

MEDDELELSER OM GRØNLAND

UDGIVNE AF

KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND

Bd. 128 · Nr. 7

DANSK PEARYLAND EKSPEDITION 1947-50

LEADER: EIGIL KNUTH

DIATOMS FROM
PEARY LAND, NORTH GREENLAND

COLLECTED BY KJELD HOLMEN

BY

NIELS FOGED

WITH 2 FIGURES IN THE TEXT
AND 14 PLATES

KØBENHAVN

C. A. REITZELS FORLAG

BIANCO LUNOS BOGTRYKKERI A/S

1955

CONTENTS

	Page
Preface	4
Introduction	5
Previous Investigations	5
Oecological Remarks	7
Material of Diatoms	7
Climate and Weather of the Area	7
Geological Conditions	11
Micro-Observations from Some Localities	11
Plant-geographical Placing	15
Samples of Diatoms	17
Systematic Part	28
A. Centrales	29
Coscinodiscaceae	29
B. Pennales	30
I. Araphideae	30
II. Raphidioideae	35
III. Monoraphideae	38
IV. Biraphideae	43
Naviculoideae	43
Nitzschiaceae	77
Surirellaceae	80
Literature	86
Plates	91

PREFACE

The material of diatoms described in the present paper has been placed at my disposal by one of the participants in the Danish Peary Land Expedition 1947—50, Cand. mag. KJELD HOLMEN, the botanist, whom I offer my best thanks, in the first place, because he has entrusted me with the samples containing diatoms which had been collected in 1948—49, and then, in the second place, at my request supplemented the material by collections in 1950, so that a copious material of diatoms from this characteristic part of Greenland can be described here.

I offer my respectful thanks to the Directors of the Carlsberg Foundation, who by a valuable grant has enabled me to perform the work.

For the translation I am indebted to cand. mag. NIELS HAISLUND and for latinizing of diagnoses to cand. mag. TYGE CHRISTENSEN.

Odense, March 1954.

NIELS FOGED.

INTRODUCTION

Previous Investigations into the Diatoms of East and North Greenland.

On marine diatoms from the coasts of East and Northeast Greenland works by KINDLE (1909), GRAN (1904), and ØSTRUP (1895, 1897, and 1910) have been published. As the present investigations comprise freshwater material only, these works will not be mentioned in detail here.

Freshwater diatoms from the same areas have been described by ØSTRUP (1897a and 1910b), J. BRUN (1900), and BOYE PETERSEN (1924).

E. ØSTRUP (1897a) investigated about 100 samples collected by N. HARTZ. They originated from the area around Scoresbysund between 70° and 71° N. lat. near the east coast of Greenland (most of them originating from Danmarks Ø about 70° N. lat.). In this material 147 forms of freshwater diatoms belonging to 27 genera were found.

The material of diatoms from the Denmark Expedition to the northeast coast of Greenland 1906—08 was described by E. ØSTRUP in a paper from 1910 (1910b). The freshwater material consisted of 30 samples in all from a number of localities all situated along the east coast of Greenland north of 76° N. lat., but south of Independence Fjord (i. e. south of 81°30' N. lat.). 128 freshwater diatoms belonging to 24 genera were described from these samples.

The freshwater material from East Greenland investigated by J. BRUN (1900) was collected by the Swedish "Antarctic" expedition in 1899 in the area from Scoresbysund (about 70° N. lat.) in the south to Hvalros Ø (about 75° N. lat.) in the north. A total of 120 forms of diatoms belonging to 25 genera was described from this material. BRUN emphasizes the remarkable fact that he did not observe species belonging to the genera *Gyrosigma*, *Mastogloia*, *Diatoma*, *Epithemia*, *Campylodiscus*, *Cocconeis*, *Stephanodiscus*, and *Tetracyclus*.

The material of diatoms collected during the Second Thule Expedition 1916—18 by TH. WULFF was described by BOYE PETERSEN in a paper from 1924. The material, which originated from the north coast

of Greenland, consisted of 12 samples, one of which came from the Sherard-Osborne Fjord, one from a large nunatak, Midgårdssormen, and one from a hole (cryoconite) on the inland ice. The other nine samples were freshwater samples from the area around I. P. Koch Fjord, which forms an indentation in Peary Land from the northwest. In B.P.'s statements of localities the places of sampling are situated between $81^{\circ}45'$ and $83^{\circ}6'$ N. lat. The samples included 64 freshwater forms belonging to 16 genera. It should be noted that the material originated from an area built of Devonian sandstone and denudation products of it.

From areas with ecological conditions which in certain respects can be paralleled with conditions in East and North Greenland, there are a number of works, especially early ones, dealing with the diatom flora of islands in the North Atlantic, the Norwegian Sea, and the Arctic Ocean, and in the northern areas of the Eurasian continent.

The most important among these are papers on the diatom flora in Iceland (ØSTRUP 1918, BOYE PETERSEN 1928, 1935, HUSTEDT 1937, KRASSKE 1938), Jan Mayen (BRUN 1900, BOYE PETERSEN 1923), Bear Island (A. CLEVE 1900, LAGERSTEDT 1873), Svalbard (LAGERSTEDT 1873, HUSTEDT 1937, KRASSKE 1938), Franz Josef Land (P.T. CLEVE 1898, GRUNOW 1884), and Lapmark (A. CLEVE 1895, A. CLEVE-EULER 1915, 1934, HUSTEDT 1924, 1942b, MÖLDER 1937a, 1937b, 1938, 1939, 1951, KRASSKE 1943, 1949, FOGED 1952).

The diatom flora of the same areas is furthermore described in CLEVE & GRUNOW 1880 and in P.T. CLEVE 1894—95.

From the North American arctic areas there are extremely few descriptions of diatom material, the most important of which are ROSS 1947 and BOYER 1926—27. Both, however, contain little information of plant geographical interest, and only a small number of the diatom forms of the area are mentioned.

As to West Greenland reference may be made to FOGED 1953.

P.T. CLEVE 1873 and 1896 deals with marine diatoms in the seas west of Greenland.

OECOLOGICAL REMARKS

Material of Diatoms.

The diatom material from the Danish Pearyland Expedition 1948—1950 consists of 46 samples, 6 of which were collected in 1948, 8 in 1949, and 32 in 1950. 45 of the samples originate from the neighbourhood of the base of the expedition on the south side of Jørgen Brønlund Fjord (see map fig. 2), while one (no. 13) originates from the plain Kjoveslette on the north side of Independence Fjord at about 24° W. long. (see map fig. 1; leg. J. TROELSEN). The 45 samples from the station area on Jørgen Brønlund Fjord have all been collected by Cand. mag. KJELD HOLMEN.

Together the samples represent all freshwater ecotypes ranging from soil and moss with highly varying humidity, by way of ephemeral bodies of water, swamps, and pools to more proper aquatic milieus, such as lakes, springs, rivers, brooks, and waterfalls. In the survey of the diatoms found a grouping is made according to environment on the lines mentioned above. It should, however, be emphasized that the importance of differences as regards aquatic environment which in other places may be extremely prominent, is here undoubtedly much less than might be suggested by an immediate consideration, as all water in the area is frozen during 9—10 months of the year. Life processes to any appreciable extent must consequently be considered to have ceased, so that conditions, if anything, must be paralleled with e. g. the pure desert areas of other climates, where the positive biological effect of the water as a rule is also concentrated in and limited to very short annually recurrent periods. The similarity to desert areas is furthermore strengthened by the fact that the air humidity is generally very slight, so that many of the streams on the south side of Jørgen Brønlund Fjord dry up completely at the end of the very short summer (FRISTRUP 1952).

Climate and Weather of the Area.

There is a very considerable material of meteorological observations from the station area available in the meteorological journal published, which includes daily observations at three hours' intervals during the period from 1/8 1948 to 6/8 1950 (FRISTRUP 1952).

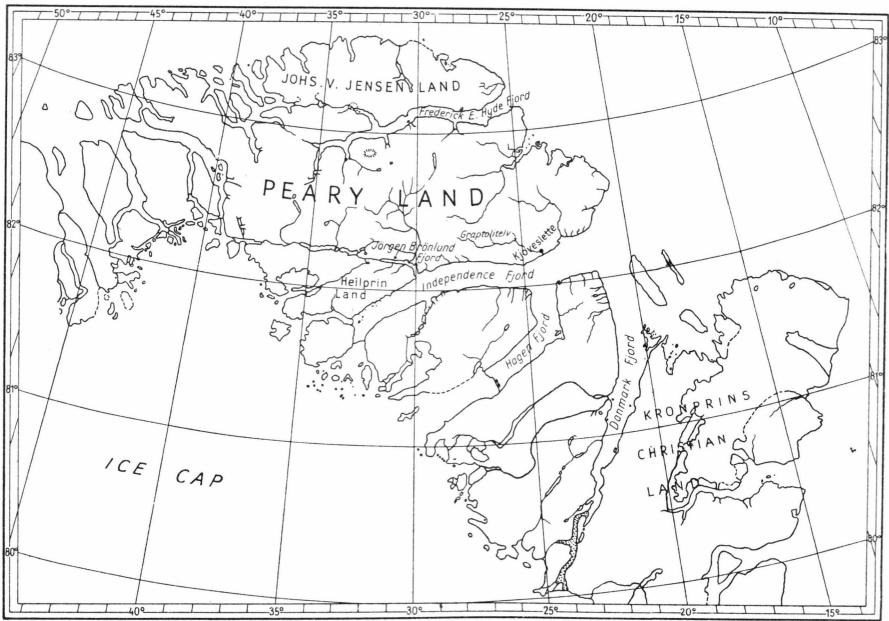


Fig. 1.

The measurements of temperature, wind, and precipitation are of special interest in the present case. In this place it will be sufficient to limit our attention to the short season when the air temperature is above 0°C ., as the period of activity of the plants normally and in the main will be restricted to this. It should, however, be kept in mind that the insolation in especially suitable places may produce microclimatic conditions of development of vegetation also out of the period mentioned, and furthermore sometimes in places in which the air temperature proper cannot get appreciably higher than 0°C . (e.g. in cryoconite holes).

As an expression of the range of temperature Table 1 shows monthly means, average extremes, and absolute maxima and minima during the observation period (mainly on the basis of KNUTH 1950).

It appears from the measurements that the frost-free period is between two months and at most two months and a half. The first positive air temperature appears at the end of May and the first negative temperature in 1948 was measured on the August 20th. The daily fluctuations in temperature on the whole are very small.

Biologically these temperatures mean little, as the microclimatic ranges of temperature may be quite different, even though they presumably often to some degree vary according to the same course of curves.

Conditions of the wind will be of importance for the course of the microtemperatures in relation to temperatures measured meteorologi-

Table 1.

	Monthly mean (°C.)		Average extremes (°C.)		Absolute extremes	
	1948-49	1949-50			Max.(°C.)	Min.(°C.)
			1949			
August	3.7	3.7	5.9	1.0	16.7	-4.5
September	-5.1	-5.6	-3.6	-7.3	5.0	-15.0
October.....	-19.4	-19.0	-17.0	-20.2	-12.0	-26.2
November.....	-24.5	-24.3	-22.5	-26.0	-14.4	-34.7
December	-31.3	-23.4	-20.7	-26.0	-12.4	-33.7
			1950			
January	-31.3	-30.6	-26.6	-33.8	-15.2	-39.2
February	-26.6	-32.0	-28.5	-34.5	-14.4	-44.1
March	-24.2	-29.0	-25.7	-32.2	-19.3	-43.4
April	-21.3	-22.7	-19.1	-26.2	-9.3	-37.6
May.....	-7.3	-6.9	-3.7	-9.9	4.2	-19.7
June	2.5	2.7	4.7	0.1	9.5	-5.5
July.....	6.0	6.4	8.8	4.0	15.0	0.2

cally, as calm with a cloudless sky gives a possibility of great fluctuations in temperature at soil and water surfaces, while wind and cloud level these. According to FRISTRUP (1952) calms are not common in summer time, which is the only season of interest here. Calm is recorded for August 1948: 2 days, Sept. 1948: 7-8 days, June 1949: 0 day, July 1949: 0 day, August 1949: 1 day, June 1950: 0 day, July 1950: 0 day, and August (1-12) 1950: 0 day. The observations were made 8 times per each 24 hours, at the station 8 m above sea level and 2 m above the ground. Conditions of the wind thus would seem to indicate comparatively small deviations and differences between meteorological temperatures and microtemperatures.

The extent of insolation will be of very great ecological importance both as regards duration and as regards the size of the angle of incidence at the biotype. According to FRISTRUP (1948-49) the heliograph in 1948-49 registered a total of 2232 hours of sunshine, which is somewhat more than the annual mean for Denmark. The highest number of monthly hours of sunshine was observed in May 1949, viz. 634 in all (out of 744 possible!).

Because of the low air humidity (a relative air humidity below 30 per cent. is most frequent both in winter and summer (FRISTRUP 1948-49)) and the low air temperatures, the precipitation is very slight, generally less than 100 mm per year. According to FRISTRUP 1952 the precipitation in August 1948 amounted to 12 mm, in Sept. 1948 to 27.8 mm, in June 1949 to 6.8 mm, in July 1949 to 2.3 mm, in August 1949 ?, in June 1950 to 4.4 mm, and in July 1950 to 6.7 mm.

This in connexion with the low air humidity and the prolonged insolation, besides windy air, means that the ground and moss cushions will be exposed to intense drying-up. The consequences of this will, however, have some possibility of being reduced by the supply of humidity from below as a consequence of thawing of the frozen subsoil.

The intense drying-up in many places on the edges of ephemeral lakes and creeks gives rise to disengagement of salts (especially Mg and Ca chloride and sulphate), which may be greatly conspicuous in the summer months (TROELSEN 1949 p. 23: "In July and August the salt crusts were so prominent that the ground looked as if it were covered with hoar-frost"). This means that the salt concentration in the small bodies of water must be very highly varying, from melt-water poor in electrolytes in May—June to a salt-lake character in July—August, so that biotopes are produced which make special demands upon the regulatory powers of the organisms occurring in them and exclude all organisms with narrow ecological limits.

Wind erosion plays a very considerable part on the south side of Jørgen Brønlund Fjord, where practically all "pebbles and boulders are polished and worn on the side that is exposed to the wind that blows from Wandel Dal towards Independence Fjord" (TROELSEN 1949 p. 22). Wind erosion is strongest in winter, when the stones freeze on to the support; but also in summer, when the soil is dried up, the wind, e. g. from drying-up pools and small lakes, will have a possibility of carrying clay and sand with resting phases of micro-organisms from place to place within the area.

On the whole the climate of the area thus may be characterized as a pronounced high arctic continental desert climate, which in many respects offers the vegetation very extreme environmental conditions. One of the most essential factors will presumably be the alternation between an almost unbroken vegetation period in the short summer time and an absolute and unbroken resting period of about 10 months. If these conditions are converted into generations of diatoms they offer some very particular perspectives, especially if it is kept in mind that the higher plants here as a rule take several years to pass through the life cycle of an individual.

Summer temperatures corresponding to those observed in Peary Land have previously been recorded in Svalbard, Franz Josef Land, the New Siberian Islands, and in Ellesmere Land, where only two or three months have positive temperatures with mean temperatures about 3°—5°C. (OSTENFELD 1923, VAHL and HATT 1922—27).

Microtemperatures for the lake Klaresø and the river Kedelkrogelv are given below.

Geological Conditions.

The country around Jørgen Brønlund Fjord is part of the North Greenland plateau area, which is built of Eocambrian sandstones and dolomite belonging to the Thule formation (also Eocambrian). See map (Plate 1) in TROELSEN 1949.

Along Jørgen Brønlund Fjord there is a zone — 1—2 km broad — of postglacial deposits, alluvial as well as marine (TROELSEN 1949 p. 19). On the south side of the fjord, where the ground is sloping slightly towards the fjord, there are distinct marine terraces mainly consisting of clay. The maximum height of such terraces is found at the mouth of the river Børglum Elv on the north side of the fjord, 113 m above sea level (FRISTRUP 1949 p. 20).

South of the postglacial zone Eocambrian deposits consisting especially of dolomite and limestone underlain by a thinner sandstone formation crop out.

Any greater changes of a geomorphological kind do not seem to have taken place in late geological times. "The topography of the region has apparently been but slightly modified by glacial activity, and it may therefore be assumed that the major features of the present land forms were modelled in preglacial time" (TROELSEN 1949 p. 27).

Together with the region east and west of Danmark Fjord Peary Land constitutes the greatest connected ice-free area in Greenland, in all 42,700 square km (FRISTRUP 1948—49 p. 42) or 16,700 square miles (KNUTH 1952 p. 17).

Micro-observations from Some Localities.

There are few micro-observations available from the localities from which the present material of diatoms originates. Most of these were made by Mag. scient. PALLE JOHNSEN (P. J.), whose information has been used in what follows together with Cand. mag. KJELD HOLMEN'S (K.H.) observations. I am much obliged to the two scientists for permission to use their observations.

1. The lake Klareso (Map fig. 2).

This lake is situated about 2 km west of the station on Jørgen Brønlund Fjord. It measures 100 × 300 m, and its greatest depth is about 3 m. In most places the bottom is stony, with stones about the size of a clenched fist. At the greatest depths there is mud. The water is limpid. Higher plants are found only along the bank, farther out there is here and there a little moss. The animal kingdom is very poorly represented. The specific gravity of the water at + 5.1°C. was determined at 1.0 (P.J.).

pH: 5/8 1949 near bank in the surface 8.0—8.2 (at 9.9°C.) (P.J.).
29/7 1950 in moss from bank: 6.4 (K.H.).

At 7 determinations of the content of oxygen in the water (P.J.), this was constantly found to be saturated with oxygen (Winckler's method).

	Temp. ° C.	Water sample from
1948: 11/9	0.0	Surface
11/9	0.0	—
28/9	0.0	—
1949: 29/6	1.7	—
30/6	1.3	2 m above bottom
2/7	—	Surface
4/8	9.9	Above bottom. Depth of 3 m.

Furthermore P.J. reports temperature measurements from Klareso temp. (° C.):

1947: 6/8	6.3	near bank
1948: 4/8	8.7	surface near bank
6/9	2.0	under ice
11/9	0.0	— —
22/9	2.5	at bottom, 3 m
22/9	0.0	under ice
1949: 7/6	4.0	near bank
25/6	5.9	surface near bank
29/6	1.7	— — —
30/6	3.7	— — —
30/6	1.3	in surface near ice edge
30/6	1.3	2 m from surface immediately above bottom
4/7	5.0	surface near bank
3/8	9.8	— — —
4/8	9.0	depth of 3 m
5/8	9.8	surface near bank

Report on ice conditions in the lake (P.J.):

1947: 30/7	ice-free.
1948: 6/9	thickness of the ice 5.5 cm; opening in the ice is found.
11/9	opening in the ice as on 6/9; wind gives rise to movement of the water in the whole lake through the opening.
17/9	the ice snow-covered, apart from a small spot; the layer of snow several cm deep.
22/9	the ice snow-covered, apart from a small spot.
27/9	the ice-cover cracks amid prolonged din; one third of the lake blown free of snow.
1949: 2/5	the ice half snow-covered, half snow-free.
25/6	a little below half of the surface, the deeper part, ice-covered.
29/6	large mass of ice in the middle of the lake.
4/7	large "pancake" of ice in the middle of the lake is disappearing.

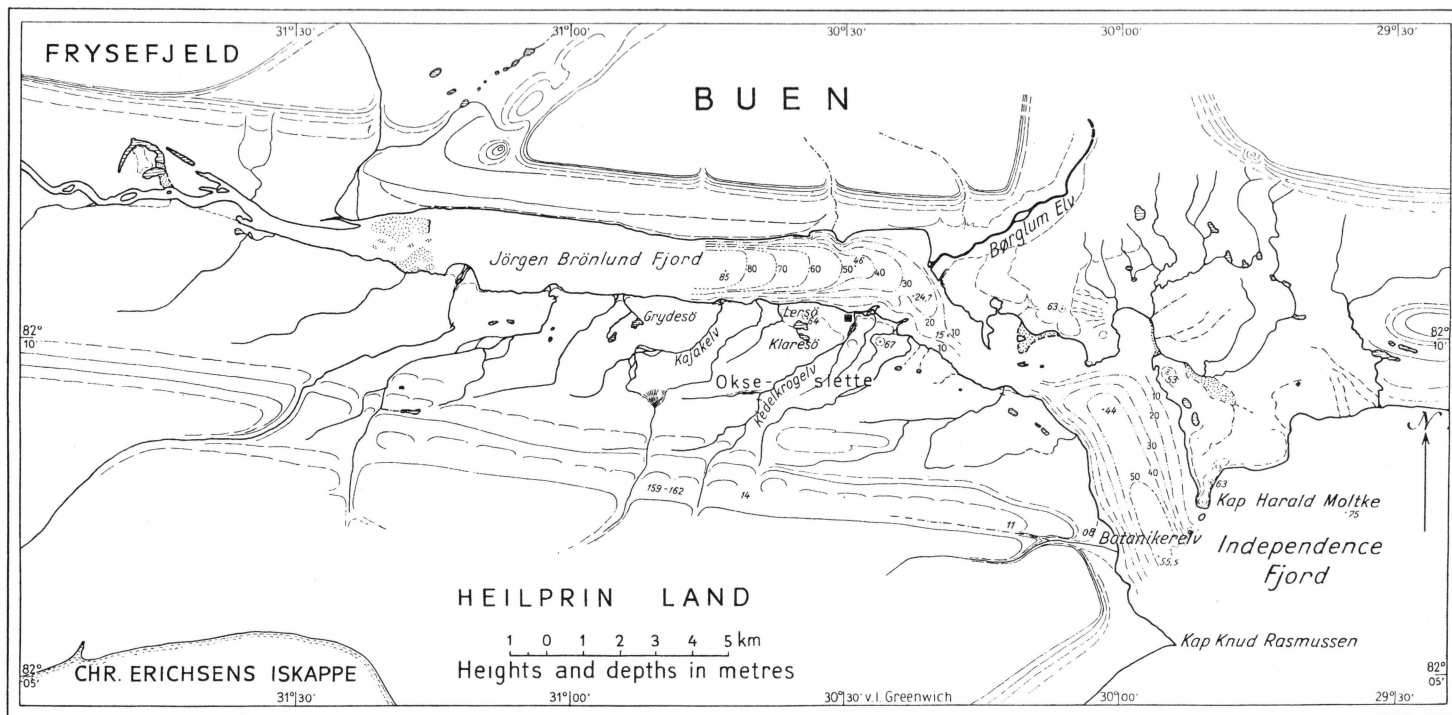


Fig. 2.

2. The river Kedelkrogelv (Map fig. 2).

This river debouches into Jørgen Brønlund Fjord close to the wintering station (see KNUTH, Arctic, No. 1, 1952).

On temperature and conditions of the ice P.J. gives the following information (° C.):

1947:	5/8	+ 4.6	
	10/8	+ 6.0	
1948:	6/8	+ 5.8	
	22/9	0.0.	The river frozen up. In a single place water under soaked ice-snow crust. Gurgle of the water was heard.
1949:	25/5	+ 17.3.	Macroclimate: max.: -1.4° . Oozing melt water, but not yet a connected stream; + 17.3° was measured in the melt water heated by the sun; the existence of a stream is out of the question.
	26/5	0.0°	
	27/5	+ 0.1	
	28/5	max. + 0.3	
	?/6	max. + 8.6	
	15/6	+ 6.4.	The river now has a connected course.
	24/6	max. + 10.0	
	11/6	+ 2.5	
	3/7	+ 2.7	
	4/7	+ 3.8	
	5/7	+ 5.8	
	15/7	+ 7.5	
	16/7	+ 6.7	
	31/7	+ 5.8	
	9/8	+ 9.9	
	10/8	+ 6.0	

The fall in temperature after the 24/6 is due to the fact that the large snowdrifts which farther up in the country had formed giant plugs in the river-bed where this passed through deep gorges, were then so soaked with water that they burst. In this way a real current arose in the river for the first time in 1949. Parts of the river which had hitherto been dried up (in Okselette) suddenly received a tearing stream mixed with snow. In a few days the temperature of the river rose again, as the snow had melted in the river-bed, and the water on its way to the sea from the snowdrift springs in the uplands was heated by the air. During the rest of the summer the river flowed with a temperature which at the small number of measurements might range from 6° to 9° C. During the last days of August the temperature of the air had dropped below 0° C. at night, and the first formation of ice in the river-bed took place. The last water was observed on 22/9 1948. Across Okselette the river flows through an almost horizontal terrain surrounded by green meadows in a small zone along the meandering river. Already before the water has got so far, it has been heated so much that it is not heated further

before reaching the sea (at any rate in the beginning of August, when the temperature at the station and 2 km higher up was exactly the same, viz. 6° C. (P. J.).

Plant Geographical Position of the Area. (Map fig. 1).

According to BÖCHER (1938, p. 305, fig. 146) the area around the head of Independence Fjord belongs to a high arctic, continental floral region, which is climatically characterized by very low July temperatures (usually monthly means below + 5.0° C.), precipitation below 200 mm per year, very slight snowfall, which in part evaporates before the break of the frost, and a high atmospheric pressure. The higher flora is characterized by the absence of scrub vegetation and by the fact that annuals are of very rare occurrence.

In our day Peary Land is without any proper land communication with the rest of the world, as the areas in the south and west are totally barred from the rest of Greenland by the inland ice, and on the other sides the country is surrounded by a generally ice-bound sea. The area thus must be characterized as an oceanic island with a pronounced continental character of climate.

As to the origin and possible immigration of the present flora it is so far only possible to advance hypotheses. As long as the conditions of Greenland during the Glacial Ages have not been elucidated, it will not be possible to establish whether the flora has survived the Glacial Age in Greenland or whether it has immigrated during an interglacial period. However, there seems to be good reasons for assuming that during the last Glacial Age (Würm, Wisconsin) there were so large ice-free areas in several places in Greenland that a survival from at any rate the last interglacial period has been possible (BÖCHER 1938, p. 316 and p. 321). The time which afterwards has been available has then been sufficient for so comprehensive floral migrations that a complete adaptation to the present-day climatic conditions has been possible.

This evolutionary adaptation may have passed off in different ways, as within the individual species there may have been a selection among several originally occurring genotypically different biotypes, or morphological changes may have taken place which gradually have become genotypically fixed under conditions of the special environmental circumstances. The pronounced uniformity in the composition of the diatom flora in the various biotopes, which is a very conspicuous characteristic of the area, may indicate a relatively high age of the diatom flora as well as the possibility that the environmental differences which in the biotopes of other plant zones must be considered to have a selective effect, have been put out of the running there as a consequence of the extreme climatic conditions. Even the fact that many of the species of

diatoms found can only with considerable uncertainty be referred to species known from other plant zones (and which on the other hand are not so deviating that the setting up of special species seems justifiable) may seem to indicate a high age of the present flora. There is a possibility that it represents an evolutionally stagnated pre-glacial diatom flora (or at least a flora the rate of evolution of which has been greatly retarded). Provided that the area through glacial and interglacial periods on the whole had a similar extreme climate as now, it is probable that the possibility of mutation formation and a development of species conditioned by it has been slight. In this connexion it must again be pointed out that the annual number of generations must be considered small as compared with that of other plant zones, a fact which at any rate is of the greatest importance for evolutionary changes.

The fact that so many species of diatoms are cosmopolitans is due partly to their high geological age, partly to the great distributional effectivity of the diatoms. What factors especially have a distributional effect on the freshwater diatoms is in the main unknown. At any rate it has not been elucidated in detail by more comprehensive concrete investigations. Regardless of the question how the distribution takes place, Peary Land as a consequence of her isolated situation must have remained out of the public highway through even geologically long periods. "Interference from abroad" must be considered very rare at any rate through the whole of the last Glacial Age and during the Post-glacial Age. Among the higher plants the majority in South and South-east Greenland point towards European origin (BÖCHER 1938). The immigration must be assumed to have taken place preglacially or perhaps interglacially. The same assumption has been advanced by ØSTRUP (1897 a, 1910), who by a comparison with the observations then available from the other arctic and subarctic regions found considerably closer similarities between the diatom floras of East Greenland and Northern Europe than between those of East Greenland and North America, although with great reservation considering the highly limited knowledge of the arctic diatom flora of North America at the time. This reservation must still be made, as even fairly copious treatments of the arctic diatom flora of Canada are not yet available, so that a comparison with it is still out of the question.

The diatom flora from the Søndre Strømfjord area described by FOGED (1953) cannot be regarded as typical of a West Greenland area as a considerable number of the samples originated from localities in the inland which were particularly rich in salts.

It is also of interest in connexion with the above consideration concerning the possible age of the diatom flora that "many common species of soil bacteria are ubiquitous" (JENSEN 1951, p. 23).

SAMPLES OF DIATOMS

In the following treatment of the samples analyzed a grouping of these according to purely hydro-mechanical points of view is used, as extremely few measurements of ecologically important physico-chemical factors are available. As, however, the purely mechanical question whether the water is stagnant or running, normally has a selective effect on the diatom flora, the grouping is made exclusively on the basis of information about this.

The samples are grouped as follows: First, samples from the localities in which there is not normally any free water surface (I: soil, II: moss), then samples from swamps (III), where there may occasionally be flooded places, from ephemeral pools (IV), where conditions as regards amount of water may also be greatly alternating, then samples from lakes (Va: Klaresø, V: other lakes), and finally the samples from running water, starting with the, on a rough estimate, smallest speed (water oozing out in springs, VI), continuing with rivers and brooks (VII), and concluding with the "fastest" localities (waterfalls, VIII).

A short characterization of each sample has been given by stating the "mass forms" or "dominants" occurring in it, these terms denoting the diatoms of which 10 per cent. or more of the valves counted occur in the sample; then the common forms (10—5 per cent. of the valves counted in the sample), and finally the fairly common forms (5—2 per cent.) are mentioned.

Finally mention will be made of centric forms and rare diatoms in the sample and the number of diatom forms in the sample.

I. Samples from Soil.

No. 13. 1.X.1948. From Kjøveslette on the north side of Independence Fjord at about 24° W. long. The sample is stated to originate from a "wet, mossy meadow", but further information is missing. The placing in this group is therefore with some reservation.

Dominants: *Fragilaria capucina* (19.2 %), *Cymbella similis* (11.8 %), *Nitzschia frustulum* (10.0 %).

Common: *Achnanthes kryophila*, *A. linearis*, *Cymbella angustata*, *Denticula tenuis*.

Fairly common: *Achnanthes flexella*, *Caloneis silicula* var. *alpina*, *Cymbella latens*, *C. turgida*, *Navicula bryophila*.

Centric: *Cyclotella comta* (rare), *Melosira islandica* (rare).

Rare: *Neidium producta* var. *polygibba*.

In all: 42 forms.

- No. 144. 4.VIII.1950. The south side of Jørgen Brønlund Fjord. Coat on moist soil in *Alopecurus alpinus* vegetation. Because of the small number of valves only 250 valves were counted in this sample (in all others 500).

Dominants: *Pinnularia divergentissima* var. *wulffii* (16.0 %), *Caloneis silicula* var. *trunculata* (10 %).

Common: *Pinnularia undulata*, *Caloneis* sp., *Stauroneis javanica*, *S. obtusa*.

Fairly common: *Achnanthes kryophila*, *Ceratoneis arcus*, *Cymbella naviculiformis*, *Denticula tenuis*, *Eunotia praerupta* var. *excelsa*, *Navicula cryptocephala*, *Nitzschia frustulum*, *N. palea*, *Pinnularia divergens* var. *elliptica*, *P. gracillima*, *Stauroneis anceps*.

No centric forms.

Many of the forms occurring in this sample are aerophilous.

In all: 45 forms.

- No. 209. 10.VIII.1950. The south side of Jørgen Brønlund Fjord. Coat on soil in dried-up branch of river.

Dominants: *Cymbella laevis* (14.4 %), *Nitzschia frustulum* var. *perpusilla* (13.0 %), *Achnanthes kryophila* (11.4 %).

Common: *Achnanthes flexella*, *Fragilaria capucina*, *Pinnularia gracillima*.

Fairly common: *Achnanthes depressa*, *Amphora ovalis* var. *pediculus*, *Caloneis silicula* var. *alpina*, *Cymbella similis*, *C. cuspidata*, *Navicula rotaeana*, *Nitzschia hantzschiana*, *Pinnularia undulata*.

No centric forms.

In all: 48 forms.

II. Samples from Moss.

- No. 145. 4.VIII.1950. The south side of Jørgen Brønlund Fjord. Moss from wet *Tortella tortuosa* growth. (See H. L. JENSEN 1951, p. 24, sample no. 1).

pH: at a depth of 5 cm, 6.2; at a depth of 30 cm, 6.8. Frost-free days: 60 (K.H.).

Dominants: *Stauroneis obtusa* (14.0 %), *Pinnularia gracillima* (11.0 %), *P. divergentissima* var. *wulffii* (10.4 %), *Cymbella cuspidata* (10.4 %).

Common: *Pinnularia undulata*, *Stauroneis anceps*.

Fairly common: *Achnanthes kryophila*, *Caloneis silicula* var. *alpina*, *Cymbella variabilis* var. *botellus*, *Eunotia bigibba* var. *pumila*, *Navicula cryptocephala*, *N. lagerstedtii*.

No centric forms.

Rare: *Eunotia papilio*, *Navicula gibbula* var. *capitata*, *Stauroneis kriegeri*.

In all: 52 forms.

- No. 208. 10.VIII.1950. The south side of Jørgen Brønlund Fjord. Moss sample from almost dried-up branch of river.

Dominants: *Nitzschia hantzschiana* (20.8 %), *Achnanthes kryophila* (17.0 %), *Caloneis bacillum* (12.6 %).

Common: *Achnanthes minutissima*, *Cymbella variabilis* var. *botellus*, *Denticula tenuis*.

Fairly common: *Amphora ovalis* var. *libyca*, *Cymbella cistula*, *C. ventricosa*,

C. knuthii, *Nitzschia frustulum* var. *perpusilla*, *Pinnularia balfouriana*.

No centric forms.

Rare: *Achnanthes lemmermanni*, *Eunotia papilio*, *Navicula gibbula*.

In all: 62 forms.

- No. 225. 11.VIII.1950. The south side of Jørgen Brønlund Fjord. Moss sample from the bank of a small shallow lake 150 m above sea level south of Okselette.

Dominants: *Cymbella angustata* (13.2 %), *C. variabilis* var. *botellus* (11.0%).
Common: *Diatoma elongatum*, *Fragilaria capucina*, *Nitzschia frustulum* var. *perpusilla*.

Fairly common: *Achnanthes kryophilla*, *A. minutissima*, *Cyclotella antiqua*, *Cymbella cesati*, *C. laevis*, *C. norvegica*, *C. ventricosa*, *C. knuthii*, *Eunotia praeurupta*, *Fragilaria capitellata*, *F. capucina* var. *lanceolata*, *Gomphonema lagerheimii*.

Centric: *Cyclotella antiqua* (fairly common).

Rare: *Achnanthes plitvicensis*.

In all: 67 forms.

III. Samples from Swamps.

- No. 4. 1.X.1948. Swamp in river delta near the station on Jørgen Brønlund Fjord. Moss: *Drepanocladus* sp. pH: 7.6 at a depth of 5—10 cm (K.H.).

Dominants: *Denticula tenuis* (30.4 %), *Nitzschia frustulum* var. *perpusilla* (17.8 %), *N. frustulum* (13.6 %).

Common: *Cymbella stauroneiformis*, *Pinnularia gracillima*.

Fairly common: *Cymbella lapponica*, *C. turgida*, *Navicula cryptocephala*, *Nitzschia commutata*.

Centric: *Cyclotella comta* (rare), *Melosira granulata* (rare).

In all: 33 forms.

- No. 222. 11.VIII.1950. The south side of Jørgen Brønlund Fjord. Mud on the bottom of mossy, water-covered meadow with *Carex stans* Dreyer.

Dominant: *Pinnularia gracillima* (11.2 %).

Common: *Amphora ovalis* var. *pediculus*, *Cymbella laevis*, *Denticula tenuis*, *Fragilaria capitellata*, *Navicula cryptocephala*, *Nitzschia hantzschiana*.

Fairly common: *Achnanthes minutissima*, *Cymbella angustata*, *C. lapponica*, *C. leptoceros* var. *rostrata*, *C. variabilis* var. *botellus*, *Fragilaria capucina* var. *lanceolata*, *Navicula bryophila*, *Nitzschia denticula*.

Centric: *Cyclotella antiqua* (rare).

Rare: *Achnanthes plitvicensis*.

In all: 60 forms.

IV. Samples from Pools.

- No. 5. 2.X.1948. The south side of Jørgen Brønlund Fjord. Mud sample from snowpatch at "Haresædet".

Dominant: *Achnanthes kryophila* (37.4 %).

Common: *Caloneis silicula* var. *alpina*, *Cymbella lapponica*, *C. turgida*, *Pinnularia gracillima*.

Fairly common: *Eunotia papilio*, *E. suecica*, *Pinnularia undulata* var. *subundulata*, *Stauroneis javanica*.

Centric: *Melosira islandica* (rare).

Rare: *Eunotia suecica*, *E. papilio*, *Neidium kozlowii*.

In all: 45 forms.

- No. 12. 2.X.1948. The south side of Jørgen Brønlund Fjord. Mud sample from the bottom of a small pool beside the river Kedelkrogelv near "Arenæen". Dominants: *Cymbella variabilis* var. *botellus* (26.2 %), *Nitzschia frustulum* (18.4 %), *Denticula tenuis* (13.6 %). Common: *Achnanthes kryophila*, *Ceratoneis arcus*, *Cymbella ventricosa*. Fairly common: *Achnanthes linearis*, *Cymbella cistula*, *C. angustata*. Centric: *Cyclotella comta* (rare), *Stephanodiscus astraæa* (rare), *S. hantzschia* (rare). Rare: *Navicula subrotundata*. In all: 69 forms.
- No. 14. 8.VII.1949. Fell field in Heilprin Land, about 460 m above sea level, south of Jørgen Brønlund Fjord. Mud sample from pool in bog. Dominant: *Achnanthes kryophila* (18.4 %), *Nitzschia hantzschiana* (18.4 %). Common: *Cymbella latens*, *C. lapponica*, *C. turgida*, *Fragilaria capucina*. Fairly common: *Eunotia tenella*, *Navicula perpusilla*, *Neidium bisulcatum*, *Nitzschia frustulum*, *Stauroneis anceps*, *S. phoenicenteron*. Centric: *Melosira ambigua* (rare), *M. islandica* (rare). Rare: *Navicula amphibola*, *N. gibbula*, *Neidium kozlowii* var. *parva*. In all: 76 forms.
- No. 133. 1.VIII.1950. The south side of Jørgen Brønlund Fjord. Puddle with putrefying green algae at creek of the Kedelkrog river. Dominants: *Achnanthes kryophila* (13.2 %), *Cymbella cistula* (13.6 %), *C. delicatula* (12.4 %), *Nitzschia frustulum* (13.0 %). Common: *Melosira roeseana*, *Navicula perpusilla*. Fairly common: *Achnanthes linearis*, *Cymbella laevis*, *Denticula tenuis*, *Fragilaria vaucheriae*. Centric: *Melosira roeseana* (common). Rare: *Achnanthes lemmermanni*, *A. plitvicensis*, *Navicula kotschyi*. In all: 67 forms.
- No. 204. 10.VIII.1950. The south side of Jørgen Brønlund Fjord. Puddle in riverbed with old musk-ox dung in the water. Dominants: *Denticula tenuis* (30.0 %), *Nitzschia hantzschiana* (16.0 %). Common: *Nitzschia denticula*. Fairly common: *Achnanthes minutissima*, *A. kryophila*, *Cymbella lapponica*, *C. angustata*, *C. knuthii*, *Navicula cryptocephala*, *Nitzschia frustulum*, *N. gracilis*, *Pinnularia undulata*. No centric forms. Rare: *Achnanthes plitvicensis*, *Neidium kozlowii* var. *parva*. In all: 88 forms.
- No. 226. 11.VIII.1950. The south side of Jørgen Brønlund Fjord. Mud from puddle with clayey bottom, 150 m above sea level, south of the station. Dominants: *Achnanthes kryophila* (11.2 %), *Cymbella variabilis* var. *botellus* (10.2 %). Common: *Achnanthes minutissima*, *Cymbella cistula*, *C. angustata*, *C. incrassata*. Fairly common: *Achnanthes depressa*, *A. flexella*, *A. plitvicensis*, *Cymbella*

knuthii, *C. laevis*, *Denticula tenuis*, *Navicula cryptocephala*, *N. cryptocephala* var. *intermedia*, *Pinnularia gracillima*.

No centric forms.

In all: 53 forms.

V. Samples from Lakes.

a. Klaresø.

The south of Jørgen Brønlund Fjord, about 60 m above sea level.

- No. 1. 19.VII.1949. Sample of mud, coat on stone in water 10 cm deep.
 Dominants: *Cymbella variabilis* var. *botellus* (11.8 %), *Nitzschia frustulum* (10.8 %).
 Common: *Achnanthes minutissima*, *Cymbella knuthii*, *C. ventricosa*, *Diatoma elongatum*, *Nitzschia denticula*.
 Fairly common: *Amphora ovalis* var. *libyca*, *Cyclotella antiqua*, *Cymbella cistula*, *Navicula cryptocephala*, *N. vulpina*, *Pinnularia gracillima*, *Cymbella broenlundensis*.
 Centric: *Cyclotella antiqua* (fairly common), *C. comta* (rare), *Melosira ambigua*, *M. distans*, *M. italica*, *M. islandica* (rare), *Stephanodiscus astraea* (rare).
 Rare: *Neidium kozlowii*, *Navicula amphibola*.
 In all: 95 forms.
- No. 2. 3.VIII.1949. Coat on stone in the lake in water about 20 cm deep.
 Cominant: *Achnanthes minutissima* (10.8 %).
 Common: *Diatoma elongatum*, *Cymbella variabilis* var. *botellus*, *C. ventricosa*, *Nitzschia denticula*, *N. frustulum* var. *perpusilla*.
 Fairly common: *Achnanthes linearis*, *Cyclotella antiqua*, *Cymbella cistula*, *C. angusta*, *C. knuthii*, *Fragilaria capucina*, *Navicula vulpina*, *Nitzschia frustulum*, *N. kützingiana*.
 Centric: *Cyclotella antiqua* (fairly common), *Melosira ambigua*, *M. islandica* (rare).
 Rare: *Neidium distincte-punctatum*.
 In all: 72 forms.
- No. 10. 22.IX.1948. Bottom sample. Depth of 3 m. Moss: *Calliergon trifarium*. A few desmids and Cyanophyceae. Mud smelling of H₂S. Thickness of ice on the lake 35 cm when the sample was taken.
 Dominants: *Fragilaria construens* (11.4 %), *Nitzschia denticula* (10.0 %).
 Common: *Achnanthes kryophila*, *Cocconeis placentula* var. *euglypta*, *Denticula tenuis*, *Navicula halophila*, *N. cincta*.
 Fairly common: *Achnanthes flexella*, *Amphora ovalis* var. *libyca*, *Cymbella norvegica*, *C. obtusa*, *Eunotia praerupta*, *Gomphonema angustatum* var. *producta*, *Navicula radiosa*, *N. tuscula*, *N. vulpina*, *Nitzschia fonticola* (Østrup var.), *Pinnularia gracillima*, *P. microstauron* var. *brébissonii*.
 Centric: *Cyclotella antiqua* (a few).
 Rare: *Neidium distincte-punctatum*, *N. kozlowii*.
 In all: 59 forms.
- No. 82. 29.VII.1950. Scraping from stone at a depth of 10 cm.
 Dominants: *Cymbella knuthii* (11.2 %), *Nitzschia frustulum* var. *perpusilla* (12.6 %).
 Common: *Cymbella variabilis* var. *botellus*, *Epithemia sorex*, *Navicula vulpina*, *Nitzschia denticula*.

Fairly common: *Achnanthes kryophila*, *A. linearis*, *Cymbella angustata*, *C. microcephala*, *C. incrassata*, *Denticula tenuis*, *Diatoma elongatum*, *Navicula cryptocephala*, *N. fälaisensis* var. *lanceola*.

Centric: *Cyclotella antiqua* (a few).

In all: 70 forms.

No. 83. 29.VII.1950. Mud between stones at a depth of 10 cm.

