

MEDDELELSER OM GRØNLAND

UDGIVNE AF

KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND

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THE DIATOMS
IN THE BASALT AREA AND ADJOINING
AREAS OF ARCHEAN ROCK IN
WEST GREENLAND

BY

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WITH 3 FIGURES IN THE TEXT
AND 16 PLATES

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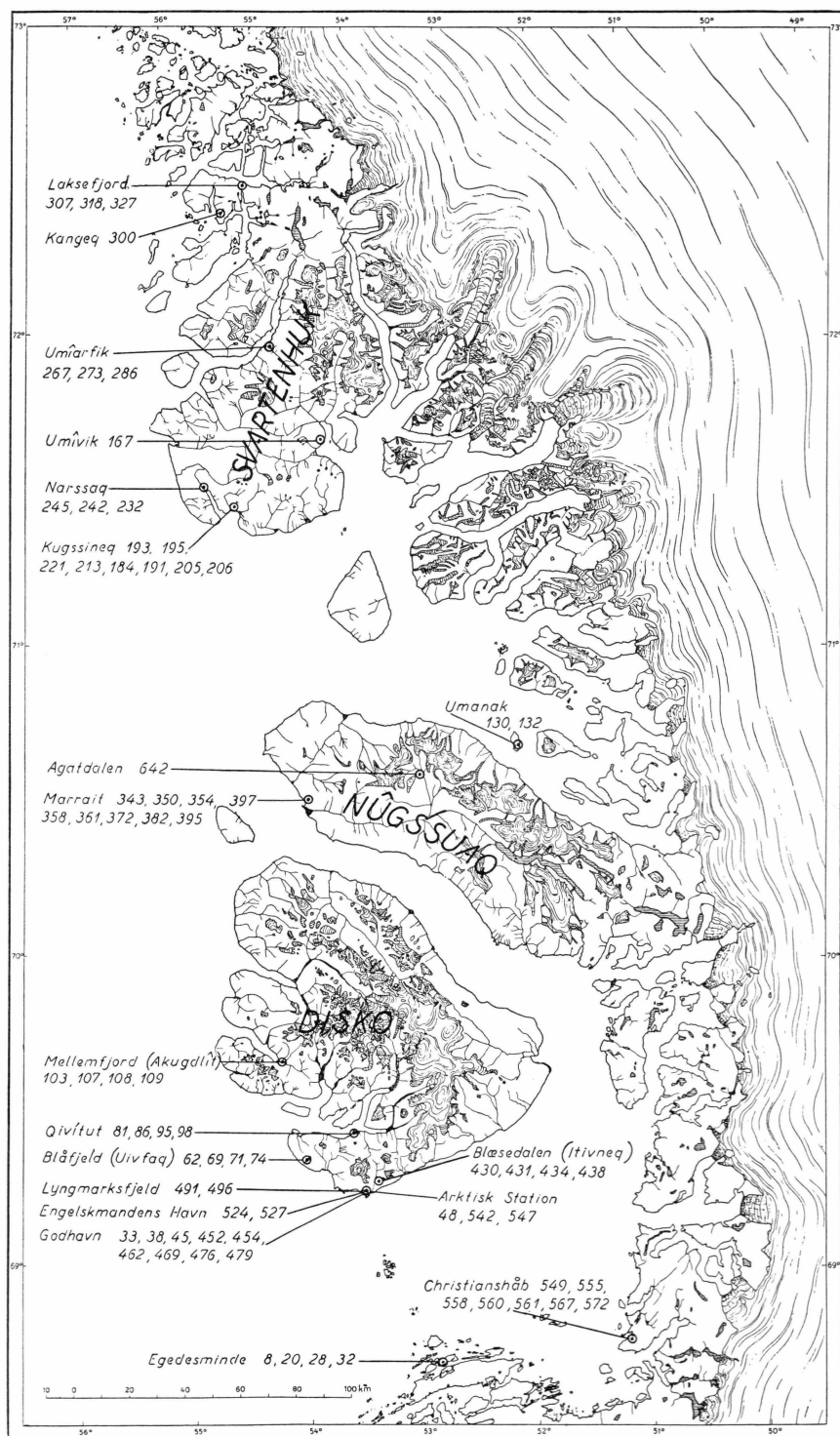


Fig. 1.

PREFACE

The material submitted here was collected from July 28th to August 31st, 1952, when as a member of Professor A. ROSENKRANTZ's geological expedition to North Greenland I got an opportunity by the ship of the expedition, the K.I.V. STEENSTRUP, to participate in a reconnaissance voyage in the area between Egedesminde (about 69° lat. N.) and the Laksefjord immediately south of Upernavik (about 73° lat. N.) on the west coast of Greenland. A possibility thus was offered of collecting diatomaceous material from many different localities in the areas with Pre-Cambrian formations, basalt, and sediment deposits found there.

I am much obliged to the directors of GRØNLANDS GEOLOGISKE UNDERSØGELSE, especially Professors A. ROSENKRANTZ and A. NOE-NYGAARD, because they offered me a possibility of participating in the expedition, and because they had everything arranged in the most practical way for me. As the voyage would necessarily continue into the new school-year, leave of absence from my school-work for some time was necessary, and so I offer my respectful thanks to the MINISTRY OF EDUCATION for granting the necessary leave. I am much obliged to the Director of DANMARKS GEOLOGISKE UNDERSØGELSE, Mr. ØDUM, Ph.D., for permission to have the comprehensive analyses of water samples brought home, made at the Chemical Laboratory of the D.G.U., to the leader of which, Mr. WERNER CHRISTENSEN, Sectional Geologist, and Mr. K. SKOUSBØLL HANSEN, Assistant Geologist, I offer my best thanks for the very great work done at the numerous analyses. For determination of the bryophytes mentioned in the text I am indebted to Mr. KJELD HOLMEN, M.Sc., and for translation of the text into English to Mr. NIELS HAISLUND, M.A. I also offer my respectful thanks to STATENS ALMINDELIGE VIDENSKABSFOND, who have given their support towards the working up of the material of diatoms. Finally I am much obliged to my wife, Mrs. ANNA CHARLOTTE FOGED, Senior Mistress, without whose assistance and constant support the performance of the work would not have been possible.

Odense, December 1956.

NIELS FOGED.



INTRODUCTION

In introductory sections in FOGED 1953 and FOGED 1955 the investigations into the diatomaceous flora of Greenland which have hitherto been made, are mentioned. The material treated in what follows supplements the investigations of other workers as well as my own previous work.

From the area along the west coast of Greenland between 69° and 73° lat. N. the diatomaceous flora has previously been treated by H. BACHMANN 1921 (the diatom analyses by A. LÖTSCHER) on the basis of material collected in 1908, especially on Disko island and a few samples from the Nûgssuaq peninsula. In the area immediately south of these districts (between 61° and 69° lat. N.) a material of diatoms was collected by A. E. NORDENSKIÖLD's expedition (The Sophia Expedition) in 1883, a material which was worked up and published by Å. BERG in 1945. From the regions on the west coast north of the Nûgssuaq peninsula no publications on the diatomaceous flora are available. This area is of special interest by its geological structure (Map fig. 1). From the southernmost part of Disko island to the region north of the Svartenhuk peninsula the great basalt covers from the Tertiary Period are spread and form the surface of the greater part of Disko island and the Nûgssuaq and Svartenhuk peninsulas. South of Disko Bugt and on its south side the Pre-Cambrian formations (in what follows called "gneiss" everywhere) turn up. They crop up in minor areas on Disko island and again replace the basalt north of 72°20' lat. N. On Disko island as well as the Nûgssuaq and the Svartenhuk peninsulas there are outcrops of sedimentary series from the Cretaceous and the Tertiary Periods.

The possibility of ascertaining whether the nature of the soil influences the diatomaceous flora thus should be present as the two main types of substratum, the Tertiary basalt and the Pre-Cambrian deposits (mainly gneiss), are chemically essentially different. Whereas basalt is a basic rock, the Pre-Cambrian deposits are mainly acid. Undoubtedly this manifests itself in the nature of the surface water, the rivers, the lakes, the ponds, indeed even that of the small puddles. Determinations of pH in the place in 1952 thus as a rule were basic on basalt and on

a basaltic breccia substratum, and as a rule acid on Pre-Cambrian rock. As the macroclimatic differences in the area as regards the localities in question are small, and presumably without any importance at all for microorganisms which like the diatoms are attached to pronouncedly hygroscopic localities, there will be good reasons to assume that causes of possible conspicuous micro-floral differences may mainly be referred to differences in petrographical conditions. In the case of the higher vegetation this is in itself a matter of course, but in the case of micro-organisms conditions are somewhat more difficult to elucidate. The substratum of the micro-organisms is often another than the inorganic surface of the locality itself, as they are often fastened to the surface of higher plants, both when these are still alive, and perhaps to a still higher degree after their death, or they are found free-floating as plankton organisms in the free water masses. Hence it is not immediately obvious that the occurrence of micro-organisms is determined by the inorganic substratum in the place in question. However, it may be stated at once that it will appear from what follows that there are very characteristic and very conspicuous differences between the diatomaceous floras in the various petrographical provinces investigated, and that these differences principally seem to be connected with the pH differences conditioned by the petrographical facts.

As to the climatic conditions of the area reference is made to the account of the climate of West Greenland in BÖCHER 1938, p. 9 ff. Only a few principal features are to be adduced here. The July isotherm $+7^{\circ}\text{C}$. in the area passes approximately through Egedesminde, Godhavn on Disko island, Marrait on the Nûgssuaq peninsula, Umanak, and farther north between the Svartenhuk peninsula and the mainland. Around the Laksefjord, from where the northernmost samples of diatoms treated here originate, the mean temperature in July is about $+5^{\circ}\text{C}$. The January mean temperatures in the area vary from about -17°C . in the south to about -21°C . in the north.

The annual mean precipitation is greatest in SW Disko (the Godhavn area) with about 390 mm, smallest in Disko Bugt (the Christianshaab region) and in the north, where it only amounts to about 230 mm annually.

Lakes and streams are frozen up the greater part of the year and there is ground ice in the whole of the area.

Water Samples and Water Analyses.

Where possible, a pH determination was made on the spot with MERCK's universal indicator during the collections in 1952. Furthermore water samples were taken which were brought home for later chemical

analysis in Copenhagen. For use at such an analysis 3 l water was available in each case, as from each locality 6 full half-litre bottles with patent closure (kindly placed at my disposal by the Carlsberg Breweries) were taken home. Apart from a single bottle we succeeded in taking all full bottles home in good condition. All the analyses were made at the Chemical Laboratory of DANMARKS GEOLOGISKE UNDERSØGELSER in Charlottenlund during the autumn of 1952.

The chemical character of the fresh waters (reference is especially made to the contents of inorganic substances, electrolytes) will normally be in a definite and close relation to the substratum with which the water gets into contact. This contact may take place when the water as subsoil water forces its way through the upper strata of earth, or when the running or stagnant water in lakes, ponds, or puddles absorbs salts from the substratum. The temperature of the water and the rate of the current, besides the time available for the influence, are important factors. The active temperature interval in the area investigated is very narrow. The annual period with temperatures above 0°C. is short, and the presence of ground ice will highly hamper the exchange of electrolytes between substratum and surface water. As, furthermore, the streams are relatively short because of the extension of the inland ice, and the volume of discharge is often fairly small, it is seen that many factors directly counteract a conveyance of electrolytes from substratum to surface water. As the production of organic matter in fresh-water as well as on land is very slight, a return of salts to water and soil as a consequence of processes of decomposition (putrefaction, etc.) will be extremely slight. It must therefore be supposed that the annual fluctuations in the contents of electrolytes in the fresh waters are very small as compared with conditions in warmer regions on the earth.

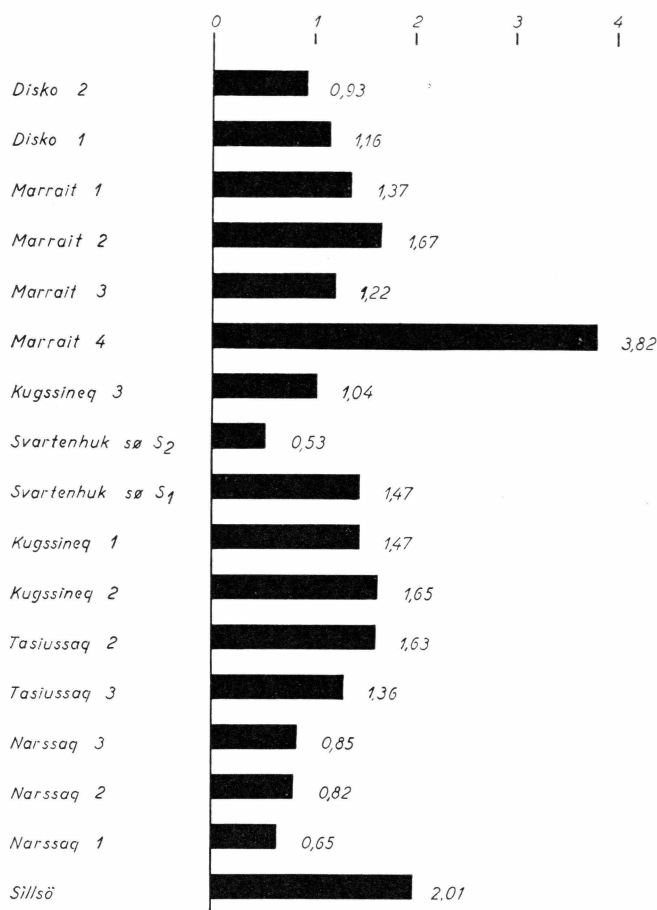
The results of the water analyses appear from Table 1. The contents of anions indicated in milli/equiv. per litre is graphically represented in figs. 2 and 3. It is seen there that if the samples are considered together (two very deviating samples from Umanak, however, being disregarded), the contents of electrolytes in the fresh waters of the area have very low values. In Northern Europe corresponding conditions are found only in regions with greatly leached fluvio-glacial sediments of sand or in areas with Pre-Cambrian outcrops. In morainic areas in Denmark the values as a rule are above 4 and often amount to 6 or more. It also appears from diagrams as well as tables that the contents of electrolytes on the whole are lowest in the areas where there is a Pre-Cambrian substratum. Apart from the two samples from Umanak only three of the samples have an anion-equivalent value of more than 1, while it is lower in 11 samples. In the basaltic area 12 samples had an anion-equivalent value of above

Table 1

	Water sample	Diatom sample nr.	mg/l							
			HCO ₃ ⁻	SO ₄ ⁻⁻	Cl ⁻	NO ₃ ⁻	PO ₄ ⁻⁻⁻	Ca ⁺⁺	Mg ⁺⁺	Fe ⁺
Basalt										
Disko Island	Disko 2....	430, 431, 434	49	0.7	4.0	0	0.1	5.7	1.5	0.26
	Disko 1....	438	61	0.8	5.0	ca. 0.5	0.2	9.7	3.3	0.26
Nûgssuaq Peninsula	Marrait 1 ..	350, 354	79	1.9	1.0	ca. 0.5	0	17	6.1	< 0.1
	Marrait 2 ..	361	98	0.6	2.0	0	0.1	17	9.7	0.22
	Marrait 3 ..	372	67	0.4	4.0	ca. 0.1	0	14	4.9	< 0.1
	Marrait 4 ..	382	183	31	6.0	ca. 0.5	0	31	21	< 0.30
	Lake in Agat-dalen	642	116	1.2	3.0	0	0.05	12	3.0	< 0.1
	Kugssineq 3	193, 195	55	0.8	4.0	ca. 1	0.2	16	0.7	< 0.1
Svartenhuk Peninsula	Sv.huk Sø S ₂	221	24	1.0	4.0	ca. 0.5	0	4.0	1.3	< 0.1
	Sv.huk Sø S ₁	213	73	0.8	9.0	0	< 0.05	23	1.3	< 0.1
	Kugssineq 1	184	73	0.8	9.0	0	0	19	5.3	< 0.1
	Kugssineq 2	191	92	1.3	4.0	ca. 1	0	26	3.9	< 0.1
	Tassiussaq 2	205	79	3.8	9.0	ca. 0.5	0	28	0.7	< 0.1
	Tassiussaq 3	206	72	0.7	9.0	0	< 0.05	16	2.6	< 0.1
	Narssaq 3..	245	35	0.8	12	ca. 0.5	0.1	5.0	1.6	< 0.1
	Narssaq 2..	242	43	0.3	4.0	0	0	5.7	2.4	< 0.1
	Narssaq 1..	232	24	0.8	8.0	ca. 0.1	0	5.0	2.1	< 0.1
Gneiss:										
Egedesminde Island	Egedesm. 2.	20	31	1.1	9.0	ca. 0.5	0.15	10	2.2	< 0.1
	Egedesm. 3.	28	18	1.8	9.0	0	0.1	3.6	0.9	< 0.1
	Egedesm. 1.	32	55	0.8	9.0	ca. 0.5	0	17	2.0	< 0.1
Disko Island	Godhavn 1.	33, 38	44	0.7	9.0	ca. 0.5	0.05	5.3	0.6	< 0.1
	Godhavn 2.	45	24	0.8	8.0	ca. 1	< 0.05	6.4	0.7	< 0.1
	Godhavn 3.	48	43	1.2	4.0	ca. 0.5	0	4.9	0.5	0.20
	Disko 3....	452, 469	24	0.8	12	ca. 0.5	0	4.3	0.6	0.20
	Disko 4....	476	31	0.8	11	ca. 0.5	0.5	6.0	0.7	0.12
	Disko 5....	479	31	0.5	18	0	0.1	5.7	1.7	0.2
Umanak Island	Qivîvtut 1 ..	81	31	1.5	22	ca. 0.5	0	5.7	1.6	< 0.1
	Umanak 1..	130	54	20	131	ca. 0.5	0	13	9.9	< 0.1
Kangeq Peninsula	Umanak 2..	132	128	30	308	0	0	18	22	0.1
	Kangeq 1..	300	18	1.0	2.0	ca. 0.5	0	1.4	0.3	1.2
	Kangeq 2..	307	18	2.3	2.0	ca. 0.5	0	5.6	0.4	< 0.43
	Kangeq 3..	318	18	0.8	2.0	ca. 0.5	0	4.3	0.4	0.30
	Kangeq 4..	327	18	2.1	3.0	0	0.1	1.4	0.6	0.18
Sediment:										
Svartenhuk Peninsula	Umîarfik 1.	267	37	0.6	2.0	ca. 0.5	0.1	7.0	2.7	< 0.1
	Umîarfik 2.	273	177	0.6	4.0	ca. 0.5	0	33	15	< 0.1
	Umîarfik 3.	286	92	0.8	4.0	0	0	23	5.8	< 0.1

¹ O₂ consumption. ² CO₂ free. ³ Hardness total, German degrees.

				Hard- ness ³	milliequiv./1						ANIONS millieq.	NH ₄ ⁺ mg/1
Na ⁺	O ₂ ¹	SiO ₂	C ₂ O ₂		HCO ₃ ⁻	SO ₄ ⁻⁻	Cl ⁻	Ca ⁺⁺	Mg ⁺⁺	Na ⁺		
12	5.28	1.0	4.4	1.1	0.80	0.015	0.11	0.28	0.12	0.53	0.93	0.05
9.4	4.80	6.0	8.8	2.1	1.00	0.017	0.14	0.48	0.27	0.31	1.16	
0.5	3.36	2.4	4.4	3.8	1.30	0.040	0.028	0.85	0.50	0.02	1.37	0.1
0.5	3.36	1.4	4.4	4.6	1.60	0.012	0.056	0.85	0.80	0.02	1.67	
2.8	2.73	3.2	4.4	3.1	1.10	0.008	0.11	0.70	0.40	0.12	1.22	0.2
12	0.80	9.4	4.4	9.2	3.00	0.65	0.17	1.55	1.73	0.54	3.82	
26	7.2	—	4.4	2.4	1.90	0.025	0.084	0.61	0.25	—	2.01	0
4.4	2.72	7.4	6.6	2.38	0.90	0.02	0.12	0.79	0.058	0.19	1.04	0.22
5.1	1.76	2.0	4.4	0.9	0.40	0.021	0.11	0.20	0.11	0.22	0.53	
4.8	3.04	4.4	Trace	3.53	1.20	0.02	0.25	1.15	0.11	0.21	1.47	0.2
2.1	4.64	7.6	6.6	3.87	1.20	0.02	0.25	0.95	0.43	0.09	1.47	
0.7	4.48	4.4	4.4	4.54	1.50	0.03	0.12	1.30	0.32	0.03	1.65	0.2
3.9	3.36	5.0	4.4	4.10	1.30	0.08	0.25	1.40	0.058	0.17	1.63	
8.1	4.00	2.0	Trace	2.83	1.10	0.01	0.25	0.80	0.21	0.35	1.36	0.2
11	3.52	2.6	0	1.1	0.50	0.017	0.34	0.25	0.13	0.48	0.85	
7.8	2.88	5.6	4.4	1.3	0.70	0.006	0.11	0.28	0.20	0.34	0.82	0.2
5.3	5.60	3.2	4.4	1.2	0.40	0.017	0.23	0.25	0.17	0.23	0.65	0.2
2.1	4.80	2.4	4.4	1.91	0.50	0.020	0.25	0.50	0.11	0.09	0.77	(Mn ⁺ 0.5
7.8	5.44	0.8	4.4	0.70	0.30	0.040	0.25	0.18	0.074	0.34	0.59	
3.7	4.80	2.0	4.4	2.83	0.90	0.020	0.25	0.85	0.16	0.16	1.17	0.15
16	5.76	2.8	4.4	0.87	0.73	0.014	0.25	0.26	0.049	0.68	0.99	0.1
6.2	7.04	2.8	4.4	0.98	0.40	0.017	0.23	0.32	0.058	0.27	0.65	0.08
13	1.76	4.6	Trace	0.8	0.70	0.025	0.11	0.24	0.041	0.58	0.84	
12	3.68	1.2	4.4	1.70	0.40	0.017	0.34	0.21	0.049	0.50	0.76	0.4
11	5.12	1.0	4.4	1.0	0.50	0.017	0.31	0.30	0.058	0.47	0.83	
14	5.76	0.6	6.6	1.2	0.50	0.010	0.51	0.28	0.14	0.60	1.02	0.08
17	4.64	1.6	4.4	1.1	0.50	0.031	0.62	0.28	0.13	0.74	1.15	0.4
81	4.16	2.0	6.6	4.1	0.88	0.42	3.69	0.65	0.81	3.53	4.99	0.3
198	16.6	2.6	4.4	7.8	2.10	0.62	8.69	0.90	1.89	8.02	11.41	0.2
6.4	2.24	0.6	4.4	0.3	0.30	0.021	0.056	0.07	0.025	0.28	0.38	0.2
2.3	2.08	1.6	4.4	0.9	0.30	0.048	0.058	0.28	0.034	0.09	0.40	
3.0	2.88	2.0	4.4	p.7	0.30	0.017	0.056	0.21	0.034	0.11	0.37	0.2
7.1	2.40	1.2	4.4	0.33	0.30	0.044	0.85	0.07	0.049	0.31	0.43	
2.3	5.12	2.0	4.4	1.6	0.60	0.012	0.062	0.35	0.22	0.10	0.67	0.2
3.2	19.5	7.2	8.8	8.1	2.90	0.012	0.11	1.65	1.23	0.14	3.02	0.2
0.2	8.48	6.0	4.4	4.5	1.50	0.017	0.11	1.15	0.47	0.01	1.63	

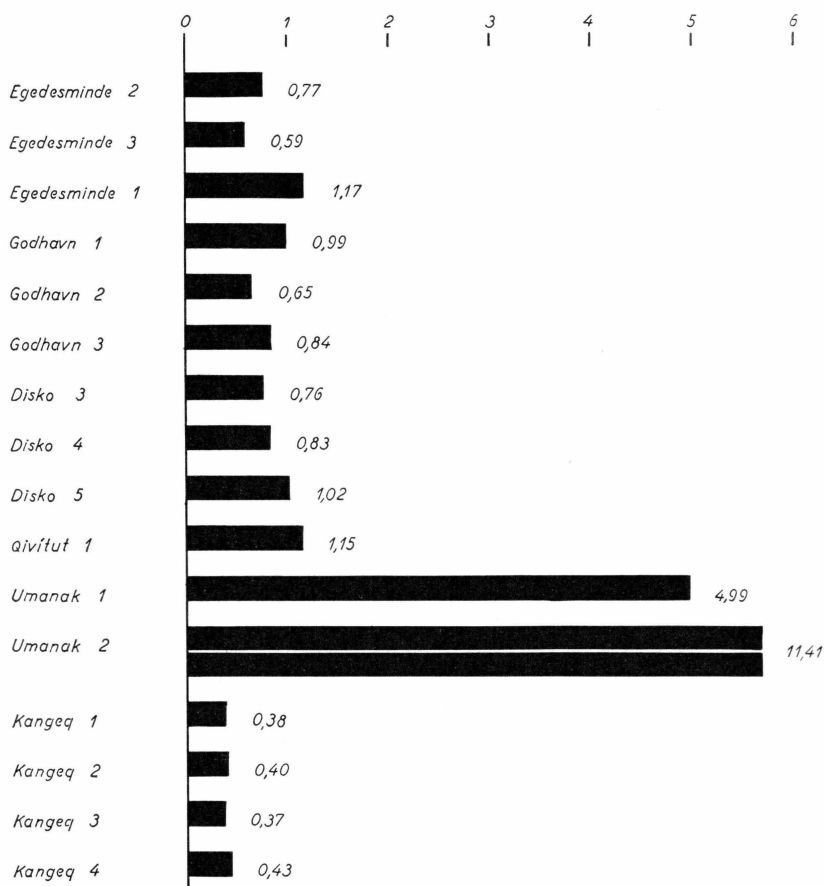


Anions. Milliequivalents per litre. (Basalt).

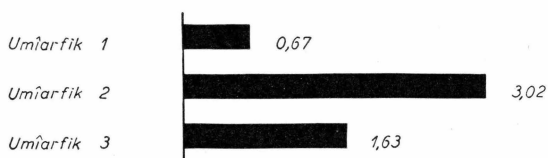
Fig. 2.

1 and only 5 samples were below 1. The three samples from the sediment area were more varied (equivalent values from 0.67 to 3.02).

The two water samples from the lakes of Umanak island deviate very considerably in contents of electrolytes from the other samples from gneissic areas. The total contents of anions were 4.99 and 11.41 milli/equiv. per litre, or much higher than those of the other samples. The cause is especially much higher values for the contents of Cl^- , which converted into milli/equiv. per litre constitute respectively 3.69 and 8.69. The contents of SO_4^{--} are high as well, respectively 0.42 and 0.62 milli/equiv. per litre. It appears from the cation spectrum that



Anions. Milliequivalents per litre. (Gneiss).



Anions. Milliequivalents per litre. (Sediment).

Fig. 3.

Na⁺ ion dominates, but also Ca⁺⁺ and Mg⁺⁺ ion occur with considerably higher values than in the other samples. In what follows these two samples are everywhere left out of consideration.

SO_4^{--} .

The values in nearly all samples were very small. In the gneissic areas 0.8—2.3 mg/l, in the basaltic areas 0.3—3.8 mg/l (a spring in Mårtrø on the Nûgssuaq peninsula, however, attained to 31 mg/l), in the sediment areas 0.6—0.8 mg/l. Especially deviating conditions as regards electrolytic components appear if the water originates from lower-lying strata, as may be the case in hot springs and in the water that flows out in connexion with mud volcanoes and similar phenomena. Such are not quite rare in that part of Greenland, but in the present material samples from them are not included.

The lowest mean values for lakes in Uppland and Dalarne indicated by LOHAMMER 1938, p. 179, are 0.6—3.0 mg/l, for lakes in North Sweden 0.2—0.4 mg/l. The highest mean values are respectively 40.7—43.7 mg/l and 9.9—16.3 mg/l.

Fresh waters in Denmark also have contents of SO_4^{--} which are considerably higher. Springs in Djursland thus have 16—24 mg/l (FOGED 1951), the dystrophic lake Sorte sø in Funen 26—28 mg/l (FOGED 1950), and some eutrophic lakes in Funen 23—35 mg/l (FOGED 1954). (All the values stated from Denmark and Greenland have been determined by the Chemical Laboratory of DANMARKS GEOLOGISKE UNDERSØGELSE on the basis of water samples collected by the present writer).

 Cl^- .

The contents of Cl^- in the localities examined must be characterized as even very low, especially considering the short distance of the localities from the coast. In the gneissic areas the values are 2.0—22.0 mg/l, in the basaltic areas 1.0—12.0 mg/l, and in the sediment areas 2.0—4.0 mg/l.

In Denmark a Cl^- -content of 20 mg/l must be considered low, even in regions in which conveyance from deep soil much be considered precluded. Precipitation in Denmark as a rule contains more Cl^- per litre than Greenland fresh water. Conveyance from the sea through the atmosphere must also be considered very slight in Greenland. This is to some degree explained by the fact that the coastal areas are ice-covered for a considerable part of the year, and by the small amount of precipitation and conditions of the wind. It should be added that in the localities investigated melt water from the ice cap is out of the question.

 NO_3^- .

In all samples the values are between 0 and about 1 mg/l, which, of course, is very low. For comparison it may be stated that springs in Djursland had 1.0—6.8 mg/l, Sorte sø in Funen had 2.3—5.5, and other lakes in Funen had 1.7—11.0 (FOGED 1951, 1950, and 1954, respectively).

Consumption of O_2 .

The values are somewhat fluctuating, but on the whole they are low. No pronounced difference between the various areas was found, as indeed was not to be expected, as this figure is expressive of the contents of oxidable substances. Danish fresh water is extremely varied in that respect. Spring water according to its origin from the depths hardly contains any oxidable substances (springs, Djursland, 0.96—2.08 mg/l consumption of oxygen), while rather high values have been measured for free fresh waters (lakes in Funen 9.6—25.9 mg/l, Sorte sø in Funen 11.8—19.8 mg/l), (FOGED 1951, 1950 and 1954, respectively).

Mg^{++} .

The values in the gneissic areas on the whole are lower than those in the basaltic area. The gneissic areas: 0.3—2.2 mg/l and the basaltic area: 0.7—9.7 mg/l. In a spring in the Nûgssuaq peninsula, however, 21 mg/l were measured. In the sediment areas the values vary between 2.7 and 15 mg/l.

LOHAMMER 1938, pp. 172—73, indicates the following lowest mean values for Uppland: 0.6—1.1 mg/l, for Dalarne: 0.3—0.6 mg/l, for North Sweden: 0.5 mg/l, and the following highest mean values: Uppland 12.5—17.3 mg/l, Dalarne 4.7—7.0 mg/l, and North Sweden 1.8—2.6 mg/l. From Denmark the following values may be stated for lakes in Funen: 1.2—9.1 mg/l, Sorte sø 2.1—4.7 mg/l, and for springs in Djursland 0.1—0.3 mg/l (FOGED 1954, 1950, and 1951, respectively).

SiO_2 .

The values on the whole are lowest in the gneissic areas, higher and more fluctuating from place to place in the basaltic area. The values are not particularly high. For comparison the following values may be reported from Denmark: springs in Djursland 6.4—14 mg/l, lakes in Funen 2.0—18.0 mg/l, and Sorte sø in Funen 1.6—5.0 mg/l (FOGED 1951, 1954, and 1950, respectively).

pH Spectra.

pH spectra are calculated on the same lines as stated in FOGED 1954. A simplification, however, has taken place, as acidobiontic and acidophilous species are all denoted as acidophilous, and alkalibiontic and alkaliphilous species are denoted as alkaliphilous. The distinction between acidobiontic and acidophilous species and between alkalibiontic and alkaliphilous ones often proves impracticable or very problematic. As this distinction at the appraisal of the material treated here cannot be

Basalt pH-spectra.

Table

	puddle		river		puddle		pond		spring	
	62		69		71		74		500	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	0.6	2	12.2	13	1.2	15	2.6	9	0.0	0
indifferent.....	38.0	16	55.4	26	21.6	29	21.0	27	90.8	4
alkaliphilous.....	31.6	7	30.6	12	74.4	13	70.4	18	9.2	3
?	29.8	4	1.8	7	2.8	4	6.0	12	0.0	0
number of species	..	29	..	58	..	61	..	66	..	7
pH.....	6.2		6.5		6.4		6.4		9.0	

	lake		river		spring		lake		lake	
	434		438		547		350		354	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	3.2	14	4.3	11	3.6	7	7.2	18	4.2	12
indifferent.....	47.6	43	41.6	31	94.8	11	32.3	49	45.4	50
alkaliphilous.....	49.2	34	54.2	13	1.6	9	58.8	53	46.4	29
?	0.0	6	0.0	3	0.0	1	1.6	14	4.0	8
number of species	..	97	..	58	..	28	..	134	..	99
pH.....	7.0		6.4		> 9.0		7.5		7.5	

	lake		river		river		lake		lake	
	642		193		195		221		213	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	35.4	16	0.0	2	0.2	6	1.4	10	2.2	11
indifferent.....	39.8	23	46.0	22	63.8	26	66.0	41	55.0	30
alkaliphilous.....	23.4	25	51.8	18	32.4	21	32.4	25	41.4	26
?	1.4	2	2.2	4	3.6	6	0.2	6	1.4	5
number of species	..	66	..	46	..	59	..	82	..	72
pH.....	?		7.0		?		6.7		6.7	

spring		river		river		puddle		pond		lake		lake	
516		107		109		108		103		430		431	
%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
0.0	0	0.2	8	0.0	5	0.6	3	6.4	1	0.8	11	6.6	13
96.4	2	38.4	27	22.2	22	47.6	23	49.2	9	22.0	28	18.0	28
3.6	6	60.0	9	77.8	14	39.0	5	44.2	12	76.2	30	72.6	36
0.0	0	1.4	7	0.0	1	12.8	7	0.2	2	1.0	2	2.8	7
..	8	..	51	..	42	..	38	..	24	..	71	..	84
9.0		?		?		6.6		?		7.0		7.0	

pond		lake		lake		river		spring		river		earth	
358		361		372		395		382		397		343	
%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
6.0	13	8.0	12	3.2	8	1.2	5	0.0	0	0.0	1	11.2	8
47.6	37	60.0	32	23.0	21	42.0	22	44.4	9	65.8	11	20.6	24
45.2	31	27.6	25	72.2	29	49.4	29	50.0	13	34.2	12	66.6	20
1.2	8	4.4	3	1.6	2	7.4	12	5.6	7	0.0	0	1.6	7
..	89	..	72	..	60	..	68	..	29	..	24	..	59
7.5		9.0		8.0		7.9		7.5		7.7		?	

swamp		river		pond		pond		lake		lake		pond	
184		191		205		206		245		242		232	
%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
8.8	7	0.6	3	3.2	11	0.2	3	1.4	16	32.4	21	26.2	22
38.4	20	43.4	25	32.4	34	34.4	29	24.2	35	41.2	27	25.4	31
51.0	27	50.8	16	59.6	45	64.0	39	70.8	45	26.0	25	45.2	34
1.8	5	5.2	11	4.8	6	1.4	7	3.6	9	0.4	2	3.2	11
..	59	..	55	..	96	..	78	..	105	..	75	..	98
6.7		6.7		8.8		7.5		9.0		9.0		6.7	

Gneiss pH-spectra.

Table 3

	lake		lake		lake		lake		lake	
	8		20		28		32		549	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	57.8	25	48.0	43	55.0	35	15.6	35	39.2	27
indifferent.....	40.8	21	29.2	34	36.0	43	61.6	48	51.0	44
alkaliphilous.....	0.0	3	6.2	11	0.6	9	12.0	25	7.2	18
?	1.4	2	16.6	21	8.4	6	10.8	18	2.6	8
number of species	..	51	..	109	..	93	..	126	..	97
pH.....	6.3		6.3		6.2		?		6.3	

	lake		pond		river		lake		lake	
	38		45		48		452		469	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	25.6	28	48.4	30	1.0	14	50.8	19	27.0	24
indifferent.....	64.4	29	17.8	35	77.6	32	32.2	29	48.8	38
alkaliphilous.....	9.8	17	33.4	19	18.0	15	17.0	14	24.2	16
?	0.2	2	0.4	2	3.4	3	0.0	3	0.0	1
number of species	..	76	..	86	..	64	..	65	..	79
pH.....	6.9		6.3		6.9		6.2		6.2	

	spring		spring		lake		spring		spring	
	527		542		81		86		95	
	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	0.6	3	4.4	13	13.2	21	1.0	4	0.4	2
indifferent.....	85.4	17	54.6	34	40.0	43	26.2	13	10.0	14
alkaliphilous.....	11.0	13	41.0	13	45.2	45	67.6	7	88.0	4
?	3.0	3	0.0	3	1.6	14	5.2	10	1.6	7
number of species	..	36	..	63	..	123	..	34	..	27
pH.....	6.0		6.7		7.4		6.7		6.5	

Sediment pH-spectra.

	lake		lake		swamp		pond	
	267		273		286		167	
	%	spec.	%	spec.	%	spec.	%	spec.
acidophilous.....	9.2	27	6.8	16	11.0	14	2.6	9
indifferent.....	34.0	50	34.0	34	17.8	9	34.4	31
alkaliphilous.....	53.2	38	56.4	36	69.2	15	62.4	28
pH.....	3.6	10	2.8	6	2.0	5	0.6	4
number of species	..	125	..	92	..	43	..	72
pH.....	7.3		9.0		?		8.5	

lake		lake		lake		lake		pond		lake		lake	
555		558		560		561		567		572		33	
%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
77.6	23	44.4	32	5.4	23	1.2	13	55.4	23	25.6	32	13.8	18
15.2	21	34.6	36	66.4	33	55.0	21	42.6	14	59.2	41	18.8	18
6.4	7	16.4	24	8.0	20	33.2	21	0.0	0	10.4	22	67.4	15
0.8	3	4.6	5	20.2	10	10.6	5	2.0	8	4.8	11	0.0	0
..	54	..	97	..	86	..	60	..	45	..	106	..	51
6.2		6.2		6.6		6.6		5.8		6.4		6.9	

puddle		puddle		lake		lake		spring		spring		river	
454		462		476		479		491		496		524	
%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
85.2	18	41.8	21	13.4	20	6.4	18	0.0	4	0.4	4	0.4	3
12.4	17	54.2	27	48.4	38	53.0	36	51.8	17	73.6	23	41.4	21
2.4	2	2.2	3	22.2	18	22.4	25	33.2	8	15.2	6	47.8	18
0.0	0	1.8	2	16.0	10	18.2	11	15.0	6	10.8	3	10.4	1
..	37	..	53	..	86	..	90	..	35	..	36	..	43
6.0		6.0		6.8		7.5		6.8		6.3		6.6	

puddle		lake		pond		lake		lake		lake		lake	
98		130		132		300		307		318		327	
%	spec.	spec.	%	%	spec.	%	spec.	%	spec.	%	spec.	%	spec.
43.6	18	6.2	18	0.4	4	21.2	31	23.2	21	62.2	31	59.6	20
45.6	22	17.6	37	76.0	21	67.6	25	57.8	34	21.2	36	33.8	16
9.2	9	73.6	31	20.2	23	10.2	14	9.2	14	15.8	12	5.4	7
1.6	5	2.6	8	3.4	2	1.0	8	9.8	11	0.8	3	1.2	5
..	54	..	94	..	50	..	78	..	80	..	82	..	48
6.3		7.9		9.0		?		6.2		6.2		6.0	

seen to be of any importance, the simplification has been carried through. Species the placement of which is uncertain or unknown are classed with a ?. There the species are also placed which are not named (sp.).

In the schematic account of the pH-spectra in Tables 2 and 3 the samples are listed in the same succession as in the next section (Localities and Material). The percentage figure calculated is accompanied by the corresponding number of species.

There are rather conspicuous differences between the pH spectra in the various areas. The pH spectra of the basaltic areas thus mainly shows predominance towards the alkaliphilous side of the spectrum. In the 36 samples examined and recorded here the alkaliphilous group is the largest as regards number of valves in 21 cases, the indifferent group is the largest, as a rule followed by the alkaliphilous group, in 15 samples. There is in no case dominance of acidophilous diatoms. In 34 samples the acidophilous group was represented by few, often even very few valves. In some samples a fairly large number of species of acidophilous diatoms were found, but then they generally occurred as single individuals only. The pH values recorded in the diagrams all originate from determinations made in the field when the samples were taken, and they show that the reaction of the water in many places was circumneutral, varying between 6.2 and 7.5. In 15 of the measurements pH was 7.5 or more, so these localities must be considered mainly alkaline. The four springs which geographically fall within this group, have pH values from 7.5 to more than 9.0, which seems to indicate that the subsoil water in the basaltic area is pronouncedly alkaline. In lakes, ponds, and puddles the vegetation of macrophytes will highly influence the pH value.

The pH spectra of the gneissic areas are of a somewhat different character, as there is here a distinct inclination towards the acidophilous side of the spectrum. In 11 of the samples the acidophilous group is largest (as regards number of valves), in 19 the indifferent group is dominant, as a rule followed by the acidophilous group, and in 6 of the samples the alkaliphilous group is dominant. As to these 6 samples with alkaliphilous dominance, it is seen that 3 of them originate from the Qivitut peninsula on Disko island, from the small area of Archean rock on the west side of Disko island, where the basaltic covers in the higher hinterland may influence both subsoil water and surface water, which from there make for the gneissic area. The Umanak sample No. 549 originates from a locality which by its extraordinary contents of electrolytes is quite deviating from the other gneissic localities. The pH values, apart from those of Umanak and a single Qivitut locality, as a rule vary between 6.0 and 6.5, so that the localities in these gneissic areas normally

must be considered to have an acid reaction, a fact which decidedly seems to be confirmed by the pH spectra.

The pH spectra of the four samples from the sediment areas have an absolute and distinct dominance of the alkaliphilous group. The distribution over the whole of the spectrum is clearly more pronounced than in the case of the basaltic and the gneissic areas. Thus there are in all the four samples a rather large number of acidophilous species. The reasons for this do not seem to appear from the material. The contents of electrolytes (see Table 1) vary greatly from place to place, but are within the border values ascertained in gneissic and basaltic areas. The pH was alkaline everywhere.

Diatoms with a haline preference rarely occur in the material. After all, this is rather remarkable, as all the localities are situated near the sea. Conveyance by birds, etc., might be expected to give a clearly recognizable contribution of euhalobous and mesohalobous diatoms at any rate to some of the localities at the seaside. As this possibility seems quite insignificant, and as practically all the forms found are decidedly freshwater forms, halobion spectra are not recorded.

LOCALITIES AND MATERIAL

In the following section a brief characterization of the various localities and diatom samples is given. The whole area has been mapped and the localities may be found on the maps of the Geodetic Institute, the special designation of which is indicated below in the case of each area. On the map fig. 1 localities and numbers of samples are recorded.

In the descriptions of the samples of diatoms "dominant" means that the species occurs with 10 % or more of 500 valves counted in the sample (see details in FOGED 1954), common species have the frequency of 10—5 %, rather common 5—2 %. The term of more rarely occurring forms as a rule denotes diatoms which on the whole have been found rather rarely. In some cases species which have so far been found rarely in Greenland are included in this group. It may therefore occur that a species which has been recorded as common or rather common, will afterwards be mentioned as "occurring more rarely".

The pH spectrum belonging to the sample is recorded last in the characterization of the sample.

A. THE BASALTIC AREA

I. Disko Island.

Map: The Geodetic Institute: 69 V. 1 Godhavn. (1:250,000).

Blåfjeld (Uivfaq) S. of Disko Fjord on the SW coast of Disco island,

about 69°23' lat. N., 54°14' long. W.

Puddle on the SW Side of Blåfjeld, about 20—30 m a.s.l.

The open surface of the water about 3×4 m, the maximum depth of the water about 30 cm. Water clear, light, pH 6.2. No visible inflow. Outflow with clear water and with mosses on sides and bottom. Substratum: old deposits of basaltic scree.

Diatom Sample No. 62 (2/8 1952).

Moss with coating of algae. The diatomaceous flora rather poor (about 30 species). Dominants: *Stauroneis anceps* (22.2 %), *Meridion cir-*

Diatom Sample No. 71 (2/8 1952).

Mosses (*Philonotis tomentella* Mol. and *Brachythecium* sp.). Fairly rich diatomaceous flora (about 60 species). Dominants: *Meridion circulare* (49.9 %), *Nitzschia hantzschiana* (11.0 %), and *Achnanthes lanceolata* (10.8 %). Fairly common: *Frustulia vulgaris*, *Navicula cincta* var. *heufleri*, *Nitzschia palea*, *N. thermalis* var. *minor*, and *Pinnularia krockii*. Centric species: *Melosira distans* (0.4 %).

pH spectrum: acidophilous.....	1.2 % (15)
indifferent.....	21.6 % (29)
alkaliphilous.....	74.4 % (13)
?	2.8 % (4)

Pond on the SW Side of Blåfjeld behind Beach Ridge.

The pond had an open surface of about 30 × 30 m. It was dammed up behind a 6—8 m high beach ridge of coarse basaltic pebbles. There was no visible outflow, but inflow of slowly running clear water, which presumably oozes away through the beach ridge. The water was clear, with brown coatings on the bottom. There were many feathers on the bottom and on the shore of the pond, just as many excrements suggested frequent visits by birds. pH 6.4.

Diatom Sample No. 74 (2/8 1952).

Moss from the bottom of the pond.

Fairly rich diatomaceous flora (about 65 species). Dominants: *Fragilaria construens* var. *binodis* (37.0 %), a somewhat irregular form; *Achnanthes lanceolata* (16.0 %), *Fragilaria pinnata* (11.2 %). Common: *Meridion circulare*, *Nitzschia frustulum*. Fairly common: *Achnanthes kryophila* and *Fragilaria vaucheriae*. Centric forms: *Melosira distans* (rare). Very remarkable is a single finding of *Didymosphenia geminata*, which has not previously been reported from Greenland. Furthermore the sample included *Navicula certa*, hitherto found fairly rarely. In spite of the proximity of the sea and the obviously frequent visits of birds there is no demonstrable displacement of the diatomaceous flora in a halophilous direction.

pH spectrum: acidophilous.....	2.6 % (9)
indifferent.....	21.0 % (27)
alkaliphilous.....	70.4 % (18)
?	6.0 % (12)

Lyngmarksfjeldet, Godhavn, 69°16' lat. N., 53°32' long. W.

At the foot of the mountain gneiss crops out. Higher on the mountain side gneiss is overlain by basaltic breccia, which, again, is overlain

by the strata of basalt that constitute the higher parts of the mountains north of Godhavn. Whereas the resistant strata of gneiss and basalt form steep slopes ("hammers"), the less resistant strata of basaltic breccia inserted between them form a more gently sloping hillside. On the border between "hammers" and hillsides numerous springs abounding in clear water break out. The springs are surrounded by mosses, which continue along the outflows from the springs.

**Spring on the Basaltic Breccia Level on Lyngmarksfjeldet,
about 1000 m a. s. l. pH 9.0.**

Diatom Sample No. 500 (28/8 1952).

Moss (*Bryum* sp.).

Sample very poor in species (7), completely dominated by *Achnanthes kryophila*, which constitutes 89.6 % of the valves counted. *Gomphonema angustatum* var. *producta* constituted 9.0 %.

pH spectrum: acidophilous	0.0 % (0)
indifferent	90.8 % (4)
alkaliphilous	9.2 % (3)

**Spring on the Basaltic Breccia Level at the foot of the basalt
mountain side on Lyngmarksfjeldet.**

The water wells out through an opening with about 70 × 25 cm open surface and with a depth of 30—40 cm. The spring and outflow are completely surrounded by mosses. The water is quite clear, light. pH 9.0.

Diatom Sample No. 516 (28/8 1952).

The sample from which the diatoms originate, consisted of gelatinous pellicles in the spring.

This sample, too, was extremely poor in species (8 in all). *Cymbella ventricosa* dominated completely with 96.4 % of the valves counted. The percentage of *Amphora veneta* was 2.8.

pH spectrum: acidophilous	0.0 % (0)
indifferent	96.4 % (2)
alkaliphilous	3.6 % (6)

Mellemfjord (Akugdlît) on the West Side of Disco.

The entrance of the valley Kildedalen to Mellemfjord, about 69°40' lat. N., 54°26' long. W.

Glaciers jut out from the peninsula between Mellemfjord in the north and Disko Fjord in the south down towards Mellemfjord. Samples were taken near a glacier tongue with the above-mentioned position on the south side of Mellemfjord at the entrance to Kildedalen. From some

large morainic walls in front of the glaciers rivers with clear water run down towards the Mellemfjord over a flat of deposits.

River about 100 m from Morainic Wall.

Clear, light water.

Diatom Sample No. 107 (4/8 1952).

Filaments of green algae in running water.

Diatomaceous flora fairly rich in species (about 50). Dominants: *Meridion circulare* (40.8 %), *Ceratoneis arcus* (26.6 %), and *Nitzschia frustulum* (15.6 %). The two first-mentioned species are markedly rheophilous forms. Fairly common: *Ceratoneis arcus* var. *amphioxys*, *Navicula mutica* var. *cohnii*, and *Nitzschia thermalis* var. *minor*. The centric *Melosira roeseana* very rare. A number of forms only rarely found in the rest of the material were found here. Thus *Stauroneis schroederi*, *Achnanthes fragilarioides*, *Caloneis clevei*, *Navicula amygdalina*, and *N. järnefelti*.

pH spectrum: acidophilous.....	0.2 % (8)
indifferent.....	38.4 % (27)
alkaliphilous.....	60.0 % (9)
?	1.4 % (7)

Small Stream on Cone of Deposits.

The cone of deposits, $\frac{1}{2}$ —1 km broad, between the morainic wall and the coast of the fjord is crossed by numerous rivers and streams. In one of the streams with slowly running, clear water, 5—10 m a. s. l., there were brown, flocculent coatings on the mossy vegetation of the bottom.

Diatom Sample No. 109 (4/8 1952).

Moss with brown, flocculent coatings.

Diatomaceous flora fairly rich in species (40—45). Dominants: *Nitzschia frustulum* (71.0 %), *Diatomella balfouriana* (17.4 %). Common: *Navicula radiosa*. Fairly common: *Cymbella turgida*. Centric species: *Melosira roeseana* very rare. Furthermore, the sample included the fairly rare species *Navicula certa* and *N. gibbula* var. *triundulata*.

pH spectrum: acidophilus.....	0.0 % (5)
indifferent.....	22.2 % (22)
alkaliphilous.....	77.8 % (14)
?	0.0 % (1)

Moist Area with *Equisetum* and *Poa* Vegetation with Puddle.

On a gently sloping expanse crossed by streams with slowly running, clear water, there was a small basin with about 30 × 70 cm open surface

of water. Vegetation and stones in it were covered by brown pellicles. Temperature in the water 5°C. (air temperature at the same time about 12°C.). pH 6.6.

Diatom Sample No. 108 (4/8 1952).

Brown pellicles on vegetation and stones in the puddle.

Diatomaceous flora fairly rich in species (about 40). Dominant: *Meridion circulare* (37.4 %). Common: *Achnanthes fragilarioides*, *A. lanceolata*, *A. linearis*(?), *Cymbella ventricosa*, and *Nitzschia palea*. Fairly common: *Achnanthes kryophila*, *Ceratoneis arcus*, and *Navicula importuna*. Centric species: *Melosira rooseana* (1.0 %). *Achnanthes fragilarioides*, which is fairly rare in the rest of the material, occurs in this sample with about 5 % of the 500 valves counted. Furthermore, the sample included *Navicula kotschy* and *Caloneis clevei*.

pH spectrum: acidophilous.....	0.6 % (3)
indifferent.....	47.6 % (23)
alkaliphilous.....	39.0 % (5)
?	12.8 % (7)

**Basin, Open Surface of Water about 1 × 1 m, about 150 m from
the Edge of the Glacier.**

Diatom Sample No. 103 (4/8 1952).

The sample consisted of very low moss vegetation from the sides of the basin with brown membranous coatings.

Diatomaceous flora poor in species (about 25). Dominants: *Nitzschia palea* (29.4 %), *Meridion circulare* (18.0 %), and *Navicula mutica* var. *gracilis* (12.0 %). Common: *Nitzschia thermalis* var. *minor*, *Navicula gibbula*, and *Gomphonema angustatum* var. *producta*. Fairly common: *Hantzschia amphioxys*, *Navicula mutica* var. *cohnii*, *Nitzschia ignorata*, and *Surirella angustata*. No centric forms. Rare form: *Pinnularia notata*.

pH spectrum: acidophilous.....	6.4 % (1)
indifferent.....	49.2 % (9)
alkaliphilous.....	44.2 % (12)
?	0.2 % (2)

**Blæsedalen (Itivneq), SW of Skarvefjeldet (Ivnarssuaq)
and NNE of Godhavn.**

Position: about 69°16' lat. N., 55°30' long. W.

Lake in Blæsedalen.

On the SW side of Skarvefjeldet, towards the Rødeelv, about 1.3 km from the south coast of Disko island and about 80 m a. s. l.

there is a lake with clear water, the longest diameter of which was estimated at about 300 m. Along the shores there are *Carex* and *Eriophorum* water meadows. As far as could be seen from the shore, the bottom of the lake was overgrown with mosses. *Lepidurus arcticus* and other small crustaceans were common. pH 7.0. At the southern shore of the lake there was scattered *Hippuris* vegetation.

Water sample: Disko 2.

Diatom Sample No. 430 (26/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) from the bottom of the lake, at a depth of about 40—50 cm, with coatings.

Diatomaceous flora rich in species (about 70). Dominants: *Epithemia sorex* (19.8 %), *Fragilaria construens* (14.6 %), *F. pinnata* (12.6 %), and *Achnanthes linearis* (11.6 %). Common: *Gomphonema angustatum*. Fairly common: *Synedra ulna*, *Tabellaria fenestrata*, *Nitzschia frustulum*, *Denticula tenuis*, *Opephora martyi*. The centric species *Cyclotella comta*, *Melosira ambigua*, and *M. granulata* were present, but few in number. Rarer forms found in this sample were *Achnanthes peragalli*, *A. østrupi*, *Navicula järnefelti*, and *N. pelliculosa*, none of them being common.

pH spectrum: acidophilous.....	0.8 % (11)
indifferent.....	22.0 % (28)
alkaliphilous.....	76.2 % (30)
?	1.0 % (2)

Diatom Sample No. 431 (26/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) from the bottom of the lake, at a depth of about 40—50 cm, near the shore.

Diatomaceous flora rich in species (about 85). Dominants: *Fragilaria construens* (29.8 %), *F. pinnata* (20.0 %), and *Achnanthes linearis* (11.0 %). Fairly common: *Opephora martyi*, *Fragilaria brevistriata*, *F. lapponica*, *Epithemia sorex*, and *Nitzschia frustulum*. No centric species. Forms of fairly rare occurrence: *Achnanthes østrupi*, *Gomphonema rosenkrantzii* (spec. nov.), *Navicula clementis*, *N. explanata*, and *N. järnefelti*.

pH spectrum: acidophilous.....	6.6 % (13)
indifferent.....	18.0 % (28)
alkaliphilous.....	72.6 % (36)
?	2.8 % (7)

Diatom Sample No. 434 (26/8 1952).

Dead leaves of *Carex* with coatings, from the bottom at a depth of about 30—40 cm.

Diatomaceous flora very rich in species (about 100). Dominants: *Achnanthes linearis* (19.6 %), *Nitzschia frustulum* var. *perminuta* (15.6 %),

Epithemia sorex (12.0 %), and *Fragilaria construens* (11.0 %). Common: *Fragilaria pinnata*. Fairly common: *Opephora martyi*, *Cymbella microcephala*, *C. ventricosa*, *Denticula tenuis*, and *Tabellaria fenestrata*. No centric species. Rarer forms: *Achnanthes ostrupi*, *A. peragalli*, *Navicula clementis*, *N. järnefelti*, *N. lagerstedti* var. *palustris*, *N. pelliculosa*, and *N. opportuna*.

pH spectrum: acidophilous.....	3.2 % (14)
indifferent.....	47.6 % (43)
alkaliphilous.....	49.2 % (34)
?	0.0 % (6)

Flow to the Lake from Steep Slope on Skarvefjeldet.

Small river with fast running, clear water. pH 6.4. Water sample: Disko 1.

Diatom Sample No. 438 (26/8 1952).

Moss (*Philanotis tomentella* Mol.) from the river.

Diatomaceous flora rich in species (about 60). Dominants: *Meridion circulare* (47.0 %), *Diatomella balfouriana* (11.0 %), and *Nitzschia frustulum* var. *perminuta* (10.2 %). Common: *Achnanthes lanceolata*. Fairly common: *Diatoma hiemale* var. *mesodon*, *Nitzschia frustulum* var. *perpusilla*, *Pinnularia balfouriana*, *P. subcapitata*. The centric species *Melosira roeseana* very rare. Fairly rare forms: *Achnanthes fragilarioides*, *Navicula lagerstedti* var. *palustris*, *N. mutica* fo. *rhombica*, *N. obsidialis*, and *N. suecorum*.

pH spectrum: acidophilous.....	4.2 % (11)
indifferent.....	41.6 % (31)
alkaliphilous.....	54.2 % (13)
?	0.0 % (3)

Wall of Basaltic Breccia at the Arctic Station, Godhavn.

From a crevice in a vertical to slightly overhanging wall of basaltic breccia clear water flows down over the wall, which is coated with brown mucilaginous pellicles. Where the water hits the horizontal surface at the foot of the wall, there are some loose small stones from the breccia wall quite covered with cartilaginous-gelatinous coatings, which are golden brown. pH in the flowing water more than 9.0.

Diatom Sample No. 547 (29/8 1952).

Brown mucilaginous pellicles from the surface of basaltic breccia.

Diatomaceous flora rather poor in species (about 30) which is completely dominated by *Navicula perpusilla* (91.4 %). Fairly common:

Achnanthes coarctata. The two centric species *Melosira distans* and *M. roeseana* were present.

pH spectrum: acidophilous.....	3.6 % (7)
indifferent.....	94.8 % (11)
alkaliphilous.....	1.6 % (9)
?	0.0 % (1)

II. The Nûgssuaq Peninsula.

Map: The Geodetic Institute: 70 V. 1 Nûgssuaq (1:250,000).

Marrait, about 70°30' lat. N., 54°12' long. W.

Lake 1, about 6—7 km from the Coast.

The extension of the lake, which is situated about 450—500 m a.s.l., is estimated at 300 × 150 m. It is found on an expanse consisting of basaltic moraine, which presumably forms the bottom of the lake. At the shores scattered vegetation of *Eriophorum*. In washed-up matter many pellicles of *Nostoc*. Small dark crustaceans (daphniae?) are found in multitudes in the completely clear water. pH 7.5. Water sample: Marrait 1.

In the south end of the lake an area near the shore was observed, 22 m long and up to 10 m broad, with a soft clayey bottom, moss-grown, from where a strong discharge of air in the form of very large bubbles took place. 75—100 m west of this field there was another, somewhat smaller field of discharge, which stretched some metres into the water and some distance on to the shore above the water, where the discharge of air through numerous small "valves" in the soft, moist clay was observed.

Diatom Sample No. 350 (21/8 1952).

Mosses (*Calliergon sarmentosum* (Wg.) Kindb., *Drepanocladus revolvens* (Sm.) Warnst., *Calliergon trifarium* (Web. & Mohr) Kindle) from the shore at the north end of the lake.

Diatomaceous flora very rich in species (about 135). Dominants: *Nitzschia palea* (14.0 %) and *Epithemia sorex* (10.0 %). Common: *Epithemia zebra* var. *saxonica*, *Fragilaria capucina*, *F. pinnata*, and *Pinnularia gracillima*. Fairly common: *Achnanthes linearis*, *Caloneis silicula* var. *alpina*, and *Tabellaria flocculosa*. Centric species: *Cyclotella antiqua*, fairly rare. Uncommon forms found in the sample: *Achnanthes broenlundensis*, *A. montana*, *Cymbella similis*, *Neidium distincte-punctatum*, *N. kozlowi*, *Navicula heilprinensis*, *N. amphibola*, and *N. explanata*.

pH spectrum: acidophilous.....	7.2 ‰ (18)
indifferent.....	32.4 ‰ (49)
alkaliphilous.....	58.8 ‰ (53)
?	1.6 ‰ (14)

Diatom Sample No. 354 (21/8 1952).

Scrapings from stone in shallow water near the shore of the lake.

Diatomaceous flora very rich in species (about 100). Dominants: *Nitzschia frustulum* (16.0 ‰) and *N. palea* (12.8 ‰). Common: *Denticula tenuis*, *Diploneis ovalis*, *Navicula cryptocephala*, *Nitzschia sinuata*, *Pinnularia microstauron* var. *brébissonii* fo. *diminuta*. Fairly common: *Nitzschia amphibia* and *Pinnularia gracillima*. Centric form: *Cyclotella antiqua*, fairly rare. Fairly rare forms in the sample: *Achnanthes broenlundensis*, *Amphora obscura*, *A. triundulata*, *Caloneis clevei*, *Navicula suecorum*, *Neidium distincte-punctatum*, *N. kozłowi* var. *elliptica*, and *Pinnularia brandelii*.

pH spectrum: acidophilous.....	4.2 ‰ (12)
indifferent.....	45.4 ‰ (50)
alkaliphilous.....	46.4 ‰ (29)
?	4.0 ‰ (8)

Pond about 20 m from Lake 1.

Open surface of water about 15 × 5 m. Along the shore a vegetation of *Eriophorum* and *Carex*. Clear water. pH 7.5.

Diatom Sample No. 358 (21/8 1952).

Moist mosses (*Calliargon sarmentosum* (Wg.) Kindb. and *Drepanocladus exannulatus* (Gumb.) Warnst.) near the shore with coatings of Cyanophyceae, etc.

Diatomaceous flora very rich in species (about 90). Dominants: *Denticula tenuis* (10.8 ‰), *Nitzschia frustulum* (15.4 ‰), and *N. palea* (20.6 ‰). Common: *Achnanthes kryophila*, *Caloneis silicula* var. *alpina*, and *Pinnularia gracillima*. Fairly common: *Achnanthes linearis*, *Cyclotella antiqua*, *Epithemia sores*, *Navicula cari*, and *Nitzschia sinuata*. Centric species: *Cyclotella antiqua*, fairly common. Fairly rare forms: *Achnanthes broenlundensis*, *Navicula amphibola*, *N. fritschii*, *N. semen*, *N. suecorum*, *Neidium kozłowi*, *Synedra ulna* var. *abiskoensis*.

pH spectrum: acidophilous.....	6.0 ‰ (13)
indifferent.....	47.6 ‰ (37)
alkaliphilous.....	45.2 ‰ (31)
?	1.2 ‰ (8)

Lake 2 (near Lake 1).

Lake 2, which has an open surface of water of about 25×20 m (should perhaps rather be denoted as a pond), is situated on the same basaltic morainic expanse as Lake 1, about 450—500 m a. s. l., about 6—7 km from the coast, NNE of the geologists' camp at Marrait. Mosses and *Eriophorum* grow along the whole shore. The water is clear, maximum depth 40—50 cm. Clayey bottom overgrown with mosses. pH 9.0. Water sample: Marrait 2.

