhjemsfjorden, 70—300 Fv. (V. Storm); Molde, Christianssund (Lilljeborg); Osterfjorden, 400 Fv. (Friele); Bergensfjorden, 80—200 Fv., Haakonsund, Korsfjorden, 250 Fv., Hardangerfjorden, 350 Fv. (Danielssen). Ved Utne har Professor G. O. Sars fundet den ned til 500 Favnes Dyb. Farsund, 50—55 Fv. (Lindstrøm); Christianiafjorden, 60 Fv. (Lovén).

Desuden forekommer den ved Bohuslän, Portugal, 550—790 Fv. (Ljungman) og Nordamerikas Østkyst (Challenger, 1240—1350 Fy.; Albatross, 547—1608). Ved de britiske Kyster synes den derimod ganske at mangle, idetmindste findes den ikke optagen i Hoyles: „A revised list of British Ophiuroidea“; heller ikke omtaler Norman og Jeffrey Bell Arten.

Ophiactis abyssicola (M. Sars) Ljungman.

1861. *Amphiura abyssicola*, M. Sars, Oversigt af Norges Echinodermer, pag. 18. Tab. II, fig. 7—12.
 1865. *Ophiocnida* — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 12.
 1876. *Ophiactis* — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 324.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 123.

Amphilepis norvegica (Ljungman).

1864. *Amphiura norvegica*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 363. Pl. XV, fig. 3 a—d.
 1866. *Amphilepis* — id. *ibid.*, pag. 322.
 1871. — — id. *ibid.*, pag. 632.
 1882. — — Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 149.

Localities.

Station No. 1	5 specimens.
— „ 2	1 specimen.
— Husøen, 100—150 fath.	A few specimens.
— No. 10	1 specimen.
— „ 101	2 specimens.
— „ 147	1 specimen.
— „ 255	1 —

Distribution.

The species has been previously met with in the Trondhjem fiord, 70—300 fath. (V. Storm); Molde, Christianssund (Lilljeborg); Osterfiord, 400 fath. (Friele); the Bergen fiord, 80—200 fath., Haakonsund, Korsfiord, 250 fath., the Hardanger fiord, 350 fath. (Danielssen). Off Utne Professor G. O. Sars has found it as deep as 500 fath. Farsund, 50—55 fath. (Lindström); the Christiania fiord, 60 fath. (Lovén).

It appears, further, at Bohuslen, Portugal, 550—790 fath. (Ljungman), and the east coast of North America (Challenger, 1240—1350 fath., Albatross, 547—1608 fath.). It appears, on the other hand, to be quite absent on the British coasts; at least it is not found included in Hoyle's "A revised list of British Ophiuroidea", neither do Norman and Jeffrey Bell mention the species.

Ophiactis abyssicola (M. Sars) Ljungman.

1861. *Amphiura abyssicola*, M. Sars, Oversigt af Norges Echinodermer, pag. 18. Pl. II, figs. 7—12.
 1865. *Ophiocnida* — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 12.
 1866. *Ophiactis* — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 324.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 123.

Findested.

	Station No.	48	Nogle Exemplarer.
	—	”	164 Yderst almindelig.
Imellem	—	”	173 & 174 Nogle Exemplarer.
	—	”	192 2 Exemplarer.
	—	”	200 Temmelig hyppig.

Udbredelse.

Ophiactis abyssicola er tidligere funden ved Lervik, Hardangerfjord, 80—110 Fv.; Bukken pr. Bergen (Norman); 1 Mil vest af Herlø, 190 Fv. (M. Sars); Hellefjord, 200 Fv.; 2 Mil vest af Sognefjord (Hansen & Friele); Havdybet udenfor Storeggen, 400 Fv. (G. O. Sars); Trondhjemsfjorden, 200 Fv. (O. Storm).

Udenfor Norge er Arten hidindtil kun kjendt fra Færøkanalen, 327—767 Fv. (Lyman, Hoyle) og 3 Stationer øst af Shetlandsøerne, 64—203 Fv. (Hoyle); den er saaledes en ægte nordeuropæisk Form.

Ophiopus arcticus, Ljungman.

Tab. II, Fig. 13—17.

1866. *Ophiopus arcticus*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 309.
1872. *Ophiaregma abyssorum*, G. O. Sars, Bidr. til Kundskab om Dyrelivet paa vore Havbanker, Christ. Vidensk. Selsk. Forhandl., pag. 112.
1882. *Ophiopus arcticus*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 156.
1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 124.

Om denne Arts Generationsorganer bemærker G. O. Sars: „ Disse saakaldte Genitalspalter mangle ganske hos nærværende Form, idet Skivens Hud forbinder sig umiddelbart med Basis af Armene langs deres hele i Skiven optagne Parti uden nogen mellemkommende Aabning. Generationsorganerne, der hos enkelte Exemplarer vare tydeligt bemærkelige indenfor Skivens Hud, kunne altsaa alene ved en Ruptur af denne udtømme sit Indhold, et Forhold, der er ganske og aldeles ukjendt i denne Dyregruppe“. Manglen af Genitalspalter er dog ikke uden Sidestykke, ifølge Lyman skal disse ogsaa mangle hos *Ophiocymbium* og *Ophiothamnus*; hos *Ophiomusium pulchellum* skal der heller ikke være nogen tydelig Aabning at opdage.

Localities.

	Station No.	48	A few specimens.
	—	”	164 Extremely common.
Between	—	”	173 & 174 A few specimens.
	—	”	192 2 specimens.
	—	”	200 Pretty frequent.

Distribution.

Ophiactis abyssicola has been met with previously at Lervik, Hardanger fiord, 80—110 fath.; Bukken near Bergen (Norman); a mile to the west of Herlö, 190 fath. (M. Sars); Hellefjord, 200 fath.; two miles to the west of Sognefjord (Hansen & Friele); the ocean depth off Storeggen, 400 fath. (G. O. Sars); the Trondhjem fiord, 200 fath. (O. Storm).

Beyond Norway the species has been only known hitherto from the Færø channel, 328—767 fath. (Lyman, Hoyle) and from 3 stations east of the Shetland Islands, 64—203 fath. (Hoyle). It is thus a genuine North European form.

Ophiopus arcticus, Ljungman.

Pl. II, figs. 13—17.

1866. *Ophiopus arcticus*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 309.
1872. *Ophiaregma abyssorum*, G. O. Sars, Bidr. til Kundskab om Dyrelivet paa vore Havbanker, Christ. Vidensk. Selsk. Forhandl., pag. 112.
1882. *Ophiopus arcticus*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 156.
1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 124.

In regard to the reproductive organs of this species, G. O. Sars states: „ Disse saakaldte Genitalspalter mangle ganske hos nærværende Form, idet Skivens Hud forbinder sig umiddelbart med Basis af Armene langs deres hele i Skiven optagne Parti uden nogen mellemkommende Aabning. Generationsorganerne, der hos enkelte Exemplarer vare tydeligt bemærkelige indenfor Skivens Hud, kunne altsaa alene ved en Ruptur af denne udtømme sit Indhold, et Forhold, der er ganske og aldeles ukjendt i denne Dyregruppe“. The absence of genital fissures is, however, not without counterpart; according to Lyman they are also, for instance, absent in *Ophiocymbium* and *Ophiothamnus*; neither is there in *Ophiomusium pulchellum* any distinct opening to be found.

Nogen nærmere Undersøgelse af dette mærkelige Forhold, er saavidt vides, endnu ikke foretagen; det maa dog bemærkes, at Lyman, efter at have omtalt Sars's Angivelse, tilføjer: „An observer is apt to take the crease in the disk, close to the arm, for a true opening, while there may be none at all“. Hvem Lyman her sigter til, har det desværre ikke været muligt at faa Rede paa.

De af mig undersøgte Exemplarer viste følgende: Hos alle mindre Exemplarer, selv om de havde fuldt udviklede Kjønsprodukter, var det ikke muligt at opdage nogen Genitalspalte selv med den stærkeste Loupeforstørrelse; Forholdet svarer saaledes ganske til det af Sars iagttagne. Hos ældre Exemplarer med en Skivediameter af 6^{mm} sees derimod undertiden en fin Spalte eller rettere en Fold, svarende til de øvrige Ophiuriders Genitalspalte; det er muligens denne Fold ovennævnte „observer“ har iagttaget og taget for „a true opening“.

Vi har her imidlertid ikke nogen Aabning for os, den viser sig nemlig under Loupen at være lukket og ikke at staa i Forbindelse med de indenfor liggende Organer. Som senere skal vises, maa Folden nærmest betragtes som en Ardannelse efter tidligere Udtømmelser af Generationsprodukterne. Denne Fold er imidlertid ikke karakteristisk for alle ældre Individuer, meget ofte mangler ogsaa de den ganske.

Snittes et Individ op i Vertikalsnit, finder man ved Armene en Bursa, som ender blindt og som paa sin ydre Flade er forsynet med talrige Genitalsække, der er fyldte med Æg i forskellige Udviklingsstadier; det Billede, man saaledes faar, ligner ganske det, Ludwig¹⁾ og Hamann²⁾ giver af Generationsorganernes Bygning hos *Ophioglypha*, *Amphiura* etc. Hvad der imidlertid adskiller *Ophiopus arcticus* fra dem, er at dens Bursa ogsaa er lukket udadtil; et tyndt Cellelag, som synes at skrive sig fra Kropsvæggens Pladeepithel, dækker nemlig Genitalspaltens ydre Munding (Fig. 15; Snittet har truffet Bursaens Væg, saaat kun den nederste Del af denne kan sees, ligeledes er kun mindre Dele af et Par af Ægkapslerne synlige paa Tegningen).

Naar Generationsprodukterne er blevne modne, udtømmes de paa normal Maade i Bursaen, hvorpaa de, hvis de skal kunne blive frie og udvikle sig, maa bryde sig Vej gennem det Cellelag, der dækker Genitalspalten. Efter Udtømmelsen voxer saa Genitalspalten igjen til; men har dette gjentaget sig nogle Gange, er det klart, at der vil opstaa en Ardannelse paa Gjennembrudsstedet og den ovenfor nævnte Fold fremkommer. Hvad der synes at støtte den Antagelse, at Folden er en Ardannelse, er, at skjønt *Ophiopus arcticus* er fuldt forplantningsdygtig, naar

Any minute investigation of this remarkable relation has, so far as is known, not yet been undertaken; it must, however, be noted that Lyman, after having mentioned Sars's report, adds, „An observer is apt to take the crease in the disk, close to the arm, for a true opening, while there may be none at all“. To whom Lyman in that remark refers, it has unfortunately not been possible to obtain any enlightenment.

The specimens investigated by me showed the following features: in all the smaller species, even although they contained fully developed sexual products, it was impossible to discover any genital fissure, even with the most powerful magnifying glass; the relation quite corresponds therefore with what has been observed by Sars. In older specimens with a disc-diameter of 6^{mm} there is, on the other hand, occasionally observed a fine fissure, or more correctly a fold, corresponding to the genital fissure in the other Ophiurideans; it is, possibly, that fold the above-named „observer“ has remarked and assumed to be „a true opening“.

We have, however, here no opening before us; it is seen, namely, under the magnifier, to be closed, and not to stand in connection with the organs lying inside. As shall subsequently be shown, the fold must chiefly be considered to be a scar-formation, following upon previous evacuation of the reproductive products. This fold is, however, not characteristic of all older individuals, very frequently they are entirely deficient in it.

If an individual is cut up in vertical section, we find at the arms a bursa, which terminates blindly, and is furnished on its outer surface with numerous genital-sacs filled with ova in various stages of development; the picture we thus obtain resembles exactly that given by Ludwig¹⁾ and Hamann²⁾ of the structure of the reproductive organs in *Ophioglypha*, *Amphiura* &c. What, however, distinguishes *Ophiopus arcticus* from them is, that its bursa is also closed outwards; a thin layer of cells, which appear to be derived from the epithelial plate of the wall of the body, covers, namely, the outer aperture of the genital fissure (fig. 15; the section has struck the wall of the bursa, so that only its lowest part can be viewed; likewise there can only be seen on the drawing, small portions of a couple of the ova-capsules).

When the reproductive products have become mature, they are evacuated in the normal way into the bursa; thereafter they must, in order to become free and develop themselves, force a way through the cellular layer that covers the genital fissure. After the evacuation, the genital fissure grows together again, but when that has been repeated a few times it is evident that a scar-formation will arise at the point of rupture, and the above-named fold will be produced. What appears to support the assumption that the fold is a scar-formation is the fact,

¹⁾ Beiträge zur Anatomie der Ophiuren, Zeitschr. f. wiss. Zool., Bd. XXXI, pag. 374.

²⁾ Beiträge zur Histologie der Echinodermen, Heft IV, pag. 44.

¹⁾ Beiträge zur Anatomie der Ophiuren, Zeitschr. f. wiss. Zool., Bd. XXXI, pag. 374.

²⁾ Beiträge zur Histologie der Echinodermen, Heft IV, pag. 44.

den har en Skivediameter paa 3^{mm} , har jeg dog ikke kunnet finde Folden hos noget Individ, der har en Skivediameter under 6^{mm} . Sandsynligvis har de af Lyman omtalte Slægter *Ophiocymbium* og *Ophiothamnus*, som ogsaa mangler en ydre synlig Genitalspalte, en Bygning, der ligner den her omtalte.

Bursaens histologiske Bygning ligner den hos *Ophioglypha*; Flimmerceller har jeg imidlertid ikke kunnet paa-vise hos *Ophiopus arcticus*, muligens skriver dog dette sig fra, at jeg blot har havt ca. 15 Aar gammelt Spiritusmateriale til mine Undersøgelser.

Genitalsækkenes Vægge dannes af et Pladeepithel med et indenforliggende tyndt Bindevævslag, hvori Ernæringsvædsken cirkulerer.

Dette Bindevæv er imidlertid saa tyndt, at det kun med stor Vanskelighed lader sig paa-vise; ofte ser det endog ud, som om det ganske manglede og at Pladeepithelet stod i umiddelbar Forbindelse med Urkimcellerne. Tydeligst fremtræder det der, hvor der ligger Æg lige under Genitalsækkens Vægge, og disse er omgivne med et enkelt Lag Celler.

De fuldmodne Æg er mere eller mindre ovale og har en Størrelse af indtil 0.224^{mm} , Nucleus maaler 0.064^{mm} . Mellem Æggene ligger Urkimcellerne spredte, snart i større eller mindre Partier, snart dannende fuldstændige Follikler omkring Æggene. Medens Holothurierne og Asteriderne ifølge Hamann har et fuldstændigt Follikelepitheel, er derimod Æggene hos denne Art ligesom hos de øvrige Ophiurider omgivne af saakaldte Pseudo-Follikler. De er nemlig som oftest kun delvis omgivne af et sammenhængende Cellelag, saaat store Partier af dem kan komme til at ligge umiddelbart mod hinanden med kun en og anden mellem-liggende Celle (Fig. 17)¹⁾. Man kan dog undertiden finde Genitalsække, hvor samtlige Æg er omgivne med et fuldstændigt Follikelepitheel. Ligesom Ophiuriderne har Crinoiderne²⁾ og Echiniderne³⁾ kun Pseudo-Follikler, men ogsaa hos disse kan man stundom finde Æg med et fuldstændigt Follikelepitheel.

Findested.

Station No.	18	3 Exemplarer.
— „	31	Nogle Exemplarer.
— „	48	Temmelig almindelig.
— „	192	1 Exemplar.
— „	200	10 Exemplarer.
— „	237	Almindelig.
— „	370	1 Exemplar.

¹⁾ Hamann, op. cit. Tab. VI, fig. 3.

²⁾ Danielssen, Crinoida, Norske Nordhavsexpedition, vol. XXI, pag. 18. Tab. IV, fig. 5 & 6.