Dominants: *Nitzschia denticula* (25.0 %), *N. frustulum* var. *perpusilla* (13.2 %).

Common: *Navicula cryptocephala*.

Fairly common: *Amphora ovalis* var. *libyca*, *Cymbella angustata*, *C. microcephala*, *C. variabilis* var. *botellus*, *Diatoma elongatum*, *Navicula tuscula*, *N. vulpina*, *Nitzschia kützingiana*, *Pinnularia balfouriana*, *P. gracillima*.

Centric: *Cyclotella antiqua* (a few).

Rare: *Neidium kozlowii*.

In all: 66 forms.

No. 84. 29.VII.1950. Moss from the bank.

Dominants: *Nitzschia denticula* (17.4 %), *Pinnularia gracillima* (14.0 %), *Diatoma elongatum* (10.0 %).

Common: *Achnanthes kryophila*, *Cymbella laevis*, *C. variabilis* var. *botellus*.

Fairly common: *Cymbella angustata*, *C. knuthii*, *Navicula vulpina*.

Centric: *Cyclotella antiqua* (a few).

In all: 55 forms.

b. Other Lakes.

No. 160. Mountain lake SW of the station on Jørgen Brønlund Fjord, about 400 m above sea level. Coat on stone at a depth of about 20 cm.

Dominants: *Cymbella variabilis* var. *botellus* (17.6 %), *Ceratoneis arcus* (11.0 %), *Cymbella laevis* (10.6 %).

Common: *Cymbella cistula*, *C. knuthii*, *C. ventricosa*.

Fairly common: *Achnanthes kryophila*, *A. flexella*, *A. microcephala*, *Cymbella perpusilla*, *C. cesati*, *Fragilaria vaucheriae*, *Nitzschia frustulum*.

Centric: *Cyclotella antiqua* (rare).

Rare: *Neidium distincte-punctatum*, *N. kozlowii*.

In all: 56 forms.

No. 192. 8.VIII.1950. The lake Grydesø, W. of the river Kajakelv, the south side of Jørgen Brønlund Fjord. Scraping from stone at a depth of 25 cm.

Dominants: *Fragilaria capucina* (17.0 %), *Cyclotella antiqua* (10.0 %).

Common: *Achnanthes microcephala*, *Cymbella variabilis* var. *botellus*, *Nitzschia frustulum*.

Fairly common: *Achnanthes linearis*, *Cymbella cesati*, *C. microcephala*, *C. incrassata*, *C. knuthii*, *Denticula tenuis*, *Fragilaria construens* var. *venter*, *F. pinnata*, *Navicula cryptocephala*, *Tabellaria fenestrata* var. *intermedia*.

Centric: *Cyclotella antiqua* (dominant), *C. stelligera* (few), *C. kützingiana* var. *planetophora* (rare).

Rare: *Navicula modica*, *Neidium kozlowii*.

In all: 83 forms.

No. 193. 8.VIII.1950. The lake Grydesø. Scraping from stone at a depth of 20 cm.

Dominant: *Cymbella variabilis* var. *botellus* (10.2 %).

Common: *Cyclotella antiqua*, *Fragilaria pinnata*, *Navicula cryptocephala*, *Pinnularia gracillima*, *Tabellaria fenestrata* var. *intermedia*.

Fairly common: *Achnanthes flexella*, *A. microcephala*, *Cymbella leptoceros*

var. *rostrata*, *C. ventricosa*, *C. knuthii*, *C. heilprinensis*, *C. incrassata*, *Denticula tenuis*, *Eunotia arcus*, *Fragilaria construens*, *F. construens* var. *venter*, *F. capucina*, *Nitzschia denticula*, *N. frustulum*, *Pinnularia balfouriana*.

Centric: *Cyclotella antiqua* (common), *C. stelligera* (rare).

Rare: *Neidium distincte-punctatum*, *Navicula pseudoventralis*.

In all: 62 forms.

- No. 194. 8.VIII.1950. The lake Grydesø. Scraping from stone at a depth of 10 cm. No dominants.

Common: *Achnanthes kryophila*, *A. linearis*, *Cyclotella antiqua*, *Cymbella variabilis* var. *botellus*, *Diatoma elongatum*, *Nitzschia perminuta*.

Fairly common: *Achnanthes flexella*, *Cymbella angustata*, *C. leptoceros* var. *rostrata*, *C. ventricosa*, *C. incrassata*, *Denticula tenuis*, *Fragilaria pinnata*, *Navicula cryptocephala*, *Nitzschia denticula*, *Pinnularia gracillima*.

Centric: *Cyclotella antiqua* (common), *C. stelligera* (few).

Rare: *Navicula modica*.

In all: 88 forms.

- No. 195. 8.VIII.1950. The lake Grydesø. Mud between stones at a depth of 10 cm. Dominants: *Cymbella variabilis* var. *botellus* (10.2 %), *Pinnularia gracillima* (13.2 %).

Common: *Achnanthes microcephala*, *Cymbella knuthii*, *Navicula cryptocephala*, *Nitzschia frustulum* var. *perpusilla*, *N. kützingiana*.

Fairly common: *Achnanthes kryophila*, *A. flexella*, *Cyclotella antiqua*, *Cymbella leptoceros* var. *rostrata*, *C. microcephala*, *C. angustata*, *C. incrassata*, *C. ventricosa*, *Denticula tenuis*, *Fragilaria pinnata*.

Centric: *Cyclotella antiqua* (fairly common), *C. kützingiana* var. *planetophora*, *C. kützingiana* var. *radiosa* (rare), *C. stelligera* (few).

Rare: *Navicula subrotundata*, *Neidium distincte-punctatum*.

In all: 58 forms.

- No. 224. 11.VIII.1950. Small shallow lake south of Okseslette south of Jørgen Brønlund Fjord, about 150 m above sea level. Mud from the bottom.

Dominants: *Cymbella angustata* (11.4 %), *Navicula cryptocephala* (10.4 %). Common: *Nitzschia frustulum* var. *perpusilla*, *Pinnularia gracillima*.

Fairly common: *Achnanthes flexella*, *A. minutissima*, *Amphora ovalis* var. *libyca*, *Cymbella leptoceros* var. *rostrata*, *C. microcephala*, *C. norvegica*, *C. ventricosa*, *C. incrassata*, *C. laevis*, *C. knuthii*, *C. variabilis* var. *botellus*, *Denticula tenuis*, *Diatoma elongatum*, *Fragilaria capitellata*.

Centric: *Cyclotella antiqua* (few).

Rare: *Achnanthes plitvicensis*, *Neidium distincte-punctatum*.

In all: 85 forms.

VI. Samples from Springs.

- No. 3. 1.VIII.1949. Spring in river-bed (the river Kedelkrogelv) on the south side of Jørgen Brønlund Fjord, about 40 m above sea level. Sample of algae.

Dominants: *Cymbella laevis* (32.0 %), *Achnanthes kryophila* (29.6 %).

Common: *Cymbella cistula*, *C. lapponica*, *Pinnularia gracillima*.

Fairly common: *Achnanthes flexella*, *Amphora ovalis* var. *libyca*, *Ceratoneis arcus*.

No centric forms.

Rare: *Neidium kozlowii*, *Fragilaria vaucheriae* var. *septentrionalis*.

In all: 37 forms.

- No. 8. 1.VIII.1949. Sample of algae from spring in river-bed about 40 m above sea level on the south side of Jørgen Brønlund Fjord.
 Dominants: *Achnanthes flexella* (28.6 %), *Cymbella laevis* (11.4 %), *Achnanthes kryophila* (11.0 %).
 Common: *Achnanthes linearis*, *Fragilaria capucina* var. *lanceolata*.
 Fairly common: *Amphora ovalis* var. *libyca*, *Cymbella cistula*, *C. angustata*, *Navicula perpusilla*, *Nitzschia frustulum*, *Pinnularia gracillima*.
 Centric: *Cyclotella comta* (rare), *Melosira ambigua* (rare).
 Rare: *Cocconeis hustedtii*.
 In all: 49 forms.
- No. 9. 8.VII.1949. Small spring about 460 m above sea level south of Jørgen Brønlund Fjord. Sample of mud with Cyanophyceae.
 Dominants: *Navicula mutica* (14.8 %), *N. contenta* fo. *parallela* (11.6 %).
 Common: *Ceratoneis arcus*, *Hantzschia amphioxys* var. *maior*, *Navicula contenta*, *N. contenta* fo. *biceps*, *N. gibbula*, *N. mutica* var. *cohnii*, *Pinnularia intermedia*.
 Fairly common: *Fragilaria capucina*, *Melosira roeseana*.
 Centric: *Cyclotella comta* (few), *Melosira granulata* (rare), *M. islandica* (rare), *M. italica* (few), *M. roeseana* (fairly common), *Stephanodiscus astraea* (rare).
 Rare: *Eunotia suecica*, *Navicula gibbula*, *N. kotschyi*, *N. peterseni*, *Pinnularia obscura*, *Stauroneis kriegeri*.
 Sample rich in species with many aerophilous species (*Hantzschia*, *Melosira roeseana*, species of *Navicula* and *Pinnularia*).
 In all: 74 forms.
- No. 159. 5.VIII.1950. Spring in fell field about 460 m above sea level on the south side of Jørgen Brønlund Fjord. Moss on stone in spring.
 Dominants: *Nitzschia frustulum* (18.6 %), *Navicula contenta* fo. *parallela* (16.0 %), *N. perpusilla* (14.2 %).
 Common: *Cymbella obtusa*.
 Fairly common: *Achnanthes kryophila*, *Cymbella latens*, *Navicula* sp., *C. lapponica*, *Eunotia praerupta* var. *inflata*, *Navicula contenta* fo. *biceps*, *N. cryptocephala*, *Stauroneis anceps*.
 Centric: *Cyclotella antiqua* (rare), *Melosira roeseana* (rare).
 Rare: *Achnanthes levanderi*, *Eunotia papilio*, *E. suecica*, *Navicula gibbula*.
 As no. 9 this sample contains some aerophilous species.
 In all: 64 forms.
- No. 162. 5.VIII.1950. From fell field about 460 m above sea level on the south side of Jørgen Brønlund Fjord. Mud in spring meadow.
 Dominants: *Navicula contenta* fo. *biceps* (21.4 %), *N. contenta* fo. *parallela* (19.0 %), *N. perpusilla* (10.6 %), *Nitzschia gracilis* (10.0 %).
 Common: *Navicula contenta*, *N. frustulum*.
 Fairly common: *Cymbella similis*, *Navicula cryptocephala*.
 Centric: *Melosira roeseana* (few).
 Rare: *Navicula gibbula*, *Neidium kozlowii* var. *parva*, *Stauroneis kriegeri*.
 In this sample also some in part frequent aerophilous species.
 In all: 52 forms.
- No. 206. 10.VIII.1950. Spring in river-bed near the station south of Jørgen Brønlund Fjord. Spring with mosses.
 Dominants: *Achnanthes kryophila* (28.8 %), *Fragilaria capucina* (17.0 %), *Nitzschia hantzschiana* (14.8 %).

Common: *Achnanthes broenlundensis*, *A. minutissima*, *Ceratoneis arcus*, *Cymbella cistula*, *Fragilaria vaucheriae*, *Nitzschia frustulum*.

No centric forms.

Rare: *Achnanthes broenlundensis*.

In all: 42 forms.

No. 207. 10.VIII.1950. Spring near the station south of Jørgen Brønlund Fjord. Decomposing algae.

Dominants: *Nitzschia hantzschiana* (32.0 %), *Cymbella variabilis* var. *botellus* (22.0 %).

Common: *Cymbella ventricosa*, *Denticula tenuis*.

Fairly common: *Achnanthes kryophila*, *Amphora ovalis* var. *libyca*, *Ceratoneis arcus*, *Cymbella cistula*, *Nitzschia frustulum* var. *perpusilla*.

Centric: *Cyclotella antiqua* (rare).

Rare: *Navicula kotschyi*, *N. subrotundata*.

In all: 61 forms.

VII. Samples from Rivers and Brooks.

No. 6. 23.VII.1949. River south of Jørgen Brønlund Fjord. Sample of algae from coat on stone.

Dominants: *Cymbella variabilis* var. *botellus* (17.4 %), *Achnanthes minutissima* (14.2 %), *Pinnularia gracillima* (10.0 %).

Common: *Cymbella angustata*, *Denticula tenuis*.

Fairly common: *Achnanthes kryophila*, *A. flexella*, *Amphora ovalis* var. *libyca*, *Caloneis silicula* var. *alpina*, *Cymbella latens*, *C. delicatula*, *Navicula vulpina*, *Nitzschia frustulum*, *N. frustulum* var. *perpusilla*.

Centric: *Cyclotella antiqua* (rare), *Melosira roeseana* (rare).

Rare: *Eunotia suecica*, *Neidium kozlowii*.

In all: 71 forms.

No. 7. 24.VII.1949. Brook in the delta of the river Botanikerelv near Kap Knud Rasmussen, south of Jørgen Brønlund Fjord. Sample of algae.

Dominants: *Achnanthes kryophila* (26.0 %), *Navicula* sp. (Pl. III, fig. 15) (11.6 %).

Common: *Achnanthes plitvicensis*, *Amphora ovalis* var. *pediculus*, *Cymbella obtusa*, *C. amphicephala*.

Fairly common: *Ceratoneis arcus*, *Cymbella delicatula*, *C. cuspidata*, *Navicula bryophila*.

Centric: *Cyclotella antiqua* (rare).

Rare: *Achnanthes plitvicensis* (common), *Neidium kozlowii*, *N. kozlowii* var. *parva*, *N. knuthii*, *N. knuthii* var. *heilprinensis*, *N. munckii*, *Stauroneis kriegeri*, *Neidium productum* var. *polygibba*.

In all: 67 forms.

No. 11. 7.IX.1948. Dried-up river-bed in valley near Kap Knud Rasmussen. Sample of moist moss (mosses: *Meesia triquetra*, *Calliergon sarmentosum*, *Cinclidium subrotundum*, *Drepanocladus revolvens*).

Dominants: *Achnanthes linearis* (33.0 %), *Denticula tenuis* (17.8 %).

Common: *Achnanthes kryophila*, *Nitzschia palea*.

Fairly common: *Achnanthes flexella*, *Cymbella angustata*, *C. delicatula*, *C. laevis*, *C. variabilis* var. *botellus*, *Nitzschia denticula*.

Centric: *Cyclotella antiqua* (rare), *C. comta* (rare), *Melosira ambigua* (rare),

- M. islandica* (rare), *M. roeseana* (rare), *Stephanodiscus astraea* (rare), *S. astraea* var. *minutula* (rare).
Rare: *Fragilaria construens* var. *exigua*, *Neidium kozlowii*.
In all: 67 forms.
- No. 131. 1.VIII.1950. The river Kedelkrogelv. Coat on stone in the river.
Dominants: *Fragilaria capitellata* (19.6 %), *Ceratoneis arcus* (18.8 %), *Nitzschia hantzschiana* (17.2 %).
Common: *Achnanthes kryophila*, *Cymbella latens*.
Fairly common: *Achnanthes linearis*, *Cymbella variabilis* var. *botellus*, *C. knuthii*, *Denticula tenuis*, *Fragilaria capucina*, *Navicula cryptocephala*, *Synedra minuscula*.
No centric forms.
Rare: *Navicula subrotundata*, *Neidium kozlowii* var. *elliptica*, *N. kozlowii* var. *parva*.
In all: 66 forms.
- No. 132. 1.VIII.1950. The river Kedelkrogelv. Moss between stones on river bank.
Dominant: *Nitzschia frustulum* (31.8 %).
Common: *Achnanthes kryophila*, *A. linearis*, *Ceratoneis arcus*, *Cymbella latens*, *Denticula tenuis*.
Fairly common: *Achnanthes flexella*, *Fragilaria capitellata*, *F. vaucheriae*.
Centric: *Cyclotella antiqua* (rare).
Rare: *Neidium producta* var. *polygibba*, *N. kozlowii*.
In all: 77 forms.
- No. 134. 1.VIII.1950. The river Kedelkrogelv. Moss between stones covered by water.
Dominants: *Achnanthes kryophila* (10.2 %), *Meridion circulare* (17.6 %).
Common: *Caloneis silicula* var. *alpina*, *Ceratoneis arcus*, *Fragilaria capucina*, *Pinnularia gracillima*.
Fairly common: *Cymbella cistula*, *Denticula tenuis*, *Fragilaria vaucheriae*, *Nitzschia frustulum*, *Stauroneis javanica*.
No centric forms.
Rare: *Achnanthes plitvicensis*, *Navicula amphibola*.
Meridion circulare is a character species of running water.
In all: 68 forms.
- No. 142. 4.VIII.1950. The river Kedelkrogelv. Scraping from stone in the river.
Dominants: *Fragilaria vaucheriae* (35.6 %), *Ceratoneis arcus* (30.6 %).
Common: *Achnanthes kryophila*, *A. linearis*, *Cymbella ventricosa*.
Fairly common: *Cymbella variabilis* var. *botellus*.
No centric forms.
Rare: *Achnanthes lemmermanni*, *Navicula petersenii*, *N. declivis*, *N. subrotundata*.
In all: 45 forms.
- No. 143. 4.VIII.1950. The river Kedelkrogelv. Moss between stones in the river.
Dominants: *Ceratoneis arcus* (26.8 %), *Fragilaria vaucheriae* (27.4 %), *Achnanthes kryophila* (13.0 %), *A. linearis* (10.2 %).
Fairly common: *Achnanthes lapponica*, *Cymbella ventricosa*, *C. variabilis* var. *botellus*, *Nitzschia frustulum*.
Centric: *Cyclotella antiqua* (rare), *Melosira roeseana* (rare).
Rare: *Achnanthes lemmermanni*, *Navicula declivis*, *Stauroneis kriegeri*.
In all: 68 forms.

- No. 161. 5.VIII.1950. Brook in fell field about 450 m above sea level south of Jørgen Brønlund Fjord. Coat of plants in the brook.
 Dominants: *Achnanthes microcephala* (34.2 %), *A. kryophila* (19.6 %), *Navicula contenta* fo. *parallela* (18.4 %).
 Common: *Achnanthes broenlundensis*, *Fragilaria capucina*.
 Fairly common: *Navicula perpusilla*.
 Centric: *Cyclotella antiqua* (rare), *C. stelligera* (rare), *Melosira roeseana* (rare).
 Rare: *Eunotia papilio*, *Fragilaria vaucheriae* var. *septentrionalis*.
 In all: 56 forms.
- No. 198. 8.VIII.1950. Wall washed by water from the river Kajakelv south of Jørgen Brønlund Fjord. Scraping from dolomite wall.
 Dominants: *Ceratoneis arcus* (20.2 %), *Achnanthes minutissima* (15.4 %), *Nitzschia hantzschiana* (10.6 %).
 Common: *Cymbella variabilis* var. *botellus*.
 Fairly common: *Achnanthes kryophila*, *Cymbella laevis*, *C. ventricosa*, *Denticula tenuis*.
 Centric: *Cyclotella antiqua* (rare).
 Rare: *Achnanthes plitvicensis*, *Neidium distincte-punctatum*.
 In all: 45 forms.
- No. 223. 11.VIII.1950. Lower water-fall of the river Kedelkrogelv. Scraping of rocky ground in rapid current.
 Dominants: *Achnanthes kryophila* (35.6 %), *Ceratoneis arcus* (31.4 %), *Achnanthes minutissima* (11.8 %).
 Fairly common: *Cymbella ventricosa*, *Fragilaria vaucheriae*, *Cymbella perpusilla*.
 Centric: *Cyclotella antiqua* (rare).
 In all: 51 forms.

VIII. Samples from Water-Falls.

- No. 196. 8.VIII.1950. Water-fall in the river Kajakelv south of Jørgen Brønlund Fjord. Scraping from dolomite wall sprayed by the fall.
 Dominants: *Achnanthes microcephala* (45.4 %), *A. kryophila* (11.2 %), *Ceratoneis arcus* (11.8 %), *Gomphonema angustatum* var. *producta* (11.0 %).
 Common: *Fragilaria vaucheriae*, *F. capucina*.
 Centric: *Melosira roeseana* (rare).
 Rare: *Achnanthes plitvicensis*.
 In all: 38 forms.
- No. 197. 8.VIII.1950. Wall under the water-fall in the river Kajakelv. Scraping of dolomite wall.
 Dominants: *Achnanthes thienemanni* (37.2 %), *A. linearis* (20.0 %), *Ceratoneis arcus* (19.0 %), *Fragilaria vaucheriae* (15.0 %).
 Fairly common: *Cymbella variabilis* var. *botellus*.
 No centric forms.
 Rare: *Achnanthes thienemanni* (dominant!)
 In all: 33 forms.

SYSTEMATIC PART

In the following section the diatoms found are mentioned in systematic succession according to the arrangement used by F. HUSTEDT (preferably in 1930 and 1930—37).

As the determination in many cases has been extremely difficult and as the decision probably in a number of cases, because of the prevalent uncertainty as regards the delimitation of species on the basis of the existing, sometimes somewhat deficient description and less perfect drawings, with some justification may be contested, it will always be stated according to what descriptions and pictures the determination has been made. Furthermore drawings of a considerable number of the species found are reproduced in the plates at the end, and length, breadth, and number of striae for the specimen drawn will be indicated in the mention in the text. I have considered it important to publish drawings of a large number of forms (as I also did it in FOGED 1953) in order in this way to contribute to producing a material for comparison which may be used at the treatment of the diatom flora from other regions. The Reichert drawing apparatus, apochromatic objective $100\times$ (oil immersion), and compensation ocular $20\times$ have been used for the drawing in every case. The rendering is generally at a magnification of about $1500\times$ (if the magnification deviates very much from this, it has been stated in the description of the plate in question, and the measures as stated may be found in the description in the text).

As the localities from which the samples originate, as far as I can judge, are very homogeneous as regards the more important ecological factors, mention of ecological conditions have been restricted as much as possible and have only been included if conditions of particular interest can be adduced. As a large number of the species have also been found in the material from West Greenland described in FOGED 1953, reference is made to the general ecological information given there. The addition of "W. Greenl." to the mention of a species indicates that it has also been found in the material from West Greenland described by me. The addition of "N. Amer." indicates that the species according to

BOYER'S Synopsis (1926—27) or BOYER 1916 has been found in North America.

It is indicated for each species in which samples the species has been found by giving the numbers of the samples. If the species has been found during counting up to 500 valves, the percentage indicating its frequency is given in parenthesis after the number of the sample. The absence of a statement of percentage after the number of a sample means that the species has not been found in the preparation until the counting up to 500 valves was finished.

The samples are given for each species in the succession in which the samples have been listed in Ch. 8. For a general survey this succession is given here with statement of the biotopical placing of the sample:

Soil: nos. 13, 144, 209. Moss: nos. 145, 208, 225. Swamps: nos. 4, 222. Pools: nos. 5, 12, 14, 133, 204, 226. Lakes: a. Klareø: nos. 1, 2, 10, 82, 83, 84. b. Other lakes: nos. 160, 192, 193, 194, 195, 224. Springs: nos. 3, 8, 9, 159, 162, 206, 207. Rivers and brooks: nos. 6, 7, 11, 131, 132, 134, 142, 143, 161, 198, 223. Water-falls: nos. 196, 197.

A. Centrales.

Coscinodiscaceae.

The centric genera *Melosira*, *Cyclotella*, and *Stephanodiscus* are all represented, but are nearly always few in number. As the species of these genera often preferably occur pelagically, their possibility of occurrence in our material will be very limited. *Cyclotella* is the genus occurring most frequently in the lakes. *Stephanodiscus* is the genus occurring most rarely. This distribution of the three genera confirms the view of their trophic demands, which amongst other things has been supported by a study of their occurrence in plankton in lakes in Funen (FOGED 1954). The centric forms which may also occur aerophilously, are the most frequent forms in Pearyland. The genus *Coscinodiscus* has not been shown to occur.

In the West Greenland material centric genera were still more sparsely represented than in Pearyland.

Melosira Agardh.

It is remarkable that *M. distans* (Ehr.) Kütz., which is otherwise a widely distributed species in oligotrophic and dystrophic localities in northern regions, is extremely rare in Peary Land, whereas other—more “southerly”—species are more frequent, although never common.

Melosira ambigua (Grun.) O. Müller. HUSTEDT 1930, p. 89, fig. 49. No. 14, 1, 2, 8, 11.

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

Rare in one sample (no. 1).

As it is one of the most widely distributed *Melosira* species in the smaller oligotrophic lakes of Northern Europe, and as it must be considered a stenothermal cold-water form, its rare occurrence in this material is difficult to explain.

W. Greenl. (not common). N. Amer.

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

No. 13 (0.4 %), 14, 1, 2, 9 (0.2 %), 11 (0.2 %).

A cold-water form which is fairly common in eutrophic-oligotrophic lakes in Northern Europe.

- *italica* (Ehr.) Kütz. HUSTEDT 1930, pl. 91, fig. 50.
Few in number or rare in two samples (no. 1, 9 (0.4 %)).
W. Greenl. (very rare). N. Amer.
- *roeseana* Rabh. HUSTEDT 1930, p. 93, fig. 59.
No. 133 (5.6 %), 9 (2.0 %), 159, 162 (0.4 %), 6, 11, 134 (0.4 %), 143, 161, 196.
The commonest *Melosira* species in the area, which is in agreement with the fact that it preferably occurs aerophilously (on moist soil and in soaked moss).
W. Greenl. (not common). N. Amer.

Cyclotella Kütz.

- Cyclotella antiqua* Kütz. HUSTEDT 1930, p. 102, fig. 75.
No. 225 (2.0 %), 222 (0.2 %), 1 (3.2 %), 2 (4.8 %), 10 (0.8 %), 82 (1.4 %), 83 (1.6 %), 84 (0.8 %), 160 (0.2 %), 192 (10.0 %), 193 (6.6 %), 194 (8.2 %), 195 (4.6 %), 224 (0.8 %), 159, 207, 6 (0.4 %), 7, 11, 132, 143, 161, 198, 223.
The most frequent *Cyclotella* species in the area (in 24 samples in all).
W. Greenl. (rare). N. Amer.
- *comta* (Ehr.) Kütz. HUSTEDT 1930, p. 103, fig. 69.
No. 13 (0.2 %), 4, 12, 1, 8, 9 (0.2 %), 11.
W. Greenl. (rare). N. Amer.
- *Kützingiana* Thw. var. *planetophora* Fricke. HUSTEDT 1930, p. 99, fig. 63.
Rare in two samples (nos. 192, 195 from Klaresø).
- — var. *radiosa* Fricke. HUSTEDT 1930, p. 99, fig. 64.
Rare in two samples (nos. 192, 195 from Klaresø).
W. Greenl. (rare).
- *stelligera* Cleve & Grunow. HUSTEDT 1930, p. 100, fig. 65.
No. 192 (1.4 %), 193 (0.2 %), 194 (0.6 %), 195 (0.8 %), 161.
Four of the samples originate from Grydesø.

Stephanodiscus Ehr.

The *Stephanodiscus* genus as a rule particularly occurs in water with a higher content of nutrients than required by *Cyclotella* and *Melosira*. In W. Greenl. the genus seems even rarer than in Peary Land.

- Stephanodiscus astraea* (Ehr.) Grun. HUSTEDT 1930, p. 110, fig. 85.
No. 12, 1, 9 (0.2 %), 11.
W. Greenl. (rare), N. Amer.
- — var. *minutula* (Kütz.) Grun. HUSTEDT 1930, p. 110, fig. 86.
Rare in one sample (no. 11).
- *hantzschii* Grun. HUSTEDT 1930, p. 110, fig. 87.
Rare in one sample (no. 12).

B. Pennales.

I. Araphideae.

Tabellaria Ehr.

The two species *T. fenestrata* and *T. flocculosa*, which are very frequent in sub-arctic and temperate regions in Europe are extremely scarce in the present material.

- Tabellaria fenestrata* (Lyngb.) Kütz. HUSTEDT 1930, p. 122, fig. 99.
No. 13 (0.2 %), 145, 208, 5, 12, 14, 1, 2, 84, 3, 8 (0.4 %), 9, 159, 162, 6 (0.2 %), 7, 11, 131, 132, 161, 198.

The specimens found perhaps belong to var. *intermedia* Grun., as this variety was found in four samples in Klaresø, where the species does not seem to occur. Species and variety can only be distinguished when the number of girdle bands can be established. This was not possible in the 21 samples listed above, in which the valves are always seen in valve-view.

W. Greenl. (common). N. Amer.

- — var. *intermedia* Grun. HUSTEDT 1930—37, II, p. 27, fig. 555.
No. 192 (3.0 %), 193 (5.6 %), 194 (0.4 %), 195 (1 %). (Found in Grydesø only).
W. Greenl. (common).

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

No. 5, 12, 1, 192, 193 (0.2 %), 9.

W. Greenl. (common). N. Amer.

(*T. binalis* (Ehr.) Grun., which is characteristic of many localities with oligotrophic-dystrophic water in Northern Europe and N. Amer. has not been shown to occur in Greenland.)

Meridion Ag.

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

No. 209 (0.2 %), 225, 12, 14, 133 (1.0 %), 1, 160 (0.8 %), 192, 193, 224, 3 (1.2 %), 8, 9, 159 (0.8 %), 162, 206 (0.2 %), 7, 131, (0.2 %), 134 (17.6 %), 142 (0.6 %), 143 (0.8 %), 161 (0.8 %), 198, 223 (0.4 %), 196.

A typically rheobiontic form.

W. Greenl. (common). N. Amer.

(*Tetracyclus* Ralfs, which is fairly widely distributed both in N. Eur. and in N. Amer., has neither been found in the present material nor in W. Greenl.)

Diatoma De Candolle.

Diatoma elongatum Ag. HUSTEDT 1930, p. 127, fig. 111.

No. 225 (5.6 %), 222, 12, 204 (0.2 %), 1 (6.2 %), 2 (9.0 %), 10 (0.4 %), 82 (4.8 %), 83 (2.4 %), 84 (10.0 %), 192 (1.4 %), 193 (0.4 %), 194 (5.4 %), 195 (0.6 %), 224 (2.2 %), 8, 159, 162, 6, 7, 132, 134 (0.2 %), 143, 198 (0.4 %), 223 (0.4 %), 197.

Very eurytopic species, which is common in W. Greenl. N. Amer.

(*D. hiemale* (Lyngb.) Heiberg, which is a pronounced cold-water form has neither been found in this material nor in W. Greenl., whereas it is found in N. Eur. and in N. Amer.).

Ceratoneis Ehr.

Ceratoneis arcus (Ehr.) Kütz. HUSTEDT 1930, p. 134, fig. 122, 1930—37, II, p. 179, fig. 684 a, b.

Plate I, fig. 21: $52 \times 4.5 \mu$. 15—16 striae in 10μ .

No. 13 (0.2 %), 144 (2.4 %), 209, 145 (0.4 %), 208 (0.2 %), 225 (0.2 %), 4, 222 (0.6 %), 12 (6.6 %), 14 (0.2 %), 133 (1.0 %), 204 (1.0 %), 226 (0.6 %), 1 (0.2 %), 2 (0.4 %), 82 (0.2 %), 160 (11.0 %), 192, 193, 194 (0.8 %), 195 (0.2 %), 224 (0.2 %), 3 (4.6 %), 8, 9 (9.0 %), 159, 206 (4.8 %), 207 (2.0 %), 6 (0.4 %), 7 (2.8 %), 11, 131 (18.8 %), 132 (5.2 %), 134 (5.8 %), 142 (30.6 %), 143 (26.8 %), 161 (1.4 %), 198 (20.2 %), 223 (31.4 %), 196 (11.8 %), 147 (19.0 %).

Like *Meridion circulare* this species is markedly rheobiontic (or perhaps rheophilous). It is one of the commonest diatoms in the area, occurring with 4.8 % of all valves counted (in 41 samples in all).

W. Greenl. (not common). N. Amer.

- var. *amphioxys* (Rabh.) Brun. HUSTEDT 1930—37, II, p. 179, fig. 684d.
 Plate I, fig. 20: $23 \times 5.2 \mu$. 16—17 striae in 10μ .
 No. 82, 142 (1.0 ‰), 143 (0.4 ‰), 223 (1.2 ‰).
 Plate I, fig. 19: $27 \times 4.8 \mu$. 15—16 striae in 10μ is closely related to var. *amphioxys*. The extension in the middle of the ventral side is, however, less marked in I: 19 than in the typical *C. amphioxys*.

Fragilaria Lyngbye.

The genus is represented by a fairly large number of species, which, however, here as in many other places are difficult to keep apart. In order to show more clearly what forms are included under the names of species used, some of them have been pictured in the plates.

Fragilaria brevistriata Grun. HUSTEDT 1930—37, II, p. 168, fig. 676 a—e.

Plate I, fig. 13: $10 \times 4 \mu$. 12—14 striae in 10μ .

According to HUSTEDT 1930—37, II, p. 168 the dimensions are $12—28 \times 3—5 \mu$ with 13—17 striae in 10μ .

No. 192, 194, 195 (0.4 ‰), 11.

W.Greenl. (not common).

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

Plate I, fig. 12: $17.5 \times 2.6 \mu$. 16—17 striae in 10μ .

No. 225 (4.2 ‰), 222 (5.8 ‰), 160 (0.6 ‰), 224 (3.0 ‰), 207 (1.0 ‰), 131 (19.6 ‰), 132 (4.2 ‰), 134 (0.2 ‰), 142 (0.8 ‰), 223 (0.2 ‰).

I am inclined to think that the form pictured stands between *F. vaucheriae* Boye Petersen and *F. capitellata*, but somewhat closer to the latter than to the former; for *F. capitellata* has 18 striae in 10μ , rhombic-lanceolate, subcapitate valves with a generally lanceolate—in the middle extended—pseudoraphe and rather thin valves. Apart from the form of the pseudoraphe there is thus a fairly great similarity between I: 12 and *F. capitellata*. I: 12, however, is considerably narrower than e. g. the specimens of *F. capitellata* pictured by BOYE PETERSEN 1946, p. 54, fig. 4, the dimensions of which are $12.5—28 \times 5.0—5.8 \mu$ with 18—22 striae in 10μ . *F. vaucheriae* Boye Petersen as described by BOYE PETERSEN 1938, p. 168, fig. 1, has the dimensions $13.4—38.4 \times 5.0—5.8 \mu$ with 13.2—14.5 striae in 10μ (in Kamchatka material, however, about 15 striae in 10μ), and the valves are considerably more robust than in *F. capitellata*.

It is remarkable that *F. capitellata* and *F. vaucheriae* have not been found together in the present material, which seems to show that it must be a question of two forms which are clearly distinct.

W.Greenl. (rare).

- *capucina* Desmazieres. HUSTEDT 1930, p. 138, fig. 126.

Plate I, fig. 3: $52 \times 3 \mu$. 14—15 striae in 10μ .

Plate I, fig. 4: $41 \times 3 \mu$. 14 striae in 10μ .

No. 13 (19.2 ‰), 209 (5.4 ‰), 208 (0.2 ‰), 225 (5.0 ‰), 222 (4.4 ‰), 14 (6.0 ‰), 133 (1.4 ‰), 204 (0.8 ‰), 226 (0.6 ‰), 2 (2.0 ‰), 82, 192 (17.0 ‰), 193 (4.4 ‰), 194 (1.4 ‰), 195 (1.0 ‰), 224 (1.2 ‰), 3 (1.2 ‰), 9 (2.6 ‰), 159 (1.6 ‰), 162, 206 (17.0 ‰), 11 (1.0 ‰), 131 (4.4 ‰), 134 (7.0 ‰), 143 (1.6 ‰), 161 (8.8 ‰), 198 (1.8 ‰), 223 (0.6 ‰), 196 (6.2 ‰).

The commonest *Fragilaria* species in the area. Rather variable and widely distributed in all the biotopes.

W.Greenl. (common). N.Amer.

- — var. *lanceolata* Grun. HUSTEDT 1930—37, II, p. 144, figs. 659 f, g. A. CLEVE-EULER 1953, II, p. 46, fig. 357 g.
 Plate I, fig. 1: $80 \times 2.3 \mu$. About 17—18 striae in 10μ . No. 225 (3.6 %), 222 (3.0 %), 84 (1.0 %), 224 (1.4 %), 8 (8.6 %), 9 (0.6 %), 6 (1.6 %), 7 (0.4 %), 223. W.Greenl. (rare).
 I: 1 is with some doubt referred to *F. capucina* var. *lanceolata*, as the middle striae are very little fainter than the others and the number of striae is close to or immediately above the upper limit for this species and variety. In A. CLEVE-EULER 1953, II, p. 46 the number of striae is stated to be 13—17 in 10μ .
 There are similarities to both *F. crotonensis* KITTON and *F. gracillima* A. Mayer, but the agreement with *F. capucina* var. *lanceolata* seems more obvious than with these two species.
- *construens* (Ehr.) Grun. HUSTEDT 1930, p. 140, fig. 135.
 Plate I, fig. 17: $9.7 \times 5.2 \mu$. 15—16 striae in 10μ .
 Plate I, fig. 18: $11.2 \times 4.5 \mu$. 14 striae in 10μ .
 No. 12 (0.2 %), 14, 2 (0.2 %), 10 (11.4 %), 82, 160, 192 (0.4 %), 193 (3.0 %), 194 (1.0 %), 8, 9, 6, 7, 11, 131 (0.2 %).
 W.Greenl. (not common). N.Amer.
 According to HUSTEDT 1930—37, II, p. 156 *F. construens* has a "Pseudoraphe in der Mitte mehr oder weniger lanzettlich erweitert." Even though this is not the case, neither in I: 17 nor in I: 18, these forms must, however, be considered rather typical of this very variable species.
- — var. *exigua* (W. Smith) Schulz. HUSTEDT 1930—37, II, p. 159, figs. 670 t—v. No. 12, 14, 11.
- — var. *subsalina* Hustedt. HUSTEDT 1930—37, II, p. 159, figs. 670 p—s. No. 10.
- — var. *venter* (Ehr.) Grun. HUSTEDT 1930—37, II, p. 158, figs. 670 h—m. No. 10, 192 (2.6 %), 193 (2.2 %), 194, 195 (0.4 %).
- *pinnata* Ehr. HUSTEDT 1930, p. 142, fig. 144.
 Plate I, fig. 22: $25.3 \times 4.0 \mu$. 10 striae in 10μ .
 Plate I, fig. 24: $3.8 \times 3.3 \mu$.
 Plate I, fig. 25: $23 \times 4.3 \mu$. 8—9 striae in 10μ .
 Plate I, fig. 26: $9.1 \times 4.5 \mu$. 9 striae in 10μ .
 No. 5 (1.2 %), 12, 204, 2, 10 (1.4 %), 83, 192 (4.0 %), 193 (7.0 %), 194 (2.8 %), 195 (3.0 %), 9 (0.2 %), 11, 198, 196 (0.2 %), 197.
 W.Greenl. (not common).
 I: 22 is a typical linear form, while I: 24 represents the other extreme within this exceedingly variable species, as all transitional stages between the two forms are found (represented here by I: 25 and I: 26).
 According to HUSTEDT 1930—37, II, p. 160, the dimensions are $3-35 \times 2-6 \mu$ with 10 striae in 10μ .
- — var. *lancetula* (Schum.) Hustedt. HUSTEDT 1930—37, II, p. 161, figs. 671 m—o. Plate I, fig. 23: $13 \times 5.8 \mu$. 10 striae in 10μ . No. 14.
- *vaucheriae* (Kütz.) Boye Petersen. BOYE PETERSEN 1938, p. 167, fig. 1
 Plate I, fig. 6: $24 \times 3.3 \mu$. 12—13 striae in 10μ .
 Plate I, fig. 7: $25 \times 3.3 \mu$. 14—15 striae in 10μ .
 Plate I, fig. 8: $30 \times 3.3 \mu$. 12—13 striae in 10μ .
 Plate I, fig. 11: $19.5 \times 3.7 \mu$. 12 striae in 10μ .
 No. 144 (1.6 %), 145 (0.2 %), 208 (0.2 %), 225 (0.8 %), 4, 12, 133 (2.4 %)

204 (0.2 ‰), 1, 2 (0.4 ‰), 82 (0.4 ‰), 83, 84, 160 (2.6 ‰), 192 (0.4 ‰), 194 (0.6 ‰), 9 (0.6 ‰), 206 (4.6 ‰), 6 (2.0 ‰), 7 (0.4 ‰), 11 (0.2 ‰), 131, 132 (4.6 ‰), 134 (2.4 ‰), 142 (35.6 ‰), 143 (27.4 ‰), 198, 223 (4.2 ‰), 196 (6.4 ‰), 197 (9.2 ‰). (See above sub *F. capitellata* (Grun.) Boye Petersen).

W.Greenl. (fairly common).

- — var. *septentrionalis* Østrup. ØSTRUP 1910 b, p. 250, Plate XIV, fig. 19.

Plate I, fig. 5: $32 \times 3.8 \mu$. 16 striae in 10μ .

No. 3, 161.

According to ØSTRUP 1910 b, p. 250, the dimensions are $23-30 \times 3.6 \mu$ with 16 striae in 10μ .

- *vaucheriae* (Kütz.) Boye Petersen.?

Plate I, fig. 9: $34 \times 3 \mu$. 16 striae in 10μ .

No. 206 (0.8 ‰), 198 (0.2 ‰), 197 (5.8 ‰).

Plate I, fig. 10: $22.5 \times 4 \mu$. 16—17 striae in 10μ .

No. 9.

Both forms are referred to *F. vaucheriae* with some doubt, as they both are somewhat outside the limits given by BOYE PETERSEN 1938, p. 168.

- *virescens* Ralfs var. *elliptica* Hustedt. HUSTEDT 1930—37, II, p. 163, fig. 672A e.

No. 195, 207, 223 (0.2 ‰).

W.Greenl. (rare). N.Amer.

- — var. *oblongella* Grun. HUSTEDT 1930—37, II, p. 163, fig. 672 A f.

No. 195.

Synedra Ehr.

This genus, which includes many cosmopolitan species, is very sparsely represented in the present material, both as regards species and number of valves.

Synedra famelica Kütz.? HUSTEDT 1930, p. 158, fig. 181.

Plate I, fig. 14: $22.5 \times 3.2 \mu$. About 18 striae in 10μ .

No. 132 (0.4 ‰), 134 (0.6 ‰).

I: 14 is with some doubt referred to *S. famelica*, which is stated to be a boreo-alpine form.

- *minuscula* Grun. HUSTEDT 1930, p. 158, fig. 180.

Plate I, fig. 15: $29 \times 1.4 \mu$. 16—17 striae in 10μ .

Plate I, fig. 16: $54 \times 2 \mu$. 15—16 striae in 10μ .

No. 133 (0.2 ‰), 82, 83 (0.6 ‰), 131 (2.4 ‰), 132 (1.8 ‰), 134 (1.6 ‰).

The form pictured also resembles *S. nana* Meister, but it has not like the latter more or less capitate apices, and *S. tenera* W. Smith, which, however, differs from I: 15 and 16 by having considerably denser striae (20—24 in 10μ).

- *nana* Meister. HUSTEDT 1930—37, II, p. 212, fig. 704.

No. 2 (0.8 ‰).

Pelagic form, which, for that matter, is stated to be widely distributed in arctic and subarctic areas.

- *ulna* (Nitzsch) Ehr. HUSTEDT 1930, p. 151, fig. 158, 159.

No. 1.

W.Greenl. (fairly common). N.Amer.

- — var. *amphirhynchus* (Ehr.) Grun. HUSTEDT 1930, p. 154, fig. 167.

Plate I, fig. 2: $65 \times 3.3 \mu$. 12—13 striae in 10μ .

No. 10 (0.2 ‰).

- — var. *biceps* (Kütz.) v. SCHÖNFELDT. HUSTEDT 1930—37, II, p. 200, fig. 691 A g.

No. 11.

II. Raphidioideae.

Eunotia Ehr.

This genus, most freshwater species, which have their optimum development in slightly acid or circumneutral, oligotrophic or dystrophic water, is represented in this material by 21 forms and hence is one of the more prominent genera, even though the number of valves in most samples is rather small. Many of the species of the genus especially occur in northern regions.

Eunotia arcus Ehr. HUSTEDT 1930, p. 175, fig. 216. FOGED 1953, Pl. I, figs. 18, 20.