Diatom Sample No. 361 (21/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) with coatings from a depth of 10—20 cm.

Diatomaceous flora rich in species (about 70). Dominants: *Nitzschia frustulum* var. *perpusilla* (22.4 %) and *Epithemia sorex* (13.2 %). Common: *Achnanthes kryophila*, *A. minutissima*, and *Cymbella ventricosa*. Fairly common: *Cyclotella antiqua*, *Cymbella angustata*, *C. cistula*, *Denticula tenuis*, *Fragilaria crotonensis*, *Navicula mediocris*, *Nitzschia palea*, and *Tabellaria flocculosa*. Centric species: *Cyclotella antiqua*, fairly common. Fairly rare forms: *Amphora triundulata*, *Navicula amphibola*, *N. semen*, and *N. mediocris*.

pH spectrum: acidophilous	8.0 % (12)
indifferent	60.0 % (32)
alkaliphilous	27.6 % (25)
?	4.4 % (3)

Lake 3, 1—2 km South of Lakes 1 and 2.

Lake 3 like Lakes 1 and 2 has a substratum of basaltic moraine. It is situated on an expanse about 450—500 m a. s. l. Between half and two thirds of the circumference of the lake is overgrown with *Eriophorum*, *Carex*, or (and) mosses. Much *Nostoc* matter washed up. Many small crustaceans in the water, which is quite clear. pH 8.0. Water sample: Marrait 3.

Diatom Sample No. 372 (21/8 1952).

Scrapings of bottom mud at a depth of about $\frac{3}{4}$ m.

Fairly rich diatomaceous flora (about 60 species). Dominants: *Epithemia sorex* (33.0 %), *Cymbella norvegica* (15.0 %), and *Navicula cryptocephala* (+ var.) (10.0 %). Common: *Navicula cryptocephala*, *N. cryptocephala* var. *veneta*, *Nitzschia denticula*, and *Rhopalodia gibba*. Fairly common: *Anomoeoneis zellensis* var. *linearis*, *Cymbella alpina*, *C. leptoceros*, and *Navicula certa*. Centric species: *Cyclotella antiqua*, rare. Fairly rare forms: *Amphora triundulata*, *Navicula fossalis*, and *Neidium distinctepunctatum*.

pH spectrum: acidophilous.....	3.2 % (8)
indifferent.....	23.0 % (21)
alkaliphilous.....	72.2 % (29)
?	1.6 % (2)

River about 70—80 m a. s. l.

River poor in water near the geologists' camp at Marrait. Waterfall about 4 m high. Water quite clear. pH 7.9.

Diatom Sample No. 395 (22/8 1952).

The sample consists of coatings, moss filaments, etc., from the clayey bottom of the basin at the foot of the waterfall.

Rich diatomaceous flora (about 70 species). Dominants: *Nitzschia palea* (19.2 %), *Synedra ulna* (11.8 %), and *Meridion circulare* (11.4 %). Common: *Achnanthes lanceolata*, *Ceratoneis arcus*, and *Fragilaria vaucheriae*. Fairly common: *Achnanthes linearis* and *Nitzschia fonticola*. No centric species. Fairly rare forms: *Achnanthes broenlundensis*, *Navicula certa*, *N. obsidialis*, *N. subatomoides*, and *Amphora triundulata*.

pH spectrum: acidophilous.....	1.2 % (5)
indifferent.....	42.0 % (22)
alkaliphilous.....	49.4 % (29)
?	7.4 % (12)

Spring at the Foot of a Morainic Wall.

Near the river with Sample no. 395 a spring abounding in water gushes out at the base of a morainic wall. The water is quite clear. pH 7.5. Water sample: Marrait 4.

Diatom Sample No. 382 (22/8 1952).

The sample consists of filaments of green algae living in the water of the spring immediately at its head.

Diatomaceous flora fairly poor in species (about 30). Dominants: *Nitzschia palea* (37.2 %) and *Meridion circulare* (33.8 %). Common: *Navicula cryptocephala* var. *veneta*. Fairly common: *Achnanthes lanceolata*, *Amphora ovalis* var. *pediculus*, and *Nitzschia thermalis* var. *minor*. No centric forms. Fairly rare species: *Navicula subatomoides*.

pH spectrum: acidophilous.....	0.0 % (0)
indifferent.....	44.4 % (9)
alkaliphilous.....	50.0 % (13)
?	5.6 % (7)

Tributary of the River Kûgssuaq.

A fairly large tributary of the river Kûgssuaq, abounding in water, 5—6 km east of the geologists' camp at Marrait. The water is clear. pH 7.7.

Diatom Sample No. 397 (22/8 1952).

Scrapings from stones in rapid current in the river.

Diatomaceous flora rather poor in species (about 25). Dominants: *Ceratoneis arcus* (28.2 %), *Meridion circulare* (22.0 %), and *Cymbella ventricosa* (20.8 %). Common: *Achnanthes lanceolata*, *Navicula cryptocephala* var. *veneta*, and *Nitzschia frustulum* var. *perpusilla*. Fairly common: *Cymbella turgida* and *Nitzschia kützingiana*. No centric species. No rare forms.

pH spectrum: acidophilous.....	0.0 % (1)
indifferent.....	65.8 % (11)
alkaliphilous.....	34.2 % (12)
?	0.0 % (0)

Soil, 300—400 m a.s.l. NNE of the Geologists's Camp at Marrait.

Diatom Sample No. 343 (21/8 1952).

Brown scrapings from the surface of the soil in scattered *Eriophorum* vegetation.

Fairly rich diatomaceous flora (about 50 species). Dominants: *Nitzschia amphibia* (15.4 %), *Navicula vulpina* (11.2 %), *N. cryptocephala* var. *veneta* (10.4 %), and *Achnanthes flexella* (10.4 %). Common: *Cymbella angustata*, *C. obtusa*, and *Denticula tenuis*. Fairly common: *Cymbella leptoceros* var. *rostrata*, *Nitzschia denticula*, and *Pinnularia gracillima*. No centric species. Fairly rare forms: *Caloneis salinarum*, *Navicula tuscula*, and *Stauroneis acuta* (these species are rare in Greenland).

pH spectrum: acidophilous.....	11.2 % (8)
indifferent.....	20.6 % (24)
alkaliphilous.....	66.6 % (20)
?	1.6 % (7)

Probably the area is covered by water for some time after the snow has melted. The diatomaceous flora in this sample is a typical lacustrine flora, and the species which generally are common on ground without open water (aerophilous forms) are practically completely missing from the sample.

Lake in Agatdalen.

Map: The Geodetic Institute: 70 V. 1. Nûgssuaq (1:250,000).

Lake Sill Søen, the surface of the water about 100 × 50 m, in a hollow in a basaltic sill near the geologists' camp in Agatdalen. pH 7.25. Water sample: Lake in Agatdalen.

The analysis of a water sample from there, brought home by Professor A. ROSENKRANTZ in 1952, has by a mistake only appeared after the conclusion and translation of the paper, so that it has not been possible to insert it in the text. The result of the water analysis has been inserted in Table 1 and in the diagram fig. 2.

Diatom Sample No. 642 (22/8 1952).

Leg. A. ROSENKRANTZ and TOVE BIRKELUND.

Vegetation from the lake, with coatings of diatoms.

Diatomaceous flora fairly rich in species (about 65). Dominants: *Anomoeoneis zellensis* var. *linearis* (26.2 %), *Tabellaria fenestrata* (20.6%), and *Denticula tenuis* (11.6%). Common: *Nitzschia denticula*. Fairly common: *Anomoeoneis seriens* var. *brachysira*, *A. styriaca*, *Cymbella angustata*, *C. norvegica*, *Navicula subtilissima*, *Nitzschia frustulum* var. *perpusilla*. Centric form: *Cyclotella antiqua*, not rare. Fairly rare form: *Caloneis clevei*.

pH spectrum: acidophilous.....	35.4 % (16)
indifferent.....	39.8 % (23)
alkaliphilous.....	23.4 % (25)
?	1.4 % (2)

III. The Svartenhuk Peninsula.

Map: The Geodetic Institute: 71 V. 4 Svartenhuk (1:250,000).

The River Kugssineq.

The river Kugssineq, which falls into the sea on the south coast of the Svartenhuk peninsula at about 71°28' lat. N., 55°0' long. W., flows through a valley which on its SW side borders on basaltic mountains with altitudes up to 458 m and on its NE side has mountains with altitudes up to 561 m. Snow and ice had not thawed away in a fairly large area along the lower course of the river on August 10th, 1952. On a stretch of 500—600 m the river had its course under ice and snow. The river bed had a pebbly bottom. The water was clear. pH 7.0. Water sample: Kugssineq 3.

Diatom Sample No. 193 (10/8 1952).

Shreds of moss fastened to stones in rapid current in the river.

Diatomaceous flora not particularly rich in species (about 50). Dominants: *Meridion circulare* (32.0 %), *Ceratoneis arcus* (28.8 %), and *Fragilaria vaucheriae* (13.8 %). Common: *Cymbella ventricosa*. Fairly common: *Achnanthes lanceolata*, *Cymbella turgida*, and *Navicula cryptocephala* var. *veneta*. Centric species: *Melosira roeseana*, rare. Fairly rare forms: *Achnanthes fragilarioides*, *Navicula amygdalina*, and *N. pelliculosa*.

pH spectrum: acidophilous.....	0.0 % (2)
indifferent.....	46.0 % (22)
alkaliphilous.....	51.8 % (18)
?	2.2 % (4)

Diatom Sample No. 195 (10/8 1952).

Half withered moss (*Hygrohypnum alpestre* (Hedw.) Loeske) in slowly running water in small branch of the river.

Diatomaceous flora fairly rich in species (about 60). Dominants: *Meridion circulare* (17.2 %), *Ceratoneis arcus* (16.2 %), and *Nitzschia palea* (16.2 %). Common: *Fragilaria vaucheriae*. Fairly common: *Achnanthes lanceolata*, *Cymbella turgida*, *Diatoma hiemale* var. *mesodon*, *Nitzschia fonticola*, *N. frustulum* var. *perminuta*, and *Surirella ovata*. Centric species: none. Fairly rare forms: *Achnanthes fragilarioides*, *Navicula fossalis*, and *N. pelliculosa*.

pH spectrum: acidophilous.....	0.2 % (6)
indifferent.....	63.8 % (26)
alkaliphilous.....	32.4 % (21)
?	3.6 % (6)

Two Lakes on the Basaltic Plateau

at a height of about 300—400 m a. s. l.

According to the map of the Geodetic Institute the lakes are of approximately the same size, with a surface of about 300×250 m. They are situated with a distance of about 300 m between them. The southernmost one (Lake S₁) is about 2.75 km as the crow flies from the coast in the bay east of Kap Cranstown. The position of the lakes is about 71°28' lat. N., 54°55' long. W.

Lake S₂.

Very clear, light water. Stony or sandy bottom. Along the northern shore of the lake there is some *Eriophorum* vegetation. The bottom in part covered by growths of moss. pH 6.7. Water sample: Svartenhuk Lake S₂.

Diatom Sample No. 221 (11/8 1952).

Moss (*Calliergon sarmentosum* (Wg.) Kindb.) from shallow water near the shore with gelatinous coatings.

Diatomaceous flora rich in species (about 80). Dominants: *Nitzschia frustulum* var. *subsalina* (52.0 %) and *Fragilaria pinnata* (25.4 %). Common: *Eunotia pectinalis* var. *minor* fo. *impressa*. Fairly common: *Achnanthes linearis* and *Cymbella ventricosa*. Centric species: *Melosira roeseana*, rare. Fairly rare forms: *Stauroneis javanica*, *Caloneis clevei*, *Navicula certa*, *N. fritzschii*, *N. opportuna*, *N. suecorum*, and *Pinnularia lata*.

pH spectrum: acidophilous.....	1.4 ‰ (10)
indifferent.....	66.0 ‰ (41)
alkaliphilous.....	32.4 ‰ (25)
?	0.2 ‰ (6)

Lake S₁.

Very clear, light water. pH 6.7. Temperature 7.0°C. Very shallow with a stony bottom. Along 1/5—1/10 of the circumference there is *Eriophorum* marsh. No macrophytic vegetation on the bottom visible from the shore. Water sample: Svartenhuk Lake S₁.

Diatom Sample No. 213 (11/8 1952).

Brown, loose coatings on stones near the shore.

Diatomaceous flora rich in species (about 70). Dominants: *Nitzschia palea* (26.2 ‰), *Fragilaria pinnata* (20.2 ‰), and *Cymbella ventricosa* (10.4 ‰). Common: *Achnanthes linearis*, *Nitzschia frustulum*. Fairly common: *Achnanthes kryophila*, *Fragilaria vaucheriae*, *Nitzschia frustulum* var. *perpusilla* and *N. frustulum* var. *perminuta*. Centric species: *Melosira roeseana*. Fairly rare forms: *Neidium distincte-punctatum* and *Navicula fossalis*.

pH spectrum: acidophilous.....	2.2 ‰ (11)
indifferent.....	55.0 ‰ (30)
alkaliphilous.....	41.4 ‰ (26)
?	1.4 ‰ (5)

Marsh in the Kugssineq Valley, SW of the River.

Highly marshy area with *Equisetum* and mosses on terraced expanse. Above the terrace there is a slope of scree, from where the water in many places oozes out and forms small, slowly running streams across the terraced expanse. There are many small puddles with clear water, all interconnected through the small streams. pH 6.7. Water analyses: Kugssineq 1.

Diatom Sample No. 184 (10/8 1952).

Moss (*Calliergon sarmentosum* (Wg.) Kindb.) with coatings in slowly running water.

Diatomaceous flora fairly rich in species (about 60). Dominants: *Synedra ulna* (32.6 ‰), *Diatomella balfouriana* (11.0 ‰), and *Achnanthes kryophila* (10.0 ‰). Common: *Meridion circulare*, *Nitzschia denticula*, *N. palea*. Fairly common: *Achnanthes fragilarioides*, *Ceratoneis arcus*, *Pinnularia balfouriana*, and *Tabellaria flocculosa*. No centric forms. Fairly rare forms: *Achnanthes fragilarioides*, *Navicula fossalis*, *Amphora obscura*, *A. triundulata*, and *Nitzschia vitrea*.

pH spectrum: acidophilous.....	8.8 ‰ (7)
indifferent.....	38.4 ‰ (20)
alkaliphilous.....	51.0 ‰ (27)
?	1.8 ‰ (5)

Tributary of the Kugssineq.

Small river with steep fall over the marine terrace. It has cut into basaltic layers, the bed having steep sides, and falls into the Kugssineq on its eastern bank. The water is quite clear. pH 6.7. Temperature 4.5° C. Water sample: Kugssineq 2.

Diatom Sample No. 191 (10/8 1952).

Mosses (*Hygrohypnum polare* (Lindb.) Broth and *Philanotis tomentella* Mol.) in spray of water on the basaltic side of the river immediately above the surface of the water.

Diatomaceous flora fairly rich in species (about 55). Dominants: *Meridion circulare* (31.2 ‰), *Ceratoneis arcus* (15.6 ‰), and *Fragilaria vaucheriae* (11.4 ‰). Common: *Achnanthes linearis* (?), *Nitzschia frustulum*. Fairly common: *Achnanthes lanceolata*, *Cymbella ventricosa*, *Nitzschia palea*, and *N. frustulum* var. *perminuta*. No centric forms. Fairly rare forms: *Caloneis schroederi*, *Navicula pelliculosa*, *N. subatomoides*, and *Gomphonema bipunctata*.

pH spectrum: acidophilous.....	0.6 ‰ (3)
indifferent.....	43.4 ‰ (25)
alkaliphilous.....	50.8 ‰ (16)
?	5.2 ‰ (11)

Delta Area East of Kap Cranstown.

The 2—3 km broad river valley which leads to the NE side of the bay east of Kap Cranstown on the south coast of the Svartenhuk peninsula, is filled in by a delta covered by bogs and small lakes or ponds. The river falls into the sea at about 71°26' lat. N., 54°55' long. W.

Pond on the Expanse of the Delta.

The pond has an open surface of about 15 × 30 m in moss tundra on the expanse of the delta, about 1—2 km from the coast. The water is clear. Bog along the shores. Very little inflow and outflow. pH 8.8. Water sample: Tasiussaq 2.

Diatom Sample No. 205 (10/8 1952).

Detritus from the clayey-sandy bottom of the pond.

Diatomaceous flora rich in species (about 100). Dominants: *Epi-*

themia sorex (18.0 %), *Achnanthes linearis* (10.0 %), and *Nitzschia palea* (10.0 %). Common: *Fragilaria pinnata*. Fairly common: *Navicula cryptocephala*, *Nitzschia denticulata*, *N. gracilis*, and *Rhopalodia gibba*. Centric species: *Cyclotella antiqua*, rare. Fairly rare forms: *Navicula fossalis*, *N. subatomoides*, *N. peregrina* var. *kefvingensis*, and *Amphora triundulata*.

pH spectrum: acidophilous.....	3.2 % (11)
indifferent.....	32.4 % (34)
alkaliphilous.....	59.6 % (45)
?	4.8 % (6)

Crater-Shaped Pond on the Expanse of the Delta.

Almost circular, crater-shaped pond, about 25 m in diameter. One third of its shore is bare and consists of a basaltic sand-wall. Along the rest of the circumference there is a bog with *Eriophorum*, *Carex*, and mosses. Mosses spread from this bog over the bottom of the pond. The water is quite clear. Depth 3—4 m. pH 7.5. Temperature of the water near the shore: 12.5°C. Water sample: Tasiussaq 3.

Diatom Sample No. 206 (20/8 1952).

Brown flocculent coatings on the sandy bottom off the sandy shore, at a depth of about 1 m.

Diatomaceous flora rich in species (about 80). Dominants: *Fragilaria construens* (27.2 %), *Nitzschia frustulum* var. *perminuta* (16.4 %), and *N. frustulum* (10.4 %). Common: *Fragilaria pinnata*. Fairly common: *Achnanthes linearis*, *Cymbella ventricosa*, *Nitzschia frustulum* var. *perpusilla*, and *Opephora martyi*. No centric forms. Fairly rare forms: *Navicula amygdalina*, *N. certa*, *Amphora obscura*, *A. triundulata*, *Stauroneis javanica*.

pH spectrum: acidophilous.....	0.2 % (3)
indifferent.....	34.4 % (29)
alkaliphilous.....	64.0 % (39)
?	1.4 % (7)

The "Narssaq" Plain North of the Peninsula Qingnivik.

The localities investigated are situated near the river which falls into the bay Arfertuarssuk east of the Qingnivik peninsula.

Lake with Outflow.

The lake has an outflow to the river, which falls into Arfertuarssuk. Along the shore there is vegetation of *Eriophorum* and *Carex*. Bottom stony. The water is clear. pH 9.0. Water sample: Narssaq 3.

Diatom Sample No. 245 (12/8 1952).

Scrapings from stones near the shore.

Diatomaceous flora rich in species (about 105). Dominants: *Fragilaria construens* + var. (26.2%), *F. pinnata* (25.4%), and *Achnanthes linearis* (18.6%). Fairly common: *Nitzschia frustulum* and *Opephora martyi*. The centric species *Melosira distans* was very rare. Fairly rare forms: *Achnanthes peragalli*, *Fragilaria inflata*, *Navicula certa*, *N. clementis*, *N. subatomoides*, *N. ventralis*, and *Stauroneis javanica*.

pH spectrum: acidophilous.....	1.4 % (16)
indifferent.....	24.2 % (35)
alkaliphilous.....	70.8 % (45)
?	3.6 % (9)

Lake 7—8 km NNW of the Mouth of the River.

Very shallow lake with an open surface of water of about 50×150 m, 7—8 km NNW of the outfall of the river into Arfertuarssuk. The water is clear. pH 9.0. Water sample: Narssaq 2. The shores were overgrown with *Eriophorum* and *Carex*, and heath and bog alternate in the terrain round the lake.

Diatom Sample No. 242 (12/8 1952).

Brown, gelatinous coatings on moss near the shore of the lake.

Diatomaceous flora rich in species (about 75). Dominants: *Achnanthes linearis* (26.8%), *Nitzschia frustulum* (12.2%), and *Melosira distans* + var. (11.6%). Common: *Anomoeoneis zellensis* var. *linearis*, *Epithemia sorex*, and *Pinnularia balfouriana*. Fairly common: *Eunotia pseudopectinalis*, *Nitzschia denticula*, *N. palea*, and *N. frustulum* var. *perpusilla*. Centric species: *Melosira distans* appears as dominant form. Fairly rare forms are *Eunotia pseudopectinalis*, which is fairly common in the sample, *Navicula semen*, and *Pinnularia divergens* var. *wulffii*.

pH spectrum: acidophilous.....	32.4 % (21)
indifferent.....	41.2 % (27)
alkaliphilous.....	26.0 % (25)
?	0.4 % (2)

Ephemeral Pond Basin.

The pond is situated in the river valley NNW of the outfall of the river into Arfertuarssuk. The basin is for periods completely dried up. When the sample was taken, the maximum depth of the water was 30—40 cm. The bottom was coarsely stony with much mud with algae on the stones. *Carex* vegetation along the shores. Many specimens

of *Lepidurus arcticus* and some daphniae. pH 6.7. Temperature of the water 12.0°C. Temperature of the air immediately above the ground 14.0°C. Water sample: Narssaq 1.

Diatom Sample No. 232 (12/8 1952).

Coatings of algae on stones near the shore.

Diatomaceous flora rich in species (about 100). Dominants: *Tabelaria flocculosa* (13.4 %) and *Denticula tenuis* (10.0 %). Common: *Nitzschia denticulata*. Fairly common: *Anomooneis zellensis* var. *linearis*, *Epithemia sorex*, *Eunotia lunaris*, *Fragilaria pinnata*, *Gomphonema angustatum*, *Nitzschia amphibia*, and *N. palea*. Centric form: *Melosira italica* subsp. *subarctica*, very rare. Fairly rare forms: *Achnanthes holstei*, *Amphora triundulata*, *Cymbella broenlundensis*, *Navicula certa*, *N. fossalis*, *Pinnularia brandelii*, *P. divergens* var. *wulffii*, *P. lata* fo. *thuringiaca*, and *Stauroneis javanica*.

pH spectrum: acidophilous 26.2 % (22)
indifferent 25.4 % (31)
alkaliphilous 45.2 % (34)
? 3.2 % (11)

B. GNEISSIC AREAS

I. Egedesminde.

Map: The Geodetic Institute: 68 V. 1 Egedesminde (1:250,000).

Colony Map of Egedesminde (1:2,000).

Egedesminde: 68°42' lat. N., 52°50' long. W.

Stretch of Boggy Land SW of Egedesminde Vandsø.

Small pool with about 15 cm deep water on peaty substratum between tussocky growths of *Eriophorum* and *Carex*. pH 6.3.

Diatom Sample No. 8 (28/7 1952).

Crusty coatings on the peaty soil and on stones in the pool.

Diatomaceous flora not particularly rich in species (about 50). Dominants: *Nitzschia perminuta* (27.2 ‰), *Anomoeoneis serians* var. *brachysira* (18.6 ‰), and *Achnanthes marginatula* (14.2 ‰). Common: *Anomoeoneis exilis* var. *lanceolata*, *Frustulia rhomboides* var. *saxonica*, *Tabelaria flocculosa*. Fairly common: *Cymbella gracilis*, *Eunotia tenella*, *Frustulia rhomboides* var. *saxonica* fo. *undulata*. Centric species: *Melosira varians*, very rare; probably adventive, coming from the near sea. Fairly rare forms: *Eunotia pseudopectinalis*, *E. rhomboidea*, which have not previously been recorded from Greenland, *Peronia heribaudi*, *Surirella delicatissima*.

pH spectrum: acidophilous.....	57.8 ‰ (25)
indifferent.....	40.8 ‰ (21)
alkaliphilous.....	0.0 ‰ (3)
?	1.4 ‰ (2)

Lake Tipitôq SSE of the Continuation School.

As measured on the local map the greatest length of the lake (NNW—SSE) is 210 m and the greatest breadth (SSW—ENE) is 80 m. The shortest distance to the sea (north of the Continuation School) is about 65 m. The surface of the lake is about 5 m a. s. l. The bottom is sandy, in some places with stones. The water is clear. pH 6.3. Water sample: Egedesminde 2. The water is probably somewhat polluted by sewage from the nearby town.

Diatom Sample No. 20 (31/7 1952).

Crusts (amongst other things with many *Cyanophyceae*) on the sandy bottom near the shore.

Diatomaceous flora very rich in species (about 110). Dominants: *Anomoeoneis serians* var. *brachysira* (13.4 ‰) and *Nitzschia palea* (13.0 ‰). Common: *Fragilaria virescens* var. *subsalina*, *Tabellaria flocculosa*. Fairly common: *Achnanthes depressa*, *Cymbella gracilis*, *Eunotia exigua*, *Frustulia rhomboides* var. *saxonica*, *Gomphonema parvulum*, *Navicula subtilissima*, *Nitzschia fonticola*, and *Stauroneis* sp. (Plate V, fig. 2). Centric forms: *Melosira distans* var. *lirata*, not rare, *Stephanodiscus astraes*, very rare. Fairly rare forms: *Achnanthes holsti*, *Cymbella broenlundensis*, *Eunotia pseudopectinalis*, *Navicula levanderi*, *Pinnularia alpina*, *P. hustedti*, *P. lata* fo. *thuringiaca*, *P. virihensis*, *Stenopterobia intermedia*.

pH spectrum: acidophilous.....	48.0 ‰ (43)
indifferent.....	29.2 ‰ (34)
alkaliphilous.....	6.2 ‰ (11)
?	16.6 ‰ (21)

Lake near Egedesminde.

The size of the lake is about 300 × 400 m. The water is very clear, light. The shores and nearest surroundings are mainly bare rock. pH 6.2. Water sample: Egedesminde 3.

Diatom Sample No. 28 (31/7 1952).

Brown mucilaginous shreds on stones in shallow water near the shore of the lake.

Diatomaceous flora rich in species (about 95). Dominants: *Tabellaria flocculosa* (37.8 ‰) and *Nitzschia frustulum* var. *perminuta* (13.8 ‰).

Common: *Fragilaria virescens* var. *subsalina*. Fairly common: *Achnanthes linearis*, *Anomoeoneis serians* var. *brachysira*, *Frustulia rhomboides* var. *saxonica*, and *Tabellaria fenestrata*. Centric form: *Melosira distans* var. *lirata*, fairly rare. Fairly rare forms: *Achnanthes holsti*, *A. marginatula*, *Cymbella incrassata*, *Eunotia rhomboidea*, *Peronia heribaudi*, and *Stenopteroberia intermedia*.

pH spectrum: acidophilous.....	55.0 % (35)
indifferent.....	36.0 % (43)
alkaliphilous.....	0.6 % (9)
?	8.4 % (6)

The Lake Egedesminde Vandso.

Water sample: Egedesminde 1.

Diatom Sample No. 32 (31/7 1952).

Mosses (*Calliergon stramineum* (Brid.) Kindb. and *Scorpidium scorpioides* (L.) Limpr.) with mucilaginous coatings, at a depth of about 40 cm.

Diatomaceous flora very rich in species (about 125). Dominants: *Achnanthes linearis* + var. *pusilla* (45.0 %). Common: *Fragilaria virescens* var. *subsalina*. Fairly common: *Achnanthes microcephala*, *Cyclotella stelligera*, *Nitzschia frustulum*. Centric forms: *Cyclotella stelligera*, fairly common, *C. kützingiana*, not rare, *C. kützingiana* var. *planetophora* and var. *radiosa*, both very rare, *Melosira distans* var. *lirata*, not rare. Fairly rare forms: *Achnanthes holsti*, *Cymbella gauemanni*, *Navicula certa*, *N. järnefelti*, *N. subatomoides*, *N. ventralis*, *Peronia heribaudi* (capitate form), *Pinnularia hustedti*, and *Stauroneis javanica*.

pH spectrum: acidophilous.....	15.6 % (35)
indifferent.....	61.6 % (48)
alkaliphilous.....	12.0 % (25)
?	10.8 % (18)

II. Christianshaab.

Map: The Geodetic Institute: 68 V. 2 Christianshaab (1:250,000).
Christianshaab: 68°47' lat. N., 51°11' long. W. On peninsula on the mainland.

The Lake Christianshaab Vandso.

The lake is situated on a gneissic substratum, the nearest surroundings being in part bare rock. In the lake some *Hippuris* and *Potamogeton*. The water is quite clear and light. pH 6.3.

Diatom Sample No. 549 (31/8 (1952).

Diatomaceous flora rich in species (about 100). Dominants: *Tabellaria flocculosa* (29.6 ‰), *Achnanthes minutissima* (14.0 ‰), and *A. linearis* (12.0 ‰). Fairly common: *Anomoeoneis exilis* var. *lanceolata*, *A. serians* var. *brachysira*, *Fragilaria virescens*, *Nitzschia frustulum*, and *N. palea*. Centric forms: *Cyclotella kützingiana*, very rare, *C. kützingiana* var. *radiosa*, rare, *C. stelligera*, very rare. Fairly rare forms: *Cymbella incrasata*, *Eunotia pseudopectinalis*, *Navicula ventralis*, *Surirella delicatissima* (only rarely observed in Greenland).

pH spectrum: acidophilous	39.2 ‰ (27)
indifferent	51.0 ‰ (44)
alkaliphilous	7.2 ‰ (18)
?	2.6 ‰ (8)

Lake near Christianshaab.

Lake situated in the gneissic area behind the lake Vandsø, at a somewhat higher altitude a. s. l. than the latter. *Hippuris* and *Potamogeton* occur in this lake, too. The water clear, light. pH 6.2.

Diatom Sample No. 555 (31/8 1952).

Moss with mucilaginous coatings near the shore of the lake.

Diatomaceous flora fairly rich in species (about 55). Dominants: *Tabellaria flocculosa* (36.0 ‰) and *Eunotia bidentula* (11.2 ‰). Common: *Anomoeoneis serians* var. *brachysira*, *Frustulia rhomboides* var. *saxonica*. Fairly common: *Anomoeoneis exilis* var. *lanceolata*, *A. serians* var. *linearis*, *Eunotia arcus*, *E. exigua*, *Navicula subtilissima*, and *Nitzschia hantzschiana*. Centric form: *Cyclotella kützingiana* var. *planetophora*, rare. Fairly rare forms: *Achnanthes marginatula*, *Eunotia pseudopectinalis*, and *Pinnularia hustedti*.

pH spectrum: acidophilous	77.6 ‰ (23)
indifferent	15.2 ‰ (24)
alkaliphilous	6.4 ‰ (7)
?	0.8 ‰ (3)

Smaller Lake near Christianshaab.

The open surface of the lake is about 80—100 × 40—50 m. It is situated at the same altitude a. s. l. as the preceding lake, about 200 m east of it. The water clear, light. pH 6.2.

Diatom Sample No. 558 (31/8 1952).

Stones with coatings from the bottom of the lake at a depth of about 20—30 cm.

Diatomaceous flora rich in species (about 100). Dominants: *Tabel-laria flocculosa* (23.4 %), *Anomoeoneis exilis* var. *lanceolata* (14.6 %), and *Epithemia sorex* (11.8 %). Common: *Anomoeoneis zellensis* var. *linearis*, *Nitzschia frustulum* var. *perpusilla*. Fairly common: *Anomoeoneis serians* var. *brachysira*, *A. zellensis*, *Cymbella cesati*, *Frustulia rhomboides* var. *saxonica*, *Nitzschia frustulum*. Centric forms: *Cyclotella ocellata*, rare, *C. antiqua*, rare, *C. kützingiana* var. *planetophora*, rare, *C. kützingiana* var. *radiosa*, rare, *C. meneghiniana*, very rare (the last mentioned species presumably adventive, coming from the sea), *Melosira distans* var. *lirata*, very rare, *M. islandica*, very rare, *Stephanodiscus dubius*, very rare. Fairly rare forms: *Achnanthes holsti*, *Amphipleura rutilans* (marine form, probably adventive), *Diploneis didyma* (also adventive marine form), *Stenopterobia intermedia*, *S. intermedia* fo. *densestriata*, *Synedra pulchella*, and *S. tabulata* (the two last-mentioned forms are brackish water or salt water forms, which like the other haline forms in the sample must be considered adventive).

pH spectrum: acidophilous.....	44.4 % (32)
indifferent.....	34.6 % (36)
alkaliphilous.....	16.4 % (24)
?	4.6 % (5)

Fairly Large Lake NE of Christianshaab.

As measured on the map 68.V.2 the length of the lake is 4 km and its breadth about 1 km. The altitude above the sea is low. In a number of places along the shores there is a pronounced surf shore. pH 6.6.

Diatom Sample No. 560 (31/8 1952).

Scrapings from the bottom at a depth of about 30 cm.

Diatomaceous flora rich in species (about 85). Dominants: *Fragi-laria virescens* (38.0 %), *Synedra rosenkrantzii* (17.0 %), and *Anomoeoneis exilis* var. *lanceolata* (16.2 %). Fairly common: *Achnanthes flexella* var. *alpestris*, *A. kryophila*, *Diatoma elongatum* var. *tenuis*, and *Nitzschia palea*. Centric forms: *Cyclotella ocellata*, rare, *C. kützingiana* var. *planetophora*, *C. kützingiana* var. *radiosa*, both rare, *Melosira distans*, very rare, *Stephanodiscus astraea* var., very rare. Fairly rare forms: *Achnanthes holsti*, *Caloneis clevei*, *Eunotia pseudopectinalis*, *Navicula certa*, and *N. ventralis*.

pH spectrum: acidophilous.....	5.4 % (23)
indifferent.....	66.4 % (33)
alkaliphilous.....	8.0 % (20)
?	20.2 % (10)

Diatom Sample No. 561 (31/8 1952).

Dead branches of *Betula* with coatings from a depth of about 20—30 cm.

Diatomaceous flora fairly rich in species (about 60). Dominants: *Anomoeoneis exilis* var. *lanceolata* (45.2 %) and *Diatoma elongatum* (29.4 %). Common: *Synedra rosenkrantzii*. Fairly common: *Achnanthes linearis*, *Fragilaria virescens*. Centric forms: *Cyclotella ocellata*, fairly rare, *C. kützingiana* var. *planetophora*, rare. Fairly rare forms: *Achnanthes holsti*, *Caloneis clevei*, *Eunotia pseudopectinalis*, *Navicula järnefelti*, *N. ventralis*, *Mastogloia elliptica* (very rarely observed in Greenland), *Gyrosigma kützingii* (also rarely observed in Greenland).

pH spectrum: acidophilous	1.2 % (13)
indifferent	55.0 % (21)
alkaliphilous	33.2 % (21)
?	10.6 % (5)

The diatomaceous flora of the last two samples is of an intermediary character, as they mainly include indifferent forms. As there are no water analyses available from there, it is so far precluded to decide whether the contents of electrolytes are influenced by the sea.

Small Pond Between the Above Mentioned Lake and Christianshaab.

Open surface of water about 15×4 m. In depression with *Eriophorum* bog. pH 5.8.

Diatom Sample No. 567 (31/8 1952).

Green algae and scrapings from the bottom of the pond.

Diatomaceous flora fairly rich in species (about 45). Dominants: *Tabellaria flocculosa* (26.4 %), *Navicula seminulum* var. *intermedia* (20.0 %), *Anomoeoneis exilis* var. *lanceolata* (16.8 %), and *Frustulia rhomboides* var. *saxonica* (11.2 %). Fairly common: *Achnanthes kryophila*, *Anomoeoneis serians* var. *brachysira*, *A. serians* var. *linearis*, *Eunotia praeurupta*, *E. tenella*, and *E. triodon*. No centric forms. Fairly rare forms: *Eunotia papilio*, *E. pseudopectinalis*, *E. suecica*, and *Pinnularia hustedti*.

pH spectrum: acidophilous	55.4 % (23)
indifferent	42.6 % (14)
alkaliphilous	0.0 % (0)
?	2.0 % (8)

Lake Between Christianshaab and Bing's Cave.

Small lake (pond) with fairly dense growth of *Hippuris* and with a mossy bottom. Clear water. pH 6.4.

Diatom Sample No. 572 (31/8 1952).

Coatings on mosses (*Drepanocladus exannulatus* (Gumb.) Warnst. and *Calliergon stramineum* (Dicks.) Kindb.) from the bottom near the shore at a depth of about 30 cm.

Diatomaceous flora rich in species (about 105). Dominants: *Achnanthes linearis* (20.2 %), *Nitzschia palea* (14.4 %), and *Tabellaria flocculosa* (13.0 %). Fairly common: *Achnanthes minutissima* var. *cryptocephala*, *Eunotia rhomboidea*, *Fragilaria vaucheriae*, *F. virescens*, *Frustulia vulgaris*, *Navicula cocconeiformis*, *N. cryptocephala*, and *N. subatomoides*. No centric forms. Fairly rare forms: *Caloneis clevei*, *Eunotia fallax*, *E. pseudopectinalis*, *E. rhomboidea*, *Navicula järnefelti*, *N. subatomoides*, and *N. ventralis*.

pH spectrum: acidophilous.....	25.6 % (32)
indifferent.....	59.2 % (41)
alkaliphilous.....	10.4 % (22)
?	4.8 % (11)

III. Disko.

Map: The Geodetic Institute: 69 V. 1 Godhavn (1:250,000).

Local map of Godhavn (1:2000).

The Lake Tranbrænderisøen at Godhavn.

Shortest distance to the sea 150 m. Surface of the water about 12.5 m a. s. l. Greatest length (SW—NE) 62 m, breadth (NW—SE) 30 m (as measured on the local map). Boggy tract NE of the lake. pH 6.9. Water sample: Godhavn 1.

Diatom Sample No. 33 (1/8 1952).

Brown gelatinous coatings on layer of *Cyanophyceae* on the bottom of the lake at a depth of about 40—50 cm.

Diatomaceous flora fairly rich in species (about 50). Dominants: *Epithemia sorex* (37.0 %), *Denticula tenuis* (14.2 %), and *Cymbella norvegica* (11.6 %). Common: *Anomoeoneis zellensis* var. *linearis* and *Nitzschia denticula*. Fairly common: *Eunotia praerupta* and *Nitzschia frustulum*. Centric species: *Melosira distans*, rare. Fairly rare form in the sample: *Navicula vulpina*.

pH spectrum: acidophilous.....	13.8 % (18)
indifferent.....	18.8 % (18)
alkaliphilous.....	67.4 % (15)
?	0.0 % (0)

The sample has a considerable preponderance of alkaliphilous diatomaceous species.

Diatom Sample No. 38 (1/8 1952).

Floating connected cakes of moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) released from the bottom by discharged gases (oxygen).

Diatomaceous flora rich in species (about 75). Dominants: *Achnanthes linearis* (40.6 %) and *Anomoeoneis zellensis* var. *linearis* (12.0 %). Common: *Achnanthes microcephala*. Fairly common: *Epithemia sorex*, *Eunotia pectinalis* var. *minor*, *E. praerupta*, *Tabellaria fenestrata*, *T. flocculosa*. Centric species: *Cyclotella antiqua*, very rare. Fairly rare forms: *Eunotia tanensis*, *Navicula vulpina*, and *Pinnularia episcopolis*.

pH spectrum: acidophilous.....	25.6 % (28)
indifferent.....	64.4 % (29)
alkaliphilous.....	9.8 % (17)
?	0.2 % (2)

Pond with *Hippuris* 160 m NNE of Tranbrænderisøen.

Greatest length (W—E) about 45 m, greatest breadth (N—S) about 18 m. Altitude about the sea 22—24 m. Clear water. pH 6.3. Water sample: Godhavn 2.

Diatom Sample No. 45 (1/8 1952).

Brown, gelatinous substances on the bottom, at a depth of about half a metre.

Diatomaceous flora rich in species (about 70). Dominants: *Anomoeoneis zellensis* var. *linearis* (18.4 %), *Nitzschia kützingiana* (16.6 %), and *Anomoeoneis seriens* var. *brachysira* (16.0 %). Common: *Cymbella obtusa*, *Fragilaria virescens*, and *Nitzschia frustulum*. Fairly common: *Cymbella incerta*, *Frustulia rhomboides* var. *saxonica*, *Nitzschia palea*, and *Pinnularia balfouriana*. Centric species: *Melosira distans*, very rare. Fairly rare forms: *Achnanthes holsti* and *Surirella delicatissima*.

pH spectrum: acidophilous.....	48.4 % (14)
indifferent.....	17.8 % (35)
alkaliphilous.....	33.4 % (19)
?	0.4 % (2)

The alkaliphilous forms are fairly frequent here.

The River at the Arctic Station, Godhavn.

The samples originate from the river NW of the Arctic Station, about 15—20 m a. s. l. and about 150 m from the place where the river falls into the large lagoon south of the Station. The water in the river is clear. pH 6.9. Temperature 2.0°C. Water sample: Godhavn 3.

(The Arctic Station: 69°15' lat. N., 53°32' long. W.).

Diatom Sample No. 48 (1/8 1952).

Coatings on moss (*Hygrohypnum alpestre* (Hedw.) Loeske) in very fast running water.

Diatomaceous flora fairly rich in species (about 65). Dominants: *Nitzschia perminuta* (30.0 %), *Achnanthes lanceolata* (25.0 %), and *A. kryophila* (14.2 %). Common: *Diatoma hiemale* var. *mesodon*, *Meridion circulare*. Fairly common: *Fragilaria capitellata* and *F. capucina*. Centric species: *Melosira distans*, not rare, *M. roeseana*, very rare. Fairly rare forms: *Gomphonema bipunctata*, *Navicula amphibola*, and *N. vitabunda*.

pH spectrum: acidophilous.....	1.0 % (14)
indifferent.....	77.6 % (32)
alkaliphilous.....	18.0 % (15)
?	3.4 % (3)

Lake at the Gneissic Terrain near Godhavn (West of the Town).

Size about 60 × 25 m. In ravine valley in gneiss, which forms the bottom of the lake. In the east end some growth of *Hippuris*, and at the low, moss-covered ends of the lake in the ravine fairly dense growth of *Eriophorum*. The water is clear. pH 6.2. Water sample: Disko 3.

Diatom Sample No. 452 (27/8 1952).

Scrapings from stones at a depth of about 25 cm.

Diatomaceous flora fairly rich in species (about 65). Dominants: *Tabellaria flocculosa* (33.2 %), *Nitzschia frustulum* (15.4 %), *Anomoeoneis serians* var. *brachysira* (11.4 %), and *Achnanthes linearis* (10.6 %). Fairly common: *Achnanthes minutissima*, *Anomoeoneis exilis* var. *lanceolata*, *Cymbella cistula*, *Nitzschia frustulum* var. *perminuta*, *Peronia heribaudi* var. *laticeps*. No centric forms. Fairly rare forms: *Eunotia pseudopectinialis*, *Peronia heribaudi* var. *laticeps*, and *Surirella delicatissima*.

pH spectrum: acidophilous.....	50.8 % (19)
indifferent.....	32.2 % (29)
alkaliphilous.....	17.0 % (14)
?	0.0 % (3)

Diatom Sample No. 469 (27/8 1952).

Moss with coatings from a depth of about 15 cm.

Diatomaceous flora rich in species (about 80). Dominants: *Fragilaria virescens* (25.6 %), *Nitzschia kützingiana* (15.8 %), and *Tabellaria flocculosa* (10.0 %). Common: *Achnanthes linearis*, *Nitzschia frustulum*, *Pinularia balfouriana*. Fairly common: *Achnanthes minutissima*, *Anomoeoneis exilis* var. *lanceolata*, and *Cymbella cesati*. Centric species: *Melo-*

sira distans, rare. Fairly rare forms: *Achnanthes holsti*, *Eunotia rhomboidea*, *Peronia heribaudi* var. *laticeps*, and *Surirella delicatissima*.

pH spectrum: acidophilous.....	27.0 % (24)
indifferent.....	48.8 % (38)
alkaliphilous.....	24.2 % (16)
?	0.0 % (1)

Boggy Tract West of Godhavn.

In the gneissic terrain west of Godhavn there are some ponds and pools from where the water oozes to and through a surrounding boggy tract, either diffusely through the vegetation of the bog or through small runnels.

Puddle in the Boggy Tract.

Open surface of the water about 2 sq.m. There is a slowly running passage of water by way of small runnels. The water is clear. pH 6.0.

Diatom Sample No. 454 (27/8 1952).

Coatings on the bottom of the puddle.

Diatomaceous flora fairly poor in species (about 35). Dominants: *Tabellaria flocculosa* (50.6 %), *Frustulia rhomboides* var. *saxonica* (16.6 %), and *Anomoeoneis serians* var. *brachysira* (11.6 %). Common: *Anomoeoneis exilis* var. *lanceolata*. Fairly common: *Cymbella gracilis*, *Navicula subtilissima*, and *Nitzschia frustulum*. No centric forms found. Fairly rare forms: *Achnanthes marginatula*, *Eunotia pseudopectinalis*, *E. rhomboidea*, and *Peronia heribaudi*.

pH spectrum: acidophilous.....	85.2 % (18)
indifferent.....	12.4 % (17)
alkaliphilous.....	2.4 % (2)
?	0.0 % (0)

Another Puddle in the Boggy Tract.

Open surface about 10 × 8 m, about 20 cm deep. Shortest distance from the sea about 50 m. About 10 % of the circumference overgrown with *Eriophorum*, otherwise bare gneissic expanse. Clear water. pH 6.0. About 12 m a. s. l.

Diatom Sample No. 462 (27/8 1952).

Brown fluff on dead leaves of *Eriophorum*.

Diatomaceous flora fairly rich in species (about 50). Dominants: *Achnanthes linearis* + var. *pusilla* (19.8 %), *Eunotia rhomboidea* (16.2 %),

and *Fragilaria virescens* (15.6 ‰). Common: *Anomoeoneis seriens* var. *brachysira*, *Frustulia rhomboides* var. *saxonica*, and *Tabellaria flocculosa*. Fairly common: *Cymbella cesati*, *C. gracilis*, *Nitzschia frustulum*, and *N. palea*. No centric forms. Fairly rare forms: *Achnanthes marginatula*, *Eunotia rhomboidea* (it was dominant in this sample, *Peronia heribaudi* var. *laticeps*, and *Stauronis lapponica*.

pH spectrum: acidophilous.....	41.8 ‰ (21)
indifferent.....	54.2 ‰ (27)
alkaliphilous.....	2.2 ‰ (3)
?	1.8 ‰ (2)

Lake (Pond) Between the Town of Godhavn and Udkiggen.

The lake is found in a ravine in the gneissic terrain about 25 m a. s. l. and about 170 m west of the larger lake "Thygesens Sø". Its length (W—E) is 65 m and its breadth (N—S) is 22 m. The shortest distance from the sea is 230 m. The water seems somewhat polluted by sewage from the near-by town, but is otherwise clear. *Branchinecta paludosa* is very common. pH 6.8. Water sample: Disko 4.

Diatom Sample No. 476 (27/8 1952).

Moss with coatings from the bottom near the shore, at a depth of about 20—40 cm.

Diatomaceous flora rich in species (about 85). Dominants: *Achnanthes linearis* (20.6 ‰), *Nitzschia frustulum* var. *perpusilla* (15.8 ‰), *N. frustulum* (13.4 ‰), and *Fragilaria virescens* var. *subsalina* (12.8 ‰). Common: *Pinnularia balfouriana*. Fairly common: *Achnanthes microcephala*, *Nitzschia fonticola*, *N. palea*, and *Tabellaria flocculosa*. No centric forms. Fairly rare forms: *Eunotia elegans*, *Navicula levanderi*, *N. subatomoides*, *N. ventralis*, and *Pinnularia hustedti*.

pH spectrum: acidophilous.....	13.4 ‰ (20)
indifferent.....	48.4 ‰ (38)
alkaliphilous.....	22.2 ‰ (18)
?	16.0 ‰ (10)

Lake Taserssuaq, "Thygesens Sø", near Godhavn.

This is the largest lake in the area, situated on the outskirts of the built-up area at Godhavn. The outline of the lake is approximately elliptical, the greatest length, SSW—NNW, 300 m, breadth WNW—ESE 110 m. Altitude a. s. l. 9 m. On the east side and along the south shore there are a bog and marshy terrain, on large parts of the west side bare gneissic expanses towards the lake. There is outflow to the

harbour at Godhavn through a channel about 165 m long. The lake is somewhat polluted by sewage from the town. The water, however, is clear with some growth of *Potamogeton*. In some cases *Sphagnum* at the shore. *Branchinecta paludosa* common. pH 7.5. Water sample: Disko 5.

Diatom Sample No. 479 (27/8 1957).

Brown coatings on lake bottom near the shore, at a depth of 30—40 cm.

Diatomaceous flora rich in species (about 90). Dominants: *Nitzschia frustulum* (18.6 ‰), *Fragilaria virescens* var. *subsalina* (12.8 ‰). Common: *Achnanthes linearis*, *Cymbella ventricosa*, *Fragilaria pinnata*, *Nitzschia frustulum*, *N. palea*, *N. frustulum* var. *perminuta*. Fairly common: *Fragilaria capucina*, *Pinnularia balfouriana*. No centric forms. Fairly rare forms: *Navicula subatomoides*, *N. ventralis*, and *Surirella linearis*.

pH spectrum: acidophilous.....	6.4 ‰ (18)
indifferent.....	53.0 ‰ (36)
alkaliphilous.....	22.4 ‰ (25)
?	18.2 ‰ (11)

Spring in "Lyngmarken", Godhavn.

Spring in *Equisetum* marsh, 30–40 m a. s. l. The water is clear. pH 6.8.

Diatom Sample No. 491 (28/8 1952).

Moss (*Calliergon giganteum* (Schimp.) Kindb.) with coatings in rapid current near the well-head.

Diatomaceous flora poor in species (about 35). Dominants: *Nitzschia hantzschiana* (20.0 ‰), *Fragilaria virescens* (28.6 ‰), *Achnanthes lanceolata* (14.0 ‰), and *Meridion circulare* (11.0 ‰). Common: *Navicula tantula*. Fairly common: *Cymbella turgida*, and *Navicula minima*. Centric species: *Melosira distans*, rare. Fairly rare forms: *Gomphonema bipunctata*, *Navicula obsoleta*, and *N. suchlandi*(?).

pH spectrum: acidophilous.....	0.0 ‰ (4)
indifferent.....	51.8 ‰ (17)
alkaliphilous.....	33.2 ‰ (8)
?	15.0 ‰ (6)

Decidedly alkaliphilously marked pH spectrum.

Another Spring in "Lyngmarken", Godhavn.

This spring breaks forth on the boundary between the gneissic substratum and the overlying basaltic breccia. The water is clear. pH 6.3.

Diatom Sample No. 496 (28/8 1952).

Mud between moss (*Calliergon giganteum* (Schimp.) Kindb.) in slowly running water. pH 6.3.

Diatomaceous flora fairly poor in species (about 35). Dominants: *Pinnularia pulchra* (33 %) and *Achnanthes linearis* (13.2 %). Common: *Achnanthes kryophila*, *Fragilaria capucina*, *Nitzschia kützingiana*. Fairly common: *Achnanthes lanceolata*, *Cymbella turgida*, *Nitzschia frustulum* var. *perpusilla*, *Pinnularia subcapitata*. Centric species: *Cyclotella comta*, very rare. Fairly rare forms: *Achnanthes nodosa* and *Gomphonema bipunctata*.

pH spectrum: acidophilous.....	0.4 % (4)
indifferent.....	73.6 % (23)
alkaliphilous.....	15.2 % (6)
?	10.8 % (3)

River in Engelskmandens Havn, Godhavn.

River with very steep fall. Clear water. pH 6.6.

Diatom Sample No. 524 (28/8 1952).

Moss (*Hygrohypnum alpestre* (Hedw.) Loeske) with coatings in rapid current.

The diatomaceous flora not particularly rich (about 40 species). Dominants: *Diatoma hiemale* var. *mesodon* (21.8 %), *Achnanthes lanceolata* (20.2 %), *Navicula seminulum* (14.0 %), *Meridion circulare* (12.8 %), and *Navicula obsoleta* (10.4 %). Common: *Synedra ulna*. Fairly common: *Cymbella ventricosa*, *Melosira roeseana*, *Nitzschia frustulum*. Centric species: *Melosira roeseana*, fairly common. Fairly rare forms: *Achnanthes marginatula*, *Navicula obsoleta*.

pH spectrum: acidophilous.....	0.4 % (3)
indifferent.....	41.4 % (21)
alkaliphilous.....	47.8 % (18)
?	10.4 % (1)

The alkaliphilous trend predominant.

Oozing Spring in Engelskmandens Havn, Godhavn.

Oozing spring with Hepaticae (*Marchantia* sp.) about 10 m a. s. l. Clear water. pH 6.0.

Diatom Sample No. 527 (28/8 1952).

Moss with coating in running water.

Diatomaceous flora fairly poor in species (about 35). Dominant: *Diatomella balfouriana* (79.4 %). Common: *Nitzschia frustulum*. Fairly

common: *Pinnularia gracillima*, *P. viridis*. Centric forms: *Cyclotella comta*, very rare, *Melosira roeseana*, very rare, *Stephanodiscus astraeta*, very rare. Fairly rare form: *Navicula insociabilis*.

pH spectrum: acidophilous.....	0.6 % (3)
indifferent.....	85.4 % (17)
alkaliphilous.....	11.0 % (13)
?	3.0 % (3)

Spring in the Ravine Valley behind the Arctic Station, Godhavn.

Spring abounding in water, breaking forth from gneissic substratum. The water is clear. pH 6.7.

Diatom Sample No. 542 (29/8 1952).

Coatings on moss in running water about 3 m from the well-head.

Diatomaceous flora fairly rich in species (about 60). Dominants: *Meridion circulare* (26.0 %), *Fragilaria virescens* (22.8 %), and *Achnanthes lanceolata* (19.6 %). Common: *Fragilaria pinnata*. Fairly common: *Achnanthes linearis*, *Diatomella balfouriana*, *Fragilaria vaucheriae*, and *Tabel-laria flocculosa*. Centric forms: *Melosira roeseana*, not rare, *M. distans*, very rare. Fairly rare forms: *Navicula amygdalina*, *N. semen*, *Peronia heribaudi*, *Pinnularia lata*, and *Stauroneis javanica*.

pH spectrum: acidophilous.....	4.4 % (13)
indifferent.....	54.6 % (34)
alkaliphilous.....	41.0 % (13)
?	0.0 % (3)

The Qivítut Peninsula.

On the south side of Disko Fjord, 69°27' lat. N., 53°38' long. W., about 1.5 km in length from north to south and 1—1.2 km broad east—west. The surface consists of glaciated gneiss.

Fairly Large Lake on the Qivítut Peninsula.

On the east side of the lake there is a fairly large area overgrown with *Hippuris*. Along the shore of the lake there is an *Eriophorum* bog and heath with *Salix*, *Empetrum*, etc., and the bottom of the lake is covered by fine-grained sediments. On the west side the bottom is covered by pebbles and coarse gravel. On the south side there are several areas 2 × 4 sq.m in size with *Hippuris*. The water is quite clear. pH 7.4. Water sample: Qivítut 1.

Diatom Sample No. 81 (3/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) with mucilaginous coatings from the bottom of the sea near the shore, at a depth of about 20—30 cm, at the east shore.

Diatomaceous flora very rich in species (about 125). Dominant: *Nitzschia frustulum* (14.0 %). Common: *Achnanthes linearis*, *Fragilaria capucina*, *Nitzschia frustulum* var. *perpusilla*, *Tabellaria flocculosa*. Fairly common: *Achnanthes cryptocephala*, *Anomoeoneis exilis* var. *lanceolata*, *Cymbella ventricosa*, *Diatoma elongatum* var. *tenuis*, *Epithemia sorex*, *Fragilaria crotonensis*, *F. pinnata*, *Tabellaria fenestrata* var. *intermedia*. No centric forms. Fairly rare forms: *Caloneis clevei*, *Gomphonema subtile*, *Navicula clementis*, *N. clementioides*, *N. certa*, *N. subatomoides*, and *Stauroneis javanica*.

pH spectrum: acidophilous.....	13.2 % (21)
indifferent.....	40.0 % (43)
alkaliphilous.....	45.2 % (45)
?	1.6 % (14)

Spring on the Qivítut Peninsula.

The spring rises from a fairly large and old morainic bank with scattered vegetation of mosses and lichens on a north-facing basaltic mountain side. The substratum of the morainic bank is gneiss. Clear water. pH 6.7. Temperature at the well-head 1.3°C. About 100—150 m a. s. l.

Diatom Sample No. 86 (3/8 1952).

Mosses (*Philonotis caespitosa* Wils. and *Drepanocladus uncinatus* (Hedw.) Warnst.) with coatings in the outflow from the spring, about 15 m from the well-head.

Diatomaceous flora rather poor in species (about 35). Dominants: *Meridion circulare* (43.4 %), *Ceratoneis arcus* (16.8 %), and *Fragilaria vaucheriae* (15.6 %). Fairly common: *Navicula mutica* var. *gracilis*, *Nitzschia hantzschiana*, *N. mediocris*, *N. thermalis* var. *minor*, and *Stauroneis parvulum*. Centric form: *Melosira roeseana*, rare. Fairly rare forms: *Achnanthes fragilarioides*, *Caloneis clevei*, and *Navicula aboensis*.

pH spectrum: acidophilous.....	1.0 % (4)
indifferent.....	26.2 % (13)
alkaliphilous.....	67.6 % (7)
?	5.2 % (10)

Fairly Large Spring on the Qivítut Peninsula.

This spring rises from the same morainic bank as the preceding one, but about 10 m (vertically) below it. The water is clear. pH 6.5. Tem-

perature 1.3°C. The outflows from the two springs flow over a fairly large expanse with moss cushions and scattered growth of *Equisetum* and gradually disappear in an expanse with *Chamaenerium latifolium* vegetation between loose stones.

Diatom Sample No. 95 (3/8 1952).

Moss (*Calliergon stramineum* (Dicks.) Lindr.) with green algae in outflow from the spring.

Diatomaceous flora fairly poor in species (about 25). Dominants: *Meridion circulare* (52.0 %) and *Diatoma hiemale* var. *mesodon* (35.0 %). Fairly common: *Achnanthes kryophila*, *A. lanceolata*, and *Stauroneis anceps*. No centric and no fairly rare forms in the sample.

pH spectrum: acidophilous.....	0.4 % (2)
indifferent.....	10.0 % (14)
alkaliphilous.....	88.0 % (4)
?	1.6 % (7)

The diatomaceous flora from all the samples from springs is of a markedly alkaliphilous character.

Marshy Area on the Qivítut Peninsula.

On the east side of the peninsula there is a marshy area with *Eriophorum* and *Carex* tussocks with mosses between them. Small puddles with clear water all over the area. pH 6.3.

Diatom Sample No. 98 (3/8 1952).

Mosses with coatings from small puddle.

Diatomaceous flora not particularly rich in species (about 55). Dominants: *Tabellaria flocculosa* (20.6 %), *Achnanthes kryophila* (16.6 %), and *A. minutissima* (13.0 %). Common: *Cymbella incerta*. Fairly common: *Anomoeoneis serians* var. *brachysira*, *A. serians* var. *linearis*, *Caloneis silicula* var. *alpina*, *Cymbella aspera*, *C. spuria*, *Eunotia praeurupta*, *Fragilaria capucina*, *Neidium affine* var. *capitata*, *Pinnularia divergens*, and *P. hustedti*. Centric forms not found in the sample. Fairly rare forms: *Eunotia pseudopectinalis*, *Pinnularia episcopalis*, and *P. hustedti*.

pH spectrum: acidophilous.....	43.6 % (18)
indifferent.....	45.6 % (22)
alkaliphilous.....	9.2 % (9)
?	1.6 % (5)

Influence from the basaltic area can no more be traced. The pH spectrum is now of a distinctly acidophilous character in contradistinction to the three preceding samples.

IV. The Umanak Island.

Map: The Geodetic Institute: 70 V. 2 Umanak (1:250,000).

Island in the Umanak Fjord with the town Umanak. The greatest length of the island is about 7.5 km and the greatest breadth about 3 km.

Fairly Large Lake North of the Town of Umanak.

70°41' lat. N., 52°8' long. W. The length of the lake is about 700 m and its breadth about 200—250 m. The water is quite clear. pH 7.9. Water samples: Umanak 1.

Along the greater part of its circumference the lake is surrounded by very sparsely overgrown 10—30 m high mountain sides of gneiss. At the southern end of the lake there is a lower, boggy area. In shallow water in the lake there are a few *Hippuris* plants and some *Batrachium*.

Diatom Sample No. 130 (6/8 1952).

Green algae and "tufts" in shallow water at the southern end of the lake.

Diatomaceous flora rich in species (about 95). Dominants: *Fragilaria vaucheriae* (37.8 %) and *Diatoma elongatum* var. *tenuis* (15.0 %). Common: *Cyclotella stelligera*, *Nitzschia frustulum*. Fairly common: *Amphora veneta*, *Fragilaria virescens*, *Nitzschia palea*, and *Tabellaria flocculosa*. Centric form: *Cyclotella stelligera*, common. Fairly rare forms: *Achnanthes fragilarioides*, *Cymbella philadelphica*, *C. ventricosa* var. *groenlandica*, *Navicula accomoda*, *N. amphibola*, *N. clementis*, and *Stauroneis javanica*.

pH spectrum: acidophilous	6.2 % (18)
indifferent	17.6 % (37)
alkaliphilous	73.6 % (31)
?	2.6 % (8)

Pond near Umanak Town.

Shallow basin, about 50 × 30 m. Probably highly polluted by sewage from the near-by town. pH 9.0. Water sample: Umanak 2.

Diatom Sample No. 132 (6/8 1952).

Nostoc with coatings from shallow water at the shore of the pond.

Diatomaceous flora not particularly rich in species (about 50). Dominants: *Cymbella cesati* (44.0 %) and *Nitzschia palea* (19.4 %). Fairly common: *Achnanthes lanceolata*, *Amphora veneta*, *Fragilaria crotonensis*, *Nitzschia denticula*, *N. frustulum* var. *perminuta*, and *N. sp.* (Plate XVI, fig. 18). Centric forms: *Cyclotella comta*, very rare, *Melosira islandica*,

very rare, *M. italica* subsp. *subarctica*, not rare, *Stephanodiscus astraea*, rare. No fairly rare forms in the sample.

pH spectrum: acidophilous.....	0.4 ‰ (4)
indifferent.....	76.0 ‰ (21)
alkaliphilous.....	20.2 ‰ (23)
?	3.4 ‰ (2)

V. The Kangeq Peninsula.

Map: The Geodetic Institute: 72 V. 1 Upernavik (1:250,000).

Crater-Shaped Lake.