³⁾ Hamann, op. cit. Heft III, pag. 98. Tab. VI, fig. 16.

that although *Ophiopus arcticus* is perfectly capable of reproduction when it has a disc-diameter of 3^{mm} , I have been unable to find the fold in any individual with a smaller disc-diameter than 6^{mm} . Probably the genera *Ophiocymbium* and *Ophiothamnus* mentioned by Lyman, which are also deficient in an outer perceptible genital fissure, have a structure resembling the one spoken of here.

The histological structure of the bursa resembles that of *Ophioglypha*; I have, however, been unable to observe ciliated cells in *Ophiopus arcticus*; possibly that is due to the fact that I have only had about 15 years old alcoholic material at my disposal for investigation.

The walls of the genital sacs are formed of a laminar epithelium, with a thin connective-tissue layer lying inside, in which the nutritory fluid circulates.

This connective-tissue is, however, so thin that it is only with difficulty it can be observed; it frequently even appears as if it were entirely absent and the laminar epithelium were placed in immediate connection with the original germinative cells. It appears most distinctly at the point where ova are situated, right below the walls of the genital sac, and these are enclosed by a single layer of cells.

The fully mature ova are more or less oval, and are as much as 0.224^{mm} in size; the nucleus measures 0.064^{mm} . The original germinative cells lie spread between the ova, sometimes in larger or smaller quantities, sometimes forming perfect follicles around the ova. Whilst the Holothurians and Asterideans have, according to Hamann, a perfect follicular epithelium, the ova, on the contrary, in this species as well as in the other Ophiurideans, are surrounded by so-called pseudo-follicles. They are, namely, most frequently only partially enclosed by a continuous cellular layer, so that large portions of them may come to lie immediately opposite each other, with only an occasional intermediate cell (fig. 17)¹⁾. We may, however, sometimes find genital sacs where the whole of the ova are enclosed by a perfect follicular epithelium. Just as the Ophiurideans, have the Crinoideans²⁾ and Echinoideans³⁾ pseudo-follicles only, but also in these we may occasionally find ova with a perfect follicular epithelium.

Localities.

Station No.	18	3 specimens.
— „	31	A few specimens.
— „	48	Pretty common.
— „	192	1 specimen.
— „	200	10 specimens.
— „	237	Common.
— „	370	1 specimen.

¹⁾ Hamann, op. cit. Pl. VI, fig. 3.

²⁾ Danielssen, Crinoida, Norske Nordhavsexpedition, vol. XXI, pag. 18. Pl. IV, figs. 5 & 6.

³⁾ Hamann, op. cit. Heft III, pag. 98. Pl. VI, fig. 16.

Udbredelse.

Arten er tidligere funden i Havdybet udenfor Storeggen, 400 Fv. (G. O. Sars). Desuden forekommer den ved Kysterne af Spitzbergen (Malmgren) og Grønland (Lütken) samt i Færøkanalen, 384 Fv. (Hoyle). Af disse Lokalteter ligger blot Stat. No. 370, Havdybet udenfor Storeggen og muligens nogle af Findestederne ved Spitzbergen indenfor den varme Area (cfr. Lyman), saaat *Ophiopus arcticus* vel nærmest maa betragtes som en Koldtandsform. Artens bathymetriske Udbredelse synes at ligge mellem 109 og 649 Favnes Dyb, hyppigst forekommer den paa 200—400 Fv.; ifølge Lyman skal den dog ogsaa være funden overfor en Dybde af 30 Favne.

Ophiopholis aculeata (Linné) Gray.

1733. *Bellis scolopendrica*, Linck, De Stell. Marin., pag. 52. Tab. XL, fig. 71.
 1766. *Asterias aculeata*, Linné, Syst. Nat., ed. XII. Tome I, part 2, pag. 1101.
 1776. — — O. F. Müller, Zool. Dan. Prodr., pag. 235.
 1780. — *ophiura*, Fabricius, Fauna Grönlandica, pag. 371.
 1789. — *aculeata*, O. F. Müller, Zool. Danica, vol. III pag. 29. Tab. XCIX.
 1817. *Ophiura flemingii* & *ammothea*, Leach, Zool. Miscell., vol. II pag. 55 & 56. Tab. LXXIX.
 1828. — *bellis*, Fleming, Edin. New. Phil. Journ., vol. VIII pag. 298.
 1828. — — id. British Animals, pag. 488.
 1829. *Ophiocoma* — Forbes, Mem. Wern. Soc. Edinb., vol. VIII pag. 126.
 1840. *Ophiolepis* (*Ophiopholis*) *scolopendrica*, Müll. & Tr., Arch. f. Naturgesch., pag. 328.
 1841. *Ophiocoma bellis*, Forbes, British Starfishes, pag. 53.
 1842. *Ophiolepis* (*Ophiopholis*) *scolopendrica*, Müll. & Tr., Syst. der Aster, pag. 96.
 1848. *Ophiopholis aculeata*, Gray, Rad. Animals British Museum.
 1858. — — Lütken, Addit. ad Hist. Ophiurid, part I, pag. 60. Tab. II, fig. 15 & 16.
 1865. — *bellis*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 96. Tab. I, fig. 4—6.
 1890. — *aculeata*, Fjelstrup, Zoologia Danica, Pighudede, pag. 28. Tab. III, fig. 4.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 125.

Distribution.

The species has been previously met with in the ocean depth off Storeggen, 400 fath. (G. O. Sars). It appears, besides, on the coasts of Spitzbergen (Malmgren) and Greenland (Lütken), and in the Færø channel, 384 fath. (Hoyle). Of those localities only Stat. No. 370, the ocean depth off Storeggen, and possibly a few of the localities at Spitzbergen are situated within the warm area (cfr. Lyman), so that *Ophiopus arcticus* must presumably be chiefly considered as a cold water form. The bathymetrical distribution of the species seems to lie between 109 and 649 fath. depth; it is most frequently met with in 200—400 fath. According to Lyman it has also been found at less depth than 30 fathoms.

Ophiopholis aculeata (Linné) Gray.

1733. *Bellis scolopendrica*, Linck, De Stell. Marin. pag. 52. Pl. XL, fig. 71.
 1766. *Asterias aculeata*, Linné, Syst. Nat., ed. XII. Tome I, part 2, pag. 1101.
 1776. — — O. F. Müller, Zool. Dan. Prod., pag. 235.
 1780. — *ophiura*, Fabricius, Fauna Grönlandica, pag. 371.
 1789. — *aculeata*, O. F. Müller, Zool. Danica, vol. III pag. 29. Pl. XCIX.
 1817. *Ophiura flemingii* & *ammothea*, Leach, Zool. Miscell., vol. II pag. 55 & 56. Pl. LXXIX.
 1828. — *bellis*, Fleming, Edin. New. Phil. Journ., vol. VIII pag. 298.
 1828. — — id. British Animals, pag. 488.
 1829. *Ophiocoma* — Forbes, Mem. Wern. Soc. Edinb., vol. VIII pag. 126.
 1840. *Ophiolepis* (*Ophiopholis*) *scolopendrica*; Müll. & Tr., Arch. f. Naturgesch., pag. 328.
 1841. *Ophiocoma bellis*, Forbes, British Starfishes, pag. 53.
 1842. *Ophiolepis* (*Ophiopholis*) *scolopendrica*, Müll. & Tr., Syst. der Aster, pag. 96.
 1848. *Ophiopholis aculeata*, Gray, Rad. Animals British Museum.
 1858. — — Lütken, Addit. ad Hist. Ophiurid., part I, pag. 60. Pl. II, figs. 15 & 16.
 1865. — *bellis*, Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 96. Pl. I, figs. 4—6.
 1890. — *aculeata*, Fjelstrup, Zoologia Danica, Pighudede, pag. 28. Pl. III, fig. 4.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 125.

Findested.

Station No. 8	Nogle Exemplarer.
— Husø	Almindelig, ned til 150 Favnes Dyb.
— No. 9	Et Par Exemplarer.
— „ 48	Almindelig.
— „ 79	1 Exemplar.
— „ 101	1 —
Imellem — „ 173 & 174	3 Exemplarer.
— „ 224	1 Exemplar.
— „ 237	Nogle Exemplarer.
— Saltstrømmen, 90 Fv.	2 Exemplarer.
— No. 257, 30—40 „	Almindelig.
— „ 270	1 Exemplar.
— „ 273	1 —
— „ 275	1 —
— „ 280	1 —
— „ 290	1 —
— „ 315	Nogle Exemplarer.
— „ 322	— —
— „ 323	— —
— „ 336	Meget talrig.
— „ 357	Nogle Exemplarer.
— „ 363	— —
— „ 370	Almindelig.

Udbredelse.

Ophiopholis aculeata er en af de ved de norske Kyster hyppigst forekommende Ophiurider, især skal den ifølge M. Sars være talrig ved Finmarken og Nordland. Den gaar fra Litoralbæltet ned til 300 Favnes Dyb, i størst Mængde optræder den dog imellem Laminarierødderne.

Arten er endvidere kjendt fra Karahavet og den kariske Port (Stuxberg, 35 Fv., Levinsen, 12—75 Fv.); Barentshavet (Marenzeller, 50 Fv., Hoffmann, 5—220 Fv.); Spitsbergen (Lütken); Jan Mayen, 25—90 Fv. (Fischer); Island, Færøerne, Færøkanalen, 53—560 Fv. (Lyman, Hoyle); de britiske Kyster, 0—400 Fv. (Norman m. fl.), hvor den ligesom ved den norske Kyst tiltager i Hyppighed mod Nord; de tyske og danske Nordsøkyser, Skagerak, Kattegat, 6—24 Fv. (Petersen); Øresund (Lütken); Store og Lille Belt, Sveriges Vestkyst indtil Kullen (Ljungman); Grønland (Lütken, Duncan & Sladen); Nordamerikas Nord- og Østkyst indtil Cape Hatteras, 13—1000 Fv. (Lyman, Verrill, Murdoch) og Beringsstrædet (Ludwig). Den synes saaledes at være en circumpolar Form.

Localities.

Station No. 8	A few specimens.
— Husö	Common, to a depth of 150 fathoms.
— No. 9	A couple of specimens.
— „ 48	Common.
— „ 79	1 specimen.
— „ 101	1 —
Between — „ 173 & 174	3 specimens.
— „ 224	1 specimen.
— „ 237	A few specimens.
— Saltstrømmen, 90 fath.	2 specimens.
— No. 257, 30—40 „	Common.
— „ 270	1 specimen.
— „ 273	1 —
— „ 275	1 —
— „ 280	1 —
— „ 290	1 —
— „ 315	A few specimens.
— „ 322	— —
— „ 323	— —
— „ 336	Very frequent.
— „ 357	A few specimens.
— „ 363	— —
— „ 370	Common.

Distribution.

Ophiopholis aculeata is one of the Ophiurideans most frequently met with on the Norwegian coast; according to M. Sars, it is especially abundant in Finmark and Nordland. It passes from the littoral belt down to 300 fathoms deep. It appears most abundantly, however, between the laminaria-roots.

The species is known, further, from the Kara Sea and the Strait of Kara (Stuxberg, 35 fath., Levinsen, 12—75 fath.); the Barents Sea (Marenzeller, 50 fath., Hoffmann, 5—220 fath.); Spitzbergen (Lütken); Jan Mayen, 25—90 fath. (Fischer); Iceland, the Færö islands, the Færö channel, 53—560 fath. (Lyman, Hoyle); the British coasts, 0—400 fath. (Norman and others), where it, like as on the Norwegian coast, becomes more abundant towards the north; the German and Danish North Sea coasts, the Skager Rack, Kattegat, 6—24 fath. (Petersen); Öresund (Lütken); the Great and Little Belt, west coast of Sweden, as far as Kullen (Ljungman); Greenland (Lütken, Duncan & Sladen); the north and east coasts of North America, as far as Cape Hatteras, 13—1000 fath. (Lyman, Verrill, Murdoch) and the Behrings straits (Ludwig). It appears therefore to be a circumpolar form.

Ophiacantha bidentata (Retz.) Ljungman.

1805. *Asterias bidentata*, Retzius, Dissertatio, pag. 33.
 1817. *Ophiura retzii*, Nilsson, Collectanea Zoologiæ Scandinaviæ, pag. 15.
 1842. *Ophiacantha spinulosa*, Müll. & Tr., System der Asteriden, pag. 107.
 1842. *Ophiocoma arctica*, Müll. & Tr., ibid. pag. 103.
 1844. *Ophiocantha grønlandica*, Müll. & Tr., Beschreibung neuer Asteriden, pag. 183.
 1852. *Ophiocoma echinulata*, Forbes, Sutherlands Journ. Voy. Baffins Bay, vol. II, App.
 1858. *Ophiacantha spinulosa*, Lütken, Addit. ad Hist. Ophiurid., part I, pag. 65. Tab. II, fig. 14.
 1865. — — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 93. Fig. 6 & 7.
 1871. — *bidentata*, Ljungman, Öfversigt Kongl. Akadm. Förhandl., pag. 652.
 1877. — *spinulosa*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 466.
 1881. — — — id. Memoir on the Echinodermata of the Arctic Sea etc., pag. 68. Tab. IV, fig. 11—13.
 1892. — *bidentata*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 127.

Verrill har delt *Ophiacantha bidentata* i to Arter, hvoraf den ene, der skulde være identisk med Retzius's Art, kun kunde gaa ned til 300—400 Fv. Dyb, medens den anden, som han har kaldt *Ophiacantha fraterna*, er en ægte Dybvandsform, som blot forekommer paa de store Havdyb (900—1600 Fv.)¹⁾. Til den sidste Art skulde altsaa foruden Albatross-Exemplarerne en Del Dybvands-exemplarer fra Blake's, Challenger's, Bulldog's og Porcupine's Expeditioner høre. Hvad der skulde adskille disse Arter, er, at *Ophiacantha fraterna* er mindre end Hovedformen, som kan have en Skivediameter af indtil 15^{mm}; imidlertid er dog en saadan Størrelse meget sjelden, hyppigst har Skiven kun en Diameter af 9—12^{mm}, eller er af samme Størrelse som *Ophiacantha fraterna*'s.

Fra Skivens Bedækning kan man heller ikke hente sikre Artnmærker. I Bergens Museums Echinodermsamling findes 5 Exemplarer af *Ophiacantha bidentata*, tagne af Blake paa 1247 Favnes Dyb, de maa altsaa ifølge Verrill's egne Ord betragtes som typiske Repræsentanter for hans *Ophiacantha fraterna*. Sammenligner man disse med Grundvandsexemplarer fra Finmarken, vil man ikke kunne finde nogen nævneværdig Forskjel i Skivens Bedækning. *Ophiacantha fraterna* skal dernæst have grovere Armpigge, finere og spidsere Fodpapiller (tentacle scales) og skarpe,

¹⁾ Results of the explorations made by the steamer Albatross in 1883, pag. 545 (43).

Ophiacantha bidentata (Retz.) Ljungman.

1805. *Asterias bidentata*, Retzius, Dissertatio, pag. 33.
 1817. *Ophiura retzii*, Nilsson, Collectanea Zoologiæ Scandinaviæ, pag. 15.
 1842. *Ophiacantha spinulosa*, Müll. & Tr., System der Asteriden, pag. 107.
 1842. *Ophiocoma arctica*, Müll. & Tr., ibid. pag. 103.
 1844. *Ophiocantha grønlandica*, Müll. & Tr., Beschreibung neuer Asteriden, pag. 183.
 1852. *Ophiocoma echinulata*, Forbes, Sutherlands Journ. Voy. Baffins Bay, vol. II, App.
 1858. *Ophiocantha spinulosa*, Lütken, Addit. ad Hist. Ophiurid., part I, pag. 65. Pl. II, fig. 14.
 1865. — — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 93. Figs. 6 & 7.
 1871. — *bidentata*, Ljungman, Öfversigt Kongl. Akadm. Förhandl., pag. 652.
 1877. — *spinulosa*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 466.
 1881. — — — id. Memoir on the Echinodermata of the Arctic Sea &c., pag. 68. Pl. IV, figs. 11—13.
 1892. — *bidentata*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 127.

