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THE DIATOMS IN FOUR POSTGLACIAL DEPOSITS AT GODTHÅBSFJORD, WEST GREENLAND

BY

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WITH 5 FIGURES, 9 TABLES AND 8 PLATES

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Abstract

A core from the bottom of each of four lakes in the region of Godthåbsfjord, western Greenland, is examined for content of diatoms. It is shown that all the lakes came into existence during the postglacial upheaval, the nethermost part of the 4 cores consisting of marine sediment and the remainder part being freshwater material.

The diatoms found are listed according to their halobion and pH-relation, and the result is summed up in halobion and pH-spectra. The development of pH to the lakes from their start up to now is illustrated by means of diagrams.

Two new species are described: *Achnanthes fredskildii* and *Achnanthes iversenii*, and one forma nova: *Neidium iridis* fo. *crassiusculum*.

In addition 8 plates with photos of a total of 106 taxa are given.

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BIANCO LUNOS BOGTRYKKERI A/S

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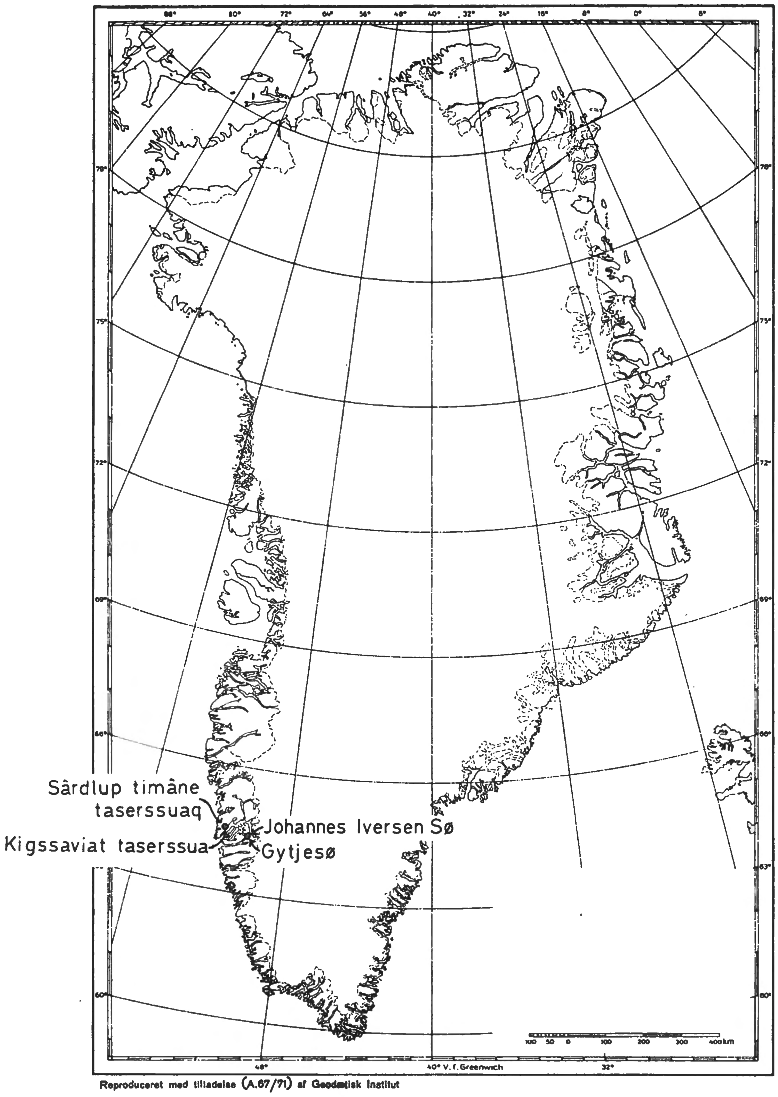

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Fig. 1. Map of Greenland.

INTRODUCTION

In connection with B. FREDSKILD's investigations on the holocene vegetation and climate in Greenland (FREDSKILD, 1968, 1972 and 1973) the diatom flora was examined in four cores, two from Peary Land (Sølejren and Klaresø) and two from the southernmost part of Greenland (Galium Kær and Spongilla Sø), published by N. FOGED (1972).

B. FREDSKILD has continued his investigations, and in 1973 he brought home cores from four lakes situated in the region of Godthåbsfjord (Fig. 1), and the result of the diatom analyses of these samples is given in this paper.

From the diatom analyses it appears that the nethermost part of each of the four cores consists of a marine sediment. The four lakes in question consequently are all developed as the result of the postglacial upheaval, minor branches being segregated from the inlet.

The remainder part of each core consists of freshwater sediments. From the diatom analyses of the samples from these sediments it appears, with varying obviousness, that from the beginning the water in the lakes was alkaline, but sooner or later pH approached the neutral point and subsequently the lakes changed towards a more or less acid reaction.

The analyses of recent samples taken from the water-sediment interface may indicate that at present a change towards the neutral point is going on. However, the estimate of this is rather uncertain, as it is based on a single sample from each lake.

In Table 1 the chemical analyses of the water from the four lakes are given, and it appears that the content of inorganic substances is small. Furthermore the pH-determinations show that the water is still faintly acid.

In the tables the diatoms found are arranged in groups according to their halobion- and pH-relation. For the clearness a tripartition is used in either case. The halobion groups cover the polyhalobous, i.e. proper marine species, the mesohalobous species indigenous to brackish water, and the halophilous species being oligohalobous. The proper freshwater species, i.e. oligohalobous, except of the halophilous ones, are placed only in the pH-spectra. Within these the alkaliphilous group includes the alkalibiontic taxa, and the acidophilous group includes the very few acidobiontic taxa. The pH-indifferent group is very heterogeneous. It covers not only the species which in a proper sense are indifferent to the acidity of the environment, i.e. species to be found at very varying pH, but also species that are circum-neutral, i.e. species, the optimum of which lies about pH 7.0. Within these two types you will find species which often change their placing in the pH-system.

The proper pH-indifferent species may be found in each of the three main groups. The optimum of the circumneutral species may vary within a rather small part of the spectrum about pH 7.0, the limitation of which is subjectively estimated. Species with the optimum slightly transposed in alkaline direction consequently may often be designated alkaliphilous, while species with the optimum in the acid direction may be called acidophilous. The evaluation is always influenced by some subjectivity, so an author may consequently be forced to change his point of view by increasing investigations.

In the present paper the evaluations principally comply with the results achieved by F. HUSTEDT (1957). Some importance is also attached to B. J. CHOLNOKY' evaluations in his diatom ecology (CHOLNOKY, 1968). HUSTEDT and CHOLNOKY frequently disagree, but this is not difficult to explain, as HUSTEDT's material covers biotopes within all climates, while CHOLNOKY's evaluations predominantly are based on South African material originating in rather peculiar biotopes. Furthermore my own observations from previous investigations are included in the final placing.

In addition to the flora lists tables are elaborated, in which the content of the lists are summed up. In the tables the number of species in each of the halobion- and pH-groups found in the individual samples, and besides the corresponding percentage of the species is given.

Finally the development of the lake as regards pH is illustrated by means of diagrams based on the percentage of each of the three pH-groups. Experience shows that this method based on the number of species ordinarily is just as applicable as the method based on the number of valves. In both cases it will always be questionable how much a sample reflects the environment, as it is usually consisting of but a small quantity of the sediment. When sampling is undertaken in recent biotopes there will always be differences as well in the composition of the flora as in the percentage of each species, even if the samples are collected close to each other. The spectra however will normally agree whether they are based on the first method or on the second one.

In the following discussion of the diatom flora of the four lakes the designation "oligohalobous taxa" does not include the halophilous species as mentioned above. They are given together with the halobion taxa. In the halobion- or pH-groups the taxa are listed alphabetically.

In the tables the oldest samples are placed to the left and the recent one to the right.

As a final part of the paper eight plates with photos of 106 taxa are given. The section is prefaced by informations about each photo, and the description of the new taxa.

LAKE A

Johannes Iversen Sø

(64°24′ N, 50°12′ W)

5 km southeast of Kapisigdlit, at the head of Godthåbsfjord, a 3 m deep lake app. 100 m a.s.l. was cored. At the coring site the depth of water is 2.8 m. The size of the lake is 150×200 m.

Myriophyllum alterniflorum (sterile), *Potamogeton alpinus* and *Sparganium hyperboreum* are growing in the lake, with *Menyanthes trifoliata* and *Carex saxatilis* in shallow water at the shore. *Spongilla* sp. is common in the lake.

The chemical composition of the water is given in Table 1.

Table 1. *Analyses of water from the four lakes*

mg/l	A	B	C	D
HCO_3^-	3.5	2.7	1.8	2.3
SO_4^{--}	2	2	1	1
Cl^-	1.7	3.0	7.7	8.8
NO_3^-	0	0	0	0.3
Ca^{++}	3.8	2.6	1.3	1.0
Mg^{++}	0.72	0.61	0.68	0.69
Fe^{++}	<0.05	0.07	<0.05	<0.05
Mn^{++}	0	0.01	0	0
NH_4^{++}	<0.1	<0.1	0.2	0.3
Na^+	3.2	2.9	4.9	5.4
K^+	1.6	1.0	0.6	0.6
SiO_2	1.0	0.96	0.59	1.0
PO^{---}	0.01	<0.01	<0.01	<0.01
F^-	0.03	<0.02	<0.02	<0.02
pH	5.8	5.2	5.6	5.8
μmho	42	37	43	46

A = Johannes Iversen Sø, B = Gytjesø, C = Sârdlup timâne taserssuaq, D = Kigssaviat taserssua.

A pollen diagram from the lake is given in J. Iversen, 1952–53, p. 92 and in B. Fredskild, 1973, plate 16. In these papers the lake is termed "Lake 100 m s.m.".

The following layers were found (cm below the lake bottom):

0–292 cm: Fine detritus gyttja, brownish. Downwards stratified and with a touch of clay.

292–298 cm: Fine detritus gyttja, darker, reddish, with a touch of clay.

298–362.5 cm: Stratified clay gyttja, with thin layers of pure clay and almost pure, fine detritus gyttja in between.

362.5–367.5 cm: Grey clay.

A sample from 337–346 cm has been radiocarbon dated: 8640 ± 130 B.P. (K-2294).

The diatom flora in 21 sediment samples from this core besides one recent sample is listed in Table 2.

Table 2. *Diatom analyses, Lake A*

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
Polyhalobous																						
Achnanthes																						
septata A. CLEVE	×																					
Amphora																						
angulosa GRUN.	×																					
angusta GREG. var.																						
ventricosa GREG.	×																					
ocellata DONK.	×																					
Cocconeis																						
costata GREG.	×																					
scutellum EHR.	×	×																				
Diploneis																						
litoralis (DONK.) CLEVE	×																					
Fragilariopsis																						
cylindrus (GRUN.) HELMCKE & KRIEGER.	×																					
Hyalodiscus																						
scoticus (KÜTZ.) GRUN.	×																					
Navicula																						
cancellata DONK.	×																					
forcipata GREV.	×	×																				
transistans CLEVE	×	×																				
Nitzschia																						
acuminata (W. SMITH) GRUN.	×	×																				
Pinnularia																						
quadratarea (A.S.) CLEVE		×																				
Pleurosigma																						
angulatum (QUEKETT) W. SMITH		×																				
salinarum GRUN.	×																					

Table 2. Continued.

Sample No. M	7701	7702	7704	7708	7712	7670	7630	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	–
Rhabdonema																						
minutum Kütz.	×																					
Scoliopleura																						
tumida (Bréb.) Rabh.	×	×																				
Thalassiosira																						
nordenskioeldii Cleve	×																					
Mesohalobous																						
Achnanthes																						
brevipes Ag.	×	×																				
hauckiana Grun.	×	×	×																			
Cocconeis																						
scutellum Ehr. var. *parva* Grun.	×																					
Diploneis																						
interrupta (Kütz.) Cleve	×	×			×																	
Melosira																						
nummuloides (Dillw.) Ag.		×																				
Navicula																						
meniscus Schum.	×		×		×	×																
peregrina (Ehr.) Kütz.			×	×																		
salinarum Grun.		×																				
Nitzschia																						
sigma (Kütz.) W. Smith	×	×		×																		
Rhopalodia																						
musculus (Kütz.) O. Müller		×		×																		
Stauroneis																						
gregorii Ralfs	×	×																				
salina W. Smith		×																				
Synedra																						
pulchella Kütz.			×	×	×	×	×			×												
Halophilous																						
Anomoeoneis																						
sphaerophora (Kütz.) Pfitzer				×	×	×																
Fragilaria																						
construens (Ehr.) Grun. var. *subsalina* Hust.					×		×															
Navicula																						
cincta (Ehr.) Kütz.	×	×		×	×																	
– var. *heufleri* Grun.						×																
digitoradiata (Greg.) A.S. var. *elliptica* (Østrup) M. Møller		×		×																		
gregaria Donk.					×																	
rhynchocephala Kütz.					×				×	×	×	×	×	×	×	×	×			×		
Synedra																						
tabulata (Ag.) Kütz.	×																					

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
Alkaliphilous																						
Achnanthes																						
lanceolata BRÉB.							×				×		×	×								
– var. *elliptica* CLEVE														×								
Amphora																						
ovalis KÜTZ.														×			×		×	×		×
– var. *libyca* (EHR.) CLEVE				×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		×	×	×
– var. *pediculus* KÜTZ.														×								
Anomoeoneis																						
styriaca (GRUN.) HUST.																×			×			×
Caloneis																						
bacillum (GRUN.) MERESCHK.							×	×	×	×	×	×	×	×	×							
silicula (EHR.) CLEVE						×						×		×	×		×				×	
– var. *truncatula* GRUN.						×		×			×		×		×	×		×				
Ceratoneis																						
arcus KÜTZ. var. *linearis* HOLMBOE		×																				
Cocconeis																						
placentula EHR.				×		×	×		×													
– var. *euglypta* (EHR.) CLEVE					×			×	×	×	×	×	×		×	×						
Cymatopleura																						
solea (BRÉB.) W. SMITH						×																
Cymbella																						
affinis KÜTZ.				×					×				×	×	×							
aspera (EHR.) CLEVE										×												
cistula (HEMPR.) GRUN.									×			×									×	×
cuspidata KÜTZ.									×		×				×		×		×			×
cymbiformis (AG.? KÜTZ.) v. HEURCK								×	×	×			×	×			×					
helvetica KÜTZ.																		×				×
leptoceros (EHR.) GRUN.										×		×		×				×				×
microcephala GRUN.								×	×	×		×		×			×					×
obtusa GRUN.										×	×	×	×	×	×	×		×				×
turgida (GREG.) CLEVE								×	×			×	×					×		×		
Denticula																						
tenuis KÜTZ. var. *crassula* (NAEG.) HUST.										×	×					×	×	×				
Diploneis																						
ovalis HILSE) CLEVE		×												×			×					
– var. *oblongella* (NAEG.) CLEVE		×																				
Epithemia																						
sorex KÜTZ.						×	×	×	×	×	×	×	×	×	×	×	×	×	×			×
turgida (EHR.) GRUN. var. *granulata* (EHR.) GRUN.						×	×	×	×	×	×	×										
zebra (EHR.) KÜTZ.					×		×															
– var. *porcellus* (KÜTZ.) GRUN.				×		×																
– var. *saxonica* (KÜTZ.) GRUN.				×	×	×			×	×	×	×										

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
Fragilaria																						
construens (EHR.) GRUN.				×	×	×	×	×	×	×	×	×	×	×	×							
– var. *binodis* (EHR.) GRUN,				×	×	×	×															
– var. *triundulata* REICHELT							×															
– var. *venter* (EHR.) GRUN.						×																
crotonensis KITTON																			×			
intermedia GRUN.				×																		
pinnata EHR.						×	×			×		×		×								
Gomphonema																						
acuminatum EHR.								×	×	×	×	×	×	×	×							
– var. *brébissonii* (KÜTZ.) CLEVE					×				×		×	×	×	×	×							
– var. *coronata* (EHR.) W. SMITH								×	×	×	×	×	×	×	×		×		×	×	×	×
– var. *trigonocephala* (EHR.) GRUN.									×													
– var. *turris* (EHR.) CLEVE													×	×	×	×	×		×		×	×
angustatum (KÜTZ.) RABH. var. *producta* GRUN.														×						×		
constrictum EHR.							×		×	×	×	×										
– var. *producta* GRUN.							×							×								
intricatum KÜTZ.									×			×		×				×	×			
– var. *pumila* GRUN.																						×
Navicula																						
bacillum EHR.								×														
clementis GRUN.			×		×																	
cryptocephala KÜTZ.			×	×					×				×			×		×				
– var. *intermedia* GRUN.								×				×										
cuspidata KÜTZ. var. *ambigua* (EHR.) CLEVE				×	×	×																
hungarica GRUN. var. *capitata* (EHR. CLEVE					×	×	×															
rhynchocephala KÜTZ.					×				×	×	×	×	×	×	×	×	×			×		
tuscula (EHR.) GRUN.					×		×	×	×													
viridula KÜTZ.			×	×																		
vitabunda HUST.						×			×		×	×	×									
vulpina KÜTZ.								×	×	×	×	×		×								
Nitzschia																						
acuta HANTZSCH												×			×	×	×	×	×	×	×	×
angusta (W. SM.) GRUN. var. *acuta* GRUN.												×				×		×				×
frustulum KÜTZ.								×		×		×		×		×	×		×			
– var. *perpusilla* (RABH.) GRUN.																		×			×	×
Opephora																						
martyi HÉRIB.					×	×						×										
Rhoicosphenia																						
curvata (KÜTZ.) GRUN.								×														
Rhopalodia																						
gibba (EHR.) O. MÜLLER				×	×	×						×		×								

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	–
Surirella																						
angusta Kütz.																×						
Synedra																						
ulna (Nitzsch) Ehr.				×		×	×	×	×	×	×	×			×							
– var. *aequalis* (Kütz.) Hust.												×										
– var. *biceps* (Kütz.) v. Schönf.														×								
pH-indifferent (circumneutral)																						
Achnanthes																						
coarctata Bréb.				×																		
laterostrata Hust.												×	×	×	×	×						
linearis W. Smith									×	×		×		×	×	×		×	×		×	
minutissima Kütz.								×	×			×	×									×
– var. *cryptocephala* Grun.										×		×					×	×	×			×
recurvata Hust.														×	×	×	×		×	×		×
Amphora																						
veneta Kütz.								×	×													
Anomoeoneis																						
exilis (Kütz.) Cleve								×		×							×	×	×		×	
– fo. *lanceolata* A. Mayer								×	×	×	×	×	×		×	×	×				×	×
Cyclotella																						
comta (Ehr.) Kütz.																		×				
Cymbella																						
amphicephala Naegeli																			×			
angusta (W. Smith) Cleve																						×
broenlundensis Foged									×					×				×		×	×	×
cesatii (Rabh.) Grun.										×					×	×	×	×	×		×	×
gracilis (Rabh.) Cleve										×		×		×		×	×	×	×	×	×	×
hustedtii Krasske																			×			
naviculiformis Auerswald								×	×	×	×	×	×	×	×	×		×		×	×	×
ventricosa Kütz.				×	×			×	×	×	×	×	×	×	×			×			×	×
Diatomella																						
balfouriana Grev.	×	×																				
Eunotia																						
arcus Ehr.							×		×	×	×	×		×	×	×	×	×	×	×		×
lunaris (Ehr.) Grun.							×	×	×	×	×			×	×	×	×	×	×	×	×	×
– var. *subarcuata* Ralfs															×		×	×	×		×	×
Fragilaria																						
lapponica Grun.								×	×		×		×									
virescens Ralfs								×				×		×	×	×	×	×	×	×	×	×
Gomphonema																						
bohemicum Reichelt & Fricke					×	×		×		×			×									
gracile Ehr.								×	×	×	×				×			×	×			
lagerheimii Cleve								×								×	×					

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7469	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
parvulum KÜTZ.				×			×		×	×				×			×					
subtile EHR.								×	×	×	×	×	×			×	×	×	×		×	×
Melosira																						
italica (EHR.) KÜTZ.											×		×	×	×							
- subspec. *subarctica* MÜLLER											×		×	×		×	×			×		
Navicula																						
abiskoensis HUST.			×			×	×	×														
charlatii PERAG.			×																			
explanata HUST.							×	×	×	×	×	×	×	×						×		
levanderi HUST.									×			×	×	×		×	×	×	×	×		×
pseudoscutiformis HUST.								×	×			×	×	×	×	×	×		×	×		
pupula KÜTZ.				×	×			×						×		×		×	×			
- var. *capitata* HUST.					×	×		×	×	×	×	×	×	×	×	×	×					×
- var. *rectangularis* (GREG.) GRUN.						×	×			×								×	×	×	×	×
radiosa KÜTZ.				×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
rotunda HUST.														×								
wittrockii (LAGERST.) A. CLEVE-EULER						×	×	×	×	×	×	×	×	×	×		×		×	×		
Neidium																						
affine (EHR.) CLEVE								×		×	×	×			×	×	×	×	×	×	×	×
- var. *amphirhynchus* (EHR.) CLEVE																						×
- var. *longiceps* (GREG.) CLEVE																×					×	
bisulcatum (LAGERST.) CLEVE										×												
iridis (EHR.) CLEVE										×		×		×				×				
- *fo. vernalis* REICHELT																		×	×			×
- var. *ampliata* (EHR.) CLEVE														×	×				×			×
productum (W. SMITH) CLEVE																×	×	×	×	×	×	×
temperei REIMER									×	×		×		×		×				×	×	×
Nitzschia																						
denticula GRUN.					×			×	×			×			×							×
gracilis HANTZSCH																	×	×		×	×	×
hollerupensis FOGED							×					×	×					×				
Pinnularia																						
biceps GREG.									×								×			×	×	
gentilis (DONK.) CLEVE												×					×					
gracillima GREG.								×		×									×			
hemiptera (KÜYZ.) CLEVE											×		×									
interrupta W. SMITH						×	×	×		×	×	×			×							×
maior KÜTZ.																						×
mesolepta (EHR.) W. SMITH								×	×	×	×	×	×	×	×	×		×		×		×
microstauron (EHR.) CLEVE									×	×		×			×				×	×	×	
- var. *brébissonii* (KÜTZ.) HUST.											×	×	×	×		×	×		×	×	×	×
molaris GRUN.										×	×	×										
nobilis EHR.														×								
nodosa EHR								×	×	×	×	×	×	×	×	×	×					
viridis (NITZSCH) EHR.							×	×	×	×	×	×		×	×	×	×	×	×	×		×