The lake is situated in the southern part of the Kaneq peninsula, 12 km ENE of Prøven. Position of the lake: 72°24' lat. N., 55°12' long. W. As measured on the map of the Geodetic Institute the longest diameter of the lake is about 600 m and the shortest about 500 m. The shores of the lake are firm mountain or very large blocks of scree. Outflow towards the SSW, through depression filled with very large blocks, to the sea, which is about 600 m from the lake. The water is very clear and light. Water sample: Kangeq 1.

Diatom Sample No. 300 (16/8 1952).

Moss (*Blindia acuta* (Hedw.) Br. & Sch.) on block at the water's edge.

Diatomaceous flora rich in species (about 80). Dominants: *Anomoeoneis exilis* var. *lanceolata* (36.0 ‰), *Navicula seminulum* var. *intermedia* (22.4 ‰), and *Tabellaria flocculosa* (12.8 ‰). Fairly common: *Anomoeoneis seriens* var. *brachysira*, *Fragilaria vaucheriae*, and *F. pinnata*. Centric forms: *Cyclotella kützingeriana* var. *planetophora*, not rare, *C. stelligera*, fairly rare, *Melosira distans*, fairly rare, *M. distans* var. *lirata*, not rare, *M. roeseana*, very rare. Fairly rare forms: *Achnanthes holsti*, *Eunotia pseudopectinalis*, *Navicula kotschyi*, *N. mediocris*, *Pinnularia divergentissima* var. *wulffii*.

pH spectrum: acidophilous.....	21.2 ‰ (31)
indifferent.....	67.6 ‰ (25)
alkaliphilous.....	10.2 ‰ (14)
?	1.0 ‰ (8)

Lake 2 near the Laksefjord (Eqaluarssuit).

Position of the lake: 72°29' lat. N., 55°0' long. W. Greatest length about 1 km (N—S) and greatest breadth about 500 m (E—W). Smallest distance from the shore (the south side of the Laksefjord) 750 m. The

water is very clear, light. pH 6.2. Water sample: Kangeq 2. The bottom of the lake is stoney or sandy.

Diatom Sample No. 307 (17/8 1952).

Coatings on the sandy bottom, at a depth of about 1 m.

Diatomaceous flora rich in species (about 80). Dominant: *Achnanthes kryophila* (10.8 %). Common: *Achnanthes didyma*, *A. levanderi*, *Fragilaria virescens*, *Melosira distans* var. *lirata*. Fairly common: *Achnanthes holsti*, *A. linearis*, *Cymbella broenlundensis*, *Anomoeoneis serians* var. *brachysira*, *Cymbella gracilis*, *Navicula seminulum* var. *intermedia*, *Nitzschia frustulum*, *N. palea*, *N. frustulum* var. *perminuta*, *N. sp.* (Plate XV, fig. 18), and *N. fonticola*. Centric forms: *Cyclotella kützingeriana* var. *planetophora*, not rare, *Melosira distans* var. *lirata*, common. Fairly rare forms: *Achnanthes didyma*, *A. holsti*, *A. levanderi*, *Cymbella broenlundensis*, and *C. gaeumanni*.

pH spectrum: acidophilous.....	23.2 % (21)
indifferent.....	57.8 % (34)
alkaliphilous.....	9.2 % (14)
?	9.8 % (11)

Lake 3 near the Laksefjord.

Lake 3 is situated about 500 m SE of Lake 2. Its surface is about 150 × 100 m.

The water is clear. pH 6.2. Water sample: Kangeq 3.

Diatom Sample No. 318 (17/8 1952).

Coatings on Sandy bottom, at a depth of about half a metre.

Diatomaceous flora rich in species (about 80). Dominants: *Tabelaria flocculosa* (20.4 %), *Nitzschia frustulum* (14.0 %), and *Anomoeoneis serians* var. *brachysira* (10.2 %). Common: *Anomoeoneis exilis* var. *lanceolata*, *A. zellensis* var. *linearis*, *Eunotia praeupta*, *Frustulia rhomboides* var. *saxonica*. Fairly common: *Cymbella cesati*, *Eunotia lapponica*, and *Nitzschia palea*. Centric form: *Melosira distans*, very rare. Fairly rare: *Achnanthes holsti*, *Cymbella ventricosa* var. *groenlandica*, and *Stauroneis javanica*.

pH spectrum: acidophilous.....	62.2 % (31)
indifferent.....	21.2 % (36)
alkaliphilous.....	15.8 % (12)
?	0.8 % (3)

Lake 4 (Pond) near the Laksefjord.

Size about 30 × 30 m and situated 600—700 m SE of Lake 2. The bottom is stony or sandy. The water is clear. Some growth of *Hippuris* scattered in the pond. pH 6.0. Water sample: Kangeq 4.

Diatom Sample No. 327 (17/8 1952).

Scrapings of stones at a depth of about $\frac{3}{4}$ m.

Diatomaceous flora not particularly rich in species (about 50). Dominants: *Anomoeoneis exilis* var. *lanceolata* (23.0 %), *A. serians* var. *brachysira* (22.2 %), and *A. zellensis* var. *linearis* (15.8 %). Common: *Eunotia praerupta*, *Frustulia rhomboides* var. *saxonica*, *Nitzschia frustulum*, *Tabellaria flocculosa*. Fairly common: *Navicula seminulum* var. *intermedia*, *Nitzschia palea*. Centric form: *Melosira distans*, very rare. Fairly rare form: *Cymbella lata*.

pH spectrum: acidophilous.....	59.6 % (20)
indifferent.....	33.8 % (16)
alkaliphilous.....	5.4 % (7)
?	1.2 % (5)

C. SEDIMENT AREAS

The Svartenhuk Peninsula.

Map: The Geodetic Institute: 71 V. 1 Svartenhuk (1:250,000).

Umíarfik.

Near the Umíarfik fjord on the NW side of the Svartenhuk peninsula there is a small sediment area around the river Simiútap kúa, 71°58' lat. N., 54°42' long. W.

Small Lake (Pond) near Umíarfik.

On the terraced expanse, 20—30 m a. s. l. at a distance from the coast of about 200—300 m there is a shallow lake with clear water. It is surrounded by heath with *Vaccinium*, *Empetrum*, and *Cassiope*. Along the shore there are *Carex* and *Eriophorum*, in some places along the shore there are bog and miry soil, in other places the bottom is stony. The water is clear. pH 7.3. Water sample: Umíarfik 1.

Diatom Sample No. 267 (14/8 1952).

Fluffy coatings on the bottom of the pond on coarse sand, at a depth of about 40—50 cm. Diatomaceous flora very rich in species (about 125). Dominants: *Fragilaria pinnata* (24.0 %) and *Nitzschia angusta* (12.4 %). Common: *Achnanthes linearis*. Fairly common: *Denticula tenuis*, *Navicula subatomoides*, *Nitzschia frustulum*, *N. frustulum* var. *perpusilla*, *N. frustulum* var. *perminuta*, and *N. hantzschiana*. Centric forms: *Cyclotella antiqua*, rare, *Melosira distans*, rare. Fairly rare forms: *Eunotia pseudopectinalis*, *Navicula certa*, *N. explanata*, *N. subatomoides*, *N. ventralis*, *Neidium distincte-punctatum*, and *Pinnularia brandelii*.

pH spectrum: acidophilous.....	9.2 % (27)
indifferent.....	34.0 % (50)
alkaliphilous.....	53.2 % (38)
?	3.6 % (10)

Lake on the Terrace near Umiarfik.

The open surface of the lake is about 300×150 m. It is situated on a terraced expanse about 30—40 m a. s. l. and about 1.2—1.4 km from the coast. It is completely surrounded by a moss and *Carex* bog, and the bottom of the lake is completely covered by moss. The water is clear. pH 9.0. Water sample: Umiarfik 2.

Diatom Sample No. 273 (15/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) with brown coatings near the water's edge.

Diatomaceous flora rich in species (about 90). Dominants: *Diatoma elongatum* (13.0 %), *Nitzschia denticula* (12.0 %), and *Tabellaria fenestrata* (11.6 %). Fairly common: *Anomoeoneis exilis*, *A. exilis* var. *lanceolata*, *Denticulata tenuis*, *Epithemia sorex*, *Fragilaria capucina*, *F. construens*, *F. pinnata*, *Nitzschia fonticola*, *N. frustulum* var. *perminuta*. Centric form: *Cyclotella antiqua*, not rare. Fairly rare forms: *Navicula explanata* and *N. semen*.

pH spectrum: acidophilous.....	6.8 % (16)
indifferent.....	34.0 % (34)
alkaliphilous.....	56.4 % (36)
?	2.8 % (6)

Bog on the Terraced Expanse.

The bog is covered with mosses, *Carex*, and *Eriophorum*. A thick layer of brown mire with Cyanophyceae on a substratum which is plane rock. The thickness of the bog and mire is about $\frac{1}{2}$ — $\frac{3}{4}$ m. There are a few specimens of *Branchinecta paludosa*, many *Ostacoda*, and numerous specimens of *Colymbetes dolabratus* in the water. Water sample: Umiarfik 3.

Diatom Sample No. 286 (15/8 1952).

Brown mire from an area with an open surface of the water.

Diatomaceous flora not particularly rich in species (about 45). Dominants: *Nitzschia denticula* (60.6 %) and *Tabellaria fenestrata* (10.0 %). Common: *Anomoeoneis zellensis* var. *linearis*. Fairly common: *Cymbella angusta*, *C. cesati*, and *Denticula tenuis*. Centric form: *Cyclotella antiqua*, rare. Fairly rare form: *Navicula naumanni*.

pH spectrum: acidophilous	11.0 % (14)
indifferent	17.8 % (9)
alkaliphilous	69.2 % (15)
?	2.0 % (5)

Umîvik Bay.

Small sediment area around the lower reaches of the river Usuit kûat on the east side of the Svartenhuk peninsula. 71°37' lat. N., 54°41' long. W.

Pond near Umîvik Bay.

The pond is surrounded by a moss-bog for about $\frac{3}{4}$ of its circumference, along the rest there is *Carex* and *Eriophorum* marsh. The distance from the coast is about 3 km. The open surface of the water is about 50 × 30 m at an altitude of about 30—40 m a. s. l. pH 8.5.

Growth of *Hippuris* on about 20 × 15 sq.m in the marsh.

Diatom Sample No. 167 (8/8 1952).

Moss (*Drepanocladus exannulatus* (Gumb.) Warnst.) with brown coatings.

Diatomaceous flora fairly rich in species (about 70). Dominants: *Synedra ulna* (32.6 %), *Diatomella balfouriana* (11.0 %), and *Achnanthes kryophila* (10.0 %). Common: *Meridion circulare*, *Nitzschia denticula*, *N. palea*. Fairly common: *Achnanthes minutissima* var. *cryptocephala*, *Ceratoneis arcus*, *Pinnularia balfouriana*, and *Tabellaria flocculosa*. No centric forms in the sample. Fairly rare forms: *Amphora obscura*, *A. triundulata*, *Cymbella latens* (only *C.* species in the sample and very rare), *Navicula fossalis*.

pH spectrum: acidophilous	2.6 % (9)
indifferent	34.4 % (31)
alkaliphilous	62.4 % (25)
?	0.6 % (4)

SYSTEMATIC SECTION

Many species of diatoms have so wide a range of variation that an unambiguous determination of them can be very difficult. As in my two previous papers on Greenland diatoms (FOGED 1953 and FOGED 1955) it is therefore in the case of each single species indicated according to which description and picture the determination has been made. If it has not been possible to refer a species to forms already described, it has, like species which with fair certainty must be considered new species, been pictured on the plates at the end of this paper. When using the present paper it must therefore be recommended always to compare text and plates. In order to facilitate the survey of the occurrence of the various species in Greenland, as it appears from my investigations, it is indicated in the text for each single species whether it has been shown to occur in West Greenland (FOGED 1953) by W. Gr. and in Peary Land (FOGED 1955) by Pearyld. Species which have been found in the material of diatoms treated in the two papers mentioned above, but not found in the samples analyzed here, have been mentioned in the text, but always in parenthesis.

At the treatment of the individual species their occurrence in the samples is indicated in the following succession: "Basalt", including finds from the basalt areas, "Gneiss", finds from the gneissic area, and "Sediment", finds from the sediment areas. The following abbreviations for names of localities have been used: D (Disko island), N (Nûgssuaq peninsula), S (Svartenhuk peninsula), E (Egedesminde Island), C (the Christianshaab region), U (Umanak island), K (Kangeq peninsula), and DQ (the Qivîitut peninsula on Disko island).

The percentages stated indicate the frequency of the species in the sample calculated on the basis of counting of 500 valves in the sample. Where no percentage is stated, the species has been found in the sample after counting up to 500 valves at the continued analysis of the sample. The place of the individual species in the pH system is indicated. The systematic placing of the species is in the main the same as that used by F. HUSTEDT 1930 and 1930—37.

A. Centrales.

Coscinodiscaceae.

Melosira Agardh.

Melosira ambigua (Grun.) O. Müller. HUSTEDT 1930—37, I, p. 256. Fig. 108.

Basalt: D: 430.

pH: indifferent. Pearyld: fairly rare.

— *distans* (Ehr.) Kütz. HUSTEDT 1930—37, I, p. 262, fig. 110.

Basalt: D: 71 (0.4 ‰), 74, 547. S: 245, 242 (5.0 ‰).

Gneiss: C: 560. D: 33 (0.2 ‰), 45, 48 (1.0 ‰), 469 (0.4 ‰), 491, 542 (0.4 ‰). U: 132 (0.4 ‰). K: 300 (0.8 ‰), 318, 327.

Sediment: 267 (0.4 ‰).

pH: acidophilous. W.Gr.: not common. Pearyld: rare.

— var. *alpigena* Grun. HUSTEDT 1930—37, I, p. 263, fig. 110 g.

Basalt: S: 242 (6.6 ‰).

pH: acidophilous.

— var. *lirata* (Ehr.) Bethge. HUSTEDT 1930—37, I, p. 264, figs. 111 a—c.

Gneiss: E: 20 (1.2 ‰), 28 (0.8 ‰), 32 (1.6 ‰). C: 558. K: 300 (1.6 ‰), 307 (8.8 ‰).

pH: acidophilous. W.Gr.: rare.

— *granulata* (Ehr.) Ralfs. HUSTEDT 1930—37, I, p. 248, figs. 104 a—c.

Basalt: D: 430.

pH: alkaliphilous.

— *islandica* O. Müller. HUSTEDT 1930—37, I, p. 252, fig. 106.

Gneiss: C: 558. U: 132 (0.2 ‰).

pH: alkaliphilous. Pearyld: fairly rare.

— *italica* (Ehr.) Kütz. HUSTEDT 1930, p. 91, fig. 50.

Gneiss: K: 300 (0.2 ‰).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

— subsp. *subarctica* O. Müller. HUSTEDT 1930, p. 91, fig. 52.

Basalt: S: 232.

Gneiss: U: 132 (1.2 ‰).

pH: alkaliphilous. W.Gr.: rare.

— *roeseana* Rabh. HUSTEDT 1930, p. 93, fig. 59.

Basalt: D: 62 (0.2 ‰), 107 (0.2 ‰), 109, 108 (1.0 ‰), 438, 547 (1.2 ‰). S: 193, 221, 213 (0.2 ‰).

Gneiss: D: 48 (0.2 ‰), 524 (2.6 ‰), 527, 542 (1.2 ‰). DQ: 86 (0.2 ‰). K: 300.

pH: indifferent. W.Gr.: not common. Pearyld: rather common.

(— *sulcata* (Ehr.) Kütz. Euhalobous. W.Gr.).

— *varians* Agardh. HUSTEDT 1930—37, I, p. 240, fig. 100.

Gneiss: E: 8.

pH: alkaliphilous.

Cyclotella Kütz.

Cyclotella antiqua Kütz. HUSTEDT 1930, p. 102, fig. 75.

Basalt: N: 350 (0.4 ‰), 354 (0.4 ‰), 361, 358 (3.8 ‰), 372, 343, 642 (1.0 ‰). S: 205.

Gneiss: C: 558 (0.2 ‰). D: 38.

Sediment: S: 267 (0.8 ‰), 273 (1.0 ‰), 281 (0.4 ‰), 167 (2.0 ‰).

pH: acidophilous. W.Gr.: rare. Pearyld: common.

Cyclotella comta (Ehr.) Kütz. HUSTEDT 1930, p. 103, fig. 69.

Basalt: D: 430.

Gneiss: D: 496, 527. U: 132 (0.2 %).

pH: indifferent. W.Gr.: rare. Pearyld: fairly rare.

(— — var. *oligactis* (Ehr.) Grun. W.Gr.: rare).

— *kützingiana* Thwaites. HUSTEDT 1930, p. 99, fig. 63.

Gneiss: 32 (0.8 %), C: 549.

pH: indifferent. Pearyld: rare.

— — var. *planetophora* Fricke. HUSTEDT 1930, p. 99, fig. 63.

Gneiss: E: 32. C: 555 (0.4 %), 558, 560 (0.2 %), 561 (0.2 %). U: 132. K: 300 (1.8 %), 307 (1.0 %).

pH: indifferent. Pearyld: rare.

— — var. *radiosa* Fricke. HUSTEDT 1930, p. 99, fig. 64.

Gneiss: E: 32. C: 549 (0.4 %), 558 (0.2 %), 560 (0.2 %).

pH: indifferent. W.Gr.: rare. Pearyld: rare.

— *meneghiniana* Kütz. HUSTEDT 1930, p. 100, fig. 67.

Gneiss: C: 558.

pH: alkaliphilous.

— *ocellata* Pant. HUSTEDT 1930—37, II, p. 340, fig. 172.

Gneiss: C: 558 (0.4 %), 560 (0.4 %), 561 (0.6 %).

pH: alkaliphilous.

— *stelligera* Cleve & Grunow. HUSTEDT 1930, p. 100, fig. 65.

Gneiss: E: 32 (2.8 %). C: 549. U: 130 (6.4 %). K: 300 (0.8 %).

pH: indifferent. Pearyld: scarce.

Stephanodiscus Ehr.

Stephanodiscus astraea (Ehr.) Grun. HUSTEDT 1930, p. 110, fig. 85.

Gneiss: E: 20. C: 560. D: 527. U: 142 (0.4 %).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

(— — var. *minutula* (Kütz.) Grun. Pearyld: rare).

— *dubius* (Fricke) Hustedt. HUSTEDT 1930, p. 109, fig. 84.

— Gneiss: C: 558.

pH: alkaliphilous.

(— *hantzschii* Grun. Pearyld: rare).

(*Coscinodiscus excentricus* Hustedt. Euhalobous. W.Gr.: rare).

(*Actinocyclus curvatulus* Janisch. Euhalobous. W.Gr.: rare).

B. Pennales.

I. Araphideae.

Tabellaria Ehr.

Tabellaria fenestrata (Lyngb.) Kütz. HUSTEDT 1930, p. 122, fig. 99.

Basalt: D: 430 (3.0 %), 431, 434 (2.4 %). N: 354, 361 (0.2 %), 372, 642 (20.6 %).

S: 205 (1.0 %), 206, 245 (0.6 %), 242 (1.6 %), 232 (0.2 %).

Gneiss: E: 8, 28 (3.2 %), 32 (0.6 %). C: 549, 558. D: 33 (0.2 %), 38 (3.8 %),

45 (1.0 %), 454 (0.4 %), 469 (1.0 %), 476 (1.2 %), 479 (0.2 %), 496, 452 (1.2 %).

DQ: 81 (1.8 %), 98. K: 307, 318.

Sediment: S: 267 (1.2 %), 273 (11.6 %), 286 (10.0 %), 167 (2.6 %).

pH: indifferent. W.Gr.: common. Pearyld: common.

— — var. *intermedia* Grun. HUSTEDT 1930—37, II, p. 27, fig. 555.

Basalt: N: 350 (0.6 %), 354, 642 (1.2 %). S: 205 (0.4 %), 245, 242, 232 (0.8 %).

Gneiss: E: 32 (0.2 %), C: 555 (0.2 %), 560, 572 (0.6 %). D: 476. DQ: 81 (2.0 %).
Sediment: S: 267, 273, 286 (0.4 %), 167 (0.2 %).

pH: acidophilous. W.Gr.: common. Pearyld: rather common.

Tabellaria flocculosa (Roth.) Kütz. HUSTEDT 1930, p. 123, fig. 101.

Basalt: D: 69 (2.0 %), 71 (0.2 %), 74 (0.2 %), 107, 109, 430, 431 (3.8 %), 438, 547, 434. N: 350 (2.8 %), 354 (0.2 %), 361 (3.2 %), 358 (0.2 %), 642 (0.2 %).
S: 193, 195, 221 (1.0 %), 213 (0.2 %), 184 (3.6 %), 191, 205 (0.8 %), 206, 245 (0.6 %), 242 (1.8 %), 232 (13.4 %).

Gneiss: E: 8 (5.8 %), 20 (8.2 %), 28 (37.8 %), 32 (7.8 %). C: 549 (29.6 %), 555 (36.0 %), 558 (23.4 %), 560 (1.4 %), 561 (0.4 %), 567 (26.4 %), 572 (13.0 %).
D: 33 (1.4 %), 38 (2.2 %), 45 (1.0 %), 48, 454 (50.6 %), 462 (6.0 %), 469 (10.0 %), 476 (2.6 %), 479 (1.0 %), 491, 496 (0.2 %), 524, 542 (2.6 %), 452 (33.6 %).
DQ: 81 (9.2 %), 95 (0.2 %), 98 (20.6 %). U: 130 (3.8 %), 132. K: 300 (12.8 %), 307 (0.6 %), 318 (20.4 %), 327 (6.2 %).

Sediment: S: 267 (1.4 %), 273 (0.4 %), 286, 167.

pH: acidophilous. W.Gr.: common. Pearyld: rather common.

Meridion Ag.

Meridion circulare Ag. HUSTEDT 1930, p. 130, fig. 118.

Basalt: D: 62 (18.4 %), 69 (17.0 %), 71 (49.0 %), 74 (9.4 %), 500, 107 (40.8 %), 109, 108 (37.4 %), 103 (18.0 %), 438 (47.0 %), 547. N: 350, 354, 358, 395 (11.4 %), 382 (33.8 %), 397 (22.0 %), 343. S: 193 (32.0 %), 195 (17.2 %), 221, 213, 184 (6.4 %), 191 (31.2 %), 205, 206, 245 (0.2 %), 242, 232 (0.4 %).

Gneiss: C: 572. D: 33 (0.8 %), 45 (0.2 %), 48 (5.2 %), 462, 469, 479 (0.2 %), 491 (11.0 %), 496 (0.8 %), 524 (12.8 %), 527 (1.0 %), 542 (26.0 %). DQ: 86 (43.4 %), 95 (52.0 %), 98 (0.4 %). U: 130 (0.4 %), 132 (0.8 %). K: 300.

Sediment: S: 273, 167.

pH: alkaliphilous. W.Gr.: common. Pearyld: common.

— — var. *constricta* (Ralfs) van Heurck. HUSTEDT 1930, p. 131, fig. 119.

Basalt: D: 69 (0.2 %). S: 184.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

(*Licmophora gracilis* (Ehr.) Grun. var. *anglica* (Kütz.) Perag. W.Gr.: rare. Euhalobous).

Diatoma De Candolle.

Diatoma elongatum Ag. HUSTEDT 1930, p. 127, fig. 11.

Gneiss: C: 561 (29.4 %). U: 132 (0.2 %).

Sediment: S: 273 (13.0 %), 286 (0.4 %).

pH: alkaliphilous. W.Gr.: common.

— — var. *tenuis* (Ag.) van Heurck. HUSTEDT 1930—37, I, p. 10, figs. 629 d—g.

Basalt: S: 221 (0.2 %), 205 (0.2 %).

Gneiss: C: 560 (3.0 %), 572 (0.2 %). D: 479 (0.2 %). DQ: 81 (3.6 %). U: 130 (15.0 %), 132 (1.0 %).

pH: alkaliphilous. W.Gr.: common.

— *hiemale* (Lyngbye) Heiberg var. *mesodon* (Ehr.) Grun. HUSTEDT 1930, p. 129, fig. 116.

Basalt: D: 71 (0.8 %), 74 (1.4 %), 438 (4.4 %). N: 397. S: 193 (0.6 %), 195 (2.6 %), 221.

Gneiss: D: 45 (1.0 %), 48 (7.0 %), 479, 491 (0.4 %), 496 (1.2 %), 524 (21.8 %), 527, 542 (1.8 %). DQ: 95 (35.0 %), 98. U: 132 (0.8 %).

pH: alkaliphilous.

Diatoma vulgare Bory. HUSTEDT 1930, p. 127, fig. 103.

Gneiss: D: 527.

pH: alkaliphilous.

(*Plagiogramma staurophorum* (Greg.) Heiberg. Euhalobous. W.Gr.: rare).

Opephora Petit.

Opephora martyi Héribaude. HUSTEDT 1930, p. 132, fig. 120.

Basalt: D: 430 (2.0 %), 431 (3.8 %), 434 (2.2 %). N: 350 (2.6 %). S: 205 (0.8 %), 206 (2.8 %), 245 (3.2 %).

Gneiss: C: 561. DQ: 81 (1.4 %).

Sediment: S: 267 (1.6 %), 273 (1.0 %).

pH: alkaliphilous.

Ceratoneis Ehr.

Ceratoneis arcus (Ehr.) Kütz. HUSTEDT 1930—37, I, p. 179, figs. 684 a, b.

Basalt: D: 62 (5.2 %), 69 (1.6 %), 71 (0.4 %), 74 (0.2 %), 107 (26.6 %), 109, 108 (3.8 %), 103 (0.2 %). N: 395 (9.0 %), 382 (0.2 %), 397 (28.2 %). S: 193 (28.8 %), 195 (16.2 %), 221, 184 (3.6 %), 191 (15.6 %), 245.

Gneiss: C: 561, 572. D: 45, 48 (1.6 %), 524, 542 (1.4 %). DQ: 86 (16.8 %), 95 (1.4 %). U: 130, 132 (0.8 %). K: 318.

Sediment: S: 273, 167.

pH: indifferent. W.Gr.: not common. Pearyld: very common.

— var. *amphioxys* (Rabh.) Grun. HUSTEDT 1930—37, II, p. 179, fig. 684 d.

Basalt: D: 62 (0.4 %), 69, 74 (0.4 %), 107 (3.0 %), 108. N: 397. S: 193, 195, 191 (0.8 %).

Gneiss: D: 45, 48, 524 (0.2 %), 527, 542 (0.4 %). DQ: 95.

pH: indifferent. Pearyld: not rare.

— var. *linearis* Holmboe. HUSTEDT 1930, p. 135, fig. 124.

Basalt: D: 107 (0.4 %). S: 191.

Gneiss: D: 542.

pH: indifferent. W.Gr.: rather common.

Fragilaria Lyngbye.

Fragilaria brevistriata Grun. HUSTEDT 1930—37, II, p. 168, figs. 676 a—e. FOGED 1955, p. 32, Pl. 1, fig. 13.

Basalt: D: 431 (3.6 %).

Sediment: S: 273.

pH: alkaliphilous. W.Gr.: not common. Pearyld: fairly rare.

— *capitellata* (Grun.) Boye Petersen. BOYE PETERSEN 1946, p. 54, fig. 4.

Gneiss: D: 45 (0.4 %), 48 (3.4 %).

pH: ?. W.Gr.: rare. Pearyld: common.

— *capucina* Desmazieres. HUSTEDT 1930—37, II, p. 144, figs. 659 a—c. FOGED 1955, p. 32, Pl. 1, figs. 3, 4.

Basalt: D: 71, 430 (1.8 %), 431 (1.2 %), 438, 434 (1.2 %). N: 350 (6.2 %), 354 (0.2 %). S: 221 (1.4 %), 213 (3.0 %), 205 (0.4 %), 206, 245 (3.4 %), 242 (1.0 %), 232 (0.8 %).

Gneiss: E: 20 (0.4 %), 28 (0.2 %), 32 (0.8 %). C: 549. D: 48 (4.2 %), 476, 479 (3.0 %), 496 (8.0 %), 542 (0.8 %), 452 (0.6 %). DQ: 81 (7.4 %), 98 (2.0 %).

U: 132 (1.4 %). K: 300 (1.2 %), 327.

Sediment: S: 267 (0.2 %), 273 (2.6 %), 167 (5.6 %).

pH: alkaliphilous. W.Gr.: common. Pearyld: very common.

Plate I, fig. 3: $36 \times 2 \mu$. 18 striae in 10μ .

The usual number of striae in 10μ is 15, but the species not rarely occurs with a somewhat larger number. This form was found to occur with 1% in No. 130 (Gneiss: U).

Fragilaria capucina var. *lanceolata* Grun. HUSTEDT 1930, p. 138, fig. 127. 1930—37, II, figs. 659 f, g. FOGED 1955, p. 33, Pl. 1, fig. 1.

Plate I, fig. 5: $32 \times 2.2 \mu$. 18 striae in 10μ .

Gneiss: C: 549 (0.8%).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather common.

— *construens* (Ehr.) Grun. HUSTEDT 1930—37, II, p. 156, figs. 670 a—c. FOGED 1955, p. 33, Pl. 1, figs. 17, 18.

Basalt: D: 430 (14.6%), 431 (29.8%), 434 (11.0%). S: 221 (1.2%), 213, 206 (27.2%), 245 (24.4%), 232 (0.8%).

Gneiss: E: 32 (0.8%). C: 572. U: 132 (2.2%). K: 307.

Sediment: S: 267 (1.2%), 273 (2.4%).

pH: alkaliphilous. W.Gr.: not common. Pearyld: rather common.

Plate I, fig. 4: $14.7 \times 6.7 \mu$. 15 striae in 10μ .

The midmost striae are characteristic by being provided with rows of pores (lineolate). Valves otherwise in accordance with the species. I have observed the same type of valve with lineolate mid-striae to be common in material from the Faroe Islands (from 1954, not publ.).

— var. *binodis* (Ehr.) Grun. HUSTEDT 1930—37, II, p. 158, figs. 670 d—g.

Basalt: D: 74 (37.0%), 434 (0.2%).

pH: alkaliphilous.

— var. *subsalina* Hustedt. HUSTEDT 1930—37, II, p. 159, figs. 670 p—s.

Sediment: S: 273 (0.4%).

pH: alkaliphilous. Pearyld: rare.

— var. *venter* (Ehr.) Grun. HUSTEDT 1930—37, II, p. 158, figs. 670 h—m.

Basalt: D: 430 (0.2%), 434. S: 245 (1.8%).

Gneiss: K: 300 (1.2%).

Sediment: S: 273 (0.8%).

pH: alkaliphilous. Pearyld: not rare.

— *crotonensis* Kitton. HUSTEDT 1930—37, II, p. 143, fig. 658.

Basalt: N: 350 (1.4%), 361 (3.2%).

Gneiss: E: 28. DQ: 81 (2.2%).

pH: alkaliphilous. W.Gr.: rare.

— *inflata* (Heid.) Hustedt. HUSTEDT 1930—37, II, p. 155, figs. 669 a, d, f—i.

Basalt: S: 245.

pH: alkaliphilous.

— var. *istvanffy* (Pant.) Hustedt. HUSTEDT 1930—37, II, p. 156, figs. 669 c, e, k.

Basalt: D: 434.

pH: alkaliphilous.

— *lapponica* Grun. HUSTEDT 1930—37, II, p. 170, fig. 678.

Basalt: D: 430 (0.8%), 431 (2.8%). S: 184 (0.2%), 191, 205 (1.8%).

pH: ? W.Gr.: rare.

— *pinnata* Ehr. HUSTEDT 1930—37, II, p. 160, figs. 671 a—i; FOGED 1955, p. 33, Pl. 1, fig. 22.

Basalt: D: 74 (11.2%), 430 (12.6%), 431 (20.0%), 434 (7.4%). N: 350 (8.0%), 354 (0.2%), 361 (0.2%), 358, 372 (0.8%), 642. S: 193 (0.8%), 221 (25.4%), 213 (20.2%), 205, 206 (8.0%), 245 (25.4%), 242 (0.6%), 232 (3.8%).

Gneiss: E: 32 (0.6 %). C: 572. D: 479 (5.6 %), 496, 524 (0.2 %), 527, 542 (6.2 %). DQ: 81 (3.4 %). K: 300 (2.6 %).

Sediment: S: 267 (24.0 %), 273 (3.4 %), 167 (2.0 %).

pH: alkaliphilous. W.Gr.: not common. Pearyld: common.

Fragilaria vaucheriae (Kütz.) Boye Petersen. BOYE PETERSEN 1938, p. 167, fig. 1. FOGED 1955, p. 33, Pl. 1, figs. 6, 7, 8, 11.

Basalt: D: 62 (0.6 %), 69 (6.4 %), 74 (2.2 %), 430 (0.2 %), 431 (0.2 %). N: 350 (1.0 %), 372, 395 (6.8 %). S: 193 (13.8 %), 195 (3.4 %), 221 (0.4 %), 213 (3.6 %), 191 (8.2 %), 205 (1.2 %), 245 (0.4 %), 242 (0.2 %), 232 (0.4 %).

Gneiss: E: 32 (0.4 %). C: 572 (2.6 %). D: 479 (1.8 %), 542 (3.0 %). DQ: 81 (0.2 %), 86 (15.6 %), 95 (1.0 %). U: 130 (37.8 %), 132 (0.2 %). K: 300 (2.0 %).

Sediment: S: 267 (1.4 %), 167 (0.4 %).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: very common.

Plate I, fig. 6: $20.6 \times 3.6 \mu$. 15 striae in 10μ .

This form is almost identical with BOYE PETERSEN 1938, p. 168, fig. 1 a ($13.4-38.4 \times 3.5-4.7 \mu$. 5 striae in 10μ).

— — var. *capitellata*.

Basalt: N: 395 (2.6 %). S: 195 (1.8 %), 191 (3.2 %).

pH: alkaliphilous.

— *virescens* Ralfs. HUSTEDT 1930—37, II, p. 162, figs. 672 A a, b.

Basalt: D: 430 (0.2 %), 431, 547 (0.6 %), 434 (0.2 %). S: 193, 195.

Gneiss: E: 28 (1.2 %). C: 549 (4.2 %), 558 (0.2 %), 560 (38.0 %), 561 (4.4 %), 572 (4.8 %). D: 33 (0.6 %), 45 (6.8 %), 462 (15.6 %), 469 (25.6 %), 491 (28.6 %), 524, 542 (22.8 %), 452 (1.0 %). U: 130 (2.0 %). K: 300 (1.2 %), 307 (6.8 %), 318 (0.2 %), 327 (0.8 %).

pH: indifferent. W.Gr.: rare. Pearyld: fairly rare.

— — var. *elliptica* Hustedt. HUSTEDT 1930—37, II, p. 163, fig. 672 A e. FOGED 1953, p. 29, Pl. 1, fig. 13.

Gneiss: D: 469 (0.2 %).

pH: indifferent. W.Gr.: rare. Pearyld: fairly rare.

— *virescens* var. *subsalina* Grun. HUSTEDT 1930—37, II, p. 164, figs. 672 A g, h.

Basalt: D: 434. S: 206.

Gneiss: E: 8 (1.4 %), 20 (9.4 %), 28 (8.4 %), 32 (5.4 %). C: 560. D: 476 (12.8 %), 479 (12.8 %). DQ: 81 (1.0 %). U: 132 (1.2 %).

pH: ?

(— *capitellata* var. *petersenii* Foged. W.Gr.: rather common).

(— *capucina* var. *lanceolata* Grun. Pearyld: common).

(— *constricta* Ehr. W.Gr.: rare).

(— *construens* var. *exigua* (W. Smith) Schultz. Pearyld: rare).

(— — var. *lancettula* (Schum.) Hustedt. Pearyld: rare).

(— *vaucheriae* var. *septentrionalis* Østrup. Pearyld: rare).

(— *virescens* var. *elliptica* Hustedt. W.Gr.: rare. Pearyld: fairly rare).

Synedra Ehr.

Synedra acus Kütz. HUSTEDT 1930, p. 155, fig. 170.

Basalt: S: 205, 245.

pH: alkaliphilous. W.Gr.: rather common.

(— — var. *radians* (Kütz.) Hustedt. W.Gr.: rare).

(— *amphicephala* Kütz. W.Gr.: rare).

(— *formosa* Hantzsch. Euhalobous. W.Gr.: rare).

- (*Synedra investiens* W. Smith. Euhalobous. W.Gr.: rare).
 (— *montana* Krasske. W.Gr.: rare).
 (— *minuscule* Grun. Pearyld: rather common).
 (— *nana* Meister. Pearyld: rare).
 — *parasitica* (W. Smith) Hustedt. HUSTEDT 1930—37, II, p. 204, figs. 695 a, b.
 Plate I, fig. 7: $7.5 \times 3.3 \mu$. 20—21 striae in 10μ .
 This form has shorter and denser striae than usual in the species.
 According to HUSTEDT 1930—37, II, p. 205, it has the "Pseudoraphe schmal lanzettlich" and the number of striae 16—19 in 10μ .
 Basalt: S: 255.
 — *pulchella* Kütz. HUSTEDT 1930, p. 160, fig. 187.
 Gneiss: C: 558, 561.
 pH: alkaliphilous. W.Gr.: common.
 — *rosenkrantzii* nov. spec.
 Valva linearis, ad apices versus parum producta, subcapitata, 57μ longa, 3μ lata. Striae transapicales 13 in 10μ , pororum serie manifestorum interruptae. Area axialis angusta, centralis striis transapicalibus destituta vel minime manifestis ornata. Tab. I, fig. 1. Hab. in aqua dulci Groenlandiae occidentalis.
 Valve linear, towards the apices somewhat extended, slightly capitate. 57μ long, 3μ broad. 13 transapical striae in 10μ with distinct row of pores. Narrow axial area. Central area with very indistinct transapical striae.
 Plate I, fig. 1: $57.3 \times 3.0 \mu$. 13 striae in 10μ .
 Freshwater. W.Gr.
 Named after the Chief of the Geological Expedition to North Greenland in 1952, Professor A. ROSENKRANTZ.
 Gneiss: C: 558, 560 (17.0 %), 561 (9.6 %).
 (— *rumpens* Kütz. W.Gr.: rather common).
 (— — var. *fragilarioides* Grun. W.Gr.: rare).
 — *tabulata* (Ag.) Kütz. HUSTEDT 1930, p. 159, fig. 184.
 Gneiss: C: 558, 572.
 pH: alkaliphilous. W.Gr.: rather common.
 (— *tenera* W. Smith. W.Gr.: rather common).
 — *ulna* (Nitzsch) Ehr. HUSTEDT 1930, p. 151, figs. 158, 159.
 Basalt: D: 109, 103, 430 (4.2 %), 431 (0.6 %), 434 (1.4 %). N: 350 (0.2 %), 354, 361 (1.4 %), 358, 395 (11.8 %), 382 (0.2 %), 397 (0.8 %), 642. S: 193 (0.2 %), 195, 221, 213 (0.2 %), 184 (32.6 %), 205, 245.
 Gneiss: D: 45 (0.2 %), 48 (0.6 %), 524 (6.6 %), 527 (0.6 %). U: 132.
 Sediment: S: 273 (0.2 %), 286, 167 (0.2 %).
 pH: alkaliphilous. W.Gr.: rather common. Pearyld: rare.
 — — var. *abiskoensis* Foged. HUSTEDT 1944, p. 92, fig. 1b.
 Basalt: N: 538. S: 221.
 pH: alkaliphilous. W.Gr.: rare.
 — — var. *aequalis* (Kütz.) Hustedt. HUSTEDT 1930, p. 152, fig. 164.
 Basalt: D: 431. S: 184.
 pH: alkaliphilous. W.Gr.: fairly rare.
 (— — var. *amphirhynchus* (Ehr.) Grun. Pearyld: rare).
 (— — var. *biceps* (Kütz.) v. Schönfeldt. Pearyld: rare).
 — sp.
 Plate I, fig. 2: $47 \times 1.4 \mu$. 21—22 striae in 10μ .
 Striae in the middle of the valve just as distinct as the others. There is some similarity to *Fragilaria capucina* var. *lanceolata*, but this form as a rule has

only about 15 striae in 10μ , and striae in the middle of the valve are discontinued or at least more indistinct. I: 2 is rather a *Synedra* species near *S. tenera* W. Smith, the apices of which, however, are said to be "ziemlich spitz gerundet", or related to *S. nana* Meister, which, however, has considerably denser striae (25—30 in 10μ).

Basalt: S: 184 (1.2 ‰), 242 (0.4 ‰), 642 (0.8 ‰), 273 (1.2 ‰), 286 (1.2 ‰), 167 (1.0 ‰).

Gneiss: E: 32 (0.4 ‰).

II. Raphidioideae.

Peronia Bréb. & Arnott.

Peronia heribaudi Brun & Peragallo. HUSTEDT 1930, p. 166, fig. 302.

Gneiss: E: 8, 28. D: 454 (0.4 ‰), 462 (0.4 ‰), 542.

pH: indifferent.

- var. *laticeps* A. Cleve-Euler. A. CLEVE-EULER, 1953, II, p. 133, figs. 481 a—g. pH: indifferent.

Plate I, fig. 8: $45.3 \times 3.4\mu$. 15—16 striae in 10μ .

Besides the typical *P. heribaudi*, which is "am Kopfpol plötzlich verschmält und breit gerundet" (HUSTEDT 1930—37, II, p. 263), this capitate form occurs with the same number of striae as the species. It seems to be identical with var. *laticeps* A. Cleve-Euler from Sweden.

Gneiss: E: 32. D: 469, 452 (2.6 ‰).

Eunotia Ehr.

Eunotia alpina (Naeg.) Hustedt. HUSTEDT 1930—37, II, p. 304, fig. 770.

Gneiss: E: 28 (1.0 ‰). C: 549, 572 (0.2 ‰).

pH: acidophilous. W.Gr.: not rare.

- *arcus* Ehr. HUSTEDT 1930, p. 175, fig. 216. FOGED 1953, p. 31, Pl. 1, figs. 18, 20. Basalt: D: 430, 431 (0.2 ‰). N: 361, 642. S: 245, 242.

Gneiss: E: 8 (0.6 ‰), 20 (0.4 ‰), 32 (0.2 ‰). C: 549, 555 (2.2 ‰), 558, 567. D: 33, 38, 45 (0.2 ‰), 48, 454 (0.2 ‰), 462 (0.2 ‰), 469 (0.2 ‰), 476 (0.2 ‰), 479, 452 (0.2 ‰). DQ: 81, 98. K: 300, 307, 327.

Sediment: S: 267, 273, 286 (0.2 ‰).

pH: indifferent. W.Gr.: rare. Pearyld: common.

Plate III, fig. 5: $32 \times 8\mu$. 12 striae in 10μ .

In A. SCHMIDT's Atlas Pl. 244, fig. 44, an abnormal form of *E. arcus* var. *uncinata* Grun. is pictured to which III: 5 would seem to be closely related. III: 5, however, has not the obliquely cut-off apices characteristic of var. *uncinata*. In A. CLEVE-EULER 1953, II, p. 124, fig. 463 v, a fo. *plicata* Brun & Hér. is pictured which also seems to be closely related to III: 5.

- *bidentula* W. Smith. HUSTEDT 1930—37, II, p. 277, fig. 744. FOGED 1953, p. 31, Pl. 1, fig. 23.

Gneiss: E: 8 (0.6 ‰), 20 (0.2 ‰), 28 (0.8 ‰), 32 (0.2 ‰). C: 555 (12.2 ‰), 558 (1.0 ‰). D: 38 (0.6 ‰), 45, 454 (0.2 ‰), 469 (0.4 ‰), 476 (0.2 ‰), 479, 452 (1.4 ‰). pH: acidophilous. W.Gr.: rare.

- *bigibba* Kütz. HUSTEDT 1930—37, II, p. 282, fig. 747 B. FOGED 1953, p. 31, Pl. 1, figs. 19, 22.

Basalt: D: 71, 74. S: 245.

Gneiss: E: 8 (0.6 ‰). C: 549, 560. D: 469. DQ: 98 (0.4 ‰). U: 130. K: 300, 318. pH: acidophilous. W.Gr.: not common. Pearyld: rather common.

- Eunotia bigibba* var. *pumila* Grun. HUSTEDT 1930—37, II, p. 282, figs. 747 B, c—h.
 Gneiss: E: 8 (0.2 %), 20 (0.8 %), 28 (0.2 %), 32. C: 549, 572 (0.2 %). DQ: 81.
 K: 307 (0.2 %), 318 (0.2 %).
 pH: acidophilous. Pearyld: fairly rare.
 Plate II, fig. 16: $14.6 \times 4.7 \mu$. 15 striae in 10μ .
- (— *crista-galli* Cleve. W.Gr.: rare).
- *denticulata* (Bréb.) Rabh. HUSTEDT 1930—37, II, p. 290, figs. 757 a—d.
 Gneiss: E: 8 (1.0 %), 20 (0.6 %), 28, 32. C: 549 (0.2 %), 555 (1.0 %), 558, 560, 561, 567 (0.6 %). D: 38 (0.2 %), 45 (0.2 %), 462 (0.6 %), 479, 452 (0.2 %). K: 318 (1.0 %).
 pH: acidophilous. W.Gr.: rare.
- *diodon* Ehr. HUSTEDT 1930—37, II, p. 276, fig. 742. FOGED 1953, p. 31, Pl. 2, figs. 11—13.
 Basalt: D: 74, 438. S: 221.
 Gneiss: C: 549, 560. D: 38, 45, 454, 462 (0.8 %), 469 (0.4 %), 452.
 pH: acidophilous. W.Gr.: not common. Pearyld: rather common.
- *elegans* Østrup. ØSTRUP 1910, p. 172, Pl. 5, fig. 105. FOGED 1953, p. 31, Pl. 2, figs. 9, 10.
 Gneiss: C: 549. D: 476.
 pH: acidophilous. W.Gr.: rare.
- *exigua* (Bréb.) Grun. BOYE PETERSEN 1950, p. 6, Pl. 1, figs. 3—13.
 Basalt: D: 69 (0.2 %), 71, 434 (0.2 %). N: 358.
 Gneiss: E: 8 (1.2 %), 20 (2.2 %), 28 (0.4 %), 32. C: 549, 555 (2.4 %), 560, 567 (1.0 %), 572 (0.2 %). D: 38 (0.6 %), 45 (0.2 %), 454 (0.4 %), 462 (1.2 %), 476 (0.2 %), 479 (0.2 %). DQ: 86 (0.2 %). K: 300, 318 (0.2 %).
 pH: acidophilous. W.Gr.: rather common. Pearyld: not rare.
- var. *bidens* Hustedt. HUSTEDT 1930—37, II, p. 286, figs. 751 v, w.
 Gneiss: D: 33 (0.8 %), 476 (0.2 %).
 pH: acidophilous.
- var. *compacta* Hustedt. HUSTEDT 1930—37, II, p. 286, fig. 225.
 Gneiss: D: 48.
 pH: acidophilous.
- *faba* (Ehr.) Grun. HUSTEDT 1930—37, II, p. 301, fig. 767.
 Basalt: D: 107.
 Gneiss: E: 20 (1.6 %), 28 (1.0 %), 32 (1.4 %). C: 549 (0.2 %), 555 (1.8 %), 558 (0.2 %). D: 469 (0.8 %), 479 (0.4 %), 452. K: 300 (0.2 %).
 pH: acidophilous.
 Plate II, fig. 14: $30 \times 6 \mu$. 14—15 striae in 10μ .
 The valves are "oblique" or asymmetrically developed. The same is the case of those pictured in A. SCHMIDT's Atlas, Pl. 270, figs. 34, 35, which originated from fossil freshwater deposits in Sweden. A. CLEVE-EULER 1953, II, fig. 449 h, is somewhat more irregularly asymmetrically developed and is denoted as fo. *asymmetrica* Font.
- The "oblique" valves as in II: 14 and A. S. Atlas 270: 34, 35 seem to be a very constant feature. In the Greenland material symmetrically developed valves fairly frequent. They often occur together with the asymmetric forms. The same feature has been observed in material from Denmark, Sweden, and Norway. Perhaps there is a relation to *E. rhomboidea* Hustedt.
- *fallax* A. Cleve. HUSTEDT 1930—37, II, p. 288, fig. 753. FOGED 1953, p. 32, Pl. 2, fig. 5.
 Gneiss: E: 28. C: 572 (0.2 %). D: 45.

pH: acidophilous. W.Gr.: rare.

Plate II, fig. 15: $27 \times 3.3 \mu$. 11 striae in 10μ .

A not quite typical form. Found in Gneiss: K: 295.

Eunotia fallax var. *gracillima* Krasske. HUSTEDT 1930—37, II, p. 288, figs. 753 b—e.

Basalt: N: 343.

pH: acidophilous.

— *flexuosa* (Bréb.) Kütz. HUSTEDT 1930—37, II, p. 312, fig. 778.

Basalt: D: 430 (0.4 %), 431 (0.8 %), 434. S: 245 (0.2 %).

Gneiss: E: 28 (0.2 %), 32. C: 549 (0.2 %), 558. D: 38 (0.6 %), 476 (0.4 %). DQ: 81. K: 300, 318.

Sediment: S: 267, 167 (0.6 %).

pH: indifferent? W.Gr.: not rare.

— *gracilis* (Ehr.) Rabh. HUSTEDT 1930—37, II, p. 305, fig. 771.

Gneiss: D: 33. K: 300.

Sediment: S: 267, 273.

pH: acidophilous. W.Gr.: rather common. Pearyld: rather common.

— *holstenborgi* Berg. Å. BERG 1945, p. 8, fig. 54 a.

Plate II, fig. 10: $24 \times 8.5 \mu$. 11 striae in 10μ .

Gneiss: K: 295.

This species is especially characterized by the course of the terminal nodes, and there seems to be good agreement between II: 10 and the species set up by Å. BERG found somewhat farther south in West Greenland.

— *lapponica* Grun. HUSTEDT 1930—37, II, p. 295, fig. 762.

Gneiss: E: 20 (0.4 %). C: 555 (1.2 %), 558, 560, 567 (0.2 %). D: 38 (0.4 %), 45 (1.4 %), 462, 476 (0.2 %), 479, 542. K: 300, 318 (2.4 %), 327 (0.2 %).

pH: acidophilous. W.Gr.: rare.

— *lunaris* (Ehr.) Grun. HUSTEDT 1930, p. 183, fig. 249. 1930—37, II, p. 302, figs. 769, a, b.

Basalt: D: 74, 430 (0.6 %), 431 (1.2 %), 438 (1.6 %), 547, 434 (0.2 %). N: 350 (0.2 %), 354, 361 (0.2 %), 358 (1.2 %). S: 221, 184, 205, 245 (0.4 %), 242 (0.4 %), 232 (3.6 %).

Gneiss: E: 8, 28, 32. C: 549, 555 (1.2 %), 558, 560. D: 38, 454, 462 (1.4 %), 469, 476 (0.2 %), 496, 524, 542. DQ: 86 (0.2 %), 98 (0.8 %). U: 130 (0.2 %).

Sediment: S: 273, 167 (0.8 %).

pH: indifferent. W.Gr.: common. Pearyld: rather common.

Plate III, fig. 2: $36 \times 2.6 \mu$. 15 striae in 10μ .

A rather strongly bent and narrow form.

— var. *capitata* Grun. HUSTEDT 1930—37, II, p. 304, fig. 769c.

Gneiss: C: 572. D: 38.

pH: indifferent. W.Gr.: rare.

Plate III, fig. 3: $25.7 \times 2.7 \mu$. 15 striae in 10μ .

Sides of valves parallel. Valves rather strongly bent.

— var. *subarcuata* (Naeg.) Grun. HUSTEDT 1930—37, II, p. 304, figs. 769 f—h.

Basalt: D: 109, 108 (0.4 %), 438 (0.2 %), 434.

Gneiss: E: 8 (0.2 %), 28. D: 542.

pH: indifferent. W.Gr.: common.

— *monodon* Ehr. HUSTEDT 1930—37, II, p. 305, figs. 772 a, b.

Basalt: D: 434. N: 361, 358. S: 221, 242 (0.8 %), 232 (1.8 %).

Gneiss: E: 20 (1.0 %), 28 (0.8 %), 32 (0.4 %). C: 549, 555 (0.8 %), 558 (0.2 %), 567. D: 33, 38 (1.2 %), 45 (0.4 %), 48, 462 (0.4 %), 469, 476, 479, 452 (0.4 %).

DQ: 81, 98. K: 300, 307 (0.4 %), 318 (0.6 %).



- Sediment: S: 267.
pH: acidophilous. W.Gr.: not common. Pearyld: not rare.
- Eunotia monodon* var. *bidens* (Greg.) W.Smith. HUSTEDT 1930—37, II, p. 306, fig. 772 d.
Basalt: D: 71.
Gneiss: D: 469. K: 300.
pH: acidophilous. W.Gr.: rare. Pearyld: fairly rare.
- var. *maior* (W.Smith) Hustedt. HUSTEDT 1930—37, II, p. 306, fig. 772 a.
Basalt: N: 358, 242.
Gneiss: E: 20. C: 567. D: 45. DQ: 98 (0.6 %).
Sediment: S: 273, 286, 167 (0.2 %).
pH: acidophilous. W.Gr.: rare. Pearyld: rare.
- (— *paludosa* Grun. W.Gr.: rare)
- *papilio* (Grun.) Hustedt. HUSTEDT 1930—37, II, p. 278, fig. 745. 1924:, Pl. 18, fig. 20. FOGED 1955, Pl. 3, figs. 1, 2.
Gneiss: C: 567 (0.2 %), 572. D: 462.
pH: acidophilous. W.Gr.: rare. Pearyld: rather common.
- *parallela* Ehr. HUSTEDT 1930—37, II, p. 302, fig. 768.
Basalt: D: 69 (2.6 %), 71, 430. N: 358. S: 245.
Gneiss: E: 20 (0.2 %). C: 558, 572. D: 38, 469, 479. K: 318 (0.2 %).
pH: acidophilous. W.Gr.: rare.
- *pectinalis* (Kütz.) Rabh. HUSTEDT 1930—37, II, p. 296, fig. 763 a.
Basalt: N: 350 (0.2 %), 358 (0.2 %).
Gneiss: C: 567. D: 454, 476 (0.2 %). K: 327.
Sediment: S: 267 (0.2 %), 167.
pH: indifferent. W.Gr.: not rare. Pearyld: rather common.
Plate I, fig. 10: $64 \times 7.0 \mu$. 10—11 striae in 10μ .
Basalt: S: 167.
Plate II, fig. 1: $36 \times 6 \mu$. 12—13 striae in 10μ . Small, short, and wide specimen.
Basalt: S: 246.
Plate II, fig. 2: $40 \times 4.8 \mu$. 12 striae in 10μ . Small specimen.
Basalt: S: 267.
- var. *curta* Van Heurck. A.CLEVE-EULER 1955, II, p. 84.
Basalt: S: 242.
Gneiss: C: 572 (1.8 %), 38.
pH: indifferent.
Plate II, fig. 7: $17 \times 5.3 \mu$. 12—13 striae in 10μ .
Plate II, fig. 8: $14 \times 4.7 \mu$. 12 striae in 10μ .
These small forms occur together with var. *minor* and var. *minor* fo. *impressa*, from which they may be difficult to distinguish. They are, however, obviously identical with var. *curta* as described in A.CLEVE-EULER 1953, II, p. 84 (dim.: $15-35 \times 5-8 \mu$ and 8—13 striae in 10μ).
- var. *minor* (Kütz.) Rabh. HUSTEDT 1930—37, II, p. 298, figs. 763 d—f.
Basalt: D: 430, 438 (1.2 %), 547, 434 (0.2 %). S: 221, 213, 245 (0.6 %), 242 (0.8 %), 232 (0.2 %).
Gneiss: E: 20 (0.2 %), 32. C: 549, 555 (1.0 %), 558, 560, 561, 572 (0.2 %). D: 33, 38 (4.8 %), 45 (0.2 %), 48 (1.0 %), 469, 476 (1.0 %), 479, 491 (0.2 %), 496 (1.8 %), 524 (0.8 %), 527 (0.2 %), 542 (0.6 %), 452. DQ: 81 (0.4 %). U: 130, 132 (0.6 %).
K: 300 (0.2 %), 318.
Sediment: S: 267 (0.2 %), 167 (3.4 %).
pH: indifferent. W.Gr.: common.
Plate I: fig. 16: $26.0 \times 4.0 \mu$. 16 striae in 10μ .

Almost identical with HUSTEDT 1930—37, II, fig. 763e.

Gneiss: D: 479.

Eunotia pectinalis var. *minor* forma.

Plate II, fig. 3: $32 \times 4.5 \mu$. 10 striae in 10μ .

Occurs in No. 491 together with var. *minor*.

Plate II, fig. 4: $33.3 \times 5.4 \mu$. Ca. 8 striae in 10μ .

Occurs in Sample 221, where typical specimens of var. *minor* fo. *impressa* are very common (5.6 %).

- — fo. *impressa* Hustedt. HUSTEDT 1930—37, II, p. 298, figs. 763 g, h.

Basalt: S: 221 (5.6 %).

Gneiss: C: 572 (1.6 %).

pH: indifferent. W.Gr.: rather common.

Plate II, fig. 5: $24.6 \times 4.6 \mu$. 11 striae in 10μ .

This not quite typical form also occurs in Sample 221 together with quite typical specimens of fo. *impressa*.

- *polydentula* Brun. HUSTEDT 1930—37, II, p. 292, figs. 759 a, b. FOGED 1953, p. 34, Pl. 2, fig. 18.

Gneiss: E: 20, 32. K: 300 (0.6 %).

pH: acidophilous. W.Gr.: rare.

- — var. *perpusilla* Grun. HUSTEDT 1930—37, II, p. 293, figs. 759 c—e.

Gneiss: C: 567 (1.2 %).

pH: acidophilous.

- *polyglyphis* Grun. HUSTEDT 1930—37, II, p. 294, fig. 761.

Gneiss: E: 8, 28 (0.4 %). D: 45 (0.2 %), 454 (0.2 %), 469 (0.2 %), 452.

pH: acidophilous. W.Gr.: rare.

- *praerupta* Ehr. HUSTEDT 1930—37, II, p. 280, figs. 747 a—e. FOGED 1955, p. 36, Pl. 2, figs. 1, 7, 8.

Basalt: D: 69 (0.2 %), 71 (0.2 %), 74 (0.2 %), 109, 108, 430 (0.4 %), 431 (0.2 %), 438, 434 (0.8 %). N: 350 (0.2 %), 354, 361 (0.2 %), 358 (0.4 %), 372, 642 (0.6 %). S: 221, 213, 184 (1.4 %), 205, 245, 242 (1.2 %), 232 (0.8 %).

Gneiss: E: 8 (0.6 %), 20 (0.2 %), 28 (0.4 %), 32 (0.2 %). C: 549 (0.8 %), 555 (0.2 %), 558 (0.6 %), 560 (0.4 %), 561, 567 (2.0 %), 572 (0.2 %). D: 33 (2.0 %), 38 (2.4 %), 45, 48 (0.2 %), 454, 462 (1.0 %), 469 (0.2 %), 476 (1.2 %), 479, 542, 452 (0.4 %). DQ: 81 (0.2 %), 95 (0.2 %), 48 (4.4 %). K: 300 (0.2 %), 307 (0.2 %), 318 (8.8 %), 327 (6.0 %). U: 130 (0.4 %).

Sediment: S: 267 (0.8 %), 273 (1.0 %), 286 (0.8 %), 167 (0.6 %).

pH: acidophilous. W.Gr.: common. Pearyld: common.

- — var. *bidens* Grun. HUSTEDT 1930—37, II, p. 281, figs. 747 A, i—m. FOGED 1955, p. 36, Pl. 2, fig. 2.

Basalt: D: 69 (0.2 %), 71, 74, 430. S: 245, 242 (0.2 %).

Gneiss: C: 567 (0.6 %). D: 48, 542 (0.4 %). DQ: 98 (0.2 %). K: 300 (0.2 %), 327.

pH: acidophilous. W.Gr.: not rare. Pearyld: not rare.

Plate II, fig. 6: $28.7 \times 4.6 \mu$. 10 striae in 10μ .

Somewhat doubtful, as the apices in this variety usually are "stark abgeflacht bis konkav ausgerandet" (HUSTEDT 1930—37, II, p. 281), while in II: 6 they are rounded-off.

Found in Sample 33 (Gneiss: D), in which *E. praerupta* is rather common (2.0 %).

Plate II, fig. 11: $17.4 \times 3.6 \mu$. 12 striae in 10μ .

Closely related to II: 6. Found in Sample 38 (Gneiss: D), in which *E. praerupta* is rather common (2.4 %).

- Eunotia praeurupta* var. *excelsa* Krasske. KRASSKE 1938, pp. 526—532, figs. 2, 3.
 FOGED 1955, p. 36, Pl. 2, figs. 3, 4.
 Basalt: N: 354, 358.
 pH: acidophilous. Pearyld: not rare.
- var. *inflata* Grun. HUSTEDT 1930—37, II, p. 280, figs. 747 A f, g. A. SCHMIDT's Atlas Pl. 273, figs. 18, 19, 20. FOGED 1953 Pl. 2, figs. 3, 4. 1955, p. 37, Pl. 2, figs. 9, 10.
 Basalt: D: 431, 438, 547. N: 358, 343. S: 245.
 Gneiss: E: 8 (0.4 %). D: 33, 38 (0.8 %), 45, 48, 524, 542 (0.2 %). K: 327.
 pH: acidophilous. W.Gr.: fairly rare. Pearyld: rather common.
- — fo. *curta* Grun.
 Plate II, fig. 9: $15.8 \times 3.5 \mu$. 11—12 striae in 10μ .
 Seems to be identical with A. SCHMIDT's Atlas, Pl. 273, fig. 18, which has been found in fossil freshwater deposits in Sweden. Cannot, perhaps, be kept distinct from *E. praeurupta*. II: 9 thus also seems to be closely related to this, as pictured in HUSTEDT 1930—37, II, fig. 747 e.
- (— — var. *laticeps* Grun. Pearyld: rare).
- (— — var. *monodon* Østrup. Pearyld: rare).
- var. *musculicola* Boye Petersen. HUSTEDT 1930—37, II, p. 280, fig. 747 A, h. BOYE PETERSEN 1928, p. 377, fig. 3. FOGED 1953, Pl. 2, fig. 2. 1955, p. 37, Pl. 2, fig. 5.
 Basalt: D: 69, 71, 108, 438. S: 221.
 Gneiss: D: 527 (0.2 %). K: 300, 307.
 pH: acidophilous. W.Gr.: fairly rare. Pearyld: fairly rare.
- *pseudopectinalis* Hustedt. HUSTEDT 1930—37, II, p. 314, fig. 779. A. SCHMIDT's Atlas Pl. 271, fig. 8. HUSTEDT 1924, p. 547, Pl. 18, fig. 1.
 Basalt: S: 242 (2.0 %).
 Gneiss: E: 8 (0.2 %), 20, 28. C: 555, 560, 561, 567, 572 (0.4 %), 454 (0.4 %), 452. DQ: 98 (1.0 %). K: 300, 318.
 Sediment: S: 267.
 pH: acidophilous.
 Plate I, fig. 11: $80 \times 10.2 \mu$. 11 striae in 10μ .
 The most characteristic feature of this species is the retrorse appendages with which the raphe system is provided at both apices. In North European *Eunotia* species such an appendage has otherwise been observed only in *E. flexuosa* (Bréb.) Kütz. The two species are clearly and pronouncedly distinct, as *E. flexuosa* has more or less capitate apices while *E. pseudopectinalis* has valves which are more or less depressed at the apices. *E. pseudopectinalis* is rather frequent in North Scandinavia.
 Plate I, fig. 12: $103 \times 5.7 \mu$. 13 striae in 10μ .
 Plate I, fig. 13: $112 \times 5.6 \mu$. 12—13 striae in 10μ .
 Both I, 12 and I, 13 have somewhat narrower valves than stated by HUSTEDT 1930—37, II, p. 314 (breadth: 8—9 μ), but as they are otherwise very similar to the form described by HUSTEDT, they are without any great hesitation referred here.
- *rhomboidea* Hustedt. HUSTEDT 1950, p. 435, Pl. 36, figs. 34—41. FOGED 1953, p. 34, Pl. 2, figs. 16, 17.
 Gneiss: E: 8, 28 (0.4 %). C: 572 (2.4 %). D: 454 (0.6 %), 462 (16.2 %), 469 (0.4 %).
 pH: acidophilous. W.Gr.: not common
- (— *rhynchocephala* Hustedt. W.Gr.: rare).