Verrill has divided *Ophiacantha bidentata* into two species, of which the one, supposed to be identical with Retzius's species, can only reach to a depth of 300—400 fathoms, while the other, which he has named *Ophiacantha fraterna* is a genuine deep-water form that is only met with in the great ocean depths (900—1600 faths.)¹⁾. To the last-named species should therefore belong, besides, the Albatross specimens, a number of deep-water specimens from Blake's, Challenger's, Bulldog's and Porcupine's expeditions. What distinguishes those species is, that *Ophiacantha fraterna* is smaller than the typical form, which may have a disc-diameter of up to 15^{mm}, but such a size is, however, very rare; most frequently the disc has a diameter of 9—12^{mm} or the same size as *Ophiacantha fraterna*'s.

Neither can we obtain from the covering of the disc decisive characteristic features. In the collection of Echinoderms in Bergens Museum, 5 specimens of *Ophiacantha bidentata* are found, obtained by the Blake at a depth of 1247 fathoms; they must, therefore, according to Verrill's own statement, be considered as typical representatives of his *Ophiacantha fraterna*. If we compare them with specimens from shallow depths from Finmark we are unable to observe any difference, worth the name, in the covering of the disc. *Ophiacantha fraterna* is further said to have

¹⁾ Results of the explorations made by the steamer Albatross in 1883, pag. 545 (43).

tornede Mundpapiller. Disse sidste Karaktermærker synes at afvige mest fra dem hos *Ophiacantha bidentata* og altsaa berettigede Dannelsen af en ny Art. Imidlertid er *Ophiacantha bidentata* underkastede mange Variationer. Duncan og Sladen siger endog: „The variations dependent on growth are very considerably, so much so that isolated specimens taken from different stages in the series might easily be regarded as affording the types of distinct species“¹⁾. *Ophiacantha fraterna* bør derfor ikke betragtes som en egen selvstændig Art, men som en Varietet af *Ophiacantha bidentata*, saameget mere da man med Letthed kan paavise Overgangsformer mellem disse to, om man har tilstrækkeligt stort Materiale til Sammenligning.

Findested.

Station No.	48	. . . . .	Temmelig hyppig.
—	„ 101	. . . . .	6 Exemplarer.
—	„ 200	. . . . .	2 —
—	„ 223	. . . . .	Meget almindelig.
—	„ 224	. . . . .	— —
—	„ 226	. . . . .	Almindelig.
—	„ 237	. . . . .	Særdeles talrig.
—	Saltstrømmen, 90 Fv.		4 Exemplarer.
—	No. 262	. . . . .	1 Exemplar.
—	„ 267	. . . . .	5 Exemplarer.
—	„ 290	. . . . .	4 —
—	„ 315	. . . . .	Nogle faa Exemplarer.
—	„ 322	. . . . .	— —
—	„ 326	. . . . .	Almindelig.
—	„ 336	. . . . .	1 Exemplar.
—	„ 337	. . . . .	Særdeles talrig.
—	„ 357	. . . . .	Almindelig.
—	„ 363	. . . . .	—
—	„ 374	. . . . .	1 Exemplar.

Udbredelse.

Foruden ved Finmarken og Lofoten, hvor Arten ifølge M. Sars skal være meget almindelig paa 20—50 Favnes Dyb (20—80 Fv., Danielssen), er den funden ved Bodø, 80—100 Fv. (G. O. Sars); Christianssund, 50—60 Fv., Herlø, 190 Fv. (M. Sars). Arten skal ifølge M. Sars ved den norske Kyst gaa ned til 300 Favnes Dyb.

Ophiacantha bidentata forekommer endvidere i Karahavet og den Kariske Port (Levinsen, 20—106 Fv., Stuxberg, 20—150 Fv.); Barentshavet (Hoffmann, Marenzeller, 65—122¹/₂ Fv.); Spitzbergen (Lovén m. fl.); Jan Mayen,

¹⁾ Cfr. Duncan: On the Zool. Position of the Ophiurans obtained by Dr. Wallich during the voyage of H. M. S. „Bulldog“ in 1860, Ann. & Mag. Nat. Hist., ser. 5, vol. III, 1879, pag. 382.

coarser brachial spikes, finer and more pointed pedal papillæ (tentacle scales) and sharp thorny oral papillæ. Those last characteristic features seem to differ most from those of *Ophiacantha bidentata*, and consequently warrant the formation of a new species. However, *Ophiacantha bidentata* is subjected to many variations. Duncan and Sladen even remark: „The variations dependent on growth are very considerable, so much so that isolated specimens taken from different stages in the series might easily be regarded as affording the types of distinct species“¹⁾. *Ophiacantha fraterna* ought, therefore, not to be considered as an independent species by itself, but as a variety of *Ophiacantha bidentata*, so much the more, that we may with ease observe transition-forms between those two if we have a sufficiently abundant material for comparison.

Localities.

Station No.	48	. . . . .	Pretty frequent.
—	„ 101	. . . . .	6 specimens.
—	„ 200	. . . . .	2 —
—	„ 223	. . . . .	Very common.
—	„ 224	. . . . .	— —
—	„ 226	. . . . .	Common.
—	„ 237	. . . . .	Particularly abundant.
—	Saltstrømmen, 90 fath.		4 specimens.
—	No. 262	. . . . .	1 specimen.
—	„ 267	. . . . .	5 specimens.
—	„ 290	. . . . .	4 —
—	„ 315	. . . . .	A few specimens.
—	„ 322	. . . . .	— —
—	„ 326	. . . . .	Common.
—	„ 336	. . . . .	1 specimen.
—	„ 337	. . . . .	Particularly abundant.
—	„ 357	. . . . .	Common.
—	„ 363	. . . . .	—
—	„ 374	. . . . .	1 specimen.

Distribution.

Besides at Finmark and Lofoten, where, according to M. Sars, the species is very common at 20—50 fathoms depth (20—80 faths. Danielssen), it is met with at Bodø, 80—100 faths. (G. O. Sars); Christianssund, 50—60 faths.; Herlø, 190 faths. (M. Sars). According to M. Sars the species passes on the Norwegian coast down to a depth of 300 fathoms.

Ophiacantha bidentata is further met with in the Kara Sea and the Strait of Kara (Levinsen, 20—106 fath., Stuxberg, 20—150 fath.); the Barents Sea (Hoffmann, Marenzeller, 65—122¹/₂ fath.); Spitzbergen (Lovén and

¹⁾ Cmp. Duncan: On the Zool. Position of the Ophiurans obtained by Dr. Wallich during the voyage of H. M. S. „Bulldog“ in 1860, Ann. & Mag. Nat. Hist., ser. 5, vol. III, 1879, pag. 382.

50—125 Fv. (Fischer); Island (Torell); saavel den kolde som den varme Area af Færøkanalen, 203—515 (Lyman, Hoyle); den nordlige Del af Atlanterhavet (Porcupine, 1869, Stat. No. 37, 2435 Fv., Stat. No. 39—41, 517—730 Fv., Bulldog, 1860, 1260 Fv.); Grønlands Kyster (Lütken, Duncan & Sladen m. fl.); Nordamerikas Østkyst, hvor dens Sydgrændse ifølge Lyman er 33° N. Br. (Blake, 922—1394 Fv., Challenger, 93—1350 Fv., Albatross, 40—1608 Fv.).

others); Jan Mayen, 50—125 fath. (Fischer); Iceland (Torell); the cold as well as the warm area of the Færø channel, 203—515 (Lyman, Hoyle); the northern portion of the Atlantic Ocean (Porcupine, 1869, Stat. No. 37, 2435 fath., Stat. 39—41, 517—730 fath.; Bulldog 1860, 1260 fath.); the coasts of Greenland (Lütken, Duncan & Sladen and others); the east coast of North America where its southern limit is, according to Lyman, 33° N. Lat. (Blake, 922—1394 faths., Challenger, 83—1350 faths., Albatross, 40—1608 faths.).

***Ophiacantha spectabilis* G. O. Sars.**

(Tab. I, Fig. 11 og 12).

1871. *Ophiacantha spectabilis*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 10.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 128.

Denne kjæmpemæssige *Ophiacantha* fandtes kun paa en Lokalitet (Station No. 255, Vestfjorden) i 2 Exemplarer, hvoraf det ene var ødelagt.

Inden de norske Farvande er Arten tidligere kun kendt fra Bodø, 80—100 Fv. (G. O. Sars) og Trondhjemsfjordens Dybvandsregion ved Rødbjerget (100—300 Fv.), hvor den ifølge Conservator Storm skal være almindelig. *Ophiacantha spectabilis* er endvidere funden i Færøkanalen, 433 Fv. (Hoyle) og ved Kysten af Nova Scotia, 131 Fv. (Verrill). Alle disse Lokaliteter ligger indenfor den varme Area.

***Ophiacantha spectabilis* G. O. Sars.**

(Pl. I, figs. 11 og 12).

1871. *Ophiacantha spectabilis*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 10.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 128.

This gigantic *Ophiacantha* was found at only one locality (Station No. 255, Vestfjord); 2 specimens, of which one was destroyed.

Within Norwegian waters the species is only previously known from Bodø, 80—100 faths. (G. O. Sars) and the deep-water region of the Trondhjem fiord at Rødbjerg (100—300 faths.), where it is, according to Mr. Storm, Curator, common. *Ophiacantha spectabilis* is further found in the Færø channel, 433 fath. (Hoyle) and on the coast of Nova Scotia, 131 fath. (Verrill). All those localities lie within the warm area.

***Ophiacantha abyssicola* G. O. Sars.**

(Tab. I, Fig. 6—10).

1871. *Ophiacantha abyssicola*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 8.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 128.

Ophiacantha abyssicola synes at være underkastet forskellige mindre Variationer, saaledes mangler ofte større eller mindre Partier af Skivens Rygside Pigge og er istedet bedækket med Skjæl ligesom Bugsiden. Armpiggene er meget ofte mere eller mindre tornede ligesom de hos *Ophiacantha bidentata*, der er saaledes Exemplarer, hvor man neppe vil finde en eneste glat Armpig (Fig. 10). Armpiggene varierer ligeledes i Antal selv paa samme Individ, saaledes fandt jeg paa en Arm Led, hvor der blot

***Ophiacantha abyssicola* G. O. Sars.**

(Pl. I, figs. 6—10).

1871. *Ophiacantha abyssicola*, G. O. Sars, Nye Echinodermer fra den norske Kyst, pag. 8.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 128.

Ophiacantha abyssicola seems to be subjected to sundry small variations; for instance, larger or smaller portions of the dorsal surface are frequently deficient in spikes, and are covered instead with scales, like the ventral surface. The brachial spikes are very often more or less aculeated, like those of *Ophiacantha bidentata*; there are specimens, for instance, where it is scarcely possible to observe a single smooth brachial spike (fig. 10). The brachial spikes, likewise, vary in number, even in the same

var 5 Pigge, paa en anden Arm af samme Individ fandtes der indtil 8 Armpigge. Lignende Variationer vil man finde hos *Ophiacantha bidentata* og muligens ogsaa hos andre Ophiacanthæ. At benytte Armpiggenes Form og Antal ved Artsdiagnosen, saaledes som Lyman har gjort i sin Nøgle til Slægten *Ophiacantha*¹⁾, er derfor neppe fuldt paalideligt.

Medens *Ophiacantha bidentata* maa betragtes som en mere arktisk end boreal Form, skjønt den oftere er funden i den varme Area, er *Ophiacantha abyssicola* nærmest en boreal Form, som kun undtagelsesvis synes at forekomme i den kolde Area (Vøringen, Station No. 286, Porcupine, 1869, Stat. No. 54 & 65).

Findested.

Station No.	8	Uhyre Mængder.
—	79	Nogle faa Exemplarer.
—	147	Yderst almindelig.
—	255	Ret almindelig.
—	286	2 Exemplarer.
—	323	Almindelig.

Udbredelse.

Denne Art er tidligere funden ved Lofoten, 120—300 Fv., Bodø, 80—100 Fv., Storeggen, 80—100 Fv., Christianssund, 60—100 Fv. (G. O. Sars); Batalden, 2 Mil vest af Sognefjorden, 100—160 Fv., Holmengraa, Hellefjord, 200 Fv. (Hansen & Friele); Mosterhavn og Hvitingsø, 150—200 Fv. (G. O. Sars). I Trondhjemsfjorden er den meget almindelig saavel i de indre som de ydre Dele af Fjorden, 70—300 Fv. (V. Storm).

Udenfor Norge er *Ophiacantha abyssicola* kun funden i Færøkanalen, hvor den forekommer saavel i den varme som den kolde Area, 203—458 Fv. (Hoyle), samt ved Nordamerikas Østkyst mellem Kap Hatteras og Nova Scotia (Blake, 304 Fv., Albatross, 1000—1108 Fv.).

Ophiothrix fragilis (O. F. Müll.) Düb. & Kor.

1789. *Asterias fragilis*, O. F. Müller, *Zoologia Danica*, vol. III pag. 28. Tab. XCVIII.
1812. — pentaphylla, Pennant, *British Zoology*, vol. IV pag. 54.

¹⁾ Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 180.

Den norske Nordhavsexpedition. James A. Grieg: Ophiuroidea.

individual; I found, for instance, a brachial joint where there were only 5 spikes, while upon another arm of the same individual there were as many as 8 spikes found. We may find similar variations in *Ophiacantha bidentata* and possibly also in other Ophiacanthæ. To make use of the form and number of the brachial spikes in the specific diagnosis, in the manner Lyman has done in his key to the genus *Ophiacantha*¹⁾, is therefore scarcely fully reliable.

While *Ophiacantha bidentata* must be considered as more an arctic than a boreal form, although it is often met with in the warm area, *Ophiacantha abyssicola* is chiefly a boreal form which only exceptionally seems to appear in the cold area (Vøringen, Stat. No. 286, Porcupine, 1869, Stat. 54 & 65).

Localities.

Station No.	8	Immense quantities.
—	79	A few specimens.
—	147	Extremely common.
—	255	Quite common.
—	286	2 specimens.
—	323	Common.

Distribution.

This species has been previously found at Lofoten, 120—300 fath., Bodø, 80—100 fath., Storeggen, 80—100 fath., Christianssund, 60—100 fath. (G. O. Sars); Batalden, 2 miles west of Sognefiord, 100—160 fath.; Holmengraa, Hellefjord, 200 fath. (Hansen & Friele); Mosterhavn and Hvitingsö, 150—200 fath. (G. O. Sars). In the Trondhjem fiord it is very common, both in the inner as well as the outer portions of the fiord, 70—300 fath. (V. Storm).

Beyond Norway *Ophiacantha abyssicola* is only found in the Færø channel, where it appears both, in the warm as well as in the cold area, 203—458 fath. (Hoyle); and on the east coast of North America between Cape Hatteras and Nova Scotia (Blake 304 fath., Albatross, 1000—1108 fath.).

Ophiothrix fragilis (O. F. Müll.) Düb. & Kor.

1789. *Asterias fragilis*, O. F. Müller, *Zoologia Danica*, vol. III pag. 28. Pl. XCVIII.
1812. — pentaphylla, Pennant, *British Zoology*, vol. IV pag. 54.

¹⁾ Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 180.