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
Stauroneis																						
anceps EHR.					×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
– fo. *gracilis* RABH.								×	×	×	×		×	×	×	×	×		×	×		×
– var. *sibirica* GRUN.												×										
phoenicenteron EHR.									×	×	×	×	×	×	×	×	×	×	×	×	×	×
smithii GRUN.																	×					
– var. *incisa* PANT.																	×		×	×	×	×
Surirella																						
delicatissima HUST.																	×					
linearis W. SMITH.												×					×					
– var. *constricta* (EHR.) GRUN.												×						×		×	×	×
robusta EHR.																			×	×		
Tabellaria																						
fenestrata (LYNGBYE) KÜTZ.							×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
flocculosa (ROTH) KÜTZ.							×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Acidophilous																						
Achnanthes																						
depressa (CLEVE) HUST.																×	×	×	×		×	×
didyma HUST.														×								
flexella (KÜTZ.) BRUN																×	×		×	×	×	×
– var. *alpestris* BRUN.									×	×		×		×	×	×	×	×	×	×	×	×
marginulata GRUN.																						×
quadratarea (ØSTRUP) MAX MØLLER.															×							
Anomoeoneis																						
serians (BRÉB.) CLEVE v. *brachysira* (BRÉB.) HUST.																			×			×
– – fo. *thermalis* (GRUN.) HUST.													×		×			×				
zellensis (GRUN.) CLEVE.														×			×					
– fo. *difficilis* (GRUN.) HUST.								×						×	×	×	×	×	×		×	
Cymbella																						
hebridica (GREG.) CLEVE.							×	×	×	×	×	×		×	×	×	×	×	×	×	×	×
incerta GRUN.								×	×	×	×	×	×		×	×	×	×	×	×	×	×
Eunotia																						
alpina (NAEG.) HUST.																×						
bigibba KÜTZ. var. *pumila* GRUN.																			×			
diodon EHR.										×			×		×	×	×		×	×	×	×
elegans ØSTRUP																	×	×				×
faba (EHR.) GRUN. v. *rhomboidea* FOGED																×	×	×	×	×	×	×
fallax A. CLEVE v. *gracillima* KRASSKE																×						
meisteri HUST.																	×		×	×		
monodon EHR.												×			×	×	×		×			
parallela EHR.												×										

Table 2. Continued

Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Depth below the bottom, cm	364	361	356	348	339.5	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	-
pectinalis (DILLW.) RABH.												×				×				×		
– var. *minor* (KÜTZ.) RABH.								×	×	×	×	×	×	×	×	×	×					×
– – fo. *impressa* (EHR.) KÜTZ.												×	×	×	×			×				
polyglyphus GRUN.																×			×			
praerupta EHR.																						×
rhomboidea HUST.																×	×		×		×	×
robusta RALFS																×	×		×	×	×	×
– var. *diadema* (EHR.) RALFS																						×
tenella (GRUN.) HUST.																×			×		×	×
valida HUST.													×									
veneris (KÜTZ.) O. MÜLLER									×	×	×		×	×								
Frustulia																						
rhomboides (EHR.) DE TONI v. *saxonica* (RALFS) DE TONI																×	×	×	×		×	×
– – fo. *capitata* (A. MAYER) HUST.																						×
Melosira distans (EHR.) KÜTZ.												×	×	×		×	×					
Navicula järnefeltii HUST.											×		×		×							
Pinnularia balfouriana GRUN.																			×			
gibba EHR.								×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
– var. *linearis* HUST.														×	×			×				×
interrupta W. SMITH fo. *minutissima* HU.									×	×	×	×	×	×	×	×	×	×	×	×	×	×
parva (EHR.) CLEVE v. *minuta* ØSTRUP			×																			
undulata GREG.														×								
Stenopterobia intermedia HUST.																					×	×

In the two nethermost samples M 7701 and M 7702, from a depth below the bottom of the lake of 364 cm and 361 cm respectively, 19 polyhalobous, 14 mesohalobous and 8 halophilous taxa were found and furthermore 5 oligohalobous species. The marine origin of this clay is thus quite evident. A few freshwater diatoms are usually found in marine sediments even at great distances from the coast. They are carried out into the sea by freshwater streams, or they are airborne.

In the next 19 samples from the freshwater gyttja, a total of 193 taxa were found, viz. 71 alkaliphilous, 79 pH-indifferent and 43 acidophilous species.

In Table 3 a summary of the number and percentage of taxa is given as halobion- and pH-spectra.

Fig. 2 is based on the percentages of the taxa in the pH-groups and covers the whole freshwater material.

It is seen from the above mentioned that the segregation from the inlet took place between the samples M 7702 (361 cm) and M 7704

Table 3. *Spectra, Lake A*

Depth below the bottom, cm		364	361	356	348	339	320	300	281	261	241	221	200	180	160	140	120	101	81	61	41	21	–.
	Sample No. M	7701	7702	7704	7708	7712	7670	7680	7522	7532	7542	7552	7422	7432	7442	7452	7462	7359	7369	7379	7389	7399	7301
Poly-	Number of species	17	7																				
halobous	% of species.....	63	32																				
Meso-	Number of species	7	9	4	4	3	2	1			1												
halobous	% of species.....	26	41	40	16	11	6	3			2												
Halo-	Number of species	2	2		3	5	2	1		1	1	1	1	1	1	1	1	1			1		
philous	% of species.....	7	9		12	18	6	3		2	2	2	1	2	1	2	2	1			2		
Alkali-	Number of species		3	7	20	21	23	18	19	26	22	20	30	18	28	17	14	14	13	10	7	7	16
philous	% of species.....		14	70	80	75	74	55	35	41	34	38	38	33	37	28	21	19	22	15	15	14	21
pH-	Number of species	1	1	2	5	7	8	14	31	31	35	26	37	26	34	30	31	36	32	35	31	28	39
indifferent	% of species.....	4	4	20	20	25	26	42	56	48	54	49	48	47	45	49	47	52	55	54	63	57	51
Acido-	Number of species			1				1	5	7	8	7	11	11	13	14	21	19	13	20	11	14	22
philous	% of species.....			10				3	9	11	12	13	14	20	17	23	32	28	22	31	23	29	28
	Number of species	27	22	10	25	28	31	33	55	64	65	53	78	55	75	61	66	69	58	65	49	49	77

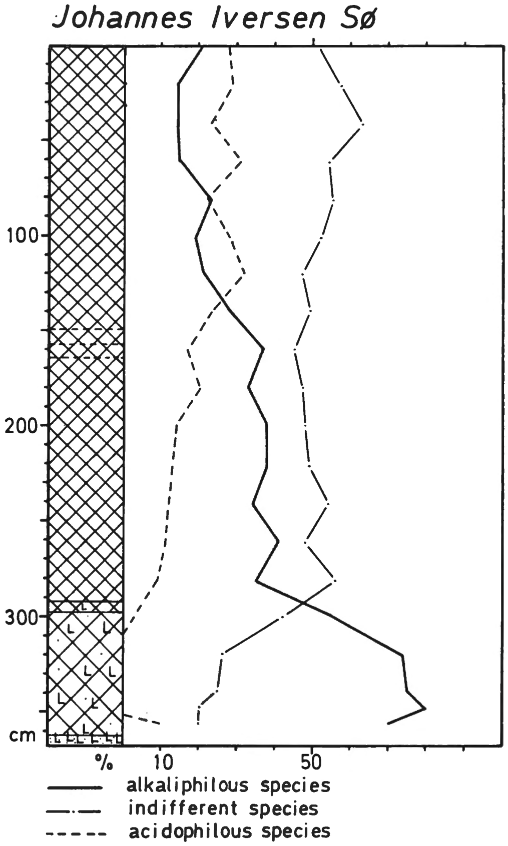

Fig. 2. Changes in number of diatom species within the three pH-groups throughout the core from Johannes Iversen Sø.

(356 cm). The lake very soon became a pronounced freshwater lake with alkaline reaction, M 7704 containing 7 alkaliphilous species, i.e. 70 % of the total of the species in the sample, while only 1 acidophilous species (10 %) is present, a small *Pinnularia* species closely related to rather pH-eurytopic forms.

The further development of the lake is illustrated by the diagram (Fig. 2).

After a steep fall of the percentage of the alkaliphilous species to the sample M 7522 (281 cm), and a corresponding increase in the pH-indifferent group, a gradual development takes place until the sample M 7442 (160 cm). In this period a tardy increase in the acidophilous species takes place, while the share of the alkaliphilous species is constant, and the percentage of the pH-indifferent species is slightly decreasing. From this point (M 7442) the number of acidophilous species increases until they share a greater part than that of the alkaliphilous species from app. 130 cm. Simultaneously the percentage of the indifferent species is slightly increasing. This indicates that the lake probably was faintly acid in the period represented by the upper part of the core.

In the present lake, the pH of which is 5.8, there once more is an increase of the percentage of the alkaliphilous species, but this share of the total is still smaller than that of the acidophilous. Thus the diatom spectrum continues to indicate a faintly acid reaction.

LAKE B

Gytjesø

(64°23.5′ N, 50°21.5′ W)

2 km northeast of the reindeer breeding station Itivnera, at the Kapisigdlit branch of Godthåbsfjord, a lake hardly more than 3 m deep and 57 m above sea level (*Fucus* line), was cored. The water depth at the coring site is 2.03 m. The size of the lake is 100×350 m. Sterile *Myriophyllum alterniflorum* is found all over the lake, while *Sparganium hyperboreum* (sterile), *Potamogeton alpinus*, *Isoëtes setacea* and single *Hippuris* are growing in shallow water. A belt of *Menyanthes* borders the lake. *Spongilla sp.* is rare.

For chemical informations see Table 1.

The following layers were found:

0–140 cm: Bright brown, very watery, fine detritus gyttja with felt of tiny rootlets, presumably of *Myriophyllum.*

140–192 cm: Bright brown, watery, fine detritus gyttja with many rootlets.

192–294 cm: Olive brown, rather loose, fine detritus gyttja with a few rootlets.

294–314 cm: Reddish brown, fine detritus gyttja.

314–394 cm: Stratified, jelly-like, fine detritus gyttja with colours varying from bright brown over dark olive to reddish.

Bracts of *Myriophyllum spicatum.*

394–395.5 cm: Paper-thin layers of clay and gyttja.

395.5–408 cm: Slightly sandy marine clay with *Pectinaria* tubes.

A sample from 394–391 cm has been radiocarbon dated: 7430 ± 100 B.P. (K-2295).

From this locality 23 sediment samples besides 1 recent sample are examined for diatoms. The 3 nethermost samples, M 7961 (405 cm), M 7965 (397 cm) and M 7966 (395 cm) consist of sandy clay, in which 48 polyhalobous, 29 mesohalobous and 1 halophilous taxa were found together with 12 oligohalobous forms. As the diatom flora is pronounced haline with an insignificant content of proper freshwater species, this indicates that the origin of the stratum is marine.

The remaining samples, 20 from the core and 1 sample of recent material, are deposited in freshwater. Here a total of 213 taxa were found, viz. 79 alkaphilous, 86 pH-indifferent and 48 acidophilous. All diatoms found in the locality are listed in Table 4.

Table 4. *Diatoms, Lake B*

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	360	240	220	201	181	161	141	116	95	80	59	41	20	–
Polyhalobous																								
Achnanthes																								
septata A. CLEVE		×																						
Actinocyclus																								
sp.			×																					
Amphora																								
ostrearea BRÉB.		×	×																					
ventricosa GREG.		×																						
Biddulphia																								
aurita (LYNGBYE) BRÉB. & GODEY.		×																						
Cocconeis																								
costata GRUN.	×	×																						
peltoides HUST.		×	×																					
pseudomarginata GREG.	×	×																						
Coscinodiscus																								
excentricus EHR.	×																							
stellaris ROPER	×																							
Diatomella																								
salina VOIGT		×	×																					
Diploneis																								
crabro EHR. v. *expleta* (A. S.) CLEVE			×																					
– var. *panduro* (BRÉB.) CLEVE			×																					
fusca (GREG.) CLEVE	×																							
– var. *hyperborea* (GRUN.) HUST.			×																					
incurvata (GREG.) CLEVE	×	×	×																					
splendida (GREG.) CLEVE		×																						
Grammatophora																								
undulata HUST.	×																							
Hyalodiscus																								
scoticus (KÜTZ.) GRUN.		×	×																					

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	–
Licmophora																								
gracilis (EHR.) GRUN. var. *anglica* (KÜTZ.) PERAG.	×																							
Melosira																								
sulcata (EHR.) KÜTZ.		×																						
Navicula																								
arenaria DONK.	×																							
cancellata DONK.	×		×																					
complanata GRUN.			×																					
crucifera GRUN.	×	×																						
dissipata HUST.	×																							
flanatica GRUN.			×																					
forcipata GRUN.	×	×	×																					
lyra EHR. var. *atlantica* A. SCHMIDT.	×																							
– fo. *elliptica* A. SCHMIDT		×																						
subinflata GRUN.		×	×																					
transistans CLEVE	×	×	×																					
Nitzschia																								
hybridaeformis HUST.			×																					
Opephora																								
pacifica (GRUN.) PETIT	×	×	×	×																				
Pinnularia																								
quadratarea (A.S.) CLEVE	×																							
Plagiogramma																								
staurophorum (GREG.) HEIBERG	×	×	×																					
Pleurosigma																								
angulosa (W. SMITH) REICHELT	×	×																						
Rhabdonema																								
arcuatum (LYNGB.) KÜTZ. v. *ventricosa* CLEVE	×																							
minutum KÜTZ.	×	×	×																					
Scoliopleura																								
tumida (BRÉB.) RABH.	×	×	×																					
Stauroneis																								
constricta (EHR. W. SMITH) CLEVE		×																						
Thalassiosira																								
baltica (GRUN.) OSTF.	×																							
gravida CLEVE	×	×																						
Trachyneis																								
aspera (EHR.) CLEVE	×	×																						
Tropidoneis																								
lepidoptera GREG.	×																							

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	–
Mesohalobous																								
Achnanthes																								
brevipes AG.		×																						
– var. *intermedia* (KÜTZ.) CLEVE	×																							
hauckiana GRUN.	×	×	×																					
linkei HUST.			×																					
Amphipleura																								
rutilans (TRENTP.) CLEVE	×	×																						
Caloneis																								
westii (W. SMITH) HENDEY	×		×																					
Cocconeis																								
scutellum EHR. var. *parva* GRUN.	×	×	×																					
– var. *stauroneiformis* W. SMITH	×	×																						
Diploneis																								
didyma (EHR.) CLEVE	×	×	×																					
interrupta (KÜTZ.) CLEVE	×	×																						
Mastogloia																								
elliptica AG.	×		×	×																				
– var. *dansei* (THWAITES) CLEVE			×																					
exigua LEWIS		×	×																					
Melosira																								
nummuloides (DILLW.) AG.	×	×	×																					
Navicula																								
digitoradiata (GREG.) A.S.	×	×	×																					
halophila (GRUN.) CLEVE		×		×																				
pygmaea KÜTZ.		×																						
meniscus SCHUM.			×																					
peregrina (EHR.) KÜTZ.			×																					
salinarum GRUN.	×		×																					
subinflata GRUN.		×																						
Nitzschia																								
sigma (KÜTZ.) W. SMITH		×	×																					
Rhopalodia																								
musculus (KÜTZ.) O. MÜLLER	×	×	×																					
Stauroneis																								
gregorii RALFS		×	×																					
salina W. SMITH	×																							
Surirella																								
ovalis BRÉB.		×	×																					
septentrionalis HUST.		×																						
Synedra																								
pulchella KÜTZ.	×		×	×																				

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	–
Halophilous																								
Anomoeoneis																								
sphaerophora (KÜTZ.) PFITZER				×	×	×	×																	
Cymbella																								
pusilla GRUN.																				×		×	×	
Fragilaria																								
construens (EHR.) GRUN. v. *subsalina* HUST.						×		×																
Navicula																								
cincta (EHR.) KÜTZ.	×	×																						
rhynchocephala KÜTZ.																	×						×	
Synedra																								
tabulata (AG.) KÜTZ.	×	×	×																					
Alkaliphilous																								
Amphora																								
ovalis KÜTZ.																	×		×				×	×
– var. *libyca* (EHR.) CLEVE			×	×			×	×	×			×	×				×							×
Anomoeoneis																								
sphaerophora (KÜTZ.) PFITZER				×	×	×	×																	
styriaca (GRUN.) HUST.											×		×											
Asterionella																								
formosa HASSALL																							×	
Caloneis																								
obtusa (W. SMITH) CLEVE						×	×	×	×							×								
silicula (EHR.) CLEVE															×		×			×				
Cocconeis																								
pediculus EHR.	×																							
placentula EHR.								×		×		×	×	×			×							
– var. *euglypta* (EHR.) CLEVE															×									
Cymatopleura																								
solea (BRÉB.) W. SMITH							×																	
Cymbella																								
affinis KÜTZ.				×	×		×	×	×		×		×											
aspera (EHR.) CLEVE					×																			
cistula (HEMPR.) GRUN.										×	×	×		×	×		×			×		×	×	×
cuspidata KÜTZ.								×	×	×	×	×	×	×	×	×			×	×	×	×	×	×
cymbiformis (AG.? KÜTZ.) v. HEURCK					×	×	×			×	×	×	×				×							×
helvetica KÜTZ.								×																
– var. *compacta* (ØSTR.) HUST.							×																	
lanceolata (EHR.) v. HEURCK				×	×		×																	
leptoceros (EHR.) GRUN.				×	×	×	×	×	×	×	×	×												
microcephala GRUN.							×	×	×	×	×	×	×		×		×	×	×		×			×
mülleri HUST. v. *groenlandica* FOGED										×	×			×										

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	360	240	220	201	181	161	141	116	95	80	59	41	20	-
obtusa GREG.						×	×	×		×	×	×	×	×		×		×	×	×	×			
turgida (GREG.) CLEVE			×								×			×	×									
Denticula																								
tenuis KÜTZ.		×																						
– var. *crassula* (NAEG.) HUST.				×		×	×	×		×		×	×	×										
Diploneis																								
interrupta (KÜTZ.) CLEVE	×	×				×																		
ovalis (HILSE) CLEVE	×	×								×														
Epithemia																								
argus KÜTZ.			×	×	×	×	×					×	×											
– var. *longicornis* GRUN.							×																	
sorex KÜTZ.							×	×	×	×	×	×	×	×	×	×			×			×		×
– var. *gracilis* HUST.																							×	
– var. *lapponica* HUST.						×	×																	
turgida (EHR.) KÜTZ.										×					×									
– var. *granulata* (EHR.) GRUN.							×		×	×	×		×	×		×								
zebra (EHR.) KÜTZ. var. *porcellus* (KÜTZ.) GRUN.		×								×		×		×			×							
– var. *saxonica* (KÜTZ.) GRUN.				×					×	×	×						×							
Fragilaria																								
brevistriata GRUN.							×																	
capucina DESMAZ.		×	×	×							×	×												
construens (EHR.) GRUN.						×	×		×	×	×	×	×		×	×	×							
– var. *binodis* (EHR.) GRUN.								×	×				×											
– var. *subsalina* HUST.						×		×																
crotonensis KITTON									×			×	×		×	×				×				
leptostauron (EHR.) HUST.								×					×											
pinnata EHR.				×	×	×	×	×	×		×		×	×		×		×			×			×
Gomphonema																								
acuminatum EHR.									×			×	×						×	×				×
– var. *brébissonii* (KÜTZ.) CLEVE										×														
– var. *coronata* (EHR.) W. SMITH						×	×	×	×								×	×		×	×	×	×	×
– var. *turris* (EHR.) CLEVE																							×	×
angustatum (KÜTZ.) RABH.																×	×	×					×	
constrictum EHR.					×	×	×									×	×	×					×	×
– var. *capitata* (EHR.) CLEVE																								×
intricatum KÜTZ.						×														×				
– var. *pumila* GRUN.																	×							×
lanceolatum EHR.					×																			×
Navicula																								
cryptocephala KÜTZ. var. *intermedia* GRUN.						×	×	×	×	×	×	×	×	×	×									
dicephala (EHR.) W. SMITH							×	×																
digitoradiata (GREG.) W. SMITH var. *elliptica* (ØSTR.) M. MØLLER						×																		