Eunotica robusta Ralfs. HUSTEDT 1930—37, II, p. 273, figs. 740a—h.

Gneiss: E: 20 (0.8%), 28 (0.2%). C: 549, 558. U: 130. K: 318 (0.2%), 327.
pH: acidophilous.

— var. *diadema* (Ehr.) Ralfs. HUSTEDT 1930—37, II, p. 274, 1930, fig. 205.

Gneiss: K: 307 (1.8%).

pH: acidophilous.

— var. *tetraodon* (Ehr.) Ralfs. HUSTEDT 1930—37, II, p. 273, fig. 740 i.

Gneiss: E: 20 (0.2%).

pH: acidophilous.

— *septentrionalis* Østrup. ØSTRUP 1897, p. 274, Pl. 1, fig. 10. BOYE PETERSEN 1950, p. 10, Pl. 2, figs. 1—9. FOGED 1953, p. 34, Pl. 2, figs. 7, 8.

Basalt: D: 71. S: 245, 242 (0.6%).

Gneiss: E: 8 (0.8%), 20, 28, 32. C: 555 (0.6%), 560 (0.2%), 561 (0.2%), 567 (0.4%), 572 (0.2%). D: 33, 38 (0.2%), 462, 479, 496, 452 (0.4%). DQ: 98 (1.8%). K: 300, 327.

pH: acidophilous. W.Gr.: fairly rare.

— *sudetica* (O. Müller) Hustedt. HUSTEDT 1930—37, II, p. 299, figs. 764 a, b.

Basalt: D: 431.

pH: acidophilous. W.Gr.: rare.

Plate I, fig. 14: $32.6 \times 5.3 \mu$. 18 striae in 10μ .

Plate I, fig. 14 is almost identical with A.SCHMIDT'S Atlas, Pl. 294, fig. 27, which by HUSTEDT is referred to *E. sudetica* O. Müll.

It seems to me that the two species *E. sudetica* and *E. veneris* are sometimes difficult to keep apart, since *E. sudetica* as in I:14 can be rather acuminate at the apices, but still I dare not refer it to *E. veneris*.

I:14 may also remind somewhat of *E. pseudoveneris* Hustedt from Hawaii, 1942, p. 29, fig. 24, with dim.: $13-42 \times 2.3-4 \mu$ and 17—21 striae in 10μ . This species has terminal nodes which are shifted far on to the ventral side of the valves.

Gneiss: E: 32.

Plate I, fig. 15: $25.3 \times 4.0 \mu$. 17 striae in 10μ .

As the terminal nodes are shifted on to the ventral side of the valves, I:15, if anything, must be referred to the form cycle of *E. sudetica*, even though the number of striae is considerably higher than usual (8—11) in this species. According to A.CLEVE-EULER 1953, II, p. 110, the species has 8—13 striae in 10μ .

Gneiss: E:20.

— *suecica* A.Cleve. HUSTEDT 1930—37, II, p. 279, fig. 746. A.SCHMIDT'S Atlas, Pl. 273, fig. 34, Pl. 291, figs. 25—27. FOGED 1955, p. 37, Pl. 3, fig. 3.

Gneiss: C: 567 (0.2%).

pH: ? Pearyld: fairly rare.

— *tanensis* A.Cleve. A.CLEVE-EULER 1955, II, p. 108, fig. 443.

Gneiss: D: 38.

pH: ?

Plate II, fig. 13: $22.0 \times 5.5 \mu$. 18 striae in 10μ .

— *tenella* (Grun.) Hustedt. HUSTEDT 1930—37, II, p. 284, fig. 749. BOYE PETERSEN 1950, p. 12, pl. 2, figs. 16—25. FOGED 1953, p. 34, Pl. 2, figs. 14, 15. 1955, Pl. 3, figs. 7—9.

Basalt: D: 107.

Gneiss: E: 8 (2.2%), 20 (1.8%), 28 (0.4%), 32 (0.2%). C: 549 (0.6%), 555 (0.6%), 560, 561, 567 (2.2%), 572 (0.2%). D: 38, 454 (0.6%), 462 (1.4%), 452 (0.6%). U: 130 (0.2%). K: 307, 318 (0.2%).

Sediment: S: 267 (0.2 %).

pH: acidophilous. W.Gr.: very common. Pearyld: not rare.

Plate I, fig. 9: $23.3 \times 5.0 \mu$. 15—15 striae in 10μ .

According to BOYE PETERSEN 1950, p. 18, dimensions for *E. tenella* are $10.0-36.7 \times 2.8-3.5 \mu$ with 15—18 striae in 10μ . I:9 does not quite fall within these limits and therefore is only hesitatingly referred here, just as FOGED 1953, Pl. 2, figs. 20, 21. It may remind somewhat of *E. parallela*, but this species has not been found in Sample 32 (Gneiss: E), while typical specimens of *E. tenella* occur in this sample.

Plate II, fig. 17: $16.6 \times 3.4 \mu$. 18 striae in 10μ .

Almost identical with BOYE PETERSEN 1950, Pl. 2, figs. 19—21 ($12.5-18.5 \times 3.2-3.5 \mu$ and 15—18 striae in 10μ).

Plate III, fig. 4: $30.0 \times 2.0 \mu$. 18 striae in 10μ .

The sides are parallel and the valves considerably bent. Narrower valves than usual in the species. Reminds very much of *E. alpina*, which, however, it hardly is, as this species has valves tapering somewhat from the middle towards the apices and apices which are more or less dorsally retrorse.

Found in Sample 20 (Gneiss: E), in which *E. tenella* is rather common (1.8 %).

Plate III, fig. 6: $18 \times 3.4 \mu$. 14 striae in 10μ .

Almost identical with BOYE PETERSEN 1950, Pl. 2, fig. 21 ($14.0 \times 3.2 \mu$ and 18 striae in 10μ).

Gneiss: K: 295.

Eunotica trinaeria Krasske. KRASSKE 1929, p. 349, figs. 1a—d.

Plate III, fig. 7: $8.7 \times 4.3 \mu$. 15 striae in 10μ .

According to KRASSKE 1929, p. 349, the dimensions are: $4-10 \times 2-4 \mu$ with 17—22 striae in 10μ , and the species is "sehr variabel". II:7 can only with difficulty be referred to other forms described and is therefore with reservation provisionally referred to this species.

Gneiss: E: 32.

— *triodon* Ehr. HUSTEDT 1930—37, II, p. 274, fig. 741.

Gneiss: E: 8 (0.2 %), 20 (0.2 %). C: 555 (1.2 %), 558, 560, 567 (3.4 %), 572 (0.2 %). D: 45, 462 (0.2 %). K: 318, 327.

pH: acidophilous. W.Gr.: rare.

— *veneris* (Kütz.) O.Müller. HUSTEDT 1930—37, II, p. 300, fig. 766.

Gneiss: E: 32. DQ: 81 (0.2 %).

pH: acidophilous.

— sp.

Plate II, fig. 12: $23.3 \times 5.3 \mu$. 11—12 striae in 10μ .

Perhaps closely related to *E. tanensis* A.Cleve.

Gneiss: K: 308.

— sp.

Plate III, fig. 1: $41.2 \times 7.3 \mu$. 10—11 striae in 10μ .

Gneiss: E: 32.

III. Monoraphideae.

Cocconeis Ehr.

(*Cocconeis costata* Greg. Euhalobous. W.Gr.: rare).

(— *hustedti* Krasske. Pearyld: rare).

(— *pediculus* Ehr. W.Gr.: rare).

Cocconeis placentula Ehr. HUSTEDT 1930, p. 189, fig. 260.

Basalt: D: 430 (0.2 ‰), 431, 438, 434.

Gneiss: C: 572. D: 524 (0.4 ‰), 527. DQ: 81 (1.2 ‰). U: 130 (0.4 ‰).

Sediment: S: 267.

pH: alkaliphilous. W.Gr.: common. Pearyld: not common.

— var. *euglypta* (Ehr.) Cleve. HUSTEDT 1930, p. 190, fig. 261.

Basalt: D: 107.

Gneiss: C: 555 (0.2 ‰).

pH: alkaliphilous. Pearyld: rather common.

— var. *klinoraphis* Geitler. HUSTEDT 1930, p. 190, fig. 263.

Gneiss: DQ: 81.

pH: alkaliphilous.

(— *thumensis* A. Mayer. Pearyld: rare).

Achnanthes Bory.

Achnanthes broenlundensis Foged. FOGED 1955, p. 39, Pl. 4, figs. 10, 11.

Basalt: D: 74. N: 350, 354 (1.6 ‰), 358, 395.

pH: ? Pearyld: rather common.

— *coarctata* (Bréb.) Grun. HUSTEDT 1930, p. 210, fig. 308 a.

Basalt: D: 547 (3.0 ‰). N: 350, 354, 361, 395. S: 195, 221, 206.

Gneiss: D: 542. U: 130.

pH: indifferent.

Is stated by HUSTEDT (1930, p. 210) to be common on rocks over which water oozes, especially on Archean and eruptive rocks. According to BOYE PETERSEN (1915, p. 296) it is often aerophilous. As a rule it occurs in small numbers in the samples. It has not been recorded from W.Gr. (1953), but occurs in small numbers in Pearyld (1955). In the present material it is clearly commonest in the basalt area.

(— *clevei* Hustedt. W.Gr.: rare).

(— *conspicua* A. Mayer. W.Gr.: rare).

(— *delicatula* Kütz. W.Gr.: rare).

— *depressa* (Cleve) Hustedt. HUSTEDT 1930—37, II, p. 417, fig. 870.

Gneiss: E: 8, 20 (2.6 ‰), 28 (0.8 ‰), 32. C: 549 (0.4 ‰), 555, 558, 560 (0.2 ‰), 572. D: 33, 38, 45 (0.2 ‰), 48, 469 (0.6 ‰), 476, 479. K: 300, 307, 318, 327 (0.2 ‰).

Sediment: S: 267 (0.2 ‰).

pH: acidophilous.

KRASSKE (1949, p. 14) found it to be rather common (single specimens, never in large numbers), especially in fairly large lakes in Lapland, at pH 5.5—6.9. Here it is clearly limited to the gneissic areas, where it is rather widely distributed in all the four areas investigated. In W.Gr. it is rare, whereas it is widely distributed and rather frequent in Pearyld. It is common in postglacial diatomaceous earth from West Norway (not publ.).

— *didyma* Hustedt. HUSTEDT 1930—37, II, p. 405, fig. 857. FOGED 1952a, p. 162, figs. 1:10 a, b, c.

Gneiss: K: 307 (5.0 ‰).

pH: ? (acidophilous).

Not previously recorded from Greenland. Rather common in Scandinavia (HUSTEDT 1930—37, II, p. 405. KRASSKE 1949, p. 13, at pH 6.5—6.8. FOGED 1952a). Also recorded from Iceland (KRASSKE 1938, at pH 8.5—9) and from Denmark (FOGED 1951).

Achnanthes exigua Grun. HUSTEDT 1930—37, II, p. 386, fig. 832.

Basalt: N: 395.

pH: alkaliphilous.

— *flexella* (Kütz) Brun. HUSTEDT 1930—37, II, p. 415, figs. 869 a—c.

Basalt: N: 350 (0.2 ‰), 361, 358, 372 (0.4 ‰), 343 (10.4 ‰), 642 (0.8 ‰). S: 242, 232 (0.6 ‰).

Gneiss: C: 549, 558, 567 (0.2 ‰), 572 (0.6 ‰). D: 33 (0.6 ‰), 38 (1.0 ‰), 45 (0.2 ‰), 476. U: 130. K: 300, 307 (0.6 ‰), 327.

Sediment: S: 267 (0.6 ‰), 273 (0.4 ‰), 286 (1.8 ‰).

Is obviously little influenced by pH, as, like here, it has previously been observed as common in acid as well as alkaline localities. It was among the commonest species of diatoms in Pearyld, but fairly rare in W.Gr.

— var. *alpestris* Brun. HUSTEDT 1930—37, II, p. 416, fig. 869 d.

Basalt: N: 350 (0.2 ‰), 354 (0.2 ‰), 358, 372, 642. S: 205, 206, 232 (0.2 ‰).

Gneiss: E: 20, 28 (0.4 ‰), 32. C: 549 (0.2 ‰), 558, 560 (2.4 ‰), 561 (0.4 ‰), 572. D: 38, 476 (0.4 ‰). DQ: 81. U: 130 (0.4 ‰). K: 307 (1.4 ‰), 318.

Sediments: S: 267 (1.4 ‰), 273 (0.2 ‰).

pH: acidophilous. W.Gr.: rare. Pearyld: common.

— *fragilarioides* Boye Petersen. BOYE PETERSEN 1923, p. 18, fig. 6. HUSTEDT 1930—37, II, p. 407, fig. 862.

Basalt: D: 69, 74 (0.2 ‰), 107 (1.2 ‰), 108 (5.0 ‰), 103 (1.6 ‰), 438 (0.4 ‰). S: 193 (1.4 ‰), 195 (2.0 ‰), 184 (2.4 ‰), 191 (0.2 ‰).

Gneiss: D: 86 (0.4 ‰). U: 130.

pH: indifferent.

Plate III, figs. 14 a, b: $12.7 \times 3.8 \mu$. 12—13 striae in 10μ .

Plate III, figs. 15 a, b: $20.5 \times 5.8 \mu$. 12—13 striae in 10μ .

Not previously recorded from Greenland. It is known from Franz Josef Land (P.T.CLEVE 1898) and Jan Mayen (BOYE PETERSEN 1923).

(— *hauckiana* Grun. Mesohalobous. W.Gr.: rare).

— *holsti* Cleve. HUSTEDT 1930—37, II, p. 399, fig. 849. FOGED 1952 b, p. 114, figs. 3 g, h.

Basalt: S: 232 (0.6 ‰).

Gneiss: E: 20, 28, 32. C: 558, 560, 561. D: 45, 469 (0.2 ‰). K: 300 (0.2 ‰), 307 (2.6 ‰), 318 (0.2 ‰).

pH: indifferent.

According to BOYER 1927, p. 236, "Known only from the type loc. (Greenland)." The situation of the locality was not stated. It seems to have been first recorded by P.T.CLEVE from Finland (CLEVE 1881, p. 13, figs. 6—7). Later it has been found in Sweden (HUSTEDT 1924), in Norway (HUSTEDT 1930, FOGED 1952 b), and on Jan Mayen (BOYE PETERSEN 1923).

(Syn.: *A. montana* Hustedt. HUSTEDT 1930, p. 543, figs. 1—2).

Plate III, fig. 9 a: $28 \times 9.3 \mu$. 12 striae in 10μ (raphe valve).

Plate III, fig. 9 b: $30.8 \times 10 \mu$. 12 striae in 10μ (rapheless valve).

Identical with P.T.CLEVE 1881, Pl. 16, figs. 6—7, p. 13, with dim. $28 \times 9 \mu$ with 14 striae in 10μ .

Gneiss: K: 307.

Plate III, fig. 10: $30 \times 10 \mu$. 12 striae in 10μ .

Raphe valve with highly deflected ends of raphe.

Almost identical with A.SCHMIDT's Atlas, Pl. 408, fig. 52, from Feforvatn in Norway and FOGED 1952, fig. 3 g, also from Norway.

Gneiss: K: 318.

Plate III, figs. 11 a, b: $18.8 \times 8.7 \mu$. 12 striae in 10μ .

Raphe valve with distinctly deflected ends of raphe.

Basalt: S: 205.

Achnanthes kryophila Boye Petersen. BOYE PETERSEN 1924, p. 316, fig. 6.

Basalt: D: 69 (8.8%), 71 (1.2%), 74 (2.0%), 500 (89.6%), 107 (0.2%), 109 (0.8%), 108 (4.2%). N: 350 (1.6%), 354 (0.4%), 361 (5.2%), 358 (5.8%), 395, 382 (0.4%), 397 (0.8%), 642. S: 193 (0.4%), 195 (15.2%), 221 (1.2%), 213 (4.6%), 184 (10.0%), 191 (0.4%), 205 (0.2%), 232 (0.2%).

Gneiss: C: 549 (1.8%), 555 (0.4%), 560 (0.2%), 567 (2.4%), 572 (1.6%).

D: 48 (14.2%), 476 (0.2%), 496 (6.0%), 542. DQ: 81 (0.4%), 86, 95 (2.2%), 98 (16.6%). U: 130 (0.8%), 132 (0.2%). K: 307 (10.8%).

Sediment: 267, 273 (0.4%).

pH: indifferent. Pearyld: very common.

Plate IV, figs. 1a, b: $13.0 \times 5.3 \mu$. 21—22 striae in 10μ .

Basalt: N: 343.

IV:1 is referred with great doubt to *A. kryophila*, which according to BOYE PETERSEN 1924, p. 316, has "lower valve with a quadrangular transapical area", which according to the accompanying drawing does not reach the edge of the valve. Nor is this the case in the drawings of the same species in HUSTEDT 1930—37, II, fig. 854.

The somewhat similar species *A. austriaca* Hustedt, HUSTEDT 1922, p. 233, Pl. 3, figs. 6—7, has a rounded central area on the rapheless valve, and therefore should no doubt be left out of consideration.

Other small species, such as *A. Peterseni* Hustedt, *A. mollis* Krasske, and *A. atomus* Hustedt, differ from IV:1 in various ways.

Achnanthes kryophila is the commonest *A.* species in Pearyld (in 43 out of 46 samples with 8% of all diatom valves counted in the Pearyland material). In the material examined here the species is also very common in basalt as well as gneissic areas.

— *lanceolata* (Bréb.) Grun. HUSTEDT 1930—37, II, p. 408, figs. 863a—d.

Basalt: D: 69 (14.0%), 71 (10.8%), 74 (16.0%), 109, 108 (7.2%), 431 (0.2%), 438 (5.6%), 547 (0.2%), 434. N: 358, 395 (8.4%), 382 (4.0%), 397 (6.6%). S: 193 (4.8%), 195 (4.2%), 221, 213, 191 (2.8%), 205, 245 (0.2%).

Gneiss: D: 45 (1.6%), 48 (25.0%), 479, 491 (14.0%), 496 (4.6%), 524 (20.2%), 527 (0.6%), 542 (19.6%). DQ: 95 (2.4%). U: 132 (2.8%).

pH: indifferent.

— — var. *elliptica* Cleve. HUSTEDT 1930—37, II, p. 410, figs. 863 n, o.

Gneiss: DQ: 81.

pH: indifferent.

— — var. *rostrata* (Østrup) Hustedt. HUSTEDT 1930—37, II, p. 410, figs. 863i—m.

Basalt: D: 74 (0.2%).

Gneiss: D: 48.

pH: indifferent.

It is remarkable that neither the species nor its varieties have been found in the material from W.Gr. and Pearyld., while the species is very common in all cases in the areas examined here.

— *lapponica* Hustedt. HUSTEDT 1930—37, II, p. 414, fig. 868.

Basalt: D: 430. S: 195 (0.2%), 213 (0.2%), 245.

Gneiss: E: 20 (0.4%), 32. DQ: 81. K: 307 (0.6%).

Sediment: S: 267 (1.0%), 286 (0.2%).

pH: acidophilous. W.Gr.: rare. Pearyld: rather common.

(— *lemmermanni* Hustedt. Pearyld: rather rare).

Achnanthes levanderi Hustedt. HUSTEDT 1930—37, II, p. 404, fig. 856.

Gneiss: K: 307 (5.4 %).

pH: ? indifferent. Pearyld: rare.

— *levanderi* Hustedt. ?.

Plate III, figs. 8 a, b: $10 \times 5.9 \mu$.

Fig. 8a: rapheless valve with 20—22 striae in 10μ , clearly punctate.

Fig. 8b: raphe valve with 20—21 striae in 10μ .

III: 8 is undoubtedly closely related to *A. levanderi*, though I dare not identify it with this species. The dimensions for *A. levanderi* were by HUSTEDT 1930—37, II, p. 404, stated to be $6-9 \times 4-5 \mu$ with 21—23 striae in 10μ on a rapheless valve and with 22—28 striae in 10μ on the raphe valve. In the accompanying drawing, fig. 856, the striae of the raphe valve are punctate, while the striae on the rapheless valve are not punctate. It is possible that the punctation which I have clearly observed on the rapheless valve in III: 8a, can be seen only under favourable conditions, which perhaps may reveal punctation on both valves. III: 8 has not the extension of the central area on the raphe valve which normally should be found in *A. levanderi*. In FOGED 1952, Pl. 1, fig. 6a, a raphe valve without any particularly extended central area is pictured, which is undoubtedly an *A. levanderi*.

Plate III, fig. 16a: $8.7 \times 4.7 \mu$. 21 striae in 10μ (rapheless valve).

Plate III, fig. 16b: $7.5 \times 4.5 \mu$. 24—26 striae in 10μ (raphe valve).

Relationship to *A. levanderi* very uncertain. The rapheless valve is in fairly close agreement with typical *A. levanderi* valves, while the raphe valve is somewhat different, especially by its rounded, rather large central area. No punctation of the striae has been observed.

Gneiss: K: 307.

— *linearis* W.Smith. HUSTEDT 1930—37, II, p. 378, figs. 821a, b.

Basalt: D: 108 (6.4 %), 430 (11.6 %), 431 (11.0 %), 438 (0.6 %), 547 (0.8 %), 434 (19.6 %). N: 350 (3.2 %), 361 (1.0 %), 358 (2.8 %), 372 (0.4 %), 395 (4.6 %), 343. S: 221 (3.6 %), 213 (6.0 %), 205 (10.0 %), 206 (3.2 %), 245 (18.6 %), 242 (26.8 %), 232 (0.8 %), 191 (7.4 %).

Gneiss: E: 20 (0.4 %), 28 (2.0 %), 32 (45.0 %). C: 549 (12.0 %), 560 (4.0 %), 561 (3.0 %), 572 (20.2 %). D: 33 (0.6 %), 38 (40.6 %), 45 (0.4 %), 454, 462 (19.8 %), 469 (5.4 %), 476 (20.6 %), 479 (9.2 %), 496 (13.2 %), 542 (2.8 %), 452 (10.6 %). DQ: 81 (8.4 %). U: 132. K: 300 (0.4 %), 307 (2.8 %), 318 (0.4 %), 327 (1.8 %).

Sediment: S: 267 (5.8 %), 273 (0.6 %), 167 (11.8 %).

pH: indifferent. W.Gr.: very common. Pearyld: very common.

As it is very difficult with fair certainty to distinguish between the species and var. *pusilla*, the latter is here referred to the species.

— *linearis* W.Smith. ?

Basalt: D: 62 (0.2 %), 69 (0.8 %), 108 (6.4 %), 103 (0.2 %). N: 395 (4.6 %), 382 (0.6 %). S: 191 (7.4 %).

Gneiss: DQ: 95.

— *marginatula* Grun. HUSTEDT 1930—37, II, p. 404, fig. 855.

Basalt: D: 108 (0.4 %), 438 (0.4 %).

Gneiss: E: 8 (14.2 %), 28. C: 555 (0.8 %). D: 454 (0.2 %), 462 (0.6 %), 524 (0.4 %).

pH: acidophilous. W.Gr.: fairly rare. Pearyld: rare.

— *marraitensis* nov. spec.

Valva elliptica, apicibus late rotundatis, 12μ longa, 5.4μ lata. Frustulum superius area perlata, elliptica, striis transapicalibus brevissimis, radiantibus 16—17 in 10μ ornatum. Frustulum inferius rraphe recta, subtili, area axiali

sat angusta, centrali rotundata, striis radiantibus 16—17 in 10μ . Tab. III, fig. 12a, b. Hab. in aqua dulci Groenlandiae occidentalis.

Plate III, figs. 12a, b: $12.0 \times 5.4\mu$. 16—17 striae in 10μ .

Valves elliptical with broadly rounded apices. 12μ long, 5.4μ broad. Rapheless valve with very broad elliptical central area, transapical striae very short, 16—17 in 10μ . Raphe valve with straight, filamentous raphe, rather narrow axial area, rounded central area. 16—17 radial striae in 10μ . Plate III, figs. 12a—b.

Freshwater. West Greenland.

It is hardly identical with the very similar *A. rupestris* Krasske, HUSTEDT 1930—37, II, p. 405, fig. 459, in spite of the fairly equal dimensions ($8—11 \times 4—5\mu$. 16—18 striae in 10μ), as the rapheless valve of *A. rupestris* has shortened or completely missing central striae and the raphe valve has transverse bands reaching right out to the side of the valve. *A. lutheri* Hustedt, HUSTEDT 1930—37, II, p. 405, must also be left out of consideration, in spite of considerable similarity, as the raphe valve of this species has about 30 striae in 10μ .

Basalt: N: 350.

Achnanthes microcephala (Kütz.) Grun. HUSTEDT 1930—37, II, p. 376, fig. 819.

Basalt: S: 232 (0.4 %).

Gneiss: E: 32 (3.4 %). D: 38 (5.0 %), 476 (2.2 %). SQ: 81 (0.2 %). K: 318 (1.0 %).

pH: indifferent. W.Gr.: very common. Pearyld: very common.

— *minutissima* Kütz. HUSTEDT 1930—37, II, p. 376, figs. 820 a—c.

Basalt: D: 430 (1.4 %). N: 361 (8.8 %).

Gneiss: E: 28 (0.8 %). C: 549 (14.0 %). D: 469 (2.4 %), 452 (2.6 %). DQ: 81 (4.4 %), 98 (13.0 %).

Sediment: S: 167 (2.4 %).

pH: indifferent. W.Gr.: very common. Pearyld: very common.

— var. *cryptocephala* Grun. HUSTEDT 1930—37, II, p. 377, figs. 820 d, e.

Basalt: N: 642 (1.8 %).

Gneiss: C: 558 (1.6 %), 560 (0.8 %), 572 (2.6 %). D: 491 (1.2 %). U: 132 (1.4 %), 167 (2.4 %).

pH: indifferent. (In W.Gr. and Pearyland included in the species).

— *montana* Krasske. HUSTEDT 1930—37, II, p. 398, fig. 847.

Basalt: N: 350 (0.2 %).

pH: ?

— *nodosa* A. Cleve. HUSTEDT 1930—37, II, p. 407, fig. 861.

Gneiss: D: 496 (1.8 %).

pH: ?

Plate III, fig. 13a: $13.3 \times 3.4\mu$. 14 striae in 10μ (raphe valve).

Plate III, fig. 13b: $10.7 \times 3.0\mu$. 15 striae in 10μ (rapheless valve).

III: 13 is somewhat smaller than the dimensions stated by HUSTEDT 1930—37, II, p. 407, for this species ($15—26 \times 5—7\mu$. 14—17 striae in 10μ), but it clearly comes within the range indicated by A. CLEVE-EULER 1953, III, p. 38 ($8—26 \times 2.5\mu$. 14—17 striae in 10μ).

— *peragalli* Brun & Héribaud. HUSTEDT 1930—37, II, p. 412, fig. 865.

Basalt: D: 430, 434. S: 245.

pH: indifferent.

(— *plitvicensis* Hustedt. Pearyld: common).

(— *thienemanni* Hustedt. Pearyld: rare).

— *ostrupi* (A. Cleve) Hustedt. HUSTEDT 1930—37, II, p. 411, fig. 864.

Basalt: D: 430 (0.2 %), 431 (0.2 %), 434 (0.4 %).

pH: indifferent.

IV. Biraphideae.

NAVICULACEAE

Diatomella Grev.

Diatomella balfouriana Grev. HUSTEDT 1930—37, II, p. 214, fig. 312. FOGED 1953, Pl. 3, fig. 5.

Basalt: D: 69 (19.0 %), 71 (0.4 %), 109 (17.4 %), 438 (11.0 %), 434. N: 350, 354 (1.0 %), 361 (0.4 %), 358 (1.6 %), 395 (0.8 %). S: 195, 221, 184 (11.0 %), 191 (0.6 %), 205 (0.6 %), 206, 245.

Gneiss: D: 48 (0.4 %), 496 (1.4 %), 524 (0.4 %), 527 (79.4 %), 542 (3.6 %). DQ: 98 (1.2 %), 132 (0.2 %).

Sediment: S: 273, 167 (0.2 %).

pH: indifferent. W.Gr.: rare. Pearyld: rare.

Mastogloia Thwaites.

Mastogloia elliptica Agardh. HUSTEDT 1930, p. 217, fig. 317.

Gneiss: C: 561.

Mesohalobous. pH: alkaliphilous.

(— *braunei* Grun. W.Gr.: rare. Mesohalobous).

(— *crucicula* (Grun.) Cleve. W.Gr.: rare. Euhalobous).

Diploneis Ehr.

Diploneis boldtiana Cleve. HUSTEDT 1930—37, II, p. 674. Fig. 1067.

Gneiss: C: 572.

pH: indifferent.

— *didyma* (Ehr.) Cleve. HUSTEDT 1930, p. 252, fig. 399.

Gneiss: C: 558.

Mesohalobous. pH: alkaliphilous. W.Gr.: rare.

— *domblitensis* (Grun.) Cleve. HUSTEDT 1930, p. 250, fig. 397.

Basalt: N: 350. S: 184 (0.2 %), 191.

pH: indifferent.

— *elliptica* (Kütz.) Cleve. HUSTEDT 1930, p. 250, fig. 395.

Basalt: N: 350, 361 (0.2 %), 358 (0.2 %), 372 (0.4 %), 395, 382 (0.2 %), 343 (0.4 %). S: 184 (1.0 %), 205, 206.

Gneiss: C: 560 (0.2 %), 561 (0.4 %). U: 132 (0.2 %).

Sediment: S: 268.

pH: indifferent. W.Gr.: rare. Pearyld: fairly rare.

(— *finnica* (Ehr.) Cleve. W.Gr.: rare).

— *fusca* (Greg.) Cleve. HUSTEDT 1930—37, II, p. 654, fig. 1053.

Sediment: S: 267.

Salt water.

— *interrupta* (Kütz.) Cleve. HUSTEDT 1930, p. 252, fig. 400.

Gneiss: C: 560. DQ: 81.

Mesohalobous. pH: alkaliphilous. W.Gr.: rare.

— *oculata* (Hilse) Cleve. HUSTEDT 1930, p. 250, fig. 392.

Basalt: D: 434.

pH: indifferent. Pearyld: rare.

Diploneis ovalis (Hilse) Cleve. HUSTEDT 1930, p. 249, fig. 390.

Basalt: D: 516, 354. N: 343. S: 193, 195.

Gneiss: U: 130.

pH: indifferent. W.Gr.: rare.

— var. ? FOGED 1953, pl. 3, fig. 7.

Basalt: D: 516. N: 350 (0.4 %), 354 (6.0 %), 361, 358, 372, 395. S: 221, 213, 184 (0.2 %), 205, 206 (0.4 %), 232 (0.4 %).

Gneiss: DQ: 81.

Sediment: S: 267, 273.

pH: indifferent. W.Gr.: rather rare.

— — var. *oblongella* (Naegeli) Cleve. HUSTEDT 1930, p. 249, fig. 391.

Basalt: D: 438 (0.4 %), 434. N: 350 (0.4 %), 354 (0.2 %), 358, 395 (0.2 %). S: 213 (0.2 %), 184 (3.6 %).

Gneiss: E: 32. C: 560. D: 524, 542. U: 130 (0.2 %).

pH: indifferent.

— *peterseni* Hustedt. HUSTEDT 1930—37, II, p. 676, figs. 1068 f—h.

Basalt: D: 430. N: 350, 354 (0.2 %).

pH: indifferent. W.Gr.: rare.

— *puella* (Schumann) Cleve. HUSTEDT 1930, p. 250, fig. 394.

Basalt: D: 69 (0.6 %), 109, 430, 547 (0.2 %). S: 195, 221, 206.

Gneiss: D: 48, 462, 469 (0.2 %), 491, 496 (0.2 %), 527 (0.2 %), 452 (0.2 %).

DQ: 81.

pH: indifferent.

Amphipleura Kütz.

Amphipleura rutilans (Trent.) Cleve. HUSTEDT 1930—37, II, p. 720, figs. 1093 a, b.

Gneiss: C: 558.

pH: alkaliphilous. Mesohalobous.

Frustulia Ag.

Frustulia rhomboides (Ehr.) De Toni. HUSTEDT 1930—37, II, p. 728, fig. 1098a.

Gneiss: E: 32. C: 558, 560. DQ: 81.

pH: acidophilous.

— — var. *saxonica* (Rabh.) De Toni. HUSTEDT 1930—37, II, p. 729, fig. 1099a.

Basalt: D: 107, 547 (0.2 %). S: 232.

Gneiss: E: 8 (6.6 %), 20 (4.6 %), 28 (3.6 %), 32 (0.4 %). C: 549 (0.6 %), 555 (6.6 %), 558 (3.2 %), 560, 561, 567 (11.2 %), 572 (1.2 %). D: 33 (0.2 %), 45 (3.2 %), 454 (16.6 %), 462 (6.8 %), 469 (1.2 %), 476, 452 (0.4 %). DQ: 86 (0.2 %). K: 300 (0.8 %), 307 (0.6 %), 318 (6.8 %), 327 (8.0 %).

pH: acidophilous. W.Gr.: not common.

— — fo. *undulata* Hustedt. HUSTEDT 1930—37, II, p. 729, fig. 1099b.

A. SCHMIDT's Atlas Pl. 369, fig. 7. FOGED 1950, Pl. 2, fig. 3.

Gneiss: E: 8 (2.0 %). C: 558 (0.4 %).

pH: acidophilous.

— — fo. *capitata* A. Mayer. HUSTEDT 1930, p. 221.

Gneiss: E: 20, 28. C: 572 (1.2 %). G: 45 (0.4 %), 462. K: 300, 307 (0.4 %), 318 (0.2 %), 327 (0.2 %).

pH: acidophilous. W.Gr.: scarce.

— *vulgaris* (Thwaites) De Toni. HUSTEDT 1930—37, II, p. 730, fig. 1100 a.

Basalt: D: 71 (3.0 %), 74. N: 350, 372. S: 245.

Gneiss: C: 561, 572 (2.6 %). D: 48, 542.

pH: indifferent. W.Gr.: rare.

Gyrosigma Hassall.

Gyrosigma acuminatum (Kütz.) Rabh. HUSTEDT 1930, p. 222, fig. 329.

Gneiss: C: 560.

pH: alkaliphilous.

— *kützingii* (Grun.) Cleve. HUSTEDT 1930, p. 224, fig. 333.

Gneiss: C: 561.

pH: alkaliphilous.

Neidium Ag.

Neidium affine (Ehr.) Cleve. HUSTEDT 1930, p. 242, fig. 376.

Gneiss: E: 8 (0.8 %), 28. D: 45 (0.2 %), 454.

pH: indifferent. W.Gr.: rare.

— — var. *amphirhynchus* (Ehr.) Cleve. HUSTEDT 1930, p. 234, fig. 377.

Gneiss: E: 20 (1.4 %), 28, 32. D: 45, 462, 469. K: 300 (1.6 %), 307 (0.4 %), 318 (0.4 %), 327.

Sediment: S: 267.

pH: indifferent. W.Gr.: rare.

— — fo. *undulata* Grun. HUSTEDT 1930, p. 243. P.T.CLEVE 1894—95, I, p. 68.

Basalt: N: 350. S: 205, 206, 245, 232 (0.4 %).

Gneiss: E: 32. D: 45 (0.2 %).

pH: acidophilous. W.Gr.: rare.

— — var. *capitata* Mölder. MÖLDER 1937, p. 30, fig. 1. FOGED 1955, p. 44, Pl. 5, fig. 2.

Basalt: N: 350, 372 (0.2 %). S: 232 (0.2 %), 205 (0.2 %), 242 (0.8 %), 358, 372 (0.2 %).

Gneiss: D: 38 (0.4 %). DQ: 98 (2.0 %). U: 130 (0.2 %).

Sediment: S: 267, 167, 271.

pH: acidophilous. W.Gr.: rather common. Pearyld: rather common.

— — var. *longiceps* (Greg.) Cleve. HUSTEDT 1930, p. 244, fig. 378. FOGED 1953, p. 38, Pl. 3, fig. 10.

Basalt: S: 213.

Gneiss: E: 20 (0.4 %), 32. D: 45, 469, 542.

pH: acidophilous. W.Gr.: fairly rare.

— *bisulcatum* (Lagerstedt) Cleve. HUSTEDT 1930, p. 242, fig. 386.

Basalt: D: 69 (0.4 %), 71, 74, 107, 109, 108, 434. N: 354. S: 221, 242.

Gneiss: E: 20, 28 (0.2 %), 32. C: 549, 558, 572. D: 48, 454 (0.2 %), 476, 479 (0.4 %), 542, 452 (0.2 %). DQ: 98. U: 130, 132. K: 307 (0.2 %).

pH: indifferent. W.Gr.: rather common. Pearyld: fairly rare.

— — fo. *undulata* O.Müller. HUSTEDT 1930, p. 242, fig. 375.

Gneiss: C: 549, 560, 567 (0.2 %), 572 (0.2 %).

pH: indifferent.

— — forma.

Basalt: D: 71, 74.

(— *dubium* (Ehr.) Cleve. Pearyld: rare).

— *distincte-punctatum* Hustedt. HUSTEDT 1930, p. 247, fig. 386. FOGED 1955, p. 44, Pl. 5, fig. 6.

Basalt: N: 350, 354, 372. S: 213, 206.

Sediment: S: 267.

pH: indifferent. Pearyld: rather common.

— *iridis* (Ehr.) Cleve. HUSTEDT 1930, p. 245, fig. 379.

Basalt: N: 350, 358, 343.

Gneiss: C: 558. D: 33, 38, 45. DQ: 81 (0.2 %).

pH: indifferent. W.Gr.: not common. Pearyld: rather common.

Neidium iridis fo. *vernalis* Reichelt. HUSTEDT 1930, p. 245, fig. 380. FOGED 1955, p. 44, Pl. 5, fig. 5.

Basalt: D: 430, 434 (0.2 %). N: 354.

Gneiss: E: 8, 20, 28. D: 45. DQ: 81. K: 307.

Sediment S: 267.

pH: indifferent. Pearyld: rare.

— var. *ampliata* (Ehr.) Cleve. HUSTEDT 1930, p. 245, fig. 381.

Basalt: D: 434. N: 358, 343 (0.2 %). S: 206, 242 (0.2 %).

Gneiss: E: 20 (0.4 %), 28 (0.2 %), 32. C: 549 (0.2 %), 479. DQ: 81, 98.

Sediment: S: 267 (0.2 %), 273.

pH: indifferent. W.Gr.: scarce.

— var. *amphigomphus* (Ehr.) Van Heurck. HUSTEDT 1930, p. 245, fig. 382.

Basalt: N: 358.

Gneiss: D: 38 (0.2 %).

pH: indifferent.

— var. *luminosa* J. Brun? J. BRUN 1900, p. 13, Pl. 2, fig. 26.

Plate IV, fig. 2: $46.6 \times 17.0 \mu$. 15 striae in 10μ .

According to J. BRUN 1900, p. 13, this form is 40—50 μ long and provided with "Stries monoliformes très nettes et presque parallèles; 14 à 16 en 10μ ." "Crochets médians du raphé peu marqués. A l'im. hom. le raphé apparaît bifide et fourchu aux 2 bouts." It is not possible to decide whether there are deflected central nodes in IV:2. The polar nodules seem to be onesidedly deflected. It is, therefore, with great doubt that I refer IV:2 to the above-mentioned form, even though this has also been found in Greenland (Ile Murray, "provenant de mousses sur des rochers arrosés d'eau douce").

In habit IV:2 is also closely related to *N. iridis* (Ehr.) Cleve var. *maior* Font, A. CLEVE-EULER 1955, IV, figs. 1170 g—h, but the punctuation of striae of this form seems considerably finer than the punctuation in IV:2.

Basalt: N: 350 (0.2 %), 358.

Gneiss: E: 20, 32. D: 476. DQ: 81.

Sediment: S: 267.

pH: indifferent.

(— *knuthii* Foged. Pearyld: rare).

— *knuthii* Foged formae. FOGED 1955, p. 45, Pl. 5, fig. 8.

Plate IV, fig. 4: $27.4 \times 6.0 \mu$. 21 striae in 10μ .

Deviate from the type by having purely elliptical valves, which are also somewhat smaller than those found in Pearyland.

Basalt: N: 348, 350, 354.

Plate IV, fig. 6: $22.0 \times 6.0 \mu$; ca. 24 striae in 10μ .

Smaller and with somewhat denser striae than the type. Purely elliptical.

Basalt: N: 354 (0.8 %). S: 232.

Plate IV, fig. 7: $22.7 \times 5.3 \mu$. 24 striae in 10μ .

Also small, densely striated specimen of the species. Shape of the valve typical.

Basalt: N: 354.

Plate IV, fig. 13: $28 \times 8.6 \mu$. 22—23 striae in 10μ .

Large form reminding very much of IV:6.

Basalt: N: 342, 350.

Gneiss: K: 308.

(— var. *heilprinensis* Foged. Pearyld: rare).

Neidium knuthii var. *heilprinensis* Foged forma. FOGED 1955, p. 45, Pl. 5, fig. 9.

Plate IV, fig. 3: $28.5 \times 6.7 \mu$. 21 striae in 10μ .

The longitudinal striation reminds very much of the striation in *Anomoeoneis* species, but as the raphe in IV:3 has central pores which are clearly deflected each in its own direction, it must be considered an *N.* species closely related to that described above.

Basalt: N: 351.

— *kozlowii* Mereschk. HUSTEDT 1930, p. 247, fig. 387.

Basalt: N: 350, 354, 358.

pH: indifferent. Pearyld: rather common.

— var. *elliptica* Mereschk. HUSTEDT 1930, p. 248, fig. 388. FOGED 1955, p. 45, Pl. 5, fig. 4.

Basalt: N: 350, 354 (1.0 %).

pH: indifferent. Pearyld: rare.

(— — var. *parva* Mereschk. Pearyld: rather common).

— *marraitensis* nov. spec.

Valva anguste elliptica, $26-27 \mu$ longa, 7.5μ lata. Raphe subtilis, recta, poris centralibus brevibus, deflexis. Area axialis angusta, centralis transversa, rotundata. Striae transapicales 14 in 10μ , sat valide punctatae, medio paulum radiantes, ad apices versus in utraque latere raphes eandem paene directionem secutae cum axe apicali angulum paulum obliquum formantem. Tab. IV, fig. 10. Hab. in aqua dulci Groenlandiae occidentalis.

Plate IV, fig. 10: $31 \times 7.5 \mu$. 15—16 striae in 10μ .

Valve narrowly elliptical. $26-27 \mu$ long, 7.5μ broad. Filamentous, straight raphe with short, deflected central nodes. Narrow axial area. Central area extended transversely, rounded. 14 transapical striae in 10μ , in the middle of the valve slightly radial, towards the apices somewhat obliquely oriented, rather strongly punctated.

Freshwater. West Greenland.

Basalt: N: 342.

Can hardly be referred to *N. dubium* (Ehr.) Cleve, the striae of which are considerably more faintly punctated. The structure rather nearly approaches to that of *N. dilatatum* (Ehr.) Cleve, which has 16 clearly punctated striae in 10μ , but these are more obliquely oriented in relation to the raphe than is the case in IV: 10 (HUSTEDT 1930, p. 246: $50-60 \times 25-28 \mu$). *N. distincte-punctatum* Hustedt because of the characteristic course of its raphe must also be left out of consideration.

— *marraitensis* nov. spec. forma.

Plate IV, fig. 11: $26.6 \times 7.5 \mu$. 14 striae in 10μ .

Should undoubtedly be referred to the form cycle of IV:10. Deviates from this form by having linear-elliptical valves with broadly drawn-out apices.

Basalt: N: 354.

(— *munkii* Foged. Pearyld: rare).

— *nugsuaqensis* nov. spec.

Valva elongate elliptica, $26-27 \mu$ longa, 10μ lata. Raphe subtilis, recta. Area axialis angusta, centralis transversa, angusta. Striae transapicales 15 in 10μ , parallelae vel parum radiantes, crasse punctatae. Tab. IV, fig. 9.

Hab. in aqua dulci Groenlandiae occidentalis.

Plate IV, fig. 9: $26.5 \times 10 \mu$. 15 striae in 10μ .

Valves elongate-elliptical, $26-27 \mu$ long, 10μ broad. Raphe filamentous, straight. Narrow axial area. Narrow central area extended transversely. 15 transapical striae in 10μ , parallel or slightly radial, coarsely punctate.

Freshwater. West Greenland.

Basalt: N: 344.

(*Neidium productum* (W.Smith) Cleve var. *polygibba* J. Brun. Pearyld: rather rare).

— *rosenkrantzii* nov. spec.

Valva lineari-elliptica, apicibus late rotundatis, 26μ longa, 6μ lata. Rraphe subtilis, recta, poris centralibus longis, ad suum quisque latus abrupte deflexis. Area axialis angusta, centralis rotundata. Striae transapicales 18 in 10μ , medio paulum radiantes, ad apices versus parallelae vel parum convergentes, duabus lineis longitudinalibus interruptae. Tab. IV, fig. 8.

Hab. in aqua dulci Groenlandiae occidentalis.

Plate IV, fig. 8: $26 \times 6\mu$. 18 striae in 10μ .

Valves elliptical with broadly rounded apices. 26μ long, 6μ broad. Raphe filamentous, straight; central nodes long, sharply deflected each in its own direction. Axial area narrow. Central area rounded. 18 transapical striae in 10μ , in the middle of the valve slightly radial, towards the apices parallel or slightly convergent, crossed by two longitudinal striae.

Freshwater. West Greenland.

Basalt: N: 354.

Seems to be closely related to *N. minutissimum* Krasske, KRASSKE 1932, p. 108, fig. 12, as the dimensions of this species are $27-29 \times 5-5.5\mu$ with 18-20 striae in 10μ . The valves are linear with slightly triundulate sides and cuneiformly rounded apices. ("Hauptmerkmal sind die nach entgegengesetzten Seiten abgelenkten langen Fortsätze der Zentralporen"). In the drawing of *N. minutissimum* Krasske in J.W.G. LUND 1945, p. 59, fig. 2, the apical spores are not seen to be deflected. *N. mirum* Krasske, KRASSKE 1943, p. 85, fig. 26, must also be excluded, especially because of the fact that the polar nodules there are expressly stated to be in continuation of the raphe.

— sp.

Plate IV, fig. 5: $44 \times 8.7\mu$. 21 striae in 10μ .

In IV:5 the striae are all "oblique" and punctate, there being four fairly distinct longitudinal striae.

The form must be rather closely related to *N. kozłowi* Mereschk.; but this species is stated to be considerably larger (HUSTEDT 1930, p. 247: $68-78 \times 17-24\mu$), just as the number of striae is much smaller ($10-12$ in 10μ), and the punctuation is strong, while in IV:5 it is finer.

Var. *parva* Mereschk., which is of a size similar to IV:5, has only 15 striae in 10μ . *N. obliquestriatum* (A.S.) Cleve, P.T. CLEVE 1894-95, I, p. 69, and *N. obliquestriata* A.S., A. SCHMIDT's Atlas, Pl. 49, figs. 41-42, are also considerably larger than IV:5 and have valves with slightly triundulate margins, a rhombic-circular central area, and $14-20$ coarsely punctate striae in 10μ .

Gneiss: C: 567.

— sp.

Plate IV, fig. 12: $24 \times 8\mu$. 24-25 striae in 10μ .

Very narrow axial area and very small elliptical central area. Central nodes not deflected. The striae are finely punctate, radial in the middle of the valve, towards the apices slightly convergent.

Gneiss: K: 304.

Stauroneis Ehr.

Stauroneis acuta W.Smith. HUSTEDT 1930, p. 259, fig. 415.

Basalt: N: 358, 343 (0.2%). S: 206 (0.2%), 232 (0.2%).

pH: alkaliphilous.

(— *agrestis* Boye Petersen. W.Gr.: rare).

Stauroneis anceps Ehr. HUSTEDT 1930, p. 256, fig. 405.

Basalt: D: 62 (22.2 %), 69 (0.2 %), 71 (0.4 %), 74, 107, 109, 108 (0.4 %), 430 (0.2 %), 431, 438 (0.2 %), 434. N: 350 (0.4 %), 354 (0.2 %), 361, 358, 372, 343. S: 193, 195, 221, 213 (0.2 %), 191 (0.2 %), 206, 245, 232 (0.2 %).

Gneiss: E: 20 (0.2 %), 28, 32. C: 549 (0.2 %), 567 (0.4 %), 572 (0.2 %) D: 45 (0.2 %), 454 (0.4 %), 462 (1.8 %), 469, 476, 479 (0.2 %), 542, 452 (0.2 %). DQ: 81 (1.8 %), 95 (3.5 %). N: 130, 132. K: 300, 307 (0.4 %), 318 (0.8 %).

Sediment: S: 267, 273.

pH: indifferent. W.Gr.: not common. Pearyld: common.

Plate V, fig. 5: $25.3 \times 6.0 \mu$. 24—26 striae in 10μ .

- fo. *gracilis* (Ehr.) Cleve HUSTEDT 1930, p. 256, fig. 406.

Gneiss: K: 307 (0.2 %), 318 (0.2 %).

pH: indifferent. W.Gr.: not common. Pearyld: rare.

- var. *hyalina* Brun & Peragallo. HUSTEDT 1930, p. 256, fig. 406.

Basalt: D: 71 (0.2 %), 74 (0.2 %), 431 (0.2 %), 434 (0.2 %).

Gneiss: E: 28, 32 (0.2 %). C: 549. D: 48, 476.

Sediment: S: 267 (0.2 %).

pH: indifferent.

- (— fo. *linearis* (Ehr.) Cleve. W.Gr.: rare).

- (— *ignorata* Hustedt. Pearyld: rare).

- *javanica* Grun. ØSTRUP 1897, p. 259, pl. 1, fig. 4. A. SCHMIDT's Atlas, Pl. 241, fig. 3.

Basalt: N: 350, 358 (0.2 %), 642. S: 221, 206, 245, 232.

Gneiss: E: 32. D: 542. DQ: 81, 98 (0.6 %). U: 130 (0.2 %). K: 318.

Sediment: S: 167 (0.2 %).

pH: indifferent. W.Gr.: ØSTRUP 1897, p. 259. Pearyld: rather common.

- *kriegeri* Patrick. HUSTEDT 1930, p. 257, fig. 409.

Basalt: D: 107, 108. N: 354 (0.8 %), 397 (0.2 %).

pH: indifferent. Pearyld: not rare.

- *legumen* Ehr. HUSTEDT 1930, p. 260, fig. 419. FOGED 1953, p. 39, Pl. 4, fig. 2.

Gneiss: D: 48.

pH: indifferent. W.Gr.: rare.

Plate V, fig. 6: $28 \times 4.7 \mu$. 24—26 striae in 10μ .

Basalt: N: 344.

- *lapponica* A. Cleve. A. CLEVE 1895, p. 257, fig. 409.

Gneiss: D: 462 (1.4 %).

pH: indifferent? Pearyld: rather rare.

- *nugsuaqensis* nov. spec.

Valva lanceolata, apicibus productis, rotundatis, $52-53 \mu$ longa, 11μ lata. Rhaphe recta, crassior, poris centralibus brevibus, uncinatis. Area axialis ad medium versus dilatata, centralis transversa, usque ad margines expansa, ad latera versus dilatata. Striae 18 in 10μ , radiantes, manifesto punctatae. Septa polaria brevita. Tab. V, fig. 1.

Hab. in aqua dulci Groenlandiae occidentalis.

Plate V, fig. 1: $52.6 \times 10.8 \mu$. 18 striae in 10μ .

Valves lanceolate with drawn-out, rounded apices. $52-53 \mu$ long, about 11μ broad. Raphe straight, rather broad; short, hook-like deflected central nodes. Axial area increasing in breadth towards the central area, which is extended to the margins of the valves and increasing in breadth towards the margins. 18 transapical striae in 10μ , clearly punctate. Polar septa short.

Freshwater. West Greenland.

Undoubtedly rather closely related to *S. javanica* Grun., P.T. CLEVE 1894—95, I, p. 150, which, however, with the dimensions $120-210 \times 2-40 \mu$ has much

larger valves, while as regards the number of striae (A. CLEVE-EULER 1953, III, p. 213: 11—20 in $10\ \mu$) there is agreement, and both have clearly punctate striae. It also seems to be related to *S. obtusa* Lagerst. sensu FOGED 1955, p. 46, Pl. 4, fig. 31 ($35.7 \times 9.6\ \mu$ with 18—20 striae in $10\ \mu$), but differs from this species amongst other things by the course of the raphe.

Basalt: N: 343 (0.2 %).

Stauroneis obtusa Lagerst. HUSTEDT 1930, p. 260, fig. 416. LAGERSTEDT 1873, Pl. 1, fig. 11. FOGED 1955, p. 46, Pl. 4, fig. 31.

Basalt: D: 71. S: 191, 232 (0.6 %).

Gneiss: D: 542.

pH: indifferent. W.Gr.: not common. Pearyld: rather common.

— *parvula* Grun. HUSTEDT 1930, p. 260, fig. 417a. FOGED 1953, p. 39, Pl. 3, figs. 12, 14, 15.

Gneiss: 462 (0.4 %), 86 (4.0 %).

pH: indifferent. W.Gr.: scarce

— var. *prominula* Grun. HUSTEDT 1930, p. 260, fig. 417b. FOGED 1953, p. 39, Pl. 4, fig. 1.

Basalt: D: 107. S: 221.

Gneiss: C: 560 (0.8 %), 561 (0.2 %), 572 (0.6 %).

pH: indifferent. W.Gr.: rare

— *phoenicenteron* Ehr. HUSTEDT 1930, p. 255, fig. 404.

Basalt: D: 69, 71, 74, 431 (0.2 %), 434. N: 354, 361, 358, 343. S: 221, 206 (0.2 %), 242.

Gneiss: E: 8, 20 (0.2 %), 28 (0.4 %), 32. C: 549, 555, 558, 560, 572 (0.2 %).

D: 33 (1.0 %), 38 (0.8 %), 45 (0.4 %), 454, 462 (0.2 %), 469 (0.2 %), 476, 479,

496 (0.8 %), 542 (0.2 %). DQ: 81 (0.2 %), 98 (0.2 %). U: 130 (0.2 %), 132. K: 307.

Sediment: S: 267 (0.6 %), 273.

pH: indifferent. W.Gr.: common. Pearyld: rather common.

— *schroederi* Hustedt. HUSTEDT 1930, p. 257, fig. 410.

Basalt: D: 107.

pH: ?.

— *smithii* Grun. HUSTEDT 1930, p. 261, fig. 420.

Basalt: D: 430, 431, 434. N: 350 (0.2 %), 354 (0.2 %). S: 221, 213, 245 (0.2 %).

Sediment: S: 267 (0.2 %).

pH: indifferent. W.Gr.: rare.

(— — var. *incisa* Pantocsek. W.Gr.: rare).

— sp.

Plate V, fig. 2: $33.3 \times 7.0\ \mu$. 21—22 striae in $10\ \mu$.

Striae radial, clearly punctate, very narrow axial area, central area transversely extended, mid-striae much shortened, but not missing. Somewhat downward turned polar septa.

In habit V:2 reminds very much of *S. parvula* or *S. parvula* var. *prominula*, but the mid-striae present make its relation to these forms somewhat problematic.

Gneiss: E: 20 (2.0 %), 32. C: 549.

— sp.

Plate V, fig. 3: $28 \times 8.5\ \mu$. 24 striae in $10\ \mu$.

The valves have short polar septa, shortly drawn-out, rounded apices, a very narrow axial area, a transversely extended, narrow central area, which does not quite reach the margin.

It is undoubtedly rather closely related to *S. parvula* Grun. var. *prominula* Grun., but differs from this variety by the shape of the central area and by

having shortened mid-striae (*S. parvula* as well as the other *S.* species is completely without mid-striae). V:3 has certain points of similarity to *Navicula ruttneri* Hustedt and var. (HUSTEDT 1937—39, p. 238, Pl. 17, figs. 18—28), thus in the polar septa and shortened mid-striae.

Gneiss: D: 462 (1.4 ‰).

Stauroneis sp.

Plate V, fig. 4: $26.0 \times 6.0 \mu$. 21—22 striae in 10μ .

There are some small *S.* species which resemble V:4 very much. Thus *S. agrestis* Boye Petersen, which, however, has much denser striation, *S. kriegeri* Patrick, which also has denser striation, *S. parvula* Grun., which has no polar septa, and *S. ignorata* Hustedt, which has somewhat denser striation.

Basalt: S: 249.

Gneiss: C: 560.

Caloneis Cleve.

Caloneis alpestris (Grun.) Cleve. HUSTEDT 1930, p. 240, fig. 372.

Basalt: D: 107. N: 354, 358.

pH: alkaliphilous.

— *bacillares* Greg. P.T. CLEVE 1884—95, I, p. 50.

Plate V, fig. 8: $21.3 \times 4.7 \mu$. 24 striae in 10μ .

By P.T. CLEVE 1894—95, p. 50, this species is characterized as follows: "Axial area very narrow; central area small, sometimes unilaterally dilated to a fascia." Dimensions: $23-50 \times 5-6 \mu$ with 20—33 striae in 10μ . This form, which according to CLEVE has been found in Scotland and Illinois seem to be practically identical with V:8.

Gneiss: C: 567 (0.4 ‰).

— *bacillum* (Grun.) Cleve. HUSTEDT 1930, p. 236, fig. 360. FOGED 1953, p. 39, Pl. 3, fig. 17.

Basalt: D: 103 (0.2 ‰), 431. N: 350 (0.2 ‰), 354 (1.0 ‰), 395 (0.8 ‰), 382 (1.2 ‰), 343 (1.2 ‰). S: 193, 195, 221, 184 (0.4 ‰), 191, 205 (1.2 ‰), 232 (0.6 ‰). Gneiss: S: 560, 572 (0.2 ‰). D: 48, 479. DQ: 81 (0.2 ‰). U: 130. K: 307 (0.2 ‰). Sediment: S: 273.

pH: indifferent. W.Gr.: rather common. Pearyld: rare.

(— — var. *lancettula* (Schulz) Hustedt. Pearyld: rare).

(— *boecheri* Foged. W.Gr.: rare. Pearyld: rare).

— *clevei* (Lagerstedt) Cleve. HUSTEDT 1930, p. 236, fig. 359.

Basalt: D: 107 (0.2 ‰), 108 (0.2 ‰). N: 350 (0.2 ‰), 354 (0.4 ‰), 395, 642. S: 221.

Gneiss: C: 560 (0.2 ‰), 561 (0.2 ‰), 572 (0.2 ‰). DQ: 81, 86.

pH: ?.

Plate V, fig. 7: $32.6 \times 6.7 \mu$. 20—22 striae in 10μ .

— *fasciata* (Lagerstedt) Cleve fo. *acuta* Boye Petersen. BOYE PETERSEN 1928, p. 384, fig. 10.

Basalt: N: 395 (0.2 ‰). S: 221.

pH: acidophilous. W.Gr.: fairly rare. Pearyld: rare.

Plate V, fig. 9: $16.7 \times 4.0 \mu$; ca. 20 striae in 10μ .

The number of striae is here as in FOGED 1953, p. 40, but somewhat smaller than stated in BOYE PETERSEN 1928, p. 384 (23 in 10μ); but as there otherwise seems to be correspondence, V:9 is without particular hesitation referred here.

— *latiuscula* (Kütz.) Cleve. HUSTEDT 1930, p. 233, fig. 351.

Basalt: S: 206.

pH: alkaliphilous.

Caloneis obtusa (W.Smith) Cleve. HUSTEDT 1930, p. 240, fig. 373.

Gneiss: C: 555, 558 (0.2 %). D: 33 (0.4 %), 38 (0.4 %).

pH: alkaliphilous.

— *pulchra* Messikommer. ? HUSTEDT 1930, p. 235, fig. 357.

Gneiss: D: 491.

Sediment: S: 167.

pH: ?

— *schumanniana* (Grun.) Cleve. HUSTEDT 1930, p. 239, fig. 369.

Basalt: D: 74. N: 350, 354 (0.6 %), 343 (0.8 %). S: 205 (0.2 %), 206 (0.2 %), 245.

pH: alkaliphilous. W.Gr.: rather common. Pearyld: common.

— var. *biconstricta* Grun. HUSTEDT 1930, p. 240, fig. 370.

Basalt: D: 431. S: 205.

pH: alkaliphilous.

— *silicula* (Ehr.) Cleve. HUSTEDT 1930, p. 236, fig. 362.

Basalt: D: 74. N: 350, 354 (0.4 %), 361 (0.2 %), 372, 382 (0.2 %). S: 195, 221, 205 (0.6 %), 206, 245, 242, 232 (0.6 %).

Gneiss: C: 561. D: 38 (0.2 %), 45, 469, 476. DQ: 81.

Sediment: S: 267.

pH: alkaliphilous. W.Gr.: rather common. Pearyld: rather common.

— var. *alpina* Cleve. A.CLEVE 1895, p. 15, fig. 9. P.T.CLEVE 1894—95, I, p. 51. FOGED 1953, Pl. 3, fig. 9.

Basalt: D: 69 (2.6 %), 109 (0.4 %), 438 (0.4 %), 434. N: 350 (3.0 %), 354 (0.8 %), 361, 358 (5.2 %), 372 (1.0 %), 395, 382 (1.8 %), 642 (0.4 %). S: 221, 213, 184 (0.4 %), 191, 205 (0.2 %), 245, 242 (0.6 %), 232 (1.6 %).

Gneiss: C: 558 (0.2 %), 560. D: 38 (0.4 %), 45 (0.2 %), 527. DQ: 98 (2.8 %).