1816. *Ophiura fragilis*, Lamarck, An. s. Vert., vol. II pag. 546.
 1841. *Ophiocoma rosula*, Forbes, British Starfishes.
 1842. *Ophiothrix fragilis*, Müller & Troschel, Syst. d. Aster., pag. 110. Tab. IX, fig. 2.
 1842. — *rammelsbergii*, id. ibid., pag. 113. Tab. VIII, fig. 3.
 1846. — *fragilis*, Düben & Koren, Zool. Bidrag, pag. 238.
 1859. — — M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 18.
 1869. — — Lütken, Addit. ad Hist. Ophiurid., part III, pag. 52.
 1871. — *pentaphyllum*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 622.
 1874. — *fragilis*, Lyman, Bull. Mus. Comp. Zool., vol. III, part 10, pag. 243 & 249. Tab. II, fig. 37—44.
 1885. — — Carus, Prod. Faunæ Mediterraneæ, vol. I pag. 95.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 25. Tab. II, fig. 5.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 131.

Findested.

Station Husøen, 20—100 Fv.	Ret almindelig.
— No. 25	3 Exemplarer.
— „ 26	1 Exemplar.
— „ 200	1 —

Udbredelse.

Ophiothrix fragilis forekommer langs hele vor Syd-og Vestkyst indtil Lofoten, hvor den er meget sjelden og kun optræder paa de større Dyb (G. O. Sars); søndenfor Trondhjemsfjorden er den derimod en af de hyppigst forekommende Ophiurider; 0—400 Fv. (M. Sars, G. O. Sars, V. Storm m. fl.).

Arten er endvidere funden ved Island (?), Færøerne, Færøkanalen, 87—516 Fv. (Hoyle); de britiske Kyster, Holland (Horst); de tyske og danske Nordsøkytter; Kattegat; 10—50 Fv. (Pettersen); Øresund; Bohuslän (Ljungman); Kanalen, 35 Fv.; Frankriges Vestkyst; Neapel og Messina (Ludwig, M. Sars).

Ophiothrix fragilis maa saaledes nærmest betragtes som en sydlig Form, undtagelsesvis synes den dog ogsaa at kunne forekomme i rent arktiske Farvande, hvis Temperatur er under 0° (Station 200). Dens bathymetriske Udbredelse er 0—620 Favne.

1816. *Ophiura fragilis*, Lamarck, An. s. Vert., vol. II pag. 546.
 1841. *Ophiocoma rosula*, Forbes, British Starfishes.
 1842. *Ophiothrix fragilis*, Müller & Troschel, Syst. d. Aster., pag. 110. Pl. IX, fig. 2.
 1842. — *rammelsbergii*, id. ibid., pag. 113. Pl. VIII, fig. 3.
 1846. — *fragilis*, Düben & Koren, Zool. Bidrag, pag. 238.
 1859. — — M. Sars, Nyt Mag. for Naturvidensk., vol. X pag. 18.
 1869. — — Lütken, Addit. ad Hist. Ophiurid., part III, pag. 52.
 1871. — *pentaphyllum*, Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 622.
 1874. — *fragilis*, Lyman, Bull. Mus. Comp. Zool., vol. III, part 10, pag. 243 & 249. Pl. II, figs. 37—44.
 1885. — — Carus, Prod. Faunæ Mediterraneæ, vol. I pag. 95.
 1890. — — Fjelstrup, Zoologia Danica, Pighudede, pag. 25. Pl. II, fig. 5.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 131.

Localities.

Station Husøen, 20—100 fath.	Quite common.
— No. 25	3 specimens.
— „ 26	1 specimen.
— „ 200	1 —

Distribution.

Ophiothrix fragilis is met with along the whole of the Norwegian south and west coasts as far as Lofoten, where it is very rare and only appears in the great depths (G. O. Sars); south of the Trondhjem fiord it is, on the other hand, one of the most frequent Ophiurideans; 0—400 fath. (M. Sars, G. O. Sars, V. Storm and others).

The species is met with, further, at Iceland (?), the Færø islands, the Færø channel, 87—516 fath. (Hoyle); the British coasts, Holland (Horst); the German and Danish North Sea coasts; the Kattegat, 10—50 fath. (Pettersen); Øresund, Bohuslän (Ljungman); the British channel, 35 fath.; west coast of France; Naples and Messina (Ludwig, M. Sars).

Ophiothrix fragilis must, therefore, be chiefly considered as a southern form; but it seems to be able to appear, exceptionally, in purely arctic waters whose temperature is lower than zero (Station 200). Its bathymetrical distribution is 0—620 fathoms.

Streptophiuræ Bell.

Ophioscolex glacialis Müll. & Tr.

1842. *Ophioscolex glacialis*, Müll. & Tr., Syst. der Aster., pag. 109.
 1864. — — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 366.
 1883. — — Lyman, Bull. Mus. Comp. Zool., vol. X, No. 6, pag. 268.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 134.

Det største Exemplar, som hjembragtes fra Expeditionen, havde en Skivediameter af 38^{mm}, Armenes Længde var 117^{mm}; et andet Exemplar fra samme Lokalitet (Station No. 362) maalte: Skive 35^{mm}; Armene 89^{mm}. De ved den norske Kyst levende Individuer er som Regel ligesom de bohuslänske betydeligt mindre og har en tyndere Hud end de arktiske; dette er især fremtrædende hos de Exemplarer, som er tagne i vore Fjorde¹⁾. De sidste synes saaledes at ligne meget de af „Blake“ ved Dominic og Barbados fundne Exemplarer (cfr. Lyman). Farven paa de større Exemplarer er mørkerød, dog varierer den noget, saaledes var et Exemplar fra Station 226 purpur-rødt med gule Armpigge, gulhvid Bugside og røde Fødder. I Spiritus er Farven lys gulgraa.

Ophioscolex glacialis kan ikke, som af Hoyle, betragtes som en „well-marked cold water species“; den forekommer tværtom næsten lige hyppig i den varme som i den kolde Area. Halvparten af Nordhavsexpeditionens Stationer ligger nemlig indenfor den varme Area, samtlige skandinaviske Lokalteter søndenfor Lofoten tilhører ligeledes denne Zone, det samme er Tilfælde med 2 af Stationerne i Færøkanalen („Porcupine“ 1869, Stat. 78 & 82).²⁾ Adskillige af de amerikanske Lokalteter ligger ogsaa indenfor den varme Area. Det maa dog bemærkes, at de største og kraftigste Individuer er tagne i den kolde Area.

Findested.

Station No.	10	8 mindre Exemplarer.
— „	48	1 meget stort Exemplar.
— „	79	2 Exemplarer.
— „	101	1 Exemplar.

¹⁾ Arten kan dog undertiden ogsaa her i vore trange indelukkede Fjordbassiner naa omtrent samme Størrelse som den spitzbergske Form, saaledes fandt Professor M. Sars paa 100—120 Favnes Dyb ved Drøbak nogle Exemplarer, som maalte ca. 150^{mm}, 5^{7/8}”. (Om arktiske Dyreformer i Christianiafjorden, Christ. Vidensk. Selsk. Forhandl. 1865, pag. 200).

²⁾ Hoyle, Report on the Ophiuroidea of the Færø Channel, pag. 712.

Streptophiuræ Bell.

Ophioscolex glacialis Müll. & Tr.

1842. *Ophioscolex glacialis*, Müll. & Tr., Syst. der Aster., pag. 109.
 1864. — — Ljungman, Öfversigt Kongl. Vetensk. Akadm. Förhandl., pag. 366.
 1883. — — Lyman, Bull. Mus. Comp. Zool., vol. X, No. 6, pag. 268.
 1892. — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 134.

The largest specimen brought home by the expedition had a disc-diameter of 38^{mm}; the length of the arms was 117^{mm}; another specimen from the same locality (Station No. 362) measured: the disc 35^{mm}, the arms 89^{mm}. The live specimens obtained from the Norwegian coast are, as a rule, like those from Bohuslen, considerably smaller and have a thinner integument than the arctic; that is especially prominent in the specimens taken in the Norwegian fjords¹⁾. The last-named seem, therefore, to much resemble the specimens obtained by “Blake” at Dominico and Barbadoes (cfr. Lyman). The colour of the larger specimens is dark-red, but it varies somewhat, for instance one specimen from station 226 was purple-red with yellow brachial spikes, whity-yellow ventral surface and red feet. In alcohol the colour is light yellowish grey.

Ophioscolex glacialis cannot, as has been done by Hoyle, be considered as a “well-marked cold water species”; on the contrary it appears almost quite as frequently in the warm as in the cold area. Half of the stations of the North Atlantic Expedition are, namely, situated within the warm area; all the Scandinavian localities south of Lofoten also pertain to that zone. The same is the case with 2 of the stations in the Færø channel (“Porcupine”, 1869, Stat. No. 78 & 82).²⁾ Several of the American localities also lie within the warm area. It must, however, be noted that the largest and most vigorous individuals are obtained in the cold area.

Localities.

Station No.	10	8 small specimens.
— „	48	1 very large specimen.
— „	79	2 specimens.
— „	101	1 specimen.

¹⁾ The species may, however, occasionally even in the narrow, shut-in, Norwegian fiord-basins, attain nearly the same size as the form from Spitzbergen; Professor M. Sars found, for instance, a few specimens at Drøbak in 100—120 faths. depth which measured about 150^{mm}, 5^{7/8}”. (Om arktiske Dyreformer i Christianiafjorden, Christ. Vidensk. Selsk. Forhandl. 1865, pag. 200).

²⁾ Hoyle, Report on the Ophiuroidea of the Færø Channel, pag. 712.

Station No.	124	4 større Exemplarer.
—	”	147 2 mindre Exemplarer.
—	”	164 1 mindre Exemplar.
—	”	224 1 lidet Exemplar.
—	”	226 1 stort Exemplar.
—	”	237 Nogle meget store Exemplarer.
—	”	262 4 mindre Exemplarer.
—	”	270 1 lidet Exemplar.
—	”	273 1 — —
—	”	290 2 Exemplarer.
—	”	312 3 Exemplarer.
—	”	315 2 —
—	”	323 Nogle Exemplarer.
—	”	337 2 meget store Exemplarer.
—	”	357 5 — —
—	”	362 4 — —
—	”	370 Nogle mindre Exemplarer.

Station No.	124	4 large specimens.
—	”	147 2 small —
—	”	164 1 small specimen.
—	”	224 1 — —
—	”	226 1 large specimen.
—	”	237 A few very large specimens.
—	”	262 4 small specimens.
—	”	270 1 small specimen.
—	”	273 1 — —
—	”	290 2 specimens.
—	”	312 3 —
—	”	315 2 —
—	”	323 A few specimens.
—	”	337 2 very large specimens.
—	”	357 5 — —
—	”	362 4 — —
—	”	370 A few small specimens.

Udbredelse.

Arten synes at forekomme paa de større Dyb (100—300 Fv.) langs hele den norske Kyst; den er nemlig tagen ved Finmarken, Lofoten, Bodø, 100 Fv. (G. O. Sars); Trondhjemsfjorden (Storm); Eggen udenfor Christianssund, 100 Fv. (G. O. Sars); Sognefjordens Munding, 100—160 Fv., Havet 6 Mil vest af Holmengraa (Hansen & Friele); Hardangerfjorden, 300 Fv. (Danielssen). Den tyske Nordsø-expedition i 1872 fandt den i Bukkenfjordens Munding (106 Fv.), ved Lindesnes (220 Fv.) og Indseilingen til Christianssund (294 Fv.) Den er endvidere funden i Christianiafjorden, 50—120 Fv. (M. Sars).

Udenfor Norge kjendes *Ophioscolex glacialis* fra Karahavet, 80—130 Fv. (Stuxberg); Barentshavet (Hoffmann); Spitsbergen, Jan Mayen, 45 Fv. (Fischer); Færøkanalen, 290—375 Fv. (Hoyle); Bohuslän, 120—130 Fv. (Lovén); Hirshals, Jylland, 250 Fv. (Möbius & Bütschli); Grønland, (Lütken); Nordamerikas Østkyst, 101—1000 Fv. (Verrill). Dens Sydgrændse ved den amerikanske Kyst er ifølge Lyman Barbados og Dominic (82—333 Fv.).

***Ophioscolex purpureus* Düb. & Kor.**

1846. *Ophioscolex purpureus*, Dübén & Koren, Zool. Bidrag, pag. 235. Tab. VI, fig. 2 a—c.
 1861. — — — M. Sars, Oversigt af Norges Echinodermer, pag. 8. Tab. I, fig. 8—10.
 1892. — — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 134.

Distribution.

The species appears to be met with in the great depths (100—300 faths.) along the entire Norwegian coast; it is, namely, taken at Finmark, Lofoten, Bodø, 100 fath. (G. O. Sars); the Trondhjem fiord (Storm); the ridge off Christianssund, 100 fath. (G. O. Sars); the mouth of the Sognefiord, 100—160 fath.; the sea 6 miles west of Holmengraa (Hansen & Friele); the Hardanger fiord, 300 fath. (Danielssen); the German North Sea Expedition in 1872, obtained it at the mouth of the Bukken fiord (106 fath.); at Lindesnes (220 fath.) and the channel into Christianssund (294 fath.). It has been further obtained in the Christiania fiord, 50—120 fath. (M. Sars).

Beyond Norway *Ophioscolex glacialis* is known from the Kara Sea, 80—130 fath. (Stuxberg); the Barents Sea, (Hoffmann); Spitzbergen, Jan Mayen, 45 fath. (Fischer); the Færø channel, 290—375 fath. (Hoyle); Bohuslen, 120—130 fath. (Lovén); Hirshals, Jutland, 250 fath. (Möbius & Bütschli); Greenland (Lütken); the east coast of North America, 101—1000 fath. (Verrill). Its southern limit on the American coast is, according to Lyman, Barbadoes and Dominico (82—333 fathoms).

***Ophioscolex purpureus* Düb. & Kor.**

1846. *Ophioscolex purpureus*, Dübén & Koren, Zool. Bidrag, pag. 235. Pl. VI, fig. 2 a—c.
 1861. — — — M. Sars, Oversigt af Norges Echinodermer, pag. 8. Pl. I, fig. 8—10.
 1892. — — — Jeffrey Bell, Catalogue of British Echinoderms, pag. 134.

Findested.

	Station No.	8	Ikke saa ganske sjelden.
	—	25	2 Exemplarer.
	—	26	Adskillige Exemplarer.
	—	101	1 Exemplar.
	—	147	4 Exemplarer.
Imellem	—	173 & 174	2 Exemplarer.
	—	195	2 —
	—	200	17 Exemplarer.

Udbredelse.

Arten forekommer mere eller mindre sjelden langs Norges Vestkyst, fra Lofoten idetmindste til Hardangerfjorden, hvor Norman og Ray-Lancaster har taget den paa 100—160 Favnes Dyb, Danielssen paa 300 Favne. I Trondhjemsfjorden skal den dog ifølge Storm være meget almindelig, 30—200 Favne.

Udenfor Norge kjendes denne Art kun fra Færøkanalen, 203—676 Fv. (Hoyle) og Vestindien, 190 Fv. (Lyman). *Ophioscolex purpureus* synes saaledes fortrinsvis at høre hjemme i den varme Area, den er dog saavel paa denne Expedition (Stat. 200) som paa „Porcupine's“ Togt i 1869 (Stat. 54 & 57) funden i den kolde Area.

Cladophiuræ Bell.**Asteronyx lovéni Müll. & Trosch.**

(Tab. III, Fig. 22 & 23).

1842.	Asteronyx lovéni,	Müller & Troschel, Syst. der Aster., pag. 119. Tab. X, fig. 3—5.
1861.	—	— Stewart, Ann. & Mag. Nat. Hist., ser. 3, vol. VIII, pag. 77.
1861.	—	— M. Sars, Oversigt af Norges Echinodermer, pag. 5. Tab. I, fig. 1—5.
1862.	—	— Dujardin & Hupé, Hist. nat. des Zoophytes Echinodermes, pag. 296.
1865.	—	— Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV, pag. 106.
1882.	—	— Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 285.
1892.	—	— Jeffrey Bell, Catalogue of British Echinoderms, pag. 136.

Localities.