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	-
gracilis EHR.				×																				
rhynchocephala KÜTZ.																	×						×	
simplex KRASSKE						×																		
tuscula (EHR.) GRUN.				×		×		×	×															
vulpina KÜTZ.				×		×	×	×	×	×	×	×	×	×	×		×			×				×
Nitzschia																								
acuta HANTZSCH															×				×			×		×
angusta (W. SMITH) GRUN. var.																								
acuta GRUN.						×	×	×	×	×	×	×	×	×	×	×			×	×				
amphibia GRUN.													×		×									
frustulum KÜTZ.													×	×							×		×	
- var. *perpusilla* (RABH.) GRUN.																						×		×
Opephora																								
martyi HÉRIB.																	×							
Rhoicosphenia																								
curvata (KÜTZ.) GRUN.	×	×																						
Rhopalodia																								
gibba (EHR.) O. MÜLLER				×											×									
parallela (GRUN.) O. MÜLLER		×			×	×	×	×	×		×	×	×					×						
Stauroneis																								
acuta W. SMITH									×															
Surirella																								
elegans EHR.		×																						
robusta EHR. var. *splendida*																								
(EHR.) v. HEURCK		×																						
Synedra																								
pulchella KÜTZ.	×		×	×																				
ulna (NITZSCH) EHR.	×				×	×	×					×	×				×							
- var. *aequalis* (KÜTZ.) HUST.						×		×		×														
- var. *biceps* (KÜTZ.) v. SCHÖNFELDT								×																
pH-indifferent (circumneutral)																								
Achnanthes																								
linearis W. SMITH										×	×		×		×	×	×	×	×	×				×
minutissima KÜTZ.												×												
- var. *cryptocephala* GRUN.									×		×	×				×	×	×	×	×	×		×	×
recurvata HUST.																		×		×				×
Amphora																								
veneta KÜTZ.							×	×	×	×	×													
Anomoeoneis																								
exilis (KÜTZ.) CLEVE						×	×	×	×	×	×	×	×	×	×			×	×		×	×		×
- var. *lanceolata* A. MAYER								×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×
Cyclotella																								
comta (EHR.) KÜTZ.																				×	×			
pseudostelligera HUST.											×	×	×	×							×			

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	–
Cymbella																								
alpina GRUN.						×																		
amphicephala NAEG.																								×
angustata (W. SMITH) CLEVE						×	×	×	×															×
broenlundensis FOGED												×	×	×	×		×	×	×	×	×	×	×	
cesatii (RABH.) GRUN.						×	×				×		×		×	×		×			×			×
gracilis (RABH.) CLEVE												×			×			×	×		×	×	×	×
hustedtii KRASSKE				×	×	×	×		×		×	×												
naviculiformis AUERSW.															×	×	×	×	×	×	×	×	×	×
norvegica GRUN.							×	×	×		×	×			×	×								×
pusilla GRUN.																				×		×	×	
reinhardtii GRUN.					×																			
sinuata GREG.																	×							
ventricosa KÜTZ.				×			×	×	×	×	×			×	×			×						
Eunotia																								
arcus EHR.							×	×	×	×	×	×		×	×	×	×	×	×	×	×	×	×	×
– var. *bidens* GRUN.																				×	×			×
gracilis (EHR.) RABH.												×												
lunaris (EHR.) GRUN.											×	×	×	×		×	×	×	×	×	×	×	×	×
– var. *subarcuata* (NAEG.) GRUN.																					×		×	×
Fragilaria																								
lapponica GRUN.		×							×			×												
virescens RALFS																	×				×	×	×	×
Gomphonema																								
bipunctatum KRASSKE							×																	
bohemicum REICHELT							×																	
gracile EHR.							×		×								×						×	×
longiceps EHR.												×												×
– v. *montana* (SCHUM.) CLEVE																								×
subtile EHR.						×	×	×	×	×	×	×					×	×		×		×	×	×
Hantzschia																								
amphioxys (EHR.) GRUN. var. *maior* GRUN.												×												
Navicula																								
abiskoensis HUST.			×	×			×		×		×	×	×				×							
cari EHR.						×	×																	
explanata HUST.												×								×				×
hustedtii KRASSKE v. *obtusa* HUST.																	×							
jaagii MEISTER											×	×	×	×	×						×			
levanderi HUST.																	×						×	×
pseudoscutiformis HUST.												×					×							×
pupula KÜTZ.								×																
– var. *capitata* HUST.						×	×	×	×	×	×	×	×	×	×		×	×		×	×	×		×
– var. *rectangularis* (GREG.) GRUN.											×				×	×		×	×			×	×	×

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	-
radiosa KÜTZ.				×	×	×	×		×	×	×	×	×	×	×	×			×	×	×	×	×	×
wittrockii (LAGERST.) A. CLEVE-EULER						×	×	×	×	×	×	×	×			×	×		×		×	×		
Neidium																								
affine (EHR.) CLEVE															×		×	×	×	×	×	×	×	
- var. *capitata* MÖLDER																								×
- v. *amphirhynchus* (EHR.) CLEVE														×		×								×
- - fo. *undulata* (GRUN.) CLEVE																								×
bisulcatum (LAGERST.) CLEVE																			×					×
iridis (EHR.) CLEVE									×	×	×	×	×	×	×	×		×						
- fo. *vernalis* REICHELT						×	×	×	×	×	×	×	×	×										
- v. *amphigomphus* (EHR.) v. HEURCK																×	×	×	×	×	×	×	×	
- v. *ampliata* (EHR.) CLEVE															×									×
productum (W. SMITH) CLEVE																		×	×			×	×	×
temperei REIMER										×		×		×	×		×		×					×
Nitzschia																								
denticula GRUN.				×	×	×	×	×	×	×	×	×		×	×	×		×						×
gracilis HANTZSCH																								×
hollerupensis FOGED						×	×		×	×	×	×	×	×		×		×						
Pinnularia																								
biceps GREG.															×		×	×	×		×	×	×	
braunii GRUN. var. *amphicephala* (A. MAYER) HUST.											×				×				×				×	
gentilis (DONK.) CLEVE				×			×		×	×	×	×	×	×	×							×		×
interrupta W. SMITH								×	×	×	×	×		×	×	×	×		×	×		×		×
- fo. *biceps* CLEVE																								×
maior KÜTZ.				×			×			×		×								×				×
mesolepta (EHR.) W. SMITH											×	×	×	×	×	×	×		×		×			×
microstauron (EHR.) CLEVE												×			×					×			×	×
- v. *brébissonii* (KÜTZ.) HUST.		×		×	×																	×	×	×
nobilis EHR.									×	×	×													
nodosa EHR.																	×			×				
pulchra ØSTRUP								×																
viridis (NITZSCH) EHR.				×		×			×	×	×	×		×	×	×	×		×	×	×	×		×
Stauroneis																								
anceps EHR.							×		×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
- fo. *gracilis* RABH.																	×	×				×		
- var. *hyalina* BRUN & PERAG.																					×			
obtusa LAGERST.							×																	
phoenicenteron EHR.						×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
smithii GRUN. v. *incisa* PANT.																				×	×	×	×	×
Surirella																								
linearis W. SMITH v. *constricta* (EHR.) GRUN.																								×

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	360	240	220	201	181	161	141	116	95	80	59	41	20	-
Synedra																								
nana MEISTER								×	×	×	×	×			×		×		×	×				
rumpens KÜTZ.											×		×	×	×									
Tabellaria																								
fenestrata (LYNGBYE) KÜTZ.						×	×	×	×	×	×	×	×	×	×		×	×	×	×	×	×	×	×
flocculosa (ROTH) KÜTZ.							×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Acidophilous																								
Achnanthes																								
depressa (CLEVE) HUST.															×	×			×			×	×	×
flexella (KÜTZ.) BRUN						×	×	×	×	×	×	×	×	×	×		×	×	×		×	×	×	×
– var. *alpestris* BRUN							×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
quadratarea (ØSTR.) M. MØLLER									×															
Amphicampa																								
hemicyclus (EHR.) KARSTENS																								×
Anomoeoneis																								
serians (BRÉB.) CLEVE var. *brachysira* (BRÉB.) HUST.							×	×	×		×	×	×	×	×					×	×		×	×
zellensis (GRUN.) CLEVE						×	×					×		×	×									
– fo. *difficilis* (GRUN.) HUST.									×	×	×		×							×				
Cyclotella																								
antiqua W. SMITH						×	×																	
Cymbella																								
hebridica (GREG.) CLEVE																	×		×	×	×	×	×	×
incerta GRUN.						×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Eunotia																								
alpina (NAEG.) HUST.															×		×	×	×				×	×
bactriana EHR.																								×
bigibba KÜTZ. v. *pumila* GRUN.																			×					×
diodon EHR.												×					×			×				×
elegans ØSTRUP																				×	×		×	×
exigua BRÉB.																					×	×	×	×
faba (EHR.) GRUN.															×									
– fo. *rhombica* FOGED													×						×	×	×	×	×	×
flexuosa (BRÉB.) KÜTZ.															×									
lapponica GRUN.															×									
meisteri HUST.																						×	×	×
monodon EHR.													×				×					×	×	×
– v. *maior* (W. SMITH) HUST.																×			×					×
parallela EHR.																×								
pectinalis (DILLW.) RABH. var. *minor* (KÜTZ.) RABH.												×			×	×	×	×	×	×		×	×	×
– – fo. *impressa* (EHR.) HUST.																×			×					
robusta RALFS																					×	×	×	
– v. *diadema* (EHR.) RALFS																								×

Table 4. Continued

Sample No. M	7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	recent
Depth below the bottom, cm	405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	–
rhomboidea HUST.																						×	×	×
tenella (GRUN.) HUST.																			×					×
praerupta EHR.						×	×		×			×	×											×
– var. *bidens* GRUN.							×																	
– var. *inflata* GRUN.									×															
testudinata Å. BERG																								×
triodon EHR.													×											
veneris (KÜTZ.) O. MÜLLER																	×							
Frustulia																								
rhomboides (EHR.) DE TONI var. *saxonica* (RALFS) DE TONI											×				×			×	×	×		×	×	×
– – fo. *capitata* (A. MAYER) HUST.															×	×		×	×		×	×	×	×
Melosira																								
distans (EHR.) KÜTZ.																		×					×	
Navicula																								
järnefeltii HUST.																	×							×
tenella (GRUN.) HUST.																								×
Pinnularia																								
gibba EHR.											×	×	×		×	×	×	×	×	×		×	×	×
– var. *linearis* HUST.								×			×		×	×	×	×	×	×		×	×		×	
interrupta W. SMITH fo. *minutissima* HUST.													×				×	×			×	×	×	
undulata GRUN.																		×					×	×
Stenopterobia																								
arctica A. CLEVE																								×

By means of the pH-spectra in Table 5 and the diagram (Fig. 3) the changing acidity of the lake is illustrated.

In the earliest freshwater samples the predominance of alkaliphilous species is very great, but the decrease of the alkaliphilous species soon begins (from M 7973, 381 cm), contemporary with an increase of indifferent as well as of acidophilous species. Gradually the reaction of the lake changes over neutral, probably between 200 and 150 cm, continuing towards slightly acid.

The flora of the two uppermost samples may indicate a decrease in acidity. pH of the present lake is 5.2.

Table 5. *Spectra, Lake B*

Sample No. M		7961	7965	7966	7967	7973	7983	7993	8003	7920	7930	7940	7950	7960	7797	7807	7817	7827	7834	7841	7746	7753	7759	7766	rec.
Depth below the bottom, cm		405	397	395	393	381	361	341	321	300	280	260	240	220	201	181	161	141	116	95	80	59	41	20	-
Polyhalobous	Number of species	24	24	20	1																				
	% of species	54	45	46	4																				
Mesohalobous	Number of species	15	18	18	3																				
	% of species	33	34	41	11																				
Halophilous	Number of species	2	2	1	1	1	2	1	1									1			1		1	2	
	% of species	4	4	2	4	6	5	2	2									2			2		2	2	
Alkaliphilous	Number of species	6	9	5	18	12	24	28	24	21	21	19	21	25	15	16	11	18	7	8	10	6	6	11	18
	% of species	9	17	11	64	70	53	44	49	36	42	31	30	43	33	25	26	29	15	16	20	13	12	18	19
pH-indifferent	Number of species		2	1	9	5	16	27	20	29	25	35	39	22	24	32	22	31	27	27	28	29	27	28	49
	% of species		4	2	32	30	36	43	41	50	50	56	57	37	53	51	51	50	59	54	56	61	55	46	50
Acidophilous	Number of species						5	8	5	8	4	8	9	12	6	15	19	13	12	15	12	12	16	22	30
	% of species						11	13	10	14	8	13	13	20	14	24	23	21	26	30	24	26	33	36	31
	Number of species	45	53	44	28	17	45	63	49	58	50	62	69	59	45	63	43	62	46	50	50	47	49	61	97

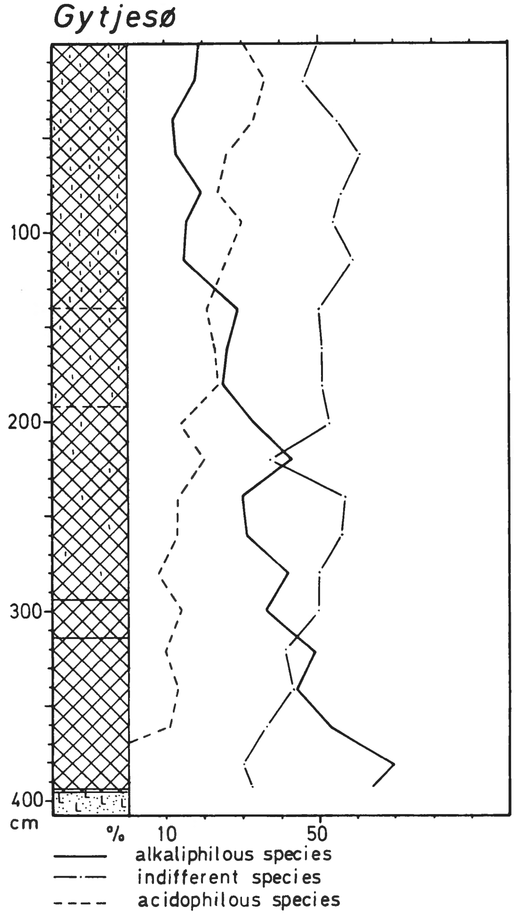

Fig. 3. Changes in number of diatom species within the three pH-groups throughout the core from Gytjesø.

LAKE C

Sârdlup timâne taserssuaq

(64°27.5′ N, 51°35′ W)

12 km NNE of Sardloq, on the east side of the peninsula Nordlandet, a more than 7 m deep lake, 70×200 m, was cored. The depth of water is 3.25 m at the coring site. The elevation above the sea (*Fucus* line) is 61 m.

In shallow water at the south end of the lake *Hippuris*, *Isoëtes setacea*, *Ranunculus confervoides* (flowering submerged) and a few *Callitriche hamulata* are growing. In deeper water only *Drepanocladus exan-*

nulatus ssp. *purpurascens* and *Calliergon sarmentosum* are found (NIELS JACOBSEN det.).

The chemical analyses are given in Table 1.

The following layers were found (cm below the lake bottom):

0–62 cm: Fine detritus gyttja, olive brown, upwards greyish.

62–72 cm: Fine detritus gyttja.

72–88 cm: Fine detritus gyttja with tiny rootlets of water plants.

88–98 cm: Fine detritus gyttja with mosses and many carcasses of *Eurycercus glacialis* (U. RØEN det.).

98–126.5 cm: Detritus gyttja with many *Eurycercus*.

126.5–130 cm: Paper-thin, fine detritus gyttja layers, jellied, of varying colours.

130–160 cm: Clay with sand and small stones.

A sample from 126–130 cm was radiocarbon dated: 9000 ± 140 B.P. (K-2292).

The examined diatom material consists of 18 sediment samples and one recent sample.

The 2 nethermost samples, M 8069 (136 cm) and M 8071 (131,5 cm), consist of clay with sand and have proved to be marine, as 26 polyhalobous, 18 mesohalobous and 2 halophilous taxa were found here. Furthermore 6 proper freshwater species occurred.

The remaining 16 samples from the core and the recent sample consist of detritus gyttja sedimentated in freshwater. Here a total of 223 taxa were found, viz. 63 alkaliphilous, 107 pH-indifferent and 53 acidophilous. All diatoms shown are listed in Table 6.

In this locality the transition from the marine stage to the freshwater stage is very abrupt, the diatom flora of M 8071 (131.5 cm) being pronounced marine. In the following sample (M 8072, 129 cm) only a single polyhalobous and a few mesohalobous valves indicate the proximity to the sea of the now formed lake.

In the freshwater sediment the mesohalobous *Synedra pulchella* is found in the 6 nethermost samples, and it seems to be present until the reaction in the lake approaches the neutral point according to the diagram (Fig. 4).

Cymbella pusilla, by several scientists considered to be halophilous, does not occur in the sediment series until in the sample M 8094 (85 cm), but in the remainder of the core it is found in most of the samples. Generally it is considered to be pH-indifferent, an opinion confirmed by its occurrence here. Its placing in the halobion spectrum, however, seems more questionable.

After the segregation from the inlet the lake was pronounced alkaline, as 26 alkaliphilous, 4 pH-indifferent and no acidophilous species are found in the nethermost freshwater sample M 8072 (129 cm), Table 7.

Table 6. *Diatoms, Lake C*

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Polyhalobous																			
Amphora																			
ostrearia BRÉB.	×																		
Cocconeis																			
costata GRUN.	×	×																	
scutellum EHR.		×																	
Coscinodiscus																			
sp.	×												×						
Diatomella																			
salina VOIGT	×	×																	
Dimerogramma																			
minor (GREG.) RALFS	×																		
Diploneis																			
crabro EHR.	×	×																	
incurvata (GREG.) CLEVE		×																	
litoralis (DONK.) CLEVE	×																		
smithii (BRÉB.) CLEVE		×																	
splendida (GREG.) CLEVE	×																		
Isthmia																			
sp.	×																		
Navicula																			
forcipata GREV.	×	×																	
groschopfi HUST.	×																		
plicata DONK.	×																		
scopulorum BRÉB.	×																		
transistans CLEVE	×																		
Pinnularia																			
quadratarea (A. SCHMIDT) CLEVE	×	×																	
Plagiogramma																			
staurophorum (GREG.) HEIBERG	×	×																	
Scoliopleura																			
tumida (BRÉB.) RABH.	×	×																	
Stauroneis																			
constricta (EHR. W. SMITH) CLEVE		×																	
Surirella																			
armoricana PERAG.		×																	
fastuosa EHR.	×	×	×																
Thalassiosira																			
baltica (GRUN.) OSTF.	×	×																	
gravida CLEVE	×																		
Trachyneis																			
aspera (EHR.) CLEVE	×	×																	

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Mesohalobous																			
Achnanthes																			
hauckiana GRUN.	×	×	×																
Amphora																			
proteus GREG.	×																		
ventricosa GREG.	×																		
Cocconeis																			
scutellum EHR. var. *parva* GRUN.	×																		
– var. *stauroneiformis* W. SMITH	×																		
Diploneis																			
didyma (EHR.) CLEVE	×																		
interrupta (KÜTZ.) CLEVE	×																		
Mastogloia																			
elliptica AG.	×	×	×																
– var. *dansei* (THWAITES) CLEVE			×	×															
Navicula																			
digitoradiata (GREG.) A. SCHMIDT	×	×													×				
halophila (GRUN.) CLEVE			×	×															
pygmaea KÜTZ.	×	×																	
meniscus SCHUM.				×															
salinarum KÜTZ.			×																
Nitzschia																			
sigma (KÜTZ.) W. SMITH	×	×																	
Rhopalodia																			
musculus (KÜTZ.) O. MÜLLER	×	×	×																
Stauroneis																			
salina W. SMITH	×	×																	
Synedra																			
pulchella KÜTZ.		×	×	×	×	×	×	×											
Halophilous																			
Cymbella																			
pusilla GRUN.									×	×	×		×	×		×		×	×
Navicula																			
rhynchocephala KÜTZ.				×								×	×						
Surirella																			
amphioxys W. SMITH																		×	
Synedra																			
tabulata (AG.) KÜTZ.	×						×												
Alkaliphilous																			
Achnanthes																			
lanceolata BRÉB.						×													
– var. *elliptica* CLEVE							×		×	×									

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Amphora																			
ovalis Kütz.	×		×								×	×	×	×	×	×	×	×	×
– var. *libyca* (Ehr.) Cleve			×								×	×			×				
Anomoeoneis																			
styriaca (Grun.) Hust.													×			×			×
Caloneis																			
bacillum (Grun.) Mereschk.				×				×											
silicula (Ehr.) Cleve					×	×	×	×	×		×								
Cocconeis																			
placentula Ehr.	×		×	×	×	×	×												
– var. *euglypta* (Ehr.) Cleve								×	×			×							
Cymbella																			
affinis Kütz.								×		×	×		×					×	
cistula (Hempr.) Grun.										×	×	×	×	×	×	×	×	×	×
cuspidata Kütz.										×	×	×	×	×	×	×		×	×
cymbiformis (Ag.? Kütz.) v. Heurck			×									×			×				
hauckii v. Heurck															×				
microcephala Grun.			×				×	×		×					×				×
mülleri Hust. var. *groenlandica* Fog.											×		×						
turgida (Greg.) Cleve				×	×		×	×				×							
Epithemia																			
argus Kütz.			×							×									
sorex Kütz.					×	×	×												
turgida (Ehr.) Kütz.				×	×	×							×		×				
– var. *granulata* (Ehr.) Grun.				×	×	×	×	×	×										
zebra (Ehr.) Kütz.					×														
– var. *porcellus* (Kütz.) Grun.			×									×							
– var. *saxonica* (Kütz.) Grun.			×	×	×	×	×	×											
Fragilaria																			
capucina Desmaz.	×																		
construens (Ehr.) Grun.	×		×	×	×	×	×	×	×	×	×	×	×	×	×	×			
– var. *binodis* (Ehr.) Grun.			×	×	×	×		×	×										
intermedia Grun.							×						×						
pinnata Ehr.			×		×	×			×										
Gomphonema																			
acuminatum Ehr.						×	×	×	×	×		×	×						
– var. *coronata* (Ehr.) W. Smith						×	×	×	×	×	×	×	×						
– var. *turris* (Ehr.) Cleve													×						
angustatum (Kütz.) Rabh.															×				×
constrictum Ehr.			×	×		×			×	×		×	×	×	×	×			
– var. *capitata* (Ehr.) Cleve						×	×						×		×				
intricatum Kütz.			×																
– var. *pumila* Grun.					×	×	×		×		×		×			×	×	×	×
lanceolatum Ehr.				×	×										×				