U: 130 (0.2 %). K: 300, 318.

Sediment: C: 273 (0.2 %), 167 (0.6 %).

pH: alkaliphilous. W.Gr.: not common. Pearyld: very common.

— var. *truncatula* Grun. HUSTEDT 1930, p. 238, figs. 363, 364.

Basalt: D: 74 (0.2 %), 109, 430, 434. N: 350 (0.4 %), 354, 372 (0.2 %). S: 184, 245.

Gneiss: C: 560 (0.4 %), 561. D: 479.

Sediment: S: 267 (0.2 %).

pH: alkaliphilous. W.Gr.: fairly rare.

(— — fo. *minutissima* Hustedt. W.Gr.: rare).

Anomoeoneis Pfitzer.

Anomoeoneis exilis (Kütz.) Cleve. HUSTEDT 1930, p. 264, fig. 429. FOGED 1953, p. 40, Pl. 3, fig. 8.

Basalt: S: 213. N: 642 (0.6 %).

Gneiss: E: 20 (0.4 %), 28 (0.4 %), 32 (1.0 %). C: 549 (0.8 %), 555 (0.4 %), 558 (1.4 %), 560 (0.4 %). D: 38 (0.6 %), 469, 476 (0.2 %). DQ: 81 (0.4 %). U: 130 (1.2 %). K: 307 (1.0 %), 318 (0.4 %), 327 (1.0 %).

Sediment: S: 267 (0.6 %), 273 (4.2 %).

pH: indifferent. W.Gr.: not rare. Pearyld: fairly rare.

— var. *lanccolata* A.Mayer. HUSTEDT 1930, p. 264. FOGED 1950, Pl. 1, fig. 8.

Basalt: D: 71. N: 354, 642 (0.8 %).

Gneiss: E: 8 (7.8 %), 20 (0.6 %), 28 (1.6 %), 32 (0.6 %). C: 549 (3.2 %), 555 (3.6 %), 558 (14.6 %), 560 (16.2 %), 561 (45.2 %), 567 (16.8 %), 572 (0.4 %). D: 454 (7.4 %), 469 (4.6 %), 476, 479 (0.4 %), 452 (3.0 %). DQ: 81 (4.2 %).

K: 300 (36.0 %), 307 (0.4 %), 318 (6.0 %), 327 (23.0 %).

Sediment: S: 267 (0.2 %), 273 (2.8 %).

pH: indifferent. W.Gr.: Scarce.

Anomoeoneis serians (Bréb.) Cleve var. *brachysira* (Bréb.) Hustedt. HUSTEDT 1930, p. 264, fig. 427.

Basalt: D: 107 (0.2 %), N: 354 (0.2 %), 642 (2.2 %). S: 232 (0.2 %).

Gneiss: E: 8 (18.6 %), 20 (13.4 %), 28 (3.8 %), 32 (1.8 %). C: 549 (4.8 %), 555 (9.2 %), 558 (4.0 %), 560 (0.4 %), 561, 567 (4.2 %). D: 33 (0.6 %), 38 (0.8 %), 45 (16.0 %), 48, 454 (11.6 %), 462 (5.4 %), 469 (1.4 %), 476, 479 (0.2 %), 452 (11.4 %). DQ: 81 (0.4 %), 98 (4.8 %). K: 300 (2.2 %), 307 (4.8 %), 318 (10.2 %), 327 (22.2 %).

Sediment: S: 273 (0.6 %).

pH: acidophilous. W.Gr.: not common. Pearyld: scarce.

— *styriaca* (Grun.) Hustedt. HUSTEDT 1930, p. 265, fig. 432. FOGED 1953, p. 41, Pl. 3, fig. 16.

Basalt: N: 642 (3.0 %).

Gneiss: E: 8 (0.2 %), 20 (0.8 %), 28 (0.4 %), 32 (0.4 %). C: 549 (1.2 %), 555 (0.4 %), 558 (1.4 %). D: 33 (0.2 %), 38 (0.4 %), 462, 469 (0.4 %), 476 (0.4 %), 479 (0.2 %), 452 (0.4 %). DQ: 81 (0.2 %). K: 318 (1.0 %), 327 (0.8 %).

Sediment: S: 273 (0.8 %).

pH: indifferent. W.Gr.: rare.

— *zellensis* (Grun.) Cleve. HUSTEDT 1930, p. 264, fig. 430.

Basalt: N: 642. S: 242 (0.4 %).

Gneiss: C: 549 (0.2 %), 558 (4.0 %), 560, 561. D: 33 (0.2 %), 38 (0.2 %). K: 318 (0.6 %), 327 (0.4 %).

Sediment: S: 267, 273 (0.2 %), 286 (0.4 %).

pH: acidophilous. W.Gr.: rare.

— var. *linearis* Østrup. HUSTEDT 1930, p. 265. ØSTRUP 1910, p. 239, Pl. 9, fig. 6. FOGED 1953, p. 41, Pl. 3, fig. 13.

Basalt: N: 361, 372 (2.0 %). N: 642 (26.2 %). S: 242 (6.4 %), 232 (3.6 %).

Gneiss: E: 32 (0.4 %). C: 558 (7.0 %), 560, 572 (0.4 %). D: 33 (7.4 %), 38 (12.0 %), 45 (18.4 %), 469 (1.8 %), 476 (0.6 %), 452 (1.4 %). K: 300 (0.4 %), 318 (9.0 %), 327 (15.8 %).

Sediment: S: 267 (0.4 %), 273 (1.6 %), 286 (6.4 %), 167 (0.4 %).

pH: acidophilous. W.Gr.: not common. Pearyld: not common.

Navicula Bory.

Naviculae orthostichae Cleve.

Navicula accomoda Hustedt.? HUSTEDT 1946—50, p. 446, Pl. 39, figs. 17, 19.

Plate V, fig. 13: $22.7 \times 6.7 \mu$. 19—20 striae in 10μ .

According to HUSTEDT 1946—50, p. 446, the dimensions of *N. accomoda* are $22 \times 7.5 \mu$ with 25 striae in 10μ in the middle of the valve. It differs from *N. halophila* (Grun.) Cleve by there being a great distance between the central pores of the raphe. In V:10 there is also a great distance between the central pores, but it has a somewhat coarser striation than typical of the species.

Gneiss: U: 130.

— pH: ?

(— *cuspidata* Kütz. W.Gr.: rare. Pearyld: rare).

— var. *ambigua* (Ehr.) Cleve. HUSTEDT 1930, p. 268, fig. 436.

Basalt: S: 206 (0.2 %), 232 (0.6 %).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

— var. *heribaudi* Perag. HUSTEDT 1930, p. 268, fig. 435.

Gneiss: E: 20. D: 45. K: 307 (0.2 %), 318.

pH: alkaliphilous. W.Gr.: scarce.

Naviculae gregaria Donkin. HUSTEDT 1930, p. 269, fig. 437.

Basalt: N: 395 (0.6 ‰).

Gneiss: C: 561, 572 (1.0 ‰). D: 524 (0.2 ‰). U: 130 (0.8 ‰).

pH: alkaliphilous. W.Gr.: rare.

(— *halophila* (Grun.) Cleve. W.Gr.: common. Pearyld: rather common. Mesohalobous).

— fo. *subcapitata* Østrup. HUSTEDT 1930, p. 269. ØSTRUP 1910, p. 29, Pl. 1, fig. 22.

Basalt: S: 213 (0.4 ‰), 206 (0.4 ‰).

pH: alkaliphilous.

Plate V, fig. 10: $25 \times 6 \mu$. 15 striae in 10μ .

Probably a small specimen of ØSTRUP's form, which by ØSTRUP was stated to have the dimensions $35 \times 7 \mu$ with 18 striae in 10μ .

Naviculae minusculae Hustedt.

Navicula amygdalina Hustedt. A. SCHMIDT's Atlas Pl. 404, figs. 1—3. FOGED 1952, p. 165, Pl. 2, fig. 10.

Plate VIII, fig. 1: $11.0 \times 8.0 \mu$. ca. 24 striae in 10μ .

Plate VIII, fig. 2: $14.6 \times 7.2 \mu$. 22—24 striae in 10μ .

Freshwater species previously found in Northern Europe.

Basalt: D: 107 (0.4 ‰). N: 358. S: 193, 206.

Gneiss: D: 542.

pH: ?

— *bacilliformis* Grun. HUSTEDT 1930, p. 273, fig. 446.

Basalt: D: 430, 431, 434. N: 350 (0.4 ‰), 372, 343 (0.8 ‰). S: 221, 245, 242.

Gneiss: C: 549, 572 (0.4 ‰), 33 (0.4 ‰), 38, 45, 462, 479. DQ: 81. U: 130 (0.2 ‰).

K: 318.

Sediment: S: 267 (0.4 ‰).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: rare.

Plate V, fig. 15: $32 \times 8.7 \mu$. 15—16 striae in 10μ .

Plate V, fig. 16: $28 \times 8.7 \mu$. 13 striae in 10μ .

Striae very clearly punctate.

— *begeri* Krasske. KRASSKE 1932, p. 113, fig. 16.

Plate IX, fig. 15: $12.7 \times 2.0 \mu$. 19—20 striae in 10μ .

Gneiss: C: 555.

pH: ?

— *bryophila* Boye Petersen. BOYE PETERSEN 1928, fig. 13. 1946, p. 87, fig. 11. FOGED 1955, p. 49, Pl. 7, fig. 13.

Basalt: D: 69 (0.4 ‰), 71, 438. N: 350 (0.2 ‰), 354 (0.4 ‰), 343 (0.2 ‰). S: 213 (0.2 ‰), 184, 206.

Gneiss: E: 20 (1.2 ‰), 28 (0.8 ‰), 32. C: 555 (1.2 ‰), 558, 560. D: 33 (0.4 ‰), 38, 45 (0.8 ‰), 462, 469, 527 (0.3 ‰), 452 (0.4 ‰). DQ: 86. U: 130 (0.2 ‰). K: 300 (0.4 ‰), 307 (0.2 ‰), 318 (0.4 ‰).

Sediment: S: 267 (0.2 ‰).

pH: indifferent. Pearyld: very common.

— var. *lapponica* Hustedt. HUSTEDT 1942b, p. 114, figs. 11—15.

Basalt: D: 62, 69 (0.6 ‰), 71 (0.4 ‰), 438 (1.6 ‰), 354. S: 191 (0.4 ‰).

Gneiss: C: 549 (0.6 ‰), 558. D: 491 (1.0 ‰).

pH: indifferent.

(— *brekkaensis* Boye Petersen. W.Gr.: rare).

— *confervacea* Kütz. HUSTEDT 1930, p. 278, fig. 460.

Plate VIII, fig. 19: $16 \times 6 \mu$. 24 striae in 10μ .

N. confervacea Kütz. according to HUSTEDT 1930, p. 278, has the dimensions $17-25 \times 6-8 \mu$ with 20—22 striae in 10μ . It is added: "Hierher gehört auch *N. semivirgata* Krasske." VIII:19 has somewhat denser striae, but otherwise agrees rather closely with this species.

Gneiss: D: 38.

Plate VIII, fig. 20: $18 \times 6 \mu$. 24—26 striae in 10μ .

N. subadnata Hustedt, HUSTEDT 1942a, p. 69, figs. 6—8, is closely related to VIII:19 and 20 (dim.: $10-13 \times 4 \mu$ with 20(—25) striae in 10μ), but as this species has a circular central area, it should no doubt be left out of consideration here, and VIII:20 is with some hesitation referred to *N. confervacea*.

Basalt: D: 438.

Navicula contenta Grun. HUSTEDT 1930, p. 277, fig. 458. FOGED 1953, p. 42, Pl. 4, fig. 11, Pl. 6, fig. 13.

Basalt: D: 107 (0.8 ‰), 108 (1.6 ‰), 434 (0.2 ‰). S: 221.

Gneiss: E: 8 (0.2 ‰). D: 462, 476.

pH: indifferent. W.Gr.: not common. Pearyld: rather common.

— var. *biceps* Arnott. HUSTEDT 1930, p. 277, fig. 458c. FOGED 1953, p. 42, Pl. 4, fig. 12.

Basalt: D: 62 (0.2 ‰), 69 (0.2 ‰), 71 (0.2 ‰), 107 (0.2 ‰), 108 (0.4 ‰), 103, 438. N: 354 (0.2 ‰), 358, 395. S: 193, 221, 213 (0.2 ‰).

Gneiss: C: 560 (0.2 ‰). D: 45, 48, 491. DQ: 86.

pH: indifferent. W.Gr.: not rare. Pearyld: common.

— fo. *parallela* Boye Petersen. HUSTEDT 1930, p. 277, fig. 458b.

Basalt: D: 547 (0.2 ‰). S: 195.

pH: indifferent. Pearyld: very common.

— *disjuncta* Hustedt. HUSTEDT 1930, p. 274, fig. 451.

Plate IX, fig. 6: $24.6 \times 5.3 \mu$. 18 striae in 10μ .

IX:6 has a somewhat coarser striation than stated for the species in HUSTEDT 1930, p. 274 (26 striae in 10μ). But IX:6 seems to be closely related to the species as it appears i.a. from A.SCHMIDT's Atlas, Pl. 399, figs. 51—53, and HUSTEDT 1954, fig. 57.

Basalt: S: 205.

pH: ?

— *festiva* Krasske. HUSTEDT 1930, p. 289, fig. 489.

Gneiss: E: 8 (0.4 ‰), 28. C: 567, 572 (0.2 ‰). D: 462 (0.2 ‰).

Basalt: N: 343.

pH: acidophilous. W.Gr.: not common.

— *fossalis* Krasske. A.SCHMIDT's Atlas, Pl. 396, figs. 46, 47. FOGED 1953, p. 42, Pl. 4, fig. 26.

Basalt: N: 358, 372. S: 195, 213, 184, 205 (0.2 ‰), 232 (0.2 ‰).

Gneiss: D: 491.

pH: acidophilous. W.Gr.: fairly rare.

Plate VIII, fig. 13: $10 \times 4.5 \mu$. 20 striae in 10μ .

Plate VIII, fig. 14: $10.7 \times 4.6 \mu$. 18 striae in 10μ .

— *fritschii* Lund. ? J.W.G.LUND 1946, p. 77, figs. 7 A—G.

Plate VII, fig. 17: $13.3 \times 5.8 \mu$. 18 striae in 10μ .

Branches of raphe straight, fairly long. Distinct polar nodules, no central nodes. The raphe takes its course in a narrow siliceous rib. Striae radial, with two distinct hyaline longitudinal lines.

VII:17 seems to be very closely related to J.W.G.LUND's species, as this (1946, p. 77) is stated to have the dimensions $7-16 \times 5-6 \mu$ and 20—25 striae in

10 μ . There is no full agreement, however, as "the raphe is straight except near the central nodule, where each branch bends more or less clearly towards one side of the valve" (LUND 1946, p. 77).

Basalt: N: 358. S: 221.

Plate VII, fig. 20: $19.3 \times 7.3 \mu$. 21 striae in 10 μ .

Is also very closely related to *N. fritschii* Lund.

Basalt: N: 354.

Navicula grimmei Krasske. HUSTEDT 1930, p. 274, fig. 448.

Plate VII, fig. 9: $17.3 \times 4.7 \mu$. 21 striae in 10 μ .

Gneiss: DQ: 81.

— *hassiaci* Krasske. HUSTEDT 1930, p. 279, fig. 462. FOGED 1953, p. 42, Pl. 4, fig. 20.

Basalt: D: 434.

Gneiss: D: 38 (0.6 %).

pH: acidophilous.

Plate IX, fig. 16: $10.2 \times 2.2 \mu$. 18 striae in 10 μ .

Sediment: S: 273.

Plate IX, fig. 17: $11.3 \times 2.3 \mu$. 18—19 striae in 10 μ .

Gneiss: D: 38.

— *hustedtii* Krasske. ? HUSTEDT 1930, p. 274, fig. 449.

Plate IX, fig. 10: $14 \times 4 \mu$. 18 striae in 10 μ .

IX:10 has somewhat coarser striae than usual in *N. hustedtii* (26—28 striae in 10 μ), and is therefore referred here with some hesitation.

Basalt: N: 344.

— *heilprinensis* Foged. FOGED 1955, p. 49, Pl. 6, figs. 6, 7.

Basalt: N: 350 (0.2 %).

pH: ? Pearyld: rare.

Plate VII, fig. 14: $16.7 \times 6.7 \mu$. 21 striae in 10 μ . This form seems to be rather closely related to *N. heilprinensis*.

Basalt: N: 342.

— Foged forma?

Plate VII, fig. 15: $32.7 \times 8.7 \mu$. 15—16 striae in 10 μ .

Related to *N. heilprinensis* Foged, FOGED 1955, p. 49, Pl. 6, figs. 6—7, but differs from this species i.a. by the form of the central area and by the fact that VII:15 has a raphe with central nodules which are sharply deflected to the same side.

Basalt: S: 232 (0.4 %).

— *importuna* Hustedt. HUSTEDT 1942a, p. 67, figs. 24, 25.

Plate IX, fig. 9: $13.3 \times 4.7 \mu$. Striae dense.

According to HUSTEDT 1942a, p. 67, the dimensions are 13×4 — 5μ with about 40 striae in 10 μ . IX:9 is without any great hesitation referred here.

Basalt: D: 62 (16.6 %), 71 (2.0 %), 107 (0.6 %), 108 (3.0 %). N: 395 (0.6 %), 382 (0.2 %). S: 193 (1.0 %), 195 (1.4 %), 191 (1.8 %).

Gneiss: DQ: 86 (1.2 %), 95 (0.6 %).

pH: ?

— *ingrata* Krasske. KRASSKE 1938, figs. 17, 18.

Plate IX, fig. 3: $13.5 \times 6.2 \mu$. 24—26 striae in 10 μ .

This species also seems to be closely related to *N. detenta* Hustedt, HUSTEDT 1954, p. 470, fig. 27, which appears as a glacial relic in Eifel Maare and otherwise is preferably known from alpine areas.

Basalt: N: 350, 351. S: 215.

pH: ?

- Navicula insociabilis* Krasske. A.SCHMIDT'S Atlas, Pl. 400, figs. 19—26, 103—105.
 Gneiss: D: 527.
 pH: indifferent.
- (— *ivigtutensis* Foged. W.Gr.: common).
- *järnefelti* Hustedt. A.SCHMIDT'S Atlas, Pl. 404, figs. 6—13. FOGED 1953, p. 42, Pl. 4, fig. 27.
 Basalt: D: 107, 430 (0.4 ‰), 431 (0.4 ‰), 434. N: 350.
 Gneiss: E: 32. C: 561 (0.2 ‰), 572. DQ: 81.
 pH: acidophilous. W.Gr.: rare.
 Plate V, fig. 11: $11.8 \times 6.0 \mu$. 30 striae or denser in 10μ .
 Perhaps a small specimen of this species. Fairly great similarity to FOGED 1953, Pl. 4, fig. 27.
 Plate V, fig. 12: $20.3 \times 10 \mu$. 23—24 striae in 10μ .
 Almost identical with FOGED 1953, Pl. 4, fig. 27.
- *kotschyi* Grun. P.T.CLEVE 1894—95, I, p. 130. A.SCHMIDT'S Atlas, Pl. 370, figs. 31, 32. FOGED 1953, p. 43, Pl. 4, fig. 8. 1955, p. 50, Pl. 7, figs. 4, 5.
 Basalt: D: 108.
 Gneiss: K: 300.
 pH: alkaliphilous. W.Gr.: rare. Pearyld: rather rare.
- *fo. undulata*.
 Basalt: S: 191.
 pH: alkaliphilous.
- *lapidosa* Krasske. ? HUSTEDT 1930, p. 272, fig. 444. A.SCHMIDT'S Atlas, Pl. 400, figs. 69—72.
 Plate IX, fig. 1: $16.5 \times 7.3 \mu$. 22—24 striae in 10μ .
 Dim. according to KRASSKE 1929, p. 354: $18 \times 8 \mu$ with 26 striae in 10μ .
 Basalt: D: 108.
 Gneiss: E: 32.
 pH: ?
- *mediocris* Krasske. A.SCHMIDT'S Atlas, Pl. 401, figs. 95—99.
 Gneiss: C: 549 (0.4 ‰), 572 (0.2 ‰). DQ: 86 (2.8 ‰). K: 300 (0.8 ‰).
 Sediment: S: 273.
 pH: indifferent.
 Plate IX, fig. 18: $11.3 \times 3.0 \mu$. 18—19 striae in 10μ .
 Seems to be identical with A.SCHMIDT'S Atlas, Pl. 401, figs. 95—98.
 Gneiss: K: 307.
- *minima* Grun.? HUSTEDT 1930, p. 272, fig. 441. 1946—50, Pl. 38, figs. 52—56.
 Plate IX, fig. 20: $17.3 \times 4.0 \mu$. ca. 24 striae in 10μ .
 Undoubtedly closely related to *N. minima* Grun., the dimensions of which are $8-17 \times 2.5-4.5 \mu$ with 26 radial striae in 10μ (HUSTEDT 1930, p. 272). In habit also closely related to *N. tantula* Hustedt, HUSTEDT 1946—50, Pl. 38, figs. 58—62, but this species has still denser striae, and its central area is pronouncedly quadrangular and not rounded as in IX:20.
 Gneiss: D: 491 (3.4 ‰).
 pH: indifferent.
- *var. atomoides* (Grun.) Cleve. HUSTEDT 1930, p. 272, fig. 442.
 Plate VIII, fig. 21: $8.7 \times 4.8 \mu$. 26—28 striae in 10μ .
 Basalt: D: 434.
 pH: indifferent. W.Gr.: rare.
- *minuscule* Grun. FOGED 1952, Pl. 3, fig. 10. A.SCHMIDT'S Atlas, Pl. 400, figs. 88—91.

Plate V, fig. 14: $22 \times 8.3 \mu$. 18 striae in 10μ .

All striae slightly radial and somewhat coarser than usual in the species, but V:14 can hardly be identified with the somewhat similar *N. simplex* Krasske, which has convergent apical striae, nor with *N. similis* Krasske, the central pores of which approach very nearly to one another.

Gneiss: C: 572.

pH: ?

(*Navicula minuscula* var. *alpestris* Hustedt. Pearyld: rare).

— *mutica* Kütz. HUSTEDT 1930, p. 274, fig. 453a.

Basalt: D: 62 (1.0%), 69, 71, 74 (0.2%), 107 (0.2%), 108, 103 (1.2%), 438, 547. N: 354 (2.0%), 358, 395, 397. S: 193 (0.4%), 195 (0.2%), 221, 213, 184, 191 (0.8%), 206, 242.

Gneiss: D: 48, 462 (0.2%), 524, 542. DQ: 86 (0.2%), 95 (0.2%).

pH: indifferent. W.Gr.: rather common. Pearyld: rather common.

— — forma.

Plate VI, fig. 6: $22 \times 11.3 \mu$ 18—19 striae in 10μ .

A short form with very slightly drawn-out apices. Almost identical with A. CLEVE-EULER 1953, III, fig. 907 n, which perhaps is fo. *rhomboidea* Playfair. Also closely related to *Stauroneis polymorpha* Lagerst., LAGERSTEDT 1873, p. 39, Pl. 1, fig. 12, which has the dimensions $19-32 \times 7-11 \mu$ and 14—15 striae in 10μ . Basalt: S: 213.

— — fo. *rhomboidea* Playfair?

Plate VI, fig. 7: $30 \times 10.7 \mu$. 18 striae in 10μ .

Perhaps a longer form of VI:6 and fairly closely related to *N. mutica* fo. *rhomboidea* Playfair in BOYE PETERSEN 1928, p. 392, fig. 18 with the dimensions $37 \times 11 \mu$ and 18 striae in 10μ .

Basalt: D: 71, 438. S: 193 (0.2%), 232 (1.6%).

— — forma (*rhombica*).

Basalt: D: 438 (0.8%).

pH: indifferent.

— — var. *binodis* Hustedt. HUSTEDT 1930, p. 275, fig. 453d. A. SCHMIDT'S Atlas, Pl. 370, fig. 28. FOGED 1955, p. 50, Pl. 6, fig. 4.

Basalt: N: 354. S: 205.

pH: indifferent. Pearyld: rare.

— — var. *cohnii* (Hilse) Grun. HUSTEDT 1930, p. 275, fig. 453b.

Basalt: D: 62 (0.6%), 107 (2.4%), 103 (4.4%). N: 350 (0.2%), 354 (0.4%), 358, 395 (0.2%). S: 195, 221, 184, 191 (0.4%).

Gneiss: DQ: 86 (0.8%), 130.

pH: indifferent. Pearyld: not rare.

— — var. *gracilis* Hustedt. HUSTEDT 1937—39, p. 233, Pl. 17, fig. 4. FOGED 1955, p. 50, Pl. 6, fig. 5.

Basalt: D: 62 (0.6%), 107, 103 (12.0%), 547. N: 354 (0.2%), 395 (0.2%), 397. S: 193, 195, 191 (0.4%).

Gneiss: D: 48. DQ: 86 (3.2%), 95. U: 130.

pH: indifferent. Pearyld: fairly rare.

— — var. *gracilis* ?

Plate VI, fig. 10: $31.4 \times 8 \mu$. 18 striae in 10μ .

Ranges between var. *ventricosa* (Kütz.) Cleve, which has "Enden breit, kaum schmaler als die Mitte", and var. *gracilis* Hustedt, which has "Enden viel schmaler als die Schalenmitte" (HUSTEDT 1937—39, p. 233). Closely related to FOGED 1955, Pl. 6, fig. 5.

Basalt: S: 191.

- Navicula mutica* var. *nivalis* (Ehr.) Hustedt. HUSTEDT 1930, p. 275, fig. 453c.
 FOGED 1955, p. 50, Pl. 6, figs. 2, 3. A.SCHMIDT'S Atlas, Pl. 370, figs. 29, 30.
 Basalt: D: 107, 103 (0.2 %). N: 350, 354 (0.8 %), 361. S: 221, 184, 191 (0.2 %).
 Sediment: S: 267.
 pH: indifferent. W.Gr.: rare. Pearyld: not rare.
 Plate VI, fig. 2: $31.4 \times 10.0 \mu$. 14—15 striae in 10μ .
 Plate VI, fig. 3: $26.6 \times 8.6 \mu$. 18 striae in 10μ .
 Plate VI, fig. 4: $22.6 \times 9.0 \mu$. 18 striae in 10μ .
 Plate VI, fig. 5: $15.3 \times 8.0 \mu$. 18 striae in 10μ .
 — var. *nivalis* ?
 Plate VI, fig. 1: $44 \times 13.3 \mu$. 15 striae in 10μ .
 VI:1 seems to be identical with HUSTEDT 1943, fig. 24, as to the placing of which HUSTEDT is doubtful, as on p. 157 he, indeed, refers it to var. *nivalis*, but "halte es für möglich, dass sie eine besondere Form darstellen." V:1 differs clearly in habit from typical forms of var. *nivalis*.
 Basalt: S: 191.
 — var. *ventricosa* (Kütz.) Cleve. HUSTEDT 1930, p. 275, fig. 453c.
 Basalt: D: 62 (0.4 %), 107. N: 350. S: 193, 191.
 pH: indifferent.
 Plate VI, fig. 9: $29.2 \times 8.7 \mu$. 20—22 striae in 10μ .
 Almost identical with HUSTEDT 1930, p. 453e and A.SCHMIDT'S Atlas, Pl. 370, figs. 26—27.
 Basalt: S: 191.
 — *naumanni* Hustedt. HUSTEDT 1942b, p. 115, figs. 22—24.
 Basalt: N: 350.
 Sediment: S: 286 (0.4 %).
 pH: ?
 Plate VIII, fig. 7: $17.0 \times 5.0 \mu$. 18—19 striae in 10μ .
 The species is especially characterized by the fact that the "Axialarea und Centralarea sind in einem breit lanzettlichen Raum verbunden" (HUSTEDT 1942b, p. 115); *loc. cit.* the following dimensions are given: $16-20 \times 5-6 \mu$ with about 22 radial striae in 10μ .
 VIII:7 thus is somewhat more coarsely striated.
 Sediment: S: 279.
 — *obsoleta* Hustedt. HUSTEDT 1942a, p. 69, figs. 12—16.
 Gneiss: D: 491 (0.8 %), 524 (10.4 %).
 pH: ?
 Plate IX, fig. 14: $11.3 \times 2.6 \mu$. 17—18 striae in 10μ .
 HUSTEDT 1942a states the dimensions $8-11 \times 2-2.5 \mu$ with 20—24 striae in 10μ . IX:14 thus is a little more coarsely striated than the type, but otherwise there is full agreement.
 Gneiss: D: 491.
 — *opportuna* Hustedt. HUSTEDT 1946—50, p. 436. Pl. 39, figs. 21, 22.
 Plate VIII, fig. 11: $11.3 \times 6.8 \mu$. ca. 15 striae in 10μ .
 Plate VIII, fig. 12: $13.3 \times 6.8 \mu$. ca. 15 striae in 10μ .
 Dimensions for *N. opportuna* Hustedt according to HUSTEDT 1946—50, p. 436 are $10-14 \times 6-7.5 \mu$ with about 16 striae in 10μ . A characteristic feature is the shorter striae inserted in the middle.
N. modica Hustedt, HUSTEDT 1945, p. 916, Pl. 41, figs. 21—23, also seems to be rather closely related to VIII:11—12.
 Basalt: D: 434. S: 221.

Navicula pelliculosa (Bréb.) Hilse. HUSTEDT 1930, p. 287, fig. 480.

Basalt: D: 62 (8.0 %), 430 (0.2 %), 431, 434. S: 193, 195 (0.2 %), 191 (0.6 %).

pH: ?

Plate IX, fig. 8: $9.3 \times 5.3 \mu$. Striae non visible.

Sediment: S: 281.

— *perventralis* Hustedt. HUSTEDT 1937—39, p. 241, Pl. 17, figs. 49, 50.

Gneiss: D: 462 (1.2 %).

pH: ?

— *perpusilla* Grun. HUSTEDT 1930, p. 278, fig. 459. FOGED 1953, p. 43, Pl. 4, fig. 7. 1955, Pl. 6, fig. 13.

Basalt: D: 62 (1.0 %), 68 (3.0 %), 71, 74 (0.2 %), 107 (1.4 %), 108 (0.6 %), 438 (2.0 %), 547 (91.4 %). N: 350, 354 (0.8 %), 358, 395 (0.4 %), 343. S: 193, 195 (1.0 %), 221 (0.2 %), 213 (0.2 %), 184 (1.6 %), 191 (0.6 %), 232 (0.6 %). Gneiss: C: 567 (0.2 %). D: 48, 479 (0.2 %), 524 (0.8 %), 542 (0.2 %). DQ: 95.

pH: indifferent. W.Gr.: rather common. Pearyld: very common.

— *pseudagrestis* Lund? J.W.G.LUND 1946, p. 76, figs. 6 X—AA.

Plate VII, fig. 16: $12.0 \times 5.3 \mu$. 18 striae in 10μ .

Differing somewhat from J.W.G.LUND's forms of this species, which especially have somewhat denser striae (23—28 in 10μ) than VII:16. In habit VII:16 also approaches very nearly to *N. faceta* Hustedt, HUSTEDT 1949b, p. 88, Pl. 4, figs. 25—26, which has the dimensions $10—13 \times 5 \mu$ with 24 striae in 10μ and has slightly bent branches of the raphe within a slightly thickened siliceous rib just as in VII:16, which differs from *N. insociabilis* Krasske by not having punctate striae and by its slight siliceous rib round the raphe.

Basalt: N: 345.

pH: ?

— *rotaeana* (Rabh.) Grun. HUSTEDT 1930, p. 273, fig. 445. FOGED 1953, p. 43, Pl. 4, figs. 8—10.

Basalt: D: 69 (0.2 %), 107, 109, 434 (0.2 %). N: 350 (0.2 %). S: 193 (0.4 %) 195 (1.0 %), 221, 213, 205 (0.2 %), 206 (1.0 %), 245.

Gneiss: C: 549 (0.4 %). U: 130 (0.4 %).

Sediment: S: 267 (1.4 %).

pH: indifferent. W.Gr.: not rare. Pearyld: rather common.

Plate IX, fig. 2: $26.6 \times 8 \mu$. 24—26 striae in 10μ .

Gneiss: C: 567.

— *rotunda* Hustedt. HUSTEDT 1945, p. 916, Pl. 41, fig. 29.

Basalt: S: 213.

pH: ?

Plate VIII, fig. 15: $8.7 \times 6.0 \mu$. 21—22 striae in 10μ .

Plate VIII, fig. 16: $8.7 \times 5.0 \mu$. ca. 21 striae in 10μ .

According to HUSTEDT 1954, p. 472, figs. 41—50, the dimensions are $5—17 \times 3.5—7.5 \mu$ and about 20 striae in 10μ , and “Centralarea stets unregelmässig und oft gänzlich fehlend.” Thus there seems to be good reasons for referring VIII: 15—16 to the form cycle of *N. rotunda*. The very closely related forms *N. subrotundata* Hustedt and *N. minima* Grun. var. *atomoides* (Grun.) Cleve both have considerably denser striae.

— *seminulum* Grun. HUSTEDT 1930, p. 272, fig. 443.

Plate IX, fig. 7: $20.1 \times 4.7 \mu$. 21—22 striae in 10μ .

According to HUSTEDT 1930, p. 272, the dimensions are $11—16 \times 4 \mu$ with 18—20 striae in 10μ , so that IX:7, hesitatingly referred here, should be an abnormally large specimen with somewhat denser striae than usual to the species.

Basalt: N: 345.

Gneiss: D: 524 (14.0 %).

pH: indifferent. W.Gr.: rare.

Navicula seminulum var. *intermedia* Hustedt. ? HUSTEDT 1942b, p. 110, figs. 25—28.

Gneiss: D: 452 (0.2 %). K: 300, 307 (0.8 %), 318 (1.4 %), 327 (2.0 %).

Sediment: S: 267 (0.8 %).

pH: indifferent.

Plate VIII, fig. 22: $11.3 \times 5.3 \mu$. 22—23 striae in 10μ .

Gneiss: K: 308. C: 567 (20.0 %).

Plate VIII, fig. 23: $13.3 \times 5.8 \mu$. 22 striae in 10μ .

Gneiss: K: 300 (22.4 %), 307 (3.0 %).

— *strömii* Hustedt. ? HUSTEDT 1931, fig. 3. A.SCHMIDT's Atlas, Pl. 399, fig. 50.

Plate IX, fig. 11: $16.6 \times 3.5 \mu$. 22—24 striae in 10μ .

The apical striae are parallel or slightly convergent, so IX:1 is hesitatingly referred to *N. strömii*, in which all striae normally are slightly radial. The same hesitation applies to Pl. IX, fig. 12.

Basalt: S: 246.

Plate IX, fig. 12: $13.3 \times 3.7 \mu$. 21 striae in 10μ .

Basalt: S: 195.

Plate IX, fig. 19: $17.3 \times 3.3 \mu$. 21 striae in 10μ .

Gneiss: DQ: 86.

— *subatomoides* Hustedt. A.SCHMIDT's Atlas, Pl. 404, figs. 33—35.

Basalt: D: 74 (0.8 %), 434. N: 395 (0.2 %), 382 (0.2 %). S: 191, 205, 245 (0.2 %).

Gneiss: E: 32 (0.2 %), 572 (2.2 %). D: 476, 479 (1.2 %). DQ: 81 (0.4 %). K: 300.

Sediment: S: 267 (2.8 %).

pH: ?

— *suchlandti* Hustedt. ? HUSTEDT 1943, figs. 33, 34. A.SCHMIDT's Atlas, Pl. 399, figs. 24—28.

Plate IX, fig. 22: $12.5 \times 3.0 \mu$. ca. 22 striae in 10μ .

IX:22 is somewhat more coarsely striated than usual in *N. suchlandti* (about 30 striae in 10μ), but otherwise there is close agreement.

Gneiss: D: 491.

pH: ?

(— *subfossalis* Hustedt. W.Gr.: fairly rare).

(— *submuralis* Hustedt. Pearyld: rare).

(— *subrotundata* Hustedt. W.Gr.: rare. Pearyld: not rare).

— *suecorum* Carlsson. HUSTEDT 1949a, p. 49, Pl. 2, figs. 33—35.

Basalt: D: 107, 438. N: 354, 358 (0.2 %). S: 221.

pH: ?

— *soehrensii* Krasske. HUSTEDT 1930, p. 289, fig. 488. FOGED 1955, p. 52, Pl. 11, fig. 7.

Basalt: N: 343 (0.2 %).

Gneiss: C: 549 (0.2 %), 567 (0.2 %).

pH: ? Pearyld: rather common.

— var. *capitata* Krasske. HUSTEDT 1930, p. 289. FOGED 1955, p. 52, Pl. 11, fig. 8.

Basalt: N: 343.

Gneiss: E: 32.

pH: ? Pearyld: rare.

— var. *musciola* (Petersen) Krasske. HUSTEDT 1930, p. 289. KRASSKE 1932, Pl. 3, fig. 23e.

Gneiss: C: 555 (0.6 %). D: 469.

pH: ?

(*Navicula soehrensensis* var. *septentrionalis* Hustedt. W.Gr: rare).

— *tantula* Hustedt. HUSTEDT 1930, p. 401, Pl. 38, figs. 58—62.

Plate IX, fig. 21: $12.0 \times 2.6 \mu$. 26—28 striae in 10μ .

Striae radial. The central area is of the same characteristic shape as that of *N. tantula*. It is very difficult to distinguish this species from *N. minima* Grun., *N. minima* var. *atomoides* Grun., and *N. seminulum* Grun. (see i. a. J.W.G. LUND 1946, pp. 68—71).

Gneiss: D: 491 (8.4 %).

As IX:21 and IX:20 generally occur together and both are fairly numerous in Sample 491, it is very doubtful whether they should actually be kept apart. Their being still kept apart is due to the characteristic difference between their central areas.

— *variostrata* Krasske. HUSTEDT 1930, p. 273, fig. 447. FOGED 1953, p. 44, Pl. 4, fig. 22. Basalt: D: 74 (0.4 %), 430 (0.2 %), 431 (0.8 %), 434. N: 350 (0.2 %), 395 (0.6 %). S: 213, 205, 245 (0.4 %).

Gneiss: E: 32. C: 549, 560, 572 (2.8 %). D: 45 (0.2 %), 454, 469 (0.6 %), 476 (0.4 %), 479 (0.4 %), 452. DQ: 81 (0.2 %). K: 300, 307 (1.2 %), 308 (0.2 %). Sediment: S: 267 (0.4 %).

pH: acidophilous. W.Gr.: rare.

— *vaucheriae* Boye Petersen. BOYE PETERSEN 1915, p. 291, fig. 13.

Plate VIII, fig. 17: $12.7 \times 4.7 \mu$. 22—24 striae in 10μ .

According to BOYE PETERSEN 1915, p. 291, the dimensions are $11.5 \times 4.6 \mu$ with 20 striae in 10μ , but it is added: "It is hardly possible to distinguish small specimens of *N. atomus*, *N. muralis*, and *N. vaucheriae* from each other."

Basalt: N: 344, 350.

Gneiss: K: 307.

Plate VIII, fig. 18: $13.8 \times 5.0 \mu$. 24 striae in 10μ .

Like VIII:17 has somewhat denser striae than stated by BOYE PETERSEN.

Basalt: N: 345.

— *ventralis* Krasske. HUSTEDT 1930, p. 274, fig. 450.

Basalt: S: 245 (0.4 %).

Gneiss: E: 32 (0.2 %). C: 549, 560 (0.8 %), 561 (0.2 %), 572 (0.6 %). D: 476 (0.2 %), 479 (0.2 %).

Sediment: S: 267 (0.2 %).

pH: indifferent.

— var. *simplex* Hustedt. A.SCHMIDT's Atlas Pl. 400, fig. 77.

Plate VIII, fig. 25: $12.6 \times 5.3 \mu$. 24 striae in 10μ .

Basalt: N: 350.

Gneiss: D: 462.

pH: ?

— *ventralis* Krasske. ? HUSTEDT 1942a, p. 70, fig. 17.

Plate VIII, fig. 24: $12.0 \times 5.4 \mu$. 24 striae in 10μ .

Closely related to *N. ventralis* Krasske, A.SCHMIDT's Atlas Pl. 400, figs. 73—76.

Basalt: S: 246.

— sp.

Plate VII, fig. 13: $14.7 \times 6.0 \mu$. 21—22 striae in 10μ .

Is perhaps related to *N. grimmei* Krasske, but differs from this species by its broadly drawn-out apices and the central nodes deflected to the same side.

Basalt: N: 342.

Navicula sp.

Plate VII, fig. 18: $16.0 \times 6.7 \mu$. 18—19 striae in 10μ .

The branches of the raphe are bent in their whole course. Polar nodules not observed. Fairly broad axial area, which is not extended into a special central area. Striae with two distinct, hyaline longitudinal stripes.

Closely related to *N. insociabilis* Krasske, KRASSKE 1932, p. 114, fig. 17 (dim.: $12-18 \times 5-7 \mu$ with 20 striae in 10μ), which, however, according to HUSTEDT 1937—39, p. 252, has polar nodules "von den Schalenpolen entfernt." It also seems to be closely related to *N. fritschii* Lund, J.G.W. LUND 1946, p. 77, figs. 7 A—G (dim.: $7-16 \times 5-6 \mu$ with 20—25 striae in 10μ), but this species has the raphe "straight except near the central nodule, where each branch bends more or less clearly towards one side of the valve."

Basalt: N: 389.

— sp.

Plate IX, fig. 13: $14.6 \times 4.0 \mu$. 22—24 striae in 10μ .

Differs from *N. mediocris* Krasske, KRASSKE 1932, p. 113, fig. 15 (dim.: $9-12 \times 2.5-3 \mu$ with 22—24 striae in 10μ) especially by not having the axial area extended in the middle of the valve.

Sediment: S: 281.

— sp.

Plate VII, fig. 19: $24.6 \times 7.3 \mu$. 24 striae in 10μ .

The striae are finely, but distinctly punctate, all radial. There are no intercalated shorter mid-striae. The polar nodules seem to be deflected to either side. I hesitate to refer the form to *N. rotacana* (Rabh.) Grun., to which it otherwise bears no small resemblance.

Gneiss: C: 567.

— sp.

Plate VII, fig. 21: $11.3 \times 5.3 \mu$. ea. 20 striae in 10μ .

Raphe straight. Axial area narrow, about the central nodules very little extended. Striae radial, with a distinct hyaline longitudinal stripe.

Basalt: S: 215.

— sp.

Plate VIII, fig. 10: $30 \times 8 \mu$. 27—28 striae in 10μ .

All striae radial. Some mid-striae are shortened.

Basalt: N: 344.

— sp. (?)

Plate IX, fig. 5: $40 \times 9.8 \mu$. 16—18 striae in 10μ .

Basalt: N: 350. S: 249.

Gneiss: K: 307.

Naviculae bacillares Cleve.*Navicula bacillum* Ehr. HUSTEDT 1930, p. 280, fig. 465.

Basalt: N: 350, 343.

Gneiss: C: 549. D: 469, 479.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather common.

— *pupula* Kütz. HUSTEDT 1930, p. 281, fig. 467a.

Basalt: D: 431. N: 350, 354, 372, 343 (0.2 %). S: 245.

Gneiss: E: 32. U: 130.

Sediment: S: 267.

pH: indifferent. W.Gr.: rare. Pearyld: fairly rare.

— var. *capitata* Hustedt. HUSTEDT 1930, p. 281, fig. 467c.

Basalt: D: 430. N: 372, 642. S: 205, 206 (0.4 %), 245, 232 (0.2 %).

Gneiss: C: 560, 561. D: 33 (0.2 %), 476. DQ: 81.

Sediment: S: 267 (0.2 %), 273 (0.4 %).

pH: indifferent. W.Gr.: not rare.

Navicula pupula var. *rectangularis* (Greg.) Grun. HUSTEDT 1930, p. 281, fig. 467b.

Basalt, S: 221, 206.

Gneiss: C: 561, 572. D: 469. U: 130.

pH: indifferent. W.Gr.: scarce.

(— *subhamulata* Grun. Pearyld: scarce).

Naviculae annulatae Hustedt.

Navicula ignota Krasske var. *anglica* Lund. J.W.G. LUND 1946, p. 67, fig. 4 W, X.

Plate VII, fig. 3: $18.7 \times 5.3 \mu$. 15 striae in 10μ .

Polar nodules deflected to the same side. According to J.W.G. LUND 1945, p. 67, the dimensions are $13-16 \times 4-5 \mu$ with 15-20 radial striae.

Gneiss: K: 307.

Plate VII, fig. 1: $20 \times 7.5 \mu$. 15 striae in 10μ .

Probably the same form as the one described above. It is very difficult on the basis of characters recorded so far to distinguish between the species *N. schönfeldi* Hustedt and *N. lagerstedti* Cleve (see especially HUSTEDT 1946-50, pp. 353-54, and J.W.G. LUND 1946, pp. 65-68).

Basalt: N: 246.

Plate VII, fig. 2: $18.7 \times 7.5 \mu$. 15 striae in 10μ .

Very closely related to the two preceding forms.

Gneiss: K: 307.

— *lagerstedti* Cleve. A. SCHMIDT'S Atlas, Pl. 400, figs. 34-37.

Basalt: N: 358. S: 206.

pH: indifferent. W.Gr.: rare. Pearyld: scarce.

— var. *palustris* Hustedt. HUSTEDT 1934, p. 385.

A. SCHMIDT'S Atlas, Pl. 400, figs. 27-29. FOGED 1953, p. 47, Pl. 4, figs. 13-16.

Basalt: D: 69 (0.4 %), 71 (0.2 %), 438, 434. N: 354. S: 221, 191, 205.

Gneiss: D: 542.

pH: indifferent. W.Gr.: scarce. Pearyld: not common.

Plate VII, fig. 4: $28 \times 6.7 \mu$. 12 striae in 10μ .

Plate VII, fig. 5: $30 \times 6.8 \mu$. 12 striae in 10μ .

Linear, with slightly triundulate sides. Isolated point in central area.

Basalt: S: 215.

Plate VII, fig. 6: $27.4 \times 8.0 \mu$. 15 striae in 10μ .

Deviates from VII:5 by the fact that the mid-striae are somewhat S-shaped, but otherwise corresponding to VII:5.

Gneiss: K: 307.

— sp.

Plate VII, fig. 7: $22 \times 6 \mu$. 12-13 striae in 10μ .

All striae radial, apical striae (2-3) with a hyaline longitudinal groove. Striae in the middle of the valve S-shaped.

Presumably closely related to *N. lagerstedti* var. *palustris*, but differs from it especially by the S-shaped mid-striae. *N. decussis* Hustedt, which also has S-shaped mid-striae, has convergent apical striae, so that it must be left out of consideration. There are also certain similarities to *N. latens* Krasske, *N. tecta* Krasske, *N. schönfeldi* Hustedt, but the differences are in all cases so great, that these species probably all should be disregarded here.

Basalt: N: 337.

Plate VII, fig. 8: $22 \times 6 \mu$. 12—13 striae in 10μ .

Closely related to VII:7.

Basalt: N: 354.

Navicula sp.

Plate VII, fig. 10: $26 \times 7.6 \mu$. 14 striae in 10μ .

Striae radial, three apical striae with hyaline longitudinal streak. Other striae rather coarsely and distinctly punctate. Neither *N. schönfeldi* nor *N. lagerstedti* seems to have distinctly punctate striae.

Basalt: S: 255.

— sp.

Plate VII, fig. 12: $14 \times 5.4 \mu$. 21 striae in 10μ .

Striae finely, but distinctly punctate. The midmost shortened striae alternately longer and shorter. Two apical striae with longitudinal line. Valves elliptical.

Basalt: N: 358.

— sp.

Plate VII, fig. 11: $17.5 \times 5.6 \mu$. 17 striae in 10μ .

Two apical striae with longitudinal line. Other striae finely, but distinctly punctate. Midmost stria shortened. Closely related to VII:10.

Basalt: S: 195.

Naviculae lineolatae Cleve.

Navicula aboensis (Cleve) Hustedt. HUSTEDT 1943—55, IV, p. 407, figs. 131, 132.

Plate VIII, fig. 3: $14.7 \times 8.4 \mu$. 21 striae in 10μ .

Gneiss: DQ: 86.

Plate VIII, fig. 5: $8.7 \times 6.7 \mu$.

Found in the same sample (Gneiss: DQ: 86) as VIII:3 and is undoubtedly a small specimen of the same species.

— *avenacea* (Bréb.) Grun. HUSTEDT 1930, p. 297. P.T. CLEVE 1894—95, II, p. 15.

FOGED 1953, p. 44, Pl. 5, fig. 3.

Basalt: D: 74.

Gneiss: D: 48.

pH: alkaliphilous. W.Gr.: rare.

— *cari* Ehr. HUSTEDT 1930, p. 299, fig. 512. FOGED 1953, p. 44, Pl. 5, fig. 4.

Basalt: N: 350 (1.0 %), 354, 361 (0.4 %), 358 (4.0 %). S: 184.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather common.

— *cari* Ehr. ?

Plate X, fig. 5: $36.6 \times 8.0 \mu$. 12—13 striae in 10μ .

As the central area is "quer-rechteckig" as in *N. cari* Ehr., this otherwise somewhat deviating form is referred here.

Basalt: N: 358.

— *certa* Hustedt. HUSTEDT 1945, p. 924, pl. 42, figs. 2, 3. MESSIKOMMER 1951, Pl. 1, fig. 1. FOGED 1955, p. 53, Pl. 6, figs. 9, 17.

Basalt: D: 74 (0.2 %), 109. N: 354 (1.0 %), 372 (2.8 %), 395 (0.2 %). S: 221, 205 (2.0 %), 206 (0.2 %), 245, 232 (0.2 %).

Gneiss: E: 32. C: 560. DQ: 81 (0.2 %).

Sediment: S: 267.

pH: alkaliphilous. Pearyld: rare.

— *cincta* (Ehr.) Kütz. HUSTEDT 1930, p. 298, fig. 510. FOGED 1953, p. 44, Pl. 5, figs. 8, 9.

Basalt: D: 103 (0.4 %), 438, 434 (0.2 %). N: 350 (1.0 %), 354 (0.8 %), 361 (0.2 %), 395 (0.6 %), 343 (0.8 %). S: 221, 184 (1.2 %), 205 (0.4 %), 206 (0.4 %).

Gneiss: U: 130.

pH: alkaliphilous. W.Gr.: not common. Pearyld: rather common.

- Navicula cincta* var. *heufleri* Grun. HUSTEDT 1930, p. 298, fig. 511. FOGED 1955, p. 53, Pl. 6, fig. 11.
 Basalt: D: 62 (2.0 %), 69, 71 (4.0 %), 74 (0.2 %).
 pH: alkaliphilous. Pearyld: rare.
 Plate X, fig. 6: $22 \times 4.7 \mu$. 11 striae in 10μ .
 In fairly close agreement with FOGED 1955, Pl. 6, fig. 11.
 Gneiss: D: 103.
 Plate X, fig. 7: $22 \times 4.7 \mu$. 9 striae in 10μ .
 Very similar to X:6.
 Basalt: N: 351.
- *clementioides* Hustedt. HUSTEDT 1945, p. 348, Pl. 37, figs. 59—61.
 Gneiss: DQ: 81.
 pH: alkaliphilous. W.Gr.: rare. Pearyld: very rare.
- *clementis* Grun. A.SCHMIDT's Atlas, Pl. 398, fig. 12.
 Basalt: D: 431 (0.2 %), 434. S: 245.
 Gneiss: DQ: 81. U: 130.
 pH: alkaliphilous. W.Gr.: rare.
- *costulata* Grun. HUSTEDT 1930, p. 298, fig. 505.
 Basalt: N: 350 (0.2 %).
 pH: alkaliphilous.
- *cryptocephala* Kütz. HUSTEDT 1930, p. 295. FOGED 1953, p. 45, Pl. 5, figs. 11, 13, 14. 1955, p. 53, Pl. 6, figs. 14, 22.
 Basalt: D: 107, 109, 108 (0.4 %), 103 (1.6 %), 430, 434 (0.6 %). N: 350 (1.4 %), 354 (5.4 %), 361, 358 (0.2 %), 372 (6.4 %), 395 (1.0 %), 397 (1.0 %). S: 193 (0.2 %), 195 (0.2 %), 184 (0.6 %), 205 (4.4 %), 206 (1.8 %), 245 (0.6 %).
 Gneiss: E: 20. C: 549, 572 (2.2 %). D: 48 (0.4 %), 469 (0.2 %), 479 (0.2 %), 524, 527 (0.4 %), 542 (0.6 %). U: 130. K: 307 (0.4 %).
 Sediment: S: 267 (1.0 %), 273.
 pH: alkaliphilous. W.Gr.: very common. Pearyld: very common.
- var. *intermedia* Grun. HUSTEDT 1930, p. 295, fig. 497 b.
 Basalt: N: 372 (0.4 %), 343 (1.0 %), 642 (0.6 %). S: 205 (0.6 %), 206 (0.2 %).
 Gneiss: C: 549 (0.2 %). D: 45 (0.6 %).
 Sediment: S: 267, 273 (0.4 %).
 pH: alkaliphilous. W.Gr.: not rare. Pearyld: not rare.
- fo. *terrestris* Lund. J.W.LUND 1946, p. 86, figs. 9 H—W. FOGED 1953, Pl. 5, figs. 7, 18. 1955, p. 54, Pl. 6, fig. 23.
 Basalt: D: 431 (0.4 %), 434 (0.4 %). N: 350. S: 195 (0.2 %), 213, 184, 205, 245.
 Gneiss: E: 32 (0.2 %). C: 549 (0.2 %). D: 476 (0.4 %), 479 (1.8 %). DQ: 81.
 U: 130 (1.0 %), 132.
 Sediment: S: 267 (0.2 %).
 pH: alkaliphilous. W.Gr.: not common. Pearyld: rather common.
- var. *veneta* (Kütz.) Grun. HUSTEDT 1930, p. 295, fig. 497 a. FOGED 1955, p. 54, Pl. 6, fig. 21.
 Basalt: N: 350 (1.6 %), 354 (0.2 %), 361 (0.2 %), 358 (0.2 %), 372 (3.2 %), 395 (1.6 %), 382 (7.4 %), 397 (5.8 %), 343 (10.4 %). S: 193 (2.0 %), 213 (0.2 %), 184 (1.2 %), 191, 205 (1.2 %).
 Gneiss: E: 32 (0.4 %). D: 524 (1.0 %). K: 307 (0.4 %), 318.
 pH: alkaliphilous. Pearyld: fairly rare.
- *decussis* Østrup. FOGED 1951, p. 55, Pl. 4, figs. 6, 11.
 Basalt: N: 354.
 pH: alkaliphilous.
- *dicephala* (Ehr.) W.Smith. HUSTEDT 1930, p. 302, fig. 526.

- Basalt: D: 434 (0.2 ‰). N: 350, 354 (0.4 ‰). S: 245 (0.2 ‰).
 pH: alkaliphilous. W.Gr.: rare.
 Plate X, fig. 8: $37.3 \times 10.6 \mu$. 12 striae in 10μ .
 Gneiss: C: 572.
- (*Navicula dicephala* var. *elginensis* (Greg.) Cleve. Pearyld: rare).
 — — var. ?
 Plate X, fig. 9: $24 \times 6.7 \mu$. 13—14 striae in 10μ .
 Basalt: N: 344.
 Plate X, fig. 10: $28.7 \times 10.0 \mu$. 10—11 striae in 10μ .
 Basalt: S: 245.
 Plate X, fig. 11: $30 \times 11.3 \mu$. 9—10 striae in 10μ .
 Basalt: S: 249.
- (— *digitoradiata* (Greg.) A. Smidt. Mesohalobous. W.Gr.: scarce).
 — — fo. *minor* Foged. FOGED 1953, p. 45, Pl. 5, figs. 1, 2.
 Gneiss: C: 560 (0.4 ‰), 561 (0.2 ‰). DQ: 81. Basalt: S: 205 (0.2 ‰), 206 (0.6 ‰), 245.
 pH: alkaliphilous. Mesohalobous. W.Gr.: rather common.
- (— *exigua* (Greg.) O. Müller. HUSTEDT 1930, p. 305, fig. 538.
 Basalt: D: 107. S: 193.
 pH: alkaliphilous.
- (— *explanata* Hustedt. HUSTEDT 1948, p. 207, figs. 7, 8.
 Plate VIII, fig. 6: $29.2 \times 11.0 \mu$. 9—10 striae in 10μ .
 This characteristic species has by HUSTEDT (1948, p. 207) been found in interglacial sediments in Poland.
 Basalt: D: 431. N: 350 (0.2 ‰). Sediment: S: 267, 273.
 pH: ?
- (— *falaisensis* Grun. Pearyld: not rare).
 (— — var. *lanceola* Grun. Pearyld: not rare).
 — *gracilis* Ehr. HUSTEDT 1930, p. 299, fig. 514.
 Basalt: S: 213.
 pH: alkaliphilous.
- (— *graciloides* A. Mayer. Pearyld: rare).
 — *hambergi* Hustedt. HUSTEDT 1924, Pl. 17, fig. 2.
 Plate IX, fig. 4: $20.6 \times 8.6 \mu$. 13—14 striae in 10μ .
 According to HUSTEDT 1924 the dimensions of *N. hambergi* are $18-23 \times 7-8 \mu$ with 16 striae in 10μ in the middle of the valve. There is also a considerable similarity to *N. exigua* (Greg.) O. Müller, but this species has apices differing somewhat from IX:4.
 IX:4 is with some hesitation referred to *N. hambergi*.
 Gneiss: D: 48.
 pH: ?
- (— *hungarica* Grun. HUSTEDT 1930, p. 298, fig. 506.
 Basalt: D: 434.
 pH: alkaliphilous.
- (— *hungarica* forma ?
 Plate IX, fig. 23: $23.3 \times 4.8 \mu$. 10 striae in 10μ .
 Deviates from the type by having an almost linear valve, slightly extended in the middle and with slightly extended apices.
 Basalt: N: 342.
- (— *interglacialis* Hustedt. HUSTEDT 1943—55 (1944), p. 286, fig. 27.
 Plate VI, fig. 12: $22.7 \times 10.0 \mu$. 11—12 striae in 10μ .
 This very characteristic *N.* species, which was first found by HUSTEDT (1944)

in interglacial deposits on Lüneburger Heide, has later been found in interglacial deposits in Denmark (Foged 1954) and in recent material from Finland and Sweden (Hustedt 1954). In recent material from Iceland (from 1954, not publ.) I have found it to be rather common.

Basalt: S: 222, 255.

Plate VI, fig. 11: $23.3 \times 4.8 \mu$. 11—12 striae in 10μ .

This form should probably be referred to *N. interglacialis*.

Basalt: S: 245, 249.

pH: ?

Navicula lanceolata (Ag.) Kütz. HUSTEDT 1930, p. 305, fig. 540.

Basalt: D: 430, 431 (0.2 %), 434. S: 245, 232 (0.4 %).

Gneiss: E: 28 (0.2 %), 32. C: 549, 572.

pH: alkaliphilous.

— *menisculus* Schum. var. *obtusa* Hustedt. HUSTEDT 1937—39, p. 271, Pl. 20, figs. 12, 13.

Plate X, fig. 3: $18 \times 8 \mu$. 14 striae in 10μ .

Basalt: N: 344. D: 71. S: 195.

pH: alkaliphilous.

— *peregrina* (Ehr.) Kütz. HUSTEDT 1930, p. 300, fig. 516.

Gneiss: DQ: 81 (0.4 %).

pH: alkaliphilous. Mesohalobous. W.Gr.: rather common.

— var. *kefvingensis* (Ehr.) Cleve. HUSTEDT 1930, p. 300. A.SCHMIDT's Atlas, Pl. 47, figs. 61, 62.

Basalt: S: 205 (0.6 %).

Gneiss: U: 130 (0.6 %).

pH: alkaliphilous. Mesohalobous.

(— *pseudocryptocephala* Foged. W.Gr.: rather common).

— *pseudocryptocephala* Foged. ? FOGED 1953, p. 45, Pl. 6, fig. 12.

Plate IX, fig. 24: $30 \times 6.7 \mu$. 18 striae in 10μ .

It is hesitatingly that IX:24 is referred to *N. pseudocryptocephala*, as it has highly radial apical striae and is without a distinct siliceous rib along the raphe. Sediment: S: 267 (0.8 %).

pH: ?

— *radiosa* Kütz. HUSTEDT 1930, p. 299, fig. 513.

Basalt: D: 109 (6.0 %), 430 (0.6 %), 431 (0.8 %), 434 (0.8 %). N: 350 (0.4 %), 354 (0.2 %), 361, 358 (0.2 %), 372, 642 (0.2 %). S: 221 (0.2 %), 205 (0.4 %), 206 (3.8 %), 245 (0.6 %), 242 (0.6 %).

Gneiss: E: 28, 32 (0.4 %). C: 549 (0.2 %), 572 (0.2 %). D: 476, 479 (0.4 %). DQ: 81 (0.6 %). U: 130. K: 327.

Sediment: S: 267 (0.6 %), 273 (1.0 %), 167 (1.4 %).

pH: alkaliphilous. W.Gr.: not rare. Pearyld: rare.

(— — var. *tenella* (Bréb.) Grun. W.Gr.: rare).

— *reinhardtii* Grun. HUSTEDT 1930, p. 301, fig. 519.

Basalt: N: 350.

pH: alkaliphilous.

— *rhynchocephala* Kütz. HUSTEDT 1930, p. 296, fig. 501.

Basalt: D: 430, 431 (0.2 %), 434 (0.2 %), 245 (0.4 %).

Gneiss: E: 28 (0.2 %), 32 (0.2 %). C: 558, 572 (0.2 %). D: 479 (0.2 %), 452.

Sediment: S: 267.

pH: alkaliphilous. Halophilous. W.Gr.: not rare.

(— *rostellata* Kütz. W.Gr.: rare).

Navicula salinarum Grun. HUSTEDT 1930, p. 295, fig. 498.

Basalt: S: 213, 206.

Gneiss: C: 560, 561. DQ: 81.

pH: alkaliphilous. Mesohalobous. W.Gr.: not rare. Pearyld: rare.

(— *fo. minima* Kolbe. Mesohalobous. W.Gr.: dominant in one sample)

— *schönfeldii* Hustedt. HUSTEDT 1930, p. 301, fig. 520. FOGED 1955, p. 54, Pl. 7, figs. 8—12.

Basalt: N: 350, 354 (0.6 %), 372, 395, 343. S: 232.

Gneiss: D: 45, 479, 452. K: 300, 307.

Sediment: S: 267 (0.2 %).

pH: alkaliphilous. Pearyld: fairly rare.

(— *similis* Krasske. Pearyld: rare).

(— *simplex* Krasske. W.Gr.: rare).

— *tuscula* (Ehr.) Grun. HUSTEDT 1930, p. 308, fig. 552.