No. 225 (1.8 ‰), 204, 1 (0.4 ‰), 2, 83 (0.2 ‰), 84, 192 (0.4 ‰), 193 (3.6 ‰), 194 (0.4 ‰), 195, 224, 8, 9, 7, 223 (0.2 ‰).

W.Greenl. (rare). N.Amer.

— *bigibba* Kütz. HUSTEDT 1930—37, II, p. 282, fig. 747 B, a. Schmidt's Atl. Pl. 290, figs. 9—19. FOGED 1953, Pl. II, fig. 1.

Plate III, fig. 4: $33 \times 8.5 \mu$. 13 striae in 10μ .

No. 225, 5 (0.8 ‰), 14 (0.2 ‰), 133 (0.2 ‰), 1, 194 (1.0 ‰), 224, 159 (1.4 ‰), 6 (0.4 ‰), 11, 131 (0.2 ‰), 132, 134 (1.2 ‰).

According to HUSTEDT 1930—37, II, p. 282 the dimensions are $20-55 \times 9-18 \mu$ with 12—15 striae in 10μ ; the apices are capitate and more or less turned back towards the dorsal side "und etwas nach aussen gerichtet, am apikalen Rand flach gestutzt." III: 4 differs from this by not having capitate but rounded-off ends. III: 4 has a certain similarity to forms of *E. diodon* Ehr., but as the latter has a completely straight ventral margin and III: 4 is otherwise in good agreement with *E. bigibba* Kütz, it has been referred to this species.

W.Greenl. (not common).

— var. *pumila* Grun. HUSTEDT 1930—37, II, p. 282, figs. 747 B, c—h.

No. 145 (4.4 ‰), 132 (0.2 ‰).

— *diodon* Ehr. HUSTEDT 1930—37, II, p. 276, fig. 742. FOGED 1953, Pl. II, figs. 11-13.

Plate III, fig. 5: $27 \times 10 \mu$. 12—14 striae in 10μ .

No. 145 (0.6 ‰), 14, 193 (0.4 ‰), 134 (0.2 ‰), 161.

W.Greenl. (not common). N.Amer.

— *exigua* (Bréb.) Grun. BOYE PETERSEN 1950, p. 6, Pl. 1, figs. 3—13.

No. 145 (0.4 ‰), 5 (1.8 ‰), 161 (0.4 ‰).

W.Greenl. (fairly common).

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

No. 209 (0.6 ‰), 208 (0.4 ‰), 204, 206, 207, 131.

W.Greenl. (not common). N.Amer. (BOYER 1926, p. 217: Common, especially northward).

— *lunaris* (Ehr.) Grun. HUSTEDT 1930, p. 183, fig. 249.

Plate III, fig. 10: $32 \times 3 \mu$. 18—19 striae in 10μ . Fairly small specimens.

No. 14 (0.2 ‰), 134, 161.

W.Greenl. (common). N.Amer.

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

No. 208 (0.6 ‰), 14 (0.2 ‰), 207, 6, 161.

W.Greenl. (not common). N.Amer. (BOYER 1926, p. 216: Generally distributed northward).

— var. *bidens* (Greg.) W. Smith. HUSTEDT 1930—37, II, p. 306, fig. 772 d.

No. 194, 159, 161 (0.4 ‰).

W.Greenl. (rare).

- — var. *maior* (W. Smith) Hustedt. HUSTEDT 1930—37, II, p. 306, fig. 772 c.
No. 193 (0.6 ‰).
W.Greenl. (rare).
- *papilio* (Grun.) Hustedt. HUSTEDT 1930—37, II, p. 278, fig. 745. 1924, Pl. 18, fig. 20.
Plate III, fig. 1: $50 \times 13 \mu$. 7—8 striae in 10μ .
Plate III, fig. 2: $34 \times 14 \mu$. 8 striae in 10μ .
No. 145 (0.4 ‰), 208, 5 (3.4 ‰), 14 (0.2 ‰), 159, 161.
W.Greenl. (rare).
In the present material the species *E. papilio* and *E. suecica* A. Cleve are obviously connected by transitional forms, as it is often very difficult with certainty to refer the valves observed to either of the two species. The valves also often seem to point towards *E. bigibba*. The forms from the present material which have been referred to *E. papilio* or *E. suecica* are all coarsely striated (7—9 striae in 10μ), which is the lower limit of the ordinary striation, as *E. papilio* is stated to have 9—16, and *E. suecica* 8—12 striae in 10μ .
Both III: 1 and III: 2 have steeply sloping curves and broad, flat ends, which in III: 1 are flatly cut off, in III: 2 rounded-off.
According to HUSTEDT 1930—37, II, p. 278 *E. papilio* has “Buckel gegen die Enden steil, mehr oder weniger rechtwinklig abfallend. Enden breit und stumpf, flach gerundet bis gestutzt” and the dimensions $18—50 \times 12—23 \mu$ with 9—16 striae in 10μ , while *E. suecica* has (p. 279) “wenig konkavem bis fast geradem Ventralrand. Buckel nach den Enden schief abfallend. Schalen vor den Polen mehr oder weniger deutlich eingeschnürt, an den Enden flach fast geradlinig gestutzt” and the dimensions $30—60 \times 13—20 \mu$ with 8—12 striae in 10μ .
- *pectinalis* (Kütz.) Rabh. HUSTEDT 1930, p. 180, fig. 237.
No. 225 (0.4 ‰), 204, 194 (0.6 ‰), 224 (0.4 ‰), 6, 132 (0.4 ‰).
W.Greenl. (not rare). N.Amer.
- *praerupta* Ehr. HUSTEDT 1930, p. 194, fig. 211.
Plate II, fig. 1: $66 \times 9 \mu$. 7 striae in 10μ .
Plate II, fig. 7: $44 \times 11 \mu$. 12—13 striae in 10μ .
Plate II, fig. 8: $22 \times 6.5 \mu$. 11 striae in 10μ .
According to HUSTEDT 1930—37, II, p. 280 the dimensions are $10—100 \times 4—13 \mu$ with 6—12 striae in 10μ . The species consequently is very variable.
No. 13 (1.8 ‰), 144 (0.4 ‰), 145 (0.2 ‰), 225 (3.4 ‰), 5 (0.6 ‰), 14 (1.2 ‰), 2, 10 (4.2 ‰), 82, 192 (0.2 ‰), 193 (1.2 ‰), 195 (0.6 ‰), 224, 159 (1.2 ‰), 6 (0.2 ‰), 11, 131, 132 (0.2 ‰), 161, 223 (0.4 ‰).
W.Greenl. (common). N.Amer.
- — var. *bidens* Grun. HUSTEDT 1930, p. 174, fig. 213, 1930—37, II, p. 281, figs. 747 A, i—m.
Plate II, fig. 2: $63 \times 9 \mu$. 14—16 striae in 10μ .
No. 14 (0.4 ‰), 194 (0.4 ‰), 159 (0.2 ‰).
W.Greenl. (not rare). N.Amer.
- — var. *excelsa* Krasske. KRASSKE 1938, pp. 526—532, figs. 2, 3.
Plate II, fig. 3: $36 \times 14 \mu$. 9 striae in 10μ .
Plate II, fig. 4: $30 \times 12 \mu$. 6 striae in 10μ .
According to KRASSKE 1938 var. *excelsa* has “Dorsalrand hoch gewölbt, Buckel ziemlich spitz gerundet.” “Grenzvariation.”
Both II: 3 and II: 4 have so highly bulging and pointedly rounded-off a curve that, if anything, they must be referred to var. *excelsa*. This variety is fairly

closely related to var. *inflata* Grun., but the latter has a considerably more flatly rounded-off protuberance.

No. 144 (2.0 ‰), 162 (0.8 ‰), 134 (0.8 ‰).

- — var. *inflata* Grun. HUSTEDT 1930, p. 174, fig. 212. 1930—37, II, p. 280, figs. 747 A, f, g. A. Schmidt's Atlas Pl. 273, figs. 18, 19, 20. FOGED 1953, Pl. II, figs. 3, 4.

Plate II, fig. 9: $17 \times 9.7 \mu$. 14—15 striae in 10μ .

Plate II, fig. 10: $19.5 \times 9.1 \mu$. 12 striae in 10μ .

Both specimens pictured resemble fo. *curta* Grun. in A. Schmidt's Atlas, Pl. 273, fig. 18, which by HUSTEDT 1930—37, II, p. 280, has been included in var. *inflata* Grun.

It only differs from the species by having a more highly vaulted curve than the latter.

No. 144 (0.4 ‰), 145 (0.4 ‰), 14, 159 (2.6 ‰), 162 (1.0 ‰), 132, 161.

W. Greenl. (fairly rare).

- — var. *laticeps* Grun. CLEVE & GRUNOW 1880, p. 109, Pl. VII, fig. 123.

Plate II, fig. 6: $23 \times 10 \mu$. 9—10 striae in 10μ .

According to CLEVE & GRUNOW 1880, p. 109: "Eine extreme Form der vielgestaltigen *E. praerupta* mit sehr breiten Enden und hochgewölbtem Rücken." "Querstreifen dünn und zart punktiert, in der Mitte 7 in 10μ , an den Enden enger." Dimensions: $38.5 \times 12.7 \mu$ with 7 striae in 10μ .

Even though II: 6 is considerably smaller than the dimensions given by CLEVE & GRUNOW, both undoubtedly belong to the same form cycle within the species *E. praerupta*.

No. 5.

- — var. *monodon* Østrup. ØSTRUP 1897, p. 273, Pl. I, fig. 11.

Plate II, fig. 11: $21.5 \times 12.3 \mu$. 8—9 striae in 10μ .

Closely related to var. *excelsa* Krasske, but has a still more pointed curve than the latter. Is maintained here as it agrees fairly closely with ØSTRUP's specimen, the dimensions of which are stated to be $24 \times 9 \mu$ with 10 striae in 10μ .

No. 5.

- — var. *musciicola* Boye Petersen. HUSTEDT 1930—37, II, p. 280, fig. 747 A, h. BOYE PETERSEN 1928, p. 377, fig. 3. FOGED 1953, Pl. II, fig. 2.

Plate II, fig. 5: $34 \times 12 \mu$. 8 striae in 10μ .

A characteristic variety, which was first found by BOYE PETERSEN in East Iceland (1928, p. 377, fig. 3). BOYE PETERSEN states the dimensions to be $26.4 \times 6.8 \mu$ with 11 striae in 10μ , and the following characteristics: "Linea ventrali ad apices recta, in medio curvata," just as the valve is uniformly broad in the whole of its length.

No. 133, 159 (0.2 ‰), 132, 161.

- *suecica* A. Cleve. HUSTEDT 1930—37, II, p. 279, fig. 746. A. Schmidt's Atlas Pl. 273, fig. 34, Pl. 291, figs. 25—27.

Plate III, fig. 3: $29 \times 13 \mu$. 8—9 striae in 10μ .

In A. CLEVE 1895, p. 29, Pl. I, figs. 31, 32 the dimensions are stated to be $25—30 \times 10 \mu$ with 14 striae in 10μ , and furthermore it is stated that it "resembles in outline *E. robusta* var. *papilio* Grun. (van Heurck Pl. 23, fig. 8), but the striation is quite different."

III: 3 is given as the type of the forms which are here included in *E. suecica*, to which it is referred, especially because of the clearly more steeply sloping curves than is the case in *E. papilio*. In the striation no differences are observed

between the two species, as both i. a. have many intercalated shorter striae. No particular differences are seen in the relations of the pseudoraphe and the terminal nodes.

HUSTEDT writes about *E. succica* (1924, p. 543): "Zweifellos stehen sie der *E. zygodon* und der *E. indica* Grun. nahe, die sich im wesentlichen nur durch ihre Grösse davon unterscheiden."

No. 5 (2.0 ‰), 14 (0.6 ‰), 1 (0.2 ‰), 194 (0.2 ‰), 9, 159 (0.2 ‰), 6.

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

Plate III, fig. 6: $32.5 \times 5.2 \mu$. 15 striae in 10μ .

Plate III, fig. 7: $30 \times 3.3 \mu$. 16—17 striae in 10μ .

Plate III, fig. 8: $20.8 \times 3.2 \mu$. 15—16 striae in 10μ .

Plate III, fig. 9: $20.5 \times 2.5 \mu$. 17—18 striae in 10μ .

According to BOYE PETERSEN 1950, p. 12, what is typical of the species is that it has an almost straight ventral side and a flat dorsal side, that it has distinct "constrictions before the apices", slightly capitate apices "which are not recurved", and 15—20 striae in 10μ .

III: 7, 8, 9 can without difficulty be identified with *E. tenella*. Fig. 6 is somewhat more deviating, but as it seems to be closely similar to BOYE PETERSEN Pl. 2, fig. 25, it has also been referred to *E. tenella*.

No. 209 (0.4 ‰), 222, 14 (3.6 ‰), 194, 9, 132.

W.Greenl. (very common).

III. Monoraphideae.

Cocconeis Ehr.

The genus, the freshwater species of which preferably occur as epiphytes, is very sparsely represented in the material, viz. by only three species.

- Cocconeis hustedti* KRASSKE. HUSTEDT 1930—37, II, p. 361, fig. 816, 1937—39, p. 189, Pl. 13, figs. 15, 16.

Plate II, figs. 13, 14: $11 \times 5.2 \mu$; about 20 striae in 10μ , on valves with raphe as well as without raphe.

II: 13, 14 on all main points agree with HUSTEDT 1930—37, p. 361, fig. 816, as well as 1937—39, Pl. 13, figs. 15—16, and only differ from them by the fact that the central area is constantly regularly rounded-off, even though as a rule there is some difference between the striations of the two sides around the central area.

No. 8 (1.2 ‰).

The species has a general distribution in the mountains of Central Europe (KRASSKE 1923) and in Indonesia (HUSTEDT 1937—39).

- *placentula* Ehr. HUSTEDT 1930, p. 189, fig. 260.

Only found in Klaresø.

No. 1, 2 (0.4 ‰), 82, 83, 84 (0.2 ‰).

W.Greenl. (common). N. Amer.

- var. *euglypta* (Ehr.) Cleve. HUSTEDT 1930, p. 190, fig. 161.

No. 5, 1 (0.2 ‰), 2 (p.2 ‰), 10 (6.8 ‰), 192, 193 (0.2 ‰), 11, 131 (0.2 ‰).

- *thumensis* A. Mayer. HUSTEDT 1950, p. 347, Pl. 35, fig. 38. FOGED 1951, Pl. 2, fig. 12a.

Plate II, fig. 12: rapheless valve: $11.5 \times 7.8 \mu$. 12—14 striae in 10μ .

Only this one valve was found in the material. It differs somewhat from the ordinary type of the species, as the striae are very coarsely punctate, the dots being distinctly rounded-off, while as a rule—especially towards the edge of the valve—they are lengthened into shorter striae.

No. 2.

Achnanthes Bory.

The genus is represented by many species in the material and some of them display a considerable number of valves. Several of the species have very small and delicately striated valves, the determination of which according to species is often very difficult. Many of the species of the genus are characteristic of aerial biotopes, and a number of them have a pronounced northern distribution.

Achnanthes biasolletiana (Kütz.) Grun. HUSTEDT 1930—37, II, p. 379, fig. 823. 1946—50, Pl. 36, fig. 11 renders a rapheless valve of this species with a somewhat extended pseudoraphe as in

Plate IV, fig. 12: $9.7 \times 4.2 \mu$. 20 striae in 10μ .

According to HUSTEDT 1930—37, II, p. 379 the dimensions are: $10-30 \times 4.5-7 \mu$ and the number of striae on rapheless valves 25 and on valves with raphe 24—26 in 10μ . Even though IV: 12 has a somewhat coarser striation than stated in HUSTEDT, it should probably be referred to this species.

No. 10.

— *broenlundensis* nov. spec.

Fig. IV: 10, 11.

Valva elliptica, 13μ longa, 5.8μ lata. Frustulum inferius raphe subtili praeditum, area axiali angustissima, centrali ad margines mediasque strias valde abbreviatis versus longitudinaliter dilatata, striis valde radiantibus, manifesto punctatis, ca. 20 in 10μ . Frustulum superius area axiali linearari, angusta ornatum, mediis striis utrobique abbreviatis, aream centralem frustulo dimidio angustiore intermittentibus, striis perpendicularibus, manifesto punctatis, ca. 18 in 10μ .

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves elliptical, 13μ in length, 5.8μ in breadth. Raphe valve with a filamentous raphe, a very narrow axial area, the central area increasing in breadth towards the margin of the valve to the greatly shortened middle striae. The striae are highly radial, distinctly punctate, about 20 in 10μ .

Rapheless valve with linear, narrow axial area. The middle striae on both sides shortened, so that a narrow central area arises, which is about half as broad as the valve. Striae parallel, distinctly punctate, about 18 in 10μ .

Freshwater, Peary Land (Greenland).

No. 13 (0.6%), 144 (1.2%), 209, 208 (0.4%), 222, 12, 133 (0.4%), 204 (0.2%), 1 (0.6%), 192 (0.4%), 193, 194, 195, 3, 8, 159 (1.2%), 206 (2.0%), 6, 7 (1.2%), 131, 132 (0.2%), 142, 161 (5.8%).

It should be stated about this presumably new species that the valves are flat and have not been observed in girdle-view. Therefore it is not possible to decide with absolute certainty whether the species belongs to *Achnanthes* or *Cocconeis*. As, however, the genus of *Cocconeis* is very rare in the area, while the *Achnanthes* genus is common, I have no particular hesitation in referring the species to the genus of *Achnanthes*.

The species has certain points of resemblance with *Cocconeis hustedti* Krasske, HUSTEDT 1930—37, II, p. 361, fig. 816, and with *Achnanthes saxonica* Hustedt,

HUSTEDT 1930—37, II, p. 403, fig. 854 B, which both as regards form and size resemble IV: 10, 11. In *A. saxonica* the number of striae, however, differs fairly much, as the rapheless valve has only 14 striae and the raphe valve 24 striae in 10 μ . *C. hustedti* especially differs as regards the rapheless valve, which has a broad lanceolate pseudoraphe.

Achnanthes oblongella ØSTRUP, ØSTRUP 1904, p. 34, fig. 9, HUSTEDT 1937—39, p. 199, Pl. 13, figs. 3—7, has also a considerable resemblance with IV: 10, 11, but *A. oblongella* like the two species mentioned above has a great difference in the number of striae on rapheless (10—11) and raphe valve (30 striae in 10 μ). Plate IV, figs. 10, 11: $13 \times 5.8 \mu$. Both valves with 20 striae in 10 μ .

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

Plate IV, fig. 1: $45 \times 9.8 \mu$. 14 striae with 5 points in 10 μ (raphe valve). The valve is rather large, with coarser punctations than usual in the species (almost as in *A. brevipes* Ag.).

No. 225 (0.2 %), 133 (0.2 %), 7 (1.0 %), 134 (0.2 %), 196.

N. Amer. (BOYER 1926—27, II, p. 233; Arctic regions).

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

No. 209 (2.2 %), 145 (0.2 %), 225, 222 (0.4 %), 133, 204 (0.2 %), 226 (3.4 %), 160 (1.2 %), 192 (0.4 %), 193 (0.8 %), 194 (0.8 %), 195 (0.2 %), 224, 206, 132, 161 (0.2 %), 197 (0.2 %).

W. Greenl. (rare).

— *exigua* Grun. HUSTEDT 1930—37, II, p. 386, fig. 832 a, b.

No. 207, 143.

N. Amer.

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

Plate IV, fig. 20: $16.3 \times 10 \mu$. Raphe valve of a shorter and more rounded-off form than that usually occurring in the material. The form is found now and then among ordinary and typical *A. flexella* valves.

Distributed in all the biotopes of the area, but rarely occurs in any appreciable number in the various samples. Found in 42 samples in all and representing 1.8 % of all valves counted.

No. 13 (2.4 %), 209 (5.2 %), 145 (0.2 %), 208, 225 (1.8 %), 222 (0.6 %), 5 (0.8 %), 12, 14 (0.2 %), 133 (1.8 %), 204 (0.8 %), 226 (3.4 %), 1 (0.4 %), 2 (0.8 %), 10 (3.6 %), 82 (1.4 %), 83 (1.4 %), 84 (1.2 %), 160 (2.2 %), 192, 193 (2.4 %), 194 (4.2 %), 195 (2.2 %), 224 (4.4 %), 3 (2.6 %), 8 (28.6 %), 9, 159, 206 (0.6 %), 6 (2.8 %), 7, 11 (3.2 %), 131 (0.4 %), 132 (2.8 %), 134, 142, 143 (0.2 %), 161 (0.4 %), 198 (1.8 %), 223 (0.2 %), 196 (0.4 %), 197 (0.2 %).

W. Greenl. (not common).

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

Rarer than the species; often found together with the species.

No. 13 (0.4 %), 209 (1.2 %), 208 (1.0 %), 225 (0.2 %), 222 (0.4 %), 12 (0.2 %), 226 (0.4 %), 1 (0.2 %), 2 (0.2 %), 10 (0.2 %), 82, 83 (0.2 %), 84, 160 (0.4 %), 193, 224 (1.2 %), 9, 159, 206 (0.4 %), 207 (0.6 %), 11 (0.2 %), 198, 223 (0.2 %).

W. Greenl. (not common).

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

Plate IV, figs. 18, 19: $11.5 \times 4.6 \mu$. Raphe valve 24—26, rapheless valve about 26—28 striae in 10 μ .

It is with some doubt that IV: 18, 19 have been referred to *A. kryophila*, which has been set up by BOYE PETERSEN 1927, p. 316, where the dimensions are stated to be $19 \times 5.5 \mu$ with 23—27 radial striae in 10 μ . Raphe valve with square, transapical area.—The specimens found in the material are always

smaller, and the central area is always extended to the margin on the raphe valve. Otherwise good agreement.

The specimens, especially as regards the form of the valve, may remind of some other small *A.* species, which, however, must all be discarded in this connexion. They are:

- A. procera* Hustedt. HUSTEDT 1945, p. 908, Pl. 39, figs. 26—31, and HUSTEDT 1953, p. 630, figs. 14—17, with the dimensions $15-32 \times 4-5 \mu$. In this species the central area is also a transversal band, but the number of striae is 30—33 in 10μ , which is considerably more than in IV: 18, 19. Furthermore the striae of *A. procera* are at right angles to the axial area.
- A. linearis* Grun. HUSTEDT 1930—37, II, p. 378, fig. 821, with the dimensions $10-20 \times 3-4.5 \mu$. This species has 22—30 radial striae in 10μ , but the two middle ones are always shortened.
- A. petersenii* Hustedt. HUSTEDT 1937, p. 179, and A. Schmidt's Atlas Pl. 409, figs. 70—73, with the dimensions $12-18 \times 3.5-4 \mu$. The raphe valve has a central area which is a transversal band reaching to the margin, but the density of striae is still greater (36—40 in 10μ) than in the species mentioned above.
- A. kryophila* var. *densestriata* Hustedt. HUSTEDT 1945, p. 909, Pl. 39, figs. 18—21, and 1934, p. 378, figs. 3—4, with the dimensions $11-14 \times 4-5 \mu$. As this variety has 32 striae in 10μ on both valves, this possibility must also be disregarded.

Achnanthes kryophila is the commonest *A.* species in the material, having been found in 43 samples and being represented by 8% of all the valves counted.

No. 13 (7.2%), 144 (2.4%), 209 (11.4%), 145 (2.0%), 208 (17.0%), 225 (2.2%), 222 (1.8%), 5 (37.4%), 12 (5.0%), 14 (18.4%), 133 (13.2%), 204 (2.0%), 226 (11.2%), 1 (1.4%), 10 (5.4%), 82 (2.2%), 83 (1.4%), 84 (7.0%), 160 (4.8%), 192 (0.6%), 193 (0.2%), 194 (5.8%), 195 (2.2%), 224 (0.4%), 3 (29.6%), 8 (11.0%), 9 (0.6%), 159 (3.0%), 206 (28.8%), 207 (2.8%), 6 (3.8%), 7 (26.0%), 11 (7.2%), 131 (5.8%), 132 (7.4%), 134 (10.2%), 142 (6.2%), 143 (13.0%), 161 (19.6%), 198 (3.2%), 223 (35.6%), 196 (11.2%), 197 (0.4%).

- *lapponica* Hustedt. HUSTEDT 1930—37, II, p. 414, fig. 868.

No. 204 (0.6%), 192, 195, 131, 142 (1.2%), 143 (2.2%), 198, 196, 197.

W.Greenl. (not common).

- *lemmermanni* Hustedt. HUSTEDT 1930—37, II, p. 390, fig. 837.

Plate IV, figs. 4, 5: $16 \times 5 \mu$. 20 striae in 10μ .

Plate IV, figs. 6, 7: $15 \times 6.5 \mu$. About 20 striae in 10μ in raphe valve as well as rapheless valve.

According to Hustedt 1930—37, II, p. 390, *A. lemmermanni* has the dimensions $10-15 \times 4.5 \mu$ and 16—18 striae in 10μ on raphe valve as well as rapheless valve.

IV: 6, 7 also have a certain resemblance with the somewhat smaller species *A. minuscula* Hustedt, HUSTEDT 1945, p. 907, Pl. 39, figs. 8—12, and 1946—50, p. 346, Pl. 35, figs. 15—20, the dimensions of which are stated to be $7-9 \times 4 \mu$ with 20—24 striae in 10μ . IV: 6, 7 have very slightly radial striae, but otherwise it seems, if anything, that they should be referred to *A. lemmermanni*.

No. 208, 133, 207, 142, 143.

- *levanderi* Hustedt. HUSTEDT 1930—37, II, p. 404, fig. 856. FOGED 1952a, p. 164, Pl. I, figs. 6 a, b.

No. 159.

- *linearis* W. Smith. HUSTEDT 1930—37, II, p. 378, figs. 821a, n. 1930, p. 198, fig. 276.
Widely distributed species, though not so frequent as *A. kryophila*. Occurs with a total of 2.4 % of all valves counted in the material.
No. 13 (5.0 %), 144 (0.4 %), 12 (3.8 %), 14, 133 (2.8 %), 1 (0.8 %), 2 (2.6 %), 82 (4.6 %), 83 (1.4 %), 84 (1.0 %), 192 (3.2 %), 194 (5.2 %), 8 (8.8 %), 9 (1.0 %), 11 (33.0 %), 131 (3.2 %), 132 (5.4 %), 134 (1.2 %), 142 (7.6 %), 143 (10.2 %), 197 (20.0 %).
W. Greenl. (common). N. Amer.
- *marginatula* Grun. HUSTEDT 1930—37, II, p. 404, figs. 855 c, d.
Plate IV, figs. 15, 16, 17: $10 \times 4.2 \mu$. About 30 striae in 10μ . IV: 15, 16, 17 are very closely related to Grunow's species (1880) and should no doubt be identified with this species, which according to CLEVE, Syn. II, p. 184, has the following dimensions: $11-22 \times 5-8 \mu$ with 24 striae on rapheless and 23—27 in 10μ on raphe valve.
No. 1, 143.
W. Greenl. (BOYER).
- *microcephala* Kütz. HUSTEDT 1930, p. 198, fig. 273.
No. 145, 225 (0.6 %), 222 (0.6 %), 160 (2.6 %), 192 (7.6 %), 193 (4.0 %), 195 (7.0 %), 161 (34.2 %), 196 (45.4 %).
W. Greenl. (very common).
- *minutissima* Kütz. HUSTEDT 1930, p. 198, fig. 274.
Plate IV, figs. 13, 14: $11 \times 2 \mu$. 30—32 striae in 10μ .
No. 208 (8.0 %), 225 (2.0 %), 4 (0.8 %), 222 (3.4 %), 204 (2.6 %), 226 (6.0 %), 1 (5.8 %), 2 (10.8 %), 224 (2.4 %), 9 (0.2 %), 206 (2.0 %), 207 (1.4 %), 6 (14.2 %), 198 (15.4 %), 223 (11.8 %).
W. Greenl. (very common).
- *plitvicensis* Hustedt. HUSTEDT 1945, p. 909, Pl. 39, figs. 22—25.
Plate IV, figs. 2, 3: $19 \times 5.8 \mu$. 20 striae in 10μ .
According to HUSTEDT 1945, p. 909, the dimensions are $13-15 \times 5-6 \mu$ with 20—22 striae in 10μ . Raphe valve: "Zentralarea eine bis nahe an den Schalenrand reichende Querbande." Striae radial. "Raphenlose Schalen mit sehr enger, gegen die Mitte nur sehr wenig erweiterter Axialarea und unregelmässiger, einseitig entwickelter, kleiner Zentralarea." IV: 2, 3 have raphe valves with much shortened striae in the middle, the rapheless valve has a more irregular one-sidedly developed central area.
HUSTEDT (1945, p. 910) points out the close morphological relation to *A. kryophila*. The form occurring in the present material is, however, very characteristically different from *A. kryophila*, and is also always somewhat larger than this species.
No. 225 (0.8 %), 222 (1.2 %), 133 (1.8 %), 204 (0.4 %), 226 (2.8 %), 224, 7 (8.2 %), 134 (0.8 %), 198, 196 (1.4 %).
- *thienemanni* Hustedt. HUSTEDT 1942 b, p. 98, figs. 2—5.
Plate IV, figs. 8, 9; $14.3 \times 3.3 \mu$. Raphe valve: 20—22 striae in 10μ . Central area extended to the margin (perhaps much shortened striae). Rapheless valve: 22—24 striae in 10μ . Striae at right angles to the axial area or very slightly radial.
According to HUSTEDT 1942 b, p. 98 the dimensions are: $16-21 \times 3.5 \mu$ with 23 but little radial striae in 10μ on rapheless valves, and about 25 striae in 10μ on raphe valves, on the latter at right angles to the axial area.

IV: 8, 9 are somewhat smaller than the species described from Lapland by HUSTEDT, but as to the striation there is good agreement. The same applies to the outline of the valves, even though the apices of IV: 8, 9 perhaps are not quite so rostrate as the specimens from Abisko. Only found in one sample (no. 197), from a waterfall, and dominant there (37.2 per cent.).

HUSTEDT (1942 b) found single specimens of the species in a spring near the timber line at Abisko in Lapland.

IV. Biraphideae.

Naviculoideae.

Diatomella Grev.

Diatomella balfouriana Grev. HUSTEDT 1930, p. 214, fig. 312. FOGED 1953, Pl. III, fig. 5.

No. 194.

W. Greenl. (rare).

(*Mastogloia* Thwaites was not found in the present material).

Diploneis Ehr.

Diploneis elliptica (Kütz.) Cleve. HUSTEDT 1930, p. 250, fig. 395.

No. 208, 22 (0.8 %), 12, 160, 193, 224, 207, 11.

W. Greenl. (rare).

— *interrupta* (Kütz.) Cleve. HUSTEDT 1930, p. 252, fig. 400.

Only a single valve was found in the whole material. The species is mesohalobous, and the valve must be supposed to have been brought in from the sea. In spite of the fact that all the localities are situated close to the sea, no other marine diatoms have been found in the material.

No. 207.

— *oculata* (Bréb.) Cleve. HUSTEDT 1930, p. 250, fig. 392.

No. 1 (0.2 %).

— *sp.*

Plate IV, fig. 26: $29.2 \times 7.3 \mu$. 26 striae in 10μ .

Plate IV, fig. 27: $17 \times 7.2 \mu$. 23—24 striae in 10μ .

IV: 26, 27 are very closely related to *D. peterseni* Hustedt. I dare not, however, identify them with the latter, i. a. because the differences in dimensions, especially as regards IV: 26, seem rather great. According to HUSTEDT 1930—37, II, p. 676 the dimensions for *D. peterseni* are: $15-19 \times 5-6 \mu$ with 24 striae in 10μ in the middle (at the apices about 28).

No. 204, 226 (1.2 %), 224.

D. peterseni is known from Iceland (BOYE PETERSEN 1928), Lapland (HUSTEDT 1944, KRASSKE 1949), Denmark (FOGED 1951), and the Balkans (HUSTEDT 1945).

(*Frustulia* Ag. was not found in the area. In W. Greenl. this genus is not common).

Neidium Ag.

Even though the number of valves representing this genus in the present material is small, they actually in an extremely peculiar way characterize a large number of the samples. Some of the species have previously been found comparatively

rarely. Several of them have a very wide geographical distribution. It applies to some of them that they may be of a considerable geological age.

Neidium affine (Ehr.) Cleve var. *capitata* Mölder. MÖLDER 1937, p. 30, fig. 1.

Plate V, fig. 2: $70 \times 18 \mu$. About 20 striae in 10μ .

According to Mölder 1937, p. 30 the dimensions are: $80-90 \times 18-22 \mu$ with 12—20 striae in 10μ , and according to Ross 1947, p. 208, the same. The specimens from Peary Land thus are somewhat smaller than usual in Finland and N. Amer.

This characteristic variety of *N. affine* was very common in a few samples from W. Greenl. In Peary Land it is widely distributed, but somewhat rarer in the various samples.

No. 144 (0.8 %), 145 (0.2 %), 208 (0.2 %), 225, 222 (0.2 %), 14 (0.8 %), 204, 1, 194, 224 (0.2 %), 207, 6 (0.2 %), 134 (1.6 %), 142, 161.

W. Greenl. (fairly common). N. Amer.

— *bisulcatum* (Lagerst.) Cleve. HUSTEDT 1930, p. 242, fig. 374.

No. 14 (4.8 %), 161.

W. Greenl. (fairly common).

— *distincte-punctatum* Hustedt. HUSTEDT 1930, p. 247, fig. 386.

Plate V, fig. 6: $64 \times 18 \mu$. 10—11 striae in 10μ .

According to HUSTEDT 1930, p. 247, the dimensions are: $40-45 \times 16 \mu$ with 11—12 striae in 10μ . The specimens from Peary Land thus are considerably larger than those described by HUSTEDT, which originate from the Alps. Apart from this fact the forms of the two areas seem to be very closely related.

HUSTEDT 1930, p. 247, states: "Raphe gerade, mehr oder weniger schief zur Mittellinie orientiert, die beiden Raphen einer Zellen kreuzen sich unter einer spitzen Winkel." Transapical striae "etwas schief orientiert." In V:6 the striation is almost regular, the striae being slightly radial. The raphe passes very close to the mid-line, so that the raphes of the two valves seem to overlap.

In HUSTEDT 1946—50, Pl. 38, fig. 32, a specimen from a North German lake is pictured (dim.: $80 \times 17 \mu$) which is somewhat slenderer than the Peary Land specimens, just as the central areas in the valves of the two regions are somewhat different. Furthermore Hustedt's drawing shows that the terminal striae in the North German form are distinctly convergent.

J. BRUN 1900 in Pl. 2, figs. 25 and 26 pictures a *Neidium iridis* Ehr. var. *luminosa* J. Brun with the dimensions (p. 13): length: $40-50 \mu$ with 14—16 striae in 10μ . This is possibly the same species as *N. distincte-punctatum* Hustedt.

No. 226 (0.2 %), 2, 10 (0.8 %), 82, 160 (0.2 %), 193, 195, 224 (0.2 %), 198.

— *dubium* (Ehr.) Cleve. HUSTEDT 1930, p. 246, fig. 384.

No. 160.

— *iridis* (Ehr.) Cleve. HUSTEDT 1930, p. 245, fig. 379.

No. 225, 12, 14, 1 (0.2 %), 10 (0.4 %), 82, 83 (0.2 %), 160, 224, 6, 134 (0.2 %).

W. Greenl. (not common).

— fo. *vernalis* Reichelt. HUSTEDT 1930, p. 245, fig. 380.

Plate V, fig. 5: $34-6.5 \mu$. 20 striae in 10μ . Differs from the usual form by the points in the striae being very delicate and extremely difficult to observe.

No. 9.

— *knuthii* nov. spec.

Fig. V: 8.

Valva lineari-lanceolata, apicibus longe productis, obtusis, late rotundatis, 39μ

longa, 7,8 μ lata. Rraphe recta: pori centrales longi, ad diversa latera oblique deflexi. Area axialis linearis, angusta, centralis rotundate rectangularis, duas circiter partes latitudinis valvae occupans. Striae mediae radiantes, ad apices versus perpendiculares vel subconvergentes, ca. 20 in 10 μ , 3—4 lineis longitudinalibus interruptae.

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves linear-lanceolate with long drawn-out, blunt, broadly rounded-off apices, 39 μ in length, 7.8 μ in breadth.

Raphe straight, central nodes long, obliquely curved to either side. Axial area linear, narrow. Central area square-rounded off, covering about two thirds of the breadth of the valve. Striae in the middle radial, towards the apices parallel or slightly convergent, about 20 in 10 μ , crossed by 3—4 longitudinal stripes. Named after the leader of the DANISH PEARYLAND EXPEDITION 1947—50, EIGIL KNUTH.

No. 7.

- — var. *heilprinensis* nov. var.

Fig. V: 9.

A *Neidium knuthii* differt lateribus leniter triundulis.

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Sides slightly 3-undulate. Otherwise like the species.

No. 7.

- *kozlowii* Mereschkowsky. HUSTEDT 1930, p. 247, fig. 387. MESSIKOMMER 1951, p. 53, Pl. I, figs. 4, 5. Ross 1947, p. 210, Pl. XI, fig. 2.

No. 5, 1 (0.2 ‰), 10, 83, 160 (0.2 ‰), 192, 3, 6, 11, 132.

N. Amer.

- *kozlowii* var. *elliptica* Mereschk. HUSTEDT 1930, p. 248, fig. 388.

Plate V, fig. 4: 39 \times 9 μ . 16 striae in 10 μ .

According to HUSTEDT 1930, p. 247, var. *elliptica* Mereschk. is characterized by "Schalen elliptisch mit stark konvexen Rändern, an den Enden nicht vorgezogen," as distinct from var. *parva* Mereschk., which have more drawn-out poles.

V: 4 seems to be identical with Ross 1947, pl. XI, fig. 1, which is stated to be var. *parva* MERESCHK., but without drawn-out apices.

No. 131.

N. Amer. (Ross).

- — var. *parva* Mereschk. HUSTEDT 1930, p. 248, fig. 389.

Plate V, fig. 10: 28.6 \times 8.5 μ . 13—14 striae in 10 μ .

According to HUSTEDT 1930, p. 248, the dimensions are: 36—39 \times 9—12 μ with 15 striae in 10 μ .

V: 10 is closely related to Hustedt's fig. 389 (1930), even though the form differs somewhat, V: 10 having almost parallel sides.

No. 14, 204, 162 (1.8 ‰), 7, 131 (0.2 ‰).

- *munkii* nov. spec.

Fig. V: 7.

Valva linearis, apicibus late rotundatis, 37 μ longa, 7.8 μ lata. Rraphe recta; pori centrales longi, ad diversa latera valde deflexi. Area axialis linearis, angusta, centralis fasciam transversalem, margines paene attingentem formans. Striae mediae paulum radiantes, apicales paulum convergentes, valide punctatae, 14 in 10 μ .

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves linear with broadly rounded-off apices, $37\ \mu$ long, $7.8\ \mu$ broad. Raphe straight, central nodes long and greatly deflected to either side. Axial area linear, narrow. The central area is a transversal band spread out across almost to the margin of the valve. Striae in the middle slightly radial, at the apices slightly convergent, coarsely punctate; 14 striae in $10\ \mu$.

No. 7.

Named after EBBE MUNCK, who together with EIGIL KNUTH was at the head of the DANISH NORTHEAST GREENLAND EXPEDITION 1938—39.

- *productum* (W. Smith) Cleve var. *polygibba* J. Brun. J. BRUN 1900, p. 18, Pl. 2, fig. 23.

Plate V, fig. 3: $53 \times 12.4\ \mu$. 17 striae in $10\ \mu$.

According to J. BRUN 1900, p. 18, the dimensions are: length 70—90 μ with 20—26 striae in $10\ \mu$. He writes: "Pour la nature des stries et leur écartement cette variété tient le milieu entre le *N. productum* et le *N. affine* Ehr."

No. 13, 144 (1.2%), 7, 132.

Stauroneis Ehr.

Stauroneis anceps Ehr. HUSTEDT 1930, p. 256, fig. 405.

No. 13 (0.2%), 144 (3.6%), 145 (7.2%), 208, 225, 222 (0.2%), 5 (1.6%), 14 (3.0%), 204, 226 (1.0%), 1, 10 (0.2%), 82, 83, 160, 194 (0.2%), 195 (0.2%), 224 (1.2%), 9 (1.2%), 159 (3.2%), 162 (0.8%), 6 (0.2%), 7 (0.6%), 11, 131, 132 (0.4%), 134, 143 (0.6%), 161, 223.

W.Greenl. (not common).

- fo. *gracilis* (Ehr.) Cleve. HUSTEDT 1930, p. 256, fig. 406.

No. 14.

W.Greenl. (not common).

- *ignorata* Hustedt. HUSTEDT 1939, p. 620, figs. 48—50.

Plate IV, fig. 29: $24 \times 4.6\ \mu$. 26—28 striae in $10\ \mu$.

No. 14 (0.4%).

- *javanica* Grun. ØSTRUP 1897, p. 259, Pl. I, fig. 4. A. Schmidt's Atlas Pl. 241, fig. 3. According to CLEVE 1894—95, I, p. 150, "This form is scarcely specifically distinct from *S. acuta*, although its form is nearly the same as that of *S. phoenicenteron*."

I feel somewhat hesitant as regards this species, in the same way as expressed by CLEVE, as I am somewhat inclined to refer the specimens found to *S. phoenicenteron*, but still there is so great a difference between them and the typical *S. phoenicenteron* that in order to maintain the type as distinct from this, I refer them to *S. javanica*.

No. 13 (0.2%), 144 (9.2%), 5 (2.2%), 12, 14, 133, 194 (0.4%), 8, 159 (0.2%), 162 (0.2%), 6, 7 (0.2%), 11, 131, 132, 134 (2.6%), 161.

E.Greenl. (ØSTRUP). N.Amer.

- *kriegeri* Patrick. HUSTEDT 1930, p. 257, fig. 409.

No. 144 (0.4%), 145 (0.8%), 9, 162 (0.2%), 7 (0.8%), 143 (0.2%).

- *lapponica* A. Cleve. A. CLEVE 1895, p. 13, Pl. I, fig. 8.

Plate IV, fig. 24: $24 \times 4.6\ \mu$. 30—32 striae in $10\ \mu$.

No. 13 (0.4%), 226 (0.4%).

W.Greenl. (not common).

- *obtusa* Lagerstedt. HUSTEDT 1930, p. 260, fig. 416. LAGERSTEDT 1873, Pl. I, fig. 11. A. CLEVE 1895, Pl. I, fig. 6.

Plate IV, fig. 31: $35.7 \times 9.6\ \mu$. 18—20 striae in $10\ \mu$. Small specimen.

No. 144 (5.2 ‰), 209, 145 (14.0 ‰), 4, 5, 14, 133 (0.2 ‰), 204, 226 (0.8 ‰), 3, 9, 159 (0.2 ‰), 162 (1.0 ‰), 206, 7 (1.2 ‰), 132, 134, 143, 161.

W.Greenl. (not common).

- *phoenicenteron* Ehr. HUSTEDT 1930, p. 255, fig. 404.

Specimens which clearly belong to this species and thus differ somewhat from the above-mentioned specimens of *S. javanica* are fairly widely distributed in the area, although never frequent.

No. 209 (0.4 ‰), 208, 14 (3.8 ‰), 204, 1 (0.2 ‰), 224, 3, 159, 206, 131, 132, 134, 143, 161.

W.Greenl. (common).

Caloneis Cleve.

- Caloneis bacillum* (Grun.) Cleve. HUSTEDT 1930, p. 236, fig. 360. FOGED 1953, Pl. III, fig. 17.

Plate IV, fig. 22: $23.4 \times 4.5 \mu$. About 23 striae in 10μ .

No. 145, 208 (12.6 ‰), 4 (0.4 ‰), 14 (0.2 ‰), 1, 2, 10, 82, 192, 3 (0.4 ‰), 9 (0.2 ‰), 207.

W.Greenl. (common).

- var. *lancettula* (Schulz) Hustedt. HUSTEDT 1930, p. 236, fig. 361.

Plate IV, fig. 23: $20 \times 4.6 \mu$. 22—24 striae in 10μ .

No. 9.

- *boecheri* Foged. FOGED 1953, p. 39, Pl. III, fig. 19.

Plate IV, fig. 28: $15 \times 4 \mu$. 25—26 striae in 10μ .