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8188	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Navicula																			
bacillum Ehr.											×	×	×	×	×				
clementis Grun.			×																
cryptocephala Kütz.				×															
– var. *intermedia* Grun.						×	×	×				×							
cuspidata Kütz.													×					×	
– var. *héribaudi* Perag.														×		×			
hungarica Grun. var. *capitata* (Ehr.) Cleve				×															
lanceolata (Ag.) Kütz.															×				
minima Grun.											×		×						×
viridula Kütz.			×																
vulpina Kütz.								×											
Nitzschia																			
acuta Hantzsch											×								×
angusta (W. Sm.) Grun. var. *acuta* Grun.											×	×	×	×	×	×	×	×	×
fonticola Grun.			×								×								
frustulum Kütz.								×	×				×						
– var. *perpusilla* (Rabh.) Grun.								×				×	×						×
Opephora																			
martyi Hérib.			×	×	×	×	×	×											
Rhoicosphenia																			
curvata (Kütz.) Grun.	×																		
Rhopalodia																			
gibba (Ehr.)O. Müller				×															
parallela (Grun.) O. Müller			×								×								
Synedra																			
ulna (Nitzsch) Ehr.			×					×		×									
– var. *aequalis* (Kütz.) Hust.							×												
– var. *biceps* (Kütz.) v. Schönf.									×										
pH-indifferent (circumneutal)																			
Achnanthes																			
holsti Cleve													×						
laterostrata Hust.								×	×	×									
linearis W. Smith						×	×	×	×	×	×	×	×						
marginulata Grun.																			×
minutissima Kütz.				×				×											
– var. *cryptocephala* Grun.		×					×												
recurvata Hust.											×	×	×		×			×	×
Amphora																			
veneta Kütz.				×							×								

3*

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	–
Anomoeoneis																			
exilis (KÜTZ.) CLEVE											×								
– var. *lanceolata* A. MAYER								×	×	×	×	×		×				×	×
Caloneis holsti CLEVE															×	×	×	×	×
Cyclotella																			
comta (EHR.) KÜTZ.										×	×	×	×						
– var. *oligactis* (EHR.) GRUN.													×						
kützingiana THWAITES var. *planetophora* FRICKE												×			×		×	×	×
– var. *radiosa* FRICKE													×	×	×			×	×
ocellata PANT.											×	×	×		×				×
pseudostelligera HUST.										×					×		×		
Cymbella																			
amphicephala NAEG.												×			×				×
angustata (W. SMITH) CLEVE																			×
broenlundensis FOGED								×			×	×	×						
cesatii (RABH.) GRUN.				×						×		×	×		×	×	×	×	×
gracilis (RABH.) CLEVE											×	×	×	×	×	×	×	×	×
naviculiformis AUERSW.					×		×	×	×	×	×	×	×	×	×	×		×	
norvegica GRUN.									×		×								
obtusa GREG.											×		×		×				
pusilla GRUN.									×	×	×		×	×		×		×	×
ventricosa KÜTZ.			×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
– var. *groenlandica* FOGED													×						×
Diatomella																			
balfouriana GREV.													×						
Eunotia																			
arcus EHR.										×	×		×	×	×	×	×	×	×
gracilis (EHR.) RABH.														×					
lunaris (EHR.) GRUN.						×	×	×	×	×	×	×			×	×			
Fragilaria																			
virescens RALFS						×	×	×	×	×	×	×	×	×	×	×	×	×	×
Gomphonema																			
gracile EHR.						×	×	×			×	×	×		×	×	×		
longiceps EHR. var. *subclavata* GRUN.				×															
– – fo. *gracilis* HUST.				×															
parvulum KÜTZ.												×		×		×	×		×
– var. *micropus* (KÜTZ.) CLEVE																	×		
subtile EHR.													×						
Hantzschia																			
amphioxys (EHR.) GRUN. var. *vivax* (HANTZ.) GRUN.															×				
Melosira																			
italica (EHR.) KÜTZ. subspec. *subarctica* MÜLLER										×	×								

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Navicula																			
abiskoensis Hust.								×											
bryophila Petersen																			×
cocconeiformis Greg.														×	×	×	×	×	×
explanata Hust.													×						
hustedtii Krasske var. *obtusa* Hust.						×		×											
levanderi Hust.											×	×	×	×	×		×	×	×
pseudoscutiformis Hust.							×	×		×		×	×		×	×	×	×	×
pupula Kütz.							×									×			×
- var. *capitata* Hust.				×	×				×		×		×				×	×	
- var. *rectangularis* (Greg.) Grun.				×							×		×	×	×			×	×
pusio Cleve																		×	×
radiosa Kütz.			×	×			×	×	×	×	×	×	×	×	×	×	×	×	×
similis Krasske								×											
subrotundata Hust.												×			×				
wittrockii (Lagerst.) A. Cleve-Eul.			×	×	×	×	×	×	×	×	×	×	×	×		×			
Neidium																			
affine (Ehr.) Cleve								×		×	×		×		×	×	×	×	×
- fo. *hercynica* (A. Mayer) Hust.																	×		
- var. *amphirhynchus* (Ehr.) Cleve												×			×				×
- - fo. *undulata* (Grun.) Cleve														×					
- var. *capitata* Mölder																			×
- var. *longiceps* (Greg.) Cleve																			×
bisulcatum (Lagerst.) Cleve																×			
iridis (Ehr.) Cleve																		×	
- fo. *vernalis* Reichelt																			×
- var. *amphigomphus* (Ehr.) v. Heurck											×								
- var. *ampliata* (Ehr.) Cleve												×			×		×		
- var. *porsildii* Foged													×						
ladogense (Cleve) Foged v. *densestriata* Østrup																			×
productum (W. Smith) Cleve																×			
temperei Reimer										×	×	×	×	×	×	×	×		×
Nitzschia																			
denticula Grun.	×	×	×								×		×						
gracilis Hantzsch																			×
Pinnularia																			
biceps Greg.											×	×		×	×	×	×	×	
borealis Ehr.															×				
braunii Grun. v. *amphicephala* (A. Mayer) Hust.								×		×		×			×				
divergens W. Smith											×	×	×	×	×	×	×	×	
- var. *undulata* Hérib. & Perag.												×							
gentilis (Donk.) Cleve											×	×	×	×		×	×	×	

Table 6. Continued

Sample No. M / Depth below the bottom, cm	8069 / 136	8071 / 131.5	8072 / 129	8074 / 125	8078 / 117	8084 / 107	8087 / 101	8090 / 93	8094 / 85	8099 / 75	8101 / 71	8105 / 63	8109 / 55	8119 / 48	8123 / 40	8128 / 30	8133 / 20	8138 / 10	recent / –
gracillima GREG.															×				
interrupta W. SMITH				×	×		×				×		×	×			×	×	
krookei GRUN.														×					
maior KÜTZ.										×		×	×		×				
mesolepta (EHR.) W. SMITH								×			×	×	×	×	×	×	×	×	
microstauron (EHR.) CLEVE											×	×	×		×		×	×	×
– var. *brébissonii* (KÜTZ.) HUST.										×		×		×	×		×	×	×
– – fo. *diminuta* GRUN.													×						
nobilis EHR.													×			×			
nodosa EHR.				×	×	×	×	×	×	×									
polyonca BRÉB.											×								
pulchra ØSTRUP											×								
ruttneri HUST.											×								
stomatophora GRUN.													×			×	×		
subsolaris GRUN.															×				
viridis (NITZSCH) EHR.				×						×	×	×			×	×		×	×
Stauroneis																			
anceps EHR.				×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
– fo. *gracilis* RABH.				×			×	×		×		×	×		×	×			×
– fo. *sibirica* GRUN.											×		×						
phoenicenteron EHR.										×	×	×	×	×	×	×	×	×	×
smithii GRUN. var. *incisa* PANT.																×	×	×	×
Surirella																			
amphioxys W. SMITH																		×	
delicatissima HUST.																			×
linearis W. SMITH																			×
– var. *constricta* (EHR.) GRUN.																×		×	
tenuissima HUST.																			×
Tabellaria																			
fenestrata (LYNGBYE) KÜTZ.								×	×	×	×	×	×	×	×	×	×	×	×
flocculosa (ROTH) HUST.								×	×	×	×	×	×	×	×	×	×	×	×
Acidophilous																			
Achnanthes																			
depressa (CLEVE) HUST.											×	×	×	×	×	×		×	×
flexella (KÜTZ.) BRUN											×	×	×		×	×	×	×	×
– var. *alpestris* BRUN								×		×	×	×	×	×	×	×			×
quadratarea (ØSTRUP) M. MØLLER													×		×				
Anomoeoneis																			
serians (BRÉB.) CLEVE v. *brachysira* (BRÉB.) HUST.											×	×	×	×	×	×	×	×	×
– – fo. *thermalis* (GRUN.) HUST.													×		×	×	×		×
zellensis (GRUN.) CLEVE													×						
– fo. *difficilis* (GRUN.) HUST.											×	×	×		×	×	×		×

Table 6. Continued

Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	recent
Depth below the bottom, cm	136	131.5	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	-
Cymbella																			
hebridica (Greg.) Cleve							×	×	×	×	×	×	×		×	×	×	×	×
incerta Grun.									×	×	×	×	×	×	×	×	×	×	×
Eunotia																			
alpina (Naeg.) Hust.								×								×			×
bidentula W. Smith																		×	
bigibba Kütz. var. *pumila* Grun.													×		×	×	×		×
denticulata (Bréb.) Rabh.													×	×		×	×	×	
diodon Ehr.											×	×	×					×	×
exigua Bréb.											×							×	
– var. *compacta* Hust.															×				
faba (Ehr.) Grun.													×						
– fo. *rhombica* Foged									×		×	×	×	×	×	×	×	×	×
fallax A. Cleve																	×		
flexuosa (Bréb.) Kütz.													×						
iatriaensis Foged																			×
lapponica Grun.												×	×	×	×		×		
meisteri Hust.											×	×	×	×	×			×	×
monodon Ehr.										×	×	×	×		×	×	×	×	×
– var. *maior* (W. Smith) Hust.										×		×	×	×	×	×	×	×	
pectinalis (Dillw.) Rabh. var. *minor* (Kütz.) Rabh.								×	×	×		×	×			×	×		×
– – fo. *impressa* (Ehr.) Hust.															×				
polyglyphis Grun.												×	×	×	×	×	×		
praerupta Ehr.												×	×		×			×	×
rhomboidea Hust.								×		×					×		×	×	×
robusta Ralfs											×	×	×	×	×	×	×	×	×
– var. *diadema* (Ehr.) Ralfs																			×
septentrionalis Østrup											×								
tenella (Grun.) Hust.										×			×		×		×		
triodon Ehr.											×	×	×	×	×	×	×	×	
veneris (Kütz.) O. Müller								×	×	×						×			
Fragilaria																			
constricta Ehr.																			×
– var. *stricta* A. Cleve																			×
Frustulia																			
rhomboides (Ehr.) De Toni													×				×	×	×
– var. *saxonica* (Ralfs) De Toni											×	×	×	×	×	×	×	×	×
Melosira																			
distans (Ehr.) Kütz.										×						×			
– var. *lirata* (Ehr.) Bethge										×	×				×	×	×	×	×
Navicula																			
järnefelti Hust.								×			×								×
tenella (Grun.) Hust.																			×
variostriata Krasske													×	×					×

Table 6. Continued

Sample No. M Depth below the bottom, cm	8069 136	8071 131.5	8072 129	8074 125	8078 117	8084 107	8087 101	8090 93	8094 85	8099 75	8101 71	8105 63	8109 55	8119 48	8123 40	8128 30	8133 20	8138 10	recent –
Pinnularia																			
balfouriana GRUN.												×	×					×	
divergentissima GRUN.													×						×
gibba EHR.							×	×	×	×	×	×	×	×	×	×	×	×	×
– var. *linearis* HUST.											×	×				×			
– var. *mesogongyla* (EHR.) HUST.													×						
interrupta W. SMITH fo. *minutissima* HUST.				×	×	×	×	×	×	×		×	×			×		×	×
undulata GREG.												×						×	×
Stauroneis																			
javanica (GRUN.) CLEVE															×				
Stenopterobia																			
intermedia LEWIS												×							×

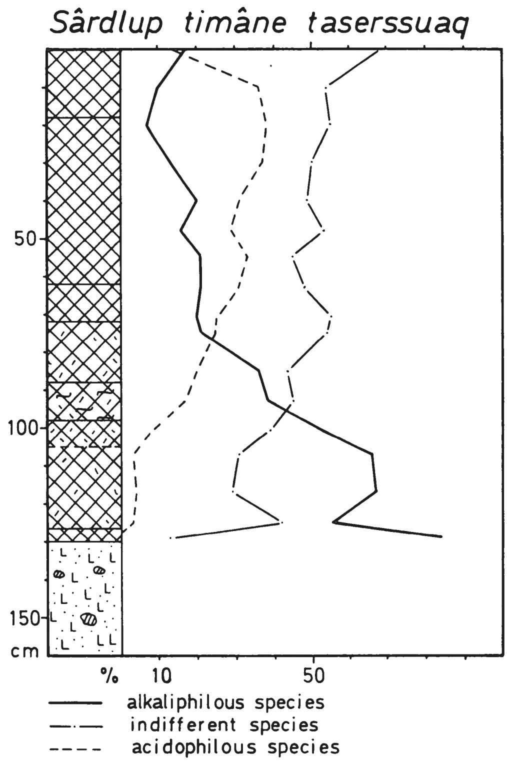

Fig. 4. Changes in number of diatom species within the three pH-groups throughout the core from Sârdlup timâne taserssuaq.

Table 7. *Spectra, Lake C*

Depth below the bottom, cm		136	131	129	125	117	107	101	93	85	75	71	63	55	48	40	30	20	10	–
	Sample No. M	8069	8071	8072	8074	8078	8084	8087	8090	8094	8099	8101	8105	8109	8119	8123	8128	8133	8138	rec.
Poly-	Number of species	21	15	1										1						
halobous	% of species.....	49	50	2										1						
Meso-	Number of species	13	8	7	4	1	1	1	1							1				
halobous	% of species.....	30	27	21	11	4	3	3	2							1				
Halo-	Number of species	1			1			1		1	1	1	1	2	1		1		2	1
philous	% of species.....	2			3			3		3	2	1	1	2	2		1		3	2
Alka-	Number of species	8	5	26	20	16	19	20	20	13	11	16	17	22	8	17	9	4	7	11
philous	% of species.....	17	17	84	55	67	66	53	38	36	21	20	21	21	16	20	13	7	10	17
pH-	Number of species	1	2	4	15	7	9	15	24	16	28	43	39	46	28	43	34	33	36	45
indifferent	% of species.....	2	6	13	42	29	31	39	45	44	54	55	48	45	53	49	50	55	54	69
Acido-	Number of species				1	1	1	3	9	7	13	20	25	34	15	27	25	23	24	9
philous	% of species.....				3	4	3	8	17	20	25	25	31	33	29	31	37	38	36	14
	Number of species	43	30	31	36	24	29	38	53	36	52	79	81	103	51	87	68	60	67	65

As illustrated by means of the pH-spectra in Table 7 and the diagram (Fig. 4), the change of the pH-reaction towards the neutral point starts immediately and accelerates from the sample M 8084 (107 cm), in which 19 alkaliphilous, 9 pH-indifferent and 1 acidophilous species are found.

From the sample M 8087 (101 cm), in which 3 acidophilous species (8 %) were found ,the acidophilous group is increasing, and in M 8099 (75 cm) 11 alkaliphilous, 28 pH-indifferent and 13 acidophilous taxa were found. The fact that the acidophilous group is greater here than the alkaliphilous indicates, that a fall of pH has taken place till about the neutral point, and in the following period it changes slightly in acid direction. When compared with the percentage of the alkaliphilous species, the acidophilous species are predominant up till M 8133 (10 cm), where a tend towards a more neutral reaction is seen.

In the recent sample the two groups are almost balancing, while the number of pH-indifferent species has increased. The pH of the present lake is 5.6.

LAKE D

Kigssaviat taserssua

(64°27.5′ N, 51°35′ W)

500 m south of Sârdlup timâne taserssuaq (Lake C) a small lake, 40×70 m, 51 m a.s.l., was cored. The greatest depth of water, 175 cm, is found at the coring site.

Isoëtes setacea and sterile *Sparganium hyperboreum* are growing. *Spongilla sp.* is found too.

The chemical analyses are given in Table 1.

The following layers were found (cm below the lake bottom):

0–129 cm: Brown, fine detritus gyttja.

129–166 cm: Bright olive detritus gyttja with leaves and a few stems of mosses.

166–178 cm: Olive detritus gyttja with tiny rootlets of limnophytes and a few moss fragments.

178–218 cm: Detritus gyttja with mosses, bright olive.

218–230 cm: Fine detritus gyttja.

230–234.5 cm: Stratified, fine detritus gyttja, café-au-lait coloured.

234.5–241.5 cm: Paper-thin clay gyttja layers of varying colours.

241.5–254 cm: Clay with sand and small stones.

A sample, 235.5–241.5 cm, has been radiocarbon dated: 8080 ± 130 B.P. (K-2293).

The examined diatom material consists of 15 sediment layers and one recent sample.

The two nethermost samples, M 8262 (243.5 cm) and M 8263 (240.5 cm), consist of clay, which proved to be marine, as a total of 42 haline taxa were found there, viz. 17 polyhalobous, 23 mesohalobous and 2 halophilous species. Furthermore 8 proper freshwater diatom species occurred. All species from the lake are listed in Table 8.

Table 8. *Diatoms, Lake D*

Sample No. M	8262	8263	8267	8271	8275	8283	8293	8217	8227	8237	8247	8257	8175	8185	8195	recent
Depth below the bottom, cm	243.5	240.5	232.5	224.5	217	200.5	180.5	161	141	121	101	81	61	41	21	-
Polyhalobous																
Amphora																
crassa GREG.	×															
ostrearia BRÉB.	×	×														
Cocconeis																
scutellum EHR.	×	×														
Diatomella																
salina VOIGT	×	×														
Diploneis																
bombus EHR.		×														
crabro EHR. var. *expleta* (A.S.) CLEVE		×														
fusca (GREG.) CLEVE	×															
incurvata (GREG.) CLEVE	×	×														
litoralis (DONK.) CLEVE	×															
Hyalodiscus																
scoticus (KÜTZ.) GRUN.	×	×														
Navicula																
cancellata DONK.	×															
forcipata GREV.	×	×														
transistans CLEVE		×														
Opephora																
pacifica (GRUN.) PETIT	×															
Plagiogramma																
staurophorum (GREG.) HEIBERG	×															
Scoliopleura																
tumida (BRÉB.) RABH.	×	×														
Surirella																
fastuosa EHR.		×														
Mesohalobous																
Achnanthes																
hauckiana GRUN.	×	×														
linkei HUST.	×															

Table 8. Continued

Sample No. M	8262	8263	8267	8271	8275	8283	8293	8217	8227	8237	8247	8257	8175	8185	8195	recent
Depth below the bottom, cm	243.5	240.5	232.5	224.5	217	200.5	180.5	161	141	121	101	81	61	41	21	-
Amphora																
proteus GREG.	×															
Caloneis																
westii (W. SMITH) HENDEY	×	×														
Cocconeis																
scutellum EHR. var. *parva* GRUN.	×															
Diploneis																
interrupta (KÜTZ.) CLEVE	×															
Mastogloia																
elliptica AG.	×	×														
Melosira																
nummuloides (DILLW.) AG.	×															
Navicula																
crucicula W. SMITH	×															
digitoradiata (GREG.) A. SCHMIDT	×															
halophila (GRUN.) CLEVE	×															
humerosa BRÉB.	×															
meniscus SCHUM.	×															
peregrina (EHR.) KÜTZ.	×	×														
pygmaea KÜTZ.		×														
salinarum GRUN.	×															
subinflata GRUN.		×														
Nitzschia																
sigma (KÜTZ.) W. SMITH	×	×														
Rhopalodia																
musculus (EHR.) O. MÜLLER	×	×														
Stauroneis																
gregorii RALFS		×														
Surirella																
ovalis BRÉB.	×															
Synedra																
pulchella KÜTZ.	×	×	×	×		×										
Halophilous																
Navicula digitoradiata (GREG.) A. SCHMIDT var. *elliptica* (ØSTRUP) M. MØLLER	×	×														
rhynchocephala KÜTZ.				×	×	×	×									
Synedra tabulata (AG.) KÜTZ.	×	×														
Alkaliphilous																
Achnanthes																
clevei GRUN.		×														
lanceolata BRÉB.				×	×											