Basalt: N: 350, 343. S: 206.

Sediment: S: 273 (0.2 %).

pH: alkaliphilous. W.Gr.: not common. Pearyld: rather common.

— *tuscula* (Ehr.) Grun. forma.

Plate X, fig. 12: $49.3 \times 19.0 \mu$. 12 striae in 10μ .

The striae along the margin consist of distinct double points. In Scandinavian material the species often occurs with highly capitate apices as here.

Basalt: S: 205 (0.4 %), 206. N: 642.

Gneiss: U: 130 (0.2 %).

Sediment: S: 267.

— *viridula* Kütz. HUSTEDT 1930, p. 297, fig. 504.

Basalt: D: 516. N: 372 (0.2 %). S: 221, 213, 205 (1.2 %), 206 (1.4 %), 245 (0.6 %).

Gneiss: C: 560 (0.2 %), 561 (0.2 %). D: 48, 542 (0.2 %). DQ: 81 (0.2 %). U: 130 (0.2 %), 132 (0.8 %).

pH: alkaliphilous. W.Gr.: rather common.

Plate X, fig. 4: $34.6 \times 6.6 \mu$. 12 striae in 10μ .

Basalt: S: 213.

— *var. slesvicensis* (Grun.) Cleve. HUSTEDT 1930, p. 297.

Gneiss: DQ: 81. U: 130 (0.6 %).

pH: alkaliphilous. W.Gr.: fairly rare.

Plate X, fig. 1: $30.8 \times 8.7 \mu$. 9 striae in 10μ .

Basalt: D: 71.

Gneiss: C: 561.

— *viridula* Kütz. forma?

Plate X, fig. 13: $44 \times 11 \mu$. 8—9 striae in 10μ .

Gneiss: E: 32.

— *vitabunda* Hustedt. HUSTEDT 1930, p. 302, fig. 523.

Gneiss: D: 48.

pH: alkaliphilous. W.Gr.: rare.

— *vulpina* Kütz. HUSTEDT 1930, p. 297, fig. 504.

Basalt: N: 350 (2.8 %), 354 (0.6 %), 361 (0.8 %), 358 (2.6 %), 372 (1.0 %), 343 (11.2 %), 642. S: 206 (0.2 %), 242 (0.2 %), 232 (1.6 %).

Gneiss: D: 33 (0.8 %), 38 (0.2 %). DQ: 81. U: 132 (0.6 %).

Sediment: S: 267 (1.4 %), 273 (0.4 %), 286 (0.2 %), 167.

pH: alkaliphilous. W.Gr.: fairly rare. Pearyld: very common.

— sp.

Plate X, fig. 2: $26.0 \times 7.3 \mu$. 9 striae in 10μ .

Valve elliptical, striae slightly radial, apical striae parallel, distinctly punctate.
Narrow axial area, central area small, rounded-off.
Basalt: S: 245.

Naviculae punctatae Cleve.

- Navicula amphibola* Cleve. HUSTEDT 1930, p. 309, fig. 554. FOGED 1953, p. 46, Pl. 6, fig. 17; Pl. 7, figs. 1, 2.
Basalt: N: 350 (0.2 %), 354, 361, 358 (1.4 %), 372, 343. S: 245.
Gneiss: D: 48. U: 130.
Sediment: S: 273 (0.2 %), 167 (0.2 %).
pH: indifferent. W.Gr.: fairly rare. Pearyld: not common.
(— *humerosa* Bréb. Mesohalobous. W.Gr.: rare).
— *pusilla* W.Smith. HUSTEDT 1930, p. 311, fig. 558.
Gneiss: U: 130 (0.2 %).
pH: alkaliphilous. Halophilous. W.Gr.: rare.
(— *scutelloides* W.Smith. Pearyld: rare).

Naviculae heterostichae Cleve.

- Navicula cocconeiformis* Greg. HUSTEDT 1930, p. 290, fig. 493.
Basalt: N: 350 (0.2 %).
Gneiss: E: 28. C: 555, 560 (1.0 %), 561 (1.2 %), 567 (1.0 %), 572 (2.2 %). D: 45, 469, 452. K: 300 (0.2 %), 307 (1.0 %).
pH: indifferent. W.Gr.: fairly rare.
— *cocconeiformis* Greg. forma.
Basalt: S: 213, 245.
Gneiss: E: 32.
— — var. *capitata* Krasske. KRASSKE 1929, p. 355, fig. 6. A.SCHMIDT'S Atlas, Pl. 400, figs. 99, 101, 102.
Plate VIII, fig. 8: $17.3 \times 8 \mu$. ca. 27 striae in 10μ .
Basalt: N: 334.
Plate VIII, fig. 9: $26.7 \times 12.7 \mu$. 24—26 striae in 10μ .
Gneiss: E: 32.
— *pseudoscutiformis* Hustedt. HUSTEDT 1930, p. 291, fig. 495.
Basalt: D: 74, 430 (0.2 %), 431 (0.6 %), 434 (0.4 %). N: 354. S: 221 (0.2 %), 205, 245.
Gneiss: E: 28 (0.4 %), 32 (0.2 %). C: 549 (1.8 %), 572 (1.4 %). D: 469, 479 (0.2 %), 452. DQ: 81.
pH: indifferent. W.Gr.: fairly rare and only found in acidophilous samples.
Pearyld: rare.
Plate VIII, fig. 4: $14.7 \times 11.8 \mu$. ca. 20 striae in 10μ , is to be identified with *N. pseudoscutiformis* Hustedt, A.SCHMIDT'S Atlas, pl. 404, fig. 20.
Basalt: N: 350. S: 245 (0.4 %), 246, 232 (0.4 %).
Gneiss: D: 479 (1.0 %). DQ: 81. K: 300 (0.2 %).
— *scutiformis* Grun. HUSTEDT 1930, p. 290, fig. 494.
Basalt: N: 354 (0.4 %), 361.
pH: indifferent. Pearyld: rare.

Naviculae decipientes Cleve.

- (*Navicula declivis* Hustedt. Pearyld: fairly rare).
— *gibbula* Cleve. P.T.CLEVE 1894—95, I, p. 140, Pl. 5, fig. 17. FOGED 1953, p. 47, Pl. 6, fig. 9. 1955, p. 56, Pl. 7, fig. 7.

Basalt: D: 62 (0.4 ‰), 69, 107, 109, 108 (0.2 ‰), 103 (6.4 ‰). N: 354 (2.0 ‰), 397. S: 195, 221, 213, 191, 232.

Gneiss: DQ: 86 (0.6 ‰). U: 132.

pH: indifferent. W.Gr.: rare. Pearyld: not common.

Navicula gibbula var. *undulata* Krasske. KRASSKE 1938, p. 514.

Plate VI, fig. 8: $32 \times 8.7 \mu$. 15 striae in 10μ .

In habit this form reminds very much of *N. holmenii* Foged, FOGED 1955, p. 56, Pl. 7, fig. 6, but as this species has not deflected central nodules, just as polar nodules have not been observed, I consider it more probable that it should be identified with KRASSKE's variety of *N. gibbula*.

Basalt: D: 109. N: 342.

(— *holmenii* Foged. Pearyld: rare).

(— *inflata* Donkin. W.Gr.: rare).

(— *lundströmii* Cleve. Pearyld: rare).

— *protracta* Grun. HUSTEDT 1930, p. 284, fig. 472.

Basalt: N: 354 (0.6 ‰).

Gneiss: C: 560, 561.

pH: alkaliphilous. W.Gr.: rare.

— *semen* Ehr. HUSTEDT 1930, p. 283, fig. 469.

Basalt: N: 361 (0.2 ‰), 358 (0.4 ‰). S: 242.

Gneiss: D: 542.

Sediment: S: 273 (0.2 ‰), 167 (0.4 ‰).

pH: indifferent. W.Gr.: scarce.

— *subtilissima* Cleve. HUSTEDT 1930, p. 285, fig. 475.

Basalt: N: 642 (2.8 ‰). S: 242 (0.2 ‰).

Gneiss: E: 8 (1.8 ‰), 20 (2.2 ‰), 28 (0.2 ‰), 32. C: 555 (2.6 ‰), 558, 561, 567 (1.8 ‰). D: 45, 454 (2.2 ‰), 469 (0.2 ‰), 452 (0.2 ‰). DQ: 81. K: 318, 327 (0.4 ‰).

Sediment: S: 286 (0.2 ‰).

(— *rhombica* Greg. Euhalobous. W.Gr.: rare).

Naviculae lyratae Cleve.

(*Navicula forcipata* Grev. var. *suborbicularis* Grun. Euhalobous. W.Gr.: rare).

— *pygmaea* Kütz. HUSTEDT 1930, p. 299, fig. 513.

Gneiss: C: 560, 561.

pH: alkaliphilous. Mesohalobous. W.Gr.: rare.

Naviculae laevistriatae Cleve.

(*Navicula elegans* W.Smith. Euhalobous. W.Gr.: rare).

Naviculae microstigmatae Cleve.

(*Navicula ignobilis* Krasske. W.Gr.: rare).

(— *plicata* Donkin. Euhalobous. W.Gr.: rare).

Naviculae?

Navicula peterseni Hustedt. A.SCHMIDT's Atlas, Pl. 402, figs. 1—7. FOGED 1953, p. 48, Pl. 6, fig. 5.

Basalt: N: 358.

pH: indifferent. W.Gr.: rare. Pearyld: rare.

Pinnularia Ehr.*a. Parallelistriatae.*

Pinnularia gracillima Greg. HUSTEDT 1942 b, p. 121, figs. 38—42. FOGED 1953, p. 49, Pl. 7, figs. 1, 2. 1955, p. 57, Pl. 7, figs. 1, 2, Pl. 11, fig. 14.

Basalt: D: 69 (0.4 ‰), 107, 109 (1.4 ‰), 430 (0.4 ‰), 431 (0.2 ‰), 438 (0.4 ‰), 547 (0.2 ‰), 434 (0.2 ‰). N: 350 (5.0 ‰), 354 (2.2 ‰), 361 (1.2 ‰), 358 (5.2 ‰), 372 (1.8 ‰), 395 (0.2 ‰), 343 (4.2 ‰), 642 (0.6 ‰). S: 221, 213, 184, 191, 205 (1.8 ‰), 245 (0.4 ‰), 242 (1.0 ‰), 232 (2.0 ‰).

Gneiss: E: 8 (0.2 ‰), 20 (0.2 ‰), 28 (0.2 ‰), 32. C: 549 (0.2 ‰), 558 (0.6 ‰), 560, 561, 567, 572 (0.2 ‰). D: 33 (1.8 ‰), 38 (1.0 ‰), 45 (0.6 ‰), 48 (0.4 ‰), 469 (0.2 ‰), 476 (0.4 ‰), 479, 491 (0.6 ‰), 496 (1.0 ‰), 527 (2.2 ‰), 542, 452. DQ: 98 (4.0 ‰). U: 130 (1.2 ‰). K: 300, 307 (0.4 ‰), 318 (0.8 ‰), 327 (1.0 ‰).

Sediment: S: 267 (1.6 ‰), 273 (0.8 ‰), 286 (1.0 ‰), 167 (3.8 ‰).

pH: indifferent. W.Gr.: very common. Pearyld: very common.

— *leptosoma* Grun. ? HUSTEDT 1930, p. 316, fig. 567.

Plate XIII, fig. 10: $30.6 \times 6.0 \mu$. 15 striae in 10μ , all radial.

P. leptosoma has only slightly radial striae, and it is with no little doubt that XIII:10 is placed here. Perhaps it is a *Caloneis* species. According to A. CLEVE-EULER 1955, IV, p. 12, the dimensions of *P. leptosoma* are $23-50 \times 4.2-8 \mu$ with 14—18 striae in 10μ . As the closely related *P. molaris* has convergent apical striae it must be disregarded.

Basalt: S: 232.

pH: indifferent.

— *molaris* Grun. HUSTEDT 1930, p. 316, fig. 568. FOGED 1953, p. 49, Pl. 7, figs. 15—17.

Gneiss: E: 8, 28. C: 549, 555, 560, 572 (0.8 ‰). D: 469 (0.2 ‰).

pH: indifferent. W.Gr.: rare.

(— *sublinearis* Grun. W.Gr.: rare).

— *undulata* Greg. HUSTEDT 1930, p. 315, fig. 565. FOGED 1953, p. 49, Pl. 2, fig. 8.

Basalt: N: 354 (0.2 ‰), 395. S: 195, 205.

Gneiss: E: 20 (0.2 ‰). C: 558, 572 (0.2 ‰). D: 45 (0.2 ‰), 469 (0.6 ‰). K: 307, 318.

pH: acidophilous. W.Gr.: rather common. Pearyld: common.

(— — var. *subundulata* Grun. Pearyld: common).

b. Capitatae.

Pinnularia braunei Grun. var. *amphicephala* (A. Mayer) Hustedt. HUSTEDT 1930, p. 319, fig. 578.

Basalt: D: 438.

Gneiss: E: 20 (0.2 ‰), 32. D: 491. DQ: 81. K: 300, 307 (0.8 ‰), 318.

pH: acidophilous. W.Gr.: rare. (Pearyld: forma, rare).

— *intermedia* Lagerst. BOYE PETERSEN 1928, p. 403, fig. 24a. FOGED 1952, p. 49, Pl. 8, figs. 5, 7—9. 1955, p. 58, Pl. 8, figs. 3—5, 8, 9.

Basalt: D: 62 (0.2 ‰), 69, 109, 108 (0.2 ‰), 431. N: 350, 354, 358, 395 (0.2 ‰), 397. S: 193, 195, 221, 232 (0.2 ‰).

Gneiss: D: 542. U: 130.

Sediment: S: 267.

pH: indifferent. W.Gr.: rare. Pearyld: common.

— *intermedia* Lagerst. sensu Lund. J.W.G. LUND 1946, p. 92, figs. A—J.

Basalt: D: 71, 74.

(*Pinnularia intermedia* fo. *minor* Boye Petersen. Pearyld: rare).

— *interrupta* W.Smith. HUSTEDT 1930, p. 317, fig. 573.

Basalt: D: 69, 431 (0.2 %), 434. N: 350, 642. S: 221, 232 (0.2 %).

Gneiss: E: 20 (0.2 %), 28 (0.6 %), 32. C: 549 (0.2 %), 558 (0.4 %), 572 (0.4 %).

DQ: 81. U: 130. K: 300, 318 (0.4 %), 327.

Sediment: S: 267 (0.2 %), 273.

pH: acidophilous. W.Gr.: not rare. Pearyld: rather common.

— fo. *minutissima* Hustedt. HUSTEDT 1930, p. 317, fig. 574. FOGED 1953, p. 49, Pl. 7, figs. 5—7, 11, 14.

Basalt: D: 434.

Gneiss: E: 20 (0.2 %), 28 (0.2 %), 32 (0.4 %). C: 558 (0.2 %), 567 (0.6 %). D: 454.

pH: acidophilous. W.Gr.: not common.

— *krockii* Grun. HUSTEDT 1930, p. 319, fig. 580. FOGED 1953, p. 50, Pl. 7, fig. 19.

Basalt: D: 62 (3.4 %), 69 (0.2 %), 71 (2.2 %), 74 (0.6 %), 109, 108 (1.2 %), 438, 434. S: 195 (0.2 %), 221, 205 (0.2 %), 245 (0.2 %), 232 (0.2 %).

Gneiss: E: 8, 28 (0.4 %). C: 560 (0.4 %), 561, 572 (0.2 %). D: 48 (0.2 %), 462 (0.6 %), 491, 496 (1.2 %), 527, 542. DQ: 81. U: 130.

pH: indifferent. W.Gr.: rare.

— *mesolepta* (Ehr.) W.Smith. HUSTEDT 1930, p. 319, fig. 575a. FOGED 1953, p. 50, Pl. 7, fig. 12.

Basalt: D: 71, 74, 109, 431 (0.2 %). N: 350, 354 (0.2 %), 372, 642. S: 213, 205, 245, 232 (0.2 %).

Gneiss: C: 549. D: 33, 45 (0.2 %), 469, 476, 479, 452. U: 130. K: 327 (0.2 %).

Sediment: S: 267.

pH: indifferent. W.Gr.: not common. Pearyld: not common.

— fo. *angusta* Cleve. HUSTEDT 1930, p. 319, fig. 575b. FOGED 1953, p. 50, Pl. 9, fig. 1.

Basalt: D: 109.

pH: indifferent. W.Gr.: rare.

— *subcapitata* Gregory. HUSTEDT 1930, p. 317, fig. 571. FOGED 1953, p. 50, Pl. 7, fig. 13.

Basalt: D: 69 (0.6 %), 71 (0.2 %), 74 (0.2 %), 107 (1.0 %), 109, 108, 438 (2.0 %), 434. S: 221, 245.

Gneiss: E: 20 (0.4 %), 28 (0.2 %). C: 567 (0.4 %), 572 (1.0 %). D: 48 (0.2 %), 462, 491 (0.4 %), 496 (2.0 %), 524, 542 (0.4 %). DQ: 86 (0.2 %), 95. U: 132. K: 300.

pH: indifferent. W.Gr.: fairly rare.

— var. *hilseana* (Janisch) O.Müller. HUSTEDT 1930, p. 317, fig. 572. FOGED 1953, p. 50, Pl. 7, fig. 9.

Gneiss: E: 8.

pH: indifferent. W.Gr.: rare.

c. *Divergentes*.

(*Pinnularia boecheri* Foged. W.Gr.: rare).

— *divergens* W.Smith. HUSTEDT 1930, p. 323, fig. 589.

Basalt: D: 69, 71, 74. N: 350. S: 221.

Gneiss: E: 8 (0.2 %), 20. C: 555, 567 (0.2 %). D: 48, 542 (0.2 %), 98 (2.4 %).

pH: acidophilous. W.Gr.: fairly rare. Pearyld: common.

— var. *elliptica* Grun. P.T.CLEVE 1894—95, II, p. 79. HUSTEDT 1930, p. 323, fig. 590.

Basalt: D: 71, 430, 642. S: 221, 232 (1.2 %).

Gneiss: E: 20 (0.2 %), 32. D: 45, 479. DQ: 98. U: 130. K: 300, 307, 318.

Sediment: S: 267.

pH: acidophilous. W.Gr.: fairly rare. Pearyld: common.

Pinnularia divergentissima (Grun.) Cleve. HUSTEDT 1930, p. 320, fig. 581.

Gneiss: E: 8 (0.2 %), 28 (0.2 %). C: 567 (0.2 %), 572 (0.2 %). D: 462 (0.2 %).

pH: acidophilous. W.Gr.: fairly rare. Pearyld: fairly rare.

(— — var. *hustedtiana* Ross. Pearyld: rare).

— — var. *subrostrata* A.Cleve. BOYE PETERSEN 1946, p. 99, fig. 19.

Basalt: N: 354 (0.2 %).

Gneiss: E: 20.

pH: acidophilous.

— — var. *wulffii* Boye Petersen. BOYE PETERSEN 1924, p. 315, fig. 4. FOGED 1953, p. 51, Pl. 7, fig. 10. 1955, p. 59, Pl. 11, fig. 16.

Basalt: N: 350. S: 242, 232 (0.4 %).

Gneiss: K: 300.

pH: acidophilous. W.Gr.: rare. Pearyld: common.

— — var. *wulffii* Boye Petersen. ?

Plate XI, fig. 7: $34 \times 6.7 \mu$. 11—12 striae in 10μ .

According to BOYE PETERSEN 1924, p. 315, the dimensions for this species are $41 \times 8.8 \mu$ with 14 striae in 10μ and "valve linear, subundulate". It is closely related to FOGED 1955, p. 59, Pl. 11, fig. 16 ($33 \times 5.5 \mu$ with 14 striae in 10μ), which has been referred to this species with some doubt, as it also seems to approach very nearly to *P. microstauron* (Ehr.).

Basalt: N: 354.

— *episcopalis* Cleve. HUSTEDT 1930, p. 323, fig. 592.

Gneiss: D: 38. DQ: 98 (0.2 %).

pH: indifferent?

— *legumen* Ehr. HUSTEDT 1930, p. 322, fig. 587.

Gneiss: D: 454 (0.4 %).

pH: indifferent.

— *microstauron* (Ehr.) Cleve. HUSTEDT 1930, p. 320, fig. 582. FOGED 1953, p. 51, Pl. 8, fig. 6. 1955, p. 59, Pl. 11, fig. 21.

Basalt: D: 62 (1.0 %), 71, 107, 108 (0.2 %), 438 (0.2 %), 434. N: 354. S: 221, 232 (0.2 %).

Gneiss: C: 558, 560, 561. D: 38, 45 (0.2 %), 469 (0.2 %), 476 (0.2 %), 491. DQ: 81, 95. U: 132. K: 300, 307 (0.2 %), 318.

Sediment: S: 267 (0.2 %).

pH: indifferent. W.Gr.: rather common. Pearyld: common.

— *microstauron* (Ehr.) Cleve forma.

Plate XI, fig. 6: $36 \times 7.8 \mu$. 11 striae in 10μ .

Gneiss: K: 299.

Plate XIII, fig. 9: $30 \times 5.4 \mu$. 9 striae in 10μ .

May perhaps be referred to *P. intermedia* Lagerstedt sensu J.W.G. LUND 1946, p. 92, figs. 12 A—J, the dimensions of which are $12-35 \times 4-5 \mu$ with 9—12 striae in 10μ .

Gneiss: DQ: 86.

— var. *brébissonii* (Kütz.) Hustedt. HUSTEDT 1930, p. 321, fig. 584. FOGED 1953, p. 51, Pl. 7, fig. 18. 1955, p. 59, Pl. 8, fig. 12; Pl. 9, fig. 6.

Basalt: D: 103 (0.2 %), 431, 438. N: 350, 343 (0.2 %). S: 221, 232 (1.2 %).

Gneiss: E: 20 (0.4 %), 28 (0.2 %). C: 558 (0.2 %), 572 (0.2 %). D: 45 (0.2 %), 479 (0.2 %), 496. U: 130 (0.2 %). K: 307, 318.

pH: indifferent. W.Gr.: rather common. Pearyld: common.

Pinnularia microstauron var. *brébissonii* (Kütz.) Hustedt, forma.

Plate XI, fig. 9: $45.3 \times 8.6 \mu$. 12 striae in 10μ .

Referred here with hesitation, especially because of the almost parallel striae, which might suggest *P. brevicostata* Cleve var. *islandica* Østrup, ØSTRUP 1918, p. 35, Pl. 3, fig. 54, with the dimensions $36 \times 8 \mu$, but with only 9 striae in 10μ . Basalt: D: 74.

Gneiss: C: 558, 572 (0.2 %).

Plate XII, fig. 10: $49.3 \times 8.7 \mu$. 6 striae in 10μ .

Should no doubt be referred to the form-cycle of *P. microstauron* var. *brébissonii* in spite of the fact that there are only 6 striae in 10μ , as compared with the usual 10—13.

Basalt: D: 74.

- — — fo. *diminuta* Grun. HUSTEDT 1930, p. 322, fig. 585. FOGED 1955, p. 60, Pl. 8, fig. 13.

Basalt: D: 431. N: 354 (3.8 %), 358, 395 (0.2 %). S: 245.

Gneiss: D: 462 (0.4 %), 452. DQ: 81, 98 (0.2 %).

pH: indifferent. W.Gr.: not rare. Pearyld: rather common.

Plate XIII, fig. 5: $20.5 \times 6.2 \mu$. 12 striae in 10μ .

Presumably a small specimen of this form. Can hardly be referred to *P. intermedia* Lagerst., of which it reminds very much in habit, as this species according to BOYE PETERSEN 1928, p. 404, i.a. is characterized by the fact that "the striae nearest to transapical fascia are not shortened," as they are in XIII:5. Basalt: D: 103.

Plate XIII, fig. 7: $22.2 \times 4.7 \mu$. 10—11 striae in 10μ .

Gneiss: DQ: 83, 86 (0.2 %).

- — — fo. *linearis* O. Müller. HUSTEDT 1930, p. 322.

Basalt: S: 232 (1.4 %).

pH: indifferent.

Plate XII, fig. 8: $44 \times 6.7 \mu$. 16 striae in 10μ .

Basalt: S: 232.

- — — var. *producta* A. Cleve. A. CLEVE-EULER 1955, IV, p. 54, fig. 1072 h.

Gneiss: C: 549.

pH: indifferent.

- *islandica* Østrup. ? ØSTRUP 1918, p. 32, Pl. 3, fig. 47.

Plate XII, fig. 3: $47.2 \times 7.6 \mu$. 11 striae in 10μ .

In habit XII:3 is closely related to ØSTRUP's *P. islandica*, but it differs from this species by its considerably smaller size. In A. CLEVE-EULER 1955, IV, p. 23, however, a fairly wide range of variation for the species is indicated, the dimensions there being recorded as $41-100 \times 10.5-16 \mu$ with 8.5—13 striae in 10μ . Basalt: DQ: 441.

- *notata* (Perag. & Herib.) A. Cleve, forma.

Plate XI, fig. 5: $42.6 \times 12.9 \mu$. 9 striae in 10μ .

Plate XII, fig. 1: $49.5 \times 10.7 \mu$. 9 striae in 10μ .

In habit these two forms are closely related to A. CLEVE-EULER 1955, IV, p. 56, fig. 1075 h (XI:5) and fig. 1075 b (XII:1).

They also seem to be closely related to *P. suchlandti* Hustedt, HUSTEDT 1943, p. 184, figs. 39—41 with the dimensions $45-60 \times 11-14 \mu$ and 9—11 striae in 10μ , but this species has rhombic lanceolate valves. See also A. SCHMIDT's Atlas, Pl. 388, figs. 9—11.

XI:5: Basalt: D: 74.

XII:1: Basalt: D: 103. N: 342.

Gneiss: E: 20.

Pinnularia sp.

Plate XIII, fig. 1: $38.6 \times 8.6 \mu$. 9 striae in 10μ .

Perhaps related to *P. microstauron* var. *brébissonii*, but the striae are coarser than usual in this variety, nor is the central area so much extended towards the sides of the valve in XIII:1. In habit also similarity to *P. islandica* Østrup (see Pl. XII, fig. 3).

Gneiss: D: 479.

— sp.

Plate XIII, fig. 4: $26.6 \times 8.7 \mu$. 11—12 striae in 10μ .

Short form of XII:1?

Gneiss: E: 20 (0.2 %).

— sp.

Plate XIII, fig. 8: $28.6 \times 4.1 \mu$. 10—11 striae in 10μ , almost parallel.

Some similarity to *P. intermedia* Lagerst. sensu J.W. G. LUND 1946, p. 92 (dim.: $12-35 \times 4-5 \mu$ with 9—12 striae in 10μ), but as this species has striae which are rather markedly radial, convergent at the apices, it should probably be disregarded.

Gneiss: DQ: 83, 86 (0.2 %).

d. *Distantes*.*Pinnularia alpina* W. Smith. HUSTEDT 1930, p. 324, fig. 594.

Gneiss: E: 20.

Sediment: S: 267.

pH: acidophilous.

— *balfouriana* Greg. HUSTEDT 1930, p. 326, fig. 599. FOGED 1953, p. 51, Pl. 8, fig. 16. 1955, p. 60, Pl. 8, figs. 10, 11.

Basalt: D: 69 (6.6 %), 74 (1.8 %), 430, 438 (3.2 %), 547 (0.2 %), 438 (1.8 %). N: 350 (1.8 %), 354 (0.6 %), 361 (0.2 %), 358 (0.8 %), 372 (0.2 %), 395 (0.4 %). S: 221 (0.4 %), 213 (1.4 %), 184 (3.8 %), 191 (0.6 %), 205 (0.8 %), 245 (0.2 %), 242 (7.0 %), 232 (0.4 %).

Gneiss: E: 28 (0.2 %), 32 (0.8 %). C: 549 (0.6 %), 560, 572. D: 33 (0.2 %), 38 (0.4 %), 45 (2.8 %), 462 (0.2 %), 469 (6.6 %), 476 (7.0 %), 479 (4.2 %), 452 (0.8 %). DQ: 81 (1.0 %), 86, 98. U: 130 (0.6 %). K: 300, 307 (0.2 %), 318 (0.8 %).

Sediment: S: 267 (0.8 %), 273 (1.0 %), 167 (0.2 %).

pH: acidophilous. W.Gr.: rare. Pearyld: common.

— *borealis* Ehr. HUSTEDT 1930, p. 326, fig. 597. FOGED 1953, p. 51, Pl. 8, figs. 13—15. 1955, p. 60, Pl. 8, figs. 1, 2.

Basalt: D: 69, 71, 74, 107 (0.2 %), 109, 108, 431 (0.6 %), 438 (0.4 %), 434. N: 354 (1.4 %), 382, 397, 343 (0.4 %). S: 193, 195, 221, 213, 191 (0.2 %), 206, 245, 232 (0.2 %).

Gneiss: C: 549, 555, 560, 572. D: 48 (0.4 %), 462, 491, 496, 524 (0.4 %), 527, 542 (0.2 %). DQ: 81, 86 (0.2 %), 95, 98 (0.4 %). U: 130. K: 327.

Sediment: S: 167.

pH: indifferent. W.Gr.: rather common. Pearyld: rather common.

Plate XII, fig. 4: $46.6 \times 11.3 \mu$. 4—5 striae in 10μ .

Basalt: N: 354.

— var. *brevicostata* Hustedt. HUSTEDT 1930, p. 326, fig. 598.

Basalt: D: 71.

pH: indifferent. W.Gr.: not rare.

(— fo. *ovalis* Boye Petersen. W.Gr.: rare).

(— *karelica* Cleve. W.Gr.: rare).

- Pinnularia lagerstedtii* (Cleve). A. Cleve. A. CLEVE-EULER 1955, IV, p. 30, fig. 1032b.
 Plate XII, fig. 7: $39.6 \times 6.7 \mu$. 10 striae in 10μ .
 XII:7 should undoubtedly be referred to this species, which according to A. CLEVE-EULER 1955, p. 30, has the dimensions $25-40 \times 5-9 \mu$ with $8.5-10$ striae in 10μ .
 (Syn: *P. parva* var. *Lagerstedtii* Cleve. P.T. CLEVE 1894-95, II, p. 87 and *Navicula parvula* Lagerst., LAGERSTEDT 1873, p. 26, Pl. 2, fig. 4).
 Gneiss: E: 20 (0.2 %), 32.
 — *lata* (Bréb.) W. Smith. HUSTEDT 1930, p. 324, fig. 595.
 Basalt: D: 71. S: 221.
 Gneiss: D: 542.
 pH: acidophilous. W.Gr.: rare.
 — fo. *thuringiaca* (Rabh.) A. Mayer. HUSTEDT 1930, p. 326, fig. 596.
 Basalt: S: 221, 232.
 Gneiss: E: 20.
 pH: acidophilous. W.Gr.: rare.
 — *parva* (Greg.) Cleve var. *minuta* Østrup. ØSTRUP 1918, p. 36, Pl. 4, fig. 55.
 BOYE PETERSEN 1928, p. 408, fig. 29b. FOGED 1953, p. 52, Pl. 8, figs. 1-4.
 1955, p. 61, Pl. 8, fig. 6.
 Plate XIII, fig. 6: $20 \times 6 \mu$. 9 striae in 10μ .
 Basalt: D: 69, 71 (0.2 %). S: 193.
 Gneiss: D: 48.
 pH: acidophilous. W.Gr.: rare. Pearyld: not common.
 (— var. *lagerstedtii* Cleve. Pearyld: rare).
 (— — fo. *interrupta* Boye Petersen. Pearyld: rare).
 — *subsolaris* (Grun.) Cleve. HUSTEDT 1930, p. 326, fig. 596.
 Plate XI, fig. 3: $60 \times 12 \mu$. 9 striae in 10μ .
 Gneiss: E: 8, 20, 28. C: 567, 572 (0.2 %). D: 454. DQ: 98 (1.6 %). K: 318.
 pH: indifferent. W.Gr.: fairly rare. Pearyld: rather rare.

e. Tabellariae.

- Pinnularia brandelii* Cleve. HUSTEDT 1930, p. 328, fig. 606.
 Basalt: N: 350, 354. S: 232 (0.2 %).
 Sediment: S: 267.
 pH: indifferent.
 — *gibba* Ehr. HUSTEDT 1930, p. 327, fig. 600.
 Basalt: D: 69, 431 (0.2 %), 438 (0.2 %). N: 350 (0.2 %), 358, 343 (0.2 %), 642.
 S: 184, 245, 242, 232 (1.4 %).
 Gneiss: E: 8, 20 (0.4 %), 28 (0.4 %), 32. C: 549, 555 (0.2 %), 558, 572. D: 33
 (0.4 %), 38 (0.4 %), 45, 48, 454, 462 (0.6 %), 469 (0.4 %), 476 (0.2 %), 479, 527
 (0.2 %), 542 (0.6 %). DQ: 81, 98. U: 130. K: 318 (0.2 %), 327.
 Sediment: S: 267, 286 (0.2 %).
 pH: acidophilous. W.Gr.: not common. Pearyld: not common.
 — var. *linearis* Hustedt. HUSTEDT 1930, p. 327, fig. 604.
 Basalt: D: 107. S: 245, 242.
 Gneiss: E: 20 (0.2 %), 28. U: 130 (0.2 %).
 Sediment: S: 267.
 pH: acidophilous. W.Gr.: rare. Pearyld: rare.
 Plate XII, fig. 9: $47 \times 6.8 \mu$. 11-12 striae in 10μ .
 Striae almost parallel. Sides of valves slightly triundulate. Probably identical
 with the *gibba* var. mentioned.

Basalt: D: 74.

Gneiss: E: 20. DQ: 83.

Pinnularia gibba var. *mesogongyla* (Ehr.) Hustedt. HUSTEDT 1930, p. 327, fig. 603.

Gneiss: E: 32. D: 38.

pH: acidophilous.

(— *obscura* Krasske. W.Gr.: rare. Pearyld: rare).

— *pulchra* Østrup. ØSTRUP 1895, p. 269, Pl. 1, fig. 3. HUSTEDT 1930, p. 329, fig. 607.

Basalt: D: 74, 438. N: 350, 354, 543 (0.4 %).

Gneiss: E: 32. D: 469, 476, 491 (0.6 %), 496 (33.0 %), 542 (0.2 %). DQ: 95.

pH: indifferent? W. Gr.: rather common.

Plate XII, fig. 6: $40 \times 6.6 \mu$. 9—10 striae in 10μ .

There seems to be rather close agreement between XII:6 and the species described by ØSTRUP 1897, p. 269, the dimensions of which are stated to be $49 \times 7 \mu$ with 10 striae in 10μ , "the striae being radial, convergent towards the apices, absent in the middle."

Gneiss: E: 299.

— *stomatophora* Grun. HUSTEDT 1930, p. 327, fig. 605.

Basalt: D: 59 (0.4 %), 71 (0.2 %), 109, 430, 431, 438 (0.2 %), 434. N: 350, 354 (0.2 %), 361 (0.2 %), 358 (0.4 %), 642. S: 221, 184, 205, 242 (0.2 %), 232.

Gneiss: E: 20, 28 (0.2 %). C: 555, 567, 572. D: 38, 48, 496 (0.2 %), 527 (0.2 %), 542. DQ: 81, 98 (0.4 %). U: 130, 132. K: 318.

Sediment: S: 267 (0.2 %), 273, 286 (0.2 %), 167 (0.6 %).

pH: acidophilous. W.Gr.: common. Pearyld: fairly rare.

— — var. *gibbosa* Hustedt. HUSTEDT 1942b, p. 126, fig. 50.

Gneiss: DQ: 98.

pH: acidophilous. W.Gr.: rare. Pearyld: rare.

f. *Brevistriatae*

Pinnularia biglobosa (Schum.) A. Cleve-Euler. ? A. CLEVE-EULER 1955, IV, p. 28, fig. 1029b.

Plate XII, fig. 2: $46.5 \times 7.7 \mu$. 12 striae in 10μ .

This form is with great doubt referred to the species described by A. CLEVE-EULER, the dimensions of which are stated to be $35-110 \times 8-16 \mu$ with 8—9 striae in 10μ . It is possible that it should rather be referred to the very comprehensive form cycle of *P. microstauron* as especially suggested by the course of the striae.

Gneiss: DQ: 86.

pH: ?

— *brevicostata* Cleve. HUSTEDT 1930, p. 329, fig. 609.

Basalt: D: 431 (0.6 %), 434. N: 354, 358. S: 205, 242.

Gneiss: D: 45, 462. K: 318.

pH: indifferent.

— *nodosa* Ehr. HUSTEDT 1930, p. 330, fig. 611.

Basalt: D: 109, 431, 438 (0.2 %). S: 221, 245.

Gneiss: E: 32. C: 558, 572. D: 479. DQ: 81. K: 300.

pH: acidophilous. W.Gr.: rare.

Plate XII, fig. 5: $64 \times 8.8 \mu$. 8 striae in 10μ .

Basalt: D: 109.

— — fo. *capitata* Cleve. FOGED 1953, p. 52, Pl. 9, fig. 6.

Plate XI, fig. 2: $55 \times 12 \mu$. 9 striae in 10μ .

XI:2 is with some hesitation referred to this *P. nodosa* form. The striae of

XI:2 are longer than usual in *P. nodosa*, which also generally has the central area extended right out to the sides of the valve.

Gneiss: C: 572.

pH: acidophilous. W.Gr.: rare.

g. Maiores.

Pinnularia maior (Kütz.) Cleve. HUSTEDT 1930, p. 334, fig. 614.

Basalt: S: 221, 206.

Gneiss: E: 32. D: 496, 542. U: 130 (0.4 %). K: 318.

pH: acidophilous. W.Gr.: rare.

h. Complexae.

Pinnularia esox Ehr. HUSTEDT 1930, p. 334, fig. 616.

Gneiss: D: 542.

pH: indifferent.

— *gentilis* (Donkin) Cleve. HUSTEDT 1930, p. 335, fig. 618.

Basalt: D: 69, 74, 431, 434. N: 358. S: 206, 232 (0.6 %).

Gneiss: E: 20 (0.4 %). C: 549 (0.2 %), 555, 560 (0.2 %), 561. D: 462, 469, 476, 479 (0.2 %), 496 (1.0 %), 524, 527. DQ: 81, 98 (1.0 %). U: 130. K: 307, 318 (0.4 %).

Sediment: S: 286, 167.

pH: indifferent. W.Gr.: fairly rare.

— *hustedtii* Mölder. MÖLDER 1951, p. 27, Pl. 3, fig. 1. FOGED 1953, p. 53, Pl. 9, fig. 5.

Basalt: S: 206.

Gneiss: E: 20, 32. C: 555, 560, 567. D: 476. DQ: 98 (0.4 %).

Sediment: S: 167.

pH: ? W.Gr.: rather common.

— *isostauron* (Ehr.? Grun.) Cleve. P.T.CLEVE 1894—95, p. 93. HUSTEDT 1924, Pl. 20, fig. 5. A.SCHMIDT's Atlas, Pl. 313, figs. 26, 27.

Plate XI, fig. 8: $34.6 \times 6.1 \mu$. 15 striae in 10μ , all radial, with a distinct, narrow longitudinal band. According to P.T.CLEVE 1894—95, II, p. 93, the dimensions are $30-70 \times 8 \mu$ with 9—12 striae in 10μ .

XI: 8 in some respects reminds of certain *Caloneis* species (amongst others *C. schröderi* Hustedt) and of *Pinnularia caloneiformis* Hustedt, HUSTEDT 1937—39, p. 397, Pl. 23, fig. 6, but differs i.a. by the course of the striae.

Basalt: S: 191.

(— *nobilis* Ehr. W.Gr.: rare).

— *streptoraphe* Cleve. HUSTEDT 1930, p. 337, fig. 620.

Sediment: S: 267.

pH: acidophilous. W.Gr.: rare.

— var. *minor* Cleve? P.T.CLEVE 1894—95, II, p. 93.

Plate XI, fig. 4: $80 \times 16 \mu$. 6 striae in 10μ .

According to P.T.CLEVE 1894—95, II, p. 93, the dimensions are $85-100 \times 15-16 \mu$ with 6.5 striae in 10μ for this variety, to which XI:4 with some doubt is referred.

Sediment: S: 267.

— *viridis* (Nitzsch) Ehr. HUSTEDT 1930, p. 334, fig. 617a.

Basalt: D: 62 (0.6 %), 71 (0.4 %), 74, 500 (0.2 %), 107, 109 (0.2 %), 438 (0.2 %), 434. N: 350 (0.2 %), 354, 358, 382 (1.0 %). S: 195, 221, 213, 184, 205 (0.2 %), 242, 232 (0.2 %).

Gneiss: E: 20 (0.6 %), 28 (0.2 %), 32. C: 558, 561. D: 33 (0.4 %), 38 (0.2 %),

48, 469 (0.2 ‰), 476, 479, 491, 496 (0.2 ‰), 524, 527 (2.0 ‰), 542, 452. DQ: 81 (0.2 ‰), 95, 98 (0.4 ‰).

pH: indifferent. W.Gr.: common.

Pinnularia viridis var. *sudetica* (Hilse) Hustedt. HUSTEDT 1930, p. 335, fig. 617b. Gneiss: E: 20.

pH: indifferent. W.Gr.: rare.

i. ?

Pinnularia sp.

Plate XIII, fig. 2: $37.3 \times 6.7 \mu$. 11 striae in 10μ .

Plate XIII, fig. 3: $26.6 \times 7.3 \mu$. 11 striae in 10μ .

These two forms perhaps are related. Both have parallel striae, which in XIII:2 are slightly convergent towards the apices.

A.CLEVE-EULER 1955, IV, p. 11, fig. 984, pictures a species, *P. virihensis* A. Cleve-Euler with the dimensions $33 \times 6.7 \mu$ and 10 striae in 10μ , which in habit is very closely related to XIII:2 and 3.

XIII:2: Gneiss: DQ: 81.

XIII:3: Gneiss: E: 20 (0.2 ‰).

— sp.

Plate XI, fig. 1: $36 \times 13.3 \mu$. 10 striae in 10μ , almost parallel. Axial area rather narrow. Central area very broad, transverse band extended right to the sides of the valve.

In habit it reminds somewhat of *P. quadratarea* (A.S.) Cleve, A.CLEVE-EULER 1955, IV, p. 10, fig. 982 (dim.: $30-100 \times 5-20 \mu$ with 8—16 striae in 10μ). According to P.T.CLEVE 1894—95, II, p. 95, this is a marine species, and “closely connected with some of the varieties are *P. floridana* Cl. and *P. cruciata* Cl.”.

The freshwater form *P. stauroptera* (Rabh.) Cleve, P.T.CLEVE 1894—95, II, p. 82. A.CLEVE-EULER 1955, IV, p. 66, fig. 1091 (dim.: $45-150 \times 7-17 \mu$ with 8—11 striae in 10μ) also bears some resemblance to XI:1, but differs from this form by having a much broader axial area.

Sediment: S: 266.

Amphora Ehr.

(*Amphora dubiosa* Østrup. W.Gr.: scarce).

(— *exigua* Gregory. W.Gr.: scarce).

(— *lineolata* Ehr. W.Gr.: rare. Mesohalobous).

(— *normanni* Rabh. W.Gr.: scarce).

— *obscura* Krasske. KRASSKE 1938, figs. 28—33. FOGED 1953, 0.53, Pl.10, figs. 3—5. Basalt: N: 354 (0.8 ‰). S: 184, 206.

pH: indifferent. W.Gr.: not rare. Pearyld: rare.

— *ovalis* Küzt. HUSTEDT 1930, p. 342, fig. 628.

Basalt: N: 354, 358, 395 (0.3 ‰), 642. S: 205, 206, 245.

Gneiss: E: 32 (0.2 ‰). C: 558. DQ: 81. U: 130.

Sediment: 267 (0.6 ‰), 273.

pH: alkaliphilous. W.Gr.: rather common. Pearyld: rather common.

— — var. *libyca* (Ehr.) Cleve. HUSTEDT 1930, p. 342. A.SCHMIDT's Atlas, Pl. 26, figs. 102—111.

Basalt: D: 430 (1.0 ‰), 431 (0.2 ‰), 434 (0.4 ‰). N: 350 (0.8 ‰), 354 (0.2 ‰), 361 (0.2 ‰), 372 (0.2 ‰), 642. S: 221 (0.2 ‰), 213, 205 (1.2 ‰), 206 (0.4 ‰), 245. Gneiss: C: 572 (0.4 ‰). D: 479 (0.2 ‰), 524. DQ: 81 (0.2 ‰). U: 130, 132 (0.4 ‰).

Sediment: S: 267 (1.0 ‰), 273, 286 (0.2 ‰).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: very common.

Amphora ovalis var. *pediculus* Kütz. HUSTEDT 1930, p. 343, fig. 629.

Basalt: N: 350, 372, 395 (0.2 ‰), 382 (3.6 ‰), 397. S: 195 (0.8 ‰), 221, 206, 232 (1.4 ‰).

Gneiss: D: 524. DQ: 81.

Sediment: S: 267 (0.2 ‰).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather common.

— *triundulata* Ross. Ross 1947, p. 222, Pl. 11, fig. 13. FOGED 1953, p. 54, Pl. 10, fig. 6. 1955, p. 61, Pl. 13, fig. 10.

Basalt: N: 350 (0.4 ‰), 354 (1.2 ‰), 361, 372, 395. S: 221, 184, 205, 206 (0.8 ‰), 232 (0.2 ‰).

Gneiss: DQ: 81.

pH: indifferent. W.Gr.: fairly rare. Pearyld: rather common.

— *veneta* Kütz. HUSTEDT 1930, p. 345, fig. 631.

Basalt: D: 516 (2.8 ‰). N: 372 (0.2 ‰).

Gneiss: C: 560 (1.6 ‰), 561 (1.4 ‰). D: 469, 476, 524. U: 130 (4.4 ‰), 132 (4.6 ‰). K: 327.

pH: alkaliphilous. W.Gr.: common. Pearyld: rather common.

Cymbella Agardh.

Cymbella affinis Kütz. HUSTEDT 1930, p. 362, fig. 671.

Basalt: D: 107. N: 350, 395 (0.2 ‰), 382 (0.2 ‰), 642. S: 205 (0.6 ‰), 206 (0.8 ‰), 245, 232 (0.4 ‰).

Gneiss: C: 558 (0.2 ‰).

Sediment: S: 273 (1.6 ‰), 286 (0.8 ‰).

pH: alkaliphilous. W.Gr.: rare.

— *alpina* Grun. ? HUSTEDT 1930, p. 352, fig. 641.

Basalt: N: 372 (2.2 ‰).

pH: indifferent.

— *amphicephala* Naegeli. HUSTEDT 1930, p. 355, fig. 651. A.SCHMIDT's Atlas, Pl. 377, fig. 34.

Gneiss: E: 28 (0.8 ‰), 32. D: 479 (0.2 ‰). DQ: 81.

Sediment: S: 267.

pH: indifferent. Pearyld: rather common.

— var. *variostrata* Foged. FOGED 1955, p. 62, Pl. 13, figs. 11, 12.

Basalt: N: 343 (1.2 ‰).

pH: indifferent. Pearyld: rare.

— *amphioxys* (Kütz.?) Grun. HUSTEDT 1930, p. 354, fig. 648.

Basalt: D: 434.

pH: indifferent.

— *angustata* (W.Smith) Cleve. HUSTEDT 1930, p. 351, fig. 639. A.SCHMIDT's Atlas, p. 9, fig. 69. FOGED 1953, p. 54, Pl. 10, fig. 10.

Basalt: N: 350 (1.0 ‰), 354 (1.4 ‰), 361 (4.6 ‰), 358 (1.4 ‰), 372 (0.8 ‰), 343 (6.8 ‰), 642 (2.0 ‰). S: 221, 191, 205 (1.6 ‰), 206 (0.2 ‰), 245 (0.4 ‰), 242, 232 (0.2 ‰).

Gneiss: E: 8 (1.0 ‰). D: 33 (0.4 ‰), 38, 45 (0.2 ‰).

Sediment: S: 267 (0.6 ‰), 273 (0.8 ‰), 286 (2.6 ‰), 167 (0.2 ‰).

pH: indifferent. W.Gr.: rare. Pearyld: very common.

Plate XIV, fig. 6: $53.3 \times 8.7 \mu$. 15 striae in 10μ .

Gneiss: DQ: 81.

Cymbella aspera (Ehr.) Cleve. HUSTEDT 1930, p. 365, fig. 680.

Basalt: D: 430 (0.2 %), 431 (0.2 %), 434 (0.2 %). N: 350 (0.2 %), 361, 358 (0.2 %).
S: 205, 206, 242.

Gneiss: DQ: 98 (2.0 %).

Sediment: S: 167.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

(— *brehmii* Hustedt. Pearyld: rare).

— *broenlundensis* Foged. FOGED 1955, p. 63, Pl. 11, figs. 22, 23.

Basalt: S: 232 (0.2 %).

Gneiss: E: 20 (0.4 %). K: 307 (4.2 %), 327 (0.4 %).

pH: ? Pearyld: rather common.

Plate XIII, fig. 12: $23.3 \times 5.3 \mu$. 18—19 striae in 10μ .

XIII:12 has slightly coarser striae than the species from Pearyland, but otherwise there is so close agreement that the present form must be considered to belong to this species.

Sediment: S: 266.

— *cesati* (Rabh.) Grun. HUSTEDT 1930, p. 351, fig. 638. A.SCHMIDT's Atlas, Pl. 71, figs. 48, 49.

Basalt: D: 430 (0.2 %), 547, 434 (1.0 %). N: 350 (0.2 %), 354 (0.2 %), 361 (0.2 %), 372 (0.2 %), 642 (0.4 %). S: 193, 213, 205 (0.2 %), 206, 242 (0.8 %), 232 (0.8 %).

Gneiss: E: 8 (0.4 %), 20 (0.6 %), 28 (1.0 %), 32. C: 549 (1.0 %), 555 (1.0 %), 558 (3.6 %), 560, 572. D: 38 (1.6 %), 45 (1.2 %), 454 (0.4 %), 462 (3.0 %), 469 (3.0 %), 476 (0.2 %), 479 (0.2 %), 452 (1.0 %). DQ: 81 (0.6 %), 98. U: 130, 132 (44.0 %). K: 300 (1.0 %), 307 (0.2 %), 318 (3.2 %), 327 (0.4 %).

Sediment: S: 267 (0.2 %), 273 (0.4 %), 286 (2.0 %), 167 (0.2 %).

pH: indifferent. W.Gr.: not rare. Pearyld: common.

Plate XIV, fig. 5: $50.6 \times 7.5 \mu$. 15 striae in 10μ .

XIV:5 has somewhat coarser striae than usual to *C. cesati*. Furthermore, the central nodules are provided with short appendices deflected sharply towards the dorsal side.

Gneiss: K: 307.

— *cistula* (Hempr.) Grun. HUSTEDT 1930, p. 363, fig. 676a. A.SCHMIDT's Atlas, Pl. 71, fig. 21. FOGED 1955, p. 64, Pl. 9, figs. 3, 4.

Basalt: D: 430 (1.0 %), 431 (0.4 %), 434 (1.2 %). N: 350 (0.2 %), 354, 361 (3.6 %), 358 (0.2 %), 343 (1.2 %), 642 (0.8 %). S: 221, 213 (0.6 %), 205, 245, 242.

Gneiss: E: 20, 28 (1.2 %), 32. C: 549 (0.6 %), 555 (0.2 %), 558 (0.4 %), 572. D: 38 (0.2 %), 45 (0.2 %), 48, 454, 469 (0.4 %), 476 (0.2 %), 479 (0.4 %), 452 (3.6 %). DQ: 81 (0.2 %). K: 318 (0.2 %).

Sediment: S: 167 (0.2 %).

pH: indifferent. W.Gr.: rare. Pearyld: very common.

Plate XIV, fig. 10: $32.6 \times 8.8 \mu$. 9 striae in 10μ .

Plate XIV, fig. 11: $38.6 \times 8.5 \mu$. 8—9 striae in 10μ .

Small specimens with a slightly different ratio between length and breadth of the valves from that of the species, but otherwise rather characteristic.

— var. *maculata* (Kütz.) van Heurck. HUSTEDT 1930, p. 363, fig. 676b.

Basalt: N: 354, 358. S: 221.

Gneiss: C: 549 (0.2 %).

Sediment: S: 267 (0.2 %).

pH: indifferent.

- Cymbella cuspidata* Kütz. HUSTEDT 1930, p. 357. P.T.CLEVE 1894—95, I, p. 166.
 A.SCHMIDT's Atlas, Pl. 9, figs. 50, 52.
 Basalt: D: 431, 434. N: 350 (0.8 ‰), 354, 361, 358, 343 (0.8 ‰). S: 205, 206 (0.6 ‰), 245, 242.
 Gneiss: E: 20 (0.2 ‰), 28 (0.2 ‰). D: 45 (0.4 ‰), 469, 476, 542. DQ: 81. K: 307, 318 (0.4 ‰).
 Sediment: S: 267 (0.2 ‰).
 pH: indifferent. Pearyld: very common.
- fo. *borealis* Foged. FOGED 1951, p. 61, Pl. 6, figs. 1—3.
 Basalt: S: 206.
 Sediment: S: 267 (0.4 ‰).
 pH: indifferent.
- *cymbiformis* (Ag.? Kütz.) Van Heurck. HUSTEDT 1930, p. 362, fig. 672.
 Sediment: S: 286.
 pH: alkaliphilous.
- (— *delicatula* Kütz. W.Gr.: rare. Pearyld: rather common).
- *ehrenbergi* Kütz. HUSTEDT 1930, p. 356, fig. 656.
 Basalt: S: 242.
 pH: alkaliphilous.
- *gaumannii* Meister. MEISTER 1934, p. 88, fig. 3.
 Gneiss: E: 20 (0.4 ‰), 32 (0.2 ‰). K: 307 (1.4 ‰).
 pH: indifferent.
 Plate XIV, fig. 1: $15.3 \times 4.0 \mu$. 18 striae in 10μ .
 XIV:1 is in rather close agreement with the species as it appears from MEISTER 1934, p. 88, fig. 3 (dim.: $16-17 \times 4 \mu$ with 16—18 striae in 10μ) and A.CLEVE-EULER 1955, IV, p. 152, fig. 1224.
 In habit it is related to *C. javanica* Hustedt, HUSTEDT 1937—39, p. 424, Pl. 24, figs. 27—28 (dim.: $15-22 \times 4-4.5 \mu$ with 11—12 striae in 10μ), but the numbers of striae are rather different. *C. javanica* is considerably smaller and has somewhat denser striae than *C. amphicephala* Naegeli.
- *gracilis* (Rabh.) Cleve. HUSTEDT 1930, p. 359, fig. 663. FOGED 1953, p. 55, Pl. 10, fig. 17. A.SCHMIDT's Atlas, Pl. 10, figs. 36, 37, 39, 40.
 Basalt: D: 500 (0.2 ‰), 109, 438. S: 242 (0.4 ‰).
 Gneiss: E: 8 (2.0 ‰), 20 (2.0 ‰), 28 (1.8 ‰), 32 (0.6 ‰). C: 549 (0.4 ‰), 555 (1.4 ‰), 558 (0.2 ‰), 560 (0.4 ‰), 572 (1.4 ‰). D: 45 (0.4 ‰), 454 (2.6 ‰), 462 (2.8 ‰), 469 (1.8 ‰), 476 (0.6 ‰), 479, 524, 527 (0.4 ‰), 542 (0.6 ‰), 452 (0.8 ‰). DQ: 81, 98 (2.4 ‰). K: 300 (0.2 ‰), 307 (4.4 ‰), 318 (0.2 ‰), 327.
 pH: indifferent. W.Gr.: not rare. Pearyld: rare.
- (— *groenlandica* Foged. W.Gr.: rare. Pearyld: rare).
- *hauckii* Van Heurck. HUSTEDT 1930, p. 355, fig. 654.
 Basalt: N: 358. S: 221.
 pH: ? W.Gr.: rare.
- *hebridica* (Greg.) Grun. HUSTEDT 1930, p. 355, fig. 654.
 Basalt: D: 430 (0.2 ‰), 431, 547 (0.2 ‰), 434 (0.2 ‰). N: 350 (0.4 ‰), 354, 361 (0.2 ‰), 358 (0.4 ‰), 372 (0.2 ‰), 343 (0.4 ‰), 642. S: 221, 213 (0.2 ‰), 205 (0.6 ‰), 245 (0.2 ‰), 242, 232 (0.6 ‰).
 Gneiss: E: 20 (1.0 ‰), 28 (0.4 ‰), 32. C: 549 (0.4 ‰), 558. D: 33, 38, 454, 469 (0.6 ‰), 476, 479. DQ: 81. U: 130.
 Sediment: S: 267 (0.2 ‰), 273 (0.2 ‰), 286, 167 (0.2 ‰).
 pH: acidophilous. W.Gr.: fairly rare. Pearyld: common.
- *heilprinensis* Foged? FOGED 1955, p. 65, Pl. 10, fig. 8.
 Plate XIV, fig. 13: $34.6 \times 11.3 \mu$. 13—15 striae in 10μ .

As the polar nodules in XIV:13 seem to be deflected towards the ventral side of the valve, while *C. heilprinensis* has the nodules deflected towards the dorsal side, I hesitate somewhat to consider the two forms identical.

Basalt: N: 348, 350, 351.

pH: ? Pearyld: rather common.

Cymbella helvetica Kütz. HUSTEDT 1930, p. 364, fig. 678.

Gneiss: C: 572 (0.2 %).

pH: alkaliphilous.

(— *heteropleura* Ehr. var. *minor* Cleve. W.Gr.: rare).

(— *holmenii* Foged. Pearyld: rare).

— *hybrida* Grun. HUSTEDT 1930, p. 357, fig. 652. A.SCHMIDT's Atlas, Pl. 377, figs. 21—27. FOGED 1955, p. 66, Pl. 11, figs. 15—17.

Basalt: N: 350, 354 (0.6 %), 372. S: 205.

Gneiss: E: 20 (0.4 %).

pH: indifferent. W.Gr.: rare. Pearyld: common.

— *incerta* Grun. HUSTEDT 1930, p. 360, fig. 665.

Basalt: D: 434. N: 361 (0.2 %), 358, 372 (0.4 %), 642 (0.4 %). S: 206 (0.2 %), 242, 232.

Gneiss: E: 20 (0.2 %), 28 (0.2 %), 32 (0.2 %). C: 549 (0.2 %), 572 (0.2 %). D: 33 (0.8 %), 38 (1.0 %), 45 (2.8 %), 48, 454 (1.6 %), 462, 469 (0.2 %), 476 (0.2 %). DQ: 81, 98 (5.0 %). U: 130. K: 300 (0.4 %), 307 (0.6 %), 318, 327.

Sediment: S: 273 (0.2 %), 286.

pH: acidophilous. W.Gr.: common. Pearyld: rare.

— *incrassata* Foged. FOGED 1955, p. 66, Pl. 12, fig. 17.

Gneiss: E: 28. C: 549.

pH: ? Pearyld: very common.

— *javanica* Hustedt? HUSTEDT 1937—39, p. 424, Pl. 24, figs. 27, 28.

Plate XIV, fig. 2: $15.0 \times 4.0 \mu$. 15 striae in 10μ .

XIV:2 unites characters from the three species *C. gaeumanni* Meister, *C. javanica* Hustedt, and *C. amphicephala* Naegeli, which may be difficult to keep apart (see HUSTEDT 1937—39, pp. 424—425). XIV:2 perhaps is most closely related to *C. javanica*, as the dimensions of this species according to HUSTEDT 1937—39, p. 424, are $15-22 \times 4-4.5 \mu$ with 11—12 striae in 10μ .

Gneiss: E: 20 (0.4 %). K: 300, 307 (0.4 %).

(— *knuthii* FOGED. Pearyld: very common).

— *laevis* Naegeli. HUSTEDT 1930, p. 353, fig. 642. A.SCHMIDT's Atlas, Pl. 380, fig. 17. FOGED 1955, p. 67, Pl. 9, fig. 10, Pl. 11, fig. 17.

Basalt: N: 350, 343 (0.2 %).

pH: alkaliphilous. W.Gr.: not common. Pearyld: very common.

— *lapponica* Grun. P.T.CLEVE 1894—95, I, p. 165, Pl. 4, fig. 28.

Gneiss: E: 8. D: 452.

pH: acidophilous. W.Gr.: rare. Pearyld: common.

— *lata* Grun. HUSTEDT 1930, p. 355, fig. 649.

Gneiss: K: 327.

pH: ?

(— — var. *minor* Mölder: Pearyld: scarce).

— *latens* Krasske. KRASSKE 1937, p. 53. 1938, fig. 21. FOGED 1953, p. 55, Pl. 11, fig. 14. 1955, p. 68, Pl. 12, fig. 4.

Basalt: D: 62 (0.2 %), 430, 431 (0.4 %), 434. N: 350 (0.2 %), 358. S: 213 (0.2 %), 184, 206, 232.

Gneiss: C: 560 (0.4 %), 572.

Sediment: S: 267 (0.2 %).

pH: acidophilous. W.Gr.: not rare. Pearyld: common.