	Station No.	8	Not so very rare.
	—	25	2 specimens.
	—	26	Several specimens.
	—	101	1 specimen.
	—	147	4 specimens.
Between	—	173 & 174	2 specimens.
	—	195	2 —
	—	200	17 specimens.

Distribution.

The species is more or less rarely met with along the west coast of Norway, from Lofoten to at least Hardanger fiord, where Norman and Ray-Lancaster have obtained it at a depth of 100—160 faths., Danielssen in 300 faths. It is, however, according to Storm, very common in the Trondhjem fiord, 30—200 faths.

Beyond Norway this species is only known from the Færø channel, 203—676 fath. (Hoyle) and the West Indies, 190 fath. (Lyman). *Ophioscolex purpureus* seems therefore, preferably, to have its home in the warm area; it has, however, both on this expedition (Stat. 200) as well as on the „Porcupine“ expedition in 1869 (Stat. 54 & 57), been obtained in the cold area.

Cladophiuræ Bell.**Asteronyx lovéni Müll. & Trosch.**

(Pl. III, figs. 22 & 23).

1842.	Asteronyx lovéni,	Müller & Troschel, Syst. der Aster., pag. 119. Pl. X, fig. 3—5.
1861.	—	— Stewart, Ann. & Mag. Nat. Hist., ser. 3, vol. VIII, pag. 77.
1861.	—	— M. Sars, Oversigt af Norges Echinodermer, pag. 5. Pl. I, figs. 1—5.
1862.	—	— Dujardin & Hupé, Hist. nat. des Zoophytes Echinodermes, pag. 296.
1865.	—	— Norman, Ann. & Mag. Nat. Hist., ser. 3, vol. XV, pag. 106.
1882.	—	— Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 285.
1892.	—	— Jeffrey Bell, Catalogue of British Echinoderms, pag. 136.

Af denne Art foreligger der kun et Exemplar fra Station 101. Exemplaret havde en Skivediameter af 6^{mm}, Armenes Længde var 32^{mm}; Forholdet mellem Skiven og Armene blir saaledes som 1 : 5, Müller & Troschel angiver Forholdet til 1 : 7, ifølge Stewart er det hos Exemplarer med en Skivediameter af 30^{mm} 1 : 9. M. Sars fandt, at det var 1 : 11 eller 12. Forholdet mellem Skiven og Armene synes saaledes med Alderen at blive større og større. Skivens femkantede Form var hos dette Individ tydeligere udpræget end hos de fuldt udviklede, som undertiden kan være næsten runde. Ligeledes traadte Ribberne, som havde en Længde af 2.5^{mm}, og en Bredde af 0.3—0.4^{mm}, skarpere frem; sandsynligvis skriver dog dette sig blot fra, at Skivens Hud var stærkt kontraheret. Hos et noget større Exemplar fra Bergensfjorden (Skivediameter 8^{mm}) var nemlig Ribberne ganske skjulte af den overliggende Hud som hos de fuldt udviklede Individuer og traadte først frem, da Exemplaret blev tørret. Skiven er, som af M. Sars bemærket, under den nøgne Hud bedækket af adspredte, rundagtige, noget convexe, større og mindre hvide Kalkkorn, som dog først blir synlige paa tørrede Exemplarer. Disse Kalkkorn synes at optræde i større Mængde hos de ældre, fuldt udviklede Exemplarer end hos de yngre.

Genitalspalterne ligger, hvad allerede Müller og Troschel har paapeget, i en Fordybning i Interbrachialrummene. Dette gjælder dog blot hos de fuldt udviklede Individuer; hos ganske unge Exemplarer, som det her omtalte, mangler derimod Fordybningen ganske. Ogsaa hos ældre kan den undertiden mangle, men det er dog meget sjældent. Hos ældre veludviklede Individuer er Fordybningen stundom afgrændset fra Interbrachialrummet ved en Vold, som synes at være dannet ved en større og tættere Ansamling af de ovenfor nævnte Kalkkorn. Mavesækkens og Genitalspalternes Bygning viser paa det tydeligste, at Slægten *Asteronyx* er en ægte Euryal. Maven løber nemlig hos denne Art ligesom hos *Gorgonocephalus eucnemis* ud i Blindsække, dog synes ikke disse at være saa dybe, heller ikke er de saa vel befæstede. Genitalspalterne munder ligeledes direkte ud i Kropshulen, cfr. Lyman¹⁾ og Levinsen²⁾. Mavesækkens 5 brachiale Blindsække er fastvoksede til de Sække, der omgiver Generationsprodukterne. Desværre var det mig ikke muligt at faa udredet disses Bygning paa Grund af det ringe Materiale, som stod til min Disposition; det er dog sandsynligt at ogsaa hos *Asteronyx lovéni* omgiver disse Sække, Peritonealsækkene, andre Sække, hvori Æggene ligger.

Skiven var hos det her omtalte Exemplar brunviolet, da det var ilive, Armene kjødfarvede; i Alkohol er Skiven mørkebrun med gulbrune Ribber og Arme.

¹⁾ The stomach and genital organs of Astrophytidæ. Bull. Mus. Comp. Zool., vol. VIII, No. 6.

²⁾ Kara-Havets Echinodermata. Dijnphna Togtets zool.-botan. Udbytte, pag. 409.

Of this species there is only one specimen from station 101. The specimen had a disc-diameter of 6^{mm}; the length of the arms was 32^{mm}; the proportion between the disc and the arms is thus, as 1 is to 5. Müller and Troschel state the proportion as 1 is to 7. According to Stewart it is, in specimens having a disc-diameter of 30^{mm} as 1 to 9. M. Sars found it to be as 1 to 11 or 12. The proportion between the disc and the arms appears therefore to be greater and greater, according to age. The pentagonal form of the disc was in this individual more distinctly marked than in the fully developed animal, which may occasionally be almost round. The ribs, likewise, which were 2.5^{mm} in length with a breadth of 0.3—0.4^{mm}, appeared more prominently; probably that is only due, however, to the fact that the integument of the disc was greatly contracted. In a somewhat larger specimen from the Bergen fiord (diameter of disc 8^{mm}); the ribs were, namely, quite concealed, by the super-incumbent integument, as in the fully developed individuals, and first appeared after the specimen had been dried. The disc is, as remarked by M. Sars, covered below the bare integument by scattered roundish, somewhat convex, larger and smaller white calcareous grains, which are, however, first visible in dried specimens. Those calcareous grains seem to appear in greatest abundance in the older, fully developed specimens rather than in the younger ones.

The genital fissures lie, as has already been pointed out by Müller and Troschel, in a cavity in the interbrachial spaces. That is the case, however, only in the fully developed individuals; in quite young specimens, as the one spoken of here, the cavity is, on the contrary, quite absent. It may also be absent in older specimens occasionally, but that is, however, very rare. In older, well-developed individuals the cavity is sometimes separated from the interbrachial space by a wall, which seems to be formed by a larger and denser collection of the above named calcareous grains. The structure of the stomach-sac and the genital fissures, shows most distinctly that *Asteronyx* is a real euryalean. The stomach passes, namely, in this species, as in *Gorgonocephalus eucnemis*, into cæca, but those do not appear to be so deep, neither are they so well secured. The genital fissures likewise debouch direct into the body-cavity, cmp. Lyman¹⁾ and Levinsen²⁾. The 5 brachial cæca of the stomach-sac are concreted to the sacs which enclose there productive products. Unfortunately it was not possible for me to elucidate the structure of these, owing to the small quantity of material at my disposal; it is, however, probable that also in *Asteronyx lovéni* those sacs, the peritoneal sacs, enclose other sacs in which the ova lie.

The disc was, in the specimen spoken of here, brown-violet, when it was alive, the arms flesh-colour. In alcohol the disc is dark-brown with yellowish brown arms and ribs.

¹⁾ The stomach and genital organs of Astrophytidæ. Bull. Mus. Comp. Zool., vol. VIII, No. 6.

²⁾ Kara-Havets Echinodermata. Dijnphna Togtets zool.-botan. Udbytte, pag. 407.

Udbredelse

Asteronyx lovéni er tidligere funden i Korsfjorden, Bergensfjorden, 50—200 Fv., Trondhjemsfjorden ved Beian, 70 Fv. (V. Storm) og ved Finmarken, hvor den ifølge M. Sars skal være ret hyppig.

Arten forekommer endvidere ved Bohuslän; Skotland (Stewart, Sim, Hoyle); Færøkanalen (Porcupine, 1869, Stat. 89, 445 Fv. ?); Portugal (Ljungman); Nordamerikas Østkyst, hvor den ifølge Verrill skal være meget almindelig paa de Lokalteter, hvor der findes Pennatulider¹⁾ (Albatross, 787—1362 Fv., Challenger, 85 Fv.) og Japan (Challenger, 345 Fv.). *Asteronyx lovéni* synes saaledes at være en i den varme Area forekommende circumpolar Form. Den ene af de tre skotske Lokalteter, hvor den er funden, Loch Torridon i Rosshire, er særlig interessant derved, at den her blev tagen i Laminariebæltet paa 9 Favnes Dyb, medens den overalt ellers har vist sig som en ægte Dybvandsform, som ikke er observeret ovenfor 50 Favne.

Gorgonocephalus lamarckii (Müll. & Tr.) Lyman.

1761. *Asterias caput medusæ* (?), Linné, Fauna Suecica, pag. 513.
 1842. *Astrophyton lamarckii*, Müller & Troschel, Syst. der Asteriden, pag. 123.
 1862. — — Dujardin & Hupé, Hist. nat. des Zoophytes Echinodermes, pag. 303.
 1872. — *caput medusæ*, G. O. Sars, Christiania Vidensk. Selsk. For handlinger pag. 114.
 1880. — *lamarckii*, Verrill, Proceed. U. S. Nat. Museum, vol. II pag. 203.
 1882. *Gorgonocephalus lamarckii*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 263.

Af denne Art foreligger der kun et yngre Exemplar (Skivediameter 28^{mm}) fra Station 173 (eller 174). Exemplaret var i frisk Tilstand havannabrun paa Rygsiden af Armene og Skiven, Bugsiden gulhvid; i Alkohol er det lyst rødligt brunt.

Gorgonocephalus lamarckii adskiller sig med Lethed fra de tre andre nordiske Gorgonocephaler foruden ved sin tætte og fine Granulering af Skivens Rygside, hvad tidligere Forfattere allerede har fremhævet, ogsaa ved at Ribbernes ydre Ende er bedækket med Kalkkorn, medens den hos de tre andre Arter er nøgen.

¹⁾ Ogsaa ved vore Kyster synes den at foretrække saadanne Lokalteter; hyppigst er den funden hæftet til *Funiculina quadrangularis*.

Distribution.

Asteronyx lovéni has been previously met with in the Korsfjord, the Bergen fiord, 50—200 faths.; the Trondhjem fiord at Beian, 70 fath. (V. Storm) and at Finmark, where it is, according to M. Sars, very frequent.

The species appears further at Bohuslän; Scotland (Stewart, Sim, Hoyle); the Færø channel (Porcupine 1869, stat. 89, 445 fath. ?); Portugal (Ljungman); east coast of North America, where, according to Verrill, it is very common in the localities where pennatulida are found¹⁾ (Albatross, 787—1362 fath., Challenger, 85 fath.) and Japan (Challenger, 345 fath.). *Asteronyx lovéni* seems therefore to be a circumpolar form appearing in the warm area. The one of the three Scottish localities in which it is found, Loch Torridon in Rosshire, is especially interesting from the fact that it was taken there from the laminaria belt at a depth of 9 faths., while it everywhere else has shown itself to be a genuine deep-water form which has not been observed at less depth than 50 fathoms.

Gorgonocephalus lamarckii (Müll. & Tr.) Lyman.

1761. *Asterias caput medusæ* (?), Linné, Fauna Suecica, pag. 513.
 1842. *Astrophyton lamarckii*, Müller & Troschel, Syst. der Asteriden, pag. 123.
 1862. — — Dujardin & Hupé, Hist. nat. des Zoophytes Echinodermes, pag. 303.
 1872. — *caput medusæ*, G. O. Sars, Christiania Vidensk. Selsk. Forhandling, pag. 114.
 1880. — *lamarckii*, Verrill, Proceed. U. S. Nat. Museum, vol. II pag. 203.
 1882. *Gorgonocephalus lamarckii*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 263.

Of this species we have only a young specimen, (disc-diameter 28^{mm}) from station 173 (or 174). The specimen was, in the live state, Havana-brown on the dorsal surface of the arms and disc, the ventral surface yellow-white. In alcohol it is light reddish-brown.

Gorgonocephalus lamarckii may easily be distinguished from the three other northern gorgonocephali, besides by its dense and fine granulation on the dorsal surface of the disc, as has already been pointed out by previous writers, also by the circumstance that the outer extremity of the ribs is covered with calcareous grains while it is bare in the three other species.

¹⁾ It seems also upon the Norwegian coasts to prefer such localities; it is frequently found attached to *Funiculina quadrangularis*.

Udbredelse.

Gorgonocephalus lamarckii forekommer meget almindelig ved Finnmarken og Lofoten, 100—250 Fv. (M. Sars). Langs Vestkysten, hvor den optræder saavel ude ved Havet som inde i Fjordene, synes den at blive sjældnere og sjældnere, jo længere syd man kommer, og har ved Bergen naaet sin sydligste Grændse (M. Sars, 100 Fv., G. O. Sars, 40—100 Fv., V. Storm, 50—100 Fv.).

Udenfor Norge kjendes Arten kun fra Kysten af Nova Scotia, hvor den ifølge Verrill skal være almindelig paa Alcyonarier (150—300 Fv.), samt fra Sitcha og Kadjak, hvor den skal være funden af Nordmann. Den synes saaledes at være en circumpolar Form.

Gorgonocephalus eucnemis (Müll. & Tr.) Lyman.

(Tab. II, fig. 18; Tab. III, fig. 19).

1780. *Asterias caput medusæ*, Fabricius, Fauna Grönlandica, pag. 372.
 1834. — — — Dewhurst, Nat. Hist. Ord. Cetacea.
 1842. *Astrophyton eucnemis*, Müller & Troschel, Syst. d. Aster., pag. 123.
 1857. — — — Lütken, Oversigt over Grönlands Echinodermer, Vidensk. Meddel., pag. 54.
 1858. — — — id. Addit. ad Hist. Ophiurid., part I, pag. 70. Tab. II, fig. 17—19.
 1861. — — — (?) M. Sars, Oversigt af Norges Echinodermer, pag. 4.
 1865. — — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, no. 1, pag. 181.
 1882. *Gorgonocephalus eucnemis*, id. Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 263.
 1887. *Astrophyton eucnemis*, Levinsen, Dijnphna Togtets zool.-bot. Udbytte, pag. 407. Tab. XXXV, fig. 3—6.
 1892. *Gorgonocephalus eucnemis*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 138.

I en foreløbig Redegjørelse fra Nordhavsexpeditionens første Togt beskriver Danielssen & Koren ganske kort en ny Euryal, *Gorgonocephalus (Astrophyton) malmgrenii*, som skal staa imellem *Gorgonocephalus eucnemis* og *Gorgonocephalus agassizii*, dog nærmest den første¹⁾. Arten diag-

¹⁾ Fra den norske Nordhavsexpedition, Nyt Mag. for Naturvidensk., vol. XIII, 1877, pag. 81.

Distribution.

Gorgonocephalus lamarckii appears very commonly off Finnmark and Lofoten, 100—250 fath. (M. Sars). Along the west coast, where it appears both out at sea as well as in the fiords, it seems to become more and more rare the farther south we pass, and reaches its most southerly limit at Bergen (M. Sars, 100 fath., G. O. Sars, 40—100 fath., V. Storm, 50—100 fath.).