Table 8. Continued

Sample No. M / Depth below the bottom, cm	243.5 8262	240.5 8263	232.5 8267	224.5 8271	217 8275	200.5 8283	180.5 8293	161 8217	141 8227	121 8237	101 8247	81 8257	61 8175	41 8185	21 8195	- recent
Amphora																
ovalis Kütz. v. *libyca* (Ehr.) Cleve..													×			
Anomoeoneis																
styriaca (Grun.) Hust.						×						×	×		×	
Caloneis																
bacillum (Grun.) Mereschk.			×	×												
obtusa (W. Smith) Cleve				×												
Cocconeis																
placentula Ehr.			×	×	×	×										
- var. *euglypta* (Ehr.) Cleve					×	×						×				
Cymbella																
affinis Kütz.				×	×	×		×								
cistula (Hempr.) Grun.							×	×	×							
cuspidata Kütz.						×		×	×							
cymbiformis (Ag.? Kütz.) v. Heurck				×			×									
microcephala Grun.							×									
obtusa Greg.												×				
prostrata (Berkeley) Cleve					×											
turgida (Greg.) Cleve					×			×								
Denticula																
tenuis Kütz. v. *crassula* (Naeg.) Hust.			×	×												
Diatoma																
elongatum Ag.		×														
Epithemia																
argus Kütz.	×															
sorex Kütz.					×	×										
turgida (Ehr.) Kütz.			×	×												
- var. *granulata* (Ehr.) Grun.			×	×	×											
zebra (Ehr.) Kütz.					×	×										
- var. *porcellus* (Kütz.) Grun.		×		×	×											
- var. *saxonica* (Kütz.) Grun.				×	×	×	×									
Fragilaria																
construens (Ehr.) Grun.					×	×										
- var. *binodis* (Ehr.) Grun.			×		×											
intermedia Grun.							×									
Gomphonema																
acuminatum Ehr.					×											
- var. *brébissonii* (Kütz.) Cleve			×		×											
- var. *coronata* (Ehr.) W. Smith				×	×	×	×	×	×							
- var. *turris* (Ehr.) Cleve									×	×						
angustatum (Kütz.) Rabh.				×					×				×			
constrictum Ehr.				×	×		×	×	×			×				
- var. *capitata* (Ehr.) Cleve				×					×							
intricatum Kütz.						×	×									

Table 8. Continued

Sample No. M / Depth below the bottom, cm	243.5 8262	240.5 8263	232.5 8267	224.5 8271	217 8275	200.5 8283	180.5 8293	161 8217	141 8227	121 8237	101 8247	81 8257	61 8175	41 8185	21 8195	- recent
Navicula																
bacillum EHR.											×					
cuspidata KÜTZ.																×
cryptocephala KÜTZ.						×	×						×			
tuscula (EHR.) GRUN.					×											
vulpina KÜTZ.				×		×										
Nitzschia																
angusta (W. SMITH) GRUN. var. *acuta* GRUN.					×			×								
frustulum KÜTZ.						×		×								
– var. *perpusilla* (RABH.) GRUN.					×											
Opephora																
martyi HÉRIB.			×	×			×									
Synedra																
ulna (NITZSCH) EHR.					×	×	×									
pH-indifferent (circumneutral)																
Achnanthes																
holsti CLEVE														×		
linearis W. SMITH				×	×	×	×	×								
minutissima KÜTZ.					×	×					×					
– var. *cryptocephala* GRUN.					×			×								
recurvata HUST.								×	×			×	×		×	
Anomoeoneis																
exilis (KÜTZ.) CLEVE									×		×	×				
– var. *lanceolata* A. MAYER				×	×	×	×	×	×		×				×	×
Caloneis																
holsti CLEVE									×		×	×	×	×	×	×
latiuscula (KÜTZ.) CLEVE v. *subholsti* HUST.													×			
Cymbella																
amphicephala NAEG.								×	×			×	×	×	×	
cesatii (RABH.) GRUN.							×	×	×		×	×		×		
gracilis (RABH.) CLEVE					×	×	×	×	×	×	×		×	×	×	×
naviculiformis AUERSW.			×	×	×	×	×	×	×	×	×	×	×	×		×
norvegica GRUN.		×		×												
spuria CLEVE				×												
ventricosa KÜTZ.			×	×	×	×	×	×	×	×						
Eunotia																
arcus EHR.				×	×		×	×	×	×						×
lunaris (EHR.) GRUN.							×	×	×	×	×	×	×	×	×	×
– var. *subarcuata* (NAEG.) GRUN.															×	×
Fragilaria																
lapponica GRUN.				×												
virescens RALFS	×	×	×	×	×	×		×	×	×	×	×	×	×	×	×

Table 8. Continued

Sample No. M / Depth below the bottom, cm	243.5 8262	240.5 8263	232.5 8267	224.5 8271	217 8275	200.5 8283	180.5 8293	161 8217	141 8227	121 8237	101 8247	81 8257	61 8175	41 8185	21 8195	- recent
Gomphonema																
gracile Ehr.					×			×	×				×			
lagerheimii A. Cleve							×									
– fo. *simplex* Foged											×	×	×		×	×
parvulum Kütz.				×	×	×	×	×	×			×				
Melosira																
italica (Ehr.) Kütz. subspec. *subarctica* Müller						×	×	×								
Navicula																
abiskoensis Hust.		×														
explanata Hust.								×								
lapidosa Krasske															×	
levanderi Hust.						×			×	×						
pseudoscutiformis Hust.				×	×	×	×	×								
pupula Kütz.			×		×	×										
– var. *capitata* Hust.			×													
– var. *rectangularis* (Greg.) Grun.			×		×	×		×	×	×						
radiosa Kütz.			×	×	×	×	×	×								
wittrockii (Lagerst.) A. Cleve-Euler			×	×	×	×	×									
Neidium																
affinis (Ehr.) Cleve								×	×	×	×	×	×	×	×	×
– var. *capitata* Mölder									×				×			
bisulcatum (Lagerst.) Cleve				×			×	×	×			×			×	×
iridis (Ehr.) Cl. fo. *vernalis* Reichelt																×
– var. *ampliata* (Ehr.) Cleve								×	×	×	×		×			×
productum (W. Smith) Cleve														×	×	×
temperei Reimer								×			×	×	×			
Nitzschia																
denticula Grun.				×												
gracilis Hantzsch								×					×	×		
hollerupensis Foged			×													
Peronia																
heribaudi Brun & Perag.														×		
Pinnularia																
biceps Greg.								×	×	×	×	×	×	×	×	×
braunii Grun. var. *amphicephala* (A. Mayer) Hust.							×	×				×	×	×		×
divergens W. Smith var. *elliptica* Gru.												×				
gentilis (Donk.) Cleve					×			×								
gracillima Greg.				×	×	×	×							×	×	
interrupta W. Smith			×	×		×										
maior Kütz.												×		×		
mesolepta (Ehr.) W. Smith									×							×
microstauron (Ehr.) Cleve									×		×	×	×	×	×	×
– var. *brébissonii* (Kütz.) Hust.						×		×	×			×	×	×	×	×

Table 8. Continued

Sample No. M / Depth below the bottom, cm	243.5 8262	240.5 8263	232.5 8267	224.5 8271	217 8275	200.5 8283	180.5 8293	161 8217	141 8227	121 8237	101 8247	81 8257	61 8175	41 8185	21 8195	– recent
molaris Grun.					×											
nodosa Ehr.			×	×	×	×	×									
subcapitata Greg.						×						×	×			
viridis (Nitzsch) Ehr.				×	×	×	×	×	×		×	×	×	×	×	×
Stauroneis																
anceps Ehr.				×	×	×	×	×	×	×	×	×	×	×	×	×
– fo. *gracilis* Rabh.						×	×	×	×	×	×					
phoenicenteron Ehr.							×	×	×			×	×			
smithii Grun. var. *incisa* Pant.														×	×	×
Surirella																
delicatissima Hust.								×	×	×		×				
linearis W. Smith var. *constricta* (Ehr.) Grun.					×							×			×	
Tabellaria																
fenestrata (Lyngbye) Kütz.					×	×	×	×					×	×	×	×
flocculosa (Roth) Kütz.					×	×	×	×	×	×	×	×	×	×	×	×
Acidophilous																
Achnanthes																
depressa (Cleve) Hust.								×							×	
flexella (Kütz.) Brun			×	×							×		×			
– var. *alpestris* Brun				×				×	×	×			×			
Amphicampa																
hemicyclus (Ehr.) Hantzsch												×	×	×	×	×
Anomoeoneis																
serians (Bréb.) Cleve var. *brachysira* (Bréb.) Hust.							×	×		×	×	×	×	×	×	×
– – fo. *thermalis* (Grun.) Hust.									×				×	×		
zellensis (Grun.) Cleve fo. *difficilis* (Grun.) Hust.				×		×		×								
Cymbella																
hebridica (Greg.) Cleve				×		×	×	×	×	×	×	×	×	×	×	×
incerta (Grun.) Cleve					×	×	×	×	×	×		×				
Eunotia																
alpina (Naeg.) Hust.						×										
bactriana Ehr.																×
bidentula W. Smith														×	×	×
bigibba Kütz.									×							
– var. *pumila* Grun.									×			×			×	
denticulata (Bréb.) Rabh.												×		×		
exigua Bréb.)													×	×	×	×
faba (Ehr.) Grun. var. *rhomboidea* Foged						×				×	×	×	×	×	×	×
meisteri Hust.							×					×	×			

Table 8. Continued

Sample No. M	8262	8263	8267	8271	8275	8283	8293	8217	8227	8237	8247	8257	8175	8185	8195	recent
Depth below the bottom, cm	243.5	240.5	232.5	224.5	217	200.5	180.5	161	141	121	101	81	61	41	21	–
microcephala KRASSKE												×				
monodon EHR.					×			×	×	×	×	×	×	×	×	×
– var. *maior* (W. SMITH) HUST.									×		×	×	×	×	×	×
– var. *scandia* A. CLEVE-EULER fo. *ventricosa* A. CLEVE													×			
parallela EHR.															×	×
pectinalis (DILLW.) RABH. var. *minor* (KÜTZ.) RABH.				×	×	×	×	×	×							
polyglyphis GRUN.											×	×	×	×		
praeminor Å. BERG													×			×
praerupta EHR.									×			×		×	×	×
rhomboidea HUST.								×	×	×	×	×	×	×	×	×
robusta RALFS									×	×	×	×	×	×		
– var. *diadema* (EHR.) RALFS																×
septentrionalis ØSTRUP															×	
sudetica O. MÜLLER																×
tenella (GRUN.) HUST.												×				
triodon EHR.									×			×	×	×	×	×
Fragilaria																
constricta EHR.													×	×	×	
Frustulia																
rhomboides (EHR.) DE TONI								×	×	×	×	×	×	×	×	×
– var. *saxonica* (RALFS) DE TONI				×			×	×	×	×	×	×	×	×	×	×
Melosira																
distans (EHR.) KÜTZ.												×	×	×	×	
– var. *alpigena* GRUN.															×	
– var. *lirata* (EHR.) BETHGE											×	×	×	×		
Navicula																
järnefelti HUST.					×											
variostriata KRASSKE				×												
Pinnularia																
divergentissima GRUN.					×											
gibba EHR.						×	×	×	×	×	×	×	×	×	×	×
– var. *linearis* HUST.								×		×		×		×		
interrupta W. SMITH var. *minutissima* HUST.					×			×	×	×	×	×	×	×	×	×
streptoraphe CLEVE					×											
Stenopterobia																
intermedia LEWIS												×				×

The segregation from the inlet took place between the sedimentation of the two samples M 8263 (240.5 cm) and M 8267 (232.5 cm), the former being a proper marine deposit, while the latter is a pronounced freshwater deposit (detritus gyttja), in which 8 alkaliphilous, 11 pH-indifferent and 1 acidophilous species were found together with a few valves of the mesohalobous *Synedra pulchella*. This species also occurs as the only haline species in M 8271 (224.5 cm) and M 8283 (200.5 cm).

In the 14 freshwater samples, the recent one included, a total of 163 taxa were found, viz. 46 alkaliphilous, 69 pH-indifferent and 48 acidophilous species.

The pH-spectra in Table 9 and the diagram (Fig. 5) show the distribution of the species of the different pH-groups. The diagram illustrates more clearly than the corresponding diagrams from the former three lakes the characteristic development from alkaline to acid reaction, which has taken place in many lakes situated in previously glaciated areas.

The decrease of the share of the alkaliphilous species takes place almost immediately after the segregation of the lake from the inlet. In the same way the increase of number and percentage of the acidophilous species starts very soon. While the alkaliphilous group is in the majority compared with the acidophilous one in M 8293 (180.5 cm) with 12 and 7 species respectively, the sample M 8217 (161 cm) has 14 acidophilous

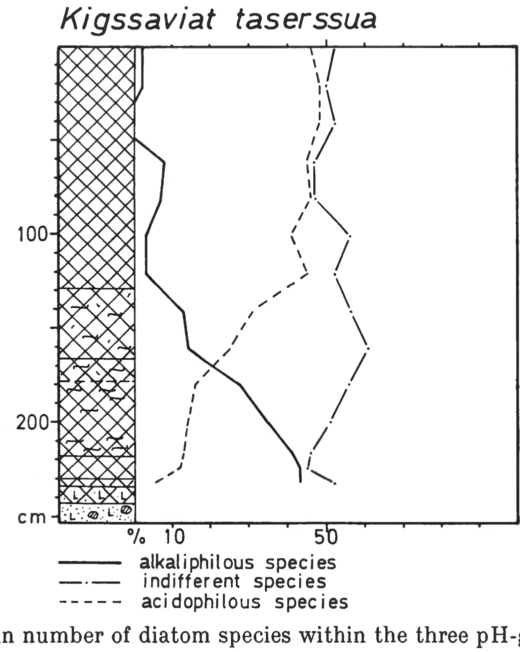

Fig. 5. Changes in number of diatom species within the three pH-groups throughout the core from Kigssaviat taserssua.

Table 9. *Spectra, Lake D*

	Depth below the bottom, cm	243½	240½	232½	224½	216½	200½	180½	161	141	121	101	81	61	41	21	–
	Sample No. M	8262	8263	8267	8271	8275	8283	8293	8217	8227	8237	8247	8257	8175	8185	8195	rec.
Polyhalobous	Number of species	13	11														
	% of species.....	36	38														
Mesohalobous	Number of species	19	10	1	1		1										
	% of species.....	52	35	5	2		2										
Halophilous	Number of species	2	2		1	1	1	1									
	% of species.....	6	7		2	2	2	2									
Alkaliphilous	Number of species	1	3	9	19	22	17	12	8	7	1	1	4	4		1	1
	% of species.....	3	10	43	43	41	35	28	14	13	3	3	7	8		2	2
	Number of species	1	3	11	20	25	25	24	35	30	15	19	26	25	25	23	24
	% of species.....	3	10	52	45	46	51	56	61	56	52	56	47	47	52	50	52
Acidophilous	Number of species			1	5	7	7	7	14	17	13	14	25	24	23	22	21
	% of species.....			5	12	13	14	16	25	31	45	41	46	45	48	48	46
	Number of species	36	29	21	44	54	49	43	57	54	29	34	55	53	48	46	46

taxa against 8 alkaliphilous. The crossing of the neutral point must have taken place between the sedimentation of these two samples.

After a sharp rise of the number of acidophilous species, followed by a simultaneous fall of the number of alkaliphilous species, a rather constant state is reached with the sample M 8237 (121 cm), in which a great predominance of the acidophilous species and a very slight representation of the alkaliphilous indicate a distinctly acid reaction in the lake. The number of pH-indifferent species varies but a little during the whole period of sedimentation.

In the present lake pH is 5.8.

In the three lakes treated previously in this paper a change towards a more neutral reaction seems to take place during the last period. By means of the analyses this can not be shown in Lake D.

TAXONOMICAL REMARKS

Achnanthes brevipes AG. var. *angustata* (GREV.) CLEVE. (A. SCHMIDT'S Atlas 418: 10–15. N. FOGED, 1975, p. 7; 9: 12–14, 17, 18).

Plate II, fig. 15: 40×8 μ. 10–11 striae in 10 μ. Lake A.

Achnanthes fredskildii nov. spec. Plate II, figs. 16a, b.

Valvae oblongae ellipticae apicibus late rotundatis, 14–15 μ longae, 8–9 μ latae, utraque striis transapicalibus radiantibus, 14–15 in 10μ. Valva sine rhaphe area axiali elliptice-lanceolata. Valva rhaphes cum rhaphe recta lineari fissuris polaribus brevibus ad idem latus deflexis, poris centralibus densis et area axiali angusta elliptica.

The valves are oblong, elliptic with broadly rounded apices, 14–16 μ long, 8–9 μ broad. Both valves have 14–15 radial transapical striae in 10 μ. The rapheless valve has elliptic-lanceolate axialarea. The raphe valve has a straight linear raphe with short polar fissures deflected into the same direction, dense central pores and a narrow elliptic axial area.

Holotype in Coll. N. FOGED, Odense. No. M 8069(2), Greenland 1973.

Type locality: Sârdlup timâne taserssuaq (Lake C), West Greenland. Postglacial marine clay.

Plate II, figs. 16a, b: 16×8 μ. 14 striae in 10 μ. Lake C.

In gratitude dedicated to BENT FREDSKILD, phil. dr., danish palynologist and botanist.

Achnanthes hauckiana GRUN. (F. HUSTEDT 1930–66, II, p. 388, fig. 834).

Plate II, figs. 8a, b: 17×8 μ. 16 striae in 10 μ. Lake B.

Achnanthes holstii CLEVE. (F. HUSTEDT 1930–66, II, p. 399, fig. 849).

Plate II, fig. 11a: 31 × 10 μ. 12–13 striae in 10 μ. Lake C.
Plate II, fig. 11b: 31 × 10 μ. 15–16 striae in 10 μ. Lake C.

Achnanthes iversenii nov. spec. Plate II, figs. 13a, b.

Valvae oblonge-ellipticae apicibus late rotundatis. 28–30 μ longae, 8–10 μ latae. Valva sine rhaphe pseudorhaphe angusta lineari, striis transapicalibus radiantibus, 16–17 in 10 μ. Valva rhaphes cum rhaphe lineari fissuris polaribus ad idem latus deflexis, poris centralibus densis, area axiali angustissima et striis transapicalibus radiantibus, 14–15 in 10 μ.

The valves are oblong-elliptic with broadly rounded apices, 28–30 μ long and 8–10 μ broad. The rapheless valve has a narrow linear pseudoraphe and 16–17 transapical striae in 10 μ. The raphe valve has a linear raphe with polar fissures deflected into the same direction, dense central pores, a very narrow axial area and 14–15 radial transapical striae in 10 μ.

Holotype in Coll. N. Foged, Odense. No. M 7966(1), Greenland1973.
Type locality: Gytje sø (Lake B), West Greenland. Postglacial detritus gyttja.

Plate II, fig. 13a: 29 × 9 μ. 16–17 striae in 10 μ. Lake B.
Plate II, fig. 13b: 29 × 9 μ. 14–15 striae in 10 μ. Lake B.

Named in honour of the late Johannes Iversen, phil. dr., danish palynologist and botanist, who has given fundamental contribution to the elucidation of the trend of the postglacial flora in Denmark and Greenland.

A. iversenii has some resemblance to *A. ignota* Hust. (A. Schmidt's Atlas 420: 20–23) from Snigsfjord, Norway, but differs from it by having elliptical valves and a smaller number of striae in 10 μ.

Achnanthes linkei Hust. (F. Hustedt, 1939, p. 607, figs. 28–32).

Plate II, figs. 14a, b: 36 × 13 μ. 11–12 striae in 10 μ. Lake D.

This characteristic mesohalobous diatom species was first depicted by P. Schulz, 1926, p. 192, fig. 43 from the Ancylus deposit at Danzig, and named *A. lanceolata* var. *rostrata*. After that F. Hustedt found it in material from the sands submerged at high tide at the Frisian Islands. He stated it to be a species apart without any connection with *A. lanceolata*.

It is rather widespread but infrequent. In my recent material one of the places is Iceland, and in subfossil material as the present I have found it in Åmosen, and at Pine Mølle near Trelleborg, both localities situated in Western Zealand (not published). Not previously recorded from Greenland.

Achnanthes septata A. Cleve. (F. Hustedt, 1930–66, II, p. 422, fig. 875).

Plate II, figs. 9a, b: 74 × 14–15 μ. 6 striae in 10 μ. Lake B.

Amphicampa hemicyclus (EHR.) KARSTEN. (F. HUSTEDT, 1930–66, II, p. 257, fig. 736).
Plate I, fig. 6: 29×4 μ. 12–13 striae in 10 μ. Lake D.
Plate I, fig. 7: 25×7 μ. 12–13 striae in 10 μ. Lake D.

Amphiprora paludosa W. SMITH. (F. HUSTEDT, 1930, p. 329, fig. 624).
Plate VII, fig. 17: 145×10–15 μ. 20–22 striae in 10 μ. Lake B.

Amphora proteus GREG. (H. & M. PERAGALLO, 1897–1908, p. 200, 44: 24–18. C. BROCKMANN, 1950, p. 22, 4: 16, 17).
Plate VII, fig. 11: Cell: 40×15 μ. 14–15 striae in 10 μ. Lake A.
Plate VII, fig. 12: 56×10 μ. Dorsal side 10–13, ventral side 10 striae in 10 μ. Lake D.

Anomoeoneis sphaerophora (KÜTZ.) PFITZER. (F. HUSTEDT, 1930–66, II, p. 740, fig. 1108a).
Plate III, fig. 6: 82×26 μ. 15 striae in 10 μ. Lake A.

Caloneis obtusa (W. SMITH) CLEVE. (F. HUSTEDT, 1930, p. 240, fig. 373. A. SCHMIDT's Atlas 263: 11, 12).
Syn.: *Caloneis hebes* (RALFS) PATRICK & REIMER, 1964, p. 589; 54: 13.
Plate IV, fig. 1: 56×16 μ. 14 striae in 10 μ. Lake B.
Plate IV, fig. 2: 47×16 μ. 13 striae in 10 μ. Lake B.
Previously recorded from fresh water in Europe, North America and SW-Greenland (N. FOGED, 1973, p. 28; 6: 3–5).