- Cymbella leptoceros* (Ehr.?) Grun. HUSTEDT 1930, p. 353, fig. 645. FOGED 1953, p. 56, Pl. 11, fig. 11. 1955, p. 68, Pl. 9, figs. 5, 6. A. SCHMIDT's Atlas, Pl. 373, figs. 32-35. Basalt: N: 361 (0.4 %), 358, 372 (3.2 %), 642. S: 245 (0.2 %). Sediment: S: 267, 273 (0.4 %). pH: alkaliphilous. W.Gr.: rare. Pearyld: fairly rare.
- *leptoceros* (Ehr.?) Grun.?
 Plate XIV, fig. 7: $42.6 \times 10.0 \mu$. Dorsal side 7, ventral side 10 striae in 10μ . In rather close agreement with HUSTEDT's description of *C. leptoceros*, 1930, p. 353. It has not, however, been possible with certainty to discern the double dots of the striae.
 Basalt: N: 350.
 Plate XIV, fig. 8: $32 \times 8.7 \mu$. Dorsal side 8-9, ventral side 10 striae in 10μ . Like *C. leptoceros* in A. SCHMIDT's Atlas, Pl. 373, fig. 350, it has the polar nodules of the raphe deflected towards the ventral side, and the raphe is convex towards the dorsal side.
 Basalt: N: 372.
- var. *rostrata* Hustedt. HUSTEDT 1942b, p. 132, figs. 52-54. A. SCHMIDT's Atlas, Pl. 378, figs. 58-60.
 Basalt: N: 354, 358, 372 (0.2 %), 343 (2.2 %), 642.
 Sediment: S: 273, 286 (0.4 %).
 pH: indifferent. Pearyld: very common.
- *microcephala* Grun. HUSTEDT 1930, p. 351, fig. 637. FOGED 1953, p. 56, Pl. 11, figs. 2-4. 1955, p. 69, Pl. 11, fig. 26; Pl. 12, fig. 12.
 Basalt: D: 430 (1.6 %), 431 (1.4 %), 547 (0.2 %), 434 (2.6 %). N: 350 (0.3 %), 354 (0.2 %), 361 (1.4 %), 372 (0.2 %), 642 (0.8 %). S: 213 (0.4 %), 205 (1.4 %), 206 (1.8 %), 245 (0.4 %), 242 (0.2 %), 232 (0.4 %).
 Gneiss: E: 28, 32 (1.0 %). C: 549 (1.0 %), 572. D: 33 (0.8 %), 38 (0.2 %), 45 (0.2 %), 469 (0.4 %). DQ: 81 (0.8 %). U: 130 (0.4 %). K: 300, 307 (2.0 %).
 Sediment: S: 267 (0.2 %), 273 (1.0 %), 286 (1.0 %), 167 (1.0 %).
 pH: alkaliphilous. W.Gr.: rather common. Pearyld: rather common.
- var. *robusta* Hustedt. HUSTEDT 1938, Pl. 25, figs. 14, 15.
 Plate XIII, fig. 11: $18.7 \times 4.0 \mu$. 15 striae in 10μ .
 With somewhat coarser striae than on the variety as it appears in Peary Land (FOGED 1955, p. 69, Pl. 11, fig. 26: $15.9 \times 2.3 \mu$ with 18-20 striae in 10μ).
 Gneiss: E: 20 (0.2 %). C: 572 (0.2 %). K: 307 (1.2 %), 308.
 pH: alkaliphilous. W.Gr.: not rare. Pearyld: scarce.
- *naviculiformis* Auersw. HUSTEDT 1930, p. 356, fig. 653. A. SCHMIDT's Atlas, Pl. 9, fig. 63. FOGED 1953, p. 56, Pl. 10, fig. 9.
 Gneiss: C: 549, 572. K: 318 (0.4 %).
 pH: indifferent. W.Gr.: common. Pearyld: not rare.
- *naviculiformis* Auersw. forma.
 Plate XIV, fig. 12: $44 \times 7.1 \mu$. 13-14 striae in 10μ .
 In A. SCHMIDT's Atlas, Pl. 377, fig. 20, there is an oblong form with drawn-out—not capitate—apices, which is related to XIV:12. The central area of XIV:12, however, is smaller than that of A.S. 377: 20.
 Gneiss: E: 20.
- *norvegica* Grun. HUSTEDT 1930, p. 359, fig. 664. 1942b, p. 136, figs. 55-59. FOGED 1953, p. 56, Pl. 11, figs. 9, 10. 1955, p. 69, Pl. 13, fig. 18.
 Basalt: D: 107, 430. N: 350, 354, 361 (0.2 %), 358 (0.2 %), 372 (15.0 %), 395 (0.2 %), 343 (0.8 %), 642 (4.2 %). S: 242 (0.4 %), 232 (1.6 %).
 Gneiss: C: 558 (0.2 %), 567 (1.2 %). D: 33 (11.6 %), 38 (1.8 %), 48 (0.2 %), 476 (0.4 %). U: 130.

Sediment: S: 267 (0.2 %), 273 (0.4 %), 286 (1.4 %), 167.

pH: indifferent. W.Gr.: rare. Pearyld: rather common.

(*Cymbella obscura* Krasske. Pearyld: common).

— *obtusa* Greg. HUSTEDT 1930, p. 361, fig. 667. A.SCHMIDT's Atlas, Pl. 379, figs. 39—45. FOGED 1953, p. 56, Pl. 11, figs. 7, 8. 1955, p. 70, Pl. 13, figs. 13, 14.

Basalt: D: 74, 431, 434 (0.2 %). N: 350 (1.0 %), 354 (1.0 %), 361, 358 (0.8 %), 372 (1.8 %), 343 (9.8 %), 642 (1.0 %). S: 195, 221, 213 (0.2 %), 205 (0.8 %), 206 (0.4 %), 245, 232 (0.8 %).

Gneiss: E: 8, 20 (1.2 %), 28. C: 549, 555 (1.0 %), 558, 560, 572. D: 33 (0.2 %), 38 (1.0 %), 45 (8.0 %), 469 (0.4 %), 476, 452. DQ: 81, 98 (0.6 %). U: 130.

Sediment: S: 267 (0.6 %), 273 (0.2 %), 286 (0.8 %).

pH: alkaliphilous. W.Gr.: not rare. Pearyld: rather common.

(— fo. *krasskei* Foged. W.Gr.: rare).

(— *obtusiuscula* Krasske. Pearyld: rare).

(— *parva* (W.Smith) Cleve. W.Gr.: rare).

— *perpusilla* A.Cleve. HUSTEDT 1930, p. 361, fig. 666.

Plate XIV, fig. 3: $20 \times 4 \mu$. 12 striae in 10μ .

Almost identical with HUSTEDT 1937—39, Pl. 25, figs. 24—27.

Gneiss: K: 304, 307 (0.2 %).

Plate XIV, fig. 4: $21.3 \times 4.0 \mu$. 11—12 striae in 10μ .

Gneiss: K: 307.

pH: acidophilous. W.Gr.: scarce. Pearyld: rather common.

— *philadelphica* Boyer. BOYER 1916, p. 63, Pl. 18, fig. 63. FOGED 1955, p. 70, Pl. 10, fig. 2.

Basalt: N: 358.

Gneiss: U: 130.

pH: indifferent? Pearyld: not rare.

— *prostrata* (Berkeley) Cleve. HUSTEDT 1930, p. 357, fig. 659.

Gneiss: E: 32. D: 469.

pH: alkaliphilous.

(— *pseudoalpinoides* Foged. Pearyld: rare).

(— *reinhardtii* Grun. Pearyld: scarce).

— *rosenkrantzii* nov. spec.

Valva asymmetrica, lineari-elliptica, apicibus obtuse rotundatis, 34μ longa, 5.3μ lata. Rhaphe recta, fissuris terminalibus ut leniter poris centralibus ad latus dorsale deflexis. Area axialis angustior, circum nodum centralem ad latus ventrale paulum dilatata, ad dorsale magis ibique duobus stigmatibus notata. Striae 11 in 10μ , omnes radiantes, manifesto lineolatae. Tab. XIV, fig. 14.

Hab. in aqua dulci Groenlandiae occidentalis.

Plate XIV, fig. 14: $34 \times 5.3 \mu$ 11 striae in 10μ .

Valves unsymmetrical, linear-elliptical, with obtusely rounded-off apices, 34μ long, 5.3μ broad. Raphe straight, with central nodules slightly deflected towards the dorsal side, polar nodules also deflected towards the dorsal side. Axial area rather narrow, round the central nodules slightly extended towards the ventral side, somewhat more extended towards the dorsal side and there provided with two isolated dots. 11 striae in 10μ , all radial and distinctly lineolate. In freshwater. West Greenland.

As the valves undoubtedly are isopolar, it is out of the question to mistake the specimens found for *Gomphonema bipunctata* Krasske, which has been found in several samples in this part of Greenland.

Gneiss: D: 542.

- Cymbella similis* Krasske. KRASSKE 1932, p. 122, fig. 24. A.SCHMIDT's Atlas, Pl. 377, figs. 43—47. FOGED 1955, p. 71, Pl. 11, fig. 20; Pl. 12, figs. 14, 15, 20—22.
 Basalt: N: 350 (0.2 ‰), 354, 361, 358. S: 195, 221.
 Gneiss: D: 48, 542.
 pH: indifferent. Pearyld: common.
- *sinuata* Greg. HUSTEDT 1930, p. 361, figs. 668a, b.
 Basalt: D: 430 (0.2 ‰), 431, 434 (0.4 ‰). S: 213.
 Gneiss: D: 524.
 pH: indifferent.
- *spuria* Cleve. P.T. CLEVE 1894—95, I, p. 166. FOGED 1953, p. 56, Pl. 11, fig. 12(?). 1955, p. 72, Pl. 10, fig. 1(?).
 Basalt: D: 69, 71, 547 (?). N: 350, 354 (0.4 ‰), 358 (0.2 ‰). S: 221, 205.
 Gneiss: E: 8 (0.2 ‰), 20, 28, 32. C: 558, 560, 561, 567. D: 38 (0.2 ‰), 45, 454 (?), 462, 476, 479: DQ: 98 (2.2 ‰). U: 130. K: 318.
 Sediment: S: 267.
 pH: indifferent. W.Gr.: rather common. Pearyld: fairly rare.
- *stauroneiformis* Lagerst. P.T. CLEVE 1894—95, I, p. 165. A.SCHMIDT's Atlas, Pl. 377, figs. 51—57. FOGED 1955, p. 72, Pl. 11, fig. 19.
 Basalt: D: 69. N: 354, 358. S: 221, 191, 242.
 Gneiss: U: 130 (0.2 ‰).
 Sediment: S: 286, 167.
 pH: ? W.Gr.: rare. Pearyld: common.
- (— *subaequalis* Grun. var. *oblonga* (Fontell) Ross. W.Gr.: rare).
- *turgida* (Greg.) Cleve. HUSTEDT 1930, p. 358, fig. 660. A.SCHMIDT's Atlas, Pl. 10, figs. 49—53.
 Basalt: D: 74 (0.2 ‰), 109 (2.0 ‰), 108 (1.2 ‰), 430 (0.2 ‰), 434. N: 354, 361 (0.2 ‰), 358 (0.2 ‰), 395 (0.2 ‰), 397 (2.2 ‰). S: 193 (2.6 ‰), 195 (2.2 ‰), 221 (0.4 ‰), 213 (0.4 ‰), 191 (0.4 ‰), 205, 206, 245 (0.2 ‰), 242.
 Gneiss: E: 32. C: 549, 572 (0.4 ‰). D: 33 (0.4 ‰), 38, 45, 48 (0.4 ‰), 462 (3.0 ‰), 476, 479 (0.4 ‰), 491 (3.0 ‰), 496 (2.8 ‰), 524, 452. DQ: 81 (0.2 ‰). U: 130 (0.2 ‰), 132. K: 300, 307 (1.4 ‰).
 Sediment: S: 267 (0.2 ‰).
 pH: indifferent (alkaliphilous?). W.Gr.: common. Pearyld: common.
- (— *variabilis* (Cramer) Heiberg var. *botellus* Lagerstedt. Pearyld: very common).
- *ventricosa* Kütz. HUSTEDT 1930, p. 359, fig. 661. A.SCHMIDT's Atlas, Pl. 10, figs. 42, 43, 57—59; Pl. 71, figs. 11, 12, 14, 15, 30—34. FOGED 1953, p. 57, Pl. 10, figs. 14, 15. 1955, p. 74, Pl. 12, figs. 7—9.
 Basalt: D: 69 (0.4 ‰), 71 (0.4 ‰), 74 (0.4 ‰), 500 (0.2 ‰), 516 (96.4 ‰), 107, 109 (0.4 ‰), 108 (12.4 ‰), 430 (1.2 ‰), 431 (2.0 ‰), 438, 434 (4.4 ‰). N: 350 (1.6 ‰), 354 (0.2 ‰), 361 (7.0 ‰), 358 (1.6 ‰), 372, 395 (0.8 ‰), 382 (1.4 ‰), 397 (20.8 ‰), 642. S: 193 (5.2 ‰), 195 (1.6 ‰), 221 (2.2 ‰), 213 (10.4 ‰), 191 (3.6 ‰), 205 (1.0 ‰), 206 (4.2 ‰), 245 (0.2 ‰), 242 (0.2 ‰), 232 (1.2 ‰).
 Gneiss: E: 20 (0.2 ‰), 28 (0.6 ‰), 32 (1.6 ‰). C: 549 (1.6 ‰), 558, 561 (0.2 ‰), 572 (0.4 ‰). D: 45, 48, 469 (0.4 ‰), 476 (0.8 ‰), 479 (5.6 ‰), 496 (0.8 ‰), 524 (2.0 ‰), 527, 542 (0.4 ‰), 452 (1.6 ‰). DQ: 81 (2.6 ‰), 95 (0.2 ‰). U: 130 (1.0 ‰), 132. K: 300 (0.2 ‰), 307 (0.2 ‰), 318.
 Sediment: S: 267 (1.4 ‰), 273 (0.2 ‰), 167 (2.4 ‰).
 pH: indifferent. W.Gr.: common. Pearyld: very common.
- var. *groenlandica* Foged. FOGED 1953, p. 57, Pl. 10, figs. 11—13.
 Basalt: N: 350, 354, 361, 358 (0.2 ‰).
 Gneiss: C: 560, 572 (0.2 ‰). U: 130. K: 318 (0.8 ‰).
 pH: indifferent. W.Gr.: rather common.

Cymbella sp.

Plate XIII, fig. 13: $24.7 \times 6 \mu$. 16—18 striae in 10μ .

Gneiss: D: 476. DQ: 81 (0.2 %).

— sp.

Plate XIII, fig. 14: $29.3 \times 6.5 \mu$.

Dorsal side 12, ventral side 15 striae in 10μ .

Plate XIII, fig. 15: $30 \times 6.7 \mu$. 15—16 striae in 10μ .

Plate XIII, fig. 16: $32 \times 6.7 \mu$. 15—17 striae in 10μ .

These three forms are undoubtedly closely related and must be supposed to related to *C. cesati* (Rabh.) Grun.

XIII:14: Sediment: S: 266.

XIII:15: Gneiss: K: 304, 308 (0.8 %).

XIII:16: Basalt: N: 349.

— sp.

Plate XIV, fig. 9: $25.6 \times 5.3 \mu$. 12 striae in 10μ .

Gneiss: K: 307 (0.6 %).

Didymosphenia M. Schmidt.

Didymosphenia geminata (Lyngbye) M. Schmidt. HUSTEDT 1930, p. 367, fig. 682.

Basalt: D: 74.

pH: indifferent.

Gomphonema Agardh.

Gomphonema acuminatum Ehr. HUSTEDT 1930, p. 370, fig. 683. FOGED 1953, p. 57, Pl. 10, fig. 19.

Basalt: D: 109, 431. N: 361 (0.2 %), 358. S: 221 (0.2 %), 213 (0.8 %), 206, 245 (0.2 %), 242.

Gneiss: D: 469, 479 (0.4 %). DQ: 81. U: 130 (0.2 %).

Sediment: S: 167 (0.6 %).

pH: alkaliphilous. W.Gr.: not common.

— — var. *brébissonii* (Kütz.) Cleve. HUSTEDT 1930, p. 370, fig. 685. FOGED 1953, p. 57, Pl. 10, fig. 20.

Basalt: D: 430 (1.4 %), 431 (0.4 %), 547, 434 (0.4 %). N: 350 (0.4 %), 354, 361 (0.4 %), 358 (0.2 %), 372 (0.2 %), 642 (0.2 %). S: 221 (0.8 %), 205 (0.2 %), 206, 245 (0.2 %), 242 (0.2 %), 232 (0.2 %).

Gneiss: E: 32. C: 549 (0.2 %), 572. D: 33 (0.2 %), 38 (0.8 %), 476, 479 (0.4 %), 452 (0.2 %). DQ: 81 (0.4 %).

Sediment: S: 267 (0.2 %), 273 (0.4 %), 286, 167 (2.8 %).

pH: alkaliphilous. W.Gr.: rather common.

— — var. *coronata* (Ehr.) W. Smith. HUSTEDT 1930, p. 370, fig. 684.

Gneiss: C: 558. D: 476, 479. DQ: 81.

pH: indifferent. W.Gr.: rare.

— — var. *trigonocephala* (Ehr.) Grun. HUSTEDT 1930, p. 371, fig. 686.

Basalt: S: 221.

Gneiss: C: 558. D: 479 (0.4 %), 452 (0.2 %).

pH: indifferent. W.Gr.: rare.

— — var. *turris* (Ehr.) Cleve. HUSTEDT 1930, p. 372, fig. 687. FOGED 1953, p. 58, Pl. 12, fig. 10.

Basalt: D: 431 (0.4 %).

Gneiss: D: 469 (0.4 %), 527.

Sediment: S: 167 (0.2 %).

pH: indifferent. W.Gr.: rare.

- Gomphonema angustatum* (Kütz.) Rabh. HUSTEDT 1930, p. 373, fig. 690. A. SCHMIDT'S Atlas, Pl. 234, figs. 20—25, 31—35. FOGED 1953, p. 58, Pl. 12, fig. 1. 1955, p. 74, Pl. 13, fig. 2.
 Basalt: D: 69, 103, 430 (5.4 ‰), 438 (0.2 ‰), 547. N: 350, 642. S: 221, 213, 245 (0.8 ‰), 242 (0.8 ‰), 232 (2.4 ‰).
 Gneiss: E: 8, 32. C: 558. D: 38 (0.2 ‰), 48, 476 (1.2 ‰), 479 (0.6 ‰), 491 (0.2 ‰), 524, 452 (0.2 ‰). DQ: 81 (0.6 ‰). U: 132 (1.2 ‰). K: 300, 307 (0.2 ‰), 327 (0.2 ‰).
 Sediment: S: 267 (0.2 ‰), 286, 167 (0.6 ‰).
 pH: alkaliphilous. W.Gr.: common. Pearyld: not rare.
- var. *linearis* Hustedt. HUSTEDT 1930, p. 373, fig. 692. FOGED 1953, p. 58, Pl. 12, fig. 8.
 Basalt: S: 184, 205 (0.2 ‰).
 Sediment: S: 273, 167 (0.4 ‰).
 pH: alkaliphilous. W.Gr.: rare.
- var. *producta* Grun. HUSTEDT 1930, p. 373, fig. 693. FOGED 1953, p. 58, Pl. 12, figs. 2, 3. 1955, p. 74, Pl. 13, fig. 9.
 Basalt: D: 69, 74 (0.2 ‰), 500 (9.0 ‰), 516 (0.2 ‰), 103 (5.0 ‰). N: 350, 361, 358, 395 (0.2 ‰), 382. S: 195, 213, 191 (0.2 ‰), 245.
 Gneiss: D: 469 (0.2 ‰), 524, 527 (0.2 ‰), 452 (0.2 ‰). DQ: 86 (0.2 ‰).
 pH: alkaliphilous. W.Gr.: common. Pearyld: very common.
- var. *producta* Grun.?
 Plate XV, fig. 10: $40 \times 12 \mu$. 12 striae in 10μ .
 In habit this form is very similar to *G. commune* Rabenh. in LAGERSTEDT 1873, Pl. 1, fig. 14a, p. 40, with the dimensions $28-44 \times 8-11 \mu$ and 8—15 striae in 10μ , which ØSTRUP 1897, p. 263, considers to be identical with *G. angustatum* var. *producta*.
 Basalt: D: 107.
- var. *sarcophagus* (Greg.) Grun. HUSTEDT 1930, p. 373, fig. 691. A. SCHMIDT'S Atlas, p. 234, figs. 36, 37. FOGED 1953, p. 58, Pl. 12, fig. 7.
 Basalt: D: 71 (0.4 ‰), 74, 109. S: 193 (0.2 ‰).
 Gneiss: C: 567. DQ: 98.
 pH: indifferent? W.Gr.: fairly rare. Pearyld: rather common.
- var. *undulata* Grun. HUSTEDT 1930, p. 373, fig. 694. 1942b, p. 145, fig. 67. FOGED 1953, p. 58, Pl. 12, figs. 4—6.
 Basalt: N: 358, 343 (0.8 ‰), 642 (0.2 ‰). S: 205, 242 (0.4 ‰), 232 (0.2 ‰).
 Gneiss: C: 558. D: 462, 469.
 pH: indifferent. W.Gr.: rather common. Pearyld: rather common.
 Plate XV, fig. 9: $35.2 \times 6.8 \mu$. 9—10 striae in 10μ .
 Sediment: S: 279.
- *bipunctata* Krasske. KRASSKE 1943, fig. 33.
 Basalt: S: 184, 191 (1.0 ‰).
 Gneiss: D: 48, 491 (1.2 ‰), 496 (9.0 ‰).
 pH: acidophilous?
 Plate XV, fig. 1: $37.2 \times 6.7 \mu$. 11 striae in 10μ .
 Plate XV, fig. 2: $30 \times 6 \mu$. 12 striae in 10μ .
 Plate XV, fig. 3: $26 \times 5.4 \mu$. 12 striae in 10μ .
 Plate XV, fig. 4: $17.3 \times 4.7 \mu$. 11—12 striae in 10μ .
 According to KRASSKE 1943, p. 87, dimensions for this species are $18-26 \times 4.5-6 \mu$ with 12 striae in 10μ . Many of the valves found here are considerably larger than KRASSKE's forms, which all originate from Lapland, where they were found at pH 6.5—6.8. The occurrence of the species in Greenland also suggests that it is, if anything, acidophilous.

(*Gomphonema boreale* Ehr. var. *minor* Foged. Mesohalobous. W.Gr.: rare).

- *clevei* Fricke var. *javanicum* Hustedt. HUSTEDT 1937—39, p. 441, Pl. 27, figs. 6—13. MESSIKOMMER 1949, fig. 5.

Plate XV, fig. 6: $27.2 \times 5.4 \mu$. 9—10 striae in 10μ .

The species has been found in tropical Africa and in Asia. Var. *javanica* Hustedt was first described from the East India islands by HUSTEDT. Later it has been found in Switzerland. It is presumably cosmopolitan.

Basalt: S: 246.

- *constrictum* Ehr. HUSTEDT 1930, p. 377, fig. 714.

Basalt: D: 434 (0.2 %). N: 350.

Gneiss: D: 469, 452. DQ: 81.

Sediment: S: 267 (0.2 %), 167 (0.2 %).

pH: alkaliphilous. W.Gr.: rather rare.

Plate XV, fig. 11: $42 \times 8 \mu$. 9 striae in 10μ .

Gneiss: D: 38.

- var. *capitata* (Ehr.) Cleve. HUSTEDT 1930, p. 377, fig. 715.

Basalt: N: 642 (0.2 %).

Gneiss: E: 28, 32 (0.4 %). C: 549, 558, 572. D: 38, 452.

Sediment: S: 273 (0.4 %).

pH: indifferent. W.Gr.: rare.

- *gracile* Ehr. HUSTEDT 1930, p. 376, fig. 702.

Basalt: D: 430 (0.8 %), 431 (0.4 %), 434. N: 350, 361 (0.2 %), 358, 642. S: 242 (0.2 %).

Gneiss: E: 32 (0.2 %). C: 549 (0.4 %), 572 (0.2 %). D: 476, 452. DQ: 81. U: 130 (0.8 %). K: 318, 327.

Sediment: S: 267.

pH: alkaliphilous. W.Gr.: rare.

- *helveticum* Brun. HUSTEDT 1930, p. 373, fig. 712.

Basalt: D: 438 (0.8 %).

pH: indifferent.

- *intricatum* Kütz. HUSTEDT 1930, p. 375, fig. 697.

Sediment: S: 267, 167.

pH: alkaliphilous. Pearyld: rare.

- var. *dichotoma* (Kütz.) Grun. HUSTEDT 1930, p. 375. A.SCHMIDT'S Atlas, Pl. 234, figs. 51—58.

Gneiss: DQ: 81.

Sediment: S: 273 (0.8 %).

pH: alkaliphilous.

- *lagerheimii* A.Cleve. HUSTEDT 1942b, p. 146, figs. 78—82. FOGED 1955, p. 75, Pl. 13, fig. 4.

Basalt: D: 438 (0.2 %). N: 350, 354, 361 (0.6 %), 358 (1.4 %), 642 (0.6 %).

Gneiss: C: 549 (0.4 %), 555. D: 33 (0.2 %), 38 (1.0 %), 462 (0.6 %), 479, 496.

DQ: 98 (0.8 %).

Sediment: S: 273 (0.2 %), 286 (0.2 %).

pH: indifferent. W.Gr.: rather common. Pearyld: rather common.

Plate XV, fig. 8: $32.6 \times 4.0 \mu$. 13 striae in 10μ .

Sediment: S: 279.

- fo. *minor* A.Cleve-Euler. A.CLEVE-EULER 1955, IV, p. 180, fig. 1271f.

Basalt: N: 358 (0.2 %).

pH: indifferent.

Plate XV, fig. 7: $22 \times 3.6 \mu$. 18 striae in 10μ .

- Gomphonema lanceolatum* Grun. HUSTEDT 1930, p. 376, fig. 700.
 Basalt: D: 430 (0.2 %), 434 (1.0 %). S: 193, 245 (0.2 %), 242.
 Gneiss: D: 33 (0.2 %), 38 (0.2 %).
 pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.
- var. *insignis* (Gregory) Cleve. HUSTEDT 1930, p. 376, fig. 701.
 Basalt: S: 206.
 Gneiss: D: 452. K: 318 (0.6 %).
 Sediment: S: 267 (0.2 %).
 pH: alkaliphilous.
- *longiceps* Ehr. HUSTEDT 1930, p. 375, fig. 704. A.SCHMIDT's Atlas, Pl. 240, figs. 34—36.
 Basalt: D: 71, 74, 109 (0.2 %), 430 (0.6 %), 431 (0.2 %), 434 (0.8 %). N: 350, 361 (0.4 %), 358 (0.6 %), 343. S: 193, 221 (0.6 %), 213 (1.0 %), 184 (0.8 %), 191 (0.8 %), 205, 245 (0.2 %), 242 (0.2 %), 232 (1.0 %).
 Gneiss: E: 32. D: 45 (0.2 %), 48 (1.4 %), 479 (0.4 %), 496 (0.2 %), 527, 542 (0.6 %). U: 132.
 Sediment: S: 267, 273, 286, 167 (1.4 %).
 pH: alkaliphilous. W.Gr.: rare. Pearyld: rather common.
- var. *subclavata* Grun. HUSTEDT 1930, p. 375, fig. 705. FOGED 1955, p. 76, Pl. 13, fig. 5.
 Gneiss: D: 45.
 pH: indifferent. W.Gr.: rather common. Pearyld: rather common.
- — fo. *gracilis* Hustedt. HUSTEDT 1930, p. 375, fig. 706.
 Gneiss: D: 476.
 pH: indifferent.
- *olivaceum* (Lyngbye) Kütz. HUSTEDT 1930, p. 378, fig. 719. FOGED 1955, Pl. 13, fig. 7.
 Plate XV, fig. 5: $19.3 \times 6 \mu$ 10 striae in 10μ .
 Basalt: N: 342.
 pH: alkaliphilous. Pearyld: rare.
- *parvulum* Kütz. HUSTEDT 1930, p. 372, fig. 713c.
 Basalt: D: 438 (0.8 %).
 Gneiss: E: 20 (3.2 %), 32 (0.4 %). C: 572 (0.4 %). D: 48 (1.4 %), 469 (1.6 %). K: 300, 307 (0.4 %), 318 (0.2 %).
 pH: indifferent (alkaliphilous?). W.Gr.: rather rare. Pearyld: rare.
- var. *micropus* (Kütz.) Cleve. HUSTEDT 1930, p. 373, fig. 713c. FOGED 1953, p. 59, Pl. 10, fig. 18.
 Gneiss: E: 20, 28 (0.2 %). C: 549 (0.6 %).
 pH: indifferent. W.Gr.: rare.
- *subtile* Ehr. HUSTEDT 1930, p. 376, fig. 709.
 Basalt: S: 242. N: 642 (0.6 %).
 Gneiss: C: 549, 555 (0.2 %). D: 45 (0.2 %). DQ: 81. K: 318.
 Sediment: S: 267 (0.2 %), 273 (0.2 %).
 pH: indifferent.
- var. *sagitta* (Schum.) Cleve. HUSTEDT 1930, p. 377, fig. 710. FOGED 1953, p. 59, Pl. 12, fig. 9.
 Sediment: S: 273 (0.4 %), 167.
 pH: indifferent? W.Gr.: rare.

EPITHEMIACEAE

Denticula Kütz.

Denticula tenuis Kütz. HUSTEDT 1930, p. 381, fig. 723.

Basalt: D: 516 (0.2 %), 430 (2.8 %), 431 (1.6 %), 547, 434 (4.4 %). N: 350 (1.6 %), 354 (7.0 %), 361 (4.0 %), 358 (10.8 %), 372 (1.7 %), 343 (8.6 %), 642 (11.6 %). S: 221 (0.8 %), 213 (0.4 %), 184 (0.4 %), 205 (1.0 %), 206 (1.6 %), 245 (0.2 %), 242 (0.4 %), 232 (10.0 %).

Gneiss: E: 28. C: 558, 560, 561. D: 33 (14.2 %), 38 (1.0 %), 45 (0.6 %), 454, 476, 452 (0.2 %). K: 318 (0.4 %).

Sediment: S: 267 (2.2 %), 273 (4.2 %), 286 (4.8 %).

pH: alkaliphilous. W.Gr.: rare. Pearyld: very common.

(— var. *crassula* (Naegeli) Hustedt. W.Gr.: scarce).

(— var. *frigida* Kütz. W.Gr.: dominant in one sample, elsewhere not common.)

Epithemia Bréb.

Epithemia argus Kütz. HUSTEDT 1930, p. 383, fig. 727a.

Basalt: N: 354 (0.4 %), 642 (0.6 %).

Gneiss: DQ: 81 (0.2 %).

Sediment: S: 286.

pH: alkaliphilous. W.Gr.: not rare.

— *hyndmanni* W.Smith. HUSTEDT 1930, p. 387, fig. 735.

Basalt: D: 434 (0.2 %).

pH: alkaliphilous. Pearyld: rare.

— *sorex* Kütz. HUSTEDT 1930, p. 388, fig. 736.

Basalt: D: 430 (19.8 %), 431 (2.4 %), 547, 434 (12.0 %). N: 350 (10.6 %), 354, 361 (13.2 %), 358 (2.2 %), 372 (33.0 %), 395 (0.2 %), 642 (1.4 %). S: 205 (18.0 %), 206 (0.4 %), 245 (1.8 %), 242 (5.4 %), 232 (4.2 %).

Gneiss: E: 32 (0.4 %). C: 549 (0.4 %), 555 (0.4 %), 558 (11.8 %), 560, 561. D: 33 (37.0 %), 38 (3.2 %), 45, 469 (0.2 %), 476 (0.2 %), 479, 452. DQ: 81 (3.6 %), 98 (0.6 %). U: 130 (1.6 %), 132. K: 307 (0.2 %), 318 (0.6 %).

Sediment: S: 267 (1.2 %), 273 (4.4 %), 286 (0.4 %), 167 (20.6 %).

pH: alkaliphilous. W.Gr.: fairly rare. Pearyld: common.

— var. *gracilis* Hustedt. HUSTEDT 1930, p. 388, fig. 737.

Gneiss: D: 38 (0.4 %).

pH: alkaliphilous. W.Gr.: rare. Pearyld: scarce.

— var. *lapponica* Hustedt. HUSTEDT 1942b, p. 149, figs. 83, 84.

Basalt: N: 358. S: 206.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rare.

— *turgida* (Ehr.) Kütz. HUSTEDT 1930, p. 387, fig. 733.

Basalt: D: 430 (0.6 %), 431 (0.8 %). N: 354, 358. S: 206.

Gneiss: DQ: 81 (0.2 %).

pH: alkaliphilous. W.Gr.: scarce.

— var. *granulata* (Ehr.) Grun. HUSTEDT 1930, p. 387, fig. 734.

Basalt: N: 358, 642.

Gneiss: DQ: 81.

Sediment: S: 167.

pH: alkaliphilous. W.Gr.: rare.

(— *zebra* (Ehr.) Kütz. W.Gr.: rare).

— (Ehr.) Kütz. var. *porcellus* (Kütz.) Grun. HUSTEDT 1930, p. 385, fig. 731.

Basalt: N: 395. S: 205 (0.6 %), 206.

pH: alkaliphilous.

Epithemia zebra var. *saxonica* (Kütz.) Grun. HUSTEDT 1930, p. 385, fig. 730.

Basalt: D: 430 (1.0 ‰), 431 (0.2 ‰), 438, 434 (0.6 ‰). N: 350 (6.6 ‰), 354, 361 (0.4 ‰), 358. S: 205 (0.2 ‰), 206 (0.2 ‰), 245 (0.8 ‰).

Gneiss: DQ: 81 (0.4 ‰).

Sediment: S: 273, 167 (0.4 ‰).

pH: alkaliphilous. W.Gr.: scarce.

Rhopalodia O. Müller.

Rhopalodia gibba (Ehr.) O. Müller. HUSTEDT 1930, p. 390, fig. 740.

Basalt: D: 430, 431, 438 (0.2 ‰), 434. N: 350 (0.2 ‰), 354 (0.8 ‰), 358, 372 (5.0 ‰), 395 (1.0 ‰), 642 (0.8 ‰). S: 205 (4.2 ‰), 206, 245.

Gneiss: C: 572. DQ: 81. U: 130 (0.8 ‰).

Sediment: S: 273, 167.

pH: alkaliphilous. W.Gr.: common. Pearyld: rare.

(— *musculus* (Kütz.) O. Müller. W.Gr.: rare. Mesohalobous).

NITZSCHIACEAE

Cylindrotheca Rabenh.

Cylindrotheca gracilis (Bréb.) Grun. HUSTEDT 1930, p. 393, fig. 746.

Basalt: N: 395.

pH: alkaliphilous (halophilous).

Hantzschia Grün.

Hantzschia amphioxys (Ehr.) Grun. HUSTEDT 1930, p. 374, fig. 747.

Basalt: D: 69, 71 (0.4 ‰), 74 (0.2 ‰), 107 (0.4 ‰), 109, 103 (3.4 ‰), 438 (0.2 ‰). N: 350 (0.2 ‰), 354 (1.0 ‰), 361, 358, 395 (0.2 ‰), 642. S: 193, 195, 221, 184, 191 (0.2 ‰), 206.

Gneiss: D: 45, 48 (0.2 ‰), 524 (0.6 ‰), 542. DQ: 86 (0.4 ‰), 95, 98 (0.8 ‰). U: 132.

pH: alkaliphilous. W.Gr.: fairly rare. Pearyld: rather common.

— *fo. capitata* O. Müller. HUSTEDT 1930, p. 394, fig. 748.

Basalt: D: 69, 71, 74. N: 358. S: 193, 195, 184 (0.2 ‰), 191 (0.8 ‰), 245, 232 (0.2 ‰).

Gneiss: D: 491 (0.2 ‰), 524.

Sediment: S: 267, 286 (0.2 ‰), 167.

pH: alkaliphilous. W.Gr.: (Å. BERG 1945). Pearyld: rare.

— var. *hyperborea* Grun. Å. BERG 1945, fig. 258. FOGED 1955, p. 77, Pl. 14, fig. 1.

Basalt: N: 354.

pH: alkaliphilous. W.Gr.: (Å. BERG 1945). Pearyld: rare.

— var. *maior* Grun. HUSTEDT 1930, p. 394, fig. 749.

Basalt: D: 62, 69 (0.2 ‰), 71 (0.8 ‰), 74, 109 (0.2 ‰), 108, 103 (0.6 ‰), 438 (0.6 ‰). N: 350, 354 (1.0 ‰), 361, 358, 343 (0.2 ‰). S: 195, 221 (0.2 ‰), 213, 184, 191 (0.2 ‰), 205 (0.2 ‰), 206, 232.

Gneiss: D: 48, 491 (0.2 ‰), 524, 527, 542 (0.4 ‰). DQ: 86. U: 130 (0.8 ‰).

Sediment: S: 267 (0.4 ‰), 167 (0.2 ‰).

pH: alkaliphilous. W.Gr.: common. Pearyld: common.

— var. *vivax* (Hantzsch) Grun. HUSTEDT 1930, p. 394, fig. 750.

Basalt: D: 431. N: 358.

pH: alkaliphilous(?).

Nitzschia Hassall.a. *Tryblionellae* (W.Smith, Grunow) Hustedt emend.*Nitzschia angustata* (W.Smith) Grunn. HUSTEDT 1930, p. 402, fig. 767.

Basalt: N: 205 (1.2 %).

Gneiss: C: 549, 558 (0.2 %). D: 33 (1.0 %).

Sediment: S: 267 (12.4 %), 273 (0.6 %).

pH: alkaliphilous. W.Gr.: rare.

— var. *acuta* Grun. HUSTEDT 1930, p. 402, fig. 768.

Gneiss: E: 20 (1.4 %), 32 (0.4 %). C: 558. D: 38 (0.4 %).

pH: indifferent.

— *apiculata* (Gregory) Grun. HUSTEDT 1930, p. 401, fig. 765.

Gneiss: D: 33.

pH: alkaliphilous. Mesohalobous. W.Gr.: rare.

— *tryblionella* Hantzsch. var. *debilis* (Arnott) A.Mayer. HUSTEDT 1930, p. 400, fig. 759.

Basalt: D: 62 (0.4 %), 69, 109. N: 350, 354, 395.

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather rare.

— var. *levidensis* (W.Smith) Grun. HUSTEDT 1930, p. 399, fig. 760.

Basalt: S: 184.

pH: alkaliphilous.

b. *Dubiae* Grunow.*Nitzschia commutata* Grun. HUSTEDT 1930, p. 405, fig. 774.

Basalt: N: 350, 354.

Gneiss: U: 130 (0.6 %).

pH: alkaliphilous. W.Gr.: rather rare. Pearyld: common.

— *dubia* W.Smith. HUSTEDT 1930, p. 403, fig. 770.

Basalt: N: 395 (0.8 %), 397.

pH: alkaliphilous. W.Gr.: not rare.

(— *stagnorum* Rabh. W.Gr.: rather common. Pearyld: scarce).— *thermalis* Kütz. HUSTEDT 1930, p. 403, fig. 771.

Basalt: D: 107 (2.2 %).

pH: alkaliphilous.

— Kütz. var. *minor* Hilse. HUSTEDT 1930, p. 403, fig. 772.

Basalt: D: 62 (10.0 %), 69 (0.2 %), 71 (3.6 %), 74 (0.8 %), 108 (1.4 %), 103 (9.6 %). N: 350 (0.2 %), 395 (0.2 %), 382 (2.4 %). S: 193 (1.2 %), 195 (1.0 %), 191 (0.8 %), 232 (0.2 %).

Gneiss: C: 560 (0.2 %), 561, 572 (0.6 %). DQ: 86 (4.8 %), 95 (0.6 %). U: 130 (0.4 %).

pH: alkaliphilous.

c. *Bilobatae* Grun.*Nitzschia bilobata* W.Smith. HUSTEDT 1930, p. 405, fig. 775.

Basalt: S: 184.

pH: alkaliphilous.

d. *Grunowiae* (Rabh.) Grun.*Nitzschia denticula* Grun. HUSTEDT 1930, p. 407, fig. 780.

Basalt: D: 516, 430 (1.8 %), 431 (0.4 %), 434 (0.8 %). N: 350 (1.4 %), 354 (1.4 %), 361 (0.4 %), 358 (1.0 %), 372 (8.6 %), 395 (0.2 %), 382 (0.6 %), 343 (3.0 %), 642 (5.2 %). S: 195, 221 (0.2 %), 213 (0.2 %), 184 (5.4 %), 205 (2.4 %), 206 (0.6 %), 245 (0.4 %), 242 (2.6 %), 232 (7.8 %).

Gneiss: C: 558, 560. D: 33 (7.2 ‰), 38 (0.6 ‰), 469, 476 (0.4 ‰), 479 (0.2 ‰).
DQ: 81. U: 130 (0.2 ‰), 132 (4.0 ‰). K: 318, 327.

Sediment: S: 267, 273 (12.0 ‰), 286 (60.6 ‰), 167 (5.0 ‰).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: very common.

Nitzschia sinuata (W.Smith) Grun. HUSTEDT 1930, p. 408, fig. 781.

Basalt: N: 350, 354 (4.8 ‰), 361 (0.4 ‰), 358 (2.2 ‰), 343 (1.2 ‰), 642: S: 205 (1.4 ‰), 206.

Sediment: S: 273 (1.2 ‰).

pH: indifferent. W.Gr.: scarce. Pearyld: fairly rare.

(— *palustris* Hustedt. W.Gr.: rare).

e. *Linearis* (Grun.) Hustedt emend.

Nitzschia linearis W.Smith. HUSTEDT 1930, p. 409, fig. 784.

Gneiss: D: 479. U: 132.

pH: alkaliphilous. W.Gr.: fairly rare. Pearyld: rare.

— *vitrea* Norman. HUSTEDT 1930, p. 411, fig. 790.

Basalt: S: 221, 184.

pH: alkaliphilous. Mesohalobous. W.Gr.: rare.

f. *Dissipatae* Grun.

Nitzschia acuta Hantzsch. HUSTEDT 1930, p. 412, fig. 790.

Basalt: N: 642.

Gneiss: E: 32.

pH: alkaliphilous.

— *dissipata* (Kütz.) Grun.? HUSTEDT 1930, p. 412, fig. 789.

Plate XVI, fig. 21: $48 \times 4.7 \mu$. 7—8 carinate dots in 10μ . Striae dense.

XVI:21 is with some hesitation referred to this species.

Gneiss: DQ: 81.

g. *Lanceolatae* Grun.

Nitzschia amphibia Grun. HUSTEDT 1930, p. 414, fig. 793.

Basalt: D: 430. N: 350 (1.8 ‰), 354 (4.8 ‰), 358 (1.2 ‰), 372 (1.6 ‰), 395 (0.2 ‰), 343 (15.4 ‰). S: 221, 184 (0.2 ‰), 205 (0.2 ‰), 206, 242, 232 (2.2 ‰).

Gneiss: D: 48, 452 (0.2 ‰). K: 308.

Sediment: S: 273, 167 (0.4 ‰).

pH: alkaliphilous. W.Gr.: common. Pearyld: rare.

— var. *thermalis* Boye Petersen. BOYE PETERSEN 1930, p. 51, fig. 9.

Basalt: N: 395 (0.2 ‰).

pH: alkaliphilous(?) W.Gr.: not rare.

(— *capitellata* Hustedt. W.Gr.: rare).

— *communis* Rabh.? HUSTEDT 1930, p. 417, fig. 798.

Plate XV, fig. 16: $24.7 \times 3.4 \mu$. 13 carinate dots and ca. 30 striae in 10μ .

With doubt referred here. The apices are rather much drawn out and the valves have almost parallel sides.

Sediment: S: 279.

— *fonticola* Grun. HUSTEDT 1930, p. 415, fig. 800. FOGED 1955, p. 78, Pl. 14, figs. 11, 13.

Basalt: N: 350 (0.6 ‰), 372 (0.2 ‰), 395 (3.4 ‰). S: 193 (1.2 ‰), 195 (2.8 ‰), 213 (1.8 ‰), 205 (0.4 ‰), 232 (0.8 ‰).

Gneiss: E: 20 (2.0 ‰), 32 (1.2 ‰). C: 549 (1.0 ‰), 572 (0.6 ‰). D: 476 (3.6 ‰).

DQ: 81 (1.6 ‰). U: 130 (0.8 ‰). K: 307 (2.0 ‰).

Sediment: S: 273 (2.0 %), 167 (0.2 %).

pH: alkaliphilous. W.Gr.: rare. Pearyld: rather rare.

Plate XVI, fig. 14: $20 \times 3.5 \mu$. 12 carinate dots, and 28 striae in 10μ .

Almost identical with the species as it appears in MESSIKOMMER 1954, Pl. 7, fig. 17 (dim.: $21 \times 3.4 \mu$. 11 carinate dots and 27.5 striae in 10μ), which is denoted as a "schmälere und längere Form."

Gneiss: K: 307.

Nitzschia frustulum (Kütz.) Grun. HUSTEDT 1930, p. 414, fig. 795. FOGED 1953, p. 62, Pl. 13, fig. 13. 1955, p. 78, Pl. 14, fig. 4.

Basalt: D: 71 (1.8 %), 74 (8.4 %), 107 (15.6 %), 109 (71.0 %), 108 (1.2 %), 430 (3.4 %), 431 (2.0 %), 438 (1.2 %), 547 (1.2 %). N: 350 (1.4 %), 354 (16.0 %), 358 (15.4 %), 372 (0.6 %), 395 (3.4 %), 343 (1.4 %), 642 (0.6 %). S: 193 (0.4 %), 221, 213 (7.2 %), 184 (0.2 %), 191 (5.4 %), 205 (1.8 %), 206 (10.4 %), 245 (3.8 %), 242 (12.2 %), 232 (0.6 %).

Gneiss: E: 20 (0.6 %), 32 (4.0 %). C: 549 (3.6 %), 555 (0.8 %), 558 (2.4 %), 560 (0.8 %). D: 33 (2.8 %), 38 (0.8 %), 45 (5.4 %), 454 (2.4 %), 462 (2.2 %), 469 (7.0 %), 476 (13.4 %), 479 (6.6 %), 491 (0.6 %), 524 (2.4 %), 527 (8.8 %), 452 (15.4 %). DQ: 81 (14.0 %). U: 130 (5.4 %). K: 300 (1.4 %), 307 (2.2 %), 318 (1.4 %), 327 (5.2 %).

Sediment: S: 267, 273 (2.4 %), 167 (18.6 %).

pH: alkaliphilous. W.Gr.: common. Pearyld: very common.

Plate XV, fig. 12: $30 \times 3.2 \mu$. 8 carinate dots and 18 striae in 10μ .

The structure of XV:12 is somewhat coarser than usual in the species; so the form has been referred here with some hesitation.

Basalt: S: 205.

Plate XVI, fig. 7: $17.0 \times 3.8 \mu$. 10 carinate dots, 21 striae in 10μ .

Sediment: S: 266.

Plate XVI, fig. 8: $18.0 \times 4.3 \mu$. 11 carinate dots, 18—19 striae in 10μ .

Basalt: S: 191, 232 (0.4 %).

Gneiss: DQ: 81 (1.4 %).

Sediment: S: 267 (6.2 %), 268 (6.2 %).

Plate XVI, fig. 9: $33.3 \times 4.5 \mu$. 8 carinate dots and 21 striae in 10μ .

Gneiss: D: 491.

Plate XVI, fig. 10: $32.6 \times 4.4 \mu$. 8 carinate dots, 21—22 striae in 10μ .

Basalt: S: 255.

— *frustulum* (Kütz.) Grun.?

Plate XVI, fig. 15: $10.6 \times 2.9 \mu$. 8—9 carinate dots, 15 striae in 10μ .

This form has been placed here with great doubt. In habit it is very similar to *N. amphibia* Grun. var. *thermalis* Boye Petersen, BOYE PETERSEN 1930, p. 51, fig. 9, which has the dimensions 15×3.5 — 4μ with 8 carinate dots and 18 striae in 10μ . On XVI:15 the striae, however, are not visibly punctate. It does not either seem to be identical with FOGED 1953, Pl. 13, figs. 21—23, which has been referred to BOYE PETERSEN's variety. Perhaps it is a small specimen of *N. frustulum* with a specially coarse structure.

Gneiss: D: 479 (0.4 %). DQ: 81.

— var. *perminuta* Grun. HUSTEDT 1930, p. 415. FOGED 1953, p. 62, Pl. 13, fig. 9.

Basalt: D: 438 (10.2 %), 434 (15.6 %). N: 354, 343 (1.4 %).

Gneiss: E: 8 (27.2 %), 28 (13.6 %). D: 48 (30.0 %), 496 (1.6 %).

pH: indifferent. W.Gr.: very common.

Plate XV, fig. 13: $27 \times 2.7 \mu$. 10 carinate dots and about 30 striae in 10μ .

Gneiss: D: 491.

Plate XVI, fig. 6: $13.0 \times 2.7 \mu$. 13—14 carinate dots and 26—28 striae in 10μ . This form is one of the commonest *N.* forms in the material.

Basalt: D: 62 (5.0 %), N: 350 (0.2 %), 361 (1.2 %), 358 (0.8 %), 372 (0.6 %). S: 195 (3.6 %), 213 (2.8 %), 184 (0.4 %), 191 (4.2 %), 205 (2.8 %), 206 (16.4 %), 245 (1.6 %), 242 (0.4 %), 232 (0.4 %).

Gneiss: E: 20 (0.4 %), 32 (3.6 %). D: 476 (1.8 %), 479 (7.4 %), 452 (2.2 %). DQ: 81 (0.8 %), 452 (2.2 %). U: 130 (0.6 %), 132 (4.8 %). K: 307 (3.4 %).

Sediment: S: 267 (3.8 %), 273 (2.8 %), 167 (1.0 %).

Plate XVI, fig. 12: $17.3 \times 3.2 \mu$. 14 carinate dots and 26—28 striae in 10μ .

Basalt: S: 221.

Nitzschia frustulum var. *perpusilla* (Rabh.) Grun. HUSTEDT 1930, p. 415. 1937—39, Pl. 41, figs. 21—24. FOGED 1953, p. 62, Pl. 13, figs. 4—6. 1955, p. 79, Pl. 14, figs. 5, 6. Basalt: N: 361 (22.4 %), 395 (0.4 %), 397 (6.6 %), 642 (3.8 %). S: 221 (52.0 %), 213 (2.4 %), 206 (4.0 %), 245 (0.6 %), 232 (0.4 %).

Gneiss: E: 20 (0.4 %), 28 (1.8 %), 32 (1.2 %). C: 555 (0.8 %), 558 (8.8 %), 560 (1.6 %). D: 33 (0.8 %), 38 (0.8 %), 48 (0.4 %), 476 (15.8 %), 479 (18.6 %), 496 (2.0 %). DQ: 81 (7.6 %).

Sediment: S: 267 (4.0 %), 167 (0.8 %).

pH: indifferent. W.Gr.: rather common. Pearyld: very common.

Plate XVI, fig. 13: $19.5 \times 4.0 \mu$. 12 carinate dots, 23—24 striae in 10μ .

Basalt: S: 221.

Plate XVI, fig. 1: $8 \times 3 \mu$. 10 carinate dots, 24 striae in 10μ .

Basalt: S: 221.

Plate XVI, fig. 2: $8.7 \times 3.3 \mu$. 15 carinate dots, 23—24 striae in 10μ .

Basalt: S: 213 (0.8 %), 191 (0.8 %), 205 (0.2 %), 206 (1.0 %), 245 (1.0 %), 242 (4.0 %).

Gneiss: E: 20 (0.8 %). D: 479 (2.8 %). DQ: 81 (5.0 %). K: 300 (0.2 %).

Sediment: S: 273 (1.0 %).

Plate XVI, fig. 3: $10 \times 3.3 \mu$. 10 carinate dots, 24 striae in 10μ .

Basalt: N: 361.

Plate XVI, fig. 4: $10.6 \times 3.4 \mu$. 12—13 carinate dots, 24 striae in 10μ .

Basalt: N: 361. S: 206.

Plate XVI, fig. 5: $14.7 \times 4.3 \mu$. 10 carinate dots, 21—22 striae in 10μ .

Basalt: S: 246.

— var. *subsalina* Hustedt. HUSTEDT 1930, p. 415, fig. 796. FOGED 1953, p. 62, Pl. 13, fig. 8.

Basalt: S: 221 (0.8 %), 232 (0.2 %).

Gneiss: E: 20 (0.2 %), 32 (0.4 %). C: 555 (1.0 %). D: 476 (2.6 %). DQ: 81 (0.2 %).

pH: alkaliphilous. W.Gr.: rare.

— *gracilis* Hantzsch. HUSTEDT 1930, p. 416, fig. 791. A. SCHMIDT's Atlas, Pl. 349, figs. 34—37.

Basalt: N: 350 (1.0 %), 354 (0.2 %), 382. S: 213 (0.4 %), 205 (2.6 %), 206 (0.8 %).

Gneiss: E: 20, 32 (1.4 %). D: 479. DQ: 81 (0.4 %). U: 130 (0.4 %).

Sediment: S: 267 (0.4 %).

pH: indifferent. W.Gr.: rather common. Pearyld: common.

— *hantzschiana* Rabh. HUSTEDT 1930, p. 415, fig. 793. FOGED 1955, p. 79, Pl. 14, figs. 16, 17.

Basalt: D: 69 (4.2 %), 71 (11.0 %), 438. N: 350 (0.6 %), 372 (0.2 %), 382 (0.8 %). S: 195 (0.8 %), 213 (1.8 %), 184 (0.8 %), 191 (0.6 %), 205 (0.4 %), 206 (0.2 %), 245 (0.2 %), 242 (0.6 %), 232 (0.2 %).

Gneiss: E: 20 (1.6 ‰). C: 555 (3.0 ‰), 558 (1.0 ‰), 561 (0.2 ‰). D: 476 (0.4 ‰), 479 (0.4 ‰), 491 (20.0 ‰). DQ: 86 (3.2 ‰), 98. K: 300 (1.8 ‰), 307 (1.2 ‰).
Sediment: S: 267 (2.2 ‰), 273 (0.4 ‰), 167 (0.2 ‰).

pH: alkaliphilous. Pearyld: very common.

Nitzschia hantzschiana Rabh.?

Plate XV, fig. 14: $24 \times 2.7 \mu$. 9 carinate dots, ca. 28 striae in 10μ .

Although with some doubt it is placed here because of the similarity to the form pictured by J.W.G. LUND 1946, p. 100, figs. 16 A—U with the dimensions $10\text{--}40 \times 2\text{--}4 \mu$ with 9—14 carinate dots and 27—30 striae in 10μ . According to LUND, however, there is as a rule “a ‘gap’ between the two approximately central carinate dots”.

Basalt: D: 438.

- *kütziana* Hilse. HUSTEDT 1930, p. 416, fig. 802. 1937—39, Pl. 41, figs. 18—20. FOGED 1953, p. 62, Pl. 13, fig. 19. 1955, p. 79, Pl. 14, figs. 18, 19.

Basalt: D: 500 (0.2 ‰). N: 397 (4.4 ‰).

Gneiss: D: 33 (0.4 ‰), 38 (0.6 ‰), 45 (16.6 ‰), 469 (15.8 ‰), 496 (5.0 ‰), 524, 542 (1.4 ‰).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: common.

- *mediocris* Hustedt. HUSTEDT 1949, p. 149, Pl. 13, figs. 21—24.

Basalt: N: 361 (3.2 ‰).

Gneiss: C: 549. DQ: 86 (2.8 ‰).

- *mediocris* Hustedt?

Plate XVI, fig. 20: $38 \times 2 \mu$. 18 carinate dots in 10μ . Striae not visible.

According to HUSTEDT 1949, p. 149, the dimensions for this species are $40\text{--}50 \times 1.5\text{--}2 \mu$ with 14—17 carinate dots, which, however, are small, in 10μ , and striae not visible. XVI:20 seems to be closely related to it. Somewhat less close to it are *N. pura* Hustedt, HUSTEDT 1954, p. 480, figs. 70—75, the breadth of which is stated to be $4\text{--}5 \mu$, and *N. pumila* Hustedt, HUSTEDT 1954, p. 480, figs. 67—69, which has rostrate apices.

Basalt: N: 361.

- *palea* (Kütz.) W.Smith. HUSTEDT 1930, p. 416, fig. 801. 1937—39, Pl. 41, figs. 8, 9. FOGED 1953, p. 63, Pl. 13, figs. 17, 18. 1955, p. 79, Pl. 14, figs. 8, 9. Basalt: D: 62 (1.0 ‰), 69 (4.4 ‰), 71 (3.8 ‰), 107 (0.8 ‰), 108 (7.8 ‰), 103 (29.4 ‰). N: 350 (14.0 ‰), 354 (12.8 ‰), 361 (3.4 ‰), 358 (20.6 ‰), 372 (1.2 ‰), 395 (19.2 ‰), 382 (37.2 ‰), 397 (0.4 ‰), 343 (0.2 ‰). S: 193 (1.8 ‰), 195 (16.4 ‰), 221 (0.2 ‰), 213 (26.2 ‰), 184 (7.6 ‰), 191 (4.2 ‰), 205 (10.0 ‰), 206 (1.8 ‰), 245 (1.0 ‰), 242 (3.4 ‰), 232 (4.6 ‰).

Gneiss: E: 20 (14.6 ‰), 28 (0.4 ‰), 32. C: 549 (4.4 ‰), 555 (0.8 ‰), 558 (0.6 ‰), 560 (0.6 ‰), 572 (14.4 ‰). D: 45 (2.2 ‰), 462 (2.4 ‰), 476 (2.4 ‰), 479 (6.8 ‰). DQ: 81 (0.4 ‰). U: 130 (2.8 ‰), 132 (19.4 ‰). K: 300 (0.6 ‰), 307 (3.8 ‰), 318 (2.4 ‰), 327 (2.8 ‰).

Sediment: S: 267 (0.2 ‰), 273 (3.8 ‰), 286, 167 (0.8 ‰).

pH: indifferent? W.Gr.: common. Pearyld: common.

Plate XVI, fig. 19: $66.6 \times 5.3 \mu$. 13 carinate dots in 10μ . Striae not visible.

Gneiss: C: 560 (0.2 ‰). D: 476 (0.4 ‰), 479 (0.4 ‰). U: 132 (5.4 ‰).

Plate XV, fig. 15: $19.3 \times 2.5 \mu$. 12 carinate dots in 10μ . Striae not visible.

Gneiss: K: 327.

- *paleacea* Grun. HUSTEDT 1930, p. 416, fig. 807.

Plate XV, fig. 17: $23.4 \times 2.4 \mu$. 15 carinate dots in 10μ . Striae not visible.

Basalt: S: 189.

XV:17 is placed here with some hesitation. It also seems to be related to *N. pu-*

mila Hustedt, HUSTEDT 1954, p. 480, figs. 67—69, which has the dimensions $30-35 \times 2.5 \mu$ with "16—18 punctis carinalibus, striae transapicales inconspicuae."

Nitzschia romana Grun. HUSTEDT 1930, p. 415, fig. 799. FOGED 1953, p. 63, Pl. 13, figs. 1—3, 7.

Basalt: D: 431 (1.0 %).

pH: alkaliphilous. W.Gr.: rather common. Pearyld: rare.

— *romana* Grun.?

Plate XVI, fig. 11: $36.6 \times 4.3 \mu$. 10 carinate dots, 22 striae in 10μ .

Basalt: S: 221.

Gneiss: E: 32 (0.2 %). K: 300 (0.2 %).

— sp.

Plate XV, fig. 18: $22.0 \times 4.8 \mu$. 9—10 carinate dots in 10μ . Striae not visible. Can hardly be referred to *N. palea* (Kütz.) W.Smith. Approaches more to *N. tericola* Lund, J.W.G. LUND 1946, p. 100, figs. 15 H—Q, which has the dimensions $21-43 \times 3-4 \mu$, 7—12 carinate dots and on which "no striation was ever visible."

Gneiss: K: 300 (0.2 %), 307 (2.2 %).

— sp.

Plate XVI, fig. 16: $25.3 \times 1.3 \mu$. 15 carinate dots in 10μ . Striae not visible. Basalt: N: 372 (1.8 %), 395.

— sp.

Plate XVI, fig. 17: $58.5 \times 5.0 \mu$. 6—7 carinate dots and 19 striae in 10μ .

Seems to be related to *N. intermedia* Hantzsch., HUSTEDT 1949, p. 136, figs. 21—23, with the dimensions $60-140 \times 4-6 \mu$ and 6—12 carinate dots and 26 striae in 10μ . A coarser form, var. *robusta* Hustedt, has 22—25 striae in 10μ .

Basalt: N: 350 (0.2 %).

Gneiss: DQ: 95 (0.4 %).

— sp.

Plate XVI, fig. 18: $70.6 \times 4 \mu$. 12 carinate dots in 10μ . Striae not visible.

Should perhaps be placed close to *N. gandersheimiensis* Krasske, which, however, has only 8—9 carinate dots in 10μ , distributed irregularly.

Basalt: D: 74 (0.6 %).

Gneiss: C: 560 (2.4 %), 561 (0.8 %). D: 479 (0.4 %). U: 132 (2.2 %).

h. *Obtusae* (Grun.) Hustedt emend.

Nitzschia ignorata Krasske. HUSTEDT 1930, p. 422, fig. 819. FOGED 1953, p. 63, Pl. 12, fig. 11.

Basalt: D: 516, 103 (2.2 %). N: 395 (0.2 %), 382 (0.2 %). S: 184.

Gneiss: S: 558, 560 (1.2 %), 561 (0.6 %). U: 132 (0.4 %).

pH: alkaliphilous. W.Gr.: scarce.

Plate XVI, fig. 22: $36 \times 3.5 \mu$. 9 carinate dots in 10μ . Striae not visible.

It seems that XVI:22 should be identified with *N. ignorata* Krasske sensu J.W.G. LUND 1946, p. 97, where the dimensions are stated to be $31-44 \times 3-4 \mu$ with 9—12 carinate dots and 34—38 striae in 10μ .

Basalt: N: 395.

i. *Nitzschiellae* (Rabh.) Grun.

Nitzschia acicularis W.Smith. HUSTEDT 1930, p. 423, fig. 821.

Basalt: S: 213.

Gneiss: DQ: 81.

pH: alkaliphilous.

j. *Sigmoideae* Grun.*Nitzschia sigmoidea* (Ehr.) W. Smith. HUSTEDT 1930, p. 419, fig. 810.

Gneiss: E: 32 (0.4 %).

pH: alkaliphilous.

— sp.

Plate XVI, fig. 23: $53.3 \times 3.0 \mu$. 10—11 carinate dots in 10μ . Striae not visible. Seems to be rather closely related to *N. irresoluta* Hustedt, HUSTEDT 1942d, p. 142, figs. 349—350, the dimensions of this species being $70 \times 3 \mu$ with 9—12 carinate dots, the two midmost of which are "weiter voneinander entfernt". Striae not visible.

Basalt: N: 382.

SURIPELLACEAE**Surirella** Turpin.*Surirella angusta* Kütz. HUSTEDT 1930, p. 435, figs. 844, 845.

Basalt: D: 109, 103 (3.2 %). N: 395 (0.2 %), 397 (0.2 %). S: 193, 195, 191.

Gneiss: D: 469.

pH: alkaliphilous.

— *delicatissima* Lewis. HUSTEDT 1930, p. 436, figs. 846, 847.

Gneiss: C: 549, 558. D: 45, 469, 452.

pH: indifferent. W. Gr.: rare.

(— *lagerheimii* A. Cleve fo. *capitata* Foged. W. Gr.: rare).— *linearis* W. Smith. HUSTEDT 1930, p. 434, figs. 837, 838.

Basalt: S: 232 (0.2 %).

Gneiss: E: 20 (0.2 %), 28, 32. C: 549, 572 (0.2 %). D: 45 (0.2 %), 476, 479.

DQ: 81. K: 300, 307, 318.

pH: alkaliphilous.

— var. *constricta* (Ehr.) Grun. HUSTEDT 1930, p. 438, fig. 839.

Basalt: D: 431.

Gneiss: E: 20. C: 549. K: 300, 307 (0.2 %), 318 (0.2 %).

pH: alkaliphilous. W. Gr.: rare.

— *minima* Ross & Abdin? Ross and ABDIN 1949, p. 226, Pl. 1, fig. 2.Plate XVI, fig. 24: $21.3 \times 9.3 \mu$. 4 carinalibus in 10μ .

This small *S.* species is undoubtedly closely related to *S. minima* Ross and Abdin, Ross and ABDIN 1949, p. 226, Pl. 1, fig. 2, the dimensions of which are $18-20 \times 8-10 \mu$ with about 6 carinate dots in 10μ . It has been found in salt water in England.