This species has a certain resemblance with *C. fasciata* (Lagerst.) fo. *acuta* Boye Petersen (BOYE PETERSEN 1928, p. 384, fig. 10), the dimensions of which are stated to be $17-22 \times 4-5 \mu$ with 23—25 striae in 10μ . According to description and diagnosis the species *C. fasciata* has slightly radial striae. Fo. *acuta* according to BOYE PETERSEN'S drawing (1928, fig. 10) has striae which in the middle are at right angles to the raphe, while towards the apices of the valves they are slightly convergent.

IV: 21 has pronouncedly convergent striae, and even though the form occurring in this material is somewhat smaller than the species described from West Greenland, I consider it identical with the latter, and clearly different from *C. fasciata*.

No. 9.

W.Greenl. (not common).

- *fasciata* (Lagerst.) Cleve fo. *acuta* Boye Petersen. BOYE PETERSEN 1928, p. 384, fig. 10.

No. 9.

W.Greenl. (fairly rare).

- *schumanniana* (Grun.) Cleve. HUSTEDT 1930, p. 239, fig. 369.

Plate IV, fig. 25: $29 \times 5.2 \mu$. 22—23 striae in 10μ .

The form pictured differs from the typical *C. schumanniana* by having denser, almost parallel striae, and no extension of the axial area towards the central area. Widely distributed, but never common, in all the biotopes of the area.

No. 144 (0.4 ‰), 208, 12 (0.2 ‰), 133, 204 (0.8 ‰), 226 (0.2 ‰), 1, 2, 10 (0.2 ‰), 82, 83 (0.8 ‰), 84 (0.2 ‰), 160, 192, 193, 194, 224 (0.2 ‰), 8 (0.4 ‰), 159, 206 (0.2 ‰), 207 (0.4 ‰), 7 (0.8 ‰), 131, 132 (0.2 ‰), 134 (0.2 ‰), 142, 143, 198 (0.4 ‰).

W.Greenl. (fairly common).

- *silicula* (Ehr.) Cleve. HUSTEDT 1930, p. 236, fig. 362.
No. 225, 204, 226 (0.2 %), 1 (0.2 %), 2, 10 (0.4 %), 83, 160, 224 (0.2 %), 131.
W.Greenl. (fairly common).
- — var. *alpina* Cleve. A. CLEVE 1895, p. 15, fig. 9. P. T. CLEVE 1894—95, I, 51.
FOGED 1953, Pl. III, fig. 9.
Plate IV, fig. 30: $44 \times 6.5 \mu$. 19 striae in 10μ .
No. 13 (2.4 %), 144 (10.0 %), 209 (2.2 %), 145 (3.0 %), 208 (1.2 %), 222 (0.6 %),
5 (9.4 %), 12 (0.2 %), 14 (1.4 %), 133 (0.2 %), 204 (0.4 %), 82 (0.2 %), 84
(1.0 %), 193 (0.4 %), 194 (0.8 %), 224 (0.2 %), 3 (0.6 %), 8 (1.8 %), 9, 206
(0.2 %), 207 (0.2 %), 6 (2.0 %), 11 (0.6 %), 132 (0.8 %), 134 (5.6 %), 143.
- *sp.*
Plate IV, fig. 21: $26.6 \times 4.8 \mu$. 18—19 striae in 10μ .
Valves with parallel sides and broadly rounded-off apices. Striae almost parallel,
near the margin of the valve with a distinct longitudinal band. Raphe straight,
central nodes slightly inspissated, terminal fissures deflected towards the same
side. Axial area very narrow, sharply defined. The central area is a transversal
band extended to the margin of the valve, almost regularly rectangular.
IV: 21 is closely related to *C. bacillum*, but has clearly fewer striae in 10μ
than usual in this species.
No. 144 (5.6 %), 145 (0.8 %).

Anomoconeis Pfitzer.

- The genus, which includes a number of "boreo-alpine" species widely distributed
and common, occurs extremely sparsely in Peary Land.
- Anomoconeis exilis* (Kütz.) Cleve. HUSTEDT 1930, p. 264, fig. 429. FOGED 1953,
Pl. III, fig. 8.
No. 1, 2 (0.2 %), 10 (0.2 %), 82 (0.2 %), 83, 84, 192, 193, 8.
W.Greenl. (not rare).
- *serians* (Bréb.) Cleve var. *brachysira* (Bréb.) Hustedt. HUSTEDT 1930, p. 264,
fig. 427.
No. 13 (0.2 %), 14, 133, 160, 159, 162, 197.
W.Greenl. (not rare).
- *zellensis* (Grun.) Cleve var. *linearis* Østrup. ØSTRUP 1910 b, p. 239, Pl. 14, fig. 6.
HUSTEDT 1930, p. 265. FOGED 1953, Pl. III, fig. 13.
No. 9 (0.2 %), 159, 11, 132.
W.Greenl. (not common).

Navicula Bory.

1. *N. orthostichae* Bory

- Navicula cuspidata* Kütz. HUSTEDT 1930, p. 268, fig. 433.
No. 10 (1.4 %), 82.
W.Greenl. (rare). N.Amer.
- — var. *ambigua* (Ehr.) Cleve. HUSTEDT 1930, p. 268, fig. 434.
No. 2 (0.2 %).
W.Greenl. (rare). N.Amer.
- *halophila* (Grun.) Cleve. HUSTEDT 1930, p. 268, fig. 436.
Plate XI, fig. 1: $30.5 \times 7.8 \mu$. 20—21 striae in 10μ .
In the area found only in Klaresø, where the species occurs in all samples.
No. 1 (0.2 %), 2 (0.8 %), 10 (6.6 %), 82 (1.0 %), 83 (0.2 %), 84 (0.6 %).
W.Greenl. (fairly common).

2. *N. minuscula* Hustedt.

Navicula bacilliformis Grun. HUSTEDT 1930, p. 273, fig. 446.

No. 192 (0.2 %).

W.Greenl. (fairly common). N.Amer.

- *bryophila* Boye Petersen. BOYE PETERSEN 1928, fig. 13. 1946, p. 87, fig. 11.
Plate VII, fig. 13: $19 \times 3.2 \mu$. About 36 striae in 10μ . This small *Navicula* species widely distributed in the area is very closely related to *N. bryophila*. The type pictured here is very characteristic by its fairly large central area extended transversally and bordered by striae of varying lengths. *N. bryophila* var. *lapponica* Hustedt (HUSTEDT 1942 b, p. 114, figs. 11—15), which has a clearly rounded-off transversally elliptical central area, lacks inserted shorter striae. In HUSTEDT 1937—39, Pl. 18, figs. 18—23, an *N. bryophila* Boye Petersen is pictured which is without any particularly clear central area, but all the figures have shorter striae inserted. The form VII: 13 thus unites characters from the species itself as well as from var. *lapponica*, and represents, if not a special variety, at least a geographical race. (In the characterization of *N. bryophila* given by A. CLEVE-EULER 1953, III, p. 174, enter both the circularly extended central area and the shorter striae inserted in the middle).
The closely related *N. pseudobryophila* Hustedt (syn.: *N. bryophila* var. *sucklandti* Hustedt, A. Smidt's Atlas Pl. 404, figs. 49—51) must because of the greater breadth of its valves (4.5 — 5.5μ), its small central area, and the striae convergent towards the apices be left out of consideration, even though it has "regelmässig abwechselnd länger und kürzer" striae round the small central area. *N. bryophila* is a widely distributed aerophilous species in arctic as well as tropical areas.
No. 13 (2.0 %), 144 (0.4 %), 209 (1.0 %), 145 (1.0 %), 225, 222 (2.2 %), 12 (0.2 %), 14 (0.2 %), 133 (1.2 %), 204 (0.4 %), 226 (0.2 %), 82, 84 (0.2 %), 192 (0.2 %), 193, 194, 195 (1.0 %), 224, 8 (0.4 %), 207, 6 (0.2 %), 7 (3.4 %), 131 (0.2 %), 132 (1.0 %), 134 (1.8 %), 198 (0.2 %), 196.
- *contenta* Grun. HUSTEDT 1930, p. 277, fig. 458. FOGED 1953, Pl. IV, fig. 11, Pl. VI, fig. 13.
No. 9 (8.2 %), 162 (8.8 %).
W.Greenl. (not common).
- — var. *biceps* Arnott. HUSTEDT 1930, p. 277, fig. 458 c. FOGED 1953, Pl. IV, fig. 12.
Plate VI, fig. 12: $11 \times 2.6 \mu$.
No. 144 (1.6 %), 145 (1.0 %), 14, 133 (0.2 %), 204 (0.2 %), 194, 9 (8.0 %), 159 (3.8 %), 162 (21.4 %), 134 (0.2 %), 161.
W.Greenl. (not rare). N.Amer.
- — fo. *parallela* Boye Petersen. HUSTEDT 1930, p. 277, fig. 458 b.
No. 144 (0.4 %), 133 (0.2 %), 9 (11.6 %), 159 (16.0 %), 162 (19.0 %), 161 (18.4 %), 223, 196 (0.2 %).
- *heilprinensis* nov. spec.
Fig. VI: 6, 7.
Valva lineari-elliptica, apicibus breviter productis, late obtuse rotundatis, 18μ longa, 6.5μ lata. Area axialis angusta, centralis magna, rotundata, saepe irregularis. Striae transapicales radiantis, ca. 20 in 10μ , 2—3 lineis longitudinalibus interruptae.
Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves linear-elliptical with shortly drawn-out, broadly and flatly rounded-off apices, 18μ long, 6.5μ broad.

Axial area narrow, central area large, rounded-off, frequently somewhat irregularly developed. Transapical striae radiate, about 20 in 10μ , crossed by 2—3 longitudinal stripes.

Freshwater, Northeast Greenland.

No. 133.

- *kotschyi* Grun. P. T. CLEVE 1894—95, I, p. 130. BOYE PETERSEN 1928, p. 389, fig. 17. HUSTEDT 1930, p. 275, fig. 454. 1946—50, Pl. 37, fig. 62. FOGED 1953, p. 43, Pl. VI, fig. 8.

Plate VII, fig. 5: $32.5 \times 9.8 \mu$. 18—19 striae in 10μ .

Plate VII, fig. 4: $35 \times 9.8 \mu$. 15—16 striae in 10μ .

There is full agreement between the specimens from Peary Land and those from West Greenland. BOYE PETERSEN'S specimens from Iceland correspond closely with the Greenland species.

No. 133 (0.8 ‰), 9, 207, 223.

W. Greenl. (rare).

- *minuscula* Grun. var. *alpestris* Hustedt A. Schmidt's Atlas Pl. 400, figs. 92—95. FOGED 1952 a, p. 168, Pl. III, fig. 12.

Plate XI, fig. 3: $19.5 \times 6.5 \mu$. About 30 striae in 10μ .

XI: 3 seems identical with the form which I have found in material from Sweden (1952 a, Pl. III, fig. 12). It also has some resemblance with some other small *Navicula* species, among them *N. ingrata* Krasske (KRASSKE 1938, fig. 18), which has been found in Svalbard, and with *N. accomoda* Hustedt (HUSTEDT 1946—50, Pl. 39, figs. 17, 18), which occurs in North German lakes.

No. 204 (0.2 ‰), 14 (0.2 ‰).

- *mutica* Kütz. HUSTEDT 1930, p. 274, fig. 453 a.

No. 13 (0.2 ‰), 144 (0.4 ‰), 133, 204, 9 (14.8 ‰), 159, 162 (0.2 ‰), 7 (0.2 ‰), 198 (0.2 ‰).

- var. *binodis* Hustedt. HUSTEDT 1930, p. 275, fig. 453 d. A. Schmidt's Atlas Pl. 370, fig. 28.

Plate VI, fig. 4: $19.5 \times 6.5 \mu$. 14—15 striae in 10μ .

No isolated point observed in the central area. It is doubtful, therefore, where it belongs.

No. 144 (0.4 ‰).

- *mutica* var. *cohnii* (Hilse) Grun. HUSTEDT 1930, p. 275, fig. 453 b.

No. 14, 82, 9 (5.0 ‰), 162, 11, 131 (0.2 ‰), 134 (0.4 ‰), 143, 223 (0.4 ‰).

- var. *gracilis* Hustedt. HUSTEDT 1937—39, p. 233, Pl. 17, fig. 4.

Plate VI, fig. 5: $22.7 \times 7.5 \mu$. About 20 striae in 10μ .

HUSTEDT 1937—39, p. 233, states about var. *nivalis*: "Enden viel schmäler als die Schalenmitte", in var. *ventricosa* "Enden breit, kaum schmäler als die Mitte der Schalen."

No. 144 (0.4 ‰), 9 (1.6 ‰), 142.

- var. *nivalis* (Ehr.) Hustedt. HUSTEDT 1930, p. 275, fig. 453 c. A. Schmidt's Atlas Pl. 370, figs. 29, 30.

Plate VI, fig. 2: $30.5 \times 7.8 \mu$. 16—17 striae in 10μ .

Plate VI, fig. 3: $14.3 \times 5.8 \mu$. 20—21 striae in 10μ .

This variety has a considerable similarity to *N. suecorum* Carlsson, HUSTEDT 1949a, p. 49, Pl. 2, figs. 33—35, about which HUSTEDT (1949 a, p. 49) remarks: "gehört zweifellos in den Formenkreis der *N. mutica* und kann nur als Varietät

dieser Art gewertet sein." Dimensions according to CARLSSON: $35 \times 13 \mu$; according to HUSTEDT 1949 a, p. 49: $40-50 \times 11-17 \mu$.

No. 144 (0.4 %), 209, 208 (0.2 %), 133, 204, 9 (0.8 %), 6, 134 (0.2 %), 143. W.Greenl. (rare).

- fo. *rhomboidea* Playfair. BOYE PETERSEN 1928, p. 392, fig. 18.
Plate VI, fig. 1: $38 \times 9.8 \mu$. 16 striae in 10μ .
According to BOYE PETERSEN 1928, p. 393, the dimensions are: $37 \times 11 \mu$ with 18 striae in 10μ (and 14 dots in 10μ). "Raphe somewhat shortened at apices, apical area narrow, at each of the apices expanded to a round area, in the middle to a square transapical area with an isolated point on the side." HUSTEDT (1921, p. 153, Pl. I, figs. 13—15) according to BOYE PETERSEN 1928, p. 393, has a somewhat similar form, which he considers identical with *N. lagerheimi* Cleve (P.T. CLEVE 1894, p. 101, Pl. VII, fig. 11. 1894—95, I, p. 131).
VI: 1 is very similar to Boye Petersen's description and drawing (1928, p. 393, fig. 18). Considerable differences are found with regard to the striation at the apices and with regard to the central point, which seems to be missing in my specimen. This is therefore referred to fo. *rhomboidea* with some doubt.
No. 133.
- *perpusilla* Grun. HUSTEDT 1930, p. 278, fig. 459. FOGED 1953, Pl. IV, fig. 7.
Plate VI, fig. 13: $9.7 \times 3.4 \mu$. About 36 striae in 10μ .
Distributed in all the biotopes of the area.
No. 144 (1.2 %), 209 (0.4 %), 145 (0.2 %), 208, 225, 12 (0.6 %), 14 (4.2 %), 133 (6.2 %), 204, 226 (0.4 %), 1 (1.2 %), 82 (0.2 %), 83 (0.4 %), 160 (0.4 %), 192, 194 (0.8 %), 3 (0.6 %), 8 (3.2 %), 9 (1.4 %), 159 (11.2 %), 162 (10.6 %), 206 (0.6 %), 207 (0.2 %), 6, 7 (0.4 %), 131, 132 (0.8 %), 134 (0.6 %), 143, 161 (3.0 %), 223 (0.2 %), 196 (1.2 %).
W.Greenl. (fairly common).
- *rotaeana* (Rabh.) Grun. HUSTEDT 1930, p. 273, fig. 445. FOGED 1953, Pl. IV, figs. 8—10.
No. 209 (1.0 %), 208 (0.8 %), 222, 12, 160 (0.4 %), 192, 195, 206, 207, 143 (0.6 %), 198 (0.2 %), 223 (0.8 %).
W.Greenl. (not rare).
- *modica* Hustedt. HUSTEDT 1945, p. 916, Pl. 41, figs. 21—23.
Plate XI, fig. 9: $13 \times 5.2 \mu$. 16—17 striae in 10μ .
Plate XI, fig. 11: $13.0 \times 4.6 \mu$. 19—20 striae in 10μ .
The form described from the Balkans by HUSTEDT (1945, p. 916) has the dimensions $10-13 \times 5-6 \mu$ with 18 striae in 10μ . The striae are radial and of unequal length in the middle of the valve. XI: 11 comes very close to this. It has also, however, a certain resemblance with some other small *Navicula* species:
- N. verecunda* Hustedt, HUSTEDT 1930, p. 302, fig. 522, which has the dimensions $14-16 \times 4-5 \mu$, but with a considerably higher number of striae, viz. 24 in 10μ .
- N. vitabunda* Hustedt, HUSTEDT 1930, p. 302, fig. 523, which has the dimensions $8-10 \times 4-5 \mu$, thus having somewhat shorter valves, and besides having denser striae, 23 in 10μ ; in the middle of the valve alternately short and long striae.
- N. perventralis* Hustedt, HUSTEDT 1937—39, p. 241, Pl. 17, figs. 49, 50, which has the dimensions $8-14 \times 4-5.5 \mu$ and also considerably denser striae,

viz. 30 in 10 μ . The same form is pictured in A. Schmidt's Atlas, Pl. 401, figs. 3—5, and HUSTEDT 1942 d, p. 58, figs. 96—97.

N. pseudoventralis Hustedt. A. Schmidt's Atlas, Pl. 401, figs. 116—118, HUSTEDT 1953, p. 631, figs. 12, 13, which has the dimensions 10—12 \times 4 μ and 20 striae in 10 μ , which are radial and more or less shortened in the middle of the valve. The apices of this species are considerably broader than in XI: 11.

No. 83 (0.6 ‰), 192, 194 (0.2 ‰).

— *submuralis* Hustedt, HUSTEDT 1945, p. 918, Pl. 41, fig. 37.

Plate VI, fig. 16: 7.8 \times 4.6 μ . 20 striae in 10 μ .

No. 82.

— *subrotundata* Hustedt, HUSTEDT 1945, p. 917, Pl. 41, figs. 30—33.

Plate VI, fig. 15: 10.4 \times 4.6 μ . About 25 striae in 10 μ .

According to HUSTEDT 1945, p. 917, the dimensions are: 7—10 \times 4.5—5.5 μ with 25—30 striae in 10 μ , rather greatly radial and with shorter striae intercalated in the middle of the valve. The somewhat similar *N. rotunda* Hustedt (HUSTEDT 1945, p. 916, Pl. 41, fig. 29) is somewhat larger (12 \times 7.5 μ), has coarser, quite rib-like striae (20 in 10 μ), and consequently can be disregarded. The same applies to *N. seminulum* Grun. var. *intermedia* Hustedt (HUSTEDT 1942 b, p. 110, figs. 25—28), which also has a certain resemblance with *N. subrotundata*, but has the dimensions 10—18 \times 5—6 μ with 20—22 striae in 10 μ .

No. 12, 192 (0.2 ‰), 195, 207 (0.2 ‰), 7 (0.4 ‰), 131, 142 (0.2 ‰).

W. Greenl. (rare).

— *söhrensis* Krasske. HUSTEDT 1930, p. 289, fig. 488.

Plate XI, fig. 7: 15.6 \times 2.0 μ . 22 striae in 10 μ .

No. 225 (0.6 ‰), 226 (0.2 ‰), 192 (0.6 ‰), 193 (0.4 ‰), 194 (0.6 ‰), 195 (1.4 ‰), 224 (0.8 ‰).

— — var. *capitata* Krasske. HUSTEDT 1930, p. 289.

Plate XI, fig. 8: 15.6 \times 2.3 μ . 21—22 striae in 10 μ .

No. 82.

— *pseudoventralis* Hustedt. HUSTEDT 1953, figs. 12, 13. A. Schmidt's Atlas, Pl. 401, figs. 116—118.

Plate VI, fig. 8: 11 \times 4.5 μ . 20—21 striae in 10 μ .

No. 10 (1.8 ‰), 193.

N. bacillares Cleve.

Navicula bacillum Ehr. HUSTEDT 1930, p. 280, fig. 465.

No. 208, 225, 222, 12, 133, 204, 226 (0.2 ‰), 1, 2, 83 (0.2 ‰), 84, 224 (0.4 ‰), 207, 6, 134 (0.6 ‰).

W. Greenl. N. Amer.

— *pupula* Kütz. HUSTEDT 1930, p. 281, fig. 467 a.

No. 222, 1, 82, 194, 224, 8.

W. Greenl. (rare). N. Amer.

— *subhamulata* Grun. HUSTEDT 1930, p. 282, fig. 468 a.

No. 226 (0.2 ‰), 192, 224, 131.

N. heterostichae Cleve.

Navicula pseudoscutiformis Hustedt. HUSTEDT 1930, p. 291, fig. 495.

No. 194.

W.Greenl. (fairly rare).

— *scutiformis* Grun. HUSTEDT 1930, p. 290, fig. 494.

No. 2.

N. lineolatae Cleve.

Navicula cari Ehr. HUSTEDT 1930, p. 299, fig. 512. FOGED 1953, Pl. V, fig. 4.

No. 209 (0.2 %), 208, 222, 5 (0.8), 204 (0.6 %), 160, 194, 159 (0.2 %), 6 (0.6 %), 131, 134 (0.6 %), 143.

W.Greenl. (rare).

— *cincta* (Ehr.) Kütz. HUSTEDT 1930, p. 298, fig. 510. FOGED 1953, Pl. V, figs. 8, 9. Plate VI, fig. 10: $35 \times 6.5 \mu$. 13 striae in 10μ .

VI: 10 is closely related to the West Greenland specimens pictured in FOGED 1953, Pl. V, fig. 9, mainly deviating from the latter only by a slight difference in the form of the central area.

No. 14, 204, 1, 10 (5.2 %), 14, 192, 9 (1.8 %).

W.Greenl. (not common).

— — var. *heufleri* Grun. HUSTEDT 1930, p. 298, fig. 511.

Plate VI, fig. 11: $22.7 \times 5 \mu$. 8—9 striae in 10μ .

No. 204 (0.4 %), 194.

— *certa* Hustedt. HUSTEDT 1945, p. 924, Pl. 42, figs. 2, 3. MESSIKOMMER 1951, Pl. I, fig. 1.

Plate VI, fig. 9: $39 \times 7.1 \mu$. 14 striae in 10μ .

Plate VI, fig. 17: $24 \times 5.5 \mu$. 10—11 striae in 10μ .

According to HUSTEDT 1945, p. 924, the dimensions are: $32\text{--}37 \times 7\text{--}8 \mu$ with 14—16 striae in 10μ . Axial area narrow, linear, central area crosswise spread. The striae in the middle of the valve rather greatly radial, towards the apices of the valves at right angles to the mid-line. The valves lanceolate with very bluntly rounded, sometimes "kaum merklich vorgezogenen Enden." Inter-calated short striae in the middle.

VI: 9, 17 seem to be identical with this species hitherto known only from the Balkans (HUSTEDT 1945, p. 924) and the Alps (MESSIKOMMER 1951, p. 53).

No. 10, 194 (0.2 %).

— *clementioides* Hustedt. HUSTEDT 1945, p. 348, Pl. 37, figs. 59—61.

No. 142 (0.2 %).

W.Greenl. (rare).

— *cryptocephala* Kütz. HUSTEDT 1930, p. 295, fig. 496. FOGED 1953, Pl. V, figs. 11, 13, 14.

Plate VI, fig. 22: $32.5 \times 6 \mu$. 16 striae in 10μ .

Plate VI, fig. 14: $26 \times 6.7 \mu$. 18—20 striae in 10μ .

The species is very variable, but the striae are always radial in the middle of the valve and convergent towards the apices, the central area is rounded-off.

VI: 14 may remind somewhat of *N. simplex* Krasske.

Very common in all the biotopes of the area.

No. 13 (0.6 %), 144 (2.4 %), 209 (0.4 %), 145 (3.2 %), 225 (1.6 %), 4 (2.6 %), 222 (8.4 %), 5 (0.6 %), 12 (1.4 %), 14 (0.8 %), 133 (0.8 %), 204 (2.6 %), 226

(2.0 ‰), 1 (4.2 ‰), 2 (1.2 ‰), 10 (0.8 ‰), 82 (2.0 ‰), 83 (5.8 ‰), 84 (1.8 ‰), 160 (0.2 ‰), 192 (2.6 ‰), 193 (5.2 ‰), 194 (4.6 ‰), 195 (8.4 ‰), 224 (10.4 ‰), 3 (0.2 ‰), 8, 159 (4.2 ‰), 162 (3.0 ‰), 206 (0.4 ‰), 207 (0.2 ‰), 6 (1.4 ‰), 7 (1.6 ‰), 11 (0.2 ‰), 131 (2.2 ‰), 132 (1.8 ‰), 134 (1.0 ‰), 142 (0.6 ‰), 143 (0.8 ‰), 161 (0.2 ‰), 198 (0.6 ‰), 223 (0.4 ‰), 196, 197.

W.Greenl. (common). N.Amer.

Navicula cryptocephala var. *intermedia* Grun. HUSTEDT 1930, p. 295, fig. 497 b.

No. 226 (2.2 ‰), 1, 194 (0.8 ‰).

W.Greenl. (not rare).

— fo. *terrestris* Lund. J.W.G. LUND 1945—46, p. 86, fig. 9 H—W. FOGED 1953, Pl. V, figs. 7, 18.

Plate VI, fig. 23: $24 \times 6.5 \mu$. 16 striae in 10μ .

VI: 23 stands between FOGED 1953, Pl. V, fig. 7 and fig. 18, which both, it seems, should be referred to fo. *terrestris* Lund.

No. 208 (0.2 ‰), 12, 14 (0.2 ‰), 204 (0.6 ‰), 83 (0.4 ‰), 207 (1.2 ‰), 134 (0.2 ‰), 142 (0.4 ‰).

W.Greenl. (not common).

— var. *veneta* (Kütz.) Grun. HUSTEDT 1930, p. 295, fig. 497 a.

Plate VI, fig. 21: $33 \times 6 \mu$. 15—16 striae in 10μ .

No. 192 (1.2 ‰), 8 (0.2 ‰).

— *dicephala* (Ehr.) W. Smith var. *elginensis* (Greg.) Cleve. FOGED 1952 a, Pl. II, fig. 12.

No. 7 (0.6 ‰).

— *falaisiensis* Grun. HUSTEDT 1930, p. 302, fig. 524.

No. 4 (1.0 ‰).

— var. *lanceola* Grun. HUSTEDT 1930, p. 302, fig. 525.

Plate XI, fig. 5: $23 \times 4.6 \mu$. 20 striae in 10μ .

According to HUSTEDT 1930, p. 302, var. *lanceola* is "linear-lanzettlich mit dünnen deutlichen geschnäbelten Enden" and has the dimensions $20-25 \times 5-7 \mu$ with about 20 radial striae in 10μ .

XI: 5 has a considerable resemblance with *N. cryptocephala* forms, but as it has distinctly radial striae, it is referred to *N. falaisiensis* var. *lanceola*.

No. 82 (2.6 ‰), 192, 193 (1.2 ‰), 195 (0.2 ‰).

— *graciloides* A. Mayer. (forma?).

Plate III, fig. 11: $32.5 \times 7.8 \mu$. 14 striae in 10μ .

No. 133.

— *radiosa* Kütz. HUSTEDT 1930, p. 299, fig. 513.

No. 10 (2.2 ‰), 84.

W.Greenl. (not rare). N.Amer.

— *radiosa* Kütz. (forma?).

Plate III, fig. 12: $39 \times 6 \mu$. 12 striae in 10μ .

No. 7.

— *salinarum* Grun. HUSTEDT 1930, p. 295, fig. 498.

No. 7 (1.4 ‰).

W.Greenl. (not rare). N.Amer.

— *schönfeldii* Hustedt. HUSTEDT 1930, p. 301, fig. 520.

Plate VII, fig. 9: $17.5 \times 5.2 \mu$. 13 striae in 10μ .

Plate VII, fig. 10: $19 \times 5.2 \mu$. 14 striae in 10μ .

Plate VII, fig. 11: $20.8 \times 7.8 \mu$. 12—13 striae in 10μ .

Plate VII, fig. 12: $19.5 \times 6.5 \mu$. 16 striae in 10μ .

Plate VII, fig. 8: $14.3 \times 5.2 \mu$. 12—13 striae in 10μ .

Deviating somewhat from the typical *N. schönfeldii*, as there are not in the valves found in this area the usual shorter and longer striae in the middle of the valve. The specimens pictured here also have a certain resemblance with *N. lagerstedtii*, but in the latter the striae are straight and not more or less curved as in VII: 8, 9, 10, 11, and 12. Common to them is the distinct longitudinal rib on the apical striae, but it occurs both in *N. schönfeldii* and in *N. lagerstedtii*. No. 226, 192, 207 (0.2 %), 7.

- *similis* Krasske. KRASSKE 1929, p. 354, fig. 15. HUSTEDT 1930, p. 303, fig. 528. Plate XI, fig. 20: $17.5 \times 6.5 \mu$. 16—17 striae in 10μ . No. 143.

- *tuscula* (Ehr.) Grun. HUSTEDT 1930, p. 308, fig. 552.

No. 225, 22 (0.4 %), 5, 226, 1 (0.4 %), 2 (1.4 %), 10 (3.8 %), 82 (0.8 %), 83 (2.0 %), 84 (0.8 %), 192, 193, 194 (0.6 %), 195, 224 (1.6 %), 6 (0.8 %), 143, 161, 223.

W.Greenl. (not common). N.Amer.

- *viridula* Kütz. fo. *capitata* A. Mayer. HUSTEDT 1930, p. 297. No. 224.

- *vulpina* Kütz. HUSTEDT 1930, p. 297, fig. 504.

Fairly widely distributed in all the biotopes of the area.

No. 209 (0.2 %), 208 (0.2 %), 225 (0.8 %), 4 (0.2 %), 222 (1.6 %), 5, 12 (1.0 %), 204 (1.0 %), 1 (3.0 %), 2 (2.2 %), 10 (3.4 %), 82 (6.4 %), 83 (3.0 %), 84 (3.6 %), 160 (1.4 %), 192 (1.0 %), 193 (0.4 %), 194 (1.8 %), 195 (0.2 %), 224 (1.8 %), 9 (0.2 %), 162, 207, 6 (3.8 %), 7, 11 (1.4 %), 131 (0.2 %), 132 (0.8 %), 134 (0.2 %), 142, 143, 198, 196, 197.

W.Greenl. (fairly rare). N.Amer. (BOYER 1927, p. 388: Arctic regions).

- *sp.*

Plate III, fig. 15: $26.5 \times 6.5 \mu$. 15 striae in 10μ .

Valves symmetric, elliptical-lanceolate, with drawn-out, slightly capitate apices. Striae radial, finely punctate. Raphe straight, terminal fissures deflected in the same direction, axial area rather narrow, sharply defined, central area rounded-off, somewhat irregular. Perhaps III: 15 is a *Cymbella* species with symmetrical valves. The characteristic central area with the striae differently shortened on the two sides is suggestive in that respect.

No. 8, 159 (4.0 %), 7 (11.6 %).

***N. punctatae* Cleve.**

Navicula amphibola Cleve. HUSTEDT 1930, p. 309, fig. 554. FOGED 1953, Pl. VI, fig. 17.

Plate VII, fig. 1: $57 \times 23 \mu$. 7—8 striae in 10μ .

Plate VII, fig. 2: $48 \times 21 \mu$. 9 striae in 10μ .

According to P. T. CLEVE 1894—95, II, p. 45, the dimensions are: $37—70 \times 20 \mu$ with 9—10 striae in 10μ , and according to HUSTEDT 1930, p. 309: $37—70 \times 20—28 \mu$ with 7—10 striae in 10μ . Both authors state the occurrence of 12—15, 16 points in 10μ .

VII: 1 is practically identical with GRUNOW 1884, fig. 35 (from Franz Josef Land), the apices in both being considerably more drawn-out than in HUSTEDT 1930, fig. 554.

VII: 2 is almost identical with HUSTEDT 1930, fig. 554.

The specimen from West Greenland in FOGED 1953, Pl. VI, fig. 17, differs from the Peary Land specimens by the course of the terminal striae being somewhat

irregular, the number of shortened striae in the middle of the valve also being smaller.

Undoubtedly there exist special geographical races of this very characteristic species, the distribution of which is very wide, as it ranges from westernmost North America (California) by way of Greenland to Scandinavia and Franz Josef Land. It is also known in a fossile state from U.S.A. (Chicago) as well as Hungary. In Denmark I have found several specimens in postglacial deposits (from pollen zone VII) from Åmosen in West Zealand.

No. 14, 226 (0.6 %), 1 (0.2 %), 10, 83, 134.

W. Greenl. (fairly rare). N. Amer.

— *scutelloides* W. Smith. HUSTEDT 1930, p. 311, fig. 557.

No. 9.

N. Amer.

N. decipientes Cleve.

Navicula declivis Hustedt?. HUSTEDT 1934, p. 384, fig. 12.

Plate XI, fig. 4: $19.5 \times 6 \mu$. 16—17 striae in 10μ .

XI: 4 is with some doubt referred to *N. declivis* Hustedt as this species is pictured in HUSTEDT 1934, p. 384, fig. 12. The isolated point at the central nodes has not been observed in XI: 4.

No. 142 (0.2 %), 143 (0.2 %).

— *gibbula* Cleve. P. T. Cleve 1894—95, I, p. 140, Pl. 5, fig. 17. FOGED 1953, Pl. VI, fig. 9.

Plate VII, fig. 7: $39 \times 9.7 \mu$. 13—14 striae in 10μ .

There is very close agreement between West Greenland and Peary Land specimens. In VII: 7 there is a slight dilation on the middle of the valve, while the West Greenland specimens are quite elliptical.

The species is widely distributed in the area of the Arctic Ocean, it having been found on Svalbard, Jan Mayen, in Franz Josef Land, and in Lapland. HUSTEDT, who has found it in the last-mentioned place (1924, p. 558), mentions it as a glacial relict there.

No. 145, 208, 14, 9 (5.2 %), 159, 162 (0.2 %).

W. Greenl. (rare).

— *holmenii* nov. spec.

Fig. VII: 6.

Valva lineari-elliptica, lateribus triundulis, apicibus productis, late rotundatis, 26μ longa, 7μ lata. Area axialis angustissima, linearis, ad nodum centralem minime dilatata. Striae transapicales radiantes, subtiliter punctatae, medio 17—19, apices versus 25—26 in 10μ .

Hab. in aqua dulci Grønlandiae boreo-orientalis.

Valves linear-elliptical with triundulate sides and drawn-out, broadly rounded-off apices, 26μ long, 7μ broad.

Axial area very narrow, linear, very little dilated round the central nodes. Transapical striae radiate, finely punctate, 17—19 in 10μ in the middle, 25—26 in 10μ towards the apices.

Freshwater, Northeast Greenland.

Perhaps closely related to the *Navicula* sp. pictured by LAGERSTEDT 1873, Pl. II, fig. 12, the dimensions of which are (p. 35): $28 \times 6 \mu$ with about 11 striae in 10μ in the middle and about 15 towards the apices. From Spitzbergen.

Named after KJELD HOLMEN, member of the DANISH PEARY LAND EXPEDITION 1947—50 and collector of the diatom material treated in the present paper.

No. 9.

- *lagerstedtii* Cleve. A. Schmidt's Atlas Pl. 400, figs. 34—37.
 Plate VI, fig. 18: $28 \times 6 \mu$. 16—17 striae in 10μ .
 According to P. T. CLEVE 1894—95, I, p. 141 the dimensions are: $28 \times 6 \mu$ with 11 striae in 10μ in the middle of the valve and 16 at the apices. VI: 18 is a typical form as regards outline and size. The number of striae is somewhat larger in the middle of the valve than stated in CLEVE.
 No. 145 (4.0 ‰), 162 (0.2 ‰).
 W. Greenl. (rare).
- — var. *palustris* Hustedt. HUSTEDT 1934, p. 385. A. Schmidt's Atlas Pl. 400, figs. 27—29. FOGED 1953, Pl. IV, figs. 13—16.
 Plate VI, fig. 19: $22.8 \times 5.2 \mu$. 17 striae in 10μ .
 Plate VI, fig. 20: $17 \times 5.2 \mu$. 16—17 striae in 10μ .
 No. 145 (0.4 ‰), 225, 5 (0.2 ‰), 133 (0.2 ‰), 224 (0.2 ‰), 207 (0.4 ‰), 7, 143.
 W. Greenl. (not rare).
- *lundströmii* Cleve. P. T. CLEVE & A. GRUNOW 1880, p. 13, 36, Pl. II, fig. 29. P. T. CLEVE 1894—95, I, p. 140. A. CLEVE-EULER 1953, III, p. 182, fig. 885 a. Plate VII, fig. 3: $44 \times 13 \mu$. 8—10 fairly coarsely punctate striae in 10μ in the middle of the valve, at the apices 20—22 more finely punctate striae in 10μ . According to P. T. CLEVE 1880, p. 13, the dimensions are: $34—51 \times 11—13 \mu$ with 19—20 punctate striae in 10μ between the middle of the valve and the apices; in 1894—95, p. 140, it is stated to have 16 striae in the middle of the valve and 20 at the apices in 10μ . Even though VII: 3 has somewhat fewer striae in 10μ in the middle of the valve, and the central nodes and terminal fissures of the raphe (according to the drawings) seem to differ somewhat from Cleve's species, the agreement seems otherwise to be so great that it has without any appreciable hesitation been referred here.
 CLEVE found the species in material from the Kara Sea and later it has been found in fossile brackish-water deposits from Sweden and Finland (A. CLEVE-EULER 1953, III, p. 182).
 In the present material only a single specimen of the species has been found, viz. in scrapings from a dolomite wall sprayed with water from the river Kajakelv. Consequently it is imaginable that its occurrence there is secondary.
 No. 196.

Naviculae?

- Navicula hambergi* Hustedt. HUSTEDT 1924, p. 562, Pl. 17, fig. 2.
 ?. Plate XI, fig. 2: $28 \times 6.5 \mu$. 18—19 striae in 10μ . (No. 84).
 — *opportuna* Hustedt. HUSTEDT 1946—50, p. 436, Pl. 39, fig. 21, 22.
 ?. Plate XI, fig. 10: $14.3 \times 5.8 \mu$. 20 striae in 10μ . (No. 12).
 — *petersenii* Hustedt. A. Schmidt's Atlas Pl. 402, figs. 1—7. FOGED 1953, Pl. VI, fig. 5. — No. 9, 142. — W. Greenl. (rare).

Pinnularia Ehr.

a. Parallelistriatae.

- Pinnularia gracillima* Greg. HUSTEDT 1942 b, p. 121, figs. 38—42. FOGED 1953, Pl. VII, figs. 1, 2.
 Plate XI, fig. 14: $24.7 \times 3.9 \mu$. 22—23 striae in 10μ .
 This was the most frequent *P.* species in West Greenland (FOGED 1953, p. 49). In Peary Land as well it is the commonest *P.* species, which is distributed and often frequent in all the biotopes of the area.

No. 13 (1.6 %), 144 (3.6 %), 209 (6.0 %), 145 (11.0 %), 208 (0.2 %), 225 (0.4 %), 4 (8.0 %), 222 (11.2 %), 5 (9.2 %), 12 (1.6 %), 14, 133 (0.8 %), 204 (1.0 %), 226 (2.4 %), 1 (4.8 %), 2 (0.4 %), 10 (2.0 %), 82 (0.8 %), 83 (4.0 %), 84 (14.0 %), 160 (0.2 %), 192 (0.8 %), 193 (6.6 %), 194 (4.2 %), 195 (13.2 %), 224 (5.0 %), 3 (5.6 %), 8 (4.2 %), 9 (0.2 %), 206 (0.4 %), 207 (1.6 %), 6 (10.0 %), 7 (0.2 %), 11 (1.4 %), 131 (0.2 %), 132 (1.0 %), 134 (6.8 %), 142, 161, 198, 223, 197.
W.Greenl. (very common). N.Amer.

- *undulata* Greg. HUSTEDT 1930, p. 315, fig. 565. FOGED 1953, Pl. VII, fig. 8.
No. 144 (6.0 %), 209 (2.6 %), 145 (7.0 %), 208 (0.4 %), 222 (0.4 %), 12 (1.2 %), 14, 133 (0.8 %), 204 (2.4 %), 82, 159 (1.6 %), 162 (0.6 %), 206 (0.6 %), 207 (0.2 %), 132 (0.6 %), 134 (1.2 %), 143.

W.Greenl. (fairly common).

Syn.: *P. cleveana* Ross. Ross 1947, p. 202, Pl. IX, fig. 12.

- — var. *subundulata* Grun. HUSTEDT 1930, p. 315.

Plate XI, fig. 13: $34.5 \times 4.7 \mu$. 20 striae in 10μ .

No. 4 (0.4 %), 5 (4.0 %), 204 (0.4 %), 1 (0.2 %), 194, 8 (0.6 %), 9, 162 (1.2 %), 7 (0.2 %), 131 (0.2 %), 132, 134 (0.2 %).

b. *Capitatae*.

- Pinnularia braunei* Grun. (*forma*). KRASSKE 1943, fig. 20.

Plate VIII, fig. 14: $36 \times 8.5 \mu$. 12—13 striae in 10μ .

No. 7 (0.2 %), 132.

- *intermedia* Lagerstedt. BOYE PETERSEN 1928, p. 403, fig. 24. FOGED 1953, Pl. VIII, figs. 5, 7—9.

Plate VIII, fig. 3: $19.5 \times 5.8 \mu$. 12—13 striae in 10μ .

Plate VIII, fig. 4: $19.5 \times 5.0 \mu$. 11 striae in 10μ .

Plate VIII, fig. 5: $16.2 \times 4.6 \mu$. 7—8 striae in 10μ .

Plate VIII, fig. 8: $17.6 \times 5.5 \mu$. 10—11 striae in 10μ .

Plate VIII, fig. 9: $21.4 \times 5.2 \mu$. 11 striae in 10μ .

A very variable species. VIII: 4 is identical with specimens from West Greenland (FOGED 1953, Pl. VIII, fig. 9), and VIII: 5 with BOYE PETERSEN 1928, p. 405, fig. 24 c, from Iceland.

No. 144 (0.4 %), 145 (0.4 %), 225, 14, 133, 204 (0.2 %), 226 (0.8 %), 194 (0.2 %), 224 (0.2 %), 9 (8.6 %), 159 (0.4 %), 206 (1.0 %), 207, 7 (1.4 %), 132, 134 (0.4 %), 143, 196.

W.Greenl. (rare).

- *interrupta* W. Smith. HUSTEDT 1930, p. 317, fig. 573.

No. 144 (0.8 %), 145 (1.0 %), 5 (0.4 %), 14, 1, 3, 159 (0.2 %), 132, 161.

W.Greenl. (not rare). N.Amer.

- — fo. *minor* Boye Petersen. BOYE PETERSEN 1928, p. 405, fig. 25. Ross 1947, p. 201, Pl. IX, fig. 11.

Plate XI, fig. 15: $24.7 \times 6 \mu$. 12 striae in 10μ .

As regards form and size XI: 15 approaches very closely to *P. intermedia* Lagerstedt (1873), but as according to BOYE PETERSEN 1928, p. 404, "The striae nearest to the transapical fascia are not shortened," I dare not refer it to this species, but identify it with that above, as it seems identical with that, as appears from Ross 1947, p. 201, Pl. IX, fig. 11 (under the name of *P. biceps* Greg. fo. *petersenii* Ross), which was drawn from specimens from Baffin Land.

No. 83.

- *mesolepta* (Ehr.) W. Smith. HUSTEDT 1930, p. 319, fig. 575 a. FOGED 1953, Pl. VII, fig. 12.
No. 225, 5 (0.2 %), 14 (1.6 %), 1 (0.2 %), 194, 224, 132.
W.Greenl. (not common). N.Amer.

c. *Divergentes*.