Cocconeis costata Greg. (F. HUSTEDT, 1930–66, II, p. 332, fig. 785. N. FOGED, 1973, p. 66; 8: 13).
Plate II, fig. 5: 21×15 μ. 7 (–8) striae in 10 μ. Lake B.

Coscinodiscus excentricus EHR. (F. HUSTEDT, 1930–66, I, p. 388, fig. 201).
Plate I, fig. 1: diam. 39 μ. Lake B.

Cyclotella comta (EHR.) KÜTZ. (F. HUSTEDT, 1930–66, I, p. 354, fig. 183).
Plate I, fig. 5: diam. 28 μ. Lake B.

Cymbella angustata (W. SMITH) CLEVE. (F. HUSTEDT, 1930, p. 351, fig. 639. N. FOGED, 1973, p. 31; 17: 6, 7).
Plate VII, fig. 8: 40×7 μ. Dorsal side 14, ventral side 16 striae in 10 μ. Lake C.

Cymbella austriaca GRUN. (F. HUSTEDT, 1930, p. 354, fig. 647. A. Schmidt's Atlas 374: 1–3).
Plate VII, fig. 13: 34×9 μ. Dorsal side 9, ventral side 8–9 striae in 10 μ. Lake B.
Almost identical with the specimen depicted by N. FOGED, 1974, 15: 18 from Iceland. Both specimens are somewhat different from F. HUSTEDT, 1930, fig. 647 as regards the size of the valve and the number of transapical striae in 10 μ.

Cymbella cistula (HEMPR.) GRUN. (F. HUSTEDT, 1930, p. 363, fig. 676a).
Plate VII, fig. 7: 49×15 μ. 9 striae in 10 μ. Lake B.

"Erstlingzelle". The species is rather common as well in the postglacial sediments here as in recent lakes in Greenland.

Cymbella gracilis (RABH.) CLEVE. (F. HUSTEDT, 1930, p. 359, fig. 663. N. FOGED, 1973, p. 32; 15: 11; 17: 10).
Plate VII, fig. 16: 46×8 μ. 12 striae in 10 μ. Lake C.

Cymbella hebridica (GREG.) GRUN. (F. HUSTEDT, 1930, p. 359, fig. 662).
Plate VII, fig. 15: 40×11 μ. 12 striae in 10 μ. Lake D.

Cymbella incerta GRUN. (F. HUSTEDT, 1930, p. 360, fig. 665. N. FOGED, 1973, p. 33; 15: 13).
Plate VII, fig. 10: 55×8 μ. 17–18 striae in 10 μ. Lake B.

Cymbella leptoceros (EHR.?) GRUN. (F. HUSTEDT, 1930, p. 353, fig. 645. N. FOGED, 1973, p. 33; 17: 13, 14).
Plate VII, fig. 14: 36×14 μ. Dorsal side 8, ventral side 8–9 striae in 10 μ. Lake B.

Cymbella obtusa GREG. (F. HUSTEDT, 1930, p. 361, fig. 667).
Plate VII, fig. 9: 40×7 μ. Dorsal side 12–13, ventral side (15–) 16 striae in 10 μ. Lake B.

Diatomella salina VOIGT. (M. VOIGT, 1957, p. 69, figs. 6–9).
Plate II, fig. 10a: 20×8 μ. 26–28 striae in 10 μ. Lake B.
Plate II, fig. 10b: 20×6 μ. 26–28 striae in 10 μ. Lake B.
This *Diatomella* species is previously only found in *Holuthurians* in Celebes (M. VOIGT, 1957). The specimens here agree exactly with M. VOIGT's description and illustrations. The species is polyhalobous and found in the marine samples from the three lakes B, C and D. *Diatomella balfouriana* Grev. occurs rather frequently in Lake B, but it differs from *D. salina* not only from an ecological point of view, but also by having 18–20 very short striae in 10 μ (vide e.g. N. FOGED, 1974, 7: 11, 12), whereas *D. salina* has 26–28 striae in 10 μ and a narrow lanceolate axial area. *D. hustedti* Manguin 1954 is a freshwater species like *D. balfouriana*; it has 18–20 striae in 10 μ.

Diploneis crabro Ehr. var. *panduro* (BRÉB.) (F. HUSTEDT, 1930–66, p. 622, fig. 1034).
Plate IV, fig. 3: 60×19–22 μ. 8 striae in 10 μ. Lake B.

Diploneis crabro var. *expleta* (A.S.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 622, fig. 1036).
Plate IV, fig. 4: 64×19–23 μ. 9 striae in 10 μ. Lake B.

Diploneis didyma Ehr. (F. HUSTEDT, 1930–66, II, p. 685, fig. 1075a).
Plate IV, fig. 8: 50×17–19 μ. 9 striae in 10 μ. Lake B.

Diploneis fusca (GREG.) CLEVE var. *hyperborea* (GRUN.) HUST. (F. HUSTEDT, 1930–66, II, p. 657, fig. 1057a).
Plate IV, fig. 9: 45×16 μ. 11 striae in 10 μ. Lake B.

Diploneis incurvata (GREG.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 593,

figs. 1012b, d. N. FOGED, 1973, p. 67; 23: 11).
Plate IV, fig. 5: 41×8.5–14 μ. 12 striae in 10 μ. Lake D.

Diploneis interrupta (KÜTZ.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 602, fig. 1019a. N. FOGED, 1973, p. 67; 23: 6).
Plate IV, fig. 7: 56×10–20 μ. 10 striae in 10 μ. Lake D.

Diploneis litoralis (DONK.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 665, fig. 1062a. N. FOGED, 1973, p. 67; 23: 12).
Plate IV, fig. 10: 34×16 μ. 14 striae in 10 μ. Lake D.

Diploneis ovalis (HILSE) CLEVE. var. *oblongella* (NAEG.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 672, figs. 1065f–h).
Plate IV, fig. 12: 33×11 μ, 14 striae in 10 μ. Lake A.

Diploneis pseudovalis HUST. (F. HUSTEDT, 1930–66, II, p. 668, fig. 1063c).
Plate IV, fig. 11: 24×13 μ. 11–12 striae in 10 μ. Lake A.

Diploneis splendida (GREG.) CLEVE. (F. HUSTEDT, 1930–66, II, p. 712, figs. 1089a–c).
Plate IV, fig. 6: 70×16–18 μ. 7 striae in 10 μ. Lake A.

Epithemia sorex KÜTZ. (F. HUSTEDT, 1930, p. 388, fig. 736).
Plate VIII, fig. 7: 34×11 μ. 15 striae in 10 μ. Lake B.

Epithemia zebra (EHR.) KÜTZ. var. *saxonica* (KÜTZ.) GRUN. (F. HUSTEDT, 1930, p. 385, fig. 730).
Plate VIII, fig. 1: 65×11 μ. 4 ribs and 13–14 striae in 10 μ. Lake B.

Eunotia arcus EHR. var. *bidens* GRUN. (F. HUSTEDT, 1930–66, II, p. 284, fig. 748d. N. FOGED, 1973, p. 37; 4: 14).
Plate I, fig. 11: 51×8 μ. 8–10 striae in 10 μ. Lake A.

Eunotia fallax A. CLEVE. (F. HUSTEDT, 1930–66, II, p. 288, fig. 753).
Plate I, fig. 9: 34×4 μ. 9 striae in 10 μ. Lake C.

Eunotia flexuosa (BRÈB.) KÜTZ. (F. HUSTEDT, 1930–66, II, p. 312, fig. 778).
Plate I, fig. 13: 115×6 μ. 12–13 striae in 10 μ. Lake B.

Eunotia maior EHR. var. *scandia* A. CLEVE-EULER fo. *ventricosa* A. CLEVE. (A. CLEVE 1895, p. 27; 1: 37. N. FOGED, 1973, p. 38; 1: 2).
Plate I, fig. 10: 86×19 μ. 10–11 striae in 10 μ. Lake D.

This characteristic form of *E. maior* must be considered circumpolar as it is found in Northern Europe, Siberia and Greenland.

Eunotia robusta RALFS. var. *diadema* (EHR.) RALFS. (F. HUSTEDT, 1930–66, II, p. 274, fig. 740i).
Plate I, fig. 14: 48×15 μ. 10–11 striae in 10 μ. Lake A.

Eunotia triodon EHR. (F. HUSTEDT, 1930–66, II, p. 274, fig. 741. N. FOGED, 1973, p. 40; 3: 5, 6, 7).
Plate I, fig. 15: 39×18 μ. 16 striae in 10 μ. Lake D.

Fragilaria leptostauron (EHR.) HUST. (F. HUSTEDT, 1930–66, II, p. 153, figs. 668a–j).
Plate I, fig. 8: 19×13 μ. 9 striae in 10 μ. Lake B.

Gomphonema lanceolatum EHR. var. *insignis* (GREG.) CLEVE. (F. HUSTEDT, 1930, p. 376, fig. 701).
Plate VIII, fig. 3: 54×11 μ. 10 striae in 10 μ. Lake C.

Gomphonema longiceps EHR. (F. HUSTEDT, 1930, p. 375, fig. 704).
Plate VIII, fig. 4: 54×8 μ. 12 striae in 10 μ. Lake B.

Gomphonema subtile EHR. (F. HUSTEDT, 1930, p. 376, fig. 708. N. FOGED, 1973, p. 44; 18: 6).
Plate VIII, fig. 2: 44×6 μ. 10 striae in 10 μ. Lake B.

Licmophora gracilis (EHR.) GRUN. var. *anglica* (KÜTZ.) PERAG. (F. HUSTEDT, 1930–66, II, p. 60, fig. 583).
Plate II, fig. 1: 38×10 μ. 16 striae in 10 μ. Lake B.

Mastogloia exigua LEWIS. (F. HUSTEDT, 1930–66, II, p. 569, fig. 1003. N. FOGED, 1973, p. 69; 23: 9, 10).
Plate II, figs. 12a, b: 38×12 μ. 3 loculi and 22–24 striae in 10 μ. Lake B.

Navicula abiskoensis HUST. (F. HUSTEDT, 1942, p. 118, fig. 36. N. FOGED, 1973, p. 46; 10: 9. 1974, p. 67; 13: 25).
Plate VI, fig. 4: 35×11 μ. 11 striae in 10 μ. Lake A.

Navicula arenaria DONK. (C. BROCKMANN, 1950, p. 18; 1: 5. N. I. HENDEY, 1964, p. 196; 30: 15. N. FOGED, 1973, p. 70; 10: 8).
Plate V, fig. 9: 50×10 μ. 10–11 striae in 10 μ. Lake B.

Navicula cancellata DONK. (N. I. HENDEY, 1964, p. 203; 30: 18.20. A. SCHMIDT's Atlas 46: 29, 30. N. FOGED, 1973, p. 70; 24: 15).
Plate VI, fig. 1: 45×12 μ. 8 striae in 10 μ. Lake B.
A small specimen of the species, almost identical with N. FOGED, 1973, 24:15.

Navicula charlatii PERAG. (F. HUSTEDT, 1930-66, III, p. 603, fig. 1607a. N. FOGED, 1953, p. 49. 1955, p. 50; 6:2).
Syn.: *N. mutica* var. *undulata* GRUN. 1880.
N. mutica var. *nivalis* HUSTEDT 1943, p. 157, fig. 24.
Plate VI, fig. 9: 40×13 μ. 16 striae and 12–13 puncta in 10 μ. Lake A.
The species Plate 6, fig. 3 in N. FOGED, 1955 named *N. mutica* var. *nivalis* (EHR.) HUST. is *N. nivaloides* BOCK, 1963, p. 236; 2: 42–49, and F. HUSTEDT, 1930–66, III, p. 622; fig. 1619.

Navicula cincta (EHR.) KÜTZ. (F. HUSTEDT, 1930, p. 298, fig. 510).
Plate V, fig. 10: 32×8 μ. 13 striae in 10 μ. Lake D.

Navicula cruciculoides BROCKMANN. (C. BROCKMANN, 1950, p. 15; 4:7–10. N. I. HENDEY, 1964, p. 161; 30:4. N. FOGED, 1973, p. 70).
Plate VI, fig. 3: 43×9 μ. 15 striae in 10 μ. Lake D. A small specimen.

Navicula cryptocephala KÜTZ. (F. HUSTEDT, 1930, p. 295, fig. 496).
Plate V, fig. 12: 30×6 μ. 12–13 striae in 10 μ. Lake C.

Navicula digitoradiata (GREG.) A. SCHMIDT. (F. HUSTEDT, 1930, p. 301,

fig. 518. N. FOGED, 1973, p. 70; 24:1–3).
Plate V, fig. 1:80×14 μ. 9 striae in 10 μ. Lake B.

Navicula dissipata HUST. (F. HUSTEDT, 1930–66, III, p. 549, fig. 1587).
Plate VI, fig. 7:17×6.5 μ. 17–18 striae in 10 μ. Lake B.

Navicula forcipata GREV. (F. HUSTEDT, 1930–66, III, p. 531, fig. 1568. N. I. HENDEY, 1964, p. 211; 33:8, 9. N. FOGED, 1973, p. 71; 27:3, 4).
Plate VI, fig. 10:45×19 μ. 15 striae in 10 μ. Lake D.

Navicula gothlandica GRUN. (F. HUSTEDT, 1939, p. 296, fig. 499).
Plate V, fig. 8:29×8 μ. 14 striae in 10 μ. Lake D.

Navicula pygmaea KÜTZ. (F. HUSTEDT, 1930–66, III, p. 538, fig. 1574. N. FOGED, 1973, p. 72; 25:11, 12).
Syn.: *N. hudsonis* GRUN. (R. SIMONSEN, 1975).
Plate VI, fig. 6:29×12 μ. 22–24 striae in 10 μ. Lake D.

Navicula humerosa BRÉB. (F. HUSTEDT, 1930, p. 311, fig. 559. N. FOGED, 1973, p. 72; 26:4).
Plate VI, fig. 11:55×26 μ. 10 striae in 10 μ. Lake B.

Navicula meniscus SCHUM. (N. I. HENDEY, 1964, p. 201; 37:4. N. FOGED, 1973, p. 73; 24:13).
Plate V, fig. 5:45×12 μ. 9 striae in 10 μ. Lake D.

Navicula palpebralis BRÉB. (H. & M. PERAGALLO, 1897–1908, p. 82; 10: 17, 18. N. FOGED, 1973, p. 73; 26:5).
Plate VI, fig. 2:45×15 μ. 8 striae in 10 μ. Lake D.
According to N. I. HENDEY, 1964. *N. palpebralis* is a very variable species.

Navicula peregrina (EHR.) KÜTZ. var. *kefvingensis* (EHR.) CLEVE. (A. CLEVE-EULER, 1953, III, p. 145; fig. 803b. H. OKUNO 1952, p. 42; 14:5).
Plate V, fig. 3:67×13 μ. 8–9 striae in 10 μ. Lake C.

Navicula ramosissima (AG.) CLEVE. (H. & M. PERAGALLO, 1897–1908, p. 92; 12:10).
Plate VI, fig. 8:25×8 μ. 15–16 striae in 10 μ. Lake B.

Navicula rhynchocephala KÜTZ. (F. HUSTEDT, 1930, p. 296).
Plate V, fig. 4:25×11 μ. 10 striae in 10 μ. Lake C.
Closely related to *N. peregrina* EHR. var. *meniscus* SCHUM. (H. & M. PERAGALLO, 1897–1908, 12:16).

Navicula subapiculata (GRUN.) HUST. (F. HUSTEDT, 1939, p. 639. 1955, p. 29; 58:26, 27. A. SCHMIDT's Atlas 46:50–53).
Syn.: *N. cancellata* DONK. var. *subapiculata* GRUN. (in P. T. CLEVE & A. GRUNOW, 1880, p. 37).
Plate V, fig. 11:30×7 μ. 10 striae in 10 μ. Lake D.

Navicula subinflata GRUN. (F. HUSTEDT, 1930–66, III, p. 292, fig. 1415).
Plate VI, fig. 5:39×9 μ. 16–18 striae in 10 μ. Lake B.

Navicula transistans CLEVE. (A. SCHMIDT's Atlas 259:14, 15. N. FOGED, 1973, p. 74; 24:8, 11, 16).

Plate V, fig. 13:50×12 μ. 10–11 striae in 10 μ. Lake A.

Plate V, fig. 14:55×12 μ. 9–10 striae in 10 μ. Lake C.

Plate V, fig. 15:62×13 μ. 10 striae in 10 μ. Lake A.

Navicula wittrockii (LAGERST.) CLEVE. (F. HUSTEDT, 1930–66, III, p. 124, fig. 1256).

Plate V, fig. 6:48×11 μ. 14 striae in 10 μ. Lake B.

Plate V, fig. 7:36×8 μ. 14 striae in 10 μ. Lake C.

Navicula vulpina KÜTZ. (F. HUSTEDT, 1930, p. 297, fig. 504. N. FOGED, 1973, p. 50; 9:9, 10).

Plate V, fig. 2:83×15 μ. 8–9 striae in 10 μ. Lake A.

Neidium iridis (EHR.) CLEVE. (F. HUSTEDT, 1930, p. 245, fig. 379).

Plate III, fig. 7:84×24 μ. 15 striae and 13 puncta in 10 μ. Lake A.

Neidium iridis fo. *crassiusculum* fo. nov. Plate III, fig. 9.

Valvis brevibus et latissimis a fo. *iridis* differt.

Differs from the species by having short and very broad valves.

Holotype in Coll. N. FOGED, Odense. No. M 8109, Greenland 1973.

Type locality: Sârdlup timâne taserssuaq (Lake C), West Greenland.

Postglacial freshwater gyttja.

Plate III, fig. 9:58×24 μ. 16–17 striae and 14 puncta in 10 μ. LakeC.

Neidium iridis fo. *vernalis* REICHELT. (F. HUSTEDT, 1930, p. 245, fig. 380).

Plate III, fig. 8:83×17 μ. 16 striae and 16 puncta in 10 μ. Lake B.

Neidium temperei REIMER. (C. W. REIMER, 1959, p. 33; 4:2. R. PATRICK & C. W. REIMER, 1966, p. 406; 37:6. N. FOGED, 1973, p. 52; 8:7–9).

Plate III, fig. 10:45×18 μ. 16 striae and 16 puncta in 10 μ. Lake A.

Nitzschia acuminata (W. SMITH) GRUN. (F. HUSTEDT, 1930, p. 401, fig. 764).

Plate VIII, fig. 6:88×17 μ. 12–13 striae and 12–13 keel puncta in 10 μ. Lake A.

Nitzschia angustata (W. SMITH) GRUN. var. *acuta* GRUN. (F. HUSTEDT 1930, p. 402, fig. 768).

Plate VIII, fig. 10:34×8 μ. 16–18 striae in 10 μ. Lake B.

Nitzschia hollerupensis FOGED. (N. FOGED, 1962, p. 25; 5:9. 1973, p. 53; 19:15).

Syn.: *N. tirstrupensis* FOGED, 1963, p. 53; 6:7.

Plate VIII, fig. 5:58×5 μ. 8–9 keel puncta and 16 striae in 10 μ. Lake B.

This species is very closely related to *N. amphibia* GRUN. and ought possibly to be included there as var. *hollerupensis*.

In F. HUSTEDT, 1945–50, 41:44–47 HUSTEDT gives 4 specimens all of them grouped with *N. amphibia* GRUN. In figs. 44 and 45 the valves are elliptic, whereas they in figs. 46 and 47 are linear. The linear valves generally are longer than the elliptical valves. In the large material in which I have found these forms, no transitions have hitherto been present. Consequently it will be reasonable to maintain the linear form as a species apart, alternatively to class it with *N. amphibia* as var. *hollerupensis*.

Opephora pacifica (GRUN.) PETIT. (F. HUSTEDT, 1930–66, II, p. 135, fig. 655).
Syn.: *O. marina* (GREG.) PETIT 1888. (N. FOGED, 1973, p. 75; 29:3).
Plate II, fig. 2:25×6 μ. 10 striae in 10 μ. Lake B.

Pinnularia divergens W. SMITH var. *linearis* ØSTRUP. (E. ØSTRUP, 1910, p. 243; 14:11).
Plate VII, fig. 2:70×15 μ. 10 striae in 10 μ. Lake C.

Pinnularia hemiptera (KÜTZ.) CLEVE. (F. HUSTEDT, 1930, p. 329, fig. 608. N. FOGED, 1973, p. 55; 12:8).
Plate VII, fig. 3:58×13 μ. 10 striae in 10 μ. Lake A.

Pinnularia islandica ØSTRUP. (E. ØSTRUP, 1918, p. 32; 3:47. N. FOGED, 1973, p. 57; 14, 15).
Plate VII, fig. 1:68×12 μ. 8 striae in 10 μ. Lake C.

Pinnularia microstauron (EHR.) CLEVE. (F. HUSTEDT, 1930, p. 320, fig. 582).
Plate VI, fig. 15:62×10 μ. 11 striae in 10 μ. Lake B.

Pinnularia microstauron var. *brébissonii* (KÜTZ.) HUST. (F. HUSTEDT, 1930, p. 321, fig. 584).
Plate VI, fig. 16:45×11 μ. 10 striae in 10 μ. Lake C.

Pinnularia microstauron var. *brébissonii* fo. *diminuta* GRUN. (F. HUSTEDT, 1930, p. 322, fig. 585).
Plate VII, fig. 6:33×8 μ. 11 striae in 10 μ. Lake D.