Gneiss: K: 295, 300.

— *moelleriana* Grun. HUSTEDT 1930, p. 435, fig. 842.

Gneiss: C: 560, 561 (0.6 %), 572.

(— *ovalis* Bréb. Mesohalobous. W. Gr.: rare).— *ovata* Kütz. HUSTEDT 1930, p. 442, figs. 863, 864.

Basalt: N: 395, 397. S: 193 (0.4 %), 195 (2.6 %).

Gneiss: E: 558. D: 542.

pH: alkaliphilous. W. Gr.: rare. Pearyld: rare.

(— *robusta* Ehr. var. *splendida* (Ehr.) Van Heurck fo. *punctata* Hustedt. W. Gr.: rare).**Stenopterobia** Bréb.*Stenopterobia intermedia* Lewis. HUSTEDT 1930, p. 428, fig. 830.

Gneiss: E: 20, 28 (0.2 %). C: 558.

pH: acidophilous.

— fo. *densestriata* Hustedt. HUSTEDT 1930, p. 429.

Gneiss: C: 558.

pH: acidophilous.

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PLATES

Plate I.

(ca. 1800 ×).

1. *Synedra rosenkrantzii* nov. spec.
2. — sp.
3. *Fragilaria capucina* Desmaz.
4. — *construens* (Ehr.) Grun.
5. — *capucina* var. *lanceolata* Grun.
6. — *vaucheriae* (Kütz.) Boye Petersen.
7. *Synedra parasitica* (W. Smith) Hustedt(?).
8. *Peronia heribaudi* Brun & Perag. var. *laticeps* A. Cleve-Euler.
9. *Eunotia tenella* (Grun.) Hustedt.
10. — *pectinalis* (Kütz.) Rabh. (ca. 1000 ×).
- 11, 12, 13. — *pseudopectinalis* Hustedt. (ca. 1050 ×).
14. — *sudetica* (O. Müller) Hustedt.
15. — — ?
16. — *pectinalis* var. *minor* (Kütz.) Rabh.

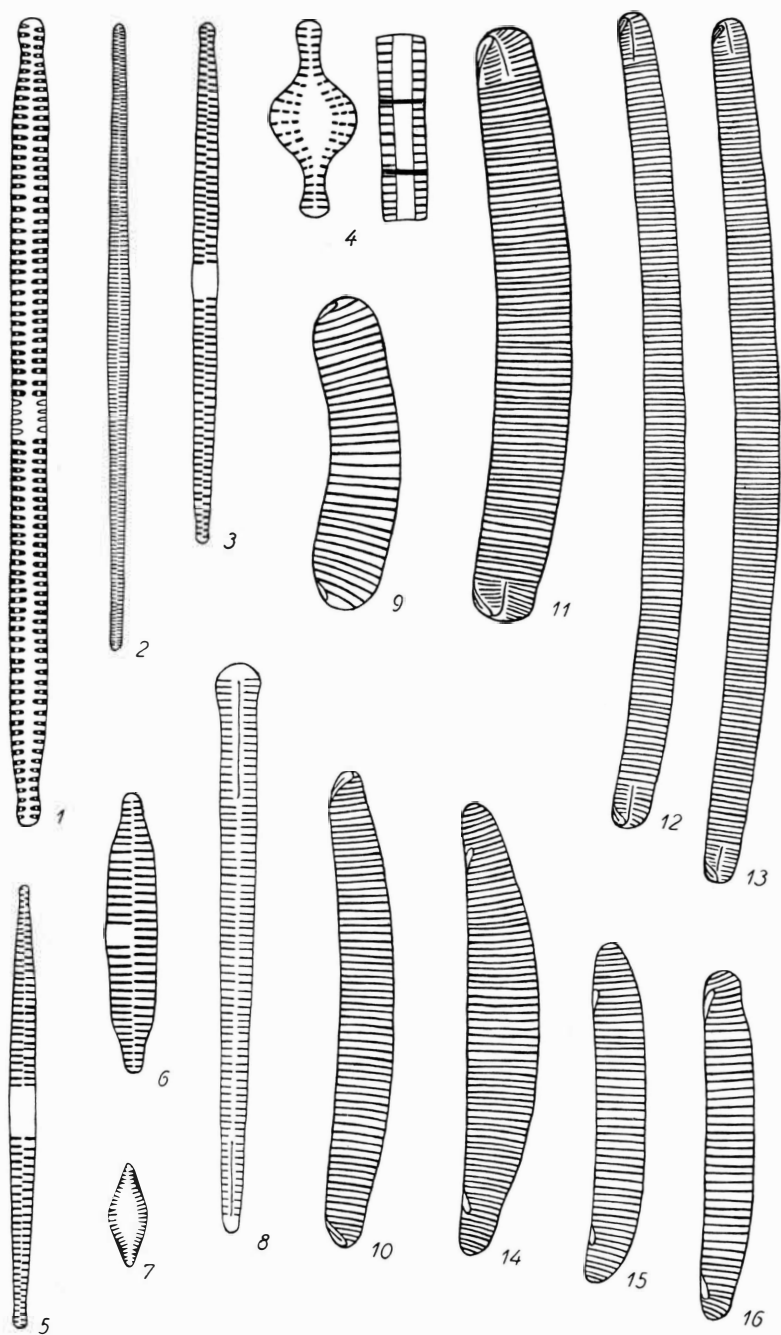


Plate II.

(ca. 1800 ×).

- 1, 2. *Eunotia pectinalis* (Kütz.) Rabh.
3. — — var. *minor* (Kütz.) Rabh. forma.
4. — — — forma.
5. — — — fo. *impressa* Hustedt.
6. — *praerupta* Ehr. var. *bidens* Grun.
- 7, 8. — *pectinalis* var. *curta* Van Heurck.
9. — *praerupta* var. *inflata* Grun. fo. *curta* Grun.
10. — *holstenborgi* Å. Berg.
11. — *praerupta* var. *bidens* Grun.
12. — sp.
13. — *tanensis* A. Cleve.
14. — *faba* (Ehr.) Grun.
15. — *fallax* A. Cleve.
16. — *bigibba* Kütz. var. *pumila* Grun.
17. — *tenella* (Grun.) Hustedt.

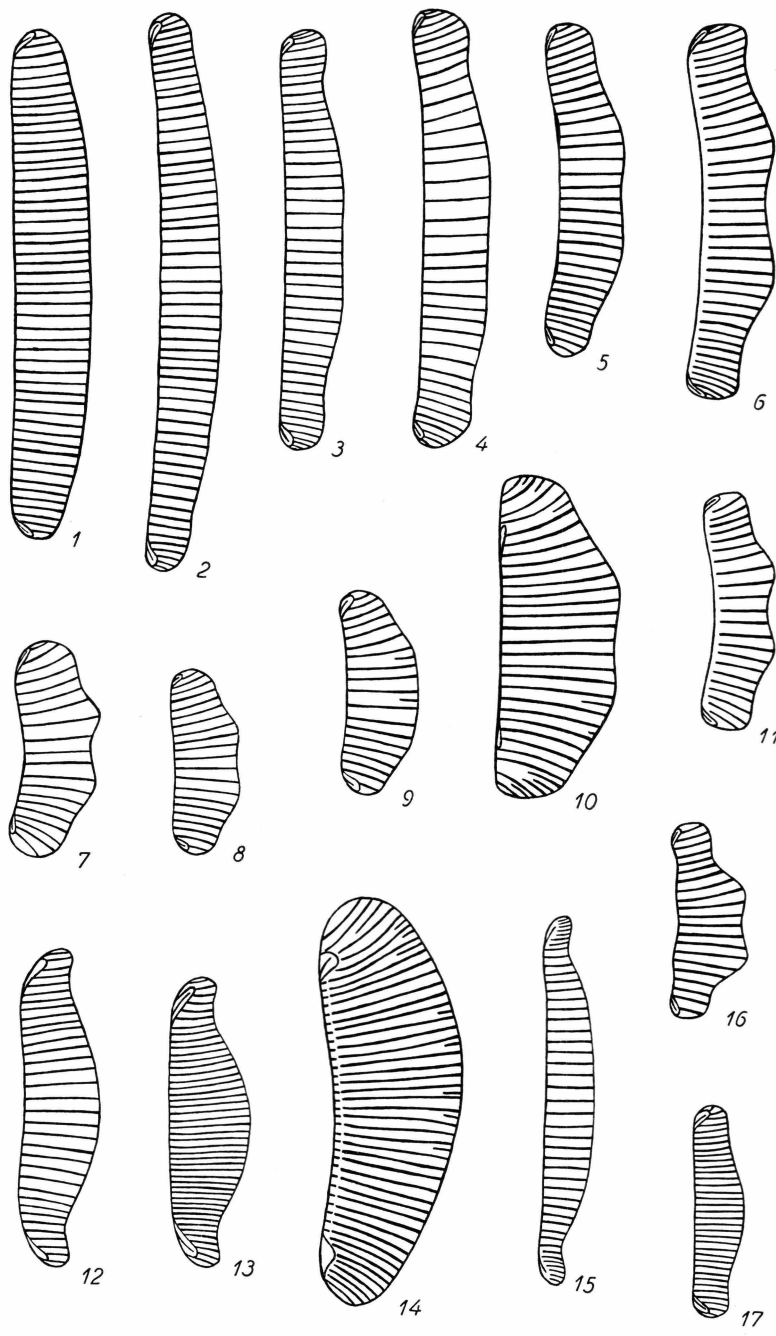


Plate III.

(ca. 1800 ×).

1. *Eunotia* sp.
2. — *lunaris* (Ehr.) Grun.
3. — — var. *capitata* Grun.
4. — *tenella* (Grun.) Hustedt.
5. — *arcus* Ehr. forma.
6. — *tenella* (Grun.) Hustedt.
7. — *trinacria* Krasske. (?)
8. *Achnanthes levanderi* Hustedt.?
- 9, 10, 11. — *holstei* Cleve.
12. — *marraitensis* nov. spec.
13. — *nodosa* A. Cleve.
- 14, 15. — *fragilarioides* Boye Petersen.
16. — *levanderi* Hustedt.?

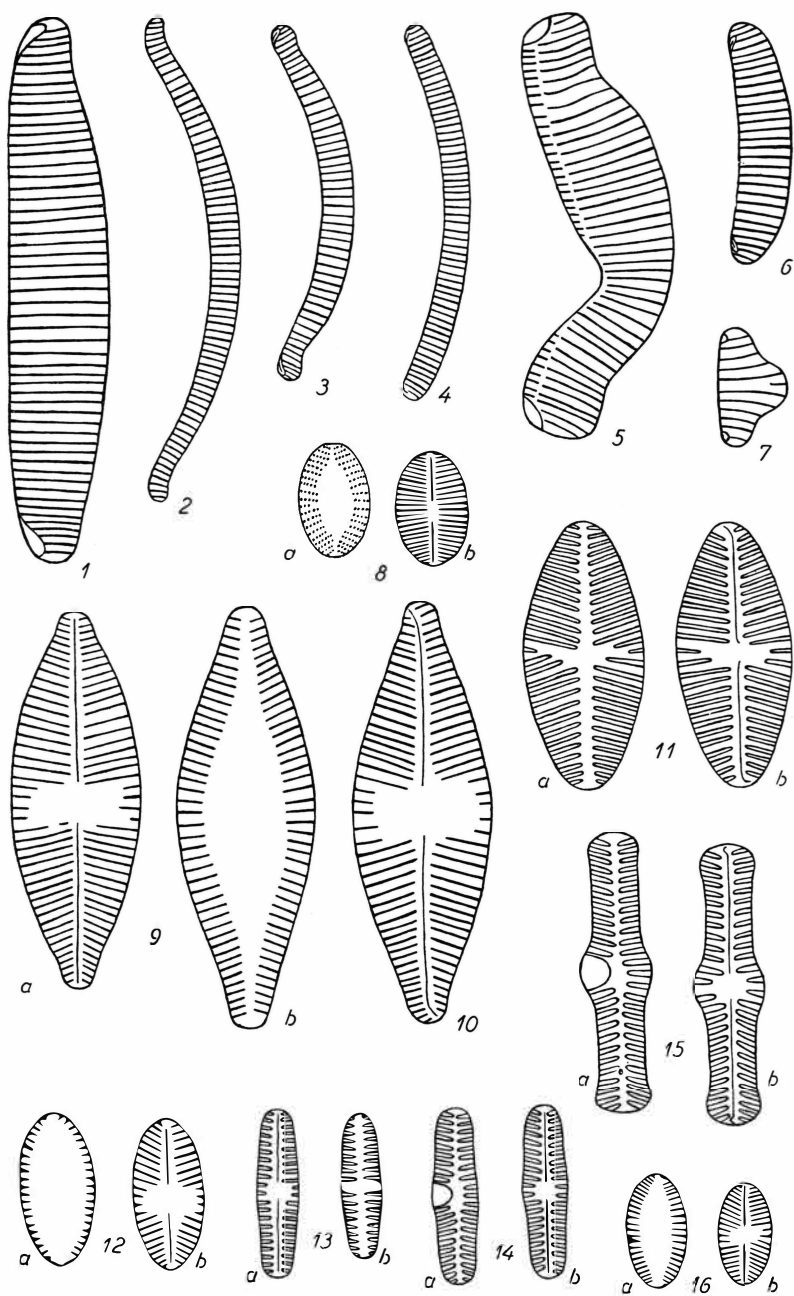


Plate IV.

(ca. 1800 $\times$).

1. *Achnanthes kryophila* Boye Petersen.
2. *Neidium iridis* Ehr. var. *luminosa* J. Brun.
3. — *knuthii* Foged var. *heilprinensis* Foged forma.
4. — *knuthii* Foged forma.
5. — sp.
- 6, 7. — *knuthii* Foged formae.
8. — *rosenkrantzii* nov. spec.
9. — *nugsuaqensis* nov. spec.
10. — *marraitensis* nov. spec.
11. — — forma.
12. — sp.
13. — *knuthii* forma.

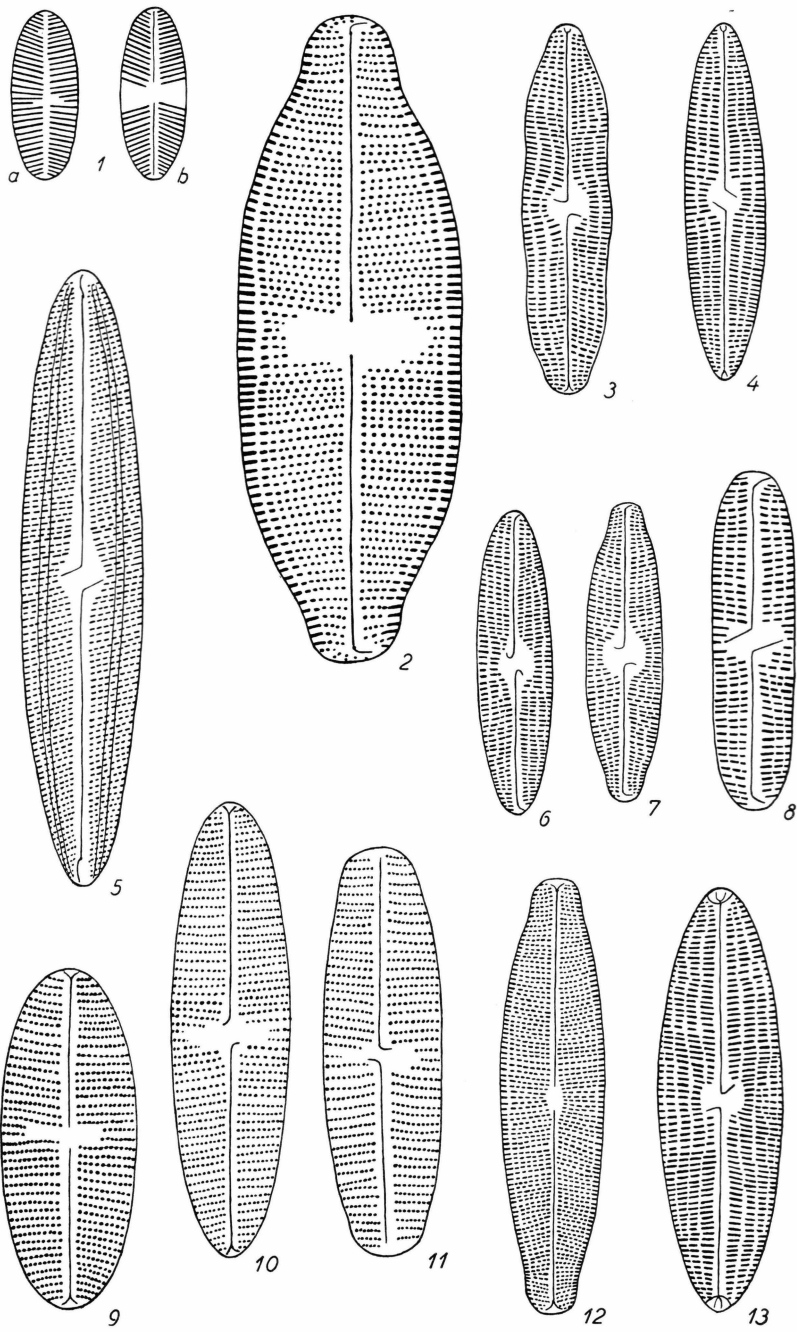


Plate V.

(ca. 1800 $\times$).

1. *Stauroneis nugsuagensis* nov. spec.
2. — sp.
3. — sp.
4. — sp.
5. — *anceps* Ehr. ?
6. — *legumen* Ehr.
7. *Caloneis clevei* (Lagerst.) Cleve.
8. — *bacillares* Greg.
9. — *fasciata* (Lagerst.) Cleve fo. *acuta* Boye Petersen.
10. *Navicula halophila* (Grun.) Cleve fo. *subcapitata* Østrup.
11. 12. — *järnefelti* Hustedt. ?
13. — *accomoda* Hustedt. (?).
14. — *minuscule* Grun. (?).
15. 16. — *bacilliformis* Grun.

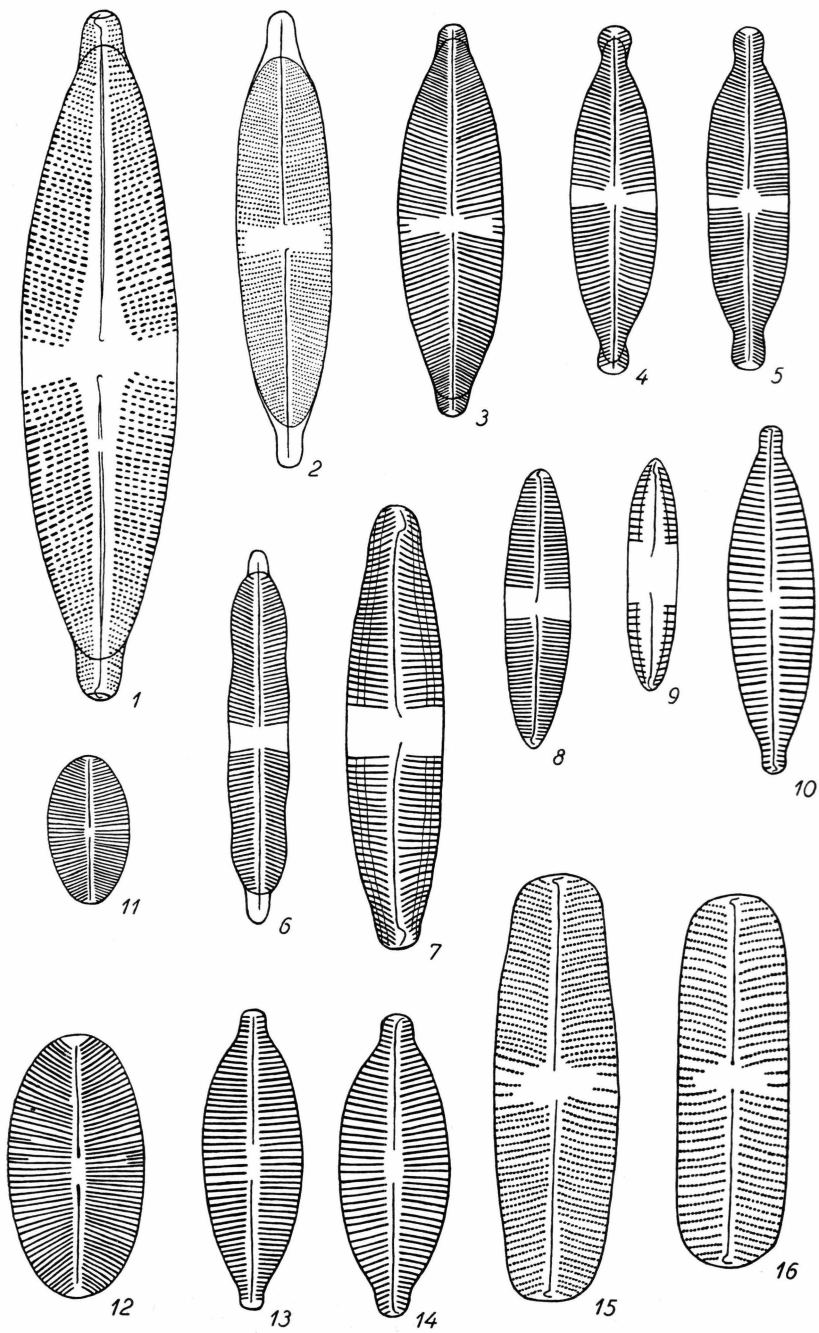


Plate VI.

(ca. 1800 $\times$).

1. *Navicula mutica* Kütz.
var. *nivalis* (Ehr.) Hustedt.?
- 2, 3, 4, 5. — — var. *nivalis* (Ehr.) Hustedt.?
6. — — forma.
7. — — fo. *rhomboidea* Playfair.?
8. — *gibbula* Cleve var. *undulata* Krasske.
9. — *mutica* var. *ventricosa* (Kütz.) Cleve.
10. — — var. *gracilis* Hustedt. (?)
- 11, 12. — *interglacialis* Hustedt.

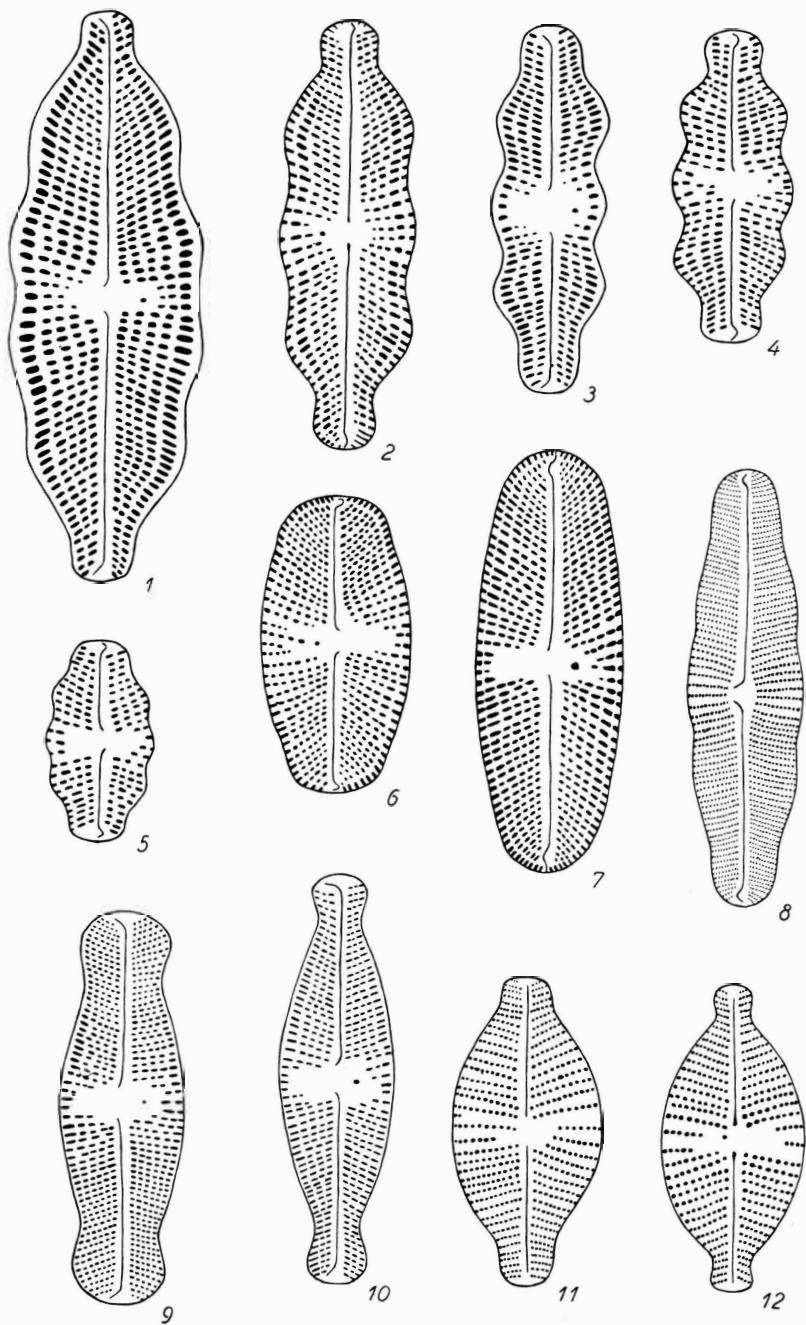


Plate VII.

(ca. 1800 ×).

- 1 2, 3. *Navicula ignota* Krasske var. *anglica* Lund.
- 4, 5. — *lagerstedtii* Cleve. var. *palustris* Hustedt.
6. — — .
7. — sp.
8. — sp.
9. — *grimmei* Krasske.
10. — sp.
11. — sp.
12. — sp.
13. — sp.
14. — *heilprinensis* Foged.?
15. — *heilprinensis* Foged forma.
16. — *pseudagrestis* Lund. (?).
17. — *fritschii* Lund.?
18. — sp.
19. — sp.
20. — *fritschii* Lund.?
21. — sp.

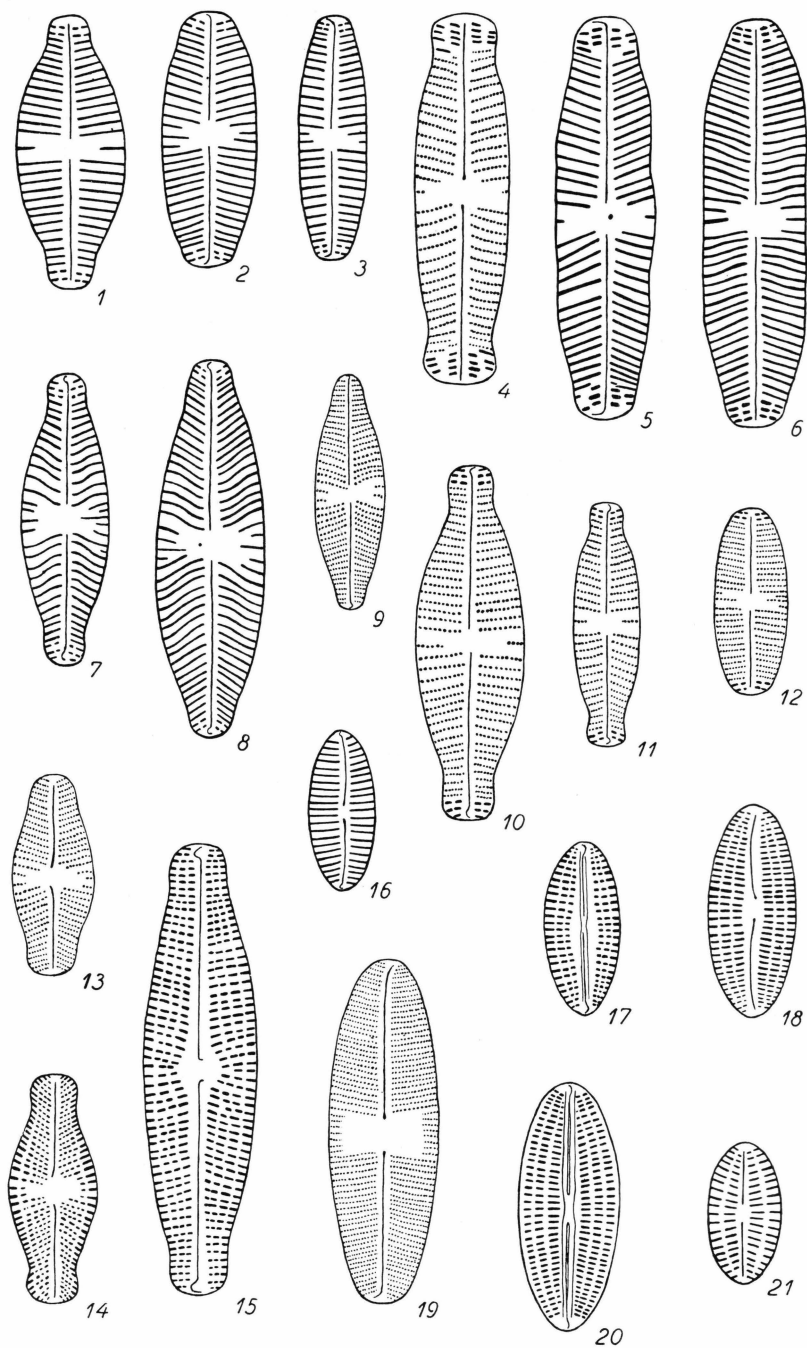


Plate VIII.

(ca. 1800 $\times$).

- 1, 2. *Navicula amygdalina* Hustedt.
3. — *aboensis* Hustedt.
4. — *pseudoscutiformis* Hustedt.
5. — *aboensis* Hustedt.
6. — *explanata* Hustedt.
7. — *naumanni* Hustedt.
- 8, 9. — *cocconeiformis* Greg. var. *capitata* Krasske.
10. — sp.
- 11, 12. — *opportuna* Hustedt.
- 13, 14. — *fossalis* Krasske.
- 15, 16. — *rotunda* Hustedt.
- 17, 18. — *vaucheriae* Boye Petersen.
- 19, 20. — *confervacea* Kütz.
21. — *minima* (Grun.) var. *atomoides* (Grun.) Cleve.
- 22, 23. — *seminulum* Grun. var. *intermedia* Hustedt.
24. — *ventralis* Krasske.?
25. — — var. *simplex* Hustedt.

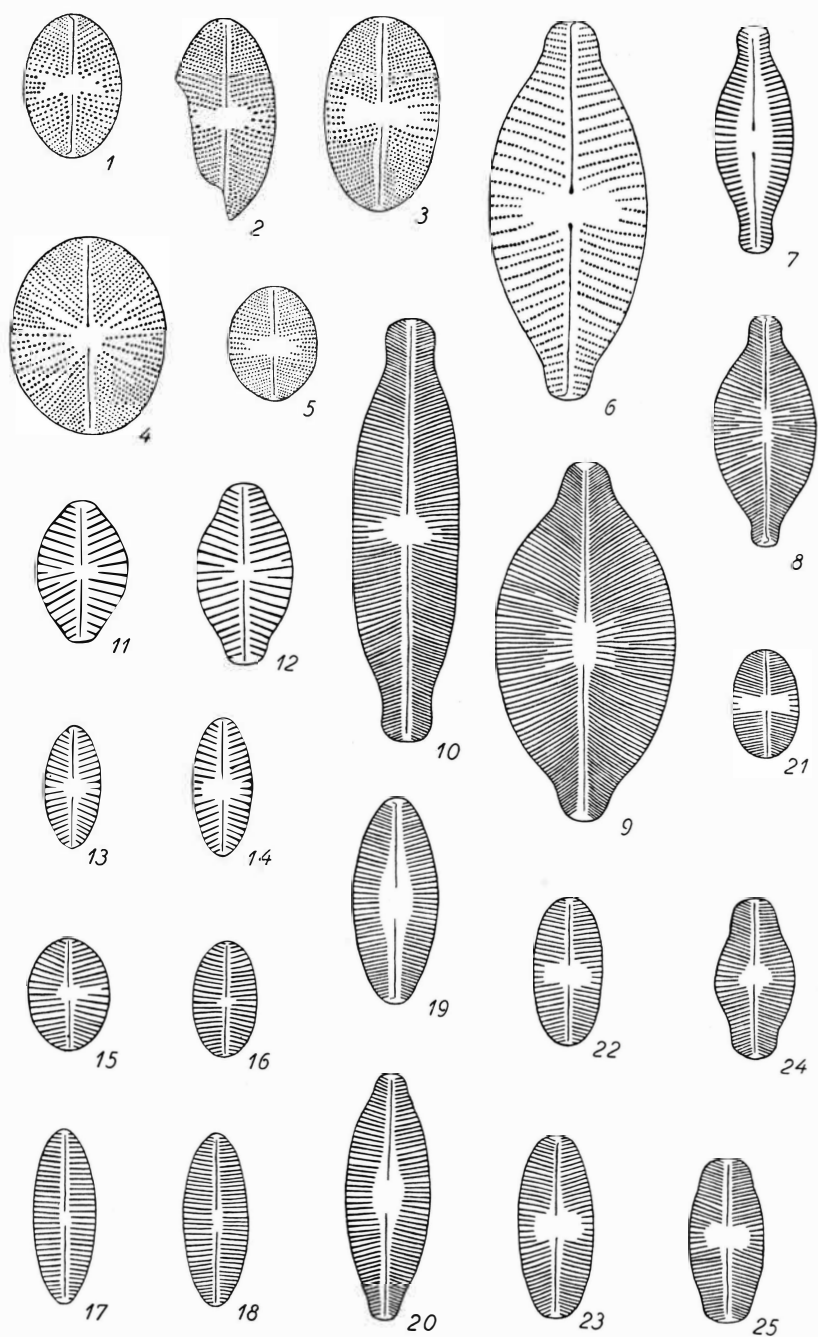


Plate IX.

(ca. 1800 $\times$).

1. *Navicula lapidosa* Krasske.
2. — *rotaeana* (Rabg.) Grun.
3. — *ingrata* Krasske.
4. — *hambergi* Hustedt.
5. — sp.?
6. — *disjuncta* Hustedt. (?)
7. — *seminulum* Grun.
8. — *pelliculosa* (Bréb.) Hilse.
9. — *importuna* Hustedt.
10. — *hustedtii* Krasske. (?)
- 11, 12. — *strömii* Hustedt. (?)
13. — sp.
14. — *obsoleta* Hustedt.
15. — *begeri* Krasske.
- 16, 17. — *hassiaci* Krasske.
18. — *mediocris* Krasske.
19. — *strömii* Hustedt. (?)
20. — *minima* Grun.
21. — *tantula* Hustedt.
22. — *suchlandti* Hustedt.
23. — *hungarica* Grun. forma. (?)
24. — *pseudocryptocephala* Foged. (?)

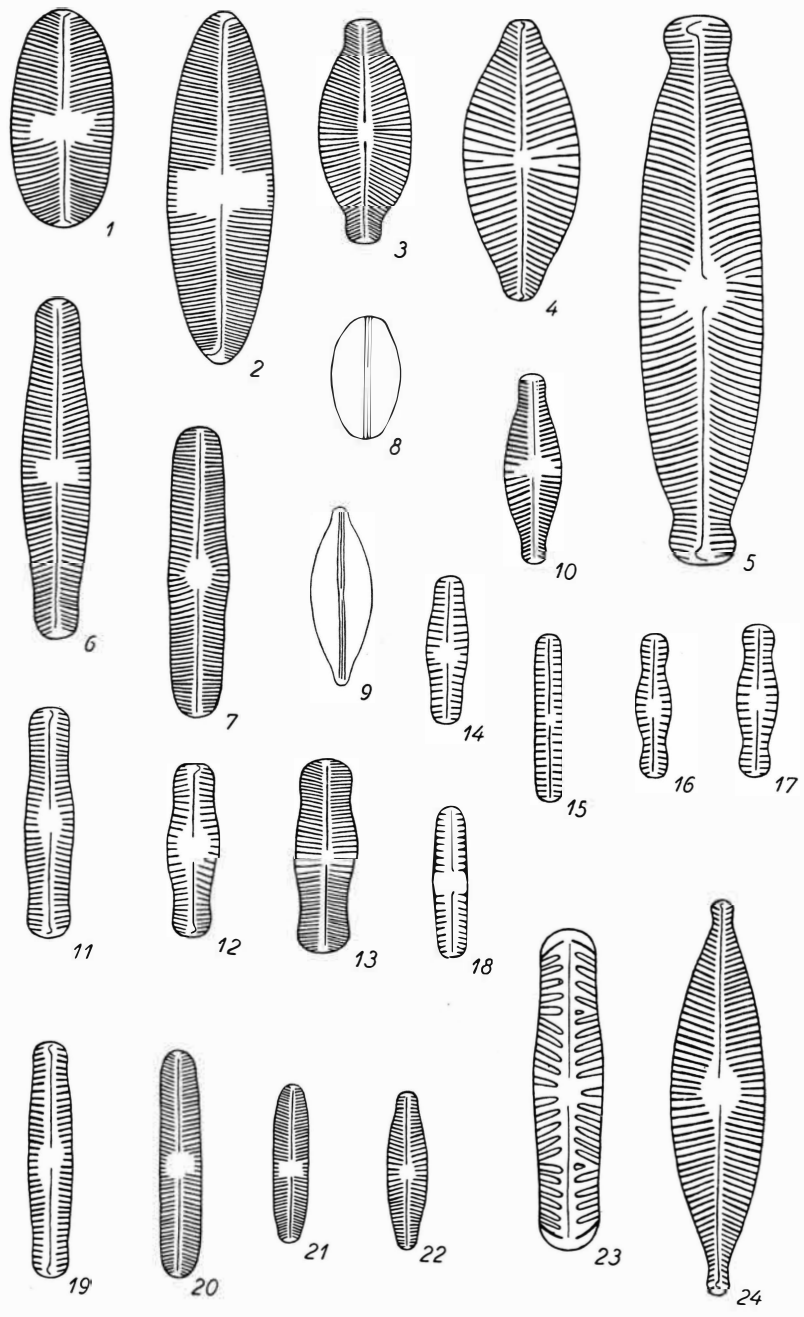


Plate X.

(ca. 1800 $\times$).

1. *Navicula viridula* Kütz. var. *slesvicensis* (Grun.) Cleve. (?)
2. — sp.
3. — *menisculus* Schum. var. *obtusa* Hustedt.
4. — *viridula* Kütz.
5. — *cari* Ehr.?
- 6, 7. — *cincta* (Ehr.) Kütz. var. *heufleri* Grun.
8. — *dicephala* (Ehr.) W. Smith.
- 9, 10, 11. — — var.?
12. — *tuscula* (Ehr.) Grun. forma (ca. 1050 $\times$).
13. — *viridula* Kütz. forma.?

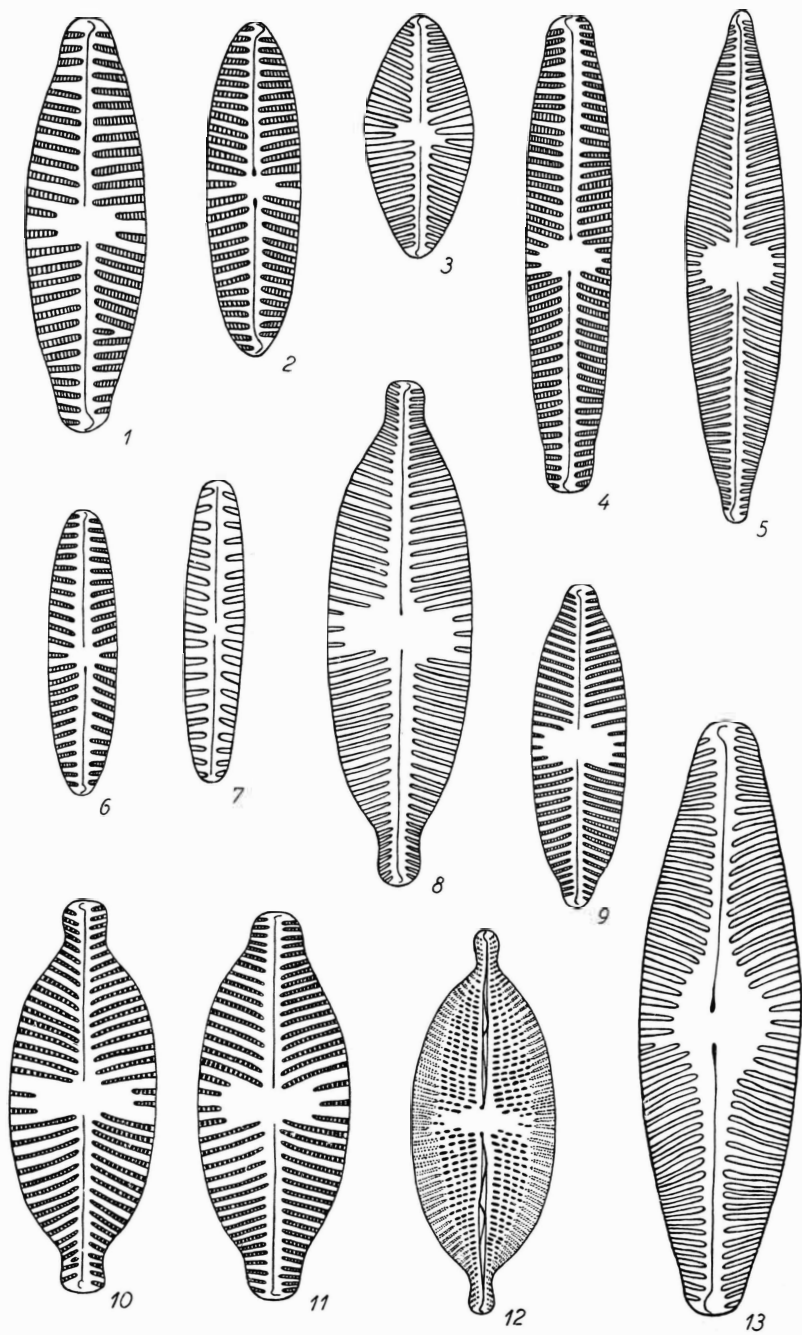


Plate XI.

(ca. 1800 $\times$).

1. *Pinnularia* sp.
2. — *nodosa* Ehr. fo. *capitata* Cleve(?)
3. — *subsolaris* (Grun.) Cleve.
4. — *streptoraphe* (Cleve var. *minor* Cleve (ca. 1050 $\times$).
5. — *notata* (Perag. & Herib.) A. Cleve, forma.
6. — *microstauron* (Ehr.) Cleve, forma.
7. — *divergentissima* (Grun.) Cleve var. *wulffii* Boye Petersen.
8. — *isostauron* (Ehr.? Grun.) Cleve.
9. — *microstauron* (Ehr.) Cleve var. *brébissonii* (Kütz.) Hustedt, forma.

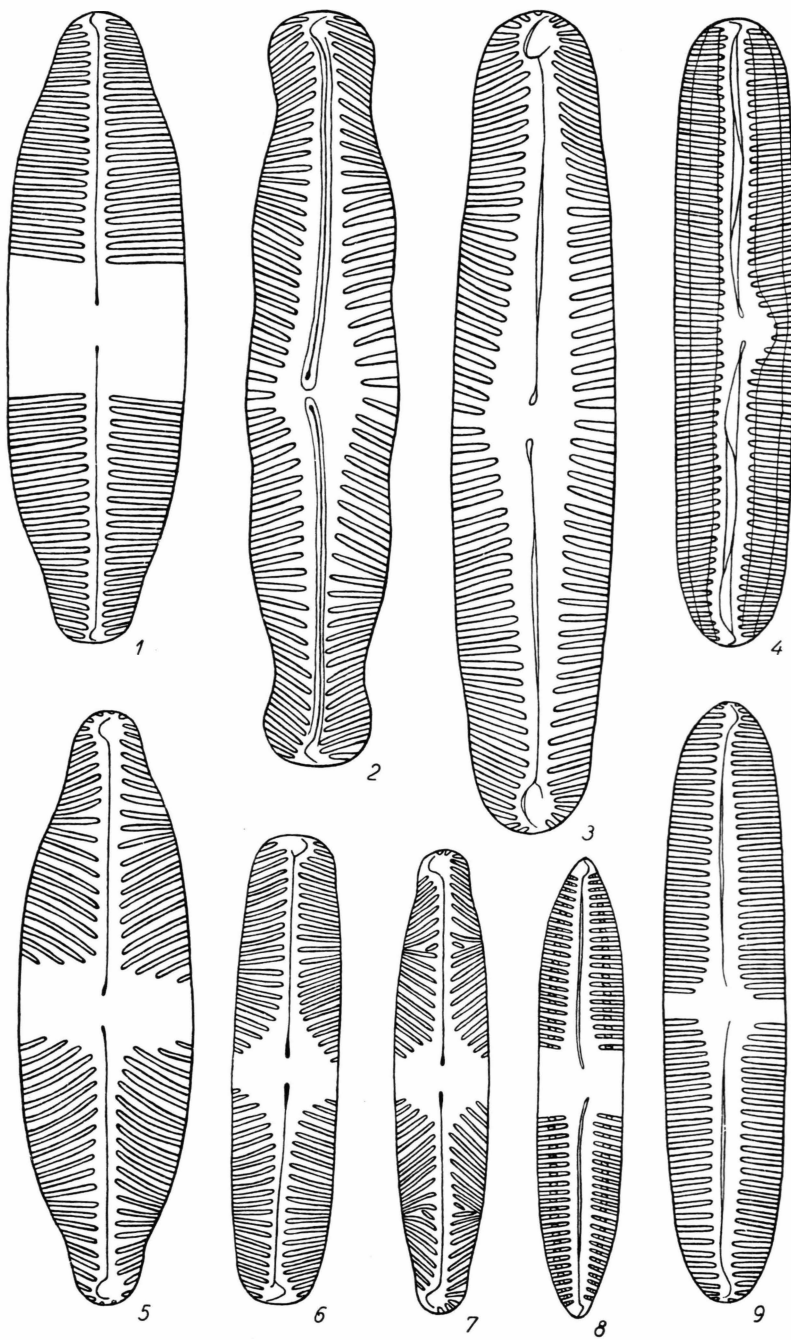


Plate XII.

(ca. 1800 $\times$).

1. *Pinnularia notata* (Perag. & Herib.) A. Cleve, forma.
2. — *biglobosa* (Schum.) A. Cleve-Euler?
3. — *islandica* Østrup.
4. — *borealis* Ehr.
5. — *nodosa* Ehr. (ca. 1075 $\times$).
6. — *pulchra* Østrup.
7. — *lagerstedti* (Cleve) A. Cleve.
8. — *microstauron* (Ehr.) Cleve var. *brébissonii* (Kütz.) Hustedt
fo. *linearis* O. Müller.
9. — *gibba* Ehr. var. *linearis* Hustedt.
10. — *microstauron* var. *brébissonii*, forma.

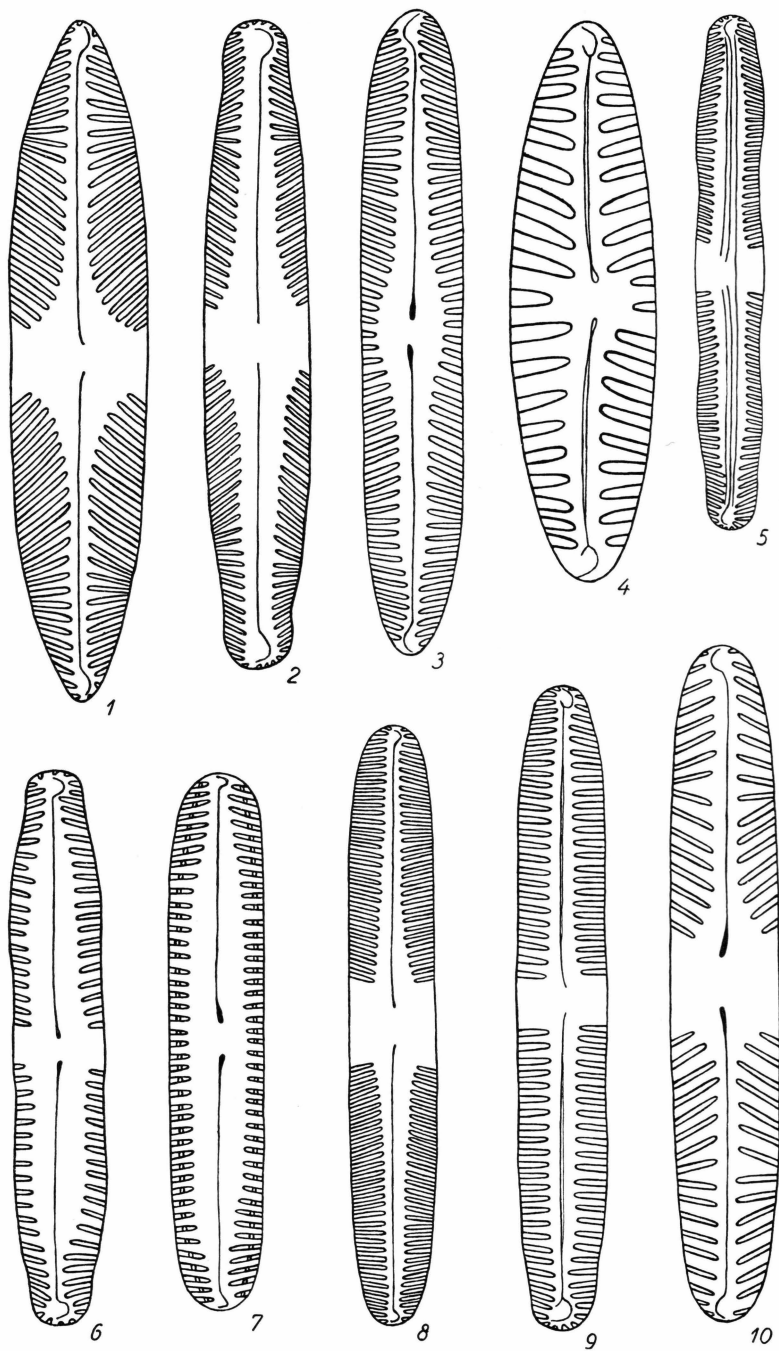


Plate XIII.

(ca. 1800 $\times$).

1. *Pinnularia* sp.
2. — sp.
3. — sp.
4. — sp.
5. — *microstauron* var. *brébissonii* fo. *diminuta* Grun.
6. — *parva* (Greg.) Cleve var. *minuta* Østrup.
7. — *microstauron* var. *brébissonii* fo. *diminuta* Grun.
8. — sp.
9. — *microstauron* (Ehr.) Cleve, forma.
10. — *leptosoma* Grun. (?)
11. *Cymbella microcephala* Grun. var. *robusta* Hustedt.
12. — *broenlundensis* Foged.
13. — sp.
- 14, 15, 16. — sp.

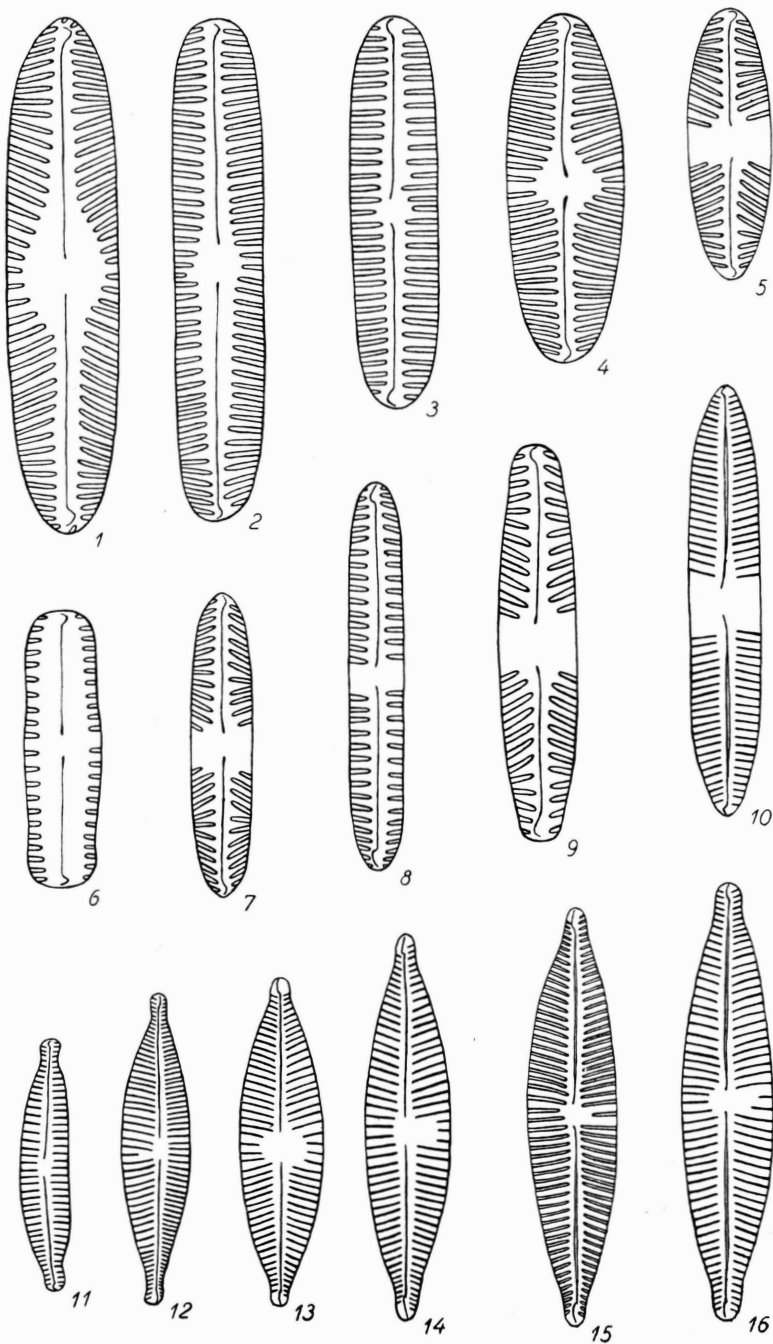


Plate XIV.

(ca. 1800 $\times$).

1. *Cymbella gaeumanni* Meister.
2. — *javanica* Hustedt.?
- 3, 4. — *perpusilla* A. Cleve.
5. — *cesati* (Rabh.) Grun.
6. — *angustata* (W. Smith) Cleve.
- 7, 8. — *leptoceros* (Ehr.) Grun. (?)
9. — sp.
- 10, 11. — *cistula* (Hempr.) Grun.
12. — *naviculiformis* Auerswald, forma.
13. — *heilprinensis* Foged.?
14. — *rosenkrantzii* nov. spec.

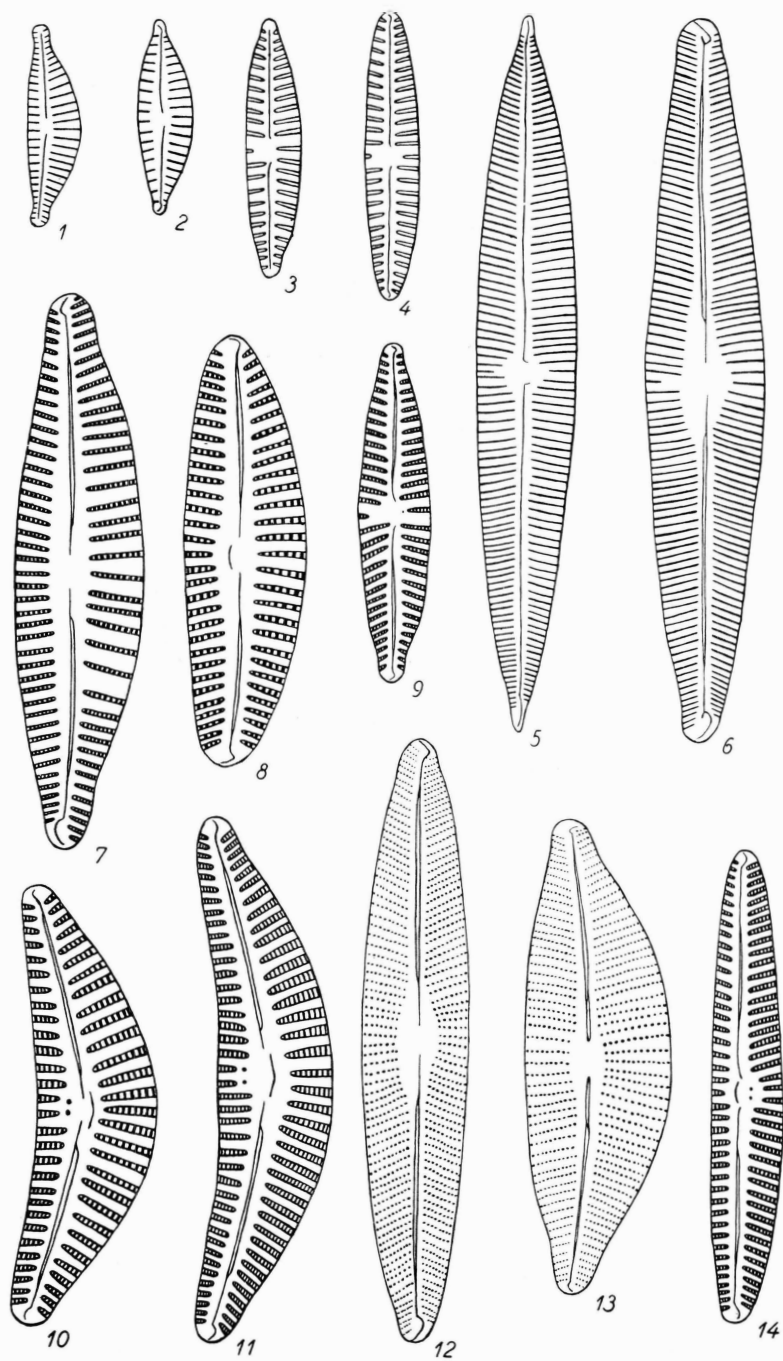


Plate XV.

(ca. 1800 ×).

- 1, 2, 3, 4. *Gomphonema bipunctata* Krasske.
5. — *olivaceum* (Lyngb.) Kütz.
6. — *clevei* Fricke var. *javanicum* Hustedt.
7. — *lagerheimii* A. Cleve fo. *minor* A. Cleve.
8. — *lagerheimii* A. Cleve.
9. — *angustatum* (Kütz.) Rabh. fo. *undulata* Grun.
10. — — var. *producta* Grun.?
11. — *constrictum* Ehr.
12. *Nitzschia frustulum* (Kütz.) Grun.
13. — — var. *perminuta* Grun.
14. — *hantzschiana* Rabh.?
15. — *palea* (Kütz.) W. Smith.
16. — *communis* Rabh.?
17. — *paleacea* Grun.
18. — sp.

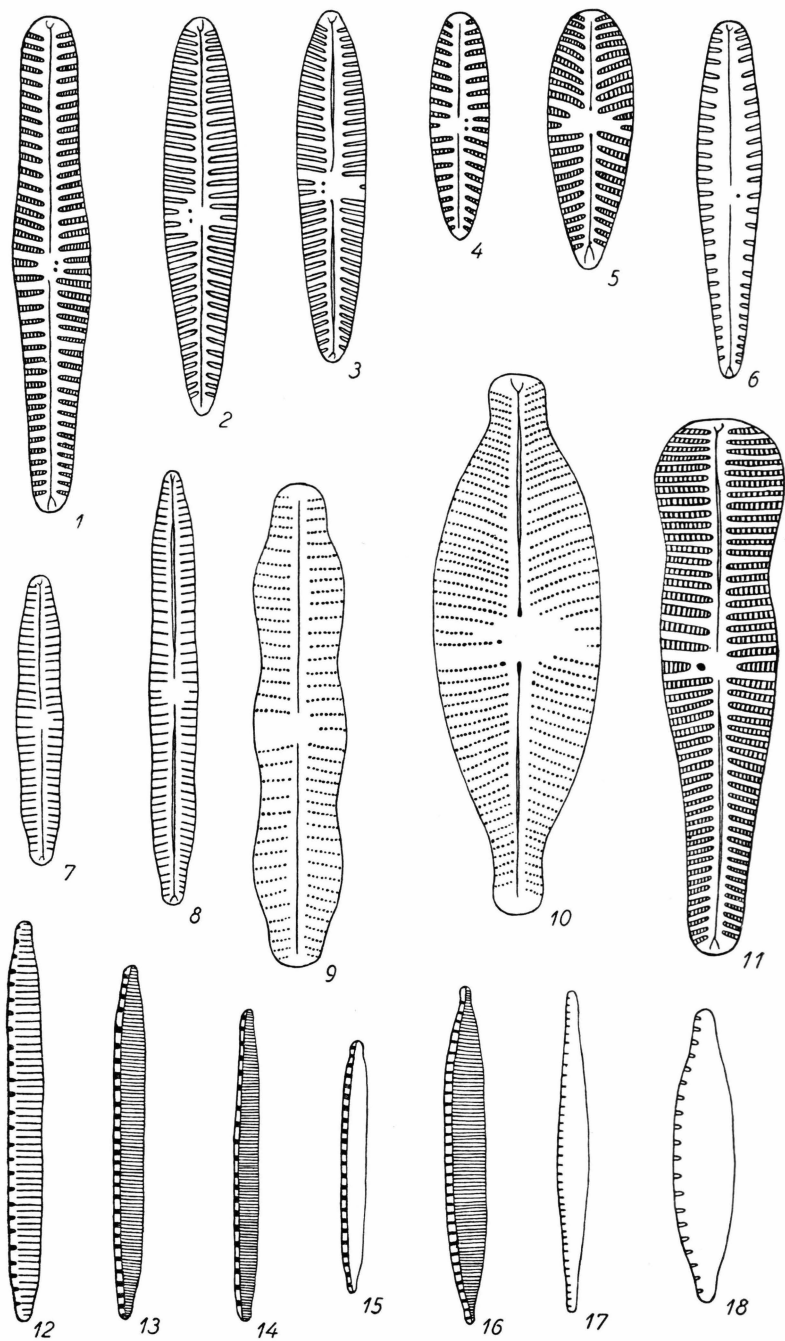


Plate XVI.

(ca. 1800 $\times$).

- 1, 2, 3, 4, 5. *Nitzschia frustulum* (Kütz.) Grun. var. *perpusilla* (Rabh.) Grun.
6. — — var. *perminuta* Grun.
- 7, 8, 9, 10. — *frustulum* (Kütz.) Grun.
11. — *romana* Grun.?
12. — *frustulum* var. *perminuta*.
13. — — var. *perpusilla*.
14. — *fonticola* Grun.?
15. — *frustulum* (Kütz.) Grun.?
16. — sp.
17. — sp. (ca. 1050 $\times$).
18. — sp. (ca. 1035 $\times$).
19. — *palea* (Kütz.) W. Smith (ca. 1040 $\times$).
20. — *mediocris* Hustedt.?
21. — *dissipata* (Kütz.) Grun.(?)
22. — *ignorata* Krasske.
23. — sp.
24. *Surirella minima* Ross & Abdin.(?)