- Pinnularia divergens* W. Smith. HUSTEDT 1930, p. 323, fig. 589.
No. 209 (0.4 %), 145 (1.4 %), 208 (0.2 %), 4 (0.2 %), 5 (0.6 %), 12, 133 (0.2 %), 160, 192 (0.2 %), 224, 8 (0.4 %), 162 (0.2 %), 207 (0.2 %), 6 (0.6 %), 11, 132, 134 (1.4 %).
W.Greenl. (fairly rare). N.Amer.
- var. *elliptica* Grun. P.T. CLEVE 1894—95, II, p. 79. HUSTEDT 1930, p. 323, fig. 590.
No. 13 (0.2 %), 144 (2.4 %), 209, 145 (1.8 %), 208, 222, 12, 133, 204 (0.2 %), 224, 3 (0.6 %), 159 (0.8 %), 162 (0.4 %), 207, 6, 131, 132, 134 (0.2 %), 143, 161, 198.
W.Greenl. (fairly rare). N.Amer.
- *divergentissima* Grun. HUSTEDT 1930, p. 320, fig. 581.
No. 209, 14 (0.2 %), 204 (0.4 %), 132.
W.Greenl. (fairly rare). N.Amer. (BOYER 1927, p. 436: Type loc.: Arctic regions).
- var. *wulffi* Boye Petersen. BOYE PETERSEN 1924, p. 315, fig. 4. FOGED 1953, Pl. VII, fig. 10.
Plate XI, fig. 16: $35 \times 6.5 \mu$. 12—13 striae in 10μ .
XI: 16 is almost identical with West Greenland specimens as pictured in FOGED 1953, Pl. VII, fig. 10.
According to BOYE PETERSEN 1924, p. 315, the dimensions are: $41 \times 8.8 \mu$ with 14 striae in 10μ , and the variety is "closely connected with certain forms of *P. divergentissima* figured by A. CLEVE (1900, p. 16, fig. 6 b) and BACHMANN (1921, p. 31, fig. 9 n)."
No. 144 (16.0 %), 209 (1.0 %), 145 (10.4 %), 12, 14 (1.4 %), 133 (0.2 %), 204 (0.2 %), 224, 9 (0.4 %), 159 (0.8 %), 162 (1.2 %), 6, 11, 131, 132, 134 (0.6 %), 143, 161.
W.Greenl. (fairly rare).
- *divergentissima* var. *hustedtiana* Ross. Ross 1947, p. 202, Pl. IX, fig. 14.
Plate VIII, fig. 16: $27.3 \times 5.2 \mu$. 14—15 striae in 10μ . Seems to be closely related to the variety described by Ross. Differs by being somewhat more markedly capitate than Ross' specimen.
No. 14.
N.Amer.
Syn.: *P. divergentissima* (Grun.) Cleve var. *capitata* Hustedt apud Sven Hedin, Southern Tibet VI, 3, p. 128 (Stockh. 1922).
- *microstauron* (Ehr.) Cleve. HUSTEDT 1930, p. 320, fig. 582. FOGED 1953, Pl. VIII, fig. 6.
Plate XI, fig. 21: $31 \times 6.5 \mu$. 8—9 striae in 10μ . (Small specimen with fairly coarse striae).
No. 13 (0.4 %), 144 (0.8 %), 145 (0.4 %), 4 (0.2 %), 5 (0.2 %), 14, 2 (0.4 %), 10, 83, 3 (0.4 %), 8, 9, 162 (0.8 %), 206, 6, 7 (0.8 %), 132 (0.4 %), 134 (0.2 %).
W.Greenl. (fairly common). N.Amer.
- var. *brébissonii* (Kütz.) Hustedt. HUSTEDT 1930, p. 321, fig. 584, FOGED 1953, Pl. VII, fig. 18.
Plate VIII, fig. 12: $35 \times 8.4 \mu$. 12 striae in 10μ .

Plate XI, fig. 6: $40 \times 9.7 \mu$. 14 striae in 10μ .

No. 12, 14 (0.2 %), 204, 1, 2, 10 (0.2 %), 82, 192, 194, 8, 159 (0.6 %), 162 (0.4 %), 131, 132 (0.4 %), 142, 143.

W.Greenl. (fairly common). N.Amer.

— fo. *diminuta* Grun. HUSTEDT 1930, p. 322, fig. 585.

Plate VIII, fig. 13: $28.6 \times 5.8 \mu$. 10 striae in 10μ .

No. 13 (0.4 %), 12, 14, 133 (0.2 %), 204, 192 (0.4 %), 159, 162 (0.8 %), 7 (0.4 %), 131, 134 (0.6 %), 142.

W.Greenl. (not rare).

— *microstauron* var. *brébissonii* fo. *diminuta* Grun.?

Plate VIII, fig. 17: $26 \times 6.5 \mu$. 9—10 striae in 10μ .

Plate VIII, fig. 18: $30.5 \times 5.8 \mu$. 9—10 striae in 10μ .

These are with some doubt referred to the form mentioned above, as the apices in VIII: 17, 18 are more pointed than usual in the latter, just as the valves are slightly drawn-in before the apices.

No. 159.

d. *Distantes*.

Pinnularia balfouriana Greg. HUSTEDT 1930, p. 326, fig. 599. FOGED 1953, Pl.VIII, fig. 16.

Plate VIII, fig. 10: $10 \times 3.3 \mu$. 10 striae in 10μ .

Plate VIII, fig. 11: $6.8 \times 3.3 \mu$. 10 striae in 10μ . (Very small specimen).

No. 208 (4.4 %), 222 (0.2 %), 12 (0.2 %), 204, 1, 2, 82, 83 (3.8 %), 84 (0.4 %), 160, 192 (1.0 %), 193 (2.2 %), 194 (0.2 %), 195 (0.4 %), 207 (0.8 %), 6 (0.2 %), 132, 161.

W.Greenl. (rare).

— *borealis* Ehr. HUSTEDT 1930, p. 326, fig. 597. FOGED 1953, Pl.VIII, figs. 11, 13—15.

Plate VIII, fig. 1: $59 \times 17 \mu$. 4 striae in 10μ .

Plate VIII, fig. 2: $24.7 \times 6.5 \mu$. 5—6 striae in 10μ .

No. 144 (0.4 %), 145 (0.2 %), 208, 14, 224, 9 (0.8 %), 159, 162 (0.8 %), 7, 132, 134.

W.Greenl. (fairly common). N.Amer. (BOYER 1926—27, II, p. 437: Common. Type loc.: North America).

— *subsolaris* Grun. HUSTEDT 1930, p. 322, fig. 588.

No. 204, 1, 134 (0.4 %).

W.Greenl. (fairly rare).

e. *Tabellariae*.

Pinnularia gibba Ehr. HUSTEDT 1930, p. 327, fig. 600.

No. 209, 145 (0.6 %), 14, 204, 206, 7.

W.Greenl. (not common). N.Amer.

— — var. *linearis* Hustedt. HUSTEDT 1930, p. 327, fig. 604.

No. 143.

W.Greenl. (rare).

— *parva* (Ehr.) Cleve var. *lagerstedtii* Cleve. P.T. CLEVE 1894—95, II, p. 87.

LAGERSTEDT 1873: *Navicula parvula* Ralfs, p. 26, Pl. II, fig. 4.

Plate VIII, fig. 7: $32.5 \times 7.2 \mu$. 9 striae in 10μ .

No. 9.

— — — fo. *interrupta* Boye Petersen. BOYE PETERSEN 1928, p. 407, fig. 28.

No. 162 (0.2 %).

— — var. *minuta* Østrup. BOYE PETERSEN 1928, p. 408, fig. 29. FOGED 1953, Pl.VIII, figs. 1—4.

- Plate VIII, fig. 6: $19 \times 5 \mu$. 9—10 striae in 10μ .
 No. 204, 9 (0.4 %), 162 (0.2 %).
 W.Greenl. (rare).
- *obscura* Krasske. KRASSKE 1932, p. 117, fig. 22. A. Schmidt's Atlas, Pl. 388, figs. 18—21. BOYE PETERSEN 1935 b, p. 147, fig. 6. 1928, p. 404, fig. 24 g.
 Plate VIII, fig. 15: $30.5 \times 5.8 \mu$. 10 striae in 10μ .
 No. 9 (1.8 %).
 W.Greenl. (rare).
- *stomatophora* Grun. HUSTEDT 1930, p. 327, fig. 605.
 No. 4, 222 (0.2 %), 224, 6, 11.
 W.Greenl. (common).
- — var. *gibbosa* Hustedt. HUSTEDT 1942 b, p. 126, fig. 50.
 No. 6.
 W.Greenl. (rare).
- No representatives of the groups of *Brevistriatae*, *Maiiores*, and *Complexae* have been found in the present material from Peary Land.

Amphora Ehr.

- Amphora obscura* Krasske. KRASSKE 1938, figs. 28—33. FOGED 1953, Pl. X, figs. 3—5.
 No. 204, 82 (0.6 %).
 W.Greenl. (not rare).
 Plate XIV, fig. 20: $18.2 \times 3.2 \mu$. 24—25 striae in 10μ , should probably be referred to *A. obscura*, both form and dimensions being in rather close agreement with KRASSKE 1928 (dimensions: $18—28 \times 2.5 \mu$ with 26 striae in 10μ).
- *ovalis* Kütz. HUSTEDT 1930, p. 342, fig. 628.
 No. 208 (0.2 %), 222 (1.0 %), 204 (0.4 %), 224 (1.8 %), 207 (0.2 %).
 W.Greenl. (fairly common). N.Amer.
- — var. *libyca* (Ehr.) Cleve. A. Schmidt's Atlas Pl. 26, figs. 102—111. HUSTEDT 1930, p. 342.
 The commonest *A.* species in the area. Found in all the biotopes of the area, though never being particularly frequent in the various samples.
 No. 209 (1.2 %), 208 (2.2 %), 225 (0.4 %), 222 (1.6 %), 5, 12, 133 (0.6 %), 204 (0.6 %), 226 (1.8 %), 1 (2.0 %), 2 (0.6 %), 10 (3.4 %), 82 (0.6 %), 83 (2.0 %), 84 (0.8 %), 160, 192 (0.2 %), 193, 194 (0.8 %), 195, 224 (2.4 %), 3 (2.0 %), 8 (2.0 %), 162, 207 (2.0 %), 6 (2.0 %), 11 (1.2 %), 131 (0.6 %), 134 (1.2 %), 142, 143 (1.2 %), 198, 223, 196, 197.
 W.Greenl. (fairly common). N.Amer.
- *ovalis* var. *pediculus* Kütz. HUSTEDT 1930, p. 343, fig. 629.
 No. 209 (4.8 %), 4, 222 (5.8 %), 12, 133, 204, 160, 192 (0.4 %), 194, 224, 3 (0.4 %), 7 (5.6 %), 11, 131, 132 (1.4 %), 142 (0.4 %), 143 (0.8 %), 198.
 W.Greenl. (rare). N.Amer.
- *triundulata* Ross. Ross 1947, p. 222, Pl. XI, fig. 13. FOGED 1953, Pl. X, fig. 6.
 Plate XIII, fig. 10: $22 \times 3.6 \mu$. 23—24 striae in 10μ .
 According to Ross 1947, p. 222, the dimensions are: $20—25 \times 3—4 \mu$ with 24 striae in 10μ . The species is very closely related to *A. duseni* Brun, BRUN 1900, p. 16, figs. 14—16, the dimensions of which are stated to be $11—13 \mu$ in length with 18—24 striae in 10μ , and the same species in KRASSKE 1938, figs. 24, 25, 34. KRASSKE states the dimensions to be $13—18 \times 2.5—3 \mu$ with 30—36 striae

in 10 μ . BOYE PETERSEN (1923, Jan Mayen) considers *A. lineata* in ØSTRUP in Bot. Tidsskr. vol. 21, p. 24, to be identical with *A. duseni*.

Syn.: *A. normanni* Rabh. var. *undulata* Krasske. KRASSKE 1929, p. 355, fig. 21. No. 208 (1.8%), 204, 1, 193 (0.4%), 194, 224, 207 (0.2%), 132, 143. W. Greenl. (fairly rare). N. Amer.

The species is undoubtedly widely distributed in arctic regions and very variable.

— *veneta* Kütz. HUSTEDT 1930, p. 345, fig. 631.

Plate XIV, fig. 21: $34 \times 5.5 \mu$. 23—24 striae in 10 μ . (Denser towards the apices). According to HUSTEDT 1930, p. 345, *A. veneta* has the dimensions $12-60 \times 7-8 \mu$ with 20—26 striae in 10 μ (in the middle of the valve 16—20 striae in 10 μ). XIV: 21 differs somewhat from this, but should no doubt be referred to the form cycle of *A. veneta*. Perhaps the same applies to the form from West Greenland pictured in FOGED 1953, Pl. IX, fig. 9.

No. 226 (0.2%), 1 (1.4%), 2, 10, 82 (0.6%), 83 (1.4%), 84, 193 (0.2%), 224, 7 (0.4%).

W. Greenl. (common). N. Amer.

Cymbella Agardh.

This genus is the most characteristic genus of diatoms in the area, as it occurs with many and partly distinctive species as well as a fairly considerable number of valves. Some of the forms are undoubtedly characteristic of the extreme environment found there. Perhaps there are among the representatives of this genus forms of a geologically considerable age—like the genera of *Neidium* and *Navicula*.

Cymbella amphicephala Naegeli. HUSTEDT 1930, p. 355, fig. 651. A. Schmidt's Atlas Pl. 377, fig. 34.

Plate IX, fig. 11: $22.7 \times 7.8 \mu$. Dorsal side: 13, ventral side: 15 striae in 10 μ . According to HUSTEDT 1930, p. 355, the dimensions are: $25-40 \times 9-10 \mu$ with 12—14 striae in 10 μ on the dorsal side and 16 on the ventral side. IX: 11 represents a somewhat smaller form, which is very closely related to A. Schmidt's Atlas Pl. 377, fig. 34 (from Grünsee near Davos).

No. 13 (0.2%), 144 (0.4%), 222 (0.4%), 12, 133 (0.2%), 204 (0.2%), 10, 192, 193 (0.4%), 224 (0.4%), 8 (0.2%), 206, 6, 7 (5.4%), 11 (0.6%), 142, 196.

— — var. *variostrata* nov. var.

Fig. XIII: 11, 12.

A *Cymbella amphicephala* differt valva pro axi apicali subsymmetrica striisque remotioribus, in latere ventrali eviderter densius quam in dorsali confertis, in ventrali 12, in dorsali 6—10 in 10 μ .

Hab. in aqua dulci Greenlandiae boreo-orientalis.

The dorsal side with 6—10 striae in 10 μ , and the ventral side with 12 striae in 10 μ . The valves almost symmetrical in relation to the apical axis. The variety has always a conspicuous difference in the density of striae on the dorsal and the ventral side, and always a greater distance between the striae than the species.

Freshwater, Northeast Greenland

No. 14.

XIII: 11: $28.6 \times 7.2 \mu$. Ventral side: 12 striae, dorsal side: 10 striae in 10 μ .

XIII: 12: $26.7 \times 7.2 \mu$. Ventral side: 12 striae, dorsal side: 6—7 striae in 10 μ .

Cymbella angustata (W. Smith) Cleve. HUSTEDT 1930, p. 351, fig. 639. A. Schmidt's Atlas Pl. 9, fig. 69. FOGED 1953, Pl. X, fig. 10.

Plate XII, fig. 18: $32.5 \times 5.8 \mu$. 17—18 striae in 10μ .

Plate XII, fig. 19: $28 \times 5.8 \mu$. 18—19 striae in 10μ .

According to HUSTEDT 1930, p. 351, the dimensions are: $30-50 \times 7-10 \mu$ with 16 radial striae in 10μ . A characteristic feature of *C. angustata* is the slightly triundulate sides, which, however, were never observed on valves in the present material. XII. 18 and 19 still are so closely related to *C. angustata* that—although with some hesitation—I refer them to this species. The species is widely distributed in all the biotopes of the area.

No. 13 (5.6 ‰), 209 (0.2 ‰), 208, 225 (13.2 ‰), 4 (0.4 ‰), 222 (4.0 ‰), 12 (2.2 ‰), 14 (0.4 ‰), 133 (0.2 ‰), 204 (2.2 ‰), 226 (7.4 ‰), 2 (3.0 ‰), 82 (3.4 ‰), 83 (2.6 ‰), 84 (2.0 ‰), 160 (1.8 ‰), 192 (0.8 ‰), 193 (1.6 ‰), 194 (4.0 ‰), 195 (2.0 ‰), 224 (11.4 ‰), 8 (4.8 ‰), 9 (0.2 ‰), 162, 207 (1.0 ‰), 6 (5.8 ‰), 7, 11 (3.8 ‰), 131 (1.8 ‰), 132 (0.2 ‰), 134 (0.2 ‰), 142, 143 (0.2 ‰), 161 (1.2 ‰), 198 (1.2 ‰), 223 (1.0 ‰), 196, 197 (0.2 ‰).

W.Greenl. (rare).

- *aspera* (Ehr.) Cleve. HUSTEDT 1930, p. 365, fig. 680.

No. 1, 83 (0.2 ‰), 6.

W.Greenl. (rare). N.Amer.

- *brehmii* Hustedt. HUSTEDT 1930, p. 1930, p. 363, fig. 673.

Plate XII, fig. 6: $11 \times 4.8 \mu$. Dorsal side: 10—12, ventral side: 12—14 striae in 10μ .

Dimensions: according to HUSTEDT 1930, p. 363: $13-16 \times 5 \mu$ with, on the dorsal side, 12, and, on the ventral side, 16 striae in 10μ . XII: 6 thus is somewhat smaller and with somewhat coarser striae.

No. 1.

- *broenlundensis* nov. spec.

Fig. XI: 22, 23.

Valva subsymmetrica, ventrali cum dorsali margine convexo, $21-24 \mu$ longa, $3.5-5 \mu$ lata. Rraphe minime excentrica, fissuris apicalibus brevibus. Area axialis angustissima, centralis manifesta, sed irregularis, in latere dorsali latior. Striae paulum radiantes, 20—22 in 10μ , subtilissime punctatae.

Hab. in aqua dulci Grœnlandiae boreo-orientalis.

Valves almost symmetrical with convex dorsal and ventral margin, $21-24 \mu$ long, $3.5-5 \mu$ broad.

Rraphe very little eccentric, polar fissures short. Axial area very narrow, central area distinctly, but irregularly developed, most expanded on the dorsal side. Striae but little radiate, 20—22 in 10μ , very finely punctate.

Freshwater, Northeast Greenland.

No. 1 (2.6 ‰), 2 (1.0 ‰), 83 (1.8 ‰), 84 (1.0 ‰).

- *cesati* (Rabh.) Grun. HUSTEDT 1930, p. 351, fig. 638. A. Schmidt's Atlas Pl. 71, figs. 48, 49.

Plate IX, fig. 8: $32 \times 6.5 \mu$. Dorsal side: 17, ventral side: 19 striae in 10μ .

Plate IX, fig. 13: $46 \times 6.5 \mu$. 20—22 striae in 10μ .

Dimensions according to HUSTEDT 1930, p. 351: $40-60 \times 6-7 \mu$ with 18—20 striae in 10μ . IX: 8 differs somewhat from the typical specimens of the species, as it shows a fairly distinct asymmetry, and also is somewhat smaller than typical specimens. Especially because of the long polar fissures it has been referred to *C. cesati*.

No. 225 (2.4 ‰), 2 (0.2 ‰), 10, 82 (0.4 ‰), 83 (0.2 ‰), 84 (0.2 ‰), 160 (3.4 ‰),

192 (3.2 ‰), 193 (0.2 ‰), 195 (1.4 ‰), 224 (1.8 ‰), 207, 7, 132 (0.2 ‰), 134 (0.8 ‰), 161 (0.2 ‰), 223 (0.2 ‰).

W.Greenl. (not rare). N.Amer.

- *cistula* (Hempr.) Grun. HUSTEDT 1930, p. 363, fig. 676 a. A.Schmidt's Atlas Pl. 71, fig. 21.

Plate IX, fig. 3: $41.5 \times 12.3 \mu$. Ventral side: 12, dorsal side: 12—13 striae in 10μ .

Plate IX, fig. 4: $46 \times 13 \mu$. Ventral side: 9, dorsal side: 9 striae in 10μ .

Widely distributed in all the biotopes of the area, but in most samples rather few in number or rare.

No. 209 (0.6 ‰), 208 (2.2 ‰), 225 (0.4 ‰), 4, 12 (3.8 ‰), 133 (13.6 ‰), 204 (0.6 ‰), 226 (6.2 ‰), 1 (2.2 ‰), 2 (3.0 ‰), 10 (0.2 ‰), 82, 83 (0.4 ‰), 84 (0.2 ‰), 160 (5.4 ‰), 192 (0.6 ‰), 193 (0.4 ‰), 194 (1.4 ‰), 195 (1.0 ‰), 224 (0.2 ‰), 3 (5.2 ‰), 8 (3.2 ‰), 159, 206 (3.8 ‰), 207 (4.6 ‰), 6 (0.6 ‰), 7 (1.6 ‰), 11 (0.2 ‰), 131 (0.4 ‰), 132 (0.4 ‰), 142, 143 (0.6 ‰), 161, 198, 223 (0.2 ‰), 196 (0.2 ‰), 197 (0.2 ‰).

W.Greenl. (rare). N.Amer.

- *cuspidata* Kütz. HUSTEDT 1930, p. 357. P.T.CLEVE 1894—95, I, p. 166. A. Schmidt's Atlas Pl. 9, figs. 50, 52.

Plate X, fig. 5: $48 \times 14 \mu$. Dorsal side: 10, ventral side: 12 striae in 10μ .

From the very beginning great uncertainty has prevailed as to the accurate delimitation of this species and the name itself, "*cuspidata*", which was used by both KÜTZING and W. SMITH as designation for a *C.* species. LAGERSTEDT (1873) mentioned this fact (p. 42), and introduced the specific name of *anglica* for a form which he considered synonymous with *C. cuspidata* W. Smith (Syn. Brit. Diat. V. I, p. 18, Pl. II, fig. 22) and which he considered quite another species than *C. cuspidata* Kütz.

The *C. naviculiformis* Auersw. mentioned by BOYE PETERSEN 1924, p. 313, is stated to be synonymous with *C. anglica* Lagerst. (1873, p. 42, Pl. II, fig. 18). In P.T.CLEVE 1894—95, I, p. 166, *C. anglica* Lagerst. is stated to be synonymous with *C. naviculiformis* Auersw. (1861), but also synonymous with *C. cuspidata* W. Smith (B. D. I, Pl. II, fig. 22 a), as it appears from A. Schmidt's Atlas Pl. 9, fig. 50 ("typical"). The dimensions are stated by CLEVE to be $30-47 \times 10-16 \mu$, on the dorsal side 14—18, on the ventral side 14 striae in 10μ , and the form to be: "V. elliptic-lanceolate, slightly asymmetrical, with rostrate-capitate ends", while he (CLEVE) writes about *C. cuspidata* (Kütz. (p. 166): "V. broadly linear-lanceolate, slightly asymmetrical, with rostrate-capitate ends." L: 40—95 μ , b: 14—24 μ . Striae 9—10 (middle), 12—14 (ends) in 10μ . As to *C. naviculiformis* Auersw. CLEVE states (p. 166) that it "closely resembles *C. amphicephala*, from which it is distinguished by the larger central area." HEIBERG (1863, p. 108) is of opinion that *C. cuspidata* W. Smith is not identical with *C. cuspidata* Kütz., but rather with *C. naviculiformis* Auersw., and according to P.T.CLEVE the drawing which he produces of it in Pl. I, fig. 3, resembles *C. amphicephala* more.

X: 5, however, agrees with *C. cuspidata* Kütz. (1844) as described by P.T.CLEVE (1894—95, I, p. 166) and by HUSTEDT 1930, p. 357. Hustedt's fig. 650, which accompanies the description, however, differs from this as regards the form and size of the central area.

X: 5 is undoubtedly also identical with *C. anglica* Lagerst., as pictured by LAGERSTEDT 1873, Pl. II, fig. 18.

C. cuspidata Kütz. is distributed in all the biotopes of the area, but is generally few in number or rare in the various samples.

No. 13 (0.8 ‰), 209 (3.0 ‰), 145 (10.4 ‰), 208 (1.4 ‰), 222 (0.4 ‰), 5 (1.2 ‰), 12 (0.2 ‰), 14 (0.2 ‰), 133 (0.6 ‰), 204 (0.2 ‰), 1 (1.4 ‰), 2 (0.2 ‰), 82 (0.2 ‰), 83 (0.4 ‰), 84 (0.6 ‰), 160 (0.4 ‰), 192, 194 (0.6 ‰), 195, 224 (0.2 ‰), 3 (10.0 ‰), 8 (0.6 ‰), 159 (1.8 ‰), 162, 207 (0.6 ‰), 6 (1.2 ‰), 7 (2.0 ‰), 11, 131, 132 (0.4 ‰), 134 (0.8 ‰), 142 (0.2 ‰), 143 (0.2 ‰), 161, 198 (0.2 ‰), 223.

N.Amer.

- *delicatula* Kütz. HUSTEDT 1930, p. 352, fig. 642. A. Schmidt's Atlas Pl. 71, figs. 54, 55, Pl. 373, figs. 36—38.

Plate XII, fig. 13: $24.7 \times 5.2 \mu$. About 22 striae in 10μ .

No. 133 (12.4 ‰), 194, 6 (4.0 ‰), 7 (4.6 ‰), 11 (4.8 ‰), 134 (1.0 ‰), 143 (0.4 ‰). W.Greenl. (rare).

- *gracilis* (Rabh.) Cleve. HUSTEDT 1930, p. 359, fig. 663. FOGED 1953, Pl. X, fig. 17. A. Schmidt's Atlas Pl. 10, figs. 36, 37, 39, 40.

No. 12.

W.Greenl. (not rare). N.Amer.

- *groenlandica* Foged. FOGED 1953, p. 35, Pl. X, fig. 7.

Plate X, fig. 6: $42 \times 8 \mu$. Dorsal side: 15, ventral side: 17 striae in 10μ . Even though the punctuation of the striae is less conspicuous, X: 6 must be considered identical with *C. groenlandica*.

No. 84.

W.Greenl. (rare).

- *hebridica* (Greg.) Grun. HUSTEDT 1930, p. 359, fig. 662.

No. 145 (1.4 ‰), 225, 222 (0.6 ‰), 5 (1.2 ‰), 204, 226 (0.6 ‰), 1 (0.8 ‰), 2, 192, 193 (0.4 ‰), 224 (0.4 ‰), 159 (0.2 ‰), 161 (0.2 ‰).

W.Greenl. (fairly rare).

Cymbella heilprinensis nov. spec.

Fig. X:8.

Valva parum pro axi apicali asymmetrica, ventrali cum dorsali margine convexo, apicibus leniter productis, obtuse rotundatis, 47μ longa, 12μ lata. Rraphe subrecta, parum excentrica, fissuris apicalibus ad latus ventrale deflexis. Striae transapicales radiantibus, validae, validius punctatae, medio ca. 13 in 10μ , ad apices versus paulo densius confertae. Area axialis latior, ad nodum centalem minime dilatata.

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves only a little asymmetrical round the apical axis, with convex dorsal and ventral margin; the apices slightly drawn-out and bluntly rounded; length 47μ , breadth 12μ .

Rraphe almost straight, only a little eccentric, polar fissures deflected towards the ventral side.

Transapical striae radiate, prominent, rather coarsely punctate, about 13 in 10μ on the middle of the valve, somewhat denser towards the apices. Rather broad axial area with very slight expansion around the central nodes.

Freshwater, Northeast Greenland.

No. 225 (0.2 ‰), 222 (0.2 ‰), 1, 10 (0.6 ‰), 83 (0.8 ‰), 84 (0.2 ‰), 192, 193 (2.0 ‰), 194, 195, 224 (0.2 ‰), 7, 142.

This species has some resemblance with *C. laevis* Naegeli, but is considerably larger and more symmetrical than the latter, the striae also having a coarser punctuation. There is also a certain resemblance with *C. reinhardtii* Grun., but the latter has a fairly central area and still coarser striation than X: 8.

— *holmenii* nov. spec.

Fig. XII: 2.

Valva asymmetrica, margine dorsali valde, ventrali leniter curvato, apicibus rotundatis, 34—40 μ longa, 10—12 μ lata. Striae dorsales ut ventrales 9 in 10 μ , radiant, valide punctatae, ventrales tamen apices versus convergentes. Rraphe excentrica, subcurva, fissuris apicalibus longis, ad latus ventrale, poris centralibus leniter ad dorsale deflexis. Area axialis late, praesertim in latere ventrali, medio paulum modo, ad latus dorsale magis, dilatata.

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves asymmetrical, with greatly convex dorsal margin, slightly convex ventral margin, and rounded-off apices: length 34—40 μ , breadth 10—12 μ , 9-radiate, coarsely punctate striae in 10 μ both on the dorsal and the ventral side; on the ventral side they converge towards the apices.

Rraphe eccentric, slightly curved, with long polar fissures deflected towards the ventral side and central nodes slightly deflected towards the dorsal side.

Axial area broad, especially on the ventral side; in the middle of the valve only slightly expanded, most towards the dorsal side.

Freshwater, Northeast Greenland.

No. 1.

Named after Cand. mag. KJELD HOLMEN.

This rarely occurring species offers points of similarity to both *C. turgida* and *C. hebridica*. It differs, however, from *C. turgida* besides by the contour of the valve by the greater breadth of the axial area and the distinct asymmetry as regards the raphe. It differs less from *C. hebridica* in form, but has distinctly and characteristically rounded-off apices in contrast to the pointed apices of *C. hebridica*, and furthermore it has a much broader axial area than the latter.

— *hybrida* Grun. HUSTEDT 1930, p. 357, fig. 652. A. Schmidt's Atlas, Pl. 377, figs. 21—27.Plate XIII, fig. 15: 39 \times 7.1 μ . 13 striae in 10 μ .Plate XIII, fig. 16: 34.5 \times 7.8 μ . 13 striae in 10 μ .Plate XIII, fig. 17: 30 \times 7.5 μ . 14 striae in 10 μ .

According to HUSTEDT 1930, p. 357, the dimensions are: 38—51 \times 9—10 μ with 11—12 striae in 10 μ , and according to P.T. CLEVE 1894—95, I, p. 166: 45 \times 9 μ with 11 striae, which are almost parallel and finely punctate, in 10 μ . XIII: 15, 16, 17 thus are all rather small and have somewhat denser striae than usual; but they seem to be identical with those rendered in A. Schmidt's Atlas Pl. 377, figs. 21—27.

No. 209 (1.2 %), 145 (0.2 %), 222, 5 (0.4 %), 14, 204 226 (0.2 %), 1 (0.4 %), 2 (0.2 %), 10, 82 (0.2 %), 83 (0.4 %), 194, 224 (0.8 %), 3, 8 (0.2 %), 207, 6, 131, 132 (0.8 %).

W. Greenl. (rare). N. Amer.

— *incerta* Grun. HUSTEDT 1930, p. 360, fig. 665.

No. 194, 159 (0.4 %), 11.

W. Greenl. (common).

— *incrassata* nov. spec.

Fig. XII: 17.

Valva asymmetrica, margine dorsali valde convexo, ventrali cavo, in medio inflato, 21 μ longa, 7 μ lata. Rraphe excentrica, valde curva, fissuris apicalibus ut poris centralibus ad latus dorsale deflexis. Area axialis angusta, medio non dilatata. Striae transapicales radiant, manifesto punctatae, dorsales 11—12, ventrales 13—14 in 10 μ .

Hab. in aqua dulci Grœnlandiæ boreo-orientalis.

Valves asymmetrical, greatly convex dorsal margin, concave ventral margin with convex curvature in the middle, 21 μ long, 7 μ broad.

Raphe eccentric, much bent, polar fissures and central nodes deflected towards the dorsal side. Axial area narrow, without any central expansion.

Transapical striae radiate, distinctly punctate; on the dorsal side 11—12 and on the ventral side 13—14 in 10 μ .

Freshwater, Northeast Greenland.

No. 225 (1.4 %), 4 (0.6 %), 222 (0.6 %), 204 (1.2 %), 226 (8.6 %), 2 (0.8 %), 82 (4.6 %), 83 (1.2 %), 84 (0.2 %), 160 (1.0 %), 192 (2.4 %), 193 (2.8 %), 194 (3.8 %), 195 (2.0 %), 224 (2.0 %), 162, 6 (0.2 %), 7 (0.2 %), 11 (0.4 %), 131 (1.2 %), 132 (0.2 %), 134, 143, 198, 223 (0.2 %).

This very characteristic species thus is widely distributed in the area, being found in all biotopes, although as a rule in small numbers or rare in the various samples.

— *knuthii* nov. spec.

Fig. XII: 11.

Valva asymmetrica, margine dorsali valde convexo, ventrali subrecto in medio paulum inflato, 23 μ longa, 6 μ lata. Rraphe excentrica, subrecta, fissuris apicalibus ad latus dorsale deflexis. Area axialis angusta, medio non dilatata. Striae transapicales radiantes, in medio 9—10 in 10 μ , valide punctatae, ad apices versus paulo densius confertae.

Hab. in aqua dulci Grœnlandiæ boreo-orientalis.

Valves asymmetrical with greatly convex dorsal margin and almost straight ventral margin with a slightly convex curvature in the middle, 23 μ long, 6 μ broad.

Rraphe eccentric, almost straight. Polar fissures deflected towards the dorsal side. Narrow axial area without any central expansion.

Transapical striae radiate; in the middle 9—10 in 10 μ and coarsely punctate; towards the apices somewhat denser.

Freshwater, Northeast Greenland.

Distributed in all the biotopes of the area and often fairly common.

No. 209, 208 (3.2 %), 225 (3.4 %), 222 (0.2 %), 204 (2.8 %), 226 (3.2 %), 1 (9.0 %), 2 (4.2 %), 82 (11.2 %), 83 (1.6 %), 84 (4.0 %), 160 (8.8 %), 192 (3.2 %), 193 (2.6 %), 194 (1.8 %), 195 (5.0 %), 224 (3.6 %), 162, 207 (1.6 %), 7 (0.4 %), 11 (0.6 %), 131 (2.6 %), 132 (0.4 %), 161, 198 (1.2 %), 223 (0.2 %), 196 (0.2 %).

The species has been named after EIGIL KNUTH, leader of the DANISH PEARY-LAND EXPEDITION 1947—50.

— *laevis* Naegeli. HUSTEDT 1930, p. 353, fig. 643. A. Schmidt's Atlas Pl. 380, fig. 17. Plate IX, fig. 10: 30 \times 9.7 μ . 14 striae in 10 μ .

Plate XI, fig. 17: 26 \times 6.5 μ . Dorsal side: 15—16, ventral side: 18 striae in 10 μ .

According to HUSTEDT 1930, p. 353, the striae on the dorsal side have a somewhat greater mutual distance than those on the ventral side (the difference, however, is small: 12—15 as against 13—16 in 10 μ . In IX: 10 there is no difference in the number of the striae on the two sides. The species is widely distributed, and often common in all the biotopes of the area.

No. 13 (1.8 %), 209 (14.4 %), 145 (1.0 %), 208 (0.2 %), 222 (6.8 %), 12 (1.2 %), 133 (3.0 %), 204 (1.2 %), 226 (3.6 %), 1 (0.2 %), 2 (1.0 %), 10 (0.4 %), 82 (1.0 %), 83 (0.2 %), 84 (8.6 %), 160 (10.6 %), 192, 193 (0.8 %), 194 (1.0 %), 195 (0.6 %), 224 (2.0 %), 3 (32.0 %), 8 (11.4 %), 9 (0.2 %), 159, 206 (6.8 %), 6 (0.4 %), 7 (1.4 %), 11 (2.0 %), 131 (0.2 %), 132 (1.4 %), 142 (0.6 %), 143 (0.2 %), 161, 198 (3.6 %), 223 (0.2 %), 196 (1.4 %), 197 (0.2 %).

W. Greenl. (not common).

- *lanceolata* (Ehr.) van Heurck. HUSTEDT 1930, p. 364, fig. 679. No. 224.
- *lapponica* Grun. P.T.CLEVE 1894—95, I, p. 165, Pl. IV, fig. 28. FOGED 1953, Pl. X, fig. 8 (non *C. stauroneiformis* Lagerst.).
 Plate X, fig. 4: $56 \times 11 \mu$. 16—17 striae in 10μ .
 Plate X, fig. 3: $42 \times 7.8 \mu$. 16—17 striae in 10μ .
 Plate IX, fig. 9: $29 \times 9 \mu$. 19 striae in 10μ (small specimen).
 Plate XI, fig. 18: $27 \times 6.5 \mu$. About 16 striae in 10μ .
 According to P.T.CLEVE 1894—95, I, p. 165, the dimensions are: $33\text{—}37 \times 8\text{—}8.5 \mu$ with 16 striae in 10μ in the middle of the valve and up to 21 towards the apices. "This species seems to connect *C. cesatii* with *C. stauroneiformis*." As to the form it is stated: "V. almost symmetrical, sublanceolate, gradually tapering from the middle to the acute ends. Central area rather large, rounded." X: 4 thus is somewhat larger than the species according to CLEVE.
 X: 3 has great resemblance with BOYE PETERSEN 1924, p. 343, fig. 3 (dimensions: $35 \times 6.6 \mu$. Ventral side 18, dorsal side 14 striae in 10μ) and with FOGED 1953, Pl. X, fig. 8, which is denoted as *C. stauroneiformis*, but because of the rounded central area should rather be referred to *C. lapponica*.
 The species is widely distributed in all biotopes in Peary Land, in most samples, however, in small numbers or rare.
 No. 13 (0.8 ‰), 209 (0.4 ‰), 145 (0.2 ‰), 208, 225, 4 (3.0 ‰), 222 (3.6 ‰), 5 (9.4 ‰), 12 (1.4 ‰), 14 (8.6 ‰), 133 (0.8 ‰), 204 (2.4 ‰), 226 (1.8 ‰), 1 (0.4 ‰), 2 (0.8 ‰), 83 (0.2 ‰), 84 (1.0 ‰), 160 (0.2 ‰), 192, 194 (1.4 ‰), 195 (1.0 ‰), 224, 3 (7.4 ‰), 8 (1.2 ‰), 159 (4.8 ‰), 162, 206 (0.4 ‰), 207, 6 (0.6 ‰), 11 (0.2 ‰), 131 (0.2 ‰), 132, 134 (0.6 ‰), 142 (0.2 ‰), 143 (0.2 ‰), 198 (0.4 ‰), 196, 197 (0.2 ‰).
 W.Greenl. (rare).
- *lata* Grun. var. *minor* Mölder. MÖLDER 1937, p. 31, fig. 5.
 Plate XI, fig. 24, with the dimensions of about $26 \times 6.5 \mu$ and 16 striae in 10μ , has been referred to this species with some doubt. It bears some similarity to *C. similis* Krasske, as this appears from KRASSKE 1932, fig. 24.
 No. 204 (0.2 ‰), 160 (0.2 ‰), 159.
- *latens* Krasske. KRASSKE 1937, p. 53. 1938, fig. 21. FOGED 1953, Pl. XI, fig. 14. Plate XII, fig. 4: $25.3 \times 8.4 \mu$. 10 striae in 10μ .
 A widely distributed species which appears under many different synonyms:
C. ventricosa Ag. var. *semicircularis* (Lagerst.) Ross. ROSS 1947, p. 221, Pl. XI, fig. 12.
C. affinis Kütz. var. *semicircularis* Lagerst. LAGERSTEDT 1873, p. 43, pl. II, fig. 20.
C. ventricosa Kütz. var. *auerswaldii* (Rabenh.) Meister. MEISTER 1912.
C. ventricosa var. *semicircularis* (Lagerst.) Boye Petersen. BOYE PETERSEN 1924, p. 314.
C. semicircularis A. Schmidt. A. Schmidt's Atlas Pl. 71, fig. 26.
 The species is distributed in all the biotopes of the area, in most samples in small numbers or rare.
 No. 13 (3.2 ‰), 209 (0.2 ‰), 208, 4 (0.2 ‰), 222 (1.2 ‰), 5, 12 (0.2 ‰), 14 (6.0 ‰), 133 (1.6 ‰), 204 (0.4 ‰), 1, 10 (0.6 ‰), 160 (0.6 ‰), 192, 194, 224, 3, 8, 9 (0.6 ‰), 159 (2.0 ‰), 162, 207, 6 (2.6 ‰), 11 (0.2 ‰), 131 (5.2 ‰), 132 (5.8 ‰), 134 (1.6 ‰), 142, 143, 161 (1.0 ‰), 198 (0.2 ‰), 223, 196, 197.
 W.Greenl. (not rare). N.Amer.
- *leptoceros* (Ehr.) Cleve. HUSTEDT 1930, p. 353, fig. 645. FOGED 1953, Pl. XI, fig. 11. A. Schmidt's Atlas Pl. 373, figs. 32—35.

Plate IX, fig. 5: $34 \times 9.8 \mu$. 14 striae in 10μ .

Plate IX, fig. 6: $30.5 \times 10.4 \mu$. 13 striae in 10μ .

IX: 5 differs from typical specimens by its distinctly rounded central area.

IX: 6 closely approaches to var. *rostrata* Hustedt (1942 b, p. 132, figs. 52—54) with the dimensions: $30\text{--}37 \times 11 \mu$ with 12 striae in 10μ . IX: 6 has only a slightly developed central area on the ventral side.

No. 133 (0.4 ‰), 2, 192, 194 (0.4 ‰).

W.Greenl. (rare).

— *leptoceros* (Ehr.) Cleve. ?

Plate XII, fig. 16: $23 \times 6.7 \mu$. On the dorsal side 10 striae and on the ventral side 12 striae in 10μ . Probably a small form of *C. leptoceros*.

No. 8.

— var. *rostrata* Hustedt. HUSTEDT 1942 b, p. 132, figs. 52—54. A. Schmidt's Atlas Pl. 378, figs. 58—60.

Plate IX, fig. 7: $26 \times 10.4 \mu$. Dorsal side: 14—15, ventral side: 15—16 striae in 10μ , i. e. somewhat denser striae than in Hustedt's specimens from Abisko. This characteristic variety is much more widely distributed than the species in the present material.

No. 13 (1.6 ‰), 209, 208 (0.2 ‰), 225 (0.8 ‰), 222 (2.6 ‰), 12 (0.2 ‰), 133 (0.2 ‰), 204 (0.8 ‰), 226 (1.8 ‰), 1 (0.4 ‰), 2 (0.4 ‰), 82 (0.2 ‰), 83 (1.2 ‰), 84 (0.4 ‰), 160 (0.6 ‰), 192 (1.2 ‰), 193 (2.2 ‰), 194 (2.6 ‰), 195 (2.4 ‰), 224 (2.0 ‰), 3, 8 (0.4 ‰), 159, 162, 6 (1.0 ‰), 7, 11 (0.4 ‰), 132 (0.4 ‰), 198, 223.

— *microcephala* Grun. HUSTEDT 1930, p. 351, fig. 637. FOGED 1953, Pl. XI, figs. 2—4. A. Schmidt's Atlas Pl. 373, figs. 20—23.

Plate XI, fig. 25: $15 \times 2.6 \mu$. 26—28 striae in 10μ .

Plate XII, fig. 12: $13 \times 2.4 \mu$. About 30 striae in 10μ .

This species has been found almost only in samples from lakes in the present material.

No. 225 (1.0 ‰), 1 (0.2 ‰), 2 (1.8 ‰), 10 (0.6 ‰), 82 (3.6 ‰), 83 (3.6 ‰), 84 (0.6 ‰), 160, 192 (2.8 ‰), 193 (1.2 ‰), 194 (0.4 ‰), 195 (3.2 ‰), 224 (2.8 ‰), 11, 223 (0.6 ‰).

W.Greenl. (fairly common).

— *microcephala* var. *robusta* Hustedt. HUSTEDT 1938, Pl. XXV, figs. 14—15. FOGED 1953, Pl. XI, fig. 1.

Plate XI, fig. 26: $15.9 \times 2.3 \mu$. 18—20 striae in 10μ .

No. 225 (0.4 ‰), 192 (1.0 ‰).

W.Greenl. (not rare).

— *naviculiformis* Auersw. HUSTEDT 1930, p. 356, fig. 653. A. Schmidt's Atlas Pl. 9, fig. 63. FOGED 1953, Pl. X, fig. 9.

No. 144 (3.6 ‰), 83 (0.2 ‰), 84, 6, 143.