Pinnularia pulchra ØSTRUP. (F. HUSTEDT, 1930, p. 329, fig. 609. N. FOGED, 1973, p. 59; 9:7, 19).
Plate VII, fig. 4:47×8 μ. 8–9 striae in 10 μ. Lake B.

Pinnularia quadratarea (A. SCHMIDT) CLEVE. (N. I. HENDEY, 1964, p. 232. N. FOGED, 1973, p. 76; 27:7–9).
Plate VII, fig. 5:43×9 μ. 10–11 striae in 10 μ. Lake A.

Pinnularia viridis (NITZSCH) EHR. (F. HUSTEDT, 1930, p. 334, fig. 617a).
Plate VI, fig. 12:112×23 μ. 7–8 striae in 10 μ. Lake B.
Plate VI, fig. 13:122×22 μ. 6 (–7) striae in 10 μ. Lake C.
Plate VI, fig. 14:83×20 μ. 6–7 striae in 10 μ. Lake A.
P. viridis varies very much as well as regards the size of the valve as the size of the axial area. There exists a very great number of forms and varieties, but it is very difficult to distinguish between most of them with tolerable certainty.

Plagiogramma staurophorum (GREG.) HEIBERG. (F. HUSTEDT, 1930–66, II, p. 110, fig. 635).

Plate II, fig. 3:33×9 μ. 9 striae in 10 μ. Lake D.

Pleurosigma angulatum (QUECKETT) W. SMITH. (F. HUSTEDT, 1930, p. 228, fig. 342).

Plate III, fig. 1:120×22 μ. 20/20 striae in 10 μ. Lake B.

Rhabdonema minutum KÜTZ. (F. HUSTEDT, 1930–66, II, p. 18, figs. 548a–d, f. N. FOGED, 1973, p. 77; 21:8).

Plate II, fig. 4:40×17 μ. Lake B.

Plate II, fig. 6:50×15 μ. 7 striae in 10 μ. Lake C.

Stauroneis anceps EHR. (F. HUSTEDT, 1930–66, II, p. 771, fig. 1120a).

Plate III, fig. 3:86×17 μ. 14–15 striae in 10 μ. Lake A.

Stauroneis halmei MÖLDER. (K. MÖLDER, 1939, p. 21, fig. 7).

Plate II, fig. 7:36×10 μ. 15 striae in 10 μ. Lake B.

Previously recorded only from brackish water in Pojo Bay, Finland. The specimen here seems to be identical with the specimens from Pojo Bay. It seems to be closely related to *Stauroneis gregorii* RALFS.

Stauroneis javanica (GRUN.) CLEVE. fo. *lapponica* HUST. (F. HUSTEDT, 1930–66, II, p. 815, fig. 1160).

Syn.: *S. obtusa* LAGERST. var. *lapponica* HUSTEDT, 1924, p. 563.

Plate III, fig. 4:55×14 μ. 16–18 striae in 10 μ. Lake B.

Stauroneis phoenicenteron (NITZSCH) EHR. (F. HUSTEDT, 1930–66, II, p. 766, fig. 1118a. N. FOGED, 1973, p. 61; 7:1–3).

Plate III, fig. 2:80×18 μ. 16–18 striae and 16–17 puncta in 10 μ. Lake B.

Stauroneis smithii GRUN. var. *incisa* PANT. (F. HUSTEDT, 1930–66, II, p. 810, figs. 1157d–g).

Plate III, fig. 5:37×9 μ. Lake A.

Surirella amphioxys W. SMITH. (F. HUSTEDT, 1930, p. 435, fig. 842. N. FOGED, 1973, p. 61; 20:8).

Plate VIII, fig. 11:55×17 μ. 30 alae in 100 μ. Lake C.

Surirella armoricana PERAG. (H. & M. PERAGALLO, 1897–1908, p. 249; 60:10. N. I. HENDEY, 1964, p. 289; 40:6).

Plate VIII, fig. 13:47×32 μ. 20–22 alae in 100 μ. Lake C.

Surirella fastuosa (EHR.) KÜTZ. (A. SCHMIDT's Atlas 4:1, 2. H. & M. PERAGALLO, 1897–1908, p. 248; 58:6. N. I. HENDEY, 1964, p. 268; 40:4).

Plate VIII, fig. 12:52×35 μ. 18–20 alae in 100 μ. Lake C.

Surirella ovata KÜTZ. (F. HUSTEDT, 1930, p. 442, figs. 863, 864. N. FOGED, 1973, p. 62; 19:12, 13).

Plate VIII, fig. 8:43×14 μ. 45 alae in 100 μ. Lake B.

Plate VIII, fig. 9:35×15 μ. 25–30 alae in 100 μ. Lake B.

Synedra tabulata (AG.) KÜTZ. (F. HUSTEDT, 1930–66, II, p. 218, figs. 710a–d).
Plate I, fig. 12: 85 × 6 μ. 10 striae in 10 μ. Lake C.

Thalassiosira baltica (GRUN.) OSTENF. (A. GRUNOW, 1884, p. 81; 3:17a, b).
Plate I, fig. 3: diam. 17 μ. Lake C.

Thalassiosira gravida CLEVE. (F. HUSTEDT, 1930–66, I, p. 325, fig. 161. E. PAASCHE, 1960, p. 204; pl. 2, 3. N. FOGED, 1973, p. 79; 21:3).
Plate I, fig. 2: diam. 23 μ. Lake C.

Thalassiosira nordenskioeldii CLEVE. (F. HUSTEDT, 1930–66, I, p. 321, fig. 157. N. FOGED, 1973, p. 79; 21:4).
Plate I, fig. 4: diam. 12 μ. Lake A.

Acknowledgements

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Færdig fra trykkeriet 10. aug 1977

PLATES

Plate I

1. *Coscinodiscus excentricus* EHR.
2. *Thalassiosira gravida* CLEVE
3. *Thalassiosira baltica* (GRUN.) OSTENF.
4. *Thalassiosira nordenskioeldii* CLEVE
5. *Cyclotella comta* (EHR.) KÜTZ.
6. *Amphicampa hemicyclus* (EHR.) KARSTEN
7. *Amphicampa hemicyclus* (EHR.) KARSTEN
8. *Fragilaria leptostauron* (EHR.) HUST.
9. *Eunotia fallax* A. CLEVE
10. *Eunotia maior* EHR. var. *scandia* A. CLEVE-EULER fo. *ventricosa* A. CLEVE
11. *Eunotia arcus* EHR. var. *bidens* GRUN.
12. *Synedra tabulata* (AG.) KÜTZ.
13. *Eunotia flexuosa* (BRÉB.) KÜTZ.
14. *Eunotia robusta* RALFS var. *diadema* (EHR.) RALFS
15. *Eunotia triodon* EHR.

Scales 10 μ

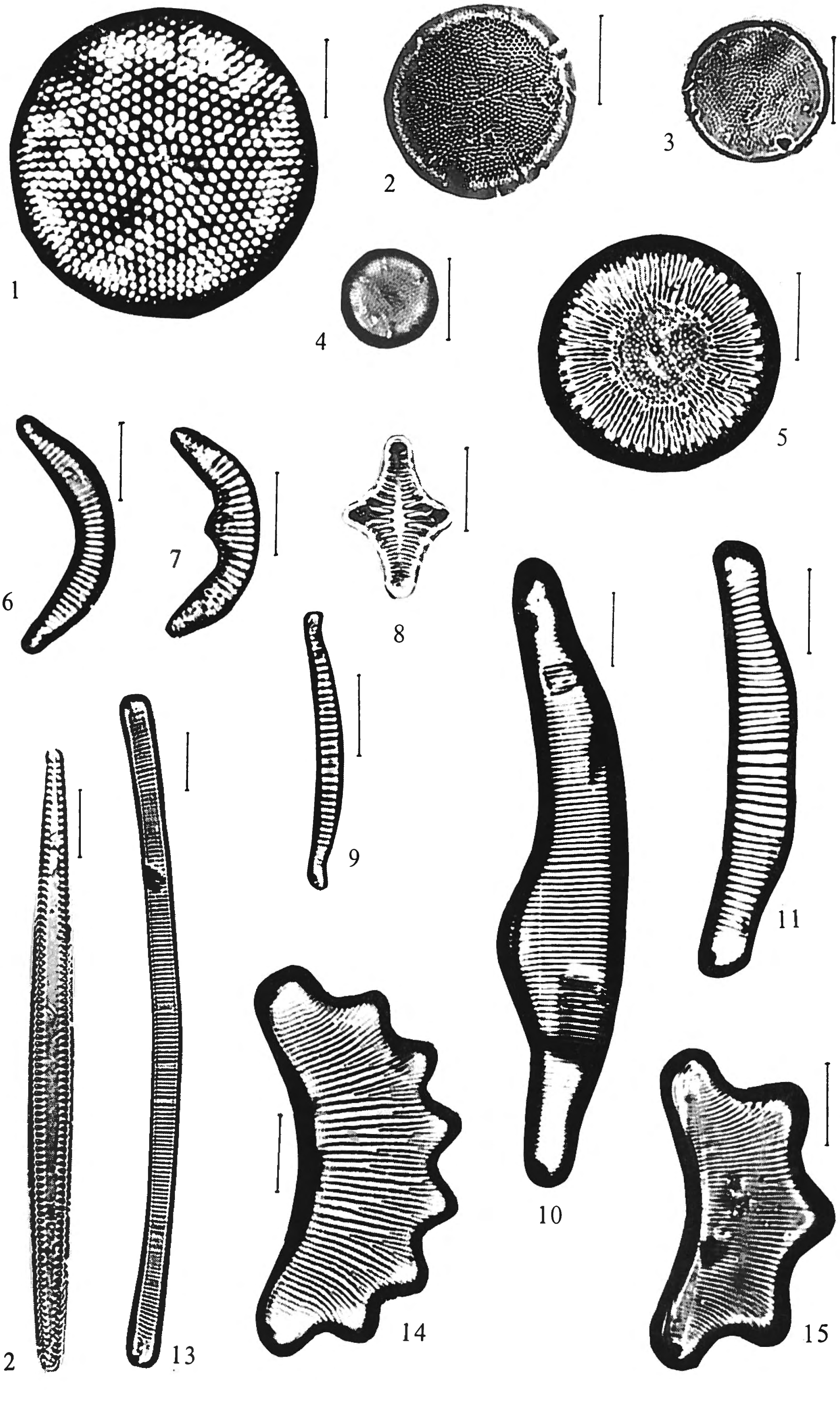
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Plate II

1.	*Licmophora gracilis* (EHR.) GRUN. var. *anglica* (KÜTZ.) PERAG.
2.	*Opephora pacifica* (GRUN.) PETIT
3.	*Plagiogramma staurophorum* (GREG.) HEIBERG
4.	*Rhabdonema minutum* KÜTZ.
5.	*Cocconeis costata* GREG.
6.	*Rhabdonema minutum* KÜTZ.
7.	*Stauroneis halmei* MÖLDER
8 a, b.	*Achnanthes hauckiana* GRUN.
9 a, b.	*Achnanthes septata* A. CLEVE
10 a, b.	*Diatomella salina* VOIGT
11 a, b.	*Achnanthes holstii* CLEVE
12 a, b.	*Mastogloia exigua* LEWIS
13 a, b.	*Achnanthes iversenii* nov. spec.
14 a, b.	*Achnanthes linkei* HUST.
15.	*Achnanthes brevipes* AG. var. *angustata* (GREV.) CLEVE
16 a, b.	*Achnanthes fredskildii* nov. spec.

Scales 10 μ

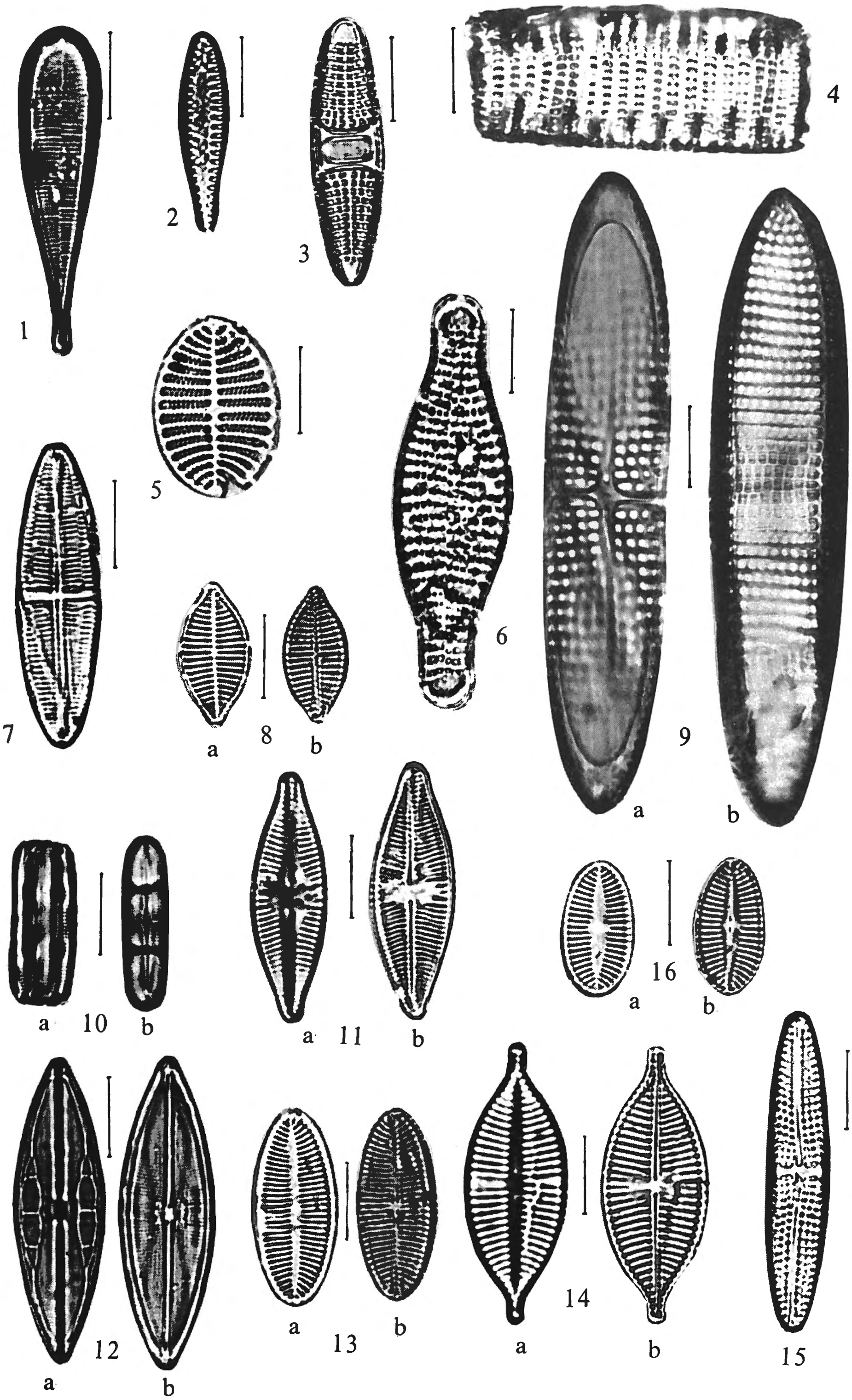
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Plate III

1. *Pleurosigma angulatum* (Queckett) W. Smith
2. *Stauroneis phoenicenteron* (Nitzsch) Ehr.
3. *Stauroneis anceps* Ehr.
4. *Stauroneis javanica* (Grun.) Cleve fo. *lapponica* Hust.
5. *Stauroneis smithii* Grun. var. *incisa* Pant.
6. *Anomoeoneis sphaerophora* (Kütz.) Pfitzer
7. *Neidium iridis* (Ehr.) Cleve
8. *Neidium iridis* fo. *vernalis* Reichelt
9. *Neidium iridis* fo. *crassiusculum* fo. nov.
10. *Neidium temperei* Reimer

Scales 10 μ

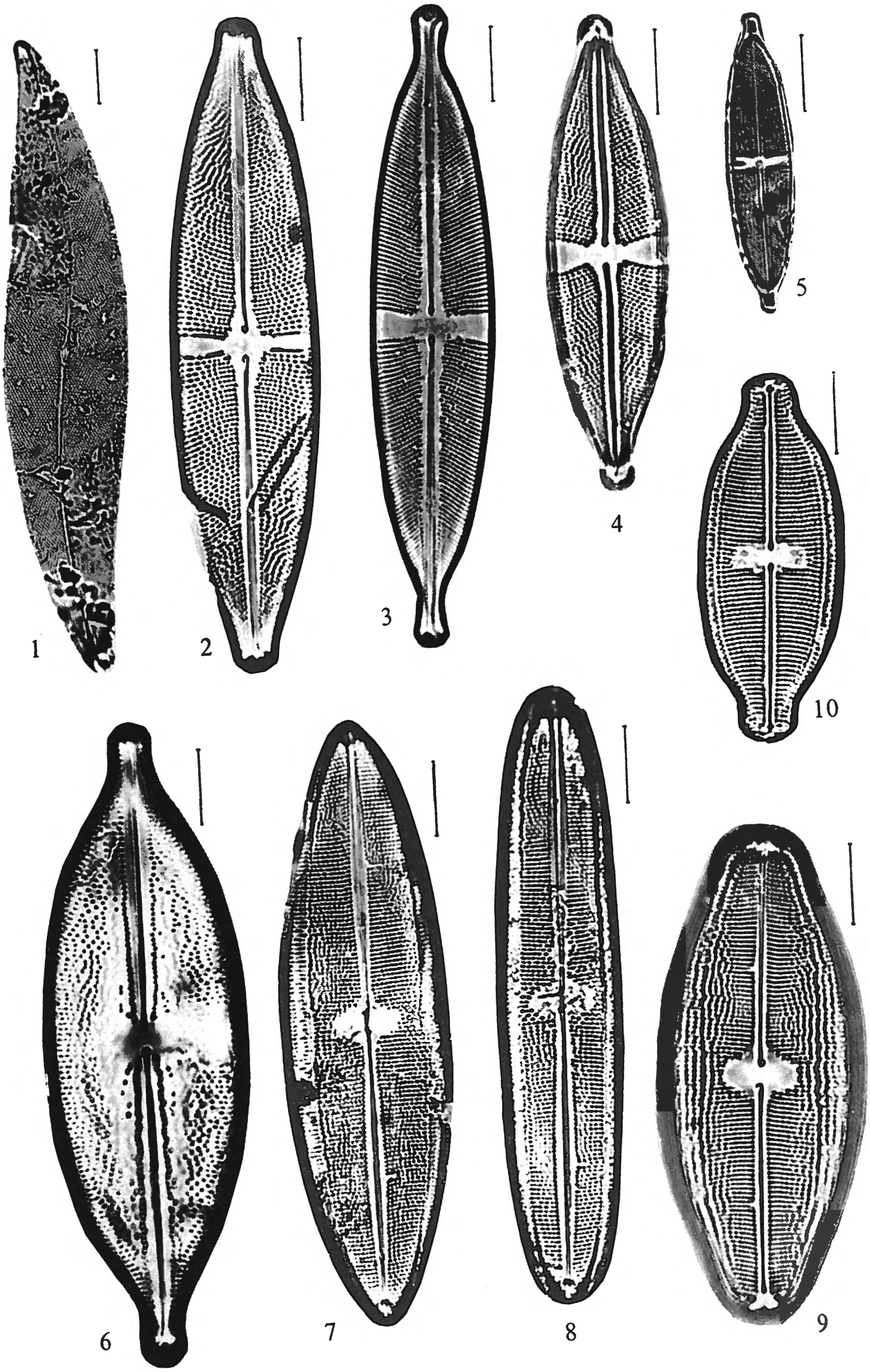
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Plate IV

1. *Caloneis obtusa* (W. SMITH) CLEVE
2. *Caloneis obtusa* (W. SMITH) CLEVE
3. *Diploneis crabro* EHR. var. *panduro* (BRÉB.) CLEVE
4. *Diploneis crabro* var. *expleta* (A.S.) CLEVE
5. *Diploneis incurvata* (GREG.) CLEVE
6. *Diploneis splendida* (GREG.) CLEVE
7. *Diploneis interrupta* (KÜTZ.) CLEVE
8. *Diploneis didyma* EHR.
9. *Diploneis fusca* (GREG.) CLEVE var. *hyperborea* (GRUN.) HUST.
10. *Diploneis litoralis* (DONK.) CLEVE
11. *Diploneis pseudovalis* HUST.
12. *Diploneis ovalis* (HILSE) CLEVE var. *oblongella* (NAEG.) CLEVE