Beyond Norway the species is only known from the coast of Nova Scotia where, according to Verrill, it is very common on Alcyonaria (150—300 fath.), and from Sitcha and Kadjak, where it is reported to have been found by Nordmann. It therefore appears to be a circumpolar form.

Gorgonocephalus eucnemis (Müll. & Tr.) Lyman.

(Pl. II, fig. 18; Pl. III, fig. 19).

1780. *Asterias caput medusæ*, Fabricius, Fauna Grönlandica, pag. 372.
 1834. — — — Dewhurst, Nat. Hist. Ord. Cetacea.
 1842. *Astrophyton eucnemis*, Müller & Troschel, Syst. d. Aster., pag. 123.
 1857. — — — Lütken, Oversigt over Grönlands Echinodermer, Vidensk. Meddel., pag. 54.
 1858. — — — id. Addit. ad Hist. Ophiurid., part I, pag. 70. Pl. II, figs. 17—19.
 1861. — — — (?) M. Sars, Oversigt af Norges Echinodermer, pag. 4.
 1865. — — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 181.
 1882. *Gorgonocephalus eucnemis*, id. Report on the ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 263.
 1887. *Astrophyton eucnemis*, Levinsen, Dijnphna Togtets zool.-bot. Udbytte, pag. 407. Pl. XXXV, fig. 36.
 1892. *Gorgonocephalus eucnemis*, Jeffrey Bell, Catalogue of British Echinoderms, pag. 138.

In a preliminary report of the first voyage of the North Atlantic Expedition, Danielssen & Koren describe quite shortly a new euryalean, *Gorgonocephalus (Astrophyton) malmgrenii*, which stands between *Gorgonocephalus eucnemis* and *Gorgonocephalus agassizii*, but nearest to the first¹⁾.

¹⁾ Fra den norske Nordhavsexpedition, Nyt Mag. for Naturvidensk., vol. XXIII, 1877, pag. 81.

nosticerer saaledes: „Radialribberne flade, lave, sparsomt besat med smaa runde Korn og de ydre Ender overordentlig brede. Interradialrummene overstrøede med lignende Korn. Armenes Bugflade nøgen. Mundpapillerne korte og spidse. Tandpapillerne kugleformige. Tænderne lange, smale, ialt 30—40. Farven paa Skiven brun, Ribberne lysere og Armene gulrøde“ (Fig. 18 & 19).

Gorgonocephalus malmgrenii skal adskille sig fra *Gorgonocephalus eucnemis* ved sine brede flade Ribber, som er sparsommere forsynede med Kalkkorn; ved at den mangler et sammenhængende Bælte af Kalkkorn langs Skivens Rand; ved de stærkere ophøiede Armsømme og ved Armenes nøgne Bugflade. Beskrivelsen er udkastet efter et 100^{mm} stort Exemplar. Sammenligner man dette med en typisk *Gorgonocephalus eucnemis*, især et yngre Individ, vil man vel se en saa stor Forskel mellem dem, at man herpaa kunde begrunde en ny Art, men har man et tilstrækkeligt stort Materiale, vil man snart finde, at disse to Arter umærkeligt gaar over i hinanden. Jeg har saaledes oftere fundet hos *Gorgonocephalus eucnemis*, at Skiveranden mellem nogle af Armene var ganske nøgne, medens den mellem de øvrige dels var tæt, dels kun delvis besat med Kalkkorn.

Saa vel Lütken som Lyman har allerede tidligere paa-vist, at Skivens og ogsaa Ribbernes Kalkbeklædning aftager med Alderen.

Rygsidens Kalkbeklædning synes samtidig hermed at være underkastede mange individuelle Variationer: „Man træffer grovtkornede og man træffer fintkornede Individuer; man træffer Exemplarer, hvor Ribberne er næsten nøgne, og andre, hvor Mellemrummene er det o. s. v.“ (Lütken¹⁾). Forholdet mellem Ribbernes Længde og Bredde synes at være underkastede den samme individuelle Variation som Rygsidens Beklædning, selv hos samme Individ vil man finde, at den varierer; Ribberne synes dog, naar Individet har naaet en vis Størrelse, at voxer stærkere i Bredden end i Længden. Ribbernes og Armsømmenes mere eller mindre Fremstaaen synes at bero paa den Kontraktions-tilstand, hvori Individet er, hvad vi allerede tidligere kjender f. Ex. fra „Ribberne eller Radialskjoldene“ hos *Ophiopleura borealis*.

Hvis man tørrer et Exemplar af *Gorgonocephalus malmgrenii*, vil man finde, at ogsaa hos denne Art er Armenes Bugside bedækket med Kalkkorn, omend sparsommere end hos den typiske *Gorgonocephalus eucnemis*. *Gorgonocephalus malmgrenii* bør vel derfor, synes mig, ikke betragtes som en selvstændig Art, men snarere som en individuel Varietet af *Gorgonocephalus eucnemis*.

The species is thus diagnosed: “The radial ribs flat, low, sparingly beset with small round grains and the outer extremities extremely broad. The interrarial spaces over-strewn with similar grains. The ventral surface of the arms bare. The oral papillæ short and pointed. The dental papillæ clavi-form. The teeth long, narrow, 30—40 altogether. The colour of the disc brown, the ribs lighter in colour, and the arms yellow-red” (fig. 18 & 19).

Gorgonocephalus malmgrenii distinguishes itself from *Gorgonocephalus eucnemis*, by its broad, flat ribs, which are sparingly furnished with calcareous grains; by the absence of a continuous belt of calcareous grains along the margin of the disc; by the more elevated arm-ridges and by the bare ventral surface of the arms. The description is based upon a specimen 100^{mm} large. If we compare this with a typical *Gorgonocephalus eucnemis*, especially a young individual, we will find such a great difference between them that upon it we might base a new species, but if we have a sufficiently abundant material at disposal, we will soon observe that those two species pass imperceptibly over into each other. I have, thus, frequently found in *Gorgonocephalus eucnemis* that the margin of the disc between a few of the arms was quite bare, whilst between the others it was partly densely, partly only partially beset with calcareous grains.

Lütken as well as Lyman have already previously pointed out that the calcareous covering of the disc, and also of the ribs, diminishes with the age.

The calcareous covering of the dorsal surface seems at same time, in correspondence therewith, to be subjected to many individual variations: “Man træffer grovtkornede og man træffer fintkornede Individuer; man træffer Exemplarer, hvor Ribberne er næsten nøgne, og andre, hvor Mellemrummene er det o. s. v.” (Lütken¹⁾). The proportion between the length and breadth of the ribs seems to be subjected to the same individual variations as the covering of the dorsal surface; even in the same individual we will find that it varies; the ribs appear, however, when the individual has reached a certain size, to grow more in breadth than in length. The greater or smaller prominence of the ridges of the ribs and arms seems to depend on the state of contraction in which the individual is, a circumstance we already know previously from, for instance, the “ribs or radial shields” in *Ophiopleura borealis*.

If we dry a specimen of *Gorgonocephalus malmgrenii* we will find that also in that species the ventral surface of the arms is covered with calcareous grains, although more sparingly than in the typical *Gorgonocephalus eucnemis*. *Gorgonocephalus malmgrenii*, should, therefore, I think, not be considered as an independent species, but rather as an individual variety of *Gorgonocephalus eucnemis*.

¹⁾ Addit. ad Hist. Ophiurid., part III, pag. 66.

Den norske Nordhavsexpedition. James A. Grieg: Ophiuroidea.

¹⁾ Addit. ad Hist. Ophiurid., part III, pag. 66.

Findested.

Station No.	18	4 Exemplarer.
—	31	6 —
—	33	2 —
—	48	3 —
—	78	1 Exemplar.
—	87	2 Exemplarer.
—	137	Et Brudstykke af et stort Exemplar.
—	164	Almindelig.
—	192	1 Exemplar.
—	200	1 —
—	255	1 —
—	286	1 —
—	315	2 Exemplarer.
—	323	1 Exemplar.
—	336	5 Exemplarer.
—	359	Almindelig.
—	363 (?)	1 Exemplar.
—	370	3 meget store Exemplarer.

Formen *Gorgonocephalus malmgrenii* fandtes ved Stationerne: 18, 31, 33, 87, 137, 359 og 370; ved de fleste af disse fandtes samtidig Hovedformen *Gorgonocephalus eucnemis*.

Udbredelse.

Arten er tidligere funden ved Finmarken, hvorfra der ifølge Ljungman skal findes Exemplarer i Riksmuseet i Stockholm ¹⁾. Hvorvidt det af M. Sars beskrevne unge Exemplar fra Varangerfjorden tilhører denne Art, er derimod meget tvivlsomt; ifølge velvillig Meddelelse fra Herr Professor R. Collett tilhører den ligesom Nordmann's Exemplar sandsynligvis *Gorgonocephalus agassizii*; desværre er dog Exemplaret gaaet tabt, saa det nu er umuligt med fuld Sikkerhed at afgjøre, til hvilken Art det hører.

Gorgonocephalus eucnemis er endvidere kjendt fra Karahavet (Levinsen, 20—106 Fv.; Stuxberg, 40—120 Fv.); Novaja Semlja's Vestkyst (Hoffmann, 110—160 Fv.; Stuxberg); Franz Josef's Land, 137 Fv. (Marenzeller); Spitsbergen, Færøkanalen, 345 og 433 Fv. (Hoyle); Grønlands Kyster (Lütken, Norman, 100 og 175 Fv.); Newfoundland og Labrador (Verrill, Lyman). Arten tilhører saavel den kolde som den varme Area; dens bathymetriske Udbredelse er 20—650 Fv. Ifølge Dewhurst skal den endog være truffen paa 1000 Favnes Dyb.

¹⁾ Öfvers. af Kongl. Vetensk. Akadm. Förhandl., 1871, pag. 658.

Localities.

Station No.	18	4 specimens.
—	31	6 —
—	33	2 —
—	48	3 —
—	78	1 specimen.
—	87	2 specimens.
—	137	A fragment of a large specimen.
—	164	Common.
—	192	1 specimen.
—	200	1 —
—	255	1 —
—	286	1 —
—	315	2 specimens.
—	323	1 specimen.
—	336	5 specimens.
—	359	Common.
—	363 (?)	1 specimen.
—	370	3 very large specimens.

The form *Gorgonocephalus malmgrenii* was obtained at the stations: 18, 31, 33, 87, 137, 359 and 370; at most of them there was, also, at same time, found the typical form *Gorgonocephalus eucnemis*.

Distribution.

The species has been previously known from Finmark, whence, according to Ljungman, specimens are found in the National Museum at Stockholm ¹⁾. Whether the young specimen from the Varanger fiord, described by M. Sars, belongs to this species is, on the contrary, very doubtful. According to information kindly supplied by Professor R. Collett, it belongs, as well as Nordmann's specimen, probably to *Gorgonocephalus agassizii*: the specimen has unfortunately been lost, so that it is not now possible to decide with perfect certainty to what species it pertains.

Gorgonocephalus eucnemis is further known from the Kara Sea (Levinsen, 20—106 fath.; Stuxberg, 40—120 fath.); west coast of Nova Zembla (Hoffmann, 110—160 fath.; Stuxberg); Frantz Joseph's Land, 137 fath. (Marenzeller); Spitzbergen, the Færø channel, 345 and 433 fath. (Hoyle); the coasts of Greenland and Labrador (Verrill, Lyman). The species belongs both to the cold as well as the warm area. Its bathymetrical distribution is 20—650 fath. According to Dewhurst it is even met with at a depth of 1000 fathoms.

¹⁾ Öfvers. af Kongl. Vetensk. Akadm. Förhandl., 1871, pag. 658.

Gorgonocephalus agassizii (Stimpson) Lyman.

(Tab. III, fig. 20 & 21).

1819. *Gorgonocephalus arcticus*, Leach, Ross's Voyage of Discovery in H.M.S. „Isabella“ and „Alexander“, vol. II App., No. IV, pag. 178.
1841. *Euryale scutatum*, Gould, Invert. of Massachusetts, pag. 345.
1853. *Astrophyton agassizii*, Stimpson, Syn. Mar. Invert. Gr. Manan, Smithson. Contrib., vol. VI pag. 12.
1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 186.
1869. — — Lütken, Addit. ad Hist. Ophiurid., part III, pag. 66.
1877. — *arcticum*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 468.
1877. — *agassizii*, Lyman, Proceed. Boston Soc. Nat. Hist., vol. XIX pag. 102.
1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea etc., pag. 69. Tab V, fig. 1—6.
1882. *Gorgonocephalus agassizii*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 264. Tab. XXXV, fig. 26. Tab. XXXVI.
1886. — — Fischer, Die österreich. Polarstation, Jan Mayen, Bd. III, pag. 37.

Det mindste Exemplar af denne Art, som Nordhavs-expeditionen erholdt (Stat. 124), havde en Skivediameter af 4.5^{mm}. Skivens Rygside med Undtagelse af et lidet Parti paa begge Sider af Armene, hvor der fandtes en liden Fordybning eller Spalte, var tæt og ensformigt granuleret med større og mindre runde eller ovale Korn og Plader (Fig. 20). Pladerne, Lyman's „primary plates, each encircled by a superimposed list of grains“ (pag. 252, Tab. XXXVI, fig. 3 g), har en hvælvet Overflade og er ligesom Kornene fint granulerede (Fig. 21). Lignende Korn findes ligeledes paa Armenes Rygside, hvis basale Del især er tæt bedækket. Skivens Bugside er ogsaa forsynet med Kalkkorn, omend sparsommere end Rygsiden; Plader synes derimod omtrent ganske at mangle paa Bug-siden. Som allerede af Lyman paapeget, minder Rygsidens Beklædning meget om den hos unge Individuer af *Ophiopholis aculeata*.

De ovenfor nævnte ti Fordybninger ved Armenes Basis strækker sig fra Skiveranden ca. 0.9^{mm} indover mod Skivens Midte; deres største Bredde er omtrent halv saa

Gorgonocephalus agassizii (Stimpson) Lyman.

(Pl. III, fig. 20 & 21).

1819. *Gorgonocephalus arcticus*, Leach, Ross's Voyage of Discovery in H.M.S. „Isabella“ and „Alexander“, vol. II App. No. IV, pag. 178.
1841. *Euryale scutatum*, Gould, Invert. of Massachusetts, pag. 345.
1853. *Astrophyton agassizii*, Stimpson, Syn. Mar. Invert. Gr. Manan, Smithson. Contrib., vol. VI pag. 12.
1865. — — Lyman, Ill. Cat. Mus. Comp. Zool., vol. I, No. 1, pag. 186.
1869. — — Lütken, Addit. ad Hist. Ophiurid., part III, pag. 66.
1877. — *arcticum*, Duncan & Sladen, Ann. & Mag. Nat. Hist., ser. 4, vol. XX pag. 468.
1877. — *agassizii*, Lyman, Proceed. Boston Soc. Nat. Hist., vol. XIX pag. 102.
1881. — — Duncan & Sladen, Memoir on the Echinodermata of the Arctic Sea etc., pag. 69. Pl. X, fig. 1—6.
1882. *Gorgonocephalus agassizii*, Lyman, Report on the Ophiuroidea, Chall. Exp. Zool., vol. V, part 14, pag. 264. Pl. XXXV, fig. 26. Pl. XXXVI.
1886. — — Fischer, Die österreich. Polarstation, Jan Mayen, Bd. III, pag. 37.

The smallest specimen of this species obtained by the North Atlantic Expedition (stat. 124) had a disc-diameter of 4.5^{mm}. The dorsal surface of the disc, except a small portion on both sides of the arms, where a small cavity or fissure was observed, was densely and uniformly granulated with larger and smaller round or oval grains and plates (fig. 20). The plates, Lyman's „primary plates, each encircled by a superimposed list of grains“ (pag. 252, Pl. XXXVI, fig. 3 g), have an arcuate outer surface and are, like the grains, finely granulated (fig. 21). Similar grains are likewise found on the dorsal surface of the arms, whose basal portion especially is densely covered. The ventral surface of the disc is also furnished with calcareous grains, although more sparingly than on the dorsal surface; plates seem, on the other hand, to be almost completely absent on the ventral surface. As already remarked by Lyman, the covering of the dorsal surface reminds much of the same feature in young individuals of *Ophiopholis aculeata*.