W.Greenl. (common). N.Amer. (BOYER 1926—27, II, p. 281: Common northward).

— *norvegica* Grun. HUSTEDT 1930, p. 359, fig. 664. A. Schmidt's Atlas Pl. 10, fig. 41. FOGED 1953, Pl. XI, figs. 9—10, HUSTEDT 1942 b, p. 136, figs. 55—59.

Plate XIII, fig. 18: $34.5 \times 5.7 \mu$. Ventral side: 16, dorsal side: 17 striae in 10μ . The *C. aequalis* var. *lapponica* pictured by A. CLEVE-EULER 1934, fig. 124 a, is identical with *C. norvegica* (according to HUSTEDT 1942 b, p. 136).

XIII: 18 is closely related to the specimens pictured by HUSTEDT 1942 b, figs. 55—59 (almost identical with fig. 55). There are always, however, minor deviations, thus XIII: 18 has always a central area which is only perceptibly

developed on the dorsal side, while the specimens pictured by HUSTEDT always have a more developed central area on the ventral side.

No. 225 (4.2 %), 5, 1, 2 (0.4 %), 10 (2.0 %), 82 (0.6 %), 83 (0.8 %), 84 (0.8 %), 192 (0.4 %), 193 (1.6 %), 195 (1.4 %), 224 (4.0 %), 9, 6 (0.6 %), 11 (1.2 %), 131, 223 (0.3 %).

W. Greenl. (rare).

- *obscura* Krasske. KRASSKE 1938, figs. 28—32.

Plate XII, fig. 3: $26 \times 7.8 \mu$. Ventral side 11, dorsal side 13 striae in 10μ .

According to KRASSKE 1938, pp. 526—32, the dimensions are: $24—27 \times 7—7.5 \mu$ with about 10 striae in 10μ (16 at the apices).

There is a little difference in the course of the raphe between XII: 3 and those pictured by KRASSKE.

No. 209 (1.0 %), 222 (0.2 %), 226 (0.4 %), 159 (1.0 %), 206 (0.8 %), 131 (0.4 %), 132, 142, 143 (0.2 %).

- *obtusa* Greg. HUSTEDT 1930, p. 361, fig. 667. A. Schmidt's Atlas, Pl. 379, figs. 39—45. FOGED 1953, Pl. XI, figs. 7—8.

Plate XIII, fig. 13: $42 \times 6.5 \mu$. 10 striae in 10μ .

Plate XIII, fig. 14: $36.5 \times 5 \mu$. 12 striae in 10μ .

XIII: 13 is in agreement with A. S. Atl. Pl. 379, figs. 39—45.

XIII: 14 has a one-sidedly developed central area, while the latter is generally more or less transversally spread out or almost circular.

Distributed in all the biotopes of the area, but few in number or rare in most samples.

No. 144 (0.4 %), 209 (0.8 %), 208 (0.6 %), 225 (0.6 %), 4 (0.6 %), 222 (1.8 %), 5, 12 (0.6 %), 133 (0.2 %), 204 (0.2 %), 226 (0.8 %), 1 (0.6 %), 2 (0.4 %), 10 (2.4 %), 82 (0.4 %), 83 (0.8 %), 84 (0.4 %), 160, 192, 193, 194 (0.4 %), 224 (1.2 %), 3 (0.4 %), 8 (1.0 %), 159 (5.0 %), 206, 6 (0.2 %), 7 (6.4 %), 11 (0.2 %), 131, 132 (0.2 %), 134 (0.4 %), 143, 223 (0.2 %).

W. Greenland (not rare) N. Amer.

- *obtusiuscula* (Kütz.) Grun. HUSTEDT 1930, p. 352, fig. 640. A. Schmidt's Atlas Pl. 9, fig. 49.

No. 12.

- *perpusilla* A. Cleve. ? A. CLEVE 1895, p. 19, Pl. I, fig. 13. (Non HUSTEDT 1930, fig. 666).

Plate XII, fig. 10: $11 \times 3.3 \mu$. Dorsal side 12—14, ventral side 15—16 striae in 10μ .

According to A. CLEVE 1895, p. 19, the dimensions are: $17 \times 3 \mu$ with 15 striae in 10μ . XII: 10 is consequently considerably smaller, but otherwise seems to approach closely to A. Cleve's form, while it differs from HUSTEDT 1930, fig. 666, by having no appreciable distance between the two midmost striae on the dorsal side.

XII: 10 also bears a considerable similarity to *C. alpina* Grun. var. *minuta* A. CLEVE-EULER 1939 b, p. 18, fig. 40, with the dimensions $19 \times 4.2 \mu$ and 11 striae in 10μ . The *C. bipartita* A. Mayer var. *densestriata* A. Cleve-Euler with 16 striae in 10μ mentioned in the same place (A. CLEVE-EULER 1939 b, p. 18, fig. 41 b) (according to HUSTEDT 1930, p. 361, *C. bipartita* A. Mayer is synonymous with *C. perpusilla* A. Cleve) is also closely related to XII: 10.

No. 160 (2.2 %), 224 (0.6 %), 207 (1.8 %), 223 (2.0 %).

W. Greenl. (not common).

- *philadelphica* Boyer. BOYER 1916, p. 63, Pl. 18, fig. 63.

Plate X, fig. 2: $62 \times 14.3 \mu$. Ventral side: 9, dorsal side: 11 striae in 10μ .

According to BOYER 1916, p. 63, the dimensions are: L. 86μ . "Striae radiate, not curved nor of unequal length, distinctly punctate, 10 in 10μ on the dorsal, 8 in 10μ on the ventral side." "This form approaches *Encyonema prostratum* (Berk.) Ralfs, A. Schmidt's Atlas Pl. 71, fig. 7, but differs in the striae and the axial and central areas."

If *C. philadelphia* Boyer is an independent species, X: 2 must undoubtedly be referred here.

No. 225 (0.2 %), 12, 14, 204 (0.2 %), 84 (0.2 %), 193, 224 (0.2 %), 162, 6 (0.2 %), 131.

— *pseudoalpinoides* nov. spec.

Fig. IX: 12.

Valva asymmetrica, margine dorsali convexo, ventrali subrecto, 19.5μ longa, 5.2μ lata. Raphe subrecta, excentrica. Area axialis in latere dorsali latissima, in ventrali angusta, circum nodum centralem paulum dilatata. Striae transapicales radiantes, 12 in 10μ .

Hab. in aqua dulci Groenlandiae boreo-orientalis.

Valves asymmetrical with a convex dorsal margin and almost straight ventral margin, 19.5μ long, 5.2μ broad.

Raphe almost straight, eccentric. Axial area very broad on the dorsal side, narrow on the ventral side, and slightly developed round the central nodi.

Transapical striae radiate, 12 in 10μ .

Freshwater, Northeast Greenland.

No. 82 (0.2 %).

IX: 12 resembles *C. alpinoides* Hustedt (A. Schmidt's Atlas Pl. 373, figs. 10—12) somewhat, but lacks the two isolated dots of the latter in front of the ventral middle striae. Furthermore there is a fairly great difference in size and in the number of striae. There is also some resemblance with *C. alpina* Grun. (A. Schmidt's Atlas Pl. 373, figs. 373, figs. 17—19), which, however, has not the remarkably broad dorsal area of IX: 12.

— *reinhardtii* Grun. HUSTEDT 1930, p. 354, fig. 644. A. Schmidt's Atlas Pl. 9, fig. 27.

A form with somewhat drawn-out apices, but otherwise agreeing with this species, has with some doubt been referred here.

No. 82, 83 (0.4 %).

— *similis* Krasske. KRASSKE 1932, p. 122, fig. 24. A. Schmidt's Atlas Pl. 377, figs. 43—47.

Plate XI, fig. 20: $17.5 \times 6.5 \mu$. 16—17 striae in 10μ .

Plate XII, fig. 14: $36.5 \times 9.1 \mu$. 8 striae in 10μ .

Plate XII, fig. 15: $36 \times 9.3 \mu$. 12 striae in 10μ .

Plate XII, fig. 20: $20 \times 5.2 \mu$. 12—14 striae in 10μ .

Plate XII, fig. 21: $17 \times 5.5 \mu$. 14 striae in 10μ .

Plate XII, fig. 22: $24.7 \times 6.5 \mu$. 10—11 striae in 10μ .

According to KRASSKE 1932, p. 122, the dimensions are: 20—25 \times 5—6 μ with 12 striae in 10μ "in der Mitte verkürzt, so dass sich hier die lineare Längsarea zu einer unbestimmten Zentralarea erweitert." "Zellen fast völlig symmetrisch."

XII: 20, 22 fall within this description by KRASSKE. XII: 21 is a very small specimen with somewhat denser striae, and XII: 14, 15 are considerably larger than usual for the species, just as XII: 14 has an extraordinarily coarse striation. For ecological reasons HUSTEDT (1953, p. 630) doubts Krasske's statement 1949, p. 25, of *C. similis*'s occurrence in Lapland on the ground that the species is distributed and frequent in highly alkaline water in the Balkans (Syn.: *C. hy-*

bridiformis HUSTEDT 1945, p. 937, Pl. 40, figs. 23—25). As far as I can judge, the Peary Land specimens are identical with those described from Lapland by KRASSKE, and if HUSTEDT's doubt about the identity between these and the Balkan form is justifiable, it must undoubtedly be a question of two genotypically different, but phenotypically almost identical forms.

The specimens in HUSTEDT 1953, figs. 18—19, differ so much from KRASSKE 1932, Pl. III, fig. 24, that I doubt their identity with *C. similis*. The same doubt—although in a somewhat less degree—applies to HUSTEDT 1945, Pl. 40, fig. 24—25.

The species is distributed in all the biotopes of Peary Land, but as a rule occurs in small numbers or is rare in the various samples.

No. 13 (11.8 %), 144 (0.4 %), 209 (4.8 %), 225, 222 (0.8 %), 12 (0.2 %), 133 (1.4 %), 204 (0.4 %), 226 (0.4 %), 1, 2, 10, 83, 84 (0.2 %), 160 (0.6 %), 192 (0.2 %), 193 (0.2 %), 194, 195, 224, 8, 162 (2.8 %), 206 (1.0 %), 207, 7, 11 (0.8 %), 131, 132 (0.6 %), 134 (0.4 %), 142, 143 (0.2 %), 198 (0.4 %), 223 (0.4 %), 196 (0.2 %).

— sp.

Plate III, fig. 13: $36.5 \times 7.5 \mu$. Ventral side: 10, dorsal side: 12 striae in 10μ .

Plate III, fig. 14: $36 \times 7.7 \mu$. Ventral side: 8, dorsal side: 9 striae in 10μ .

III: 13—14 are closely related to *C. hybrida* Grun., but differ from this species by having distinctly capitate apices. They differ from the also related species *C. hybridiformis* Hustedt (1945, p. 937, Pl. 40, figs. 23—25) and *C. similis* Krasske, which are both considerably smaller.

No. 144 (0.4 %), 145 (1.0 %), 5 (0.2 %), 12 (0.2 %), 9, 207, 6 (0.2 %), 143.

— *spuria* Cleve. P.T. CLEVE 1894—95, I, p. 166. FOGED 1953, Pl. XI, fig. 12. ?.

Plate X, fig. 1: $63 \times 17 \mu$. 11 striae in 10μ .

Almost identical with FOGED 1953, Pl. XI, fig. 12, the dimensions of which were $55 \times 15 \mu$ with 12—13 striae in 10μ on the dorsal side and 14—15 on the ventral side, and with A. Schmidt's Atlas Pl. 377, fig. 11: *C. spuria* Cleve from Australia.

According to P.T. CLEVE 1894—95, p. 166, the dimensions are: $50—60 \times 13 \mu$ with 12—13 striae in 10μ , "slightly radiate in the middle, almost parallel in the ends, finely but distinctly punctate."

The form also has a certain resemblance with *C. lata* Grun., which according to CLEVE 1894—95, I, p. 165, has the dimensions: $42—56 \times 16—18 \mu$, 9 striae in the middle and 12 towards the ends. According to HUSTEDT 1930, p. 355, the species has the "Axialarea ziemlich eng, in der Mitte etwas erweitert."

Å. BERG 1945, p. 21, fig. 225, from West Greenland, which is named *C. heteropleura* Ehr., is almost identical with X: 1. According to P.T. CLEVE 1894—95, p. 167, it is very difficult to distinguish *C. heteropleura* var. *minor* with the dimensions $60—80 \times 15—22 \mu$ and 9 striae in 10μ , from *C. cuspidata* Kütz. with the dimensions (HUSTEDT 1930, p. 357): $40—100 \times 14—28 \mu$ with 9—10 striae in the middle and 12—14 at the apices and with the "Axialarea eng, um den Mittelknoten plötzlich zu einer ziemlich grossen, kreisförmigen Zentralarea erweitert."

X: 1 must consequently, if anything, be referred to *C. spuria* Cleve, while X: 5, as shown above, must be referred to *C. cuspidata* Kütz.

No. 13 (0.2 %), 222, 5 (0.2 %), 14 (0.8 %), 194 (0.2 %), 224.

W. Greenl. (fairly common).

— *stauroneiformis* Lagerstedt. P.T. CLEVE 1894—95, I, p. 165. A. Schmidt's Atlas Pl. 377, figs. 51—57. FOGED 1953, Pl. XI, fig. 13.

Plate X, fig. 7: $51 \times 13 \mu$. 18 striae in 10μ .

Plate XI, fig. 19: $47 \times 10.4 \mu$. 17—18 striae in 10μ .

XI: 19 is identical with *C. stauroneiformis* Lagerstedt, 1873, p. 45, Pl. I, fig. 15 with the dimensions $38-50 \times 10-11 \mu$. X: 7 is a somewhat deviating form. Lagerstedt's specimen is somewhat smaller than X: 7, but almost as symmetrical as that, while KRASSKE 1943, fig. 31, pictures a *C. stauroneiformis*, which is considerably more cymbelloid than X: 7. KRASSKE 1938, fig. 27, is a form which is considerably slenderer than the Peary Land specimens.

No. 13 (1.0%), 209, 208 (0.2%), 4 (9.4%), 222, 5 (1.6%), 12, 133 (0.4%), 204 (1.4%), 1 (1.4%), 2 (0.4%), 82 (0.2%), 83 (0.6%), 84 (1.8%), 160 (0.2%), 192, 194, 3 (1.0%), 8 (0.4%), 159 (0.4%), 206 (0.4%), 207 (0.4%), 131, 132, 142 (0.2%), 143, 198.

W.Greenl. (rare).

- *turgida* (Greg.) Cleve. HUSTEDT 1930, p. 358, fig. 660. A. Schmidt's Atlas Pl. 10, figs. 49—53.

Generally distributed in the area, but in small numbers, or is rare in most samples.

No. 13 (2.8%), 145, 208 (0.4%), 225 (0.2%), 4 (2.6%), 222 (0.4%), 5 (5.6%), 12 (0.4%), 14 (5.4%), 133, 204 (0.2%), 226 (0.2%), 1 (0.2%), 2 (1.0%), 10 (0.2%), 82, 83 (0.2%), 84 (0.4%), 160, 192 (0.2%), 193 (0.6%), 194, 195, 224 (0.2%), 207, 6 (1.2%), 11, 131, 132 (0.6%), 134 (0.4%), 143 (0.6%), 197.

W.Greenl. (common). N. Amer.

Plate XII, fig. 5: $21 \times 7 \mu$. 7—9 striae in 10μ must be considered a very small specimen of *C. turgida*.

- *turgida* (Greg.) Cleve (*forma*).

Plate XII, fig. 1: $43 \times 13 \mu$. 9 striae in 10μ .

The ventral margin in XII: 1 is more bulging than usual in *C. turgida*, and the striae of the apices are somewhat different in density from typical specimens of the species. XII: 1 is also closely related to *C. grossestriata* O. Müller var. *javanica* Hustedt (HUSTEDT 1937—39, p. 425, Pl. 26, fig. 3), syn.: *C. mülleri* Hustedt var. *javanica* Hustedt (1937—39, p. 425).

The similarities between *C. turgida* (Greg.) Cleve and *C. mülleri* Hustedt, for that matter, are so close, that according to HUSTEDT (1937—39, p. 427) "es besteht die Möglichkeit, vielleicht sogar Wahrscheinlichkeit, dass beide Formen ökologische Rassen einer Species sind." The ecological differences should especially be in the relation to pH, the pH sphere of *C. turgida* being from 6.5 to somewhat above 8 with "Hauptentwicklung jedenfalls bei einem pH um 8," and about *C. mülleri* it is said on p. 426: "eine der wichtigsten Leitformen alkalischer Quellen und Wasserfälle im pH-Bereich von 7.5—8.2 mit maximaler Entwicklung bei einem um 8 liegenden pH-Wert." The difference thus does not seem conspicuously great, but as it is probably at any rate a question of two different geographical races, XII: 1, as being of arctic occurrence must, if anything, be referred to *C. turgida* (Greg.) Cleve.

XII: 1 also bears a considerable resemblance with *C. turgida* var. *muscosa* Skvortzow (SKVORTZOW 1938 c, p. 67, Pl. 1, fig. 17), which, however, is somewhat smaller ($31 \times 7 \mu$ with 8—9 striae in 10μ), but "differs from the type in its elongate and subacute ends."

No. 1.

- *variabilis* (Cramer) Heiberg var. *botellus* Lagerstedt. LAGERSTEDT 1873, p. 44, Pl. II, fig. 22.

Plate IX, fig. 1: $39 \times 6 \mu$. Ventral side: 11—12, dorsal side: 9 striae in 10μ .

Plate IX, fig. 2: $35 \times 5.7 \mu$. Ventral side: 11, dorsal side: 10 striae in 10μ .

According to LAGERSTEDT 1873, p. 44, the dimensions are: $24-34 \times 6-7 \mu$ with 10-11 striae in 10μ on the ventral side and 9-11 on the dorsal side. Syn.: *C. botellus* Lagerstedt. ØSTRUP 1910 b, p. 237. P.T. CLEVE 1894-95, p. 172. XII: 5 has a straight ventral margin with a slight bulge, while the ventral margin is usually clearly concave.

This characteristic variety is distributed in all the biotopes of the area; in many samples it is even very frequent.

No. 13 (0.2 %), 144 (1.2 %), 145 (3.2 %), 208 (5.4 %), 225 (11.0 %), 4 (0.2 %), 222 (2.2 %), 12 (26.2 %), 133 (0.2 %), 204 (1.6 %), 226 (10.2 %), 1 (11.8 %), 2 (6.4 %), 10 (0.8 %), 82 (9.4 %), 83 (3.0 %), 84 (6.8 %), 160 (17.6 %), 192 (7.6 %), 193 (10.2 %), 194 (5.4 %), 195 (10.2 %), 224 (4.4 %), 8, 9, 159, 162, 207 (22.0 %), 6 (17.4 %), 11 (2.4 %), 131 (2.8 %), 132 (0.6 %), 142 (4.0 %), 143 (3.0 %), 161, 198 (7.6 %), 223 (1.0 %), 196 (0.6 %), 194 (3.0 %).

Cymbella 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, Pl. X, figs. 14-15.

Plate XII, fig. 9: $14.2 \times 4 \mu$. 16 striae in 10μ .

Plate XII, fig. 8: $15 \times 4 \mu$. 18-20 striae in 10μ .

Plate XII, fig. 7: $19.5 \times 4.4 \mu$. 16 striae in 10μ .

XII: 8 differs from the typical form by the ventral margin being straight or slightly concave.

XII: 7 is a slender form, which bears a certain resemblance with *C. perpusilla* A. Cleve, but as it is without the characteristic greater distance between the two middle striae on the dorsal side, specimens of this form have been referred to *C. ventricosa*.

XII: 8 with fairly dense striae (18-20 in 10μ) is fairly common in the material, while the coarsely striated form var. *groenlandica* Foged, which was common in West Greenland, has not been observed here.

Distributed in all the biotopes of the area, and in many samples fairly common.

No. 13 (1.8 %), 145 (1.2 %), 208 (4.0 %), 225 (3.4 %), 4 (0.4 %), 222, 12 (5.6 %), 14 (0.4 %), 204 (1.0 %), 226 (0.2 %), 1 (6.4 %), 2 (5.8 %), 10 (1.0 %), 82 (1.2 %), 83 (1.4 %), 84 (1.6 %), 160 (9.6 %), 192 (0.4 %), 193 (2.4 %), 194 (2.6 %), 195 (2.0 %), 224 (3.4 %), 3 (0.2 %), 159 (0.2 %), 206 (0.2 %), 207 (6.4 %), 6 (0.2 %), 11 (0.6 %), 131 (1.0 %), 132 (1.0 %), 142 (6.0 %), 143 (3.0 %), 161 (0.4 %), 198 (2.2 %), 223 (2.4 %), 196 (0.2 %), 197 (0.8 %).

W.Greenl. (common). N.Amer.

Gomphonema Agardh.

Most of the species belonging to this genus are epiphytes, which especially occur in the littoral region of lakes and streams. In the diatom flora of Peary Land the genus is very little conspicuous.

Gomphonema angustatum (Kütz.) Rabh. HUSTEDT 1930, p. 373, fig. 690. FOGED 1953, Pl. XII, fig. 1. A. Schmidt's Atlas Pl. 234, figs. 20-25, 31-35.

Plate XIII, fig. 2: $27.3 \times 7.5 \mu$. 13 striae in 10μ .

No. 82, 192 (1.0 %), 8, 6 (0.4 %), 7 (0.6 %), 161, 196.

W.Greenl. (common). N.Amer.

— — var. *producta* Grun. HUSTEDT 1930, p. 373, fig. 693. FOGED 1953, Pl. XII, figs. 2, 3. A. Schmidt's Atlas Pl. 234, fig. 26.

Plate XIII, fig. 8: $32 \times 7.8 \mu$. 12 striae in 10μ .

Plate XIII, fig. 9: $20.8 \times 6.5 \mu$. 11-12 striae in 10μ .

According to HUSTEDT 1930, p. 373 *G. angustatum* var. *producta* has "oft schwach köpfigen Polen." XIII: 8 has a more pronouncedly capitate upper apex than usual together with a slightly capitate lower apex, which gives it a certain similarity to *G. sphaerophorum* Ehr.

The commonest *G.* species in the area; found in all the biotopes, but generally few in number or rare in the various samples.

No. 13 (0.6 ‰), 144 (0.4 ‰), 208, 222, 12, 14, 133 (1.2 ‰), 204, 226 (0.2 ‰), 1, 2, 10 (3.2 ‰), 160 (0.2 ‰), 3 (0.8 ‰), 8, 9 (0.4 ‰), 159, 206 (1.0 ‰), 207, 6 (0.6 ‰), 11, 131 (1.4 ‰), 132 (1.4 ‰), 134, (1.4 ‰), 142 (0.4 ‰), 143, 198 (0.4 ‰), 223 (1.0 ‰), 196 (11.0 ‰), 197.

W.Greenl. (common).

- — var. *sarcophagus* (Greg.) Grun. HUSTEDT 1930, p. 373, fig. 691. FOGED 1953, Pl. XII, fig. 7. A.Schmidt's Atlas Pl. 234, figs. 36—37.

Plate XIII, fig. 6: $30.5 \times 8 \mu$. 11—12 striae in 10μ .

According to HUSTEDT 1930, p. 373, var. *sarcophagus* is "mehr oder weniger keilförmig mit ziemlich geraden Seiten und geschnäbelt-vorgezogenen Enden."

8 striae in 10μ . XIII: 6 must, if anything, be identified with this variety, even though it differs somewhat from it by its striae being almost at right angles to the mid-line. The striae are also somewhat denser than on typical specimens. No. 208 (0.4 ‰), 5 (0.4 ‰), 133, 204, 206 (0.2 ‰), 143 (0.6 ‰), 223.

W.Greenl. (fairly rare). N.Amer.

- — var. *undulata* Grun. HUSTEDT 1930, p. 373, fig. 694. FOGED 1953, Pl. XII, figs. 4—6. HUSTEDT 1942 b, p. 145, fig. 67.

Plate XIII, fig. 1: $36 \times 9 \mu$. About 10 striae in 10μ .

Plate XIII, fig. 3: $34 \times 5.5 \mu$. 12 striae in 10μ .

This form, which has an almost isopolar apical axis, is through transitional stages connected with var. *sarcophagus*, which has a distinctly heteropolar apical axis (HUSTEDT 1942 b, p. 145).

Like var. *producta* it is found in all the biotopes of the area, but occurs in small numbers or is rare.

No. 13 (1.0 ‰), 208, 225, 5 (0.2 ‰), 133 (0.6 ‰), 204, 226 (0.2 ‰), 1, 160, 192 (0.4 ‰), 194, 224, 3 (0.2 ‰), 159 (1.0 ‰), 206 (1.6 ‰), 207, 11, 131, 132 (0.6 ‰), 134 (0.2 ‰), 143, 161, 198, 196, 197.

W.Greenland (fairly common).

- *intricatum* Kütz. HUSTEDT 1930, p. 375, fig. 697. A. Schmidt's Atlas Pl. 234, figs. 47—50, 58. Pl. 235, figs. 15—17, 34—39. Pl. 236, figs. 1—8, Pl. 248, figs. 23—25.

No. 11 (0.4 ‰).

N.Amer.

- *lagerheimii* A.Cleve. HUSTEDT 1942 b, p. 146, figs. 78—82.

Plate XIII, fig. 4: $37 \times 4.6 \mu$. 12 striae in 10μ .

No. 225 (2.0 ‰), 2, 10, 82, 84 (0.2 ‰), 193 (1.6 ‰), 194, (0.4 ‰), 224 (0.8 ‰), 6 (0.2 ‰), 131, 132, 161, 223 (0.2 ‰).

W.Greenl. (fairly common).

- *lanceolatum* Grun. HUSTEDT 1930, p. 376, fig. 700. A. Schmidt's Atlas Pl. 235, figs. 26—29. Pl. 236, figs. 33—35. Pl. 237, figs. 1—8. Pl. 238, fig. 35.

No. 193.

W.Greenl. (rare). N.Amer.

- *longiceps* Ehr. HUSTEDT 1930, p. 375, fig. 704. A. Schmidt's Atlas Pl. 237, fig. 39. Pl. 240, figs. 34—36.

No. 225 (0.2 %), 2, 82, 192 (0.2 %), 193 (1.2 %), 195 (0.2 %), 223.
W.Greenl. (rare).

- — var. *subclavata* Grun. HUSTEDT 1930, p. 375, fig. 705. A.Schmidt's Atlas Pl. 237, figs. 31—38. Pl. 238, figs. 15—18. Pl. 240, figs. 31—33. Pl. 266, figs. 29—31.

Plate XIII, fig. 5: $33 \times 4.8 \mu$. 10—11 striae in 10μ .

No. 225 (1.0 %), 192 (0.4 %), 194, 224, 7.

W.Greenl. (fairly common).

- *olivaceum* (Lyngbye) Kütz. HUSTEDT 1930, p. 378, fig. 719. A.Schmidt's Atlas 233, figs. 9—16.

Plate XIII, fig. 7: $21.5 \times 6.5 \mu$. 13 striae in 10μ .

XIII: 7 has a somewhat more pointed lower apex than usual in this species.

No. 11.

N.Amer.

- *parvulum* Kütz. HUSTEDT 1930, p. 372, fig. 713a. A.Schmidt's Atlas Pl. 234, figs. 1—15, 18—19. HUSTEDT 1937—39, Pl. 27, figs. 29—27a, b.

No. 134 (0.4 %).

W.Greenl. (fairly rare). N. Amer.

Denticula Kütz.

Denticula tenuis Kütz. HUSTEDT 1930, p. 381, fig. 723. FOGED 1953, Pl. XIII, fig. 24.

Very common in all the biotopes of the area. Observed in 41 samples with a total of 4.3 per cent. of all the valves counted. The species is generally frequent in springs.

No. 13 (9.6 %), 144 (2.0 %), 209 (0.2 %), 145 (1.0 %), 208 (5.2 %), 225 (1.4 %), 4 (30.4 %), 222 (8.2 %), 12 (13.6 %), 133 (4.0 %), 204 (30.0 %), 226 (2.6 %), 1 (1.2 %), 2 (1.8 %), 10 (5.6 %), 82 (2.0 %), 83 (0.2 %), 84, 160 (1.6 %), 192 (3.8 %), 193 (2.6 %), 194 (2.2 %), 195 (3.4 %), 224 (4.6 %), 3 (0.4 %), 8 (0.6 %), 9, 159, 206 (0.2 %), 207 (9.6 %), 6 (7.2 %), 11 (17.8 %), 131 (3.6 %), 132 (9.4 %), 134 (2.0 %), 133, 161, 198 (3.8 %), 223 (0.2 %), 196 (0.8 %), 197 (0.6 %).

W.Greenl. (rare).

Epithemia Bréb.

Genus of epiphytes especially connected with the littoral region of fresh waters. Slightly represented in Peary Land.

Epithemia hyndmanni W. Smith. HUSTEDT 1930, p. 387, fig. 735.

No. 196.

N.Amer.

- *sorex* Kütz. HUSTEDT 1930, p. 388, fig. 736.

No. 12, 14 (0.4 %), 1 (0.2 %), 2 (1.4 %), 82 (6.8 %), 83 (1.4 %), 84 (0.8 %), 192 (0.2 %), 8, 9 (0.4 %), 159, 162, 6, 7, 11, 143, 198 (0.4 %), 196 (0.2 %), 197.

W.Greenl. (fairly rare). N. Amer.

- — var. *gracilis* Hustedt. HUSTEDT 1930, p. 388, fig. 737.

No. 10 (0.4 %), 82 (0.6 %), 83 (all in Klaresø).

W.Greenl. (rare).

- — var. *lapponica* Hustedt. HUSTEDT 1942 b, p. 149, figs. 83, 84.

No. 145, 161.

W.Greenl. (rare).

Rhopalodia O. Müller.

Also a genus of epiphytes. Rare in Peary Land.

Rhopalodia gibba (Ehr.) O. Müller. HUSTEDT 1930, p. 390, fig. 740.

No. 4, 14, 7.

W.Greenl. (common). N.Amer. (BOYER 1926—27, II, p. 491: Type loc.: North America).

Nitzschiaceae.**Hantzschia** Grun.

Hantzschia amphioxys (Ehr.) Grun. HUSTEDT 1930, p. 394, fig. 747.

No. 204, 192, 9 (0.2 %), 7 (0.6 %), 134 (0.4 %), 142, 143.

According to J.W.G. LUND 1945, p. 96: "the most ubiquitous of soil diatoms."

W.Greenl. (fairly rare). N.Amer.

— fo. *capitata* O. Müller. HUSTEDT 1930, p. 394, fig. 748.

No. 145 (0.6 %), 14 (1.0 %), 226 (0.4 %), 83, 162 (0.2 %).

W.Greenl. (fairly rare).

— var. *hyperborea* Grun. Å.BERG 1945, fig. 258.

Plate XIV, fig. 1: About $60 \times 8.5 \mu$. 7—8 carinal dots and 18—20 striae in 10μ .

Plate XIV, fig. 2: $38 \times 7.8 \mu$. 7—8 carinal dots and 18—20 striae in 10μ .

No. 1.

W.Greenl. (Å. BERG 1945).

— var. *maior* Grun. HUSTEDT 1930, p. 394, fig. 749. A. Schmidt's Atlas Pl. 329, fig. 5.

No. 144 (1.2 %), 209, 208, 225, 5 (0.8 %), 12, 133, 204, 1 (0.8 %), 2, 194, 224, 3, 9 (5.8 %), 159 (0.4 %), 162 (1.4 %), 206, 207, 6 (0.2 %), 7 (0.6 %), 131, 132 (0.2 %), 134 (1.4 %), 161.

W.Greenl. (common). N.Amer.

Nitzschia Hassall.

a. *Tryblionellae* (W. Smith, Grunow) Hustedt emend.

Nitzschia tryblionella Hantzsch var. *debilis* (Arnott) A. Mayer. HUSTEDT 1930, p. 400, fig. 759. A. Schmidt's Atlas Pl. 332, fig. 17.

No. 1, 194, 162 (0.6 %), 143, 197.

W.Greenl. (rare).

b. *Dubiae* Grunow.

Nitzschia commutata Gun. HUSTEDT 1930, p. 405, fig. 774. A. Schmidt's Atlas Pl. 346, figs. 17—20.

No. 209 (0.4 %), 4 (4.2 %), 12 (0.2 %), 14, 133, 204 (0.6 %), 1 (1.6 %), 2 (0.4 %), 82, 83 (0.6 %), 84 (1.0 %), 194 (0.2 %), 3, 8 (0.6 %), 162 (0.7 %), 206, 7 (1.4 %), 132 (0.4 %).

W.Greenl. (fairly rare). N.Amer.

— *stagnorum* Rabh. HUSTEDT 1930, p. 405, fig. 773. A. Schmidt's Atlas Pl. 346, figs. 14—16.

No. 9.

W.Greenl. (fairly common). N.Amer.

c. *Grunowiae* (Rabh.) Grunow.

Nitzschia denticula Grun. HUSTEDT 1930, p. 407, fig. 780. A. Schmidt's Atlas Pl. 331, figs. 32—39.

Plate XIV, fig. 3: $26.6 \times 4.1 \mu$. 7—8 carinal dots and 15 striae in 10μ .

Especially common in the lakes of the area; it occurs with a total of 2.3 % of all samples counted in the area.

No. 145 (0.6 %), 208, 225 (1.2 %), 4 (0.4 %), 222 (2.0 %), 12, 14 (0.4 %), 133 (0.6 %), 204 (7.2 %), 226 (1.6 %), 1 (8.0 %), 2 (9.0 %), 10 (10.0 %), 82 (8.8 %), 83 (25.0 %), 84 (17.4 %), 160, 192 (0.6 %), 193 (3.4 %), 194 (4.0 %), 195 (1.8 %), 224, 9, 159, 207, 6 (0.6 %), 7, 11 (2.8 %), 143, 161, 223, 197.

W.Greenl. (fairly common). N.Amer.

- *sinuata* (W. Smith) Grun. HUSTEDT 1930, p. 408, fig. 781. A. Schmidt's Atlas Pl. 331, figs. 23—27.

No. 4 (0.6 %), 82, 83, 11.

N.Amer.

d. *Linearis* (Grun.) Hustedt emend.

- Nitzschia linearis* W. Smith. HUSTEDT 1930, p. 409, fig. 784. A. Schmidt's Atlas Pl. 334, figs. 22—24.

No. 1, 10 (0.2 %), 83.

W.Greenl. (fairly rare). N.Amer.

? Plate XIV, fig. 7: $94 \times 7.8 \mu$. 8—9 carinal dots and 22 striae in 10μ .

According to HUSTEDT 1930, p. 409, the dimensions for *N. linearis* are: $70—180 \times 5—6 \mu$ with 8—13 carinal dots and 28—30 striae in 10μ . XIV: 7 thus has a striation that is somewhat coarser than usual for *N. linearis*, for which reason I hesitate to refer it to this species.

No. 1.

e. *Lanceolatae* Grunow.

- Nitzschia amphibia* Grun. HUSTEDT 1930, p. 414, fig. 793. A. Schmidt's Atlas Pl. 348, figs. 34—47.

No. 12, 1 (0.2 %).

W.Greenl. (common). N.Amer.

- *fonticola* Grun. HUSTEDT 1930, p. 415, fig. 800. A. Schmidt's Atlas Pl. 348, figs. 60—72. HUSTEDT 1937—39, Pl. 40, figs. 33—35. HUBER-PESTALOZZI 1942, Pl. CXL, fig. 569.

Plate XIV, fig. 11: $12.3 \times 3.3 \mu$. 13 carinal dots and 30—32 striae in 10μ .

Plate XIV, fig. 13: $15 \times 4 \mu$. 11—12 carinal dots and about 30 striae in 10μ .

No. 12 (0.4 %), 10, 82, 224 (0.8 %).

W.Greenl. (rare).

- — var. ? ØSTRUP 1910 b, p. 250, Pl. 14, fig. 16.

Plate XIV, fig. 12: $10.4 \times 4 \mu$. 11—12 carinal dots and 36 striae in 10μ .

XIV: 12 seems to be identical with the supposed *N. fonticola* var., ØSTRUP 1910 b, p. 250, Pl. 14, fig. 16, which ØSTRUP found in East Greenland (Hvalrosodde). The dimensions of this variety are: $13 \times 4 \mu$. 11—12 carinal dots in 10μ . "Striis inconspicuis." "This small form may be allied to *N. fonticola* V.H.Syn. Tab. 69, figs. 16—17."

No. 2 (1.6 %), 10 (2.4 %), 193 (0.4 %).

- *frustulum* (Kütz.) Grun. HUSTEDT 1930, p. 414, fig. 795. A. Schmidt's Atlas Pl. 349, figs. 17—26. FOGED 1953, Pl. XIII, fig. 13.

Plate XIV, fig. 4: $37 \times 3.3 \mu$. 9 carinal dots and 20 striae in 10μ .

This is the commonest *N.* species in the area, as it has been found in 33 samples with a total of 3.3 per cent. of all valves counted (the whole area).

No. 13 (10.0 %), 144 (2.0 %), 145 (0.6 %), 208 (0.2 %), 225 (0.6 %), 4 (13.6 %), 12 (18.4 %), 14 (3.2 %), 133 (13.0 %), 204 (3.2 %), 1 (10.8 %), 2 (4.0 %), 84

(1.6 ‰), 160 (3.8 ‰), 192 (5.4 ‰), 193 (2.0 ‰), 194 (0.4 ‰), 224 (0.4 ‰), 3 (1.0 ‰), 8 (3.6 ‰), 9 (0.6 ‰), 159 (18.6 ‰), 162 (8.0 ‰), 206 (3.0 ‰), 207 (0.4 ‰), 6 (3.4 ‰), 11 (0.4 ‰), 132 (31.8 ‰), 134 (3.6 ‰), 142 (1.0 ‰), 143 (2.4 ‰), 161 (1.0 ‰), 197.

W.Greenl. (common).

- *frustulum* var. *perpusilla* (Rabh.) Grun. HUSTEDT 1930, p. 415; 1937—39, Pl. 41, figs. 21—24. FOGED 1953, Pl. XIII, figs. 4—6.

Plate XIV, fig. 5: $15.6 \times 3 \mu$. 11—12 carinal dots and 24 striae in 10μ .

Plate XIV, fig. 6: $14.3 \times 3.3 \mu$. 12 carinal dots and 24 striae in 10μ .

This variety like the species is very common in the material, having been found in 20 samples with 2.2 ‰ of all valves counted.

No. 209 (13.0 ‰), 208 (2.6 ‰), 225 (6.6 ‰), 4 (17.8 ‰), 204 (1.0 ‰), 226 (1.4 ‰), 2 (5.8 ‰), 82 (12.6 ‰), 83 (13.2 ‰), 84 (1.4 ‰), 192 (0.8 ‰), 194 (0.4 ‰), 195 (5.6 ‰), 224 (7.0 ‰), 206 (1.6 ‰), 207 (2.2 ‰), 6 (2.2 ‰), 131 (1.8 ‰), 198 (1.0 ‰), 197 (0.2 ‰).

W.Greenl. (fairly common).

- *hantzschiana* Rabh. HUSTEDT 1930, p. 415, fig. 797. A. Schmidt's Atlas Pl. 349, figs. 27—29.

Plate XIV, fig. 16: $26.6 \times 2.6 \mu$. 13 carinal dots and 28—30 striae in 10μ .

Plate XIV, fig. 17: $22 \times 2.7 \mu$. 10 carinal dots and 28—30 striae in 10μ .

The species is very frequent in a number of samples from all biotopes except lakes. It represents 3.2 ‰ of all valves counted in the material.

No. 209 (4.6 ‰), 208 (20.8 ‰), 222 (6.4 ‰), 14 (18.4 ‰), 204 (16.0 ‰), 195 (0.2 ‰), 224 (0.2 ‰), 206 (14.8 ‰), 207 (32.0 ‰), 131 (17.2 ‰), 198 (10.6 ‰), 223 (1.0 ‰), 197 (1.6 ‰).

- *kützingiana* Hilse. HUSTEDT 1930, p. 416, fig. 802. 1937—39, Pl. 41, figs. 18—20. FOGED 1953, Pl. XIII, fig. 19.

Plate XIV, fig. 19: $21 \times 2.3 \mu$. 15—16 carinal dots in 10μ . Striae dense.

Plate XIV, fig. 18: $29 \times 4 \mu$. 20—22 carinal dots in 10μ . Striae dense.

According to HUSTEDT 1937—39, p. 484, *N. kützingiana* has a much varied number of carinal dots ("Die Zahl der Kielpunkte ist so schwankend, dass sie für die Abtrennung nicht in Frage kommt, selbst die beiden Schalen einer Zelle können darin völlig voneinander abweichen").

XIV: 18, 19 bear a considerable resemblance with a number of related species, thus with *N. latens* HUSTEDT, 1949 b, p. 148, Pl. 13, figs. 30, 31, which has 10—20 carinal dots at irregular distances in 10μ , and with *N. capitellata* HUSTEDT, 1930, p. 414, fig. 792, the form of which is the same, but the dimensions ($45\text{--}65 \times 4\text{--}5 \mu$, 12 carinal dots, 30 striae in 10μ) differing somewhat. According to A. CLEVE-EULER 1952, p. 84, *N. capitellata* has 12—15 carinal dots in 10μ (fig. 1490 a, b). According to HUSTEDT 1930, p. 416, the dimensions of *N. kützingiana* are: $10\text{--}25 \times 3.5\text{--}5 \mu$ with 14—18 carinal dots and 36 striae in 10μ .

No. 209 (1.0 ‰), 208, 225 (0.6 ‰), 222, 226 (0.2 ‰), 2 (2.2 ‰), 83 (3.0 ‰), 195 (7.2 ‰), 9 (0.4 ‰), 207 (1.0 ‰), 142 (1.8 ‰), 143 (0.2 ‰), 223, 196 (0.8 ‰).

W.Greenl. (fairly common).

- *palea* (Kütz.) W. Smith. HUSTEDT 1930, p. 416, fig. 801. A. Schmidt's Atlas Pl. 349, figs. 1—10. HUSTEDT 1937—39, Pl. 41, figs. 8, 9. FOGED 1953, Pl. XIII, figs. 17, 18.

Plate XIV, fig. 8: $25 \times 3 \mu$. 14—15 carinal dots in 10μ . Striae dense.

Plate XIV, fig. 9: $35 \times 3.4 \mu$. 13 carinal points and 32—34 striae in 10μ .

Plate XIV, fig. 10: $36 \times 3.5 \mu$. 13—14 carinal points in 10μ . Striae dense.

Dimensions according to HUSTEDT 1930, p. 416: $20-65 \times 2.5-5 \mu$. 10—15 carinal dots and 35—40 striae in 10μ .

No. 144 (2.4 %), 145 (0.2 %), 204, 1, 82 (1.2 %), 84 (1.4 %), 194 (0.4 %), 11 (9.4 %), 132 (0.4 %), 134 (0.8 %).

W.Greenl. (common). N.Amer.

- *romana* Grun. HUSTEDT 1930, p. 415, fig. 799. FOGED 1953, Pl. XIII, figs. 1—3, 7. No. 133 (0.2 %).

W.Greenl. (fairly common).

- *gracilis* Hantzsch. ? HUSTEDT 1930, p. 416, fig. 794. A. Schmidt's Atlas Pl. 349, figs. 34—37.

Plate XIV, fig. 15: $36 \times 3.9 \mu$. 15—16 carinal dots in 10μ . Striae dense.

According to HUSTEDT 1930, p. 416, the dimensions are: $45-110 \times 2-4 \mu$ with 12—15 carinal dots in 10μ and dense striae. XIV: 15 is perhaps a small specimen of the species.

No. 225 (0.6 %), 4 (0.4 %), 133 (0.4 %), 204 (3.0 %), 226 (1.8 %), 83 (0.4 %), 160 (0.2 %), 194 (0.2 %), 159 (0.6 %), 162 (10.0 %), 6 (0.8 %), 7 (0.4 %), 131 (0.4 %), 132, 142, 143 (1.0 %).

W.Greenl. (fairly common).

- *sp.*

Plate XIV, fig. 14: $52 \times 3.3 \mu$. 9 carinal dots and 25—26 striae in 10μ .