Scales 10 μ

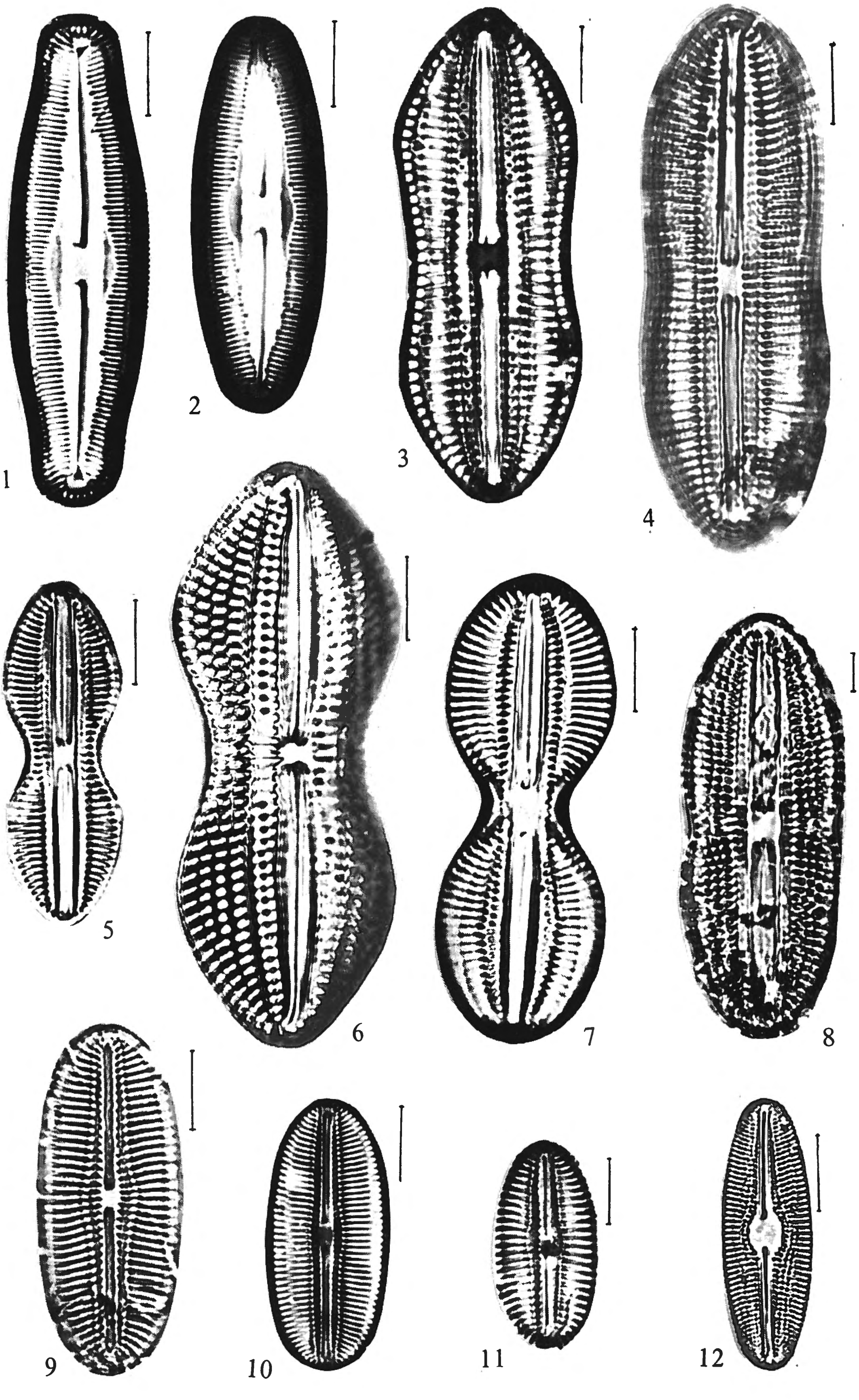
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Plate V

1. *Navicula digitoradiata* (GREG.) A. SCHMIDT
2. *Navicula vulpina* KÜTZ.
3. *Navicula peregrina* (EHR.) KÜTZ. var. *kefvingensis* (EHR.) CLEVE
4. *Navicula rhynchocephala* KÜTZ.
5. *Navicula meniscus* SCHUM.
6. *Navicula wittrockii* (LAGERST.) CLEVE
7. *Navicula wittrockii* (LAGERST.) CLEVE
8. *Navicula gothlandica* GRUN.
9. *Navicula arenaria* DONK.
10. *Navicula cincta* (EHR.) KÜTZ.
11. *Navicula subapiculata* (GRUN.) HUST.
12. *Navicula cryptocephala* KÜTZ.
13. *Navicula transistans* CLEVE
14. *Navicula transistans* CLEVE
15. *Navicula transistans* CLEVE

Scales 10 μ

Plate V

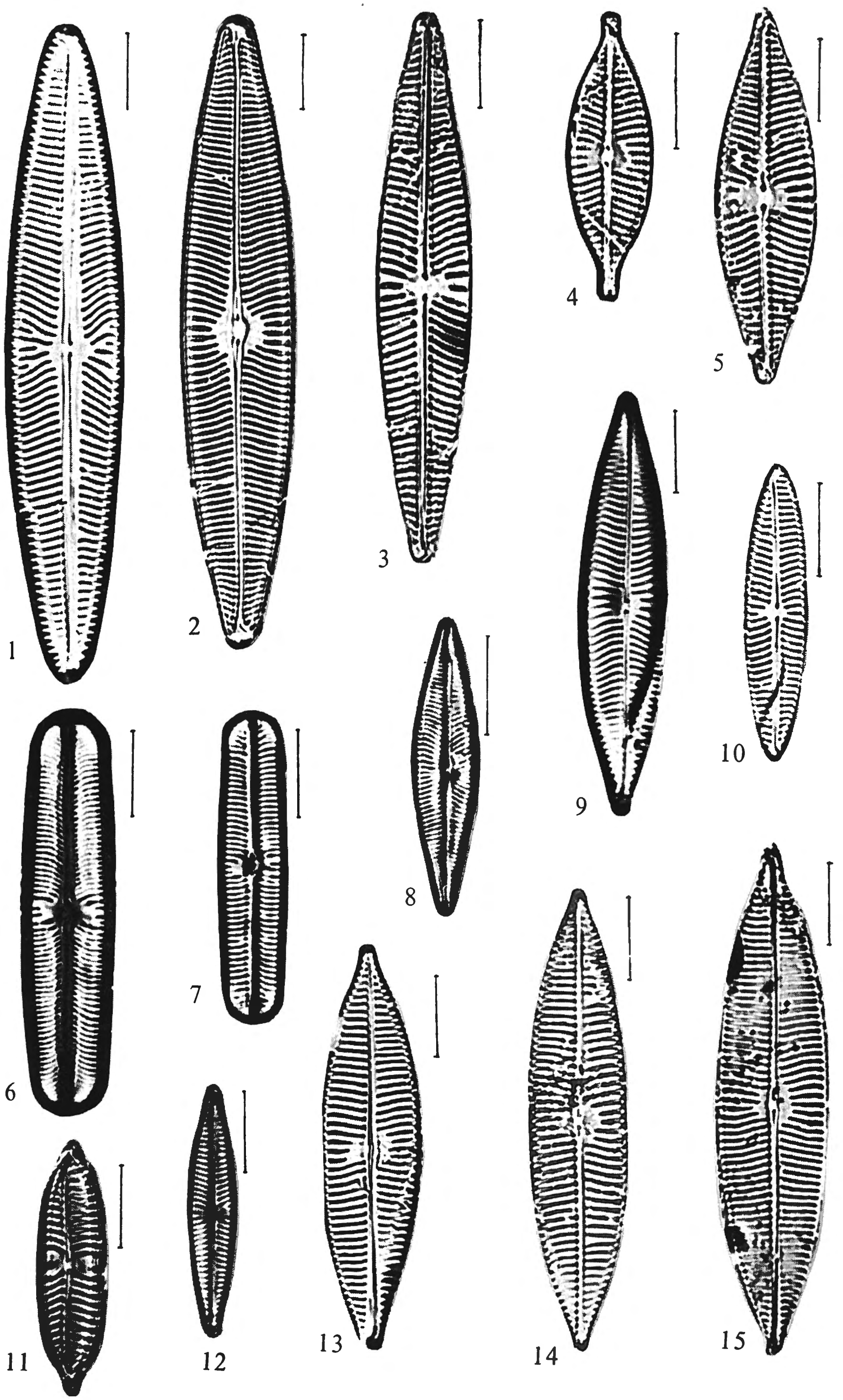

Plate VI

1. *Navicula cancellata* DONK.
2. *Navicula palpebralis* BRÉB.
3. *Navicula cruciculoides* BROCKMANN
4. *Navicula abiskoensis* HUST.
5. *Navicula subinflata* GRUN.
6. *Navicula pygmaea* KÜTZ.
7. *Navicula dissipata* HUST.
8. *Navicula ramosissima* (AG.) CLEVE
9. *Navicula charlatii* PERAG.
10. *Navicula forcipata* GREV.
11. *Navicula humerosa* BRÉB.
12. *Pinnularia viridis* (NITZSCH) EHR.
13. *Pinnularia viridis* (NITZSCH) EHR.
14. *Pinnularia viridis* (NITZSCH) EHR.
15. *Pinnularia microstauron* (EHR.) CLEVE
16. *Pinnularia microstauron* var. *brébissonii* (KÜTZ.) HUST.

Scales 10 μ

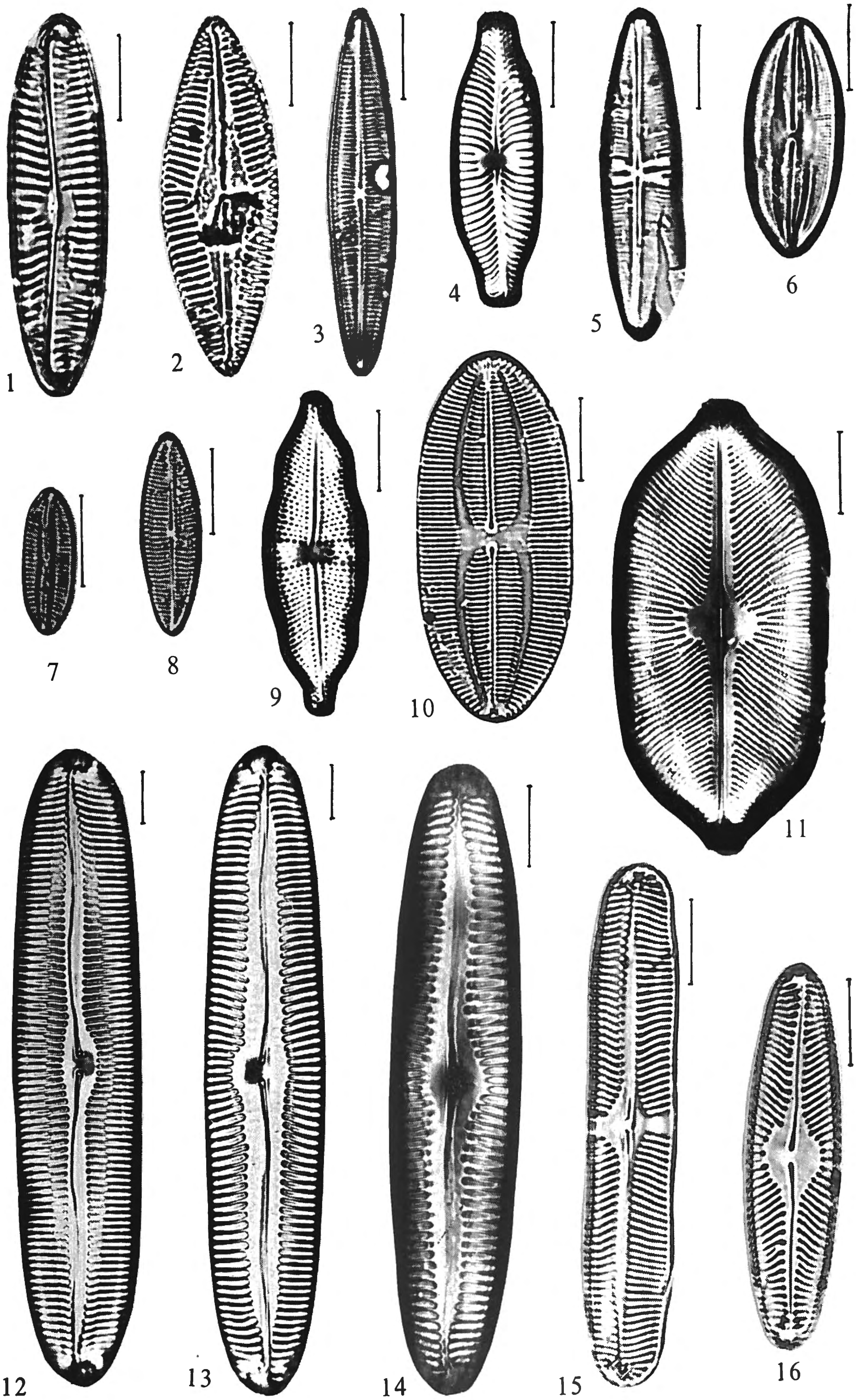
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Plate VII

1. *Pinnularia islandica* ØSTRUP
2. *Pinnularia divergens* W. SMITH var. *linearis* ØSTRUP
3. *Pinnularia hemiptera* (KÜTZ.) CLEVE
4. *Pinnularia pulchra* ØSTRUP
5. *Pinnularia quadratarea* (A. SCHMIDT) CLEVE
6. *Pinnularia microstauron* (EHR.) CLEVE var. *brébissonii* (KÜTZ.) HUST. fo. *diminuta* GRUN.
7. *Cymbella cistula* (HEMPR.) "Erstlingzelle".
8. *Cymbella angustata* (W. SMITH) CLEVE
9. *Cymbella obtusa* GREG.
10. *Cymbella incerta* GRUN.
11. *Amphora proteus* GREG.
12. *Amphora proteus* GREG.
13. *Cymbella austriaca* GRUN.
14. *Cymbella leptoceros* (EHR.?) GRUN.
15. *Cymbella hebridica* (GREG.) GRUN.
16. *Cymbella gracilis* (RABH.) CLEVE
17. *Amphiprora paludosa* W. SMITH

Scales 10 μ

PLATE VII

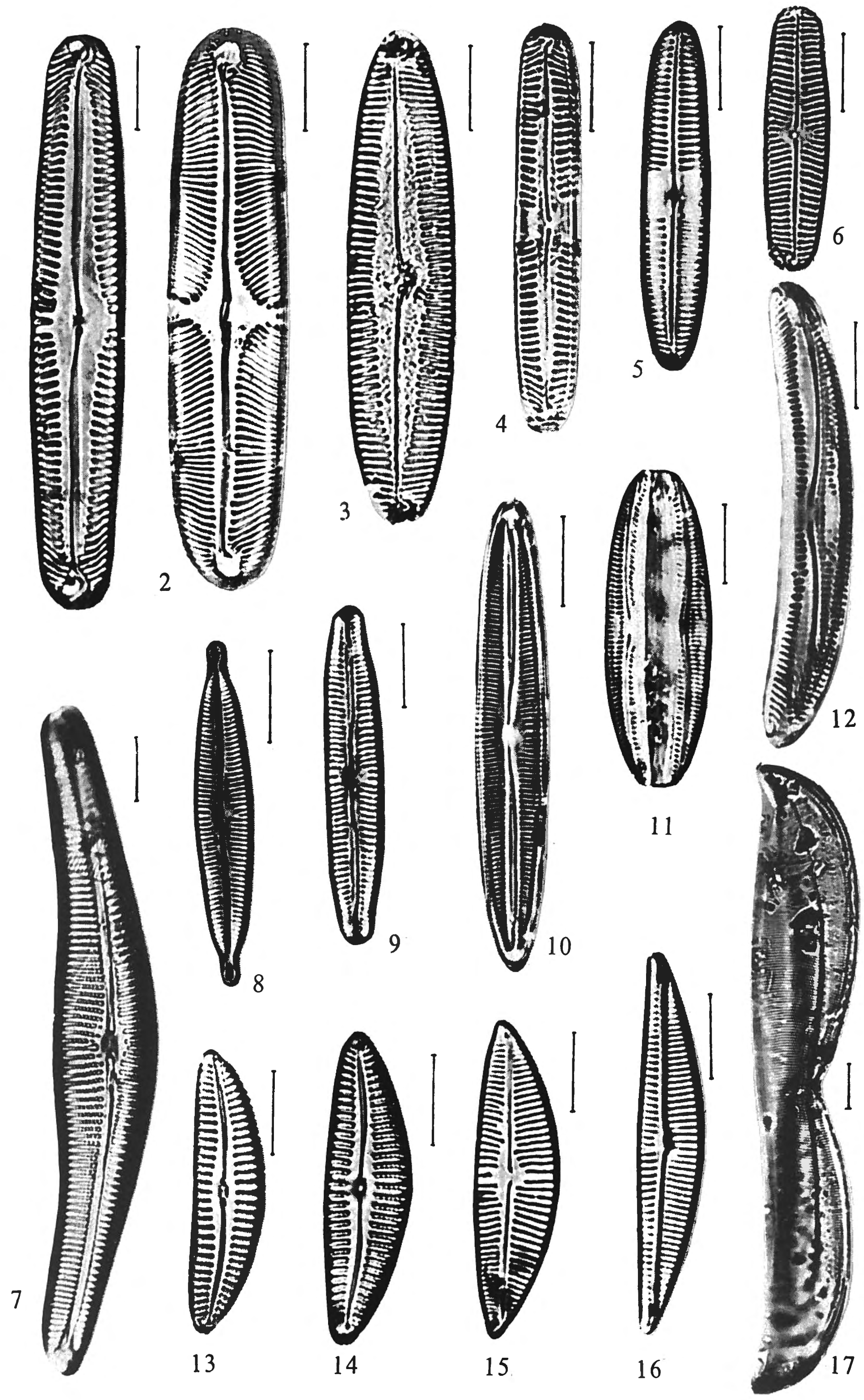
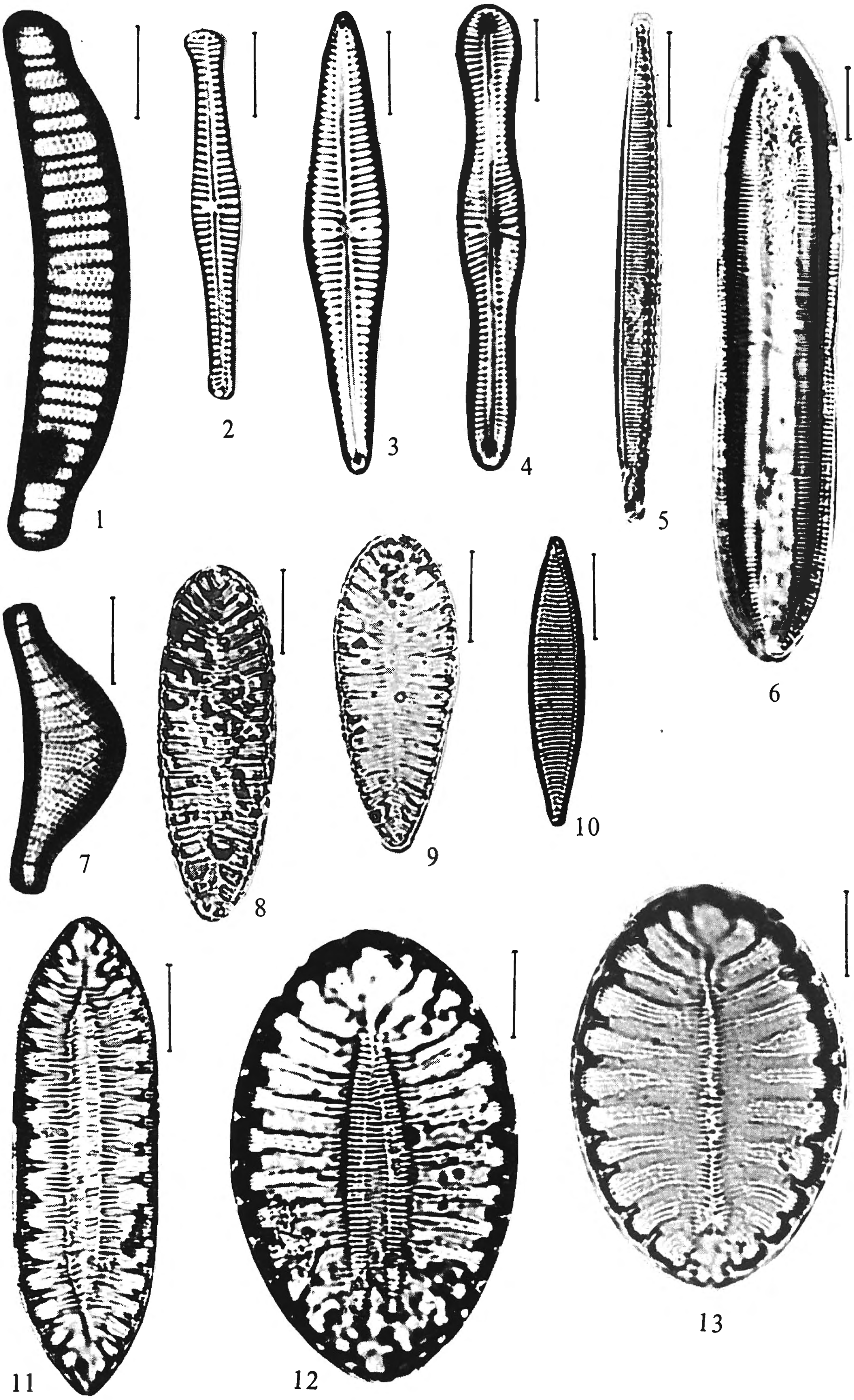


Plate VIII

1. *Epithemia zebra* (EHR.) KÜTZ. var. *saxonica* (KÜTZ.) GRUN.
2. *Gomphonema subtile* EHR.
3. *Gomphonema lanceolatum* EHR. var. *insignis* (GREG.) CLEVE
4. *Gomphonema longiceps* EHR.
5. *Nitzschia hollerupensis* FOGED
6. *Nitzschia acuminata* (W. SMITH) GRUN.
7. *Epithemia sorex* KÜTZ.
8. *Surirella ovata* KÜTZ.
9. *Surirella ovata* KÜTZ.
10. *Nitzschia angusta* (W. SMITH) GRUN. var. *acuta* GRUN.
11. *Surirella amphioxys* W. SMITH
12. *Surirella fastuosa* (EHR.) KÜTZ.
13. *Surirella armoricana* PERAG.

Scales 10 μ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