The above-named ten cavities at the base of the arms extend from the margin of the disc about 0.9^{mm} inwards, towards the middle of the disc; their greatest breadth is

stor som Længden. Fordybningerne ligger temmelig dybt nedsænkede, saaat de omliggende Kalkkorn omgiver dem som en Vold; de er ligesom Pladerne fint granulerede. Muligens bør de betragtes som Plader, sandsynligere er det dog, at disse Fordybninger er „Radialskjoldene“ og den første Antydning til Ribberne; Pladerne findes nemlig spredt over Skiven uden nogen bestemt Orden, medens Fordybningerne er ordnede parvise ved Armenes Basis paa det Sted, hvor senere Ribberne udvikler sig. De adskiller sig desuden fra Pladerne ved sin elliptiske Form og ved at Midten ikke er ophøiet.

Armene er ca. 10^{mm} lang og forgrener sig to Gange, den første Forgrening begynder 4^{mm} fra Skiven, den anden 4—5^{mm} fra den første.

I Lyman's store Arbejde over Challenger Ophiuriderne omtales to unge Exemplarer af *Gorgonocephalus agassizii*, med en Skivediameter af 2.5^{mm} og 7^{mm}. Det her omtalte Exemplar synes at staa midt imellem disse to med Hensyn til Skivens Granulation, nærmest staar det et 4^{mm} stort Exemplar, som Fischer beskriver fra Jan Mayen; det afviger dog fra alle tre, ved at de ganske mangler „Radialskjoldene“. Disse mangler endvidere hos et 7^{mm} og et 11^{mm} stort Exemplar, som ligeledes blev indsamlet ved Jan Mayen. Hos *Gorgonocephalus eucnemis* synes heller ikke disse „Radialskjoldene“ eller Fordybninger at være iagttagne, idetmindste kan de ikke sees antydede paa Lütken's Tegning af et 3^{mm} og et 4.5^{mm} stort Exemplar¹⁾.

Som bekjendt undergaar denne Art ligesom de øvrige til Slægten *Gorgonocephalus* hørende Arter store Forandringer under Væksten; det for de fuldt udviklede Individuer saa karakteristiske Udseende viser sig dog meget tidligt. Allerede ved en Skivediameter af 20^{mm} er det saaledes ikke muligt at forvexle denne Art med de øvrige tre nordiske. Ved en Skivediameter af 30^{mm} er alle denne Arts typiske Karakterer fuldt udviklede.

Findested.

Station No.	18	1 stort Exemplar.
—	„ 124	2 unge Exemplarer.
—	„ 223	1 ungt Exemplar.
—	„ 362	15 større og mindre Exemplarer.
—	„ 363	11 — — — —

Udbredelse.

Ved de norske Kyster er denne Art, saavidt vides, kun funden i Varangerfjorden, hvorfra der i Bergens

¹⁾ Addit. ad Hist. Ophiurid., part I, pag. 71. Tab. II, fig. 18 & 19.

about half as much as the length. The cavities lie pretty deeply depressed, so that the surrounding calcareous grains enclose it like a wall; they are, like the plates, finely granulated. Possibly they ought to be considered as plates; it is, however, more probable that those cavities are the radial shields and the first indications of the ribs; the plates, namely, are found spread over the disc without any definite order, whilst the cavities are arranged in couples at the base of the arms, at the points where the ribs subsequently develop themselves. They distinguish themselves, besides, from the plates, by their elliptical form and by their middle not being elevated.

The arms are about 10^{mm} long and ramify twice. The first ramification begins 4^{mm} from the disc, the second 4—5^{mm} from the first.

In Lyman's important work on the Challenger Ophiurideans two young specimens of *Gorgonocephalus agassizii*, having disc-diameters, 2.5^{mm} and 7^{mm}, are spoken of. The specimen spoken of here seems to stand just between those two with respect to granulation of the disc; it stands closest to a 4^{mm} large specimen which Fischer describes from Jan Mayen; it differs, however, from all three, in that they are completely wanting in the "radial shields". These are, further, absent in a 7^{mm} and a 11^{mm} large specimen, which specimens were likewise obtained at Jan Mayen. Neither in *Gorgonocephalus eucnemis* do those "radial shields" or cavities seem to have been observed; at least they cannot be seen indicated in Lütken's illustration of a 3^{mm} and a 4.5^{mm} large specimen¹⁾.

As is known, this species, as well as the others pertaining to the genus *Gorgonocephalus*, undergoes great changes during growth. The appearance so characteristic of the fully developed individual, presents itself, however, very early. Already with a disc-diameter of 20^{mm} it is therefore not possible to confuse this species with the other three northern species. With a disc-diameter of 30^{mm} all the typical characteristics of this species are fully developed.

Localities.

Station No.	18	1 large specimen.
—	„ 124	2 young specimens.
—	„ 223	1 young specimen.
—	„ 362	15 larger and smaller specimens.
—	„ 363	11 — — — —

Distribution.

On the Norwegian coast this species has, so far as is known, only been found in the Varanger fiord, whence

¹⁾ Addit. ad Hist. Ophiurid., part I, pag. 71. Pl. II, figs. 18 & 19.

Museum findes et stort Exemplar (Skivediameter 110^{mm}, cfr. Lütken)¹⁾.

Gorgonocephalus agassizii er endvidere funden ved Grønland (Duncan & Sladen, 600—800 Fv.; Lütken; Norman, 175 Fv.); Nordamerikas Østkyst, hvor den er sydlig udbredt til Cape Cod (Simpson; Lyman, Verrill, 0—35 Fv.), og Jan Mayen, 45—130 Fv. (Fischer).

¹⁾ Til denne Art hører sandsynligvis ogsaa den af Nordmann beskrevne *Gorgonocephalus (Astrophyton) eucnemis* var. fra Varangerfjord (Öfvers. af finske Vetensk. Societet Förhandl., vol. IV pag. 33); cfr. Lütken, pag. 67.

a large specimen is found in the Bergen Museum (disc-diameter 110^{mm}, cmp. Lütken)¹⁾.

Gorgonocephalus agassizii has been found, further, at Greenland (Duncan & Sladen, 600—800 fath.; Lütken; Norman, 175 fath.); the east coast of North America, where it is distributed southwards to Cape Cod (Stimpson, Lyman, Verrill, 0—35 fath.) and Jan Mayen, 45—130 fath. (Fischer).

¹⁾ To this species probably also pertains the *Gorgonocephalus (Astrophyton) eucnemis* var. from Varanger fiord, described by Nordmann (Öfversigt af finska Vetensk. Societet Förhandl., vol. IV pag. 33); cmp. Lütken, pag. 67.

Tavleforklaring.

Tab. I.

- Fig. 1. *Ophiopleura borealis*, seet fra Rygsiden. Skiven er noget kontraheret, hvorved Ribberne, Radialskjoldene (*a*), træder tydeligere frem. Naturlig Størrelse.
- " 2. — — Et Stykke af Skivens Rygside med noget af en Arm. *a*. Den frie Del af Radialskjoldet. *b*. Ophøiet Rand mellem denne og Armen. *c*. Armrygplade. Svag Forstørrelse.
- " 3. — — Samme seet fra Bugsiden. *a*. Mundskjold. *b*. Sidemundskjold. *c*. Mundpapiller. *d*. Tænder. *e*. Genitalspalte. *f*. De inderste Armbugplader. *g*. Bugplader fra den frie Del af Armen. *h*. Sideplader. Svag Forstørrelse.
- " 4. — — Den indvendige Flade af Skivens Rygside med to Radialskjolde.
- " 5. — — Seet fra Rygsiden, ukontraheret. Naturlig Størrelse.
- " 6. *Ophiacantha abyssicola*. Seet fra Rygsiden. Svagt forstørret.
- " 7. — — Samme seet fra Bugsiden. Svagt forstørret.
- " 8. — — Et Stykke af Skivens Rygside; forstørret.
- " 9. — — En Del af en Arm, seet fra Siden; forstørret.
- " 10. — — To armpigge.
- " 11. *Ophiacantha spectabilis*. Seet fra Rygsiden. Naturlig Størrelse.
- " 12. — — Samme seet fra Bugsiden; forstørret.

Tab. II.

- Fig. 13. *Ophiopus arcticus*. Seet fra Rygsiden, forstørret.
- " 14. — — Seet fra Bugsiden; forstørret.

Explanation of the Plates.

Pl. I.

- Fig. 1. *Ophiopleura borealis*. Dorsal aspect. The disc is very contracted, causing the ribs, radial scapuli (*a*) to come distinctly forward. Natural size.
- " 2. — — A portion of the dorsal surface of the disc, with part of an arm. *a*. The free portion of the radial scapulum. *b*. The elevated margin between it and the arm. *c*. Dorsal plate of the arm. Slight magnification.
- " 3. — — Ventral aspect. *a*. Oral scapulum. *b*. Latero-oral scapulum. *c*. Oral papillæ. *d*. Teeth. *e*. Genital fissure. *f*. The innermost ventral plates of the arm. *g*. Ventral plates from the free part of the arm. *h*. Lateral plates. Slight magnification.
- " 4. — — The inner surface of the dorsal side of the disc with two radial scapuli.
- " 5. — — Dorsal aspect; not contracted. Natural size.
- " 6. *Ophiacantha abyssicola*. Dorsal aspect. Slightly magnified.
- " 7. — — Ventral aspect. Slightly magnified.
- " 8. — — A portion of the dorsal surface of the disc; magnified.
- " 9. — — Lateral aspect of portion of an arm; magnified.
- " 10. — — Two brachial spikes.
- " 11. *Ophiacantha spectabilis*. Dorsal aspect. Natural size.
- " 12. — — Ventral aspect. Magnified.

Pl. II.

- Fig. 13. *Ophiopus arcticus*. Dorsal aspect; magnified.
- " 14. — — Ventral aspect; magnified.

Fig. 15. *Ophiopus arcticus*. Tversnit gennem Mundpartiet. *m.* Mundparti. *k.* Kropshulen. *t.* Tarm. *o.* Generationsorganerne. *b.* Bursa. *a.* Cellelag, som dækker Bursaens Munding. *ec.* Ectoderm. Snittet har truffet Bursaens Væg, saaat kun den nederste Del af denne kan sees, ligeledes er kun mindre Dele af et Par af Ægkapslerne synlige paa Tegningen. Zeiss. Oc. I, Obj. A A.

„ 16. — — Tversnit af en Ægkapsel. Zeiss. Oc. I, Obj. A A.

„ 17. — — Et Stykke af en Ægkapsel; Tversnit. Zeiss. Oc. I, Obj. D D.

„ 18. *Gorgonocephalus malmgrenii*. Seet fra Rygsiden. Naturlig Størrelse.

Tab. III.

Fig. 19. *Gorgonocephalus malmgrenii*. Seet fra Bugsiden. Naturlig Størrelse.

„ 20. *Gorgonocephalus agassizii*. Ungt Exemplar, seet fra Rygsiden. Forstørret.

„ 21. — — Et Stykke af det midtre Parti af Skivens Rygside. Forstørret.

„ 22. *Asteronyx lovéni*. Ungt Exemplar, seet fra Rygsiden. Forstørret.

„ 23. — — Seet fra Bugsiden. Forstørret.

Fig. 15. *Ophiopus arcticus*. Section through the oral portion of a specimen. *m.* The oral portion. *k.* The body-cavity. *t.* Intestine. *o.* The reproductive organs. *b.* The bursa. *a.* The cellular layer which covers the mouth of the bursa. *ec.* Ectoderm. The section has come in contact with the wall of the bursa, so that only its lowest part can be seen; likewise, only a small part of a couple of the ova capsules are visible in the illustration. Zeiss. Oc. I, Obj. A A.

„ 16. — — Section of an ovum capsule. Zeiss. Oc. I, Obj. A A.

„ 17. — — A portion of an ovum capsule; section. Zeiss. Oc. I, Obj. D D.

„ 18. *Gorgonocephalus malmgrenii*. Dorsal aspect. Natural size.

Pl. III.

Fig. 19. *Gorgonocephalus malmgrenii*. Ventral aspect. Natural size.

„ 20. *Gorgonocephalus agassizii*. Dorsal aspect of a young specimen; magnified.

„ 21. — — A portion of the medial part of the dorsal surface of the disc; magnified.

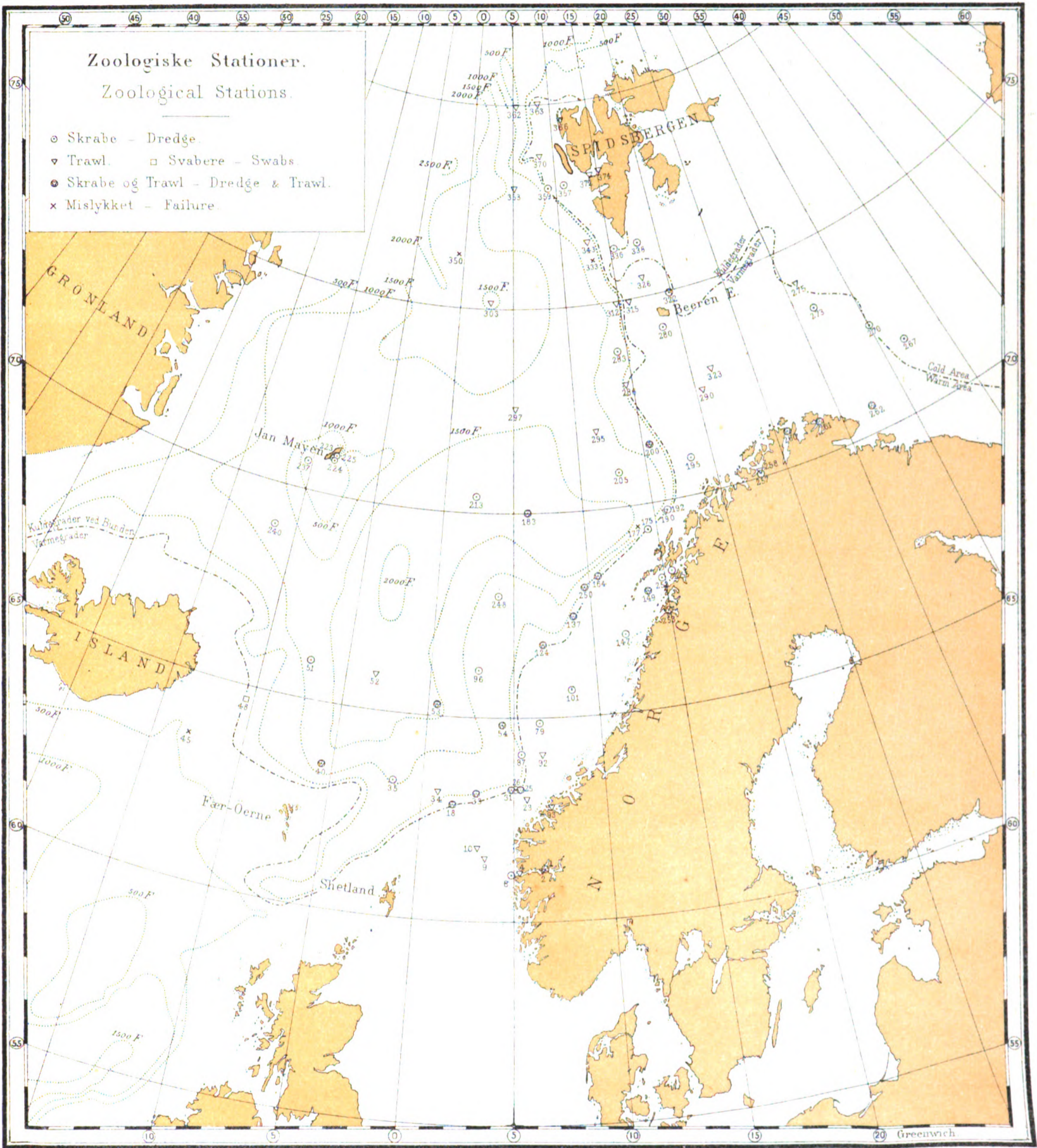
„ 22. *Asteronyx lovéni*. Dorsal aspect of a young specimen; magnified.