XIV: 14 bears a considerable resemblance with *N. parvula* Lewis var. *terricola* Lund, J.W.G. LUND 1946, p. 97, fig. 15 A—I, the dimensions of which are $25-70 \times 4-5 \mu$ with 6—9 carinal dots and 31—37 striae in 10μ , and with valves which are "sigmoid and constricted centrally."

It also resembles *N. ignorata* Krasske. J.W.G. LUND 1946, p. 97, fig. 14 J, K, and figs. 15 A—G, with the dimensions: $31-44 \times 3-4 \mu$ with 9—12 carinal dots and 34—38 striae in 10μ .

It is somewhat larger than *N. hantzschiana* Rabh. as it appears from J.W.G. LUND 1946, p. 100, fig. 16 A—U with the dimensions: $10-40 \times 2-4 \mu$ and 9—14 carinal dots and 27—33 striae in 10μ .

No. 13 (0.8 %), 208 (1.2 %).

Suirellaceae.

Suirella TURPIN.

Suirella ovata Kütz. HUSTEDT 1930, p. 442, figs. 863, 864.

No. 12.

The genera *Cymatopleura*, *Stenopterobia*, and *Campylodiscus* have not been observed in the present material.

As far as appears from the material investigated in the present paper, the diatom flora in the Peary Land area must be considered fairly rich in species, especially when the extreme conditions of life are taken into consideration. It is, however, evident that a large number of fresh-water forms have no possibilities of life there. It is difficult to decide what factors must be considered particularly restrictive or selective. Many diatoms are very sensitive to extreme pH concentrations, but in

the area investigated the pH concentration hardly varies very much. The subsoil is calcareous, and the few pH measurements available all show values around the neutral point, either a little above or a little below it. Markedly acidobiontic forms are completely absent or are very sparse, while genera with species having their optimum at pH around 7 or at a slightly acid reaction are abundant, and others with the same pH demands may perhaps be absent or occur in very small numbers. Thus *Achnanthes*, *Caloneis*, *Cymbella*, certain *Pinnularia* groups, and *Stauroneis* species are common or fairly common, whereas *Eunotia*, *Anomoconeis*, certain *Pinnularia* groups, and *Tabellaria* species are very few in number. Still, the pH demands of the two groups are the same. Genera the species of which mainly occur epiphytically, are but slightly represented. This applies, e. g., to the genera of *Cocconeis*, *Epithemia*, *Gomphonema*, and *Rhopalodia*. Typical littoral and planktonic genera also occur in very small numbers, e. g. *Cyclotella*, *Melosira*, *Stephanodiscus*, *Gyrosigma*, *Surirella*, and *Synedra*. A large number of freshwater genera have not been shown to occur in the material at all: *Mastogloia*, *Amphicampa*, *Didymosphenia*, *Cymatopleura*, *Stenopterobia*, *Campylo-discus*, *Coscinodiscus*, *Attheya*, and *Rhizosolenia*.

The two large genera *Navicula* and *Nitzschia*, which nearly all over the world are amply represented in the flora of freshwater diatoms, are also represented in the present material with a considerable number of species. Especially the *Navicula* genus seems to appear with a number of species which are preferably found under extreme conditions in northernly regions. The *Fragilaria* genus is represented by some species none of which are particularly characteristic. *F. constricta* with varieties, which for that matter is common in Northern Europe, has not been found at all in the material, whereas it also occurs in North America. The same applies to a large number of other species which are usually described as "boreo-alpine".

One of the most remarkable features at a consideration of the occurrence of the diatoms in the area is the little conspicuous differences in the diatom flora in the various biotopes. In more southerly localities there will always be very conspicuous differences as regards frequency of species in the various biotopes, certain forms being characteristic of moist soil moss, others of areas of permanently stagnant water (lakes, ponds), while others again are characteristic of the localities of running water. Differences may be pointed out at a close examination of the species here, too; but the clearly conspicuous difference is not observed. The two genera of running water *Meridion* and *Ceratoneis* occur in large numbers in springs, rivers, brooks, and water-falls, but particularly *Ceratoneis* is also always represented in the other biotopes. *Cyclotella* species (especially *C. antiqua*) are practically found in lakes

only. Similar conditions occur in the case of *Diatoma elongatum*, *Fragilaria construens* var. *venter*, *F. pinnata*, *Navicula halophila*, *N. tuscula*, *Amphora triundulata*, *A. veneta*, *Cymbella microcephala*, and *C. cesati*.

Eunotia species (apart from *E. arcus* and *praerupta*) are practically absent from the lakes in spite of the fact that they are otherwise common in oligotrophic and circumneutral-slightly acid environments.

It is also characteristic that there are hardly any forms indigenous to environments rich in salt, thus halophilous, mesohalobous, and euhalobous ones. Euhalobous forms have not been found, and halophilous and mesohalobous forms are extremely rare in spite of the fact that such forms are otherwise fairly common on soil and in moss cushions, i. e. in places in which the fluctuations as regards humidity and thus also salinity are great, and such localities which, as pointed out in a previous chapter, are distributed there.

The extreme conditions of life thus seem to cause an even distribution of the species all over the area in the places where a possibility of the development of diatoms is present.

A tabulation of the usual halobion, pH, and current spectra will consequently be without any importance for the characterization of samples and localities there; the differences will be very small and little characterizing.

As long as no more comprehensive investigations into the West Greenland diatom flora are available, a comparison between the two areas will not be particularly fruitful. A grouping of the number of forms within the various genera, as in Table 3, however, gives certain information. Thus it is evident that the genus of *Cymbella* in Peary Land has reached an even extraordinarily rich development, without it being possible at present to decide whether this is of an earlier or a recent date. Similar conditions, although to a considerably less extent, are found in the case of the genus *Neidium*. Just as characteristic of the diatom flora of Peary Land is the small number of forms within some genera which otherwise reach a considerable richness in forms in arctic and subarctic regions. This applies especially to the genera of *Anomooneis*, *Eunotia*, and *Pinnularia*. Certain other forms which otherwise often appear with a large number of valves in northern regions are extremely sparse or even completely absent, thus the genera of *Tabellaria*, *Frustulia*, *Tetracyclus*, and *Amphicampa*. The fact that typical planktonic and epiphytic genera are but sparsely represented is naturally explained from the given ecological conditions.

The various genera of freshwater diatoms are tabulated in Table 4 in such a way that it is seen what genera have hitherto been shown to occur partly in Canada-Greenland on one side of Peary Land, partly

in the North Atlantic island area and the adjoining parts of Europe on the other.

The main impression will be one of the cosmopolitan character of the diatom flora, an impression which will undoubtedly be intensified by continued investigations west of the Atlantic.

Table 2.

	Peary Land	W. Greenland (1953)
Genera	30	32
Species	222	271
Forms	303	367

Table 3.

	Peary Land (forms)	W. Greenland (1953) (forms)
Achnanthes	17	14
Amphora	6	8
Anomoeoneis	3	7
Caloneis	8	8
Ceratoneis	2	2
Cocconeis	4	5
Cyclotella	6	4
Cymbella	45	32
Denticula	1	4
Diatoma	1	2
Diatomella	1	1
Diploneis	4	3
Epithemia	4	8
Eunotia	21	37
Fragilaria	16	14
Frustulia	0	3
Gomphonema	11	21
Gyrosigma	1	0
Hantzschia	4	4
Melosira	6	8
Meridion	1	2
Navicula	64	70
Neidium	13	9
Nitzschia	18	23
Pinnularia	28	45
Rhopalodia	1	2
Stauroneis	8	11
Stephanodiscus	3	1
Surirella	1	5
Synedra	6	13
Tabellaria	3	3

Table 4.

	Previous investigations	OSTRUP 1910	BOYE PETERSEN 1924	ÅKE BERG 1945	ROSS 1947	FOGED 1953	FOGED, Peary Land	Jan Mayen, Bear Island, Svalbard	Iceland	HUSTEDT 1924 (Sarek)	HUSTEDT 1942 b (Abisko)	FOGED 1952 b (Norway)
A: Centrales:												
Melosira	+	+	..	+	+	+	+	+	+	+	+	+
Cyclotella	+	+	+	+	+	+	+	+	+	+	+	+
Stephanodiscus	+	+	..	+	+	+	+	..	+	+	+	+
Coscinodiscus	+	..	(+)
Rhizosolenia	+
Attheya
B: Pennales:												
1. <i>Araphideae</i> :												
Tetracyclus	+	+	+	+
Tabellaria	+	+	+	+	+	+	+	+	+	+	+	+
Diatoma	+	+	..	+	+	+	+	+	+	+	+	+
Meridion	+	+	+	+	+	+	+	+	+	+
Opephora	+
Centronella
Ceratoneis	+	+	+	+	+	+	+	+	+	+
Fragilaria	+	+	..	+	+	+	+	+	+	+	+	+
Asterionella	+	..	+	+
Synedra	+	+	+	+	+	+	+	+	+	+	+	+
Amphicampa	+
2. <i>Rhaphidioideae</i> :												
Peronia	+	+	..	+
Eunotia	+	+	+	+	+	+	+	+	+	+	+	+
Actinella	+
3. <i>Monoraphideae</i> :												
Cocconeis	+	+	+	+	+	+	+	+	+	+	+	+
Achnanthes	+	+	+	+	+	+	+	+	+	+	+	+
Rhoicosphenia	+	+	+
4. <i>Biraphideae</i> :												
Diatomella	+	+	+	+	+	+	+	+	+	+
Mastogloia	+	..	+	+	+	+	+
Amphipleura	+	+	+	+
Frustulia	+	..	+	+	+	+	+	+	+	+	+	+
Gyrosigma	+	+	+
Caloneis	+	+	+	+	+	+	+	+	+	+	+	+
Neidium	+	+	+	+	+	+	+	+	+	+	+
Diploneis	+	+	..	+	+	+	+	+	+	+	+	+
Stauroneis	+	+	+	+	+	+	+	+	+	+	+	+

(to be continued)

Table 4 (cont.).

	Previous investigations											
	ØSTRUP 1910	BOYE PETERSEN 1924	ÅKE BERG 1945	ROSS 1947	FOGED 1953	FOGED, Peary Land	Jan Mayen, Bear Island, Svalbard	Iceland	HUSTEDT 1924 (Sarek)	HUSTEDT 1942 b (Abisko)	FOGED 1952 b (Norway)	
Anomoeoneis	+	+	:	+	+	+	+	+	+	+	+	
Navicula	+	+	+	+	+	+	+	+	+	+	+	
Pinnularia	+	+	+	+	+	+	+	+	+	+	+	
Amphiprora . . . . .	..	..	..	..	..	..	..	..	..	..	..
Amphora	+	+	+	+	+	+	+	+	+	+	+	
Cymbella	+	+	+	+	+	+	+	+	+	+	+	
Didymosphenia . . . . .	..	..	..	..	..	..	..	..	..	..	..
Gomphonema	+	+	+	+	+	+	+	+	+	+	+	
Denticula . . . . .	+	..	..	+	+	+	+	+	+	+	+
Epithemia . . . . .	+	..	..	+	+	+	+	+	+	+	+
Rhopalodia . . . . .	..	..	..	+	+	+	+	..	+	+	+
Hantzschia	+	+	+	+	..	+	+	+	+	+	+	
Nitzschia	+	+	+	+	+	+	+	+	+	+	+	
Cymatopleura . . . . .	..	..	..	+	+	..	..	+	+	+	..
Surirella	+	+	..	+	+	+	+	+	+	+	+	
Campylodiscus . . . . .	..	..	..	..	..	..	..	..	..	..	+
Stenopterobia . . . . .	..	..	..	..	..	..	..	+	+	+	+
Genera (49)	29	25	16	33	30	32	30	29	39	37	36	43

LITERATURE

- BACHMANN, H., 1921: Beiträge zur Algenflora des Süßwassers von Westgrönland. Mitt. d. Naturf. Ges. Luzern. Hf. VIII. Luzern.
- BERG, Å., 1939: Some New Species and Forms of the Diatom Genus *Eunotia* Ehr., 1837. Botaniska Notiser. Lund.
- 1945: Diatomeen von der Sophia-Expedition im Jahre 1883. Arkiv för Botanik. Bd. 32. A. N:o 1. Stockholm.
- BOYER, CH. S., 1916: The Diatomaceæ of Philadelphia and Vicinity. Philadelphia.
- 1926—27: Synopsis of North American Diatomaceæ. Proc. Acad. Nat. Sc. Philadelphia. Vol. 78 Suppl. Vol. 79 Suppl. Philadelphia.
- BROCKMANN, C., 1950: Die Watt-Diatomeen der schleswig-holsteinischen Westküste. Abh. d. Senckenb. Naturforsch. Ges. Abh. 478. Frankfurt am Main.
- BRUN, J., 1900: Diatomées de Jan Mayen et du Grönland. — Bih. t. K. Sv. Vet. — Akad. Handl. Bd. 26, Afd. III, N:o 18. Stockholm.
- BÖCHER, T.W., 1933: Phytogeographical Studies of the Greenland Flora. Medd. om Grönland. Bd. 104. Nr. 3. København.
- 1938: Biological Distributional Types in the Flora of Greenland. Medd. om Grönland. Bd. 106. Nr. 2.
- 1949: Climate, Soil, and Lakes in Continental West Greenland. — Medd. om Grönland. Bd. 147. Nr. 2.
- CLEVE, A., 1895: On Recent Freshwater Diatoms from Lule Lappmark in Sweden. — Bih. till K. Sv. Vet.-Akad. Handl. Bd. 21. III. Nr. 2.
- 1900: Beiträge zur Flora der Bären-Insel, I. Die Diatomeen. — Bih. till K. Sv. Vet. — Akad. Handl. Bd. 26. Afd. III. No. 10.
- 1915: New Contributions to the Diatomaceous Flora of Finland. — Ark. för Botanik. Bd. 14. N:o 9.
- CLEVE, P. T., 1867: Diatomaceer från Spetsbergen. — Öfvers. af K. Vet.-Akad. Förh. N:o 10. 1864.
- 1873: On Diatoms from the Arctic Sea. — Bih. till K. Sv. Vet.-Akad. Handl. Bd. 1. No. 13.
- 1880: On Some New and Little Known Diatoms. — K. Sv. Vet.-Akad. Handl. Bd. 18. No. 5.
- und A. GRUNOW, 1880: Beiträge zur Kenntniss der arctischen Diatomeen. — K. Sv. Vet.-Akad. Handl. Bd. 17. N:o 2.
- 1882: Färskvattens-Diatomacéer från Grönland och argentinske Republiken. — Öfversigt K. Sv. Vet.-Akad. Förhandl. 10.
- 1891: The Diatoms of Finland. — Acta Soc. pro Fauna et Flora Fennica. VIII. N:o 2. Helsingfors.
- 1894—95: Synopsis of the Naviculoid Diatoms. I—II. — K. Sv. Vet.-Akad. Handl. Bd. 26, N:o 2, Bd. 27, N:o 3.

- CLEVE, P. T., 1896: Diatoms from Baffins Bay and Davis Strait. — Bih. till. K. Sv. Vet.-Akad. Handl. Bd. 22. Afd. III. No. 4.
 — 1898: Diatoms from Franz Josef Land. — Bih. till. K. Sv. Vet.-Akad. Handl. Bd. 24. Afd. III. No. 2.
- CLEVE-EULER, A., 1915: New Contributions to the Diatomaceous Flora of Finland. — Arkiv för Botanik. Bd. 14. N:o 9.
 — 1932: Die Kieselalgen des Tåkernsees in Schweden. — K. Sv. Vet.-Akad. Handl. Tredje Serien Bd. 11. No. 2.
 — 1934: The Diatoms of Finnish Lapland. — Soc. Sc. Fen. Comm. Biol. IV. Helsinki.
 — 1939a: Zur fossilen Diatomeenflora Österbottens in Finnland. — Acta Soc. pro Fauna et Flora Fennica, 62, N:o 4. Helsingfors.
 — 1939b: Bacillariaceen-Assoziationen im nördlichsten Finnland. — Acta Soc. Scient. Fennicæ. Nov. Ser. B. T. II. N:o 3. Helsingfors.
 — 1952: Die Diatomeen von Schweden und Finnland. V.-Kungl. Sv. Vet.-Akad. Handl. Fjärde Serien. Bd. 3. No. 3.
 — 1953a: Die Diatomeen von Schweden und Finnland. II. — Ibid. Bd. 4. No. 1.
 — 1953b: Die Diatomeen von Schweden und Finnland. III. — Ibid. Bd. 4. No. 5.
- FOGED, N., 1947—48: Diatoms in Water-Courses in Funen. I—VI. — Dansk Botanisk Arkiv. Bd. 12, Nr. 5, 6, 9, 12. København.
 — 1949: Diatoms in the Salt-Bog of Langemose in East-Funen. — Ibid. Bd. 13. Nr. 6.
 — 1950: Diatomévegetationen i Sorte Sø. En dystrof skovsø i Sydfyn. (Engl. summary). — Af Fyns Flora og Fauna. Vol. III. Odense.
 — 1951: The Diatom Flora of Some Danish Springs. Part I. — Natura Jutlandica. Vol. 4. Aarhus.
 — 1952a: Diatoms in Trumpet-Formed Catching-Nets of *Neureclipsis bimaculata* L. in Sweden. — Botaniska Notiser 1952. Häfte 2. Lund.
 — 1952b: The Distribution of Fresh Water Diatoms in Norway. A Preliminary Report. — Nytt Magasin for Botanikk. Vol. 1. Oslo.
 — 1953: Diatoms from West Greenland. — Medd. om Grønland. Bd. 147, Nr. 10.
 — 1954: On the Diatom Flora of Some Funen Lakes. Fol. Limnol. Scandinavica. No. 6.
- FRISTRUP, B., 1948—49: Peary Land. — Geografisk Tidsskrift. 49. bd. København.
 — 1952: Physical Geography of Peary Land. — Medd. om Grønland. Bd. 127, Nr. 4.
- GELTING, P., 1941: Über pleistozäne Pflanzenrefugien in Grønland. — Mitt. d. Naturforsch. Ges. Schaffhausen. Bd. XVII, Nr. 4.
- GRAN, H. H., 1904: Diatomaceae from the Ice-floes and Plankton of the Arctic Ocean. — The Norwegian North Polar Expedition 1893—1896. No. XI. Kristiania.
- GRUNOW, A., 1884: Die Diatomeen von Franz Josephs Land. — Denkschr. Akad. der Wiss. Wien. Bd. 48.
- GRÖNBLAD, R., 1952: Desmids from West Greenland. — Medd. om Grønland. Bd. 147, Nr. 8.
- HANSEN, C., 1872: Et lille Bidrag til Kundskaben om de danske Bilandes Diatoméflora. — Vid. Medd. fra Dansk Naturhist. Forening. København.
- HEIBERG, P. A. C., 1863: Conspectus criticus Diatomacearum Danicarum. Kritisk Oversigt over de Danske Diatomeer. København.
- VAN HEURCK, H., 1896: A Treatise on the Diatomaceae. London.
- HUBER-PESTALOZZI, G., 1942: Das Phytoplankton des Süßwassers. II: 2. Stuttgart.
- HULTÉN, E., 1937: Outline of the History of Arctic and Boreal Biota during the Quaternary Period. Stockholm.

- HUSTEDT, F., 1924: Die Bacillarien-Vegetation des Sarek-Gebirges. — Naturw. Unters. d. Sarek Geb. in Schwed. — Lappl. 3. Bot. Lief. 6.
- 1930: Bacillariophyta. — A. PASCHER: Die Süßwasser-Flora Mitteleuropas. Hf. 10.
- 1930—37: Die Kieselalgen Deutschlands, Österreichs und der Schweiz usw. — Rabenhorst, Kryptogamen-Flora, VII.
- 1931: Diatomeen aus dem Feforvatn in Norwegen. — Arch. f. Hydrobiol. Bd. 22.
- 1934: Die Diatomeenflora von Poggenpohls Moor bei Dötlingen in Oldenburg. — Abh. und Votr. d. Bremer Wiss. Ges. Jahrg. 8/9.
- 1937: Süßwasserdiatomeen von Island, Spitzbergen und den Färöer-Inseln. — Bot. Arch. 38.
- 1937—39: Systematische und ökologische Untersuchungen über die Diatomeen-Flora von Java, Bali und Sumatra. — Archiv für Hydrobiologie. Suppl. 15, 16.
- 1938: Diatomeen aus den Pyrenäen. — Ber. d. deut. Bot. Ges. Bd. LXI.
- 1939: Die Diatomeen-Flora des Küstengebietes der Nordsee vom Dollart bis zur Elbenmündung. I. — Abh. Nat. Ver. Bremen. 31.
- 1942a: Aërophile Diatomeen in der nordwestdeutscher Flora. — Ber. Deutsch. Bot. Ges. 60.
- 1942b: Diatomeen aus der Umgebung von Abisko in Swedish-Lapland. — Archiv für Hydrobiologie. 43.
- 1942c: Beiträge zur Algenflora von Bremen. V. Die Diatomeenflora einiger Sumpfwiesen bei Bremen. — Abh. Naturw. Ver. Bremen. Bd. 32.
- 1942d: Süßwasser-Diatomeen des indomalayischen Archipels und der Hawaii-Inseln. — Intern. Rev. d. ges. Hydrobiol. und Hydrographie. Bd. 42. 1/3.
- 1943: Die Diatomeenflora einiger Hochgebirgsseen der Landschaft Davos in den Schweizer Alpen. — Arch. f. Hydrobiol. 43.
- 1943—52: Neue und wenig bekannte Diatomeen. I—V.
- 1945: Diatomeen aus Seen und Quellgebieten der Balkan-Halbinsel. — Arch. f. Hydrobiol. 40.
- 1946—50: Die Diatomeenflora norddeutscher Seen mit besonderer Berücksichtigung des holsteinischen Seengebiets. — Arch. f. Hydrobiol. 40, 43.
- 1949a: Diatomeen von der Sinai-Halbinsel und aus dem Libanon-Gebiet. — Hydrobiologia. Vol. II: 1.
- 1949b: Süßwasser-Diatomeen aus dem Albert-Nationalpark in Belgisch Kongo. — Explor. du Parc Nat. Albert Mission H. Damas (1935—36).
- 1953: Diatomeen aus dem Natur Schutzgebiet Seon. — Arch. f. Hydrobiol. 47:4.
- IVERSEN, J., 1936: Biologische Pflanzentypen als Hilfsmittel in die Vegetationsforschung. København.
- JENSEN, H. L., 1951: Notes on the Microbiology of Soil from Northern Greenland. — Medd. om Grønland. Bd. 142, Nr. 8.
- KINDLE, E. M., 1909: Diatomaceous Dust on the Bering Sea Ice Floes. — Amer. Journ. Sc. Vol. 28.
- KNUTH, E., 1950: Dansk Pearyland Ekspedition. — Geografisk Tidsskrift. 50. bd. København.
- 1952: An Outline of the Archaeology of Pearyland. Arctic, vol. 5, no. 1.
- KOLBE, R. W., 1927: Zur Ökologie, Morphologie und Systematik der Brackwasser-Diatomeen. — Pflanzenforsch. 14, 7.
- KOTILAINEN, M., 1933: Zur Frage der Verbreitung des atlantischen Floraelementes Fennoskandias. — Ann. Bot. Soc. Zool. — Bot. Fennica Vanamo. 4, 1.
- KRASKE, G., 1929: Beiträge zur Kenntnis der Diatomeenflora Sachsens. — Botan. Archiv. 27.

- KRASSKE, G., 1932: Beiträge zur Kenntnis der Diatomeenflora der Alpen. — Hedwigia. 72.
- 1936: Die Diatomeenflora der Moosrasen des Wilhelmshöher Parkes. — Festschr. d. Ver. f. Naturk. Kassel.
- 1937: Diatomeen aus den postglazialen Seen auf Rügen. — Arch. für Hydrobiologie. 31.
- 1938: Beiträge zur Kenntnis der Diatomeen-Vegetation von Island und Spitzbergen. — Arch. für Hydrobiologie. 32.
- 1943: Zur Diatomeenflora Lapplands. — Ber. Deutsch. Bot. Ges. 61.
- 1948: Diatomeen tropischer Moosrasen. — Svensk Botanisk Tidskrift, Bd. 42.
- 1949: Zur Diatomeenflora Lapplands. II. — Annal. Bot. Soc. Zool. Bot. Fen. Vanamo. Tom. 23. N:o 5. Helsinki.
- LAGERSTEDT, N. G. W., 1873: Sötvattens-Diatomaceer från Spetsbergen och Beeren Eiland. — Bih. t. K. Sv. Vet.-Akad. Handl. Bd. 1. No. 14.
- LUND, J. W. G., 1945—46: Observations on Soil Algae. — The New Phytologist. Vol. 44, nr. 2. Vol. 45, nr. 1.
- MESSIKOMMER, E., 1951: Grundlagen zur einer Algenflora des Kantons Glarus. — Mitt. d. Naturforsch. Ges. d. Kantons Glarus. Hf. VIII. Glarus.
- MÖLDER, K., 1937a: Die rezente Eunotienflora Finnlands. — Annal. Bot. Soc. Zool. Bot. Fen. Vanamo. Tom. 8. No. 7.
- 1937b: Einige neue Diatomeen aus Finnland und Estland. — Ibid. Tom. 8. No. 7.
- 1938: Die rezente Diatomeenflora Estlands. — Annal. Bot. Soc. Zool. Bot. — Ibid. Tom. 12. No. 2.
- 1939: Einige neue Diatomeen aus Finnland. — Ibid. Tom. 11. No. 3.
- 1951: Beiträge zur Kenntnis der rezenten Diatomeenflora Ostkareliens. — Ibid. Tom. 25. No. 1.
- OSTENFELD, C. H., 1923: The vegetation of the North-Coast of Greenland. — Medd. om Grøn. Bd. 64.
- 1926: The Flora of Greenland and its Origin. — Kgl. Da. Vidensk. Selsk. Biol. Medd. Bd. 6.
- PERAGALLO, H. et M., 1897—1908: Diatomées marines de France.
- PETERSEN, J. BOYE, 1915: Studier over danske aérofile Alger. — D. Kgl. D. Vid. Selsk., Skr. 7. Række. Afd. XII. 7.
- 1923: Fresh-water Diatomeae. — J. Gandrup: A Botanical Trip to Jan Mayen. Dansk Botanisk Arkiv. Bd. 4. No. 5.
- 1924: Freshwater-Algae from the North-Coast of Greenland. Coll. by the late Dr. Th. Wulff. — Medd. om Grønland. Bd. LXIV.
- 1928: The Aërial Algae of Iceland. — The Botany of Iceland. Vol. II.
- 1930: Algae from O. Olufsen's Second Danish Pamir Expedition 1898—1899. — Dansk Botanisk Arkiv. Bd. 6, Nr. 6.
- 1935a: On Some Algae from Grimsey. — Botanisk Tidsskrift. 43.
- 1935b: Studies on the Biology and Taxonomy of Soil Algae. — Dansk Botan. Arkiv. Bd. 8, Nr. 9.
- 1943: Some Halobion Spectra (Diatoms). — D. Kgl. Danske Vid. Selsk. Biol. Med. Bd. XVII. Nr. 9.
- 1946: Algae Collected by Eric Hultén on the Swedish Kamtchatka Expedition 1920—22, Especially from Hot Springs. — D. Kgl. Danske Vid. Selsk. Biol. Med. Bd. XX. Nr. 1.
- 1950: Observations on Some Small Species of Eunotia. — Dansk Botanisk Arkiv. Bd. 14, Nr. 1.

- ROSS, R., 1947: Freshwater Diatomeae. — Botany of the Canadian Eastern Arctic. Part II.
- SCHMIDT, A., 1874—1944: Atlas der Diatomaceenkunde.
- SCHULZ, P.: Die Kieselalgen der Danziger Bucht. — Bot. Archiv. 13. 149.
- SKUJA, H., 1948: Taxonomie des Phytoplanktons einiger Seen in Uppland, Schweden. — Symb. Bot. Upsaliensis IX: 3. Uppsala.
- SKVORTZOW, B. W., 1938a: Subaërial Diatoms from Pin-Chiang-Sheng Province, Manchoukuo. — The Philip. Journal of Science. Vol. 65. Manila.
- 1938b: Diatoms from Kenon Lake, Transbaikalia Siberia. — Ibid. 65.
- 1938c: Fresh-water Diatoms from the Environs of Vladivostok. Ibid. 65.
- STEFFEN, H., 1937: Gedanken zur Entwicklungsgeschichte der arktischen Flora. — Beih. zum Botan. Centralblatt. Bd. 56. Abt. b. Hf. 3.
- TROELSEN, J. C., 1949: Contributions to the Geology of the Area round Jørgen Brønlunds Fjord, Peary Land, North Greenland. — Medd. om Grønland. Bd. 149, Nr. 2.
- TURESSON, G., 1932: Die Pflanzenart als Klimaindikator. — Kungl. Fysiogr. Sällsk. i Lund Förh. 2. No. 4.
- VAHL, M. og G. HATT, 1922—27: Jorden og Menneskelivet. I—IV. København.
- WESTERGAARD, M., 1953: Arvelighedslæren. København.
- WISLOUCH, S. M., 1924: Beiträge zur Diatomeenflora von Asien. II. Neuere Untersuchungen über die Diatomeen des Baikal-Sees. — Ber. d. Deut. Bot. Ges. Bd. 42.
- ØSTRUP, E., 1895: Marine Diatomeer fra Østgrønland. — Medd. om Grønland. Bd. XVIII.
- 1897a: Ferskvands-Diatomeer fra Østgrønland. — Ibid. XV.
- 1897b: Kyst-Diatomeer fra Grønland. — Ibid. XV.
- 1901: Freshwater Diatoms from the Færøes. — Botany of the Færøes. Part I.
- 1904: Marine Diatoms. Flora of Koh Chang. Botanisk Tidsskrift. Bd. 26.
- 1909: Beiträge zur Kenntnis der Diatomeenflora des Kossogolbeckens. — Hedwigia. Bd. 84. Dresden.
- 1910a: Danske Diatomeer.
- 1910b: Diatoms from North-East Greenland. — Medd. om Grønland. Bd. XLIII.
- 1918: Fresh-water Diatoms from Iceland. — The Botany of Iceland. 2:1.

PLATES

Plate I.

(ca. 1500 ×).

1. *Fragilaria capucina* Desmaz. var. *lanceolata* Grun.
2. *Synedra ulna* (Nitzsch.) Ehr. var. *amphirhynchus* (Ehr.) Grun.
- 3, 4. *Fragilaria capucina* Desmaz.
5. — *vaucheriae* (Kütz.) Boye Petersen var. *septentrionalis* Østrup.
- 6, 7, 8, 11. — *vaucheriae* (Kütz.) Boye Petersen.
9. — — ?
10. — — ?
12. — *capitellata* (Grun.) Boye Petersen.
13. — *brevistriata* Grun.
14. *Synedra famelica* Kütz. ?
- 15, 16. — *minuscule* Grun.
- 17, 18. *Fragilaria construens* (Ehr.) Grun.
- 19, 20. *Ceratoneis arcus* (Ehr.) Kütz. var. *amphioxys* Rabh.
21. — *arcus* (Ehr.) Kütz.
- 22, 24, 25, 26. *Fragilaria pinnata* Ehr.
23. — — var. *lancettula* (Schum.) Hustedt.

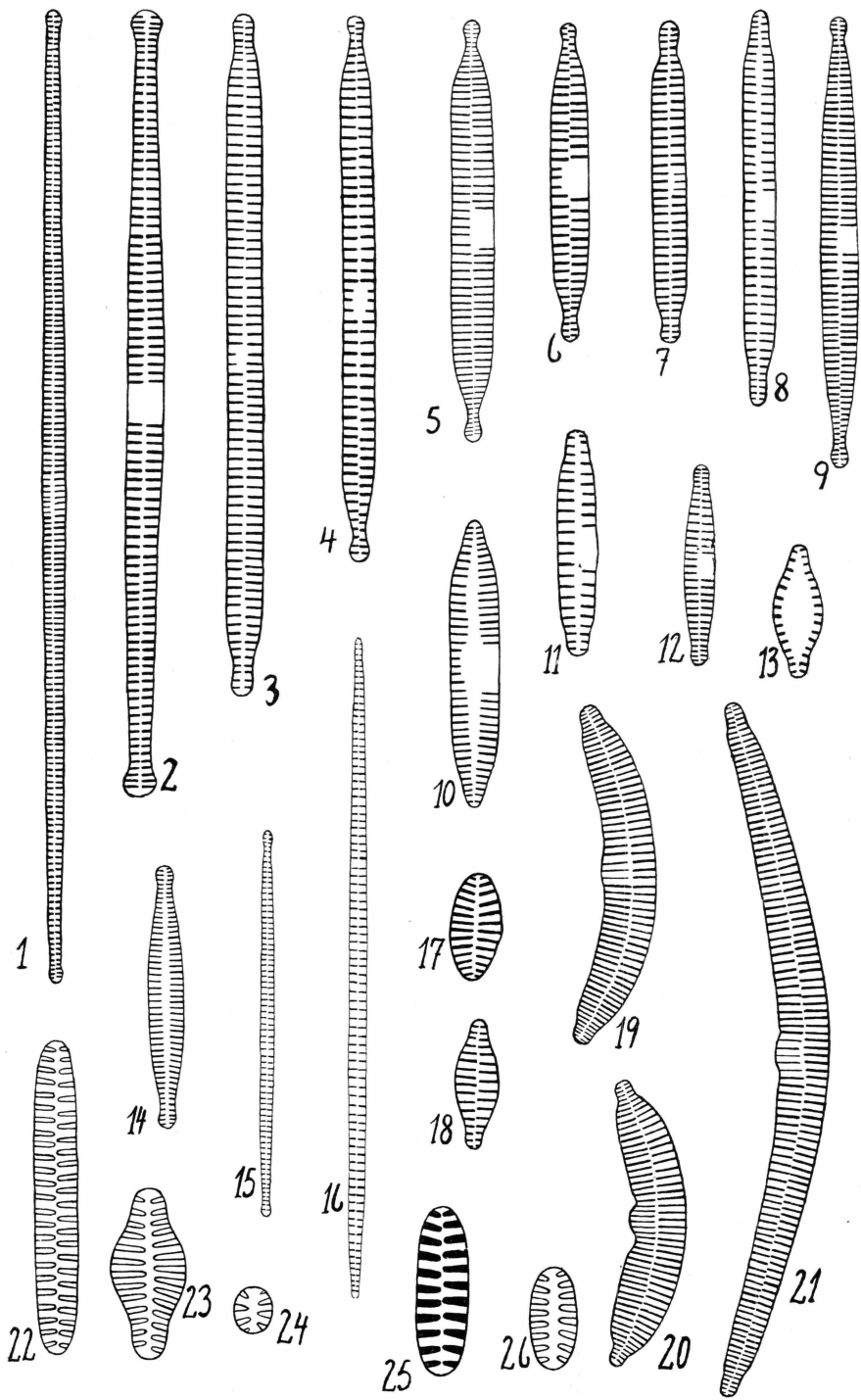


Plate II.

(ca. 1500 ×).

- 1, 7, 8. *Eunotia praerupta* Ehr.
2. — — var. *bidens* Grun.
- 3, 4. — — var. *excelsa* Krasske.
5. — — var. *muscicola* Boye Petersen.
6. — — var. *laticeps* Grun.
- 9, 10. — — var. *inflata* Grun.
11. — — var. *monodon* Østrup.
12. *Cocconeis thumensis* A. Mayer (rapheless valve).
- 13, 14. — *hustedti* Krasske.

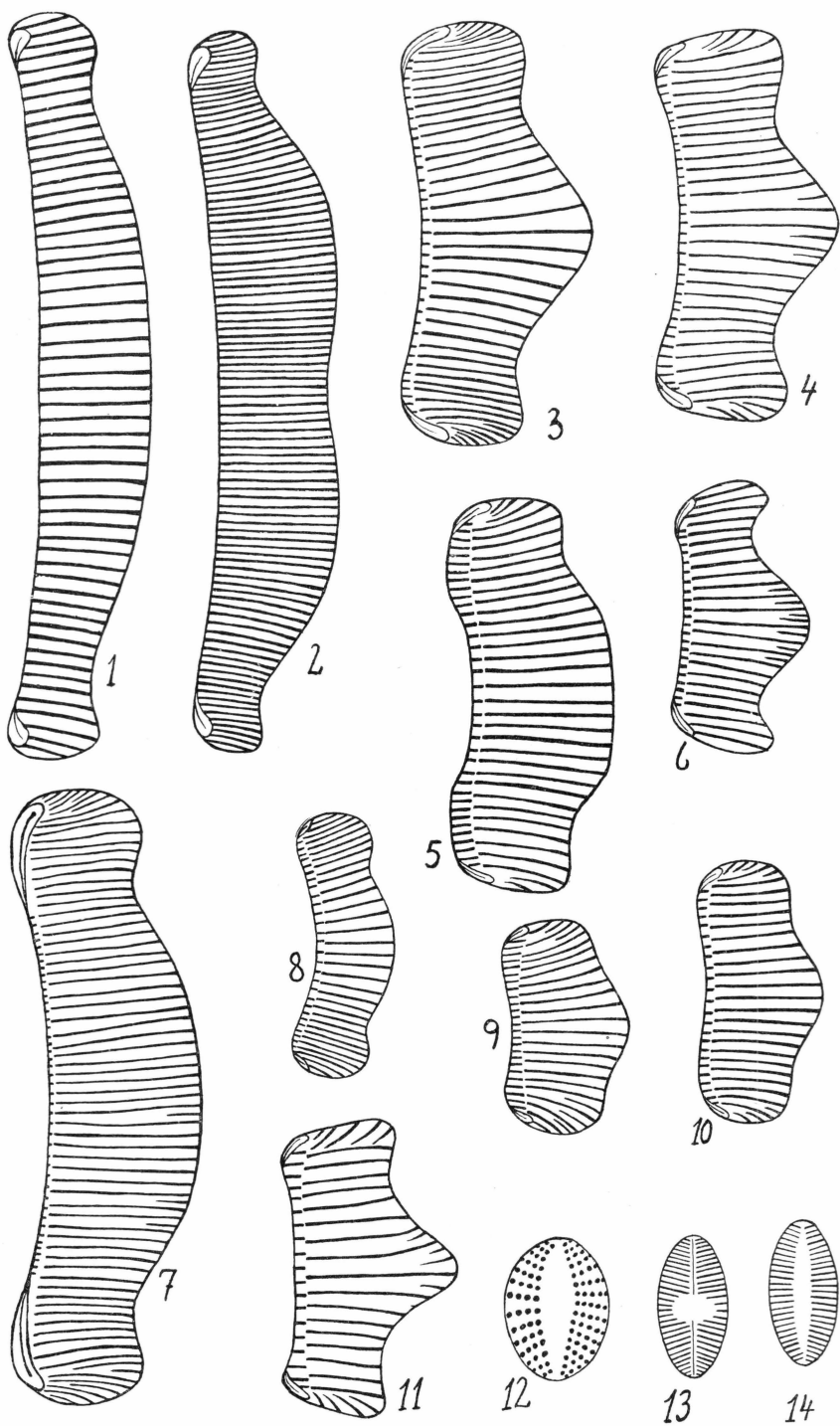


Plate III.

(ca. 1500 ×).

- 1, 2. *Eunotia papilio* (Grun.) Hustedt.
3. — *suecica* A. Cleve.
4. — *bigibba* Kütz.
5. — *diodon* Ehr.
- 6, 7, 8, 9. — *tenella* (Grun.) Hustedt.
10. — *lunaris* (Ehr.) Grun.
11. *Navicula graciloides* A. Mayer. (forma?).
12. — *radiosa* Kütz. (forma?).
- 13, 14. *Cymbella* sp.
15. *Navicula* sp.

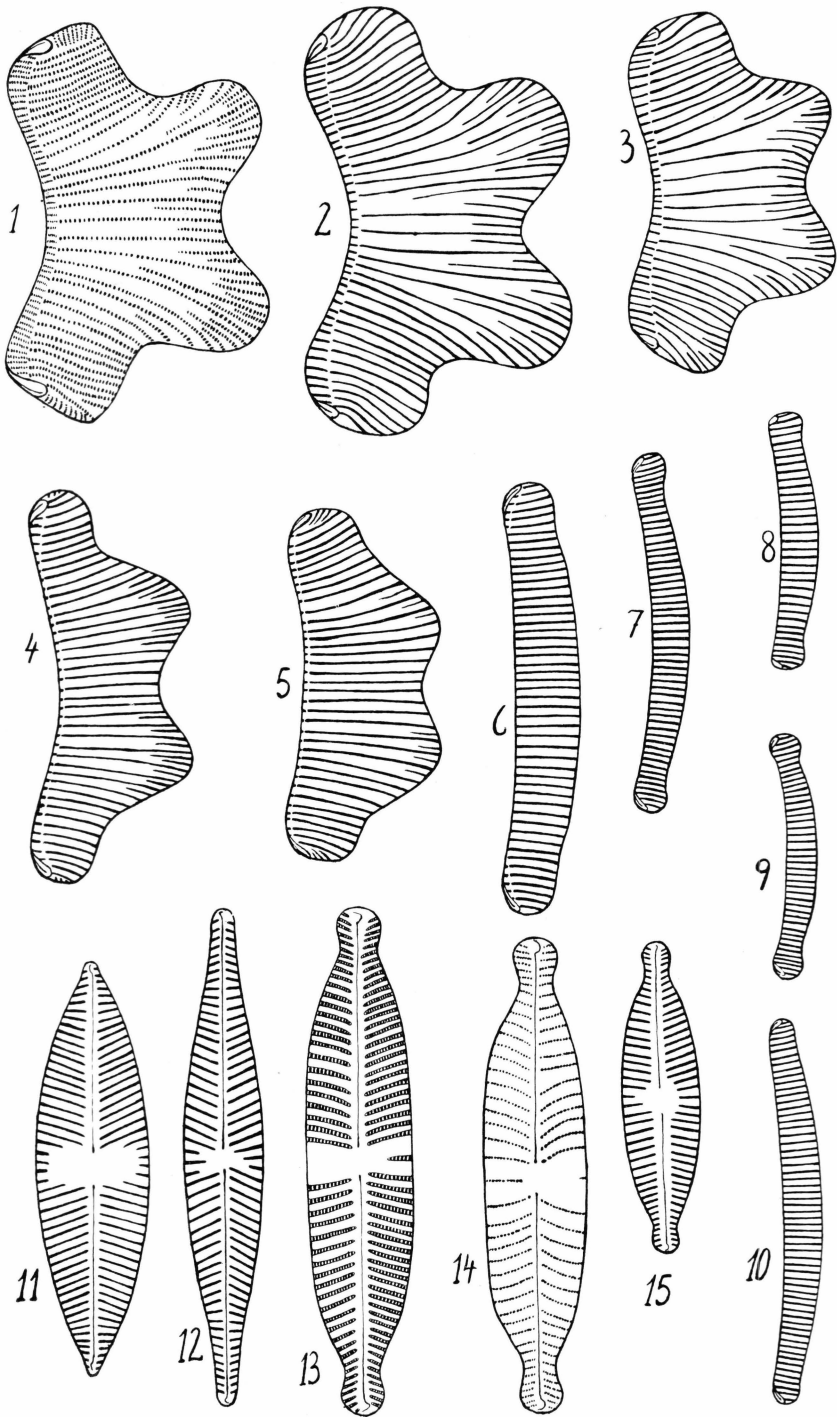


Plate IV.

(ca. 1500 ×).

1. *Achnanthes coarctata* (Bréb.) Grun. (raphe valve).
- 2, 3. — *plüvicensis* Hustedt.
- 4, 5, 6, 7. — *lemmermanni* Hustedt.
- 8, 9. — *thienemanni* Hustedt.
- 10, 11. — *broenlundensis* nov. spec.
12. — *biasollettiana* (Kütz.) Grun.
- 13, 14. — *minutissima* Kütz.
- 15, 16, 17. — *marginatula* Grun.
- 18, 19. — *kryophila* Boye Petersen.
20. — *flexella* (Kütz.) Brun.
21. *Caloneis* sp.
22. — *bacillum* (Grun.) Cleve.
23. — — var. *lancettula* (Schulz) Hustedt.
24. *Stauroneis lapponica* A. Cleve.
25. *Caloneis schummaniana* (Grun.) Cleve.
- 26, 27. *Diploneis* sp.
28. *Caloneis boecheri* Foged.
29. *Stauroneis ignorata* Hustedt.
30. *Caloneis silicula* (Ehr.) Cleve var. *alpina* Cleve.
31. *Stauroneis obtusa* Lagerst.

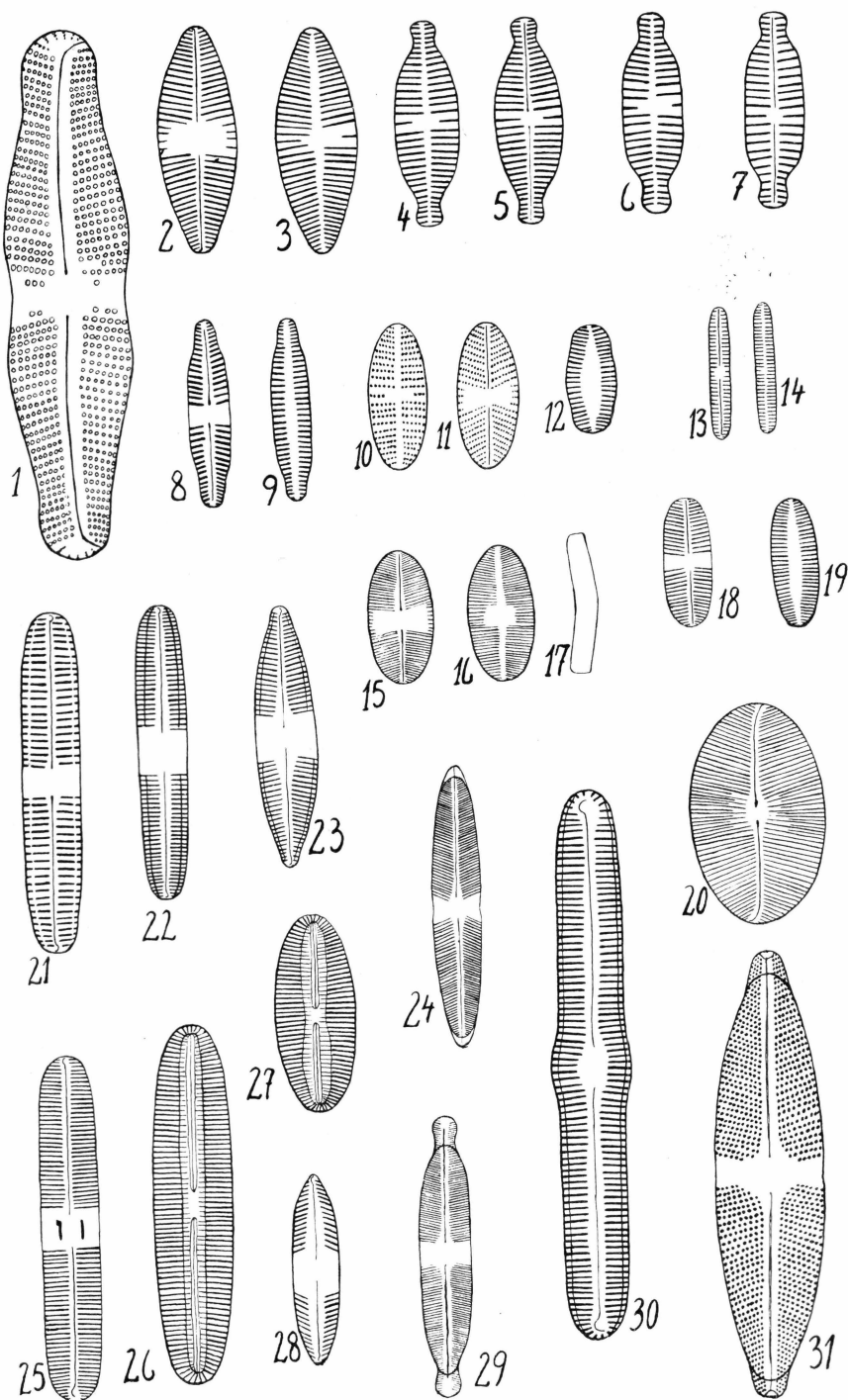


Plate V.

(ca. 1500 ×).

1. *Neidium iridis* (Ehr.) Cleve var. *ampliata* (Ehr.) Cleve.?
2. — *affine* (Ehr.) Cleve var. *capitata* Mölder.
3. — *productum* (W. Smith) Cleve var. *polygibba* Brun.
4. — *kozlowii* var. *elliptica* Mereschk.
5. — *iridis* (Ehr.) Cleve fo. *vernalis* Reichelt.
6. — *distincte-punctatum* Hustedt. (ca. 800 ×).
7. — *munchii* nov. spec.
8. — *knuthii* nov. spec.
9. — — var. *heilprinensis* nov. var.
10. — *kozlowii* var. *parva* Mereschk.

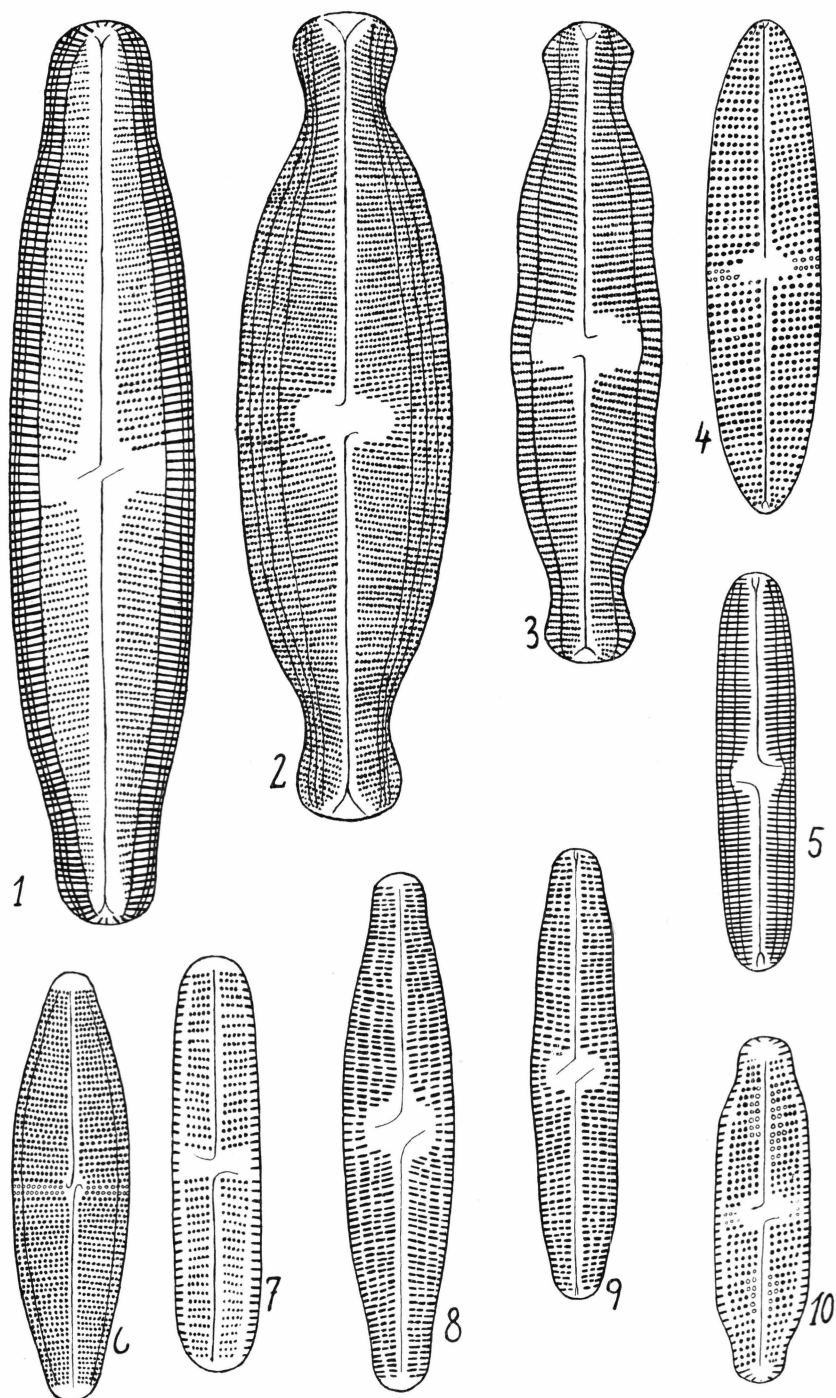


Plate VI.

(ca. 1500 ×).

1. *Navicula mutica* Kütz. fo. *rhomboidea* Playfair.
- 2, 3. — — var. *nivalis* (Ehr.) Hustedt.
4. — — var. *binodis* Hustedt.
5. — — var. *gracilis* Hustedt.
- 6, 7. — *heilprinensis* nov. spec.
8. — *pseudoventralis* Hustedt.
- 9, 17. — *certa* Hustedt.
10. — *cineta* (Ehr.) Kütz.
11. — — var. *heufleri* Grun.
12. — *contenta* Grun. fo. *biceps* Arnott.
13. — *perpusilla* Grun.
- 14, 22. — *cryptocephala* Kütz.
21. — — var. *veneta* (Kütz.) Grün.
23. — — fo. *terrestris* Lund.
15. — *subrotundata* Hustedt.
16. — *submuralis* Hustedt.
18. — *lagerstedtii* Cleve.
- 19, 20. — — var. *palustris* Hustedt.

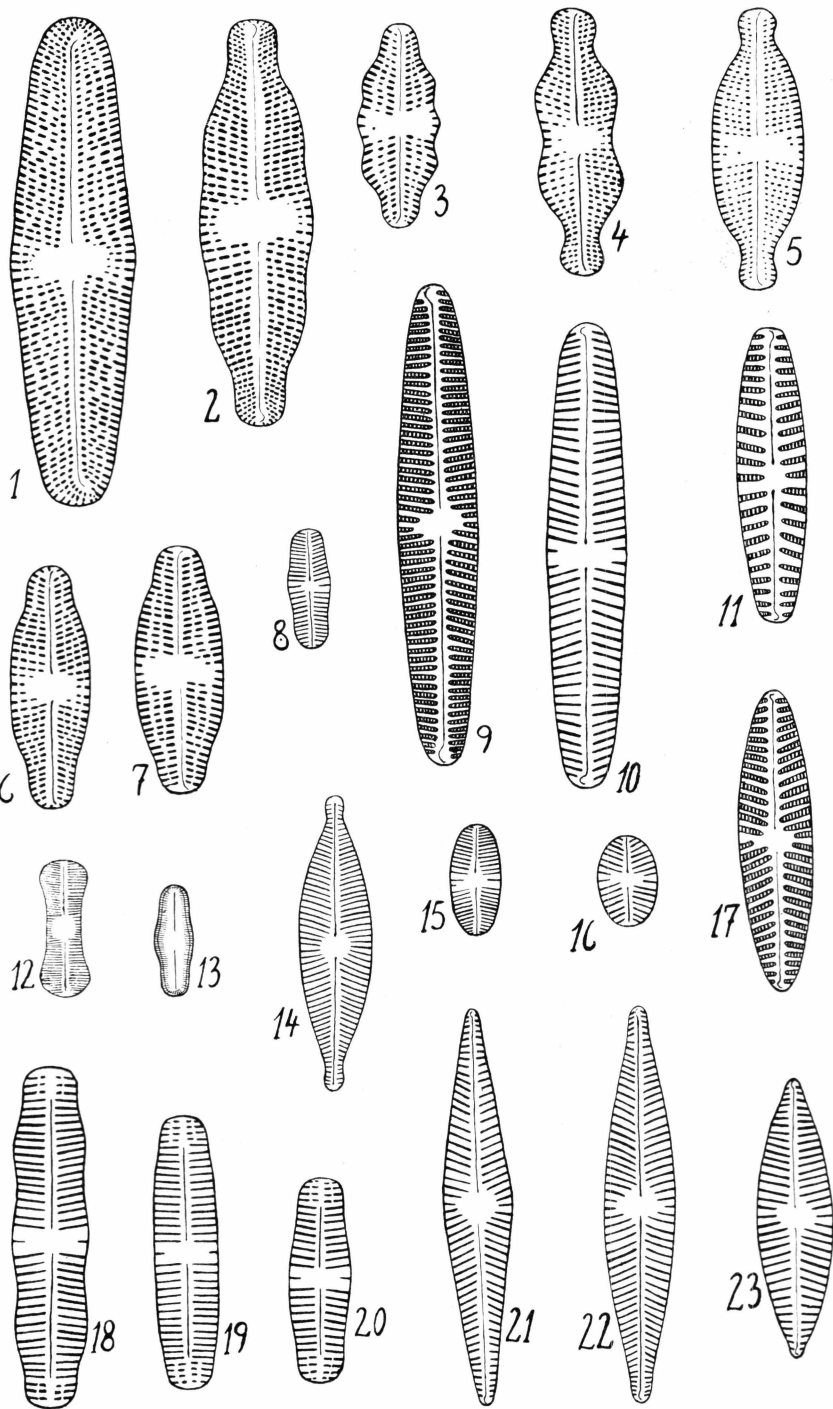


Plate VII.

(ca. 1500 ×).

- 1, 2. *Navicula amphibola* Cleve.
- 3. — *lundströmii* Cleve.
- 4, 5. — *kotzschyi* Grun.
- 6. — *holmenii* nov. spec.
- 7. — *gibbula* Cleve.
- 8, 9, 10, 11, 12. — *schönfeldii* Hustedt.
- 13. — *bryophila* Boye Petersen.

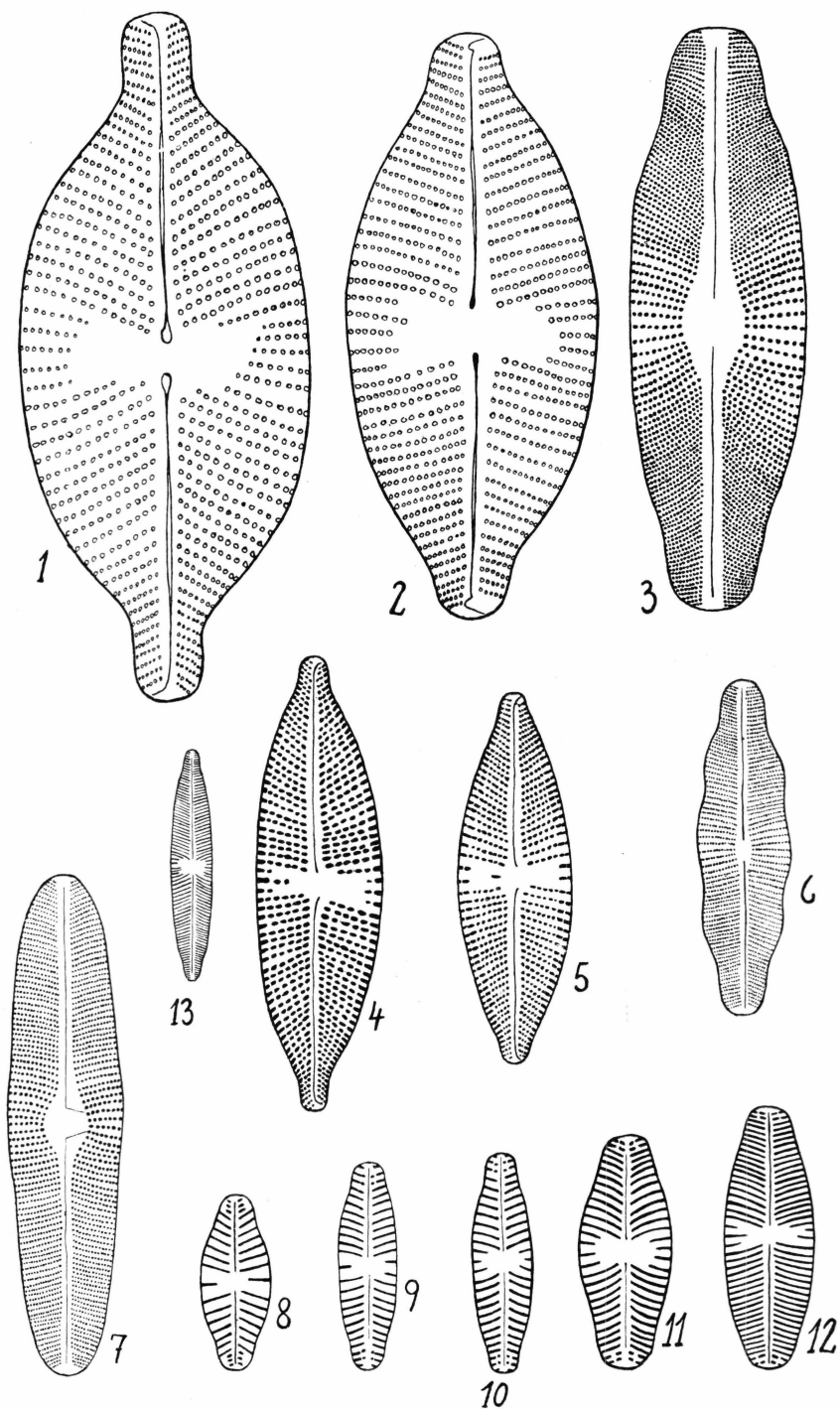


Plate VIII.

(ca. 1500 ×).

- 1, 2. *Pinnularia borealis* Ehr.
- 3, 4, 5, 8, 9. — *intermedia* Lagerstedt.
6. — *parva* (Ehr.) Cleve var. *minuta* Østrup.
7. — — var. *lagerstedtii* Cleve.
- 10, 11. — *balfouriana* Greg.
12. — *microstauron* (Ehr.) Cleve var. *brébissonii* (Kütz.) Hustedt.
13. — — — fo. *diminuta* Grun.
14. — *braunii* Grun. (forma).
15. — *obscura* Krasske.
16. — *divergentissima* Grun. var. *hustedtiana* Ross.
- 17, 18. — *microstauron* var. *brébissonii* fo. *diminuta* Grun.?

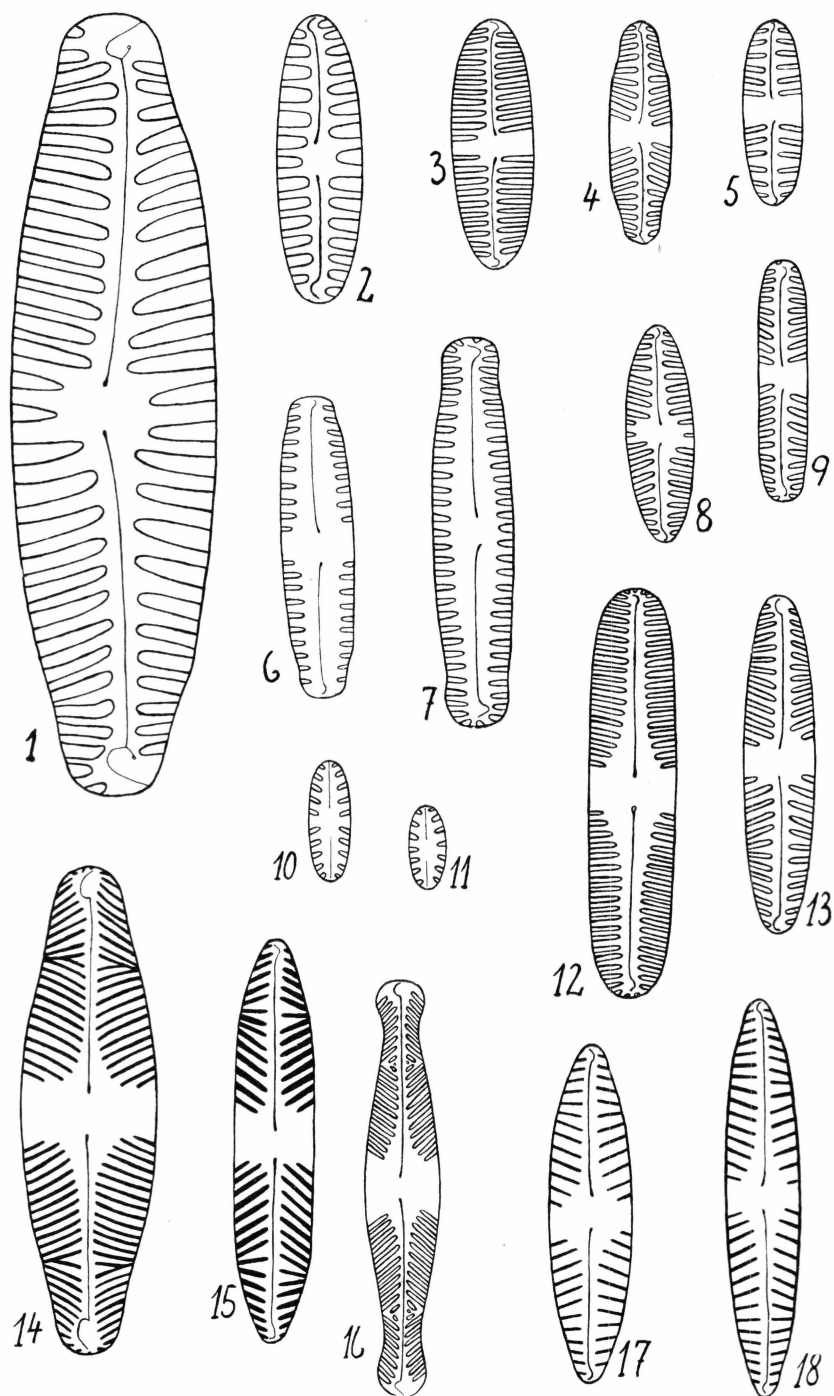


Plate IX.

(ca. 1500 ×).

- 1, 2. *Cymbella variabilis* (Cramer) Heiberg var. *botellus* Lagerstedt.
- 3, 4. — *cistula* (Hempr.) Grun.
- 5, 6. — *leptoceros* (Ehr.) Grun.
7. — — var. *rostrata* Hustedt.
- 8, 13. — *cesatii* (Rabh.) Grun.
9. — *lapponica* Grun.
10. — *laevis* Naegeli.
11. — *amphicephala* Naegeli.
12. — *pseudoalpinioides* nov. spec.

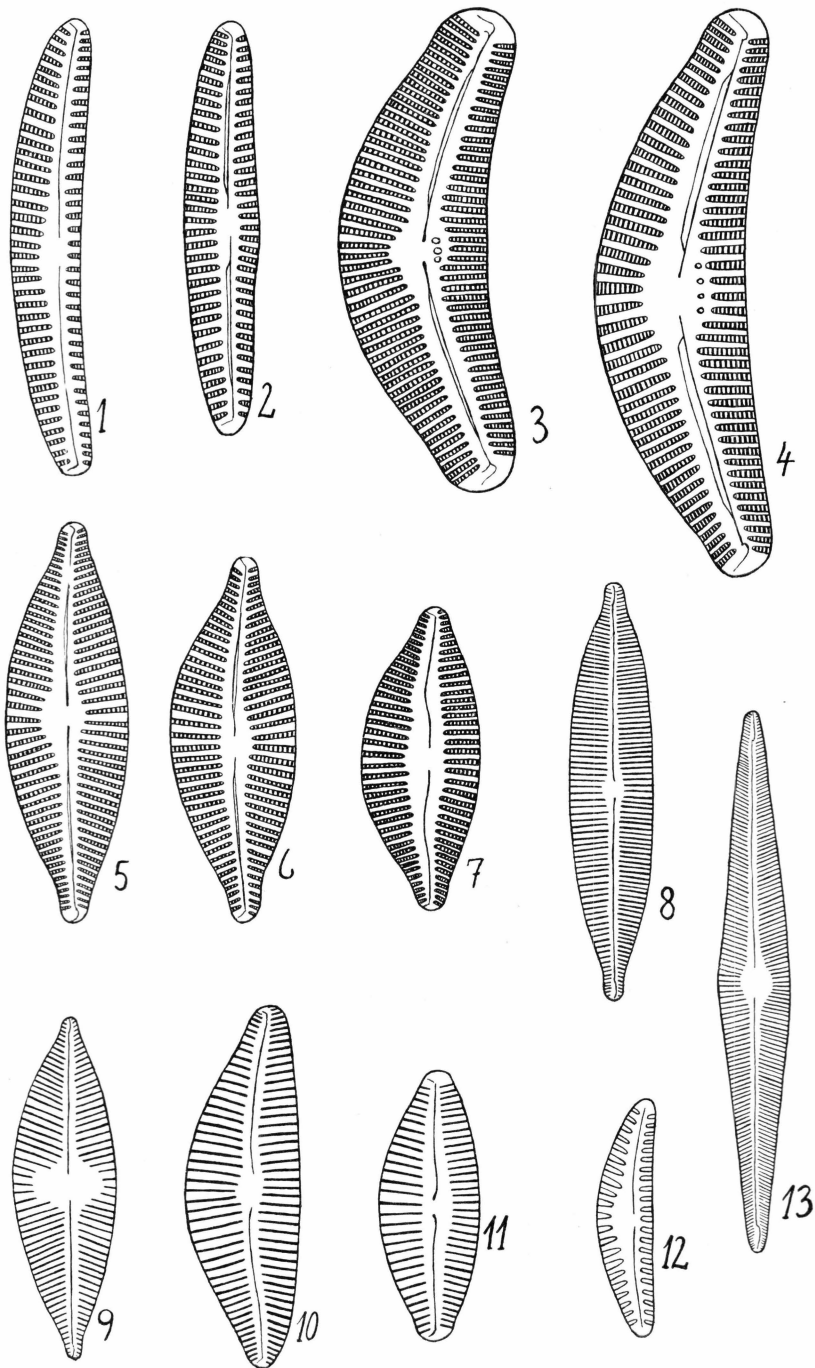


Plate X.

(ca. 1500 ×).

1. *Cymbella spuria* Cleve.
2. — *philadelphica* Boyer.
- 3, 4. — *lapponica* Grun.
5. — *cuspidata* Kütz.
6. — *groenlandica* Foged.
7. — *stauroneiformis* Lagerstedt.
8. — *heilprinensis* nov. spec.

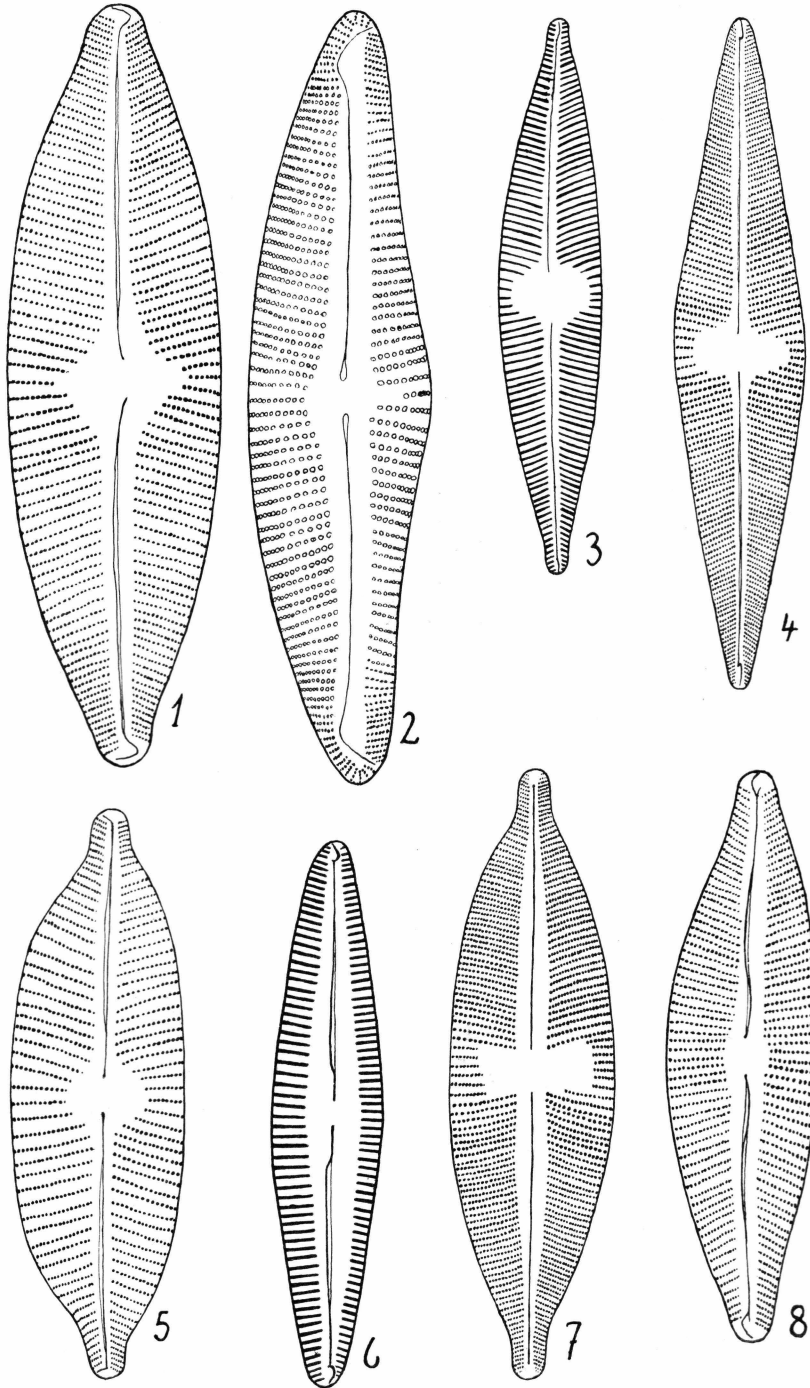


Plate XI.

(ca. 1500 ×).

1. *Navicula halophila* (Grun.) Cleve.
2. — *hambergi* Hustedt.
3. — *minuscula* Grun. var. *alpestris* Hustedt.
4. — *declivis* Hustedt. (?).
5. — *jalaisiensis* Grun. var. *lanceola* Grun.
6. *Pinnularia microstauron* (Ehr.) Cleve var. *brébissonii* (Kütz.) Hustedt.
7. *Navicula søhrensii* Krasske.
8. — — var. *capitata* Krasske.
- 9, 11. — *modica* Hustedt.
10. — *opportuna* Hustedt.
12. — *contenta* Grun. fo. *parallela* Boye Petersen.
13. *Pinnularia undulata* Greg. var. *subundulata* Grun.
14. — *gracillima* Greg.
15. — *interrupta* W. Smith fo. *minor* Boye Petersen.
16. — *divergentissima* Grun. var. *wulffii* Boye Petersen.
17. *Cymbella laevis* Naegeli.
18. — *lapponica* Grun.
19. — *stauroneiformis* Lagerstedt.
20. — *similis* Krasske.
21. *Pinnularia microstauron* (Ehr.) Cleve.
- 22, 23. *Cymbella broenlundensis* nov. spec.
24. — *lata* Grun. var. *minor* Mölder. (?).
25. — *microcephala* Grun.
26. — — var. *robusta* Hustedt.

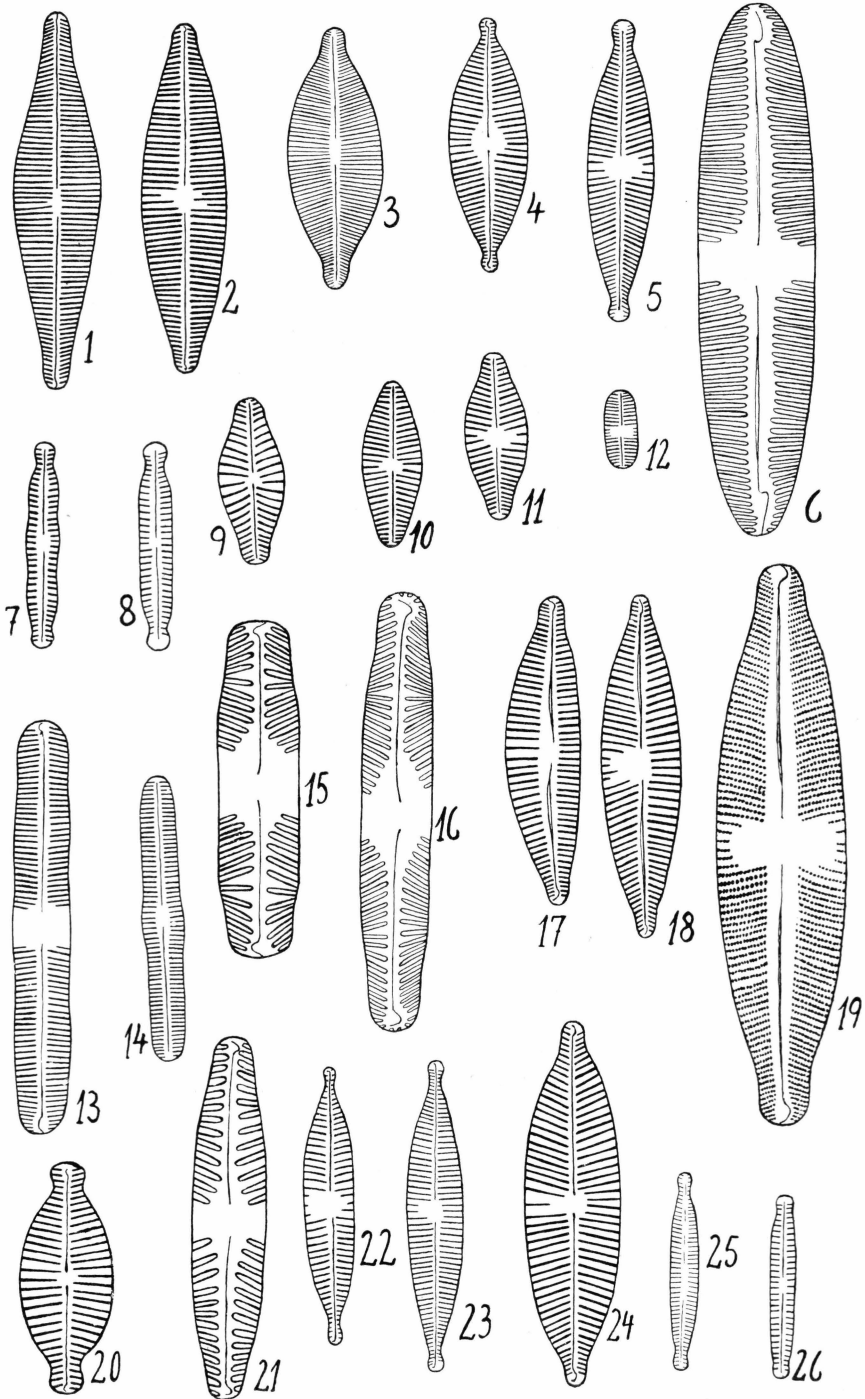


Plate XII.

(ca. 1500 ×).

1. *Cymbella turgida* (Greg.) Cleve. (forma).
2. — *holmenii* nov. spec.
3. — *obscura* Krasske.
4. — *latens* Krasske.
5. — *turgida* (Greg.) Cleve.
6. — *brehmii* Hustedt.
- 7, 8, 9. — *ventricosa* Kütz.
10. — *perpusilla* A. Cleve (?).
11. — *knuthii* nov. spec.
12. — *microcephala* Grun.
13. — *delicatula* Kütz.
- 14, 15, 20, 21, 22. — *similis* Krasske.
16. — *leptoceros* (Ehr.?) Grun. ?.
17. — *incrassata* nov. spec.
- 18, 19. — *angustata* (W. Smith) Cleve.

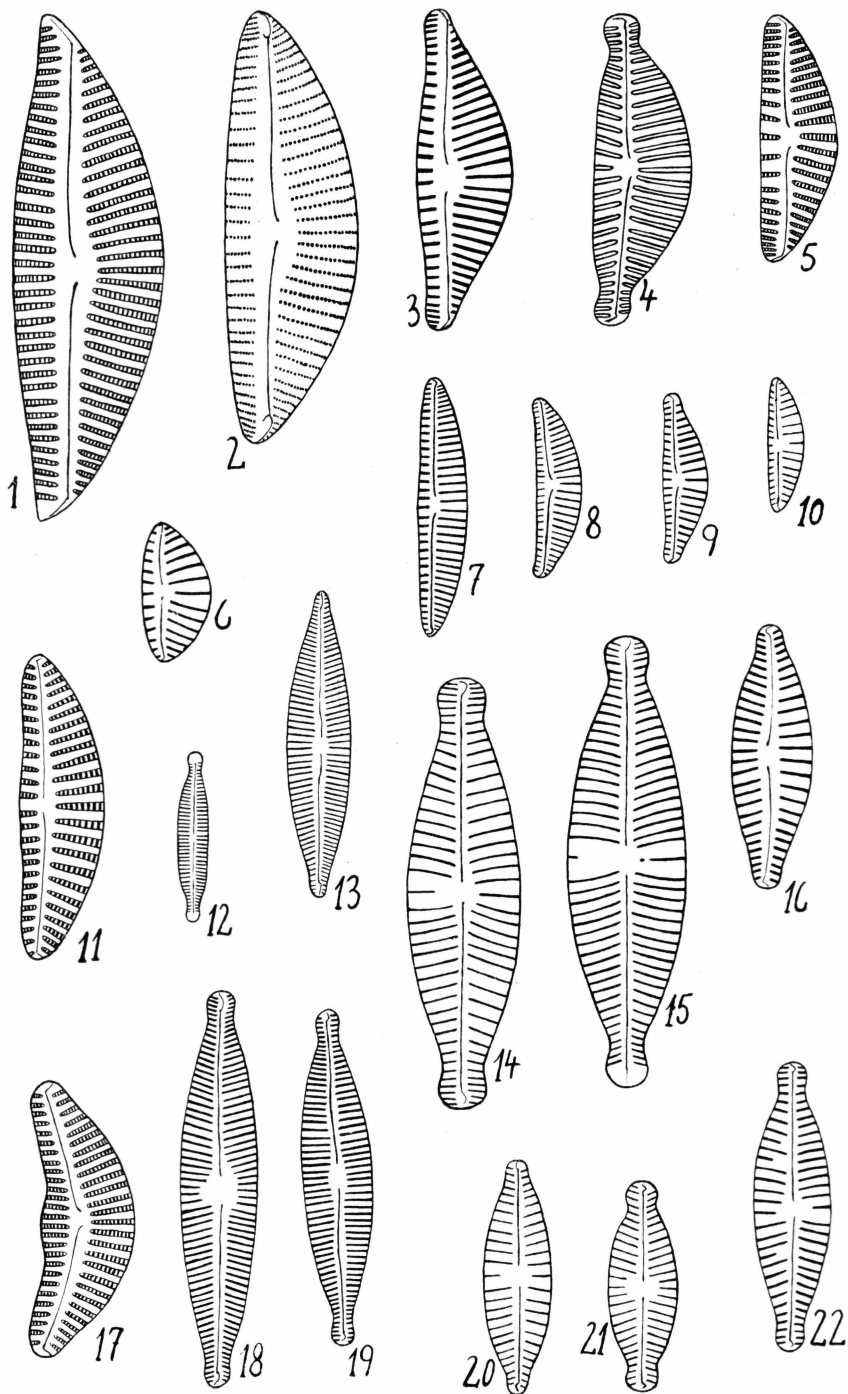


Plate XIII.

(ca. 1500 ×).

- 1, 3. *Gomphonema angustata* (Kütz.) Rabh. var. *undulata* Grun.
2. — *angustata* (Kütz.) Rabh.
4. — *lagerheimii* A. Cleve.
5. — *longiceps* Ehr. var. *subclavata* Grun.
6. — *angustata* var. *sarcophagus* (Greg.) Grun.
7. — *olivaceum* (Lyngbye) Kütz.
- 8, 9. — *angustata* var. *producta* Grun.
10. *Amphora triundulata* Ross.
- 11, 12. *Cymbella amphicephala* Naegeli var. *variostriata* nov. var.
- 13, 14. — *obtusa* Greg.
- 15, 16, 17. — *hybrida* Grun.
18. — *norvegica* Grun.

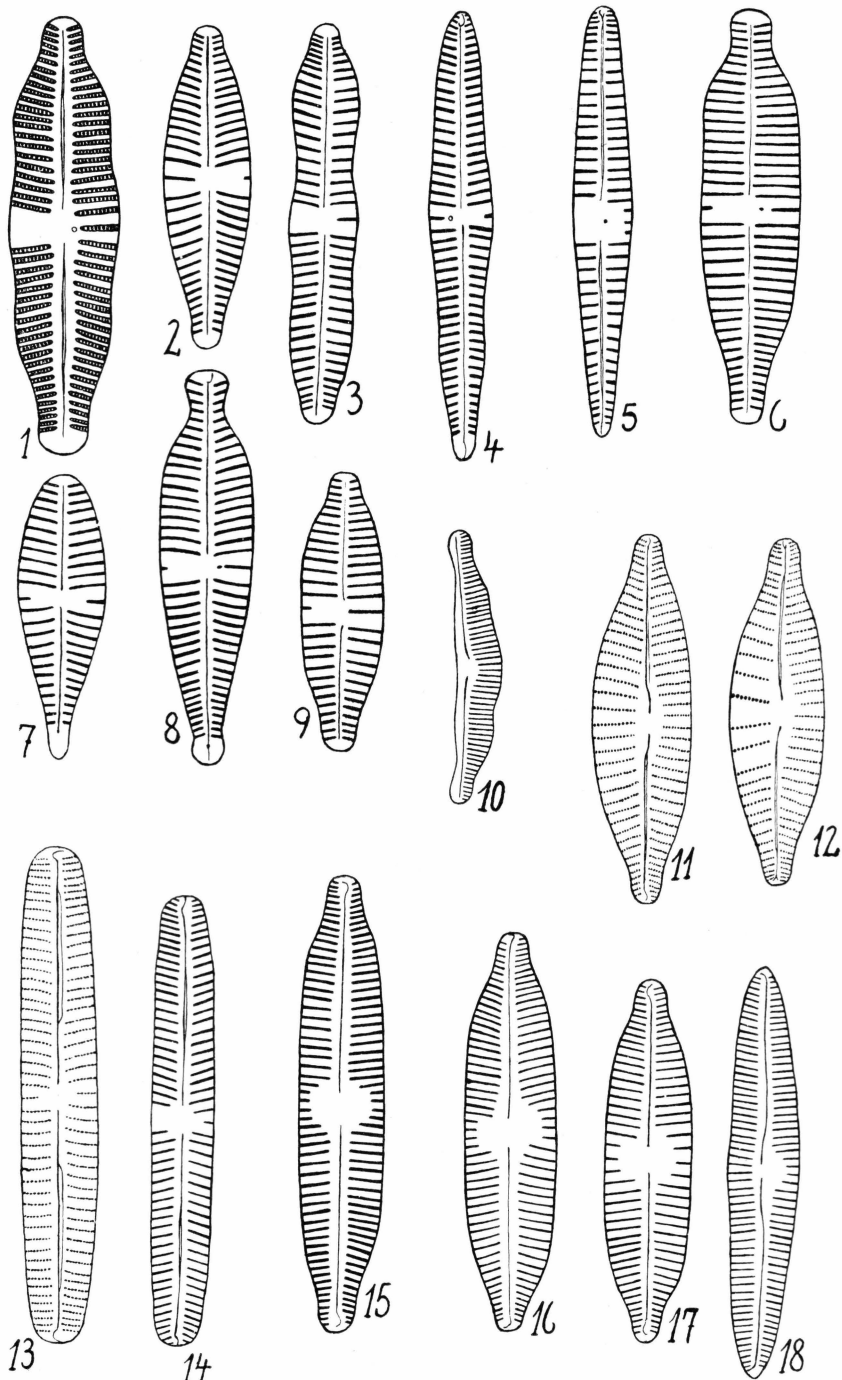


Plate XIV.

(ca. 1500 ×).

- 1, 2. *Hantzschia amphioxys* (Ehr.) Grun. var. *hyperborea* Grun.
3. *Nitzschia denticula* Grun.
4. — *frustulum* (Kütz.) Grun.
- 5, 6. — — var. *perpusilla* (Rabh.) Grun.
7. — *linearis* W. Smith. (?)
- 8, 9, 10. — *palea* (Kütz.) W. Smith.
- 11, 13. — *fonticola* Grun.
12. — — var. ?
14. — sp.
15. — *gracilis* Hantzsch. ?
- 16, 17. — *hantzschiana* Rabh.
- 18, 19. — *kützingiana* Hilse.
20. *Amphora obscura* Krasske.
21. — *veneta* Kütz.