„ 23. — — Ventral aspect; magnified.

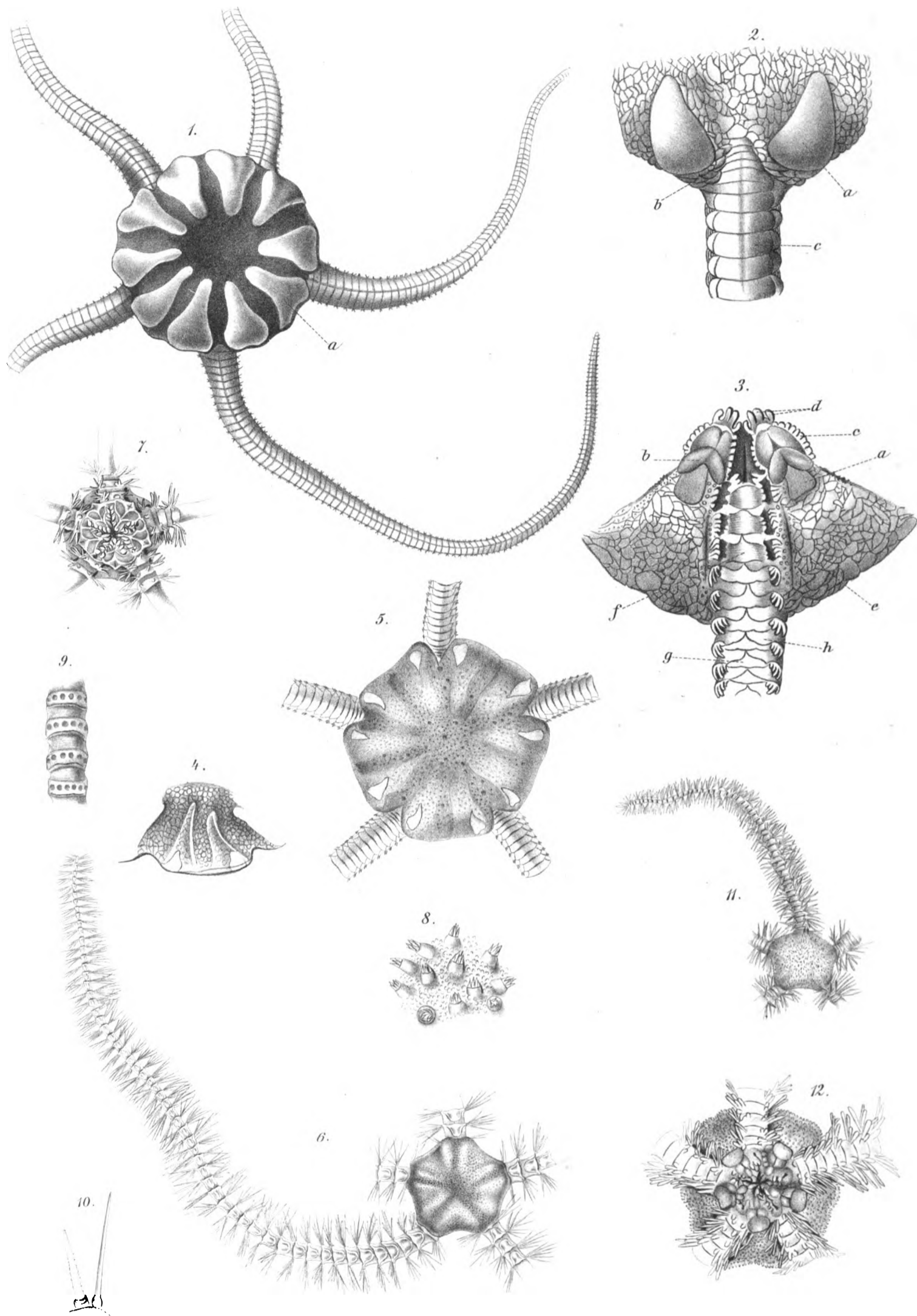
Zoologiske Stationer. (Zoological Stations.)										
Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)	Længde fra Greenwich. (Longitude.)	Dybde. (Depth.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)	
				Engl. Favne. (Fathoms.)	Meter. (Metres.)					
1876										
1	Juni 3	61° 13'	6° 36' E.	650	1189	6.06	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.	Sabulous Clay, 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 5	63 5	0 53 E.	587	1073	-1. 0	Ler.	Clay.	T.	
35	(July) 1	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	Mørkegraat 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.	
60	" 20	64 40	9 30 E.	118	216	7. 0	Haardt Ler.	Hard Clay.	S.	
78	" 21	64 48	6 45 E.	155	283	7. 0	Sandler.	Sabulous Clay.	S.	
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	Blødt 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	Sand, Stene.	Sand, Stones.	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	Sandholdigt 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 sabulous Clay	S.	
(Jan Mayen).										
224	" 1	70 51	8 20 W.	95	174	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay	S.	
225	" 2	70 58	8 4 W.	195	357	-0. 6	Graasort Sandler.	Dark-grey sabulous Clay	S.	
226	" 2	70 59	7 51 W.	340	622	-0. 6	Sort Sand og Ler.	Black Sand and Clay.	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.	

Station No.	Datum. (Date.)	Nordlig Bredde. (North Latitude.)		Længde fra Greenwich. (Longitude.)		Dybde. (Depth.)		Bundens Temperatur. (Temperature at Bottom.) C.	Bunden.	Bottom.	Apparat. (Apparatus.) S. Skrabe. (Dredge.) T. Trawl. s. Svabere. (Swabs.)		
				Engl. Favne. (Fathoms.)	Meter. (Metres.)								
248	Aug. 8	67	56	4	11	E.	778	1423	-1.04	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	Skjerstadsfjord.						263	481	3.2	Ler.	Clay.	S.
253b	" 17	Saltstrømmen.						90	165		Sten.	Stones.	S.
1878.													
255	Juni 19	68° 12'	15° 40'	E.			341	624	6.5	Ler.	Clay.	S.	
		(Vestfjord).											
257	(June) 21	70	4	23	2	E.	160	293	3.9	Ler.	Clay.	S.	
		(Altenfjord).											
258	" 21	70	13	23	3	E.	230	421	4.0	Ler.	Clay.	T.	
		(Altenfjord)											
260	" 24	70	55	26	11	E.	127	232	3.5	Ler.	Clay.	S. T.	
		(Porsangerfjord).											
261	" 25	70	47	28	30	E.	127	232	2.8	Ler.	Clay.	S. T.	
		(Tanafjord).											
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.	35	64	1.1	Sten.	Stones.	S.	
		(Beeren Eiland).											
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	Sandlerf.	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	16	17	49	E.	146	267	-1.1	Sten.	Rock.	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.	
		Magdalene 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.	129	236	1.2	Ler.	Clay.	T.	
		(Isfjord).											
374	" 22	78	16	15	33	E.	60	110	0.7	Ler.	Clay.	T.	
		(Advent Bay).											

Norske Nordhavs-Expedition.



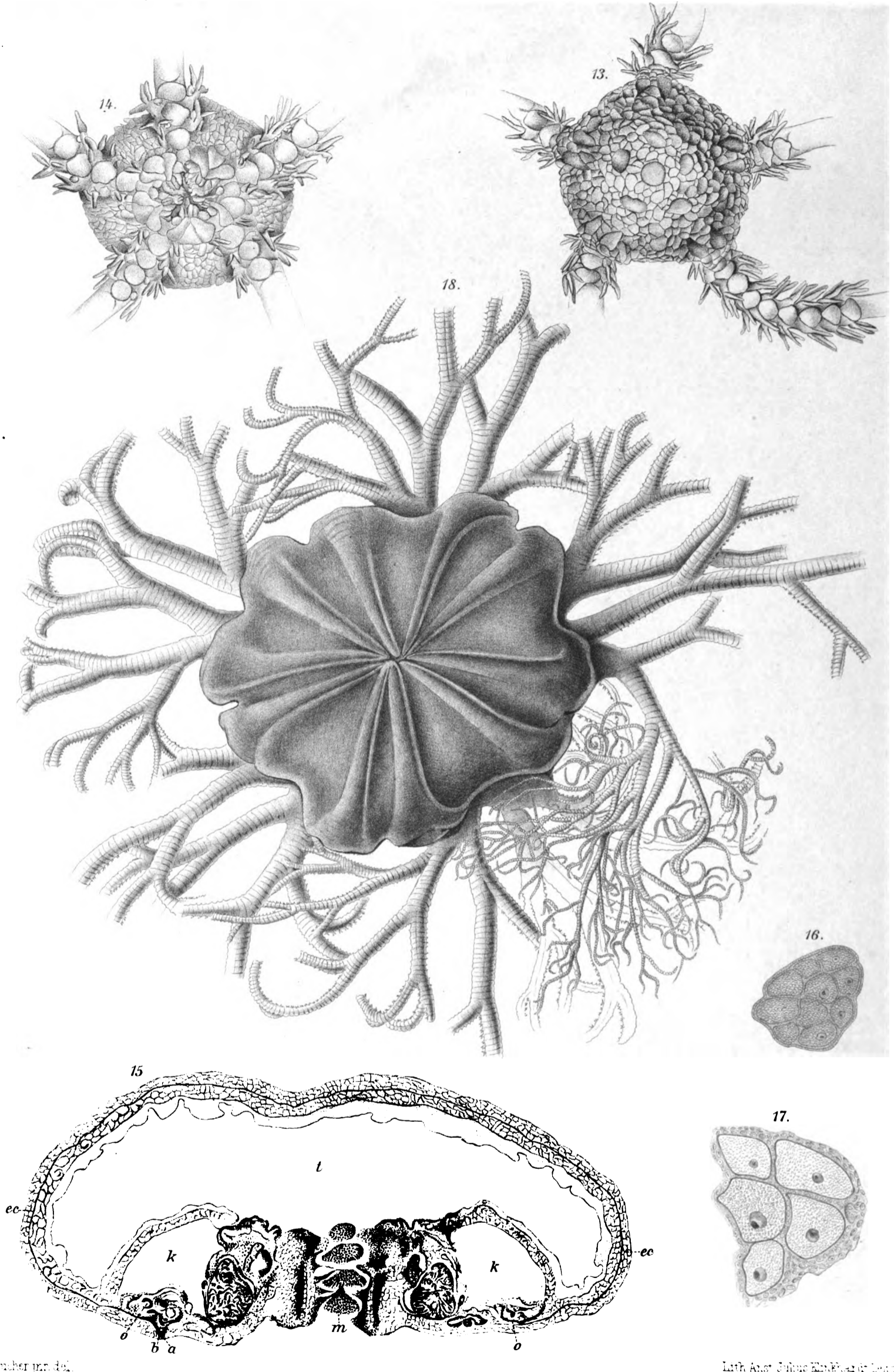
Den private Opmålings lth. Institutt. Kristiania.



H. Bucher, pin. del.

Ind. Anst. Tidn. Kgl. Mus. Bergen

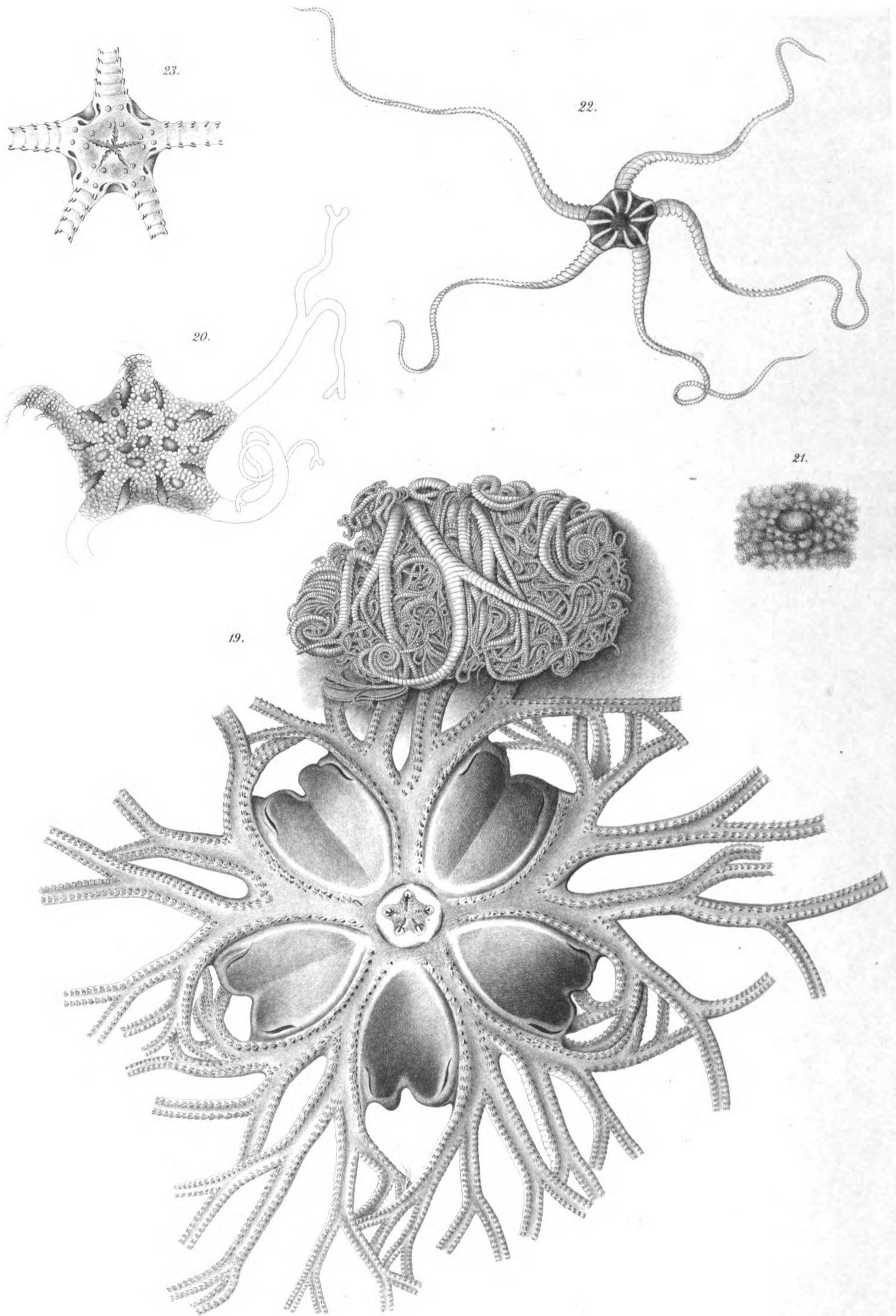
Fig. 1-5 *Ophiopleura borealis* 6-10 *Ophiacantha abyssicola*. 11-12 *O. spectabilis*



H. Fischer jun. del.

Lith. Anst. Julius E. Neumann Neudamm

Fig. 13-17 *Ophiopus arcticus* 18 *Gorgonocephalus malmgrenii*.



1874. 1875. 1876.

Dr. Carl Julius F. Schmidt del. et sculp.

Fig. 19. *Gorgonocephalus malmgrenii*.
20-21. *G. agassizii*. 22-23. *Asteronyx loveni*.

A

